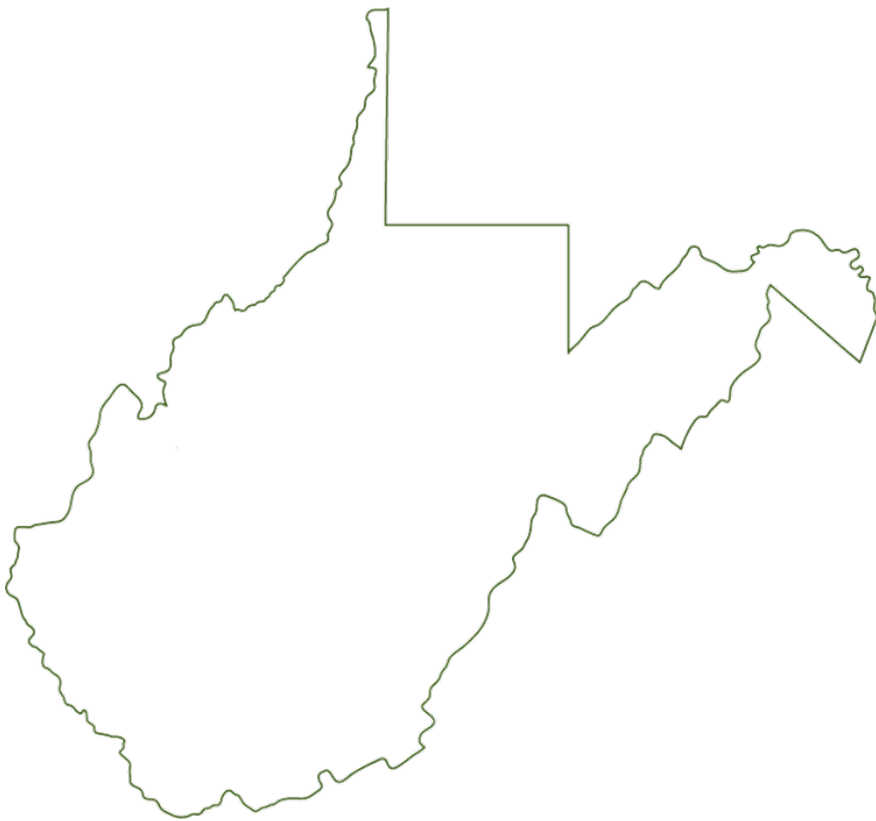


2012

Health Care in West Virginia: A Workforce Analysis



The West Virginia Rural Health Association
with data analysis by the
West Virginia Rural Health Research Center
October 2012



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Health Care in West Virginia: A Workforce Analysis

Introduction

The West Virginia Rural Health Association (WVRHA) is a non-profit 501(c)(3) organization with a volunteer Board of Directors elected from healthcare organizations and individuals from around the state. The WVRHA advocates for empowering all West Virginians to advance their quality of life, well-being and access to excellence in rural health care.

In 2011, the WVRHA Board of Directors determined that West Virginia lacked sufficient workforce data on healthcare professionals. As a result, the WVRHA developed a strategy to complete a statewide rural health workforce plan that included as its first phase the collection of data to quantify both the supply and demand for rural health professionals over the next decade. The data compiled would then be used as basis for convening a statewide rural health workforce task force to develop recommendations for state leaders.

The Problem

West Virginia is the third most rural state in the nation based on the percentage of residents living in non-metropolitan areas with populations less than 2,500 people. Fifty of West Virginia's 55 counties are federally designated, either in part or full, as Health Professional Shortage Areas or Medically Underserved Areas. Poverty and chronic health disease are endemic in the state, with higher than average rates, especially in the southern rural counties. Our state also has higher than average obesity rates, tobacco use and high risk behavior indices. Finally, West Virginia has one of the nation's oldest populations, which increases demand for additional geriatric and primary care services.

Also, the rural health professions education and training landscape in West Virginia recently underwent significant restructuring with the ending of the West Virginia Rural Health Education Partnerships Program and the launch of the new Rural Health Initiative programs at the state's three academic health centers. This transition has provided both challenges and opportunities statewide as the state continues to grapple with identifying the most effective methods for training health professional students in rural areas, and subsequently attracting them to, and retaining them in rural practice settings.

The Patient Protection and Affordable Care Act (PPACA) greatly impacts the healthcare landscape in West Virginia. When fully implemented, PPACA will require most Americans to have insurance, including an estimated 300,000 newly insured West Virginians. West Virginia has been coping with shortages of primary care health professionals for a long time. Over the years, the state has studied and implemented several programs and policies related to

eliminating the primary care shortages. But with changing practice and payment models, the continued high chronic care disease rates, the aging of West Virginia's population, and the increasing demand for primary care professionals, our state can expect a new wave of demand and shortages of primary care professionals. West Virginia is not alone. Several rural health associations and state governments around the country are revisiting health workforce issues. The magnitude of the problem in West Virginia is not fully understood, and West Virginia must comprehensively evaluate and act upon options for increasing the numbers of healthcare professionals, particularly for rural areas.

The Plan

In early 2012, the WVRHA contracted with the West Virginia Rural Health Research Center. The Center is assisting the WVRHA with our efforts to evaluate the state of the rural healthcare workforce in West Virginia. The report that follows includes data and analysis for the following healthcare professions:

- ❖ Nurses
- ❖ Nurse Practitioners
- ❖ Licensed Practical Nurses
- ❖ Dentists
- ❖ Dental Hygienists
- ❖ Physicians
- ❖ Physician Assistants
- ❖ Pharmacists

The next phase of our plan includes:

- ❖ Convening a broad-based statewide rural health workforce task force to oversee the development of a state healthcare workforce plan;
- ❖ Analysis of healthcare profession demand data (by the West Virginia Rural Research Center); and
- ❖ Conducting four workforce project forums around the state to share what we have learned so far, and to gain insight and support as we move forward.

One strength West Virginia possesses is its willingness to collaborate. Initial partners in this effort include:

- ❖ West Virginia Department of Health and Human Resources (DHHR Secretary's Office), and the Department's Bureau for Public Health, Office of Community Health Systems and Health Promotion, Division of Rural Health and Recruitment;

- ❖ West Virginia Higher Education Policy Commission;
- ❖ West Virginia School of Osteopathic Medicine; and
- ❖ West Virginia University, Charleston Division.

The WVRHA hopes that other organizations and individuals will recognize the need to develop a statewide rural health workforce plan to better serve the needs of West Virginians and improve their access to health care by trained professionals. We invite you to join us in these crucial efforts.

Data Sources and Analysis

In March 2012, the WVRHA requested licensure data from the following licensing boards in West Virginia:

West Virginia Board of Examiners for Registered Professional Nurses (RNs and APRNs)

West Virginia Board of Examiners for Licensed Practical Nurses (LPNs)

West Virginia Board of Dentistry (DMD, DDS, and hygienists)

West Virginia Board of Osteopathic Medicine (DOs and PAs)

West Virginia Board of Medicine (MDs and PAs)

West Virginia Board of Pharmacy (Pharmacists and pharmacy business locations)

All boards were notified that the West Virginia Rural Health Association, in collaboration with the West Virginia Rural Health Research Center (WVRHRC), was undertaking a study of the supply and demand of rural health care providers. To assist with this study, boards were requested to provide the following de-identified data if available:

Workplace County

Workplace City

Workplace Zip

Residence County

Residence City

Residence Zip

Boards were requested to provide the most recent data for their licensees. All boards complied with this request. Payments required by boards for data access were provided from grant funds.

Once data from all boards was received, the WVRHRC undertook data cleaning and analysis activities. All boards collect different information from their licensees. The WVRHRC

used data that was available to identify the county of work for all licensees, with the exception of Pharmacists. The Board of Pharmacy could only provide residence data. Pharmacy business locations were provided; however, there was no way to match providers to their pharmacy work location. Therefore, data presented in this report for Pharmacists indicate place of residence only, and should be interpreted with caution.

For all provider types, a series of four analyses were completed by the WVRHRC and will be presented in this report. In addition, the West Virginia Higher Education Policy Commission provided data regarding training programs in the state for each profession, including the numbers of graduates. These tables appear first in each report section. Next, tables of frequency by county and Workforce Investment Area in West Virginia by provider type are presented. A map of frequency of provider by county is then provided. Then a map of provider frequency by Workforce Investment Area is presented. Finally, a map of density of providers as compared to national averages for density per 10,000 residents for that profession is provided. In these density maps, colors indicate the relationship of the density of providers by county to the national average density per 10,000 residents. In these maps, yellow indicates the county is within 20% of the national average for density. Green indicates that the county is above national average for density per 10,000 residents. Increasingly intense red colors indicate the level below the density of providers per county per 10,000 residents and the national average.

Limitations

This report has several limitations. First, all data is self reported by licensees to their licensure board and only reflect data at the time of re-licensure with each licensing board. Next, data were provided for this analysis by each licensing board. Missing data could impact the results of these analyses. For national density comparisons, every attempt was made to use the most up to date estimates available from national organizations. However, some estimates are two years old, and may not be reflective of current density numbers nationally. Shortages noted in this report have many explanations, including the inter-relatedness of certain professions (e.g. Dentists and Dental Hygienists, Physicians and Physician Assistants) and practice patterns within communities. Specialty practice data are not available from every licensing board, so no information about specialty shortages is included in this report. Finally, the health care workforce should be considered as a sum of its parts. Consideration of shortages at the county level in one profession should be considered in light of the total workforce available to provide care.

Results

Data for the following provider types will be presented:

Registered Nurses

Advanced Practice Registered Nurses: Nurse Practitioners and Nurse Anesthetists

Licensed Practical Nurses

Dentists

Dental Hygienists

Doctors of Osteopathic Medicine (DO)

Medical Doctors (MD)

Physician Assistants registered with the West Virginia Board of Osteopathic Medicine

Physician Assistants registered with the West Virginia Board of Medicine

Pharmacists

Registered Nurses

West Virginia training programs for Registered Nurses are found in **Table 1**. The numbers of Registered Nurses employed in each West Virginia county at the time of licensure renewal in October 2011 is found in **Table 2**. County populations for 2011 and the workforce region for each county are noted for reference. The highest numbers of registered nurses are employed in Cabell, Kanawha, Monongalia and Raleigh Counties. Counties with the lowest numbers of Registered Nurses employed include Clay, Doddridge and Wirt Counties.

Table 1: WV Registered Nurse training programs

West Virginia Nursing Programs				
<i>Data provided by the West Virginia Higher Education Policy Commission*</i>				
Degree	Institution	County	Workforce Region	2010-11 Degrees Conferred**
Undergraduate Certificate	New River Community and Technical College	Raleigh	1	1
Associate	Bluefield State College	Mercer	1	39
Associate	Blue Ridge Community & Technical College	Berkeley	7	6
Associate	Davis and Elkins College	Randolph	6	39
Associate	Eastern West Virginia Community & Technical College	Hardy	7	0
Associate	Fairmont State University	Marion	6	101
Associate	Kanawha Valley Community & Technical College	Kanawha	3	84
Associate	Marshall University	Cabell	2	85
Associate	Southern West Virginia Community and Technical College	Logan	2	60
Associate	University of Charleston	Kanawha	3	18
Associate	West Virginia Northern Community College	Ohio	5	68
Associate	West Virginia University at Parkersburg	Wood	4	71
Baccalaureate	Alderson-Broaddus College	Barbour	6	18
Baccalaureate	Bluefield State College	Mercer	1	19
Baccalaureate	Fairmont State University	Marion	6	19
Baccalaureate	Marshall University	Cabell	2	93
Baccalaureate	Mountain State University***	Raleigh	1	349
Baccalaureate	Shepherd University	Jefferson	7	43
Baccalaureate	University of Charleston	Kanawha	3	18
Baccalaureate	West Virginia Wesleyan University	Upshur	6	15
Baccalaureate	West Virginia University	Fayette, Kanawha, Monongalia	1, 3, 6	232
Baccalaureate	Wheeling Jesuit University	Ohio	5	20
Master's	Marshall University	Cabell	2	42
Master's	Mountain State University***	Raleigh	1	33
Master's	West Virginia Wesleyan University	Upshur	6	0
Master's	West Liberty University	Ohio	5	34
Master's	West Virginia University	Kanawha, Monongalia	3, 6	37
Master's	Wheeling Jesuit University	Ohio	5	34
Doctoral	West Virginia University	Kanawha, Monongalia	3, 6	12

*Programs listed above only include those programs which report their number of graduates to the West Virginia Higher Education Policy Commission. For a full list of state approved nursing programs, please contact the West Virginia Board of Examiners for Professional Registered Nurses.

**Programs listed with zero degrees conferred are programs that did not confer any degrees in 2010-11. In some cases, these programs may be newly established programs that have not yet conferred degrees.

***On June 28, 2012, the Board of Trustees of the Higher Learning Commission acted to withdraw accreditation from Mountain State University.

Table 2: Number of Registered Nurses employed per WV County, 2011*Data provided by WV Board of Examiners for Registered Professional Nurses*

County	County Population 2011	West Virginia Workforce Region	Registered Nurses (RN) Employed
Barbour	16520	6	85
Berkeley	105750	7	697
Boone	24444	2	94
Braxton	14485	6	79
Brooke	23844	5	113
Cabell	96653	2	1713
Calhoun	7652	4	26
Clay	9357	4	18
Doddridge	8171	6	11
Fayette	45699	1	273
Gilmer	8705	6	22
Grant	11891	7	131
Greenbrier	35800	1	306
Hampshire	23812	7	61
Hancock	30571	5	179
Hardy	13912	7	24
Harrison	69436	6	1070
Jackson	29241	4	157
Jefferson	54225	7	273
Kanawha	192315	3	4151
Lewis	16416	6	234
Lincoln	21550	2	23
Logan	36457	2	343
Marion	21729	6	416
Marshall	56586	5	189
Mason	32800	4	126
McDowell	27298	1	97
Mercer	62465	1	587
Mineral	28192	7	118
Mingo	26563	2	87
Monongalia	98528	6	1940
Monroe	13534	1	28
Morgan	17535	7	48
Nicholas	26268	1	167
Ohio	44246	5	744
Pendleton	7673	7	30
Pleasants	7611	4	22

Pocahontas	8786	1	40
Preston	33723	6	126
Putnam	56008	2	284
Raleigh	79127	1	1099
Randolph	29465	6	337
Ritchie	10295	4	28
Roane	14858	4	71
Summers	13867	1	58
Taylor	16916	6	75
Tucker	7021	6	36
Tyler	9121	5	43
Upshur	24322	6	176
Wayne	42126	2	83
Webster	9143	1	42
Wetzel	16351	5	97
Wirt	5762	4	6
Wood	87120	4	848
Wyoming	23419	1	29

The frequency of Registered Nurses employed in each West Virginia county at the time of 2011 licensure renewal is found below in **Figure 1**. **Figure 2** demonstrates the frequency of Registered Nurses employed by West Virginia Workforce Investment Area. The Workforce Investment Areas with the highest numbers of Registered Nurses employed include Regions 3 and 6, and the lowest numbers of Registered Nurses employed include Regions 4 and 5.

Figure 1: Registered Nurses employed by county, 2011

Data provided by WV Board of Examiners for Registered Professional Nurses

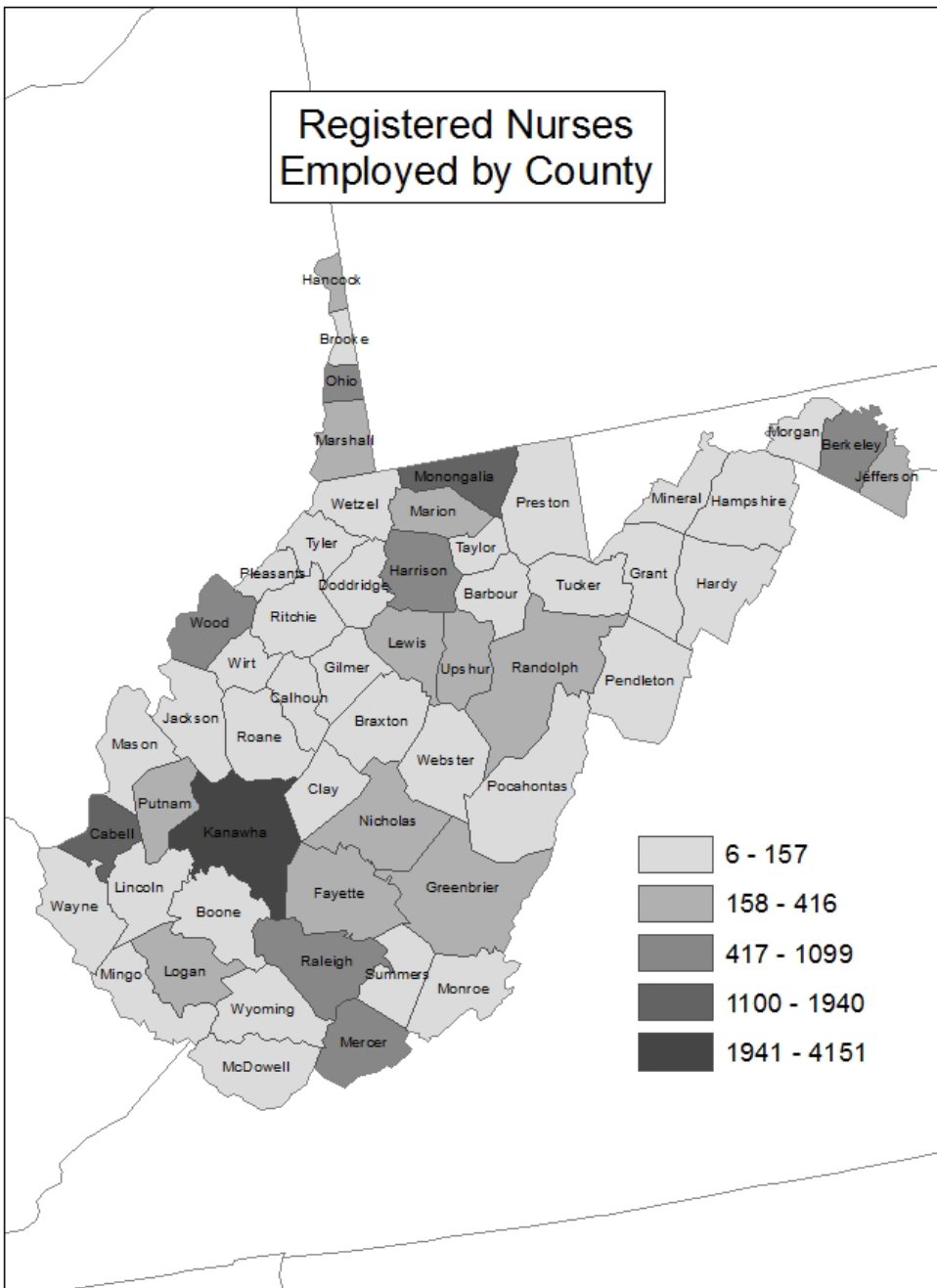
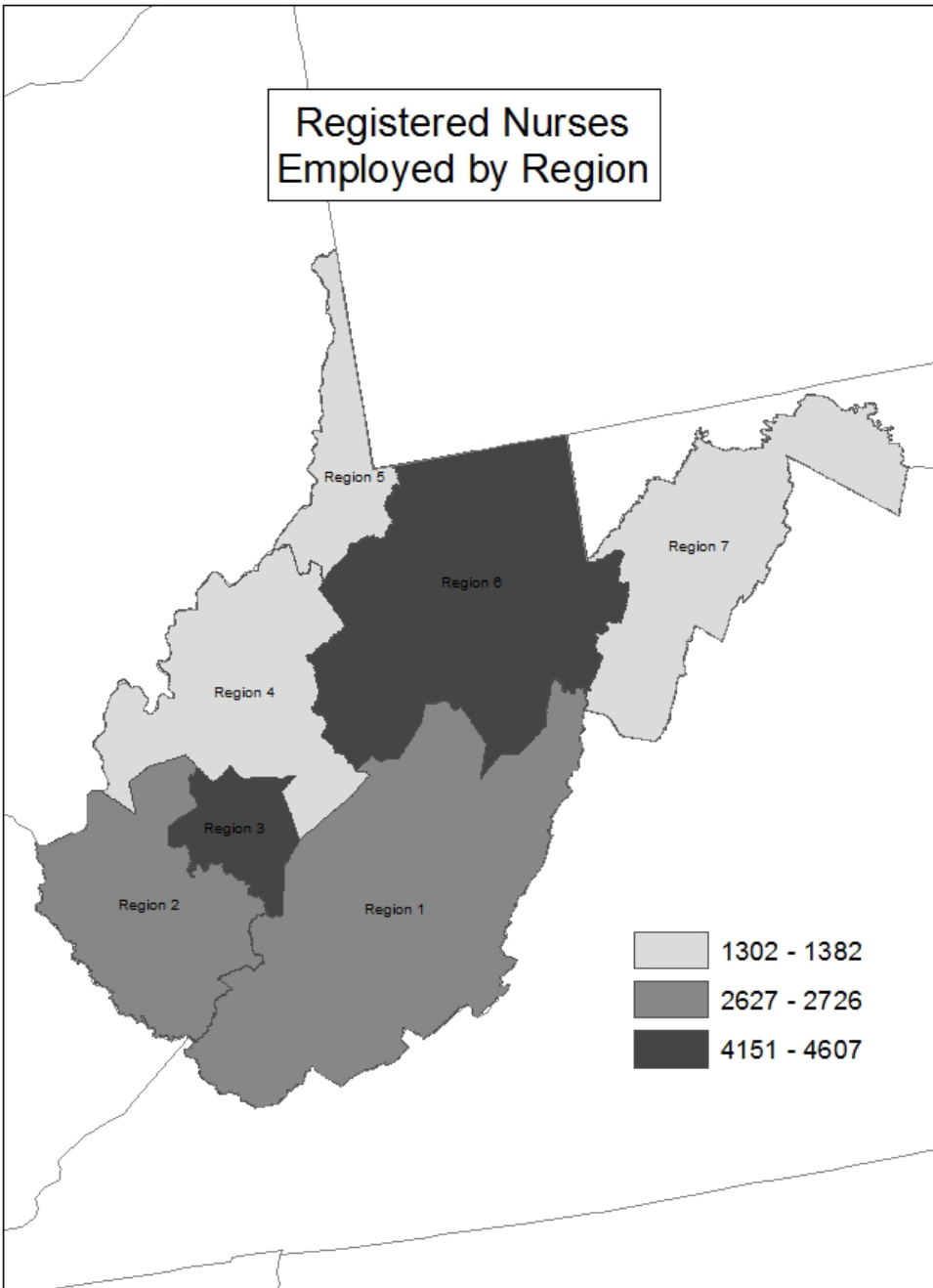


Figure 2: Registered Nurses employed by Workforce Investment Area, 2011

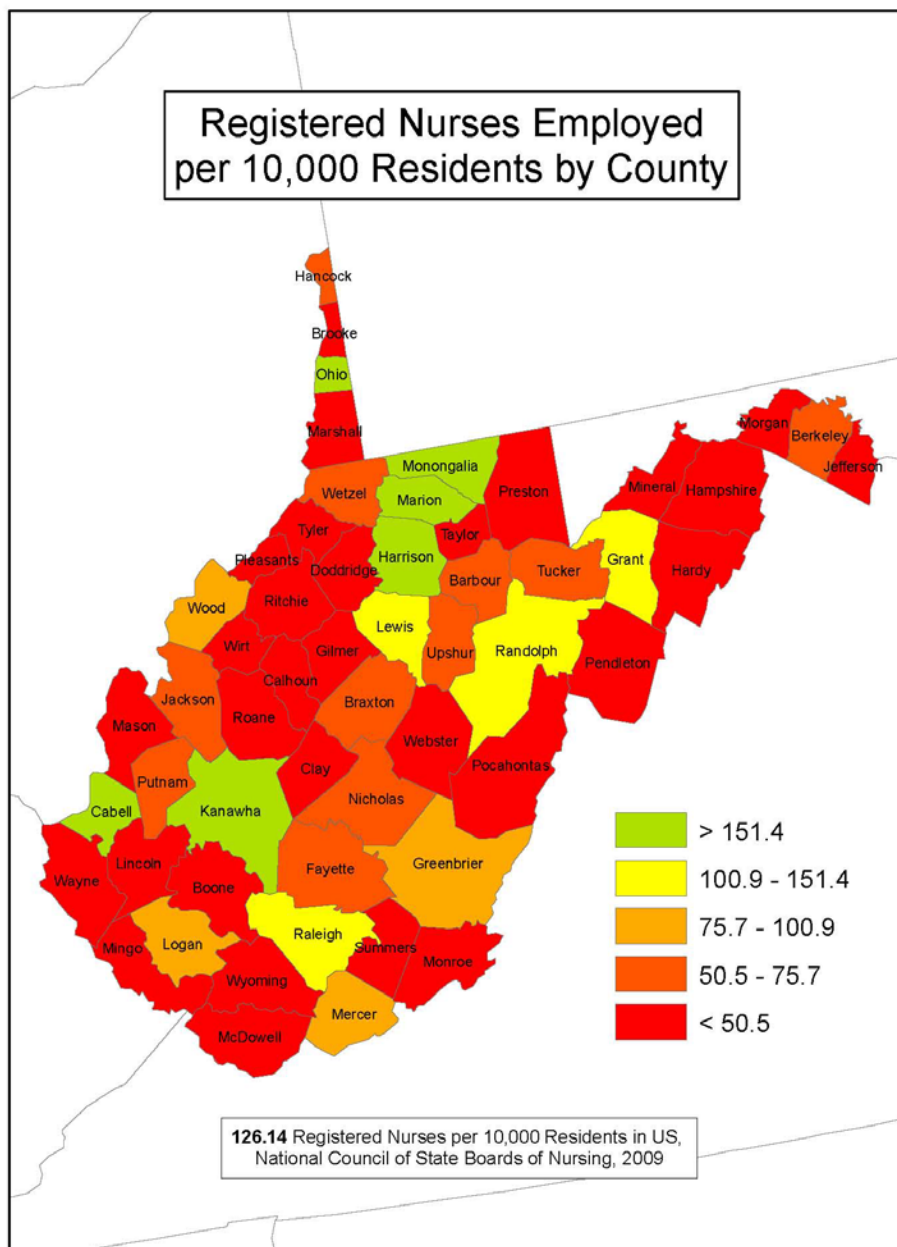
Data provided by WV Board of Examiners for Registered Professional Nurses



A comparison of expected density of providers by county population as compared to national averages can assist planners in identifying which counties fall below national averages. **Figure 3** demonstrates the density of registered nurses by county as compared to national average density per 10,000 population. Six counties (Kanawha, Cabell, Harrison, Monongalia, Marion, and Ohio) are above the national average for density per 10,000 population. Four counties (Grant, Randolph, Lewis, and Raleigh) are within 20% of the national average for density per 10,000 population. All other county densities are below the national average for density per 10,000 population.

Figure 3: Density of Registered Nurses by county as compared to national average density per 10,000 population

Data provided by WV Board of Examiners for Registered Professional Nurses



Advanced Practice Registered Nurses: Nurse Practitioners and Certified Registered Nurse Anesthetists

Training programs for Advanced Practice Registered Nurses: Nurse Practitioners are included in Table 1. The number of Advanced Practice Registered Nurses: Nurse Practitioners employed in each West Virginia county at the time of licensure renewal in October 2011 is found in **Table 3**. County populations for 2011 and the workforce region for each county are noted for reference. The highest numbers of Nurse Practitioners are employed in Cabell, Kanawha and Monongalia Counties. Two counties (Gilmer and Wyoming) had no Nurse Practitioners employed as of the 2011 licensure renewal period.

Table 3: Number of Advanced Practice Registered Nurses/Nurse Practitioners employed per WV County

Data provided by WV Board of Examiners for Registered Professional Nurses

County	County Population 2011	West Virginia Workforce Region	Advanced Practice Registered Nurses (APRN) Employed
Barbour	16520	6	9
Berkeley	105750	7	25
Boone	24444	2	7
Braxton	14485	6	4
Brooke	23844	5	5
Cabell	96653	2	101
Calhoun	7652	4	5
Clay	9357	4	8
Doddridge	8171	6	2
Fayette	45699	1	19
Gilmer	8705	6	0
Grant	11891	7	5
Greenbrier	35800	1	19
Hampshire	23812	7	4
Hancock	30571	5	8
Hardy	13912	7	9
Harrison	69436	6	33
Jackson	29241	4	14
Jefferson	54225	7	12
Kanawha	192315	3	194
Lewis	16416	6	1
Lincoln	21550	2	5

Logan	36457	2	27
Marion	21729	6	18
Marshall	56586	5	2
Mason	32800	4	12
McDowell	27298	1	6
Mercer	62465	1	48
Mineral	28192	7	5
Mingo	26563	2	10
Monongalia	98528	6	122
Monroe	13534	1	4
Morgan	17535	7	2
Nicholas	26268	1	11
Ohio	44246	5	35
Pendleton	7673	7	3
Pleasants	7611	4	2
Pocahontas	8786	1	1
Preston	33723	6	10
Putnam	56008	2	13
Raleigh	79127	1	80
Randolph	29465	6	15
Ritchie	10295	4	4
Roane	14858	4	4
Summers	13867	1	1
Taylor	16916	6	4
Tucker	7021	6	1
Tyler	9121	5	1
Upshur	24322	6	7
Wayne	42126	2	3
Webster	9143	1	6
Wetzel	16351	5	4
Wirt	5762	4	3
Wood	87120	4	52
Wyoming	23419	1	0

The frequency of Nurse Practitioners employed in each West Virginia county at the time of 2011 licensure renewal is found below in **Figure 4**. **Figure 5** demonstrates the frequency of Registered Nurses employed by West Virginia Workforce Investment Area. The Workforce Investment Areas with the highest numbers of Nurse Practitioners employed include Regions 1, 3 and 6, and the lowest numbers of Nurse Practitioners employed include Regions 4, 5 and 7.

Figure 4: Advanced Practice Registered Nurses: Nurse Practitioners employed by county, 2011
Data provided by WV Board of Examiners for Registered Professional Nurses

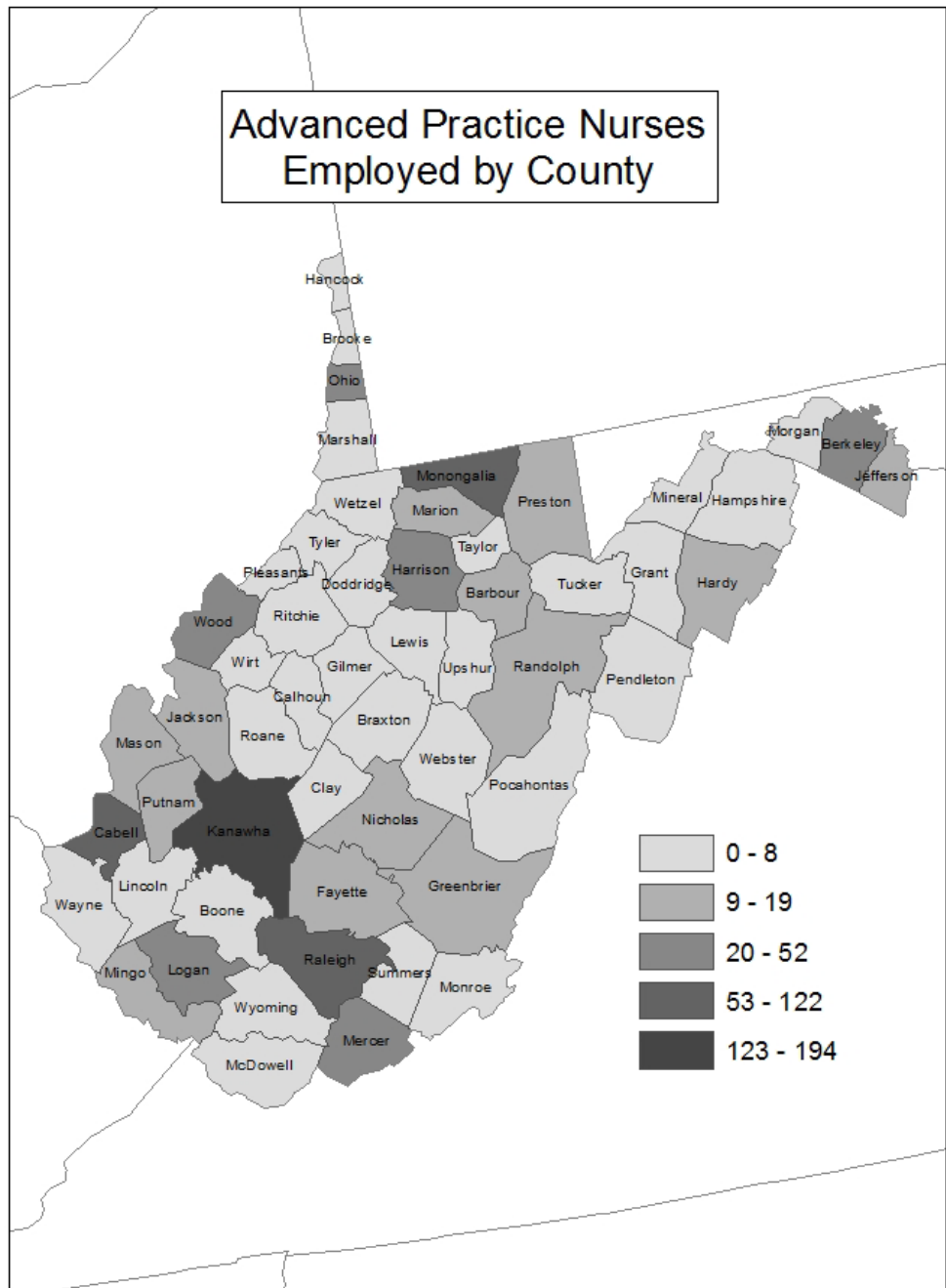


Figure 5: Advanced Practice Registered Nurses: Nurse Practitioners employed by Workforce Investment Area, 2011

Data provided by WV Board of Examiners for Registered Professional Nurses

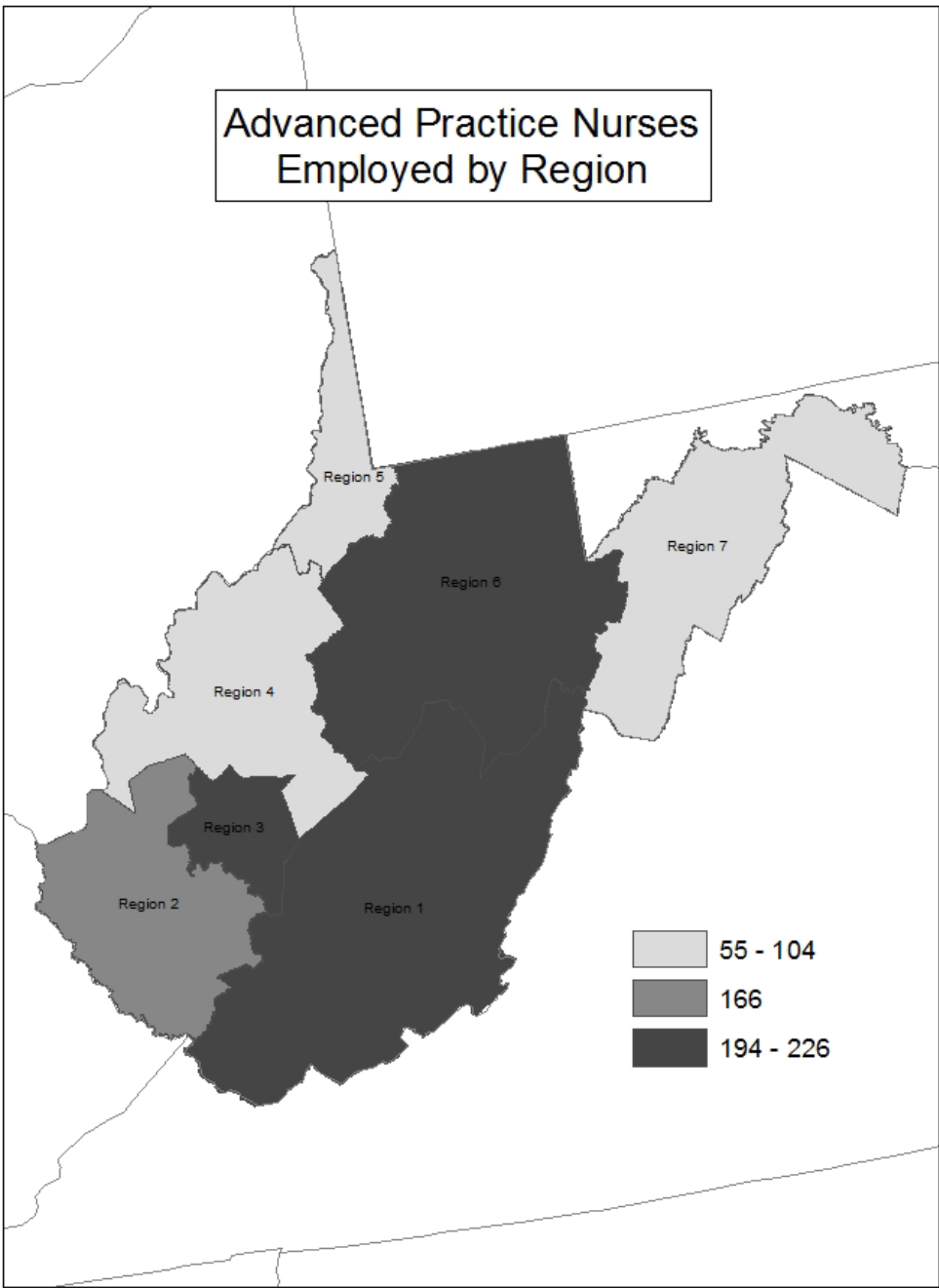
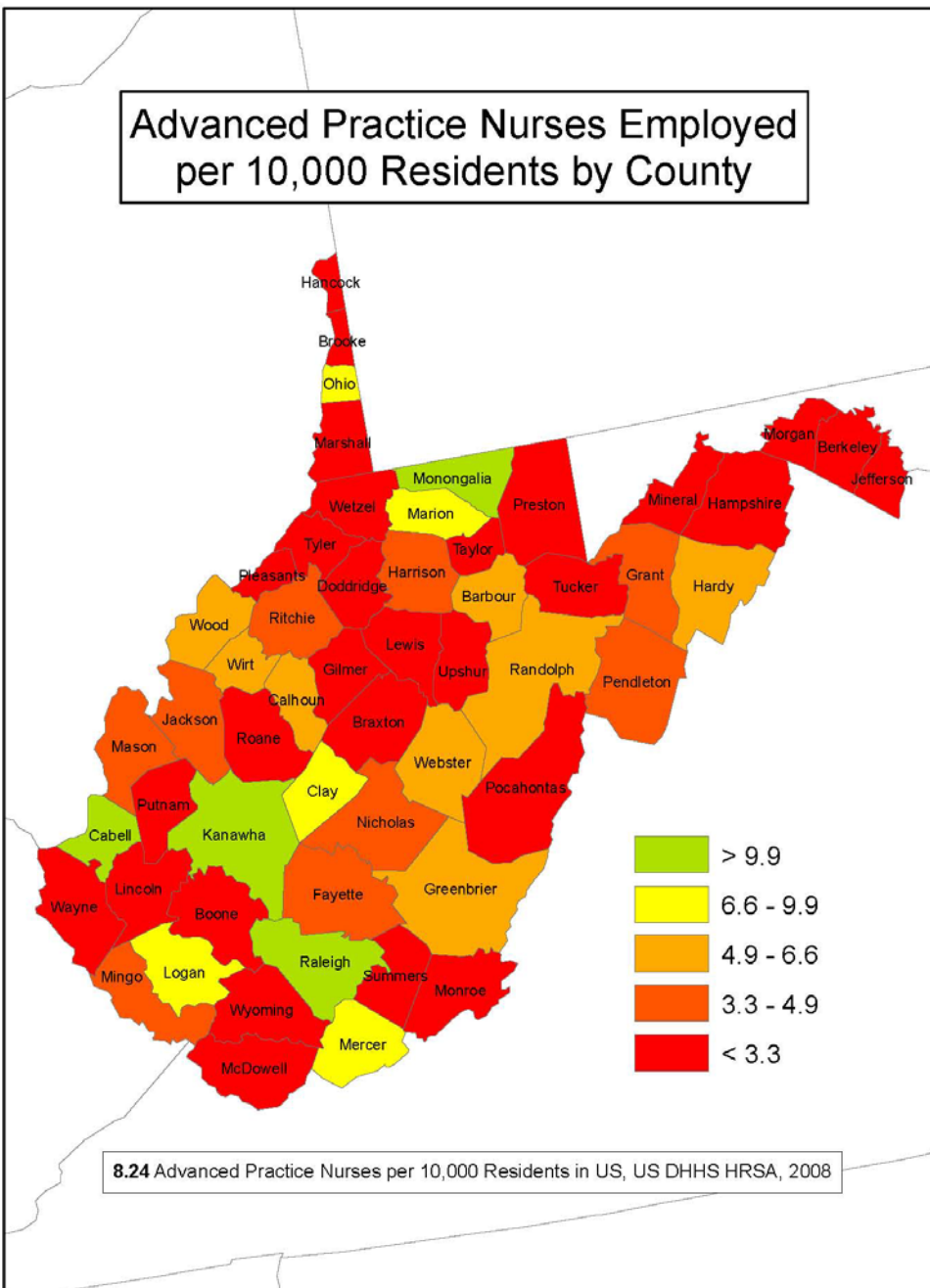


Figure 6 demonstrates the density of Advanced Practice Registered Nurses: Nurse Practitioners by county as compared to national average density per 10,000 population. Four counties (Kanawha, Raleigh, Cabell and Monongalia) are above the national average for density per 10,000 population. Five counties (Ohio, Marion, Clay, Mercer and Logan) are within 20% of the national average for density per 10,000 population. All other county densities are below the national average for density per 10,000 population.

Figure 6: Density of Advanced Practice Registered Nurses: Nurse Practitioners by county as compared to national average density per 10,000 population

Data provided by WV Board of Examiners for Registered Professional Nurses



One training program for Nurse Anesthetists is available in West Virginia, a program at Charleston Area Medical Center in collaboration with Marshall University. Fifty one students graduated from this program in 2011-2012. The number of Certified Registered Nurse Anesthetists employed in each West Virginia county at the time of licensure renewal in October 2011 is found in **Table 4**. County populations for 2011 and the workforce region for each county are noted for reference. The highest numbers of Nurse Anesthetists are employed in Cabell and Kanawha Counties. Twenty five counties have no Nurse Anesthetists who report employment in the county. Nurse Anesthetist practice is typically found in hospitals or outpatient surgery facilities. Practice patterns, surgical case load, and/or absence of those practice sites in particular counties are the most likely reasons for the high number of counties with no Nurse Anesthetists practicing in the county.

Table 4: Number of Certified Registered Nurse Anesthetists employed per WV County

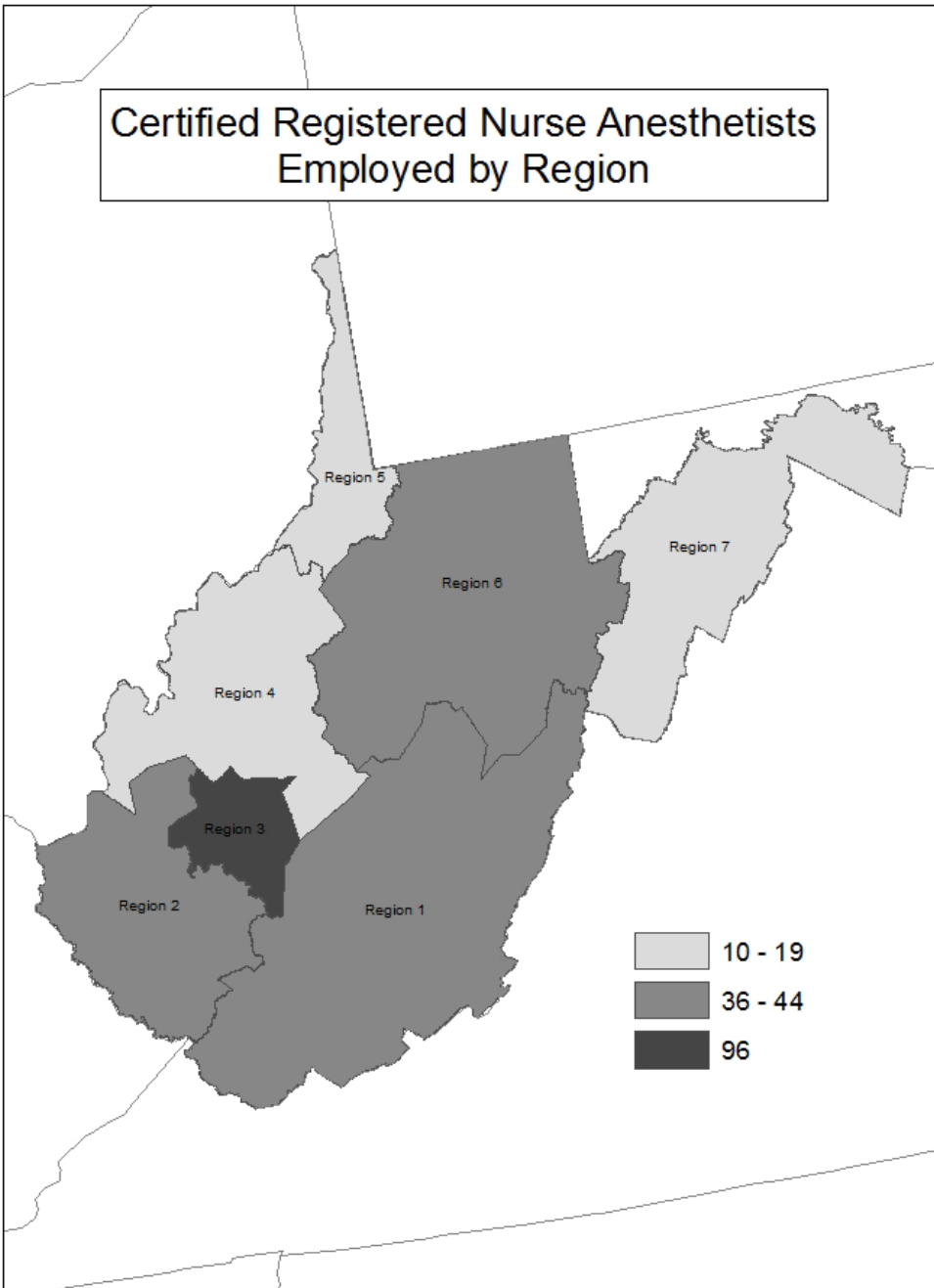
Data provided by WV Board of Examiners for Registered Professional Nurses

County	County Population 2011	West Virginia Workforce Region	Certified Registered Nurse Anesthetists (CRNA) Employed
Barbour	16520	6	0
Berkeley	105750	7	4
Boone	24444	2	0
Braxton	14485	6	1
Brooke	23844	5	1
Cabell	96653	2	32
Calhoun	7652	4	0
Clay	9357	4	0
Doddridge	8171	6	0
Fayette	45699	1	5
Gilmer	8705	6	0
Grant	11891	7	0
Greenbrier	35800	1	8
Hampshire	23812	7	1
Hancock	30571	5	1
Hardy	13912	7	0
Harrison	69436	6	10
Jackson	29241	4	3
Jefferson	54225	7	5
Kanawha	192315	3	96
Lewis	16416	6	3
Lincoln	21550	2	0

Logan	36457	2	2
Marion	21729	6	1
Marshall	56586	5	3
Mason	32800	4	0
McDowell	27298	1	0
Mercer	62465	1	10
Mineral	28192	7	0
Mingo	26563	2	2
Monongalia	98528	6	13
Monroe	13534	1	1
Morgan	17535	7	0
Nicholas	26268	1	5
Ohio	44246	5	14
Pendleton	7673	7	0
Pleasants	7611	4	0
Pocahontas	8786	1	0
Preston	33723	6	2
Putnam	56008	2	2
Raleigh	79127	1	15
Randolph	29465	6	2
Ritchie	10295	4	0
Roane	14858	4	0
Summers	13867	1	0
Taylor	16916	6	1
Tucker	7021	6	0
Tyler	9121	5	0
Upshur	24322	6	3
Wayne	42126	2	4
Webster	9143	1	0
Wetzel	16351	5	0
Wirt	5762	4	0
Wood	87120	4	10
Wyoming	23419	1	0

Figure 8: Certified Registered Nurse Anesthetists employed by region, 2011

Data provided by WV Board of Examiners for Registered Professional Nurses



Licensed Practical Nurses

The number of Licensed Practical Nurses (LPN) employed in each West Virginia county at the time of licensure renewal in 2011 is found in **Table 5**. County populations for 2011 and the workforce region for each county are noted for reference. The highest numbers of LPNs are employed in Cabell, Kanawha, Mercer, Raleigh and Wood Counties. The lowest numbers are in Gilmer and Hardy Counties.

Table 5: Number of Licensed Practical Nurses employed per WV County

Data provided by WV Board of Examiners for Licensed Practical Nurses

County	County Population 2011	West Virginia Workforce Region	Licensed Practical Nurses (LPN) Employed
Barbour	16520	6	78
Berkeley	105750	7	258
Boone	24444	2	50
Braxton	14485	6	40
Brooke	23844	5	35
Cabell	96653	2	483
Calhoun	7652	4	31
Clay	9357	4	30
Doddridge	8171	6	28
Fayette	45699	1	279
Gilmer	8705	6	7
Grant	11891	7	30
Greenbrier	35800	1	198
Hampshire	23812	7	38
Hancock	30571	5	73
Hardy	13912	7	16
Harrison	69436	6	357
Jackson	29241	4	107
Jefferson	54225	7	41
Kanawha	192315	3	573
Lewis	16416	6	64
Lincoln	21550	2	78
Logan	36457	2	186
Marion	21729	6	242
Marshall	56586	5	139
Mason	32800	4	78
McDowell	27298	1	148
Mercer	62465	1	304

Mineral	28192	7	76
Mingo	26563	2	108
Monongalia	98528	6	221
Monroe	13534	1	65
Morgan	17535	7	34
Nicholas	26268	1	157
Ohio	44246	5	107
Pendleton	7673	7	20
Pleasants	7611	4	24
Pocahontas	8786	1	29
Preston	33723	6	102
Putnam	56008	2	148
Raleigh	79127	1	450
Randolph	29465	6	154
Ritchie	10295	4	37
Roane	14858	4	28
Summers	13867	1	107
Taylor	16916	6	73
Tucker	7021	6	33
Tyler	9121	5	19
Upshur	24322	6	121
Wayne	42126	2	101
Webster	9143	1	40
Wetzel	16351	5	54
Wirt	5762	4	26
Wood	87120	4	366
Wyoming	23419	1	173

The frequency of LPNs employed in each West Virginia county at the time of 2011 licensure renewal is found below in **Figure 9**. **Figure 10** demonstrates the frequency of LPNs employed by West Virginia Workforce Investment Area. The Workforce Investment Area with the highest number of LPNs employed is Region 1, and the lowest numbers employed include Regions 3, 4, 5 and 7.

Figure 9: Licensed Practical Nurses employed by county, 2011

Data provided by WV Board of Examiners for Licensed Practical Nurses

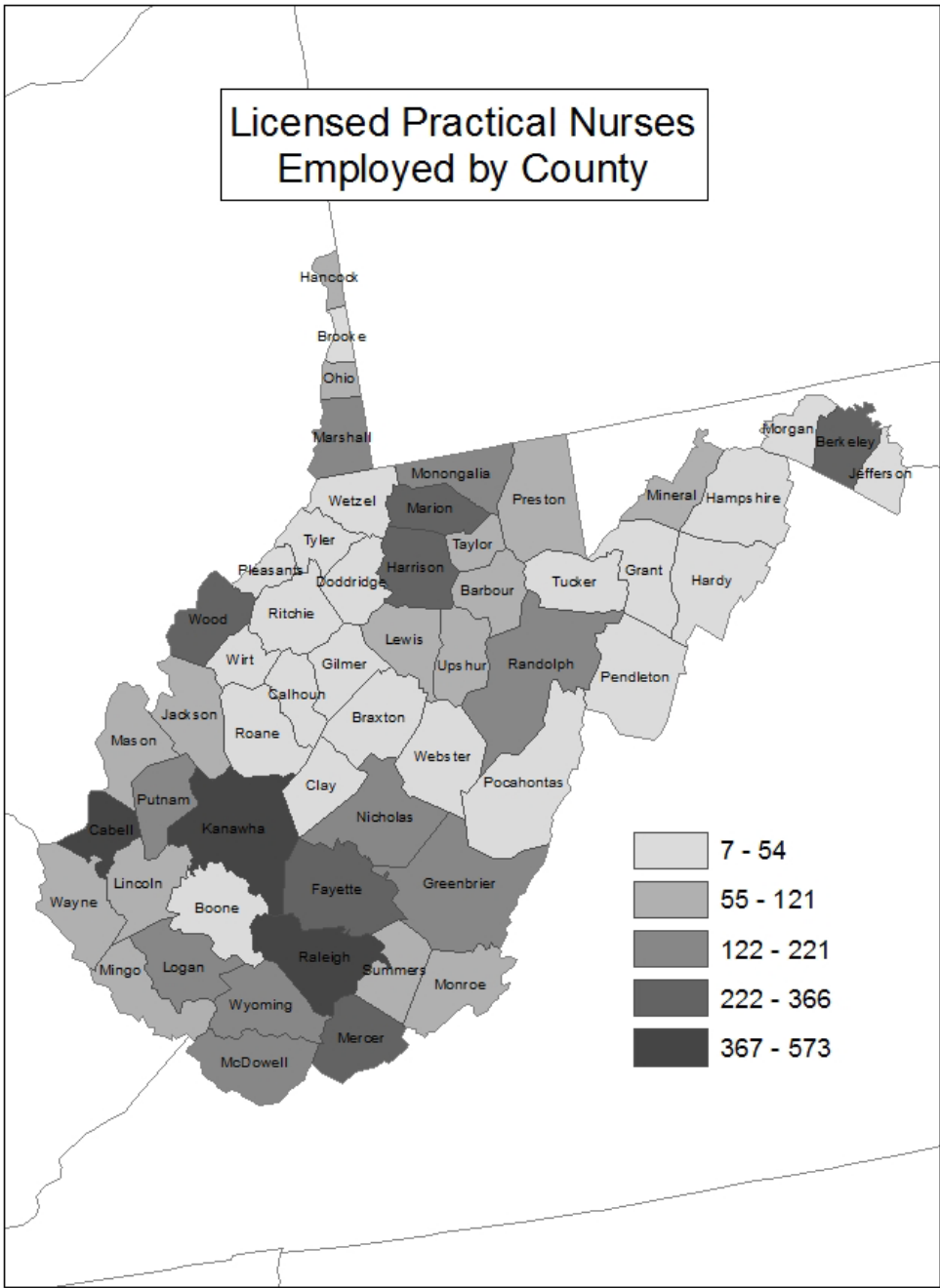


Figure 10: Licensed Practical Nurses employed by region, 2011

Data provided by WV Board of Examiners for Licensed Practical Nurses

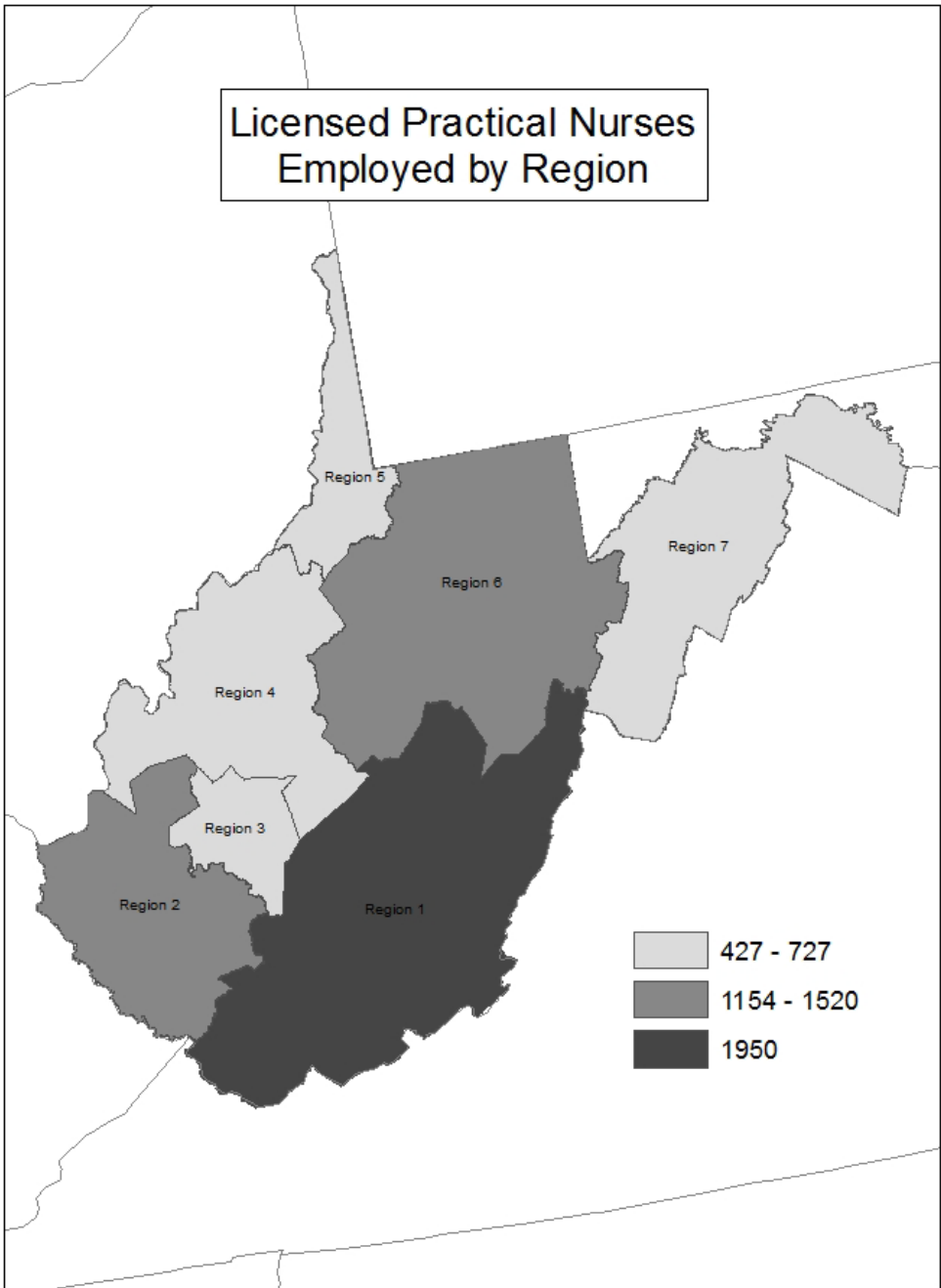
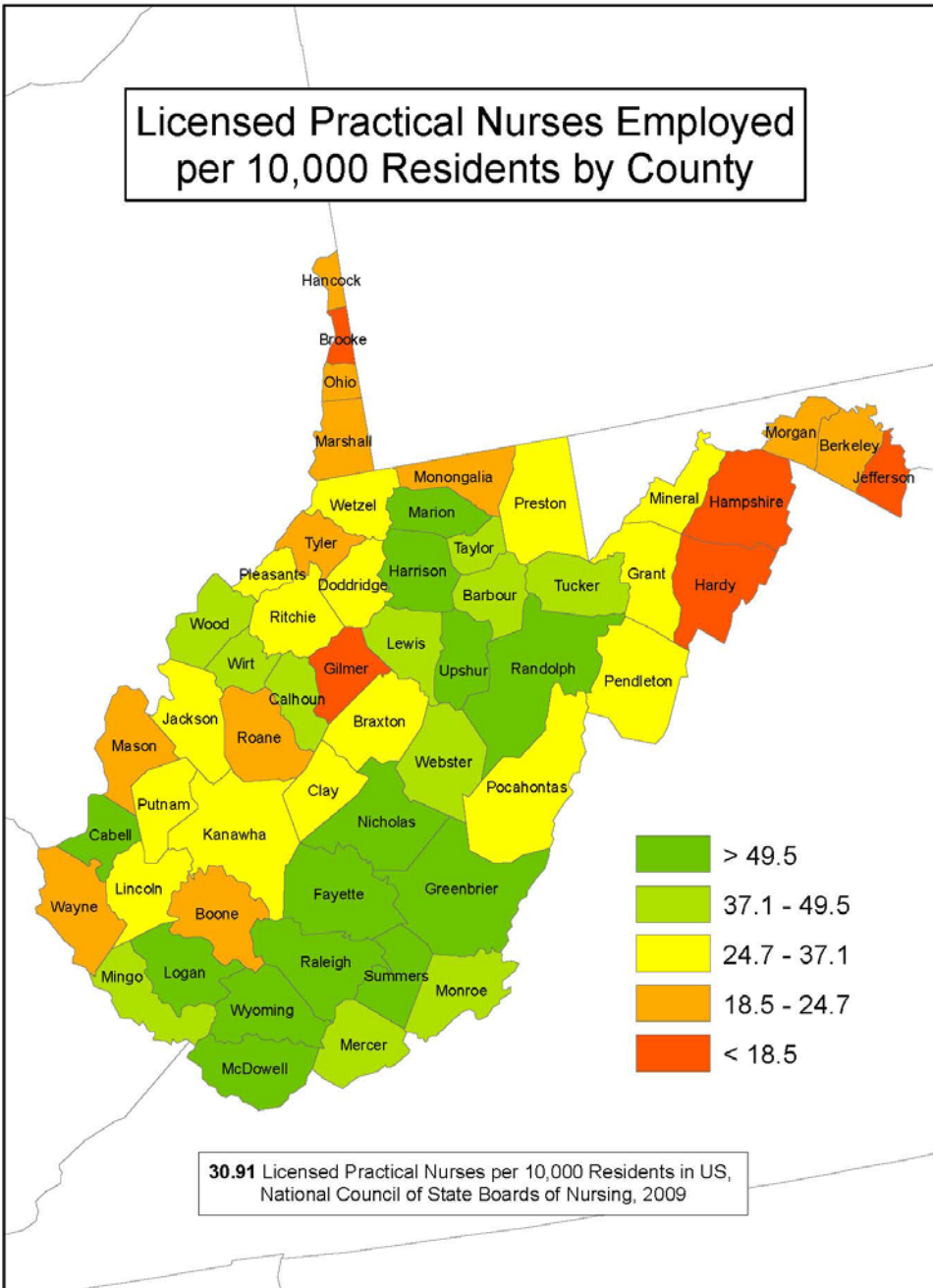


Figure 11 demonstrates the density of LPNs by county as compared to national average density per 10,000 population. Five counties (Brooke, Gilmer, Hampshire, Hardy and Jefferson) are below the national average for density per 10,000 population. All other counties are within 20% or above the national average for density per 10,000 population.

Figure 11: Density of Licensed Practical Nurses by county as compared to national average density per 10,000 population, 2009

Data provided by WV Board of Examiners for Licensed Practical Nurses



Dentists

Dental training programs in West Virginia are found in **Table 6**. The number of Dentists employed in each West Virginia county at the time of licensure renewal in 2011 is found in **Table 7**. County populations for 2011 and the workforce region for each county are noted for reference. The highest numbers of Dentists are employed in Kanawha and Monongalia Counties. The lowest numbers are in Doddridge, Pocahontas, Ritchie and Wirt Counties.

Table 6: WV Dental training programs

West Virginia Dentistry Programs

<i>Data provided by the West Virginia Higher Education Policy Commission</i>				
Degree	Institution	County	Workforce Region	2010-11 Degrees Conferred
Doctoral	West Virginia University	Monongalia	6	48

Table 7: Number of Dentists employed per WV County, 2011

Data provided by WV Board of Dentistry

County	County Population 2011	West Virginia Workforce Region	Dentists Employed
Barbour	16520	6	4
Berkeley	105750	7	50
Boone	24444	2	6
Braxton	14485	6	3
Brooke	23844	5	6
Cabell	96653	2	55
Calhoun	7652	4	2
Clay	9357	4	3
Doddridge	8171	6	1
Fayette	45699	1	17
Gilmer	8705	6	2
Grant	11891	7	5
Greenbrier	35800	1	18
Hampshire	23812	7	7
Hancock	30571	5	15
Hardy	13912	7	8
Harrison	69436	6	48
Jackson	29241	4	13
Jefferson	54225	7	13
Kanawha	192315	3	143

Lewis	16416	6	4
Lincoln	21550	2	6
Logan	36457	2	4
Marion	21729	6	25
Marshall	56586	5	13
Mason	32800	4	5
McDowell	27298	1	4
Mercer	62465	1	25
Mineral	28192	7	7
Mingo	26563	2	5
Monongalia	98528	6	112
Monroe	13534	1	3
Morgan	17535	7	3
Nicholas	26268	1	9
Ohio	44246	5	37
Pendleton	7673	7	7
Pleasants	7611	4	4
Pocahontas	8786	1	1
Preston	33723	6	9
Putnam	56008	2	22
Raleigh	79127	1	39
Randolph	29465	6	12
Ritchie	10295	4	1
Roane	14858	4	3
Summers	13867	1	2
Taylor	16916	6	5
Tucker	7021	6	3
Tyler	9121	5	2
Upshur	24322	6	9
Wayne	42126	2	9
Webster	9143	1	2
Wetzel	16351	5	6
Wirt	5762	4	1
Wood	87120	4	41
Wyoming	23419	1	4

The frequency of Dentists employed by county is found in **Figure 12**. The frequency of Dentists employed by workforce region is found in **Figure 13**. The workforce regions with the lowest number of Dentists are 2, 4, 5 and 7. The highest number of Dentists are employed in Region 7.

Figure 12: Dentists employed by county, 2011

Data provided by WV Board of Dentistry

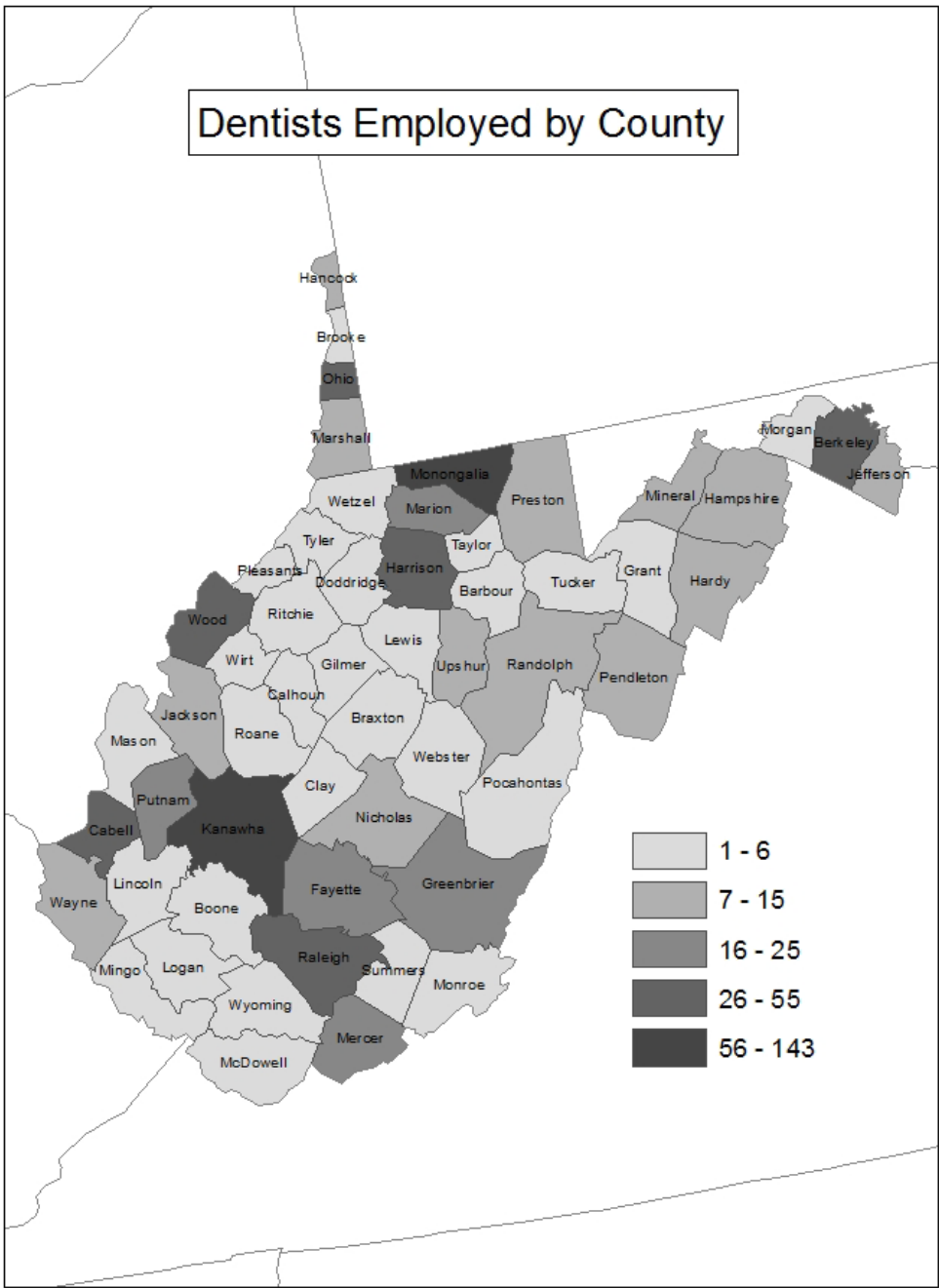


Figure 13: Dentists employed by workforce region, 2011

Data provided by WV Board of Dentistry

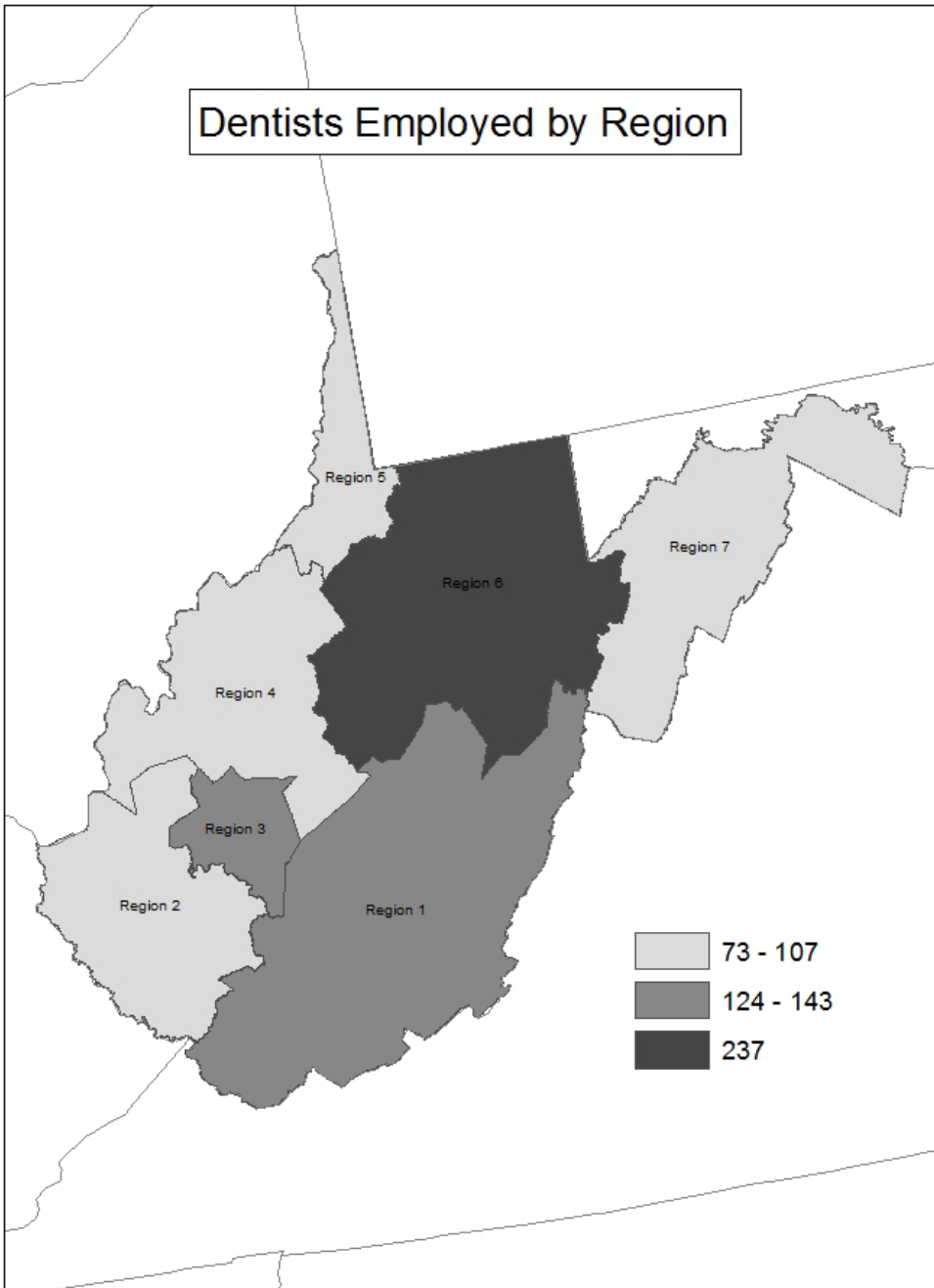
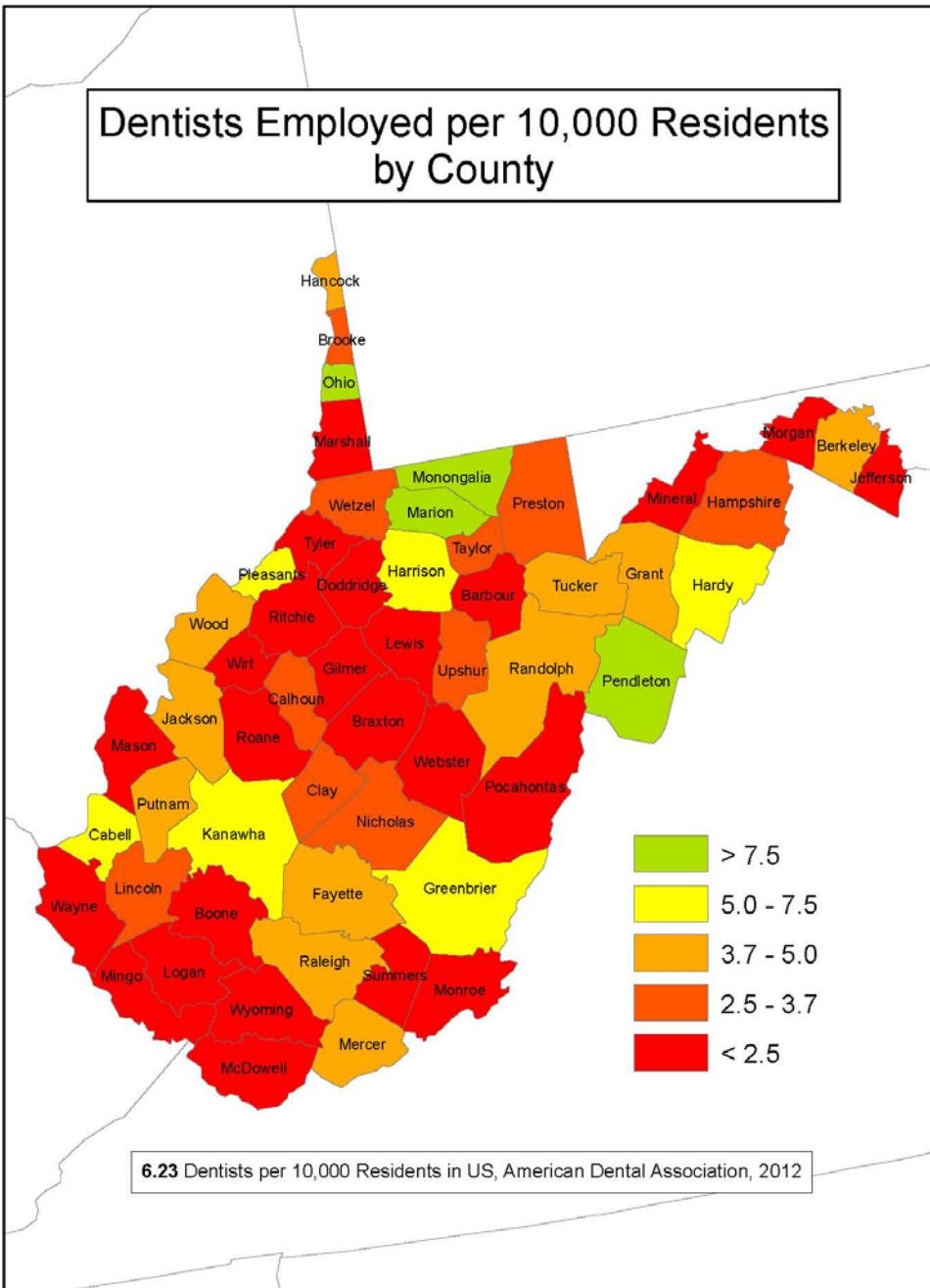


Figure 14 demonstrates the density of Dentists by county as compared to national average density per 10,000 population. Ten counties (those indicated in yellow and green below) are within 20% or above of the national average for density of 6.23 Dentists per 10,000 population. All other counties are below the national average for density per 10,000 population.

Figure 14: Density of Dentists by county as compared to national average density per 10,000 population, 2012.

Data provided by WV Board of Dentistry



Dental Hygienists

Dental Hygiene training programs are found in **Table 8**. The number of Dental Hygienists employed in each West Virginia county at the time of licensure renewal in 2011 is found in **Table 9**. County populations for 2011 and the workforce region for each county are noted for reference. The highest numbers of Dental Hygienists are employed in Kanawha and Monongalia Counties. The lowest numbers are in Doddridge, Gilmer, Pendleton, Pocahontas, Ritchie, Webster and Wirt Counties.

Table 8: WV Dental Hygiene training programs

West Virginia Dental Hygiene Programs

Data provided by the West Virginia Higher Education Policy Commission

Degree	Institution	County	Workforce Region	2010-11 Degrees Conferred*
Associate	Bridgmont State University	Fayette	1	25
Associate	West Liberty University	Ohio	5	34
Associate	Southern West Virginia Community and Technical College	Logan	2	0*
Baccalaureate	West Virginia University	Monongalia	6	21
Baccalaureate	West Liberty University	Ohio	5	35
Master's	West Virginia University	Monongalia	6	3

*The Southern West Virginia Community and Technical College dental hygiene program graduates students in even numbered years only. In 2012, eight students graduated.

Table 9: Number of Dental Hygienists employed per WV County, 2011

Data provided by WV Board of Dentistry

County	County Population 2011	West Virginia Workforce Region	Dental Hygienists Employed
Barbour	16520	6	6
Berkeley	105750	7	62
Boone	24444	2	21
Braxton	14485	6	8
Brooke	23844	5	24
Cabell	96653	2	89
Calhoun	7652	4	4
Clay	9357	4	14

Doddridge	8171	6	1
Fayette	45699	1	71
Gilmer	8705	6	3
Grant	11891	7	8
Greenbrier	35800	1	29
Hampshire	23812	7	13
Hancock	30571	5	33
Hardy	13912	7	9
Harrison	69436	6	79
Jackson	29241	4	33
Jefferson	54225	7	22
Kanawha	192315	3	302
Lewis	16416	6	8
Lincoln	21550	2	12
Logan	36457	2	25
Marion	21729	6	56
Marshall	56586	5	37
Mason	32800	4	13
McDowell	27298	1	5
Mercer	62465	1	51
Mineral	28192	7	21
Mingo	26563	2	9
Monongalia	98528	6	158
Monroe	13534	1	6
Morgan	17535	7	12
Nicholas	26268	1	20
Ohio	44246	5	118
Pendleton	7673	7	1
Pleasants	7611	4	6
Pocahontas	8786	1	1
Preston	33723	6	23
Putnam	56008	2	76
Raleigh	79127	1	90
Randolph	29465	6	27
Ritchie	10295	4	1
Roane	14858	4	4
Summers	13867	1	5
Taylor	16916	6	14
Tucker	7021	6	4
Tyler	9121	5	6
Upshur	24322	6	17
Wayne	42126	2	17
Webster	9143	1	1

Wetzel	16351	5	29
Wirt	5762	4	1
Wood	87120	4	91
Wyoming	23419	1	9

The frequency of Dental Hygienists employed in each West Virginia county at the time of 2011 licensure renewal is found below in **Figure 15**. **Figure 16** demonstrates the frequency of Dental Hygienists employed by West Virginia Workforce Investment Area. The Workforce Investment Area with the highest number of Dental Hygienists employed is Region 6, and the lowest number of Dental Hygienists employed are in Region 4.

Figure 15: Dental Hygienists employed by county, 2011

Data provided by WV Board of Dentistry

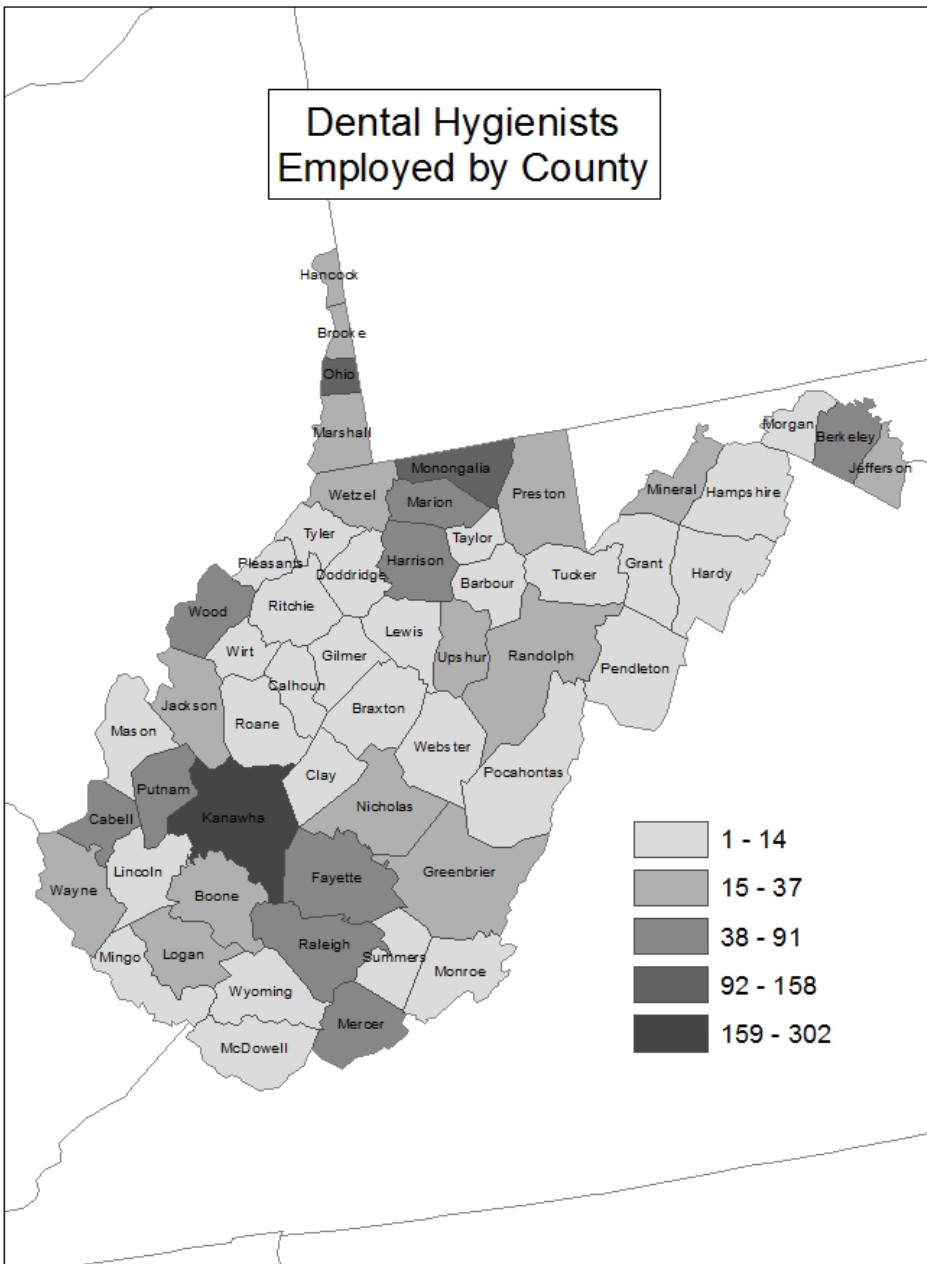


Figure 16: Dental Hygienists employed by region, 2011

Data provided by WV Board of Dentistry

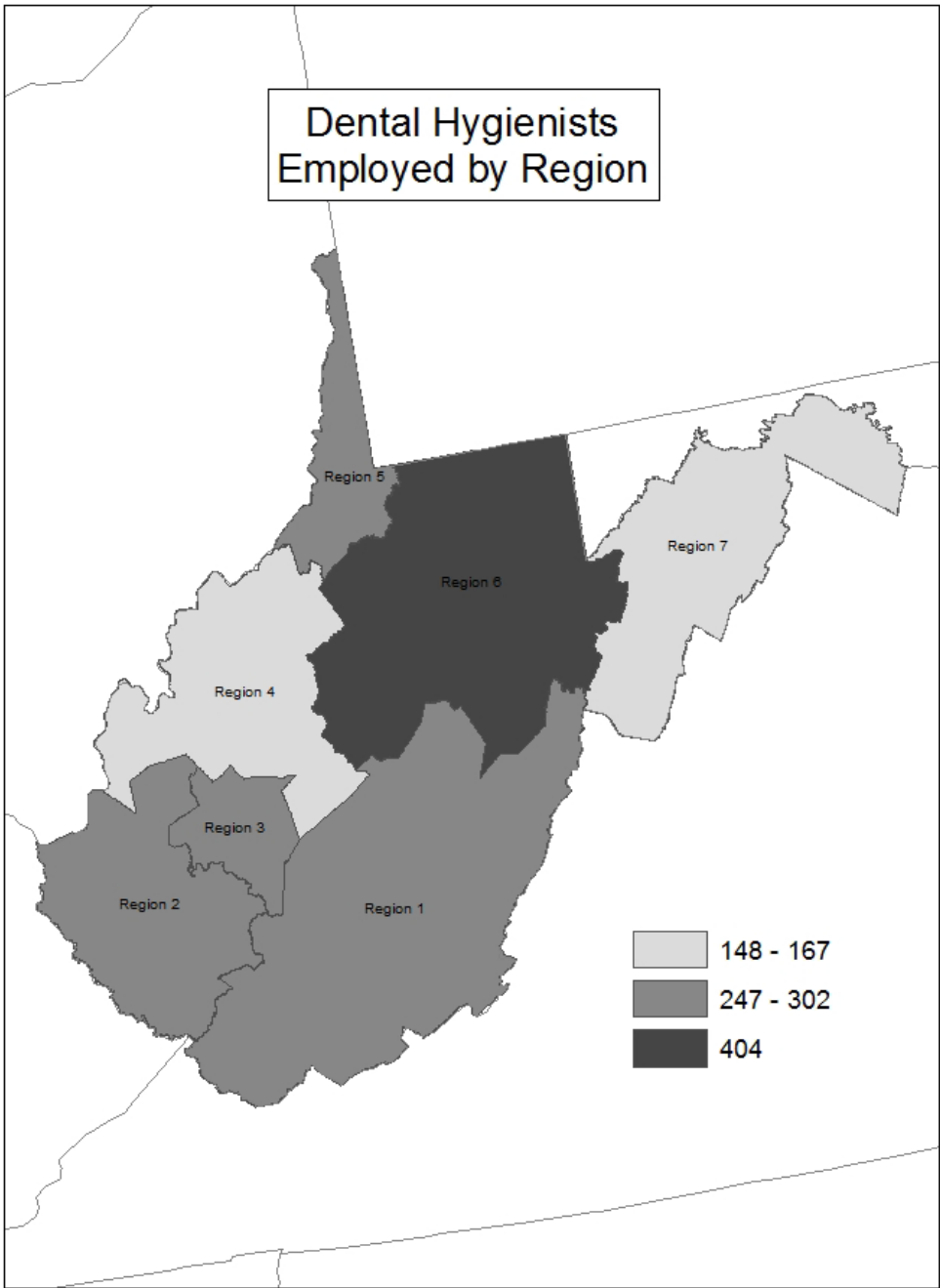
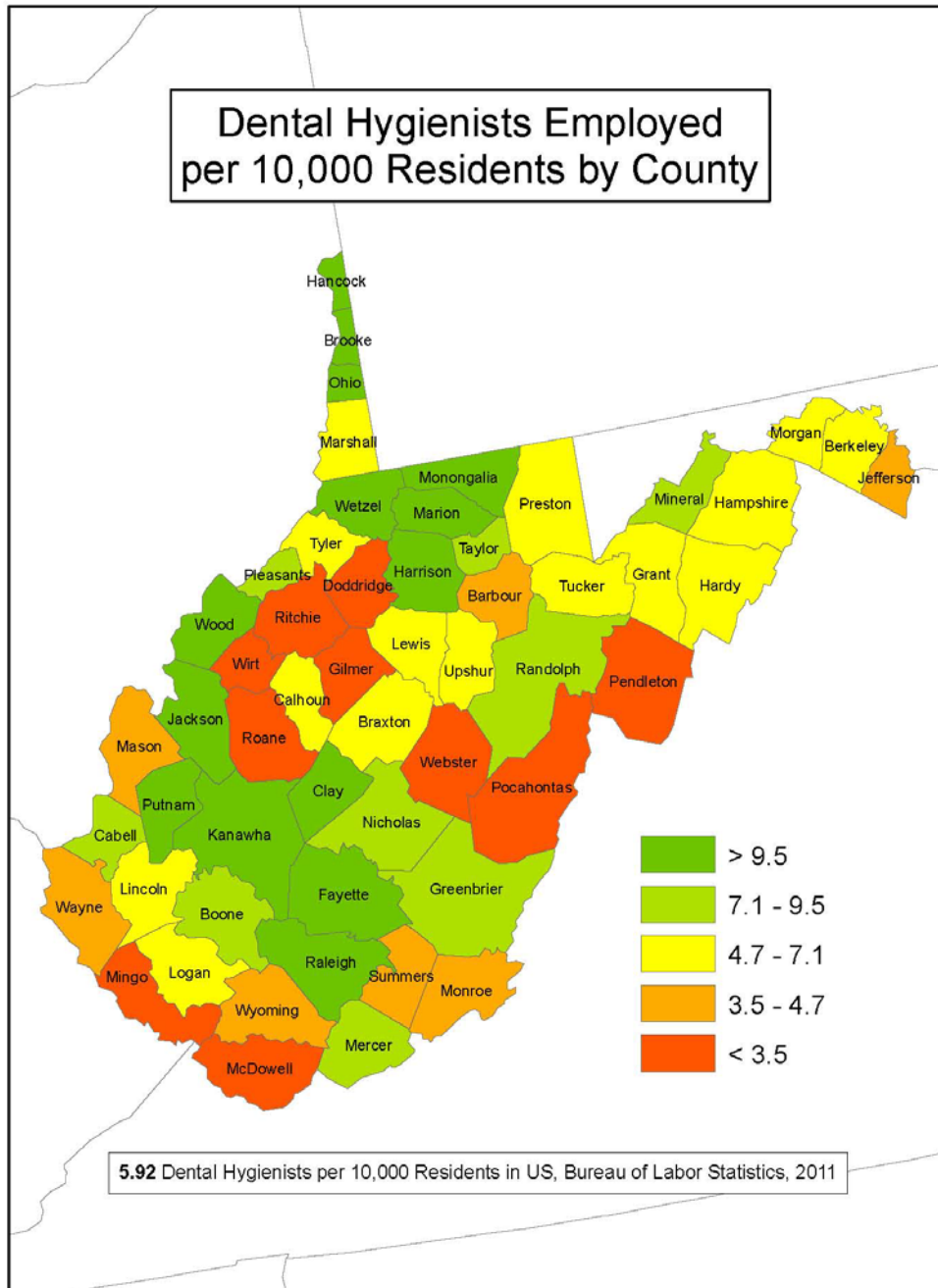


Figure 17 demonstrates the density of Dental Hygienists by county as compared to national average density per 10,000 population. Seventeen counties (those indicated in orange and red below) are below the national average for density of 5.92 Dental Hygienists per 10,000 population. All other counties are within 20% or above the national average for density per 10,000 population.

Figure 17: Density of Dental Hygienists by county as compared to national average density per 10,000 population

Data provided by WV Board of Dentistry



Physicians

The Physician workforce is divided into two sections for the purpose of this report, Doctors of Osteopathic Medicine (DO) or Medical Doctors (MD). Two separate licensing boards provide data relative to Physician licensure, and the result of the analysis of these two data sets is shown below. However, in studying the Physician workforce, it is recommended that policymakers consider the Physician workforce as a whole. Physician training programs in West Virginia are found in **Table 10**.

Table 10: WV Physician training programs

West Virginia Medical Education Programs

<i>Data provided by the West Virginia Higher Education Policy Commission</i>				
Degree	Institution	County	Workforce Region	2010-11 Degrees Conferred
Doctoral	Marshall University	Cabell	2	72
Doctoral	West Virginia School of Osteopathic Medicine	Greenbrier*	1*	198
Doctoral	West Virginia University	Kanawha, Monongalia, Berkeley	3, 6, 7	95

*WVSOM operates a Statewide Campus system of six regions where students do third year rotations and many fourth year rotations. These students are at training sites in all seven workforce regions.

Doctors of Osteopathic Medicine (DO)

The number of Doctors of Osteopathic Medicine (DO) employed in each West Virginia county at the time of licensure renewal in 2011 is found in **Table 11**. County populations for 2011 and the workforce region for each county are noted for reference. The highest numbers of DOs are employed in Kanawha and Greenbrier Counties. The lowest numbers are in Clay, Doddridge, Hardy, Pleasants, Ritchie and Tucker Counties. Pendleton and Wirt Counties have no DOs employed.

Table 11: Number of Doctors of Osteopathic Medicine employed per WV County, 2011

Data provided by WV Board of Osteopathic Medicine

County	County Population 2011	West Virginia Workforce Region	Doctor of Osteopathic Medicine (DO) Employed
Barbour	16520	6	3
Berkeley	105750	7	17
Boone	24444	2	7
Braxton	14485	6	6
Brooke	23844	5	2
Cabell	96653	2	36
Calhoun	7652	4	2
Clay	9357	4	1
Doddridge	8171	6	1
Fayette	45699	1	21
Gilmer	8705	6	2
Grant	11891	7	2
Greenbrier	35800	1	76
Hampshire	23812	7	2
Hancock	30571	5	16
Hardy	13912	7	1
Harrison	69436	6	37
Jackson	29241	4	11
Jefferson	54225	7	4
Kanawha	192315	3	157
Lewis	16416	6	7
Lincoln	21550	2	3
Logan	36457	2	13
Marion	21729	6	10
Marshall	56586	5	7
Mason	32800	4	8
McDowell	27298	1	8

Mercer	62465	1	45
Mineral	28192	7	2
Mingo	26563	2	3
Monongalia	98528	6	49
Monroe	13534	1	5
Morgan	17535	7	2
Nicholas	26268	1	8
Ohio	44246	5	65
Pendleton	7673	7	0
Pleasants	7611	4	1
Pocahontas	8786	1	7
Preston	33723	6	3
Putnam	56008	2	17
Raleigh	79127	1	45
Randolph	29465	6	11
Ritchie	10295	4	1
Roane	14858	4	2
Summers	13867	1	4
Taylor	16916	6	4
Tucker	7021	6	1
Tyler	9121	5	5
Upshur	24322	6	2
Wayne	42126	2	2
Webster	9143	1	3
Wetzel	16351	5	4
Wirt	5762	4	0
Wood	87120	4	47
Wyoming	23419	1	4

The frequency of DOs employed in each West Virginia county at the time of 2011 licensure renewal is found below in **Figure 18**. **Figure 19** demonstrates the frequency of DOs employed by West Virginia Workforce Investment Area. The Workforce Investment Areas with the highest number of DOs employed are Regions 1 and 3, and the lowest number of DOs employed are in Region 7.

Figure 18: Doctors of Osteopathic Medicine employed by county, 2011

Data provided by WV Board of Osteopathic Medicine

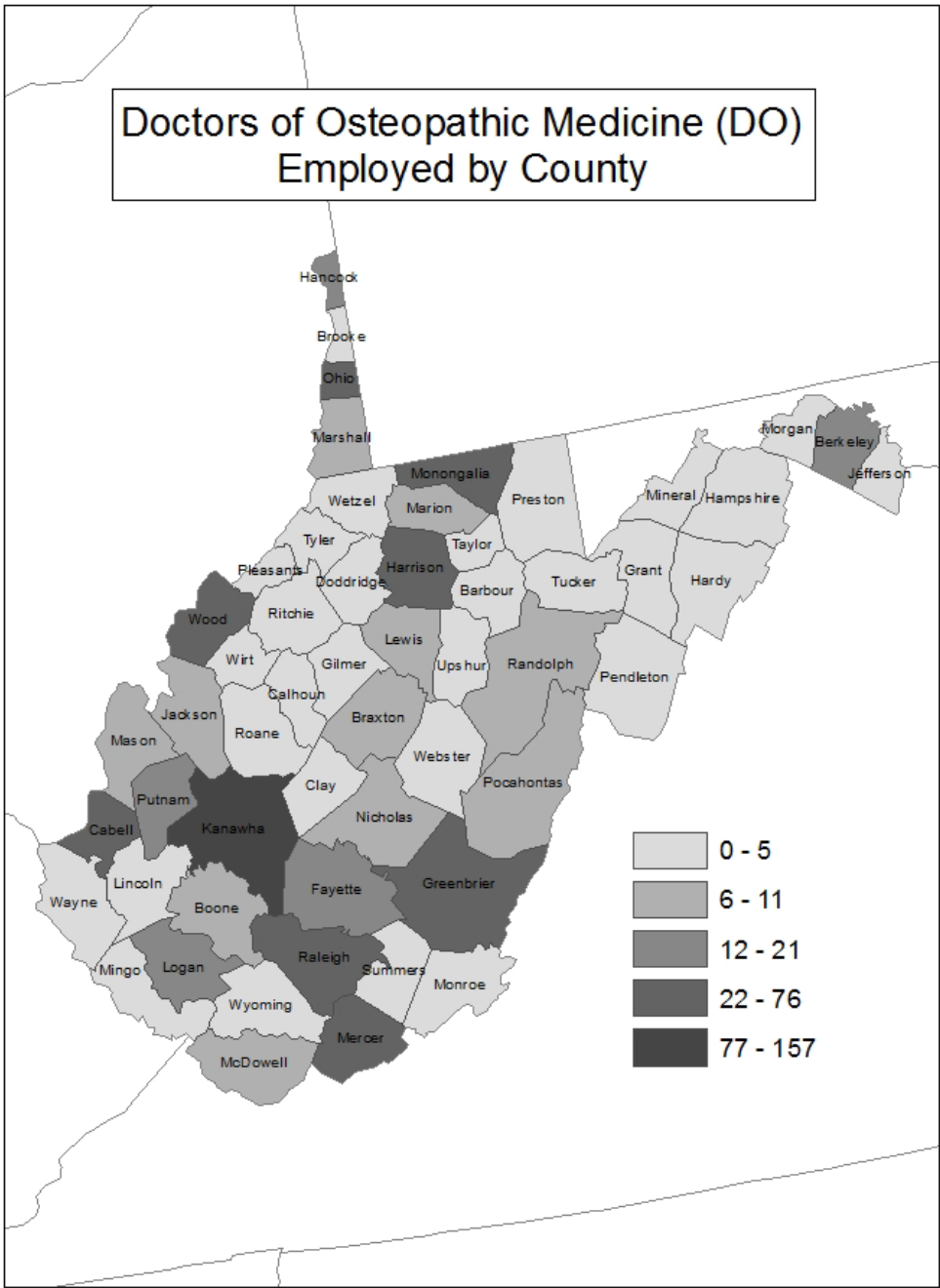


Figure 19: Doctors of Osteopathic Medicine employed by region, 2011

Data provided by WV Board of Osteopathic Medicine

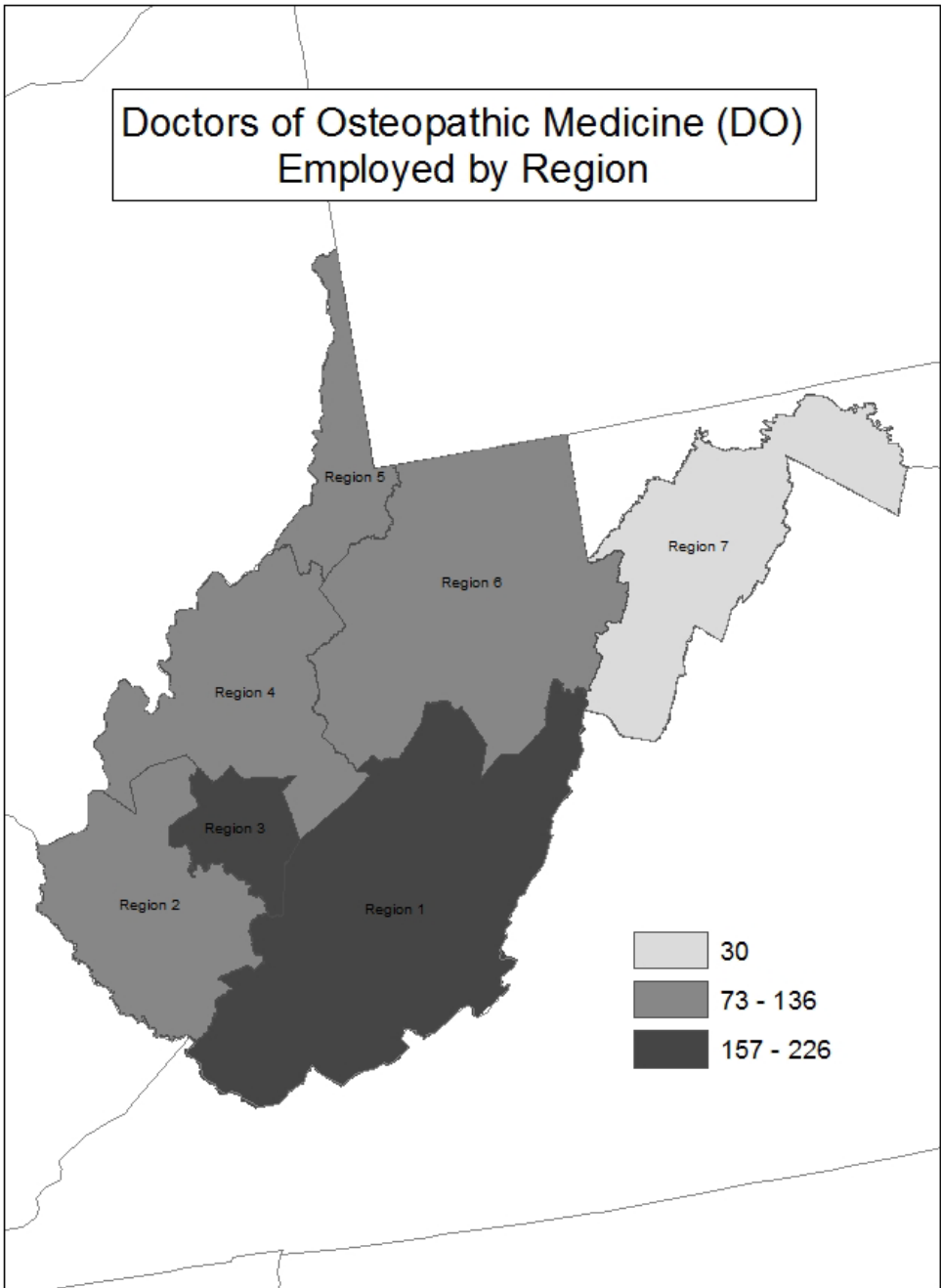
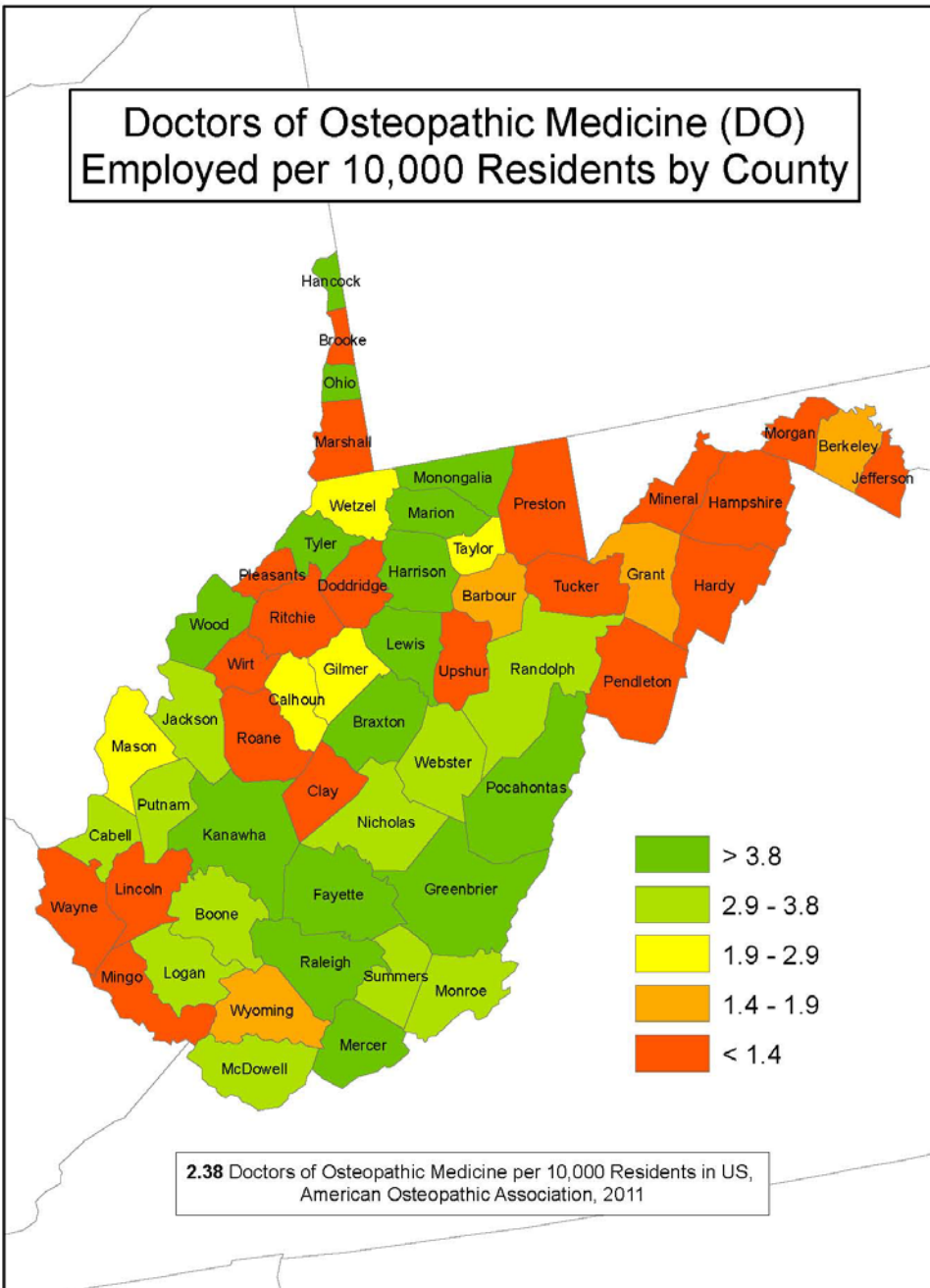


Figure 20 demonstrates the density of DOs by county as compared to national average density per 10,000 population. Twenty four counties (those indicated in orange and red below) are below the national average for density per 10,000 population. All other counties are within 20% or above the national average for density per 10,000 population. However, these numbers should be considered in light of the total Physician workforce (DO and MD).

Figure 20: Density of Doctors of Osteopathic Medicine by county as compared to national average density per 10,000 population

Data provided by WV Board of Osteopathic Medicine



Medical Doctors

The number of Medical Doctors (MD) employed in each West Virginia county at the time of licensure renewal in 2011 is found in **Table 12**. County populations for 2011 and the workforce region for each county are noted for reference. The highest numbers of MDs are employed in Cabell, Kanawha and Monongalia Counties. The lowest numbers are in Calhoun, Monroe, Pleasants, Ritchie, and Webster Counties. It is important to note that Clay, Doddridge, Pleasants, Ritchie and Wirt Counties had the lowest numbers of DOs employed.

Table 12: Number of Medical Doctors employed per WV County, 2011

Data provided by WV Board of Medicine

County	County Population 2011	West Virginia Workforce Region	Medical Doctors (MD) Employed
Barbour	16520	6	6
Berkeley	105750	7	130
Boone	24444	2	9
Braxton	14485	6	5
Brooke	23844	5	17
Cabell	96653	2	505
Calhoun	7652	4	2
Clay	9357	4	3
Doddridge	8171	6	3
Fayette	45699	1	36
Gilmer	8705	6	3
Grant	11891	7	8
Greenbrier	35800	1	57
Hampshire	23812	7	7
Hancock	30571	5	27
Hardy	13912	7	6
Harrison	69436	6	139
Jackson	29241	4	7
Jefferson	54225	7	54
Kanawha	192315	3	705
Lewis	16416	6	25
Lincoln	21550	2	7
Logan	36457	2	42
Marion	21729	6	81
Marshall	56586	5	23
Mason	32800	4	24
McDowell	27298	1	9
Mercer	62465	1	106

Mineral	28192	7	16
Mingo	26563	2	15
Monongalia	98528	6	740
Monroe	13534	1	2
Morgan	17535	7	7
Nicholas	26268	1	29
Ohio	44246	5	169
Pendleton	7673	7	4
Pleasants	7611	4	2
Pocahontas	8786	1	3
Preston	33723	6	23
Putnam	56008	2	78
Raleigh	79127	1	179
Randolph	29465	6	50
Ritchie	10295	4	1
Roane	14858	4	11
Summers	13867	1	6
Taylor	16916	6	10
Tucker	7021	6	4
Tyler	9121	5	3
Upshur	24322	6	27
Wayne	42126	2	24
Webster	9143	1	2
Wetzel	16351	5	7
Wirt	5762	4	3
Wood	87120	4	164
Wyoming	23419	1	3

The frequency of MDs employed in each West Virginia county at the time of 2011 licensure renewal is found below in **Figure 21**. **Figure 22** demonstrates the frequency of DOs employed by West Virginia Workforce Investment Area. The Workforce Investment Area with the highest number of MDs employed is Region 6, and the lowest numbers employed are in Regions 1, 4, 5 and 7.

Figure 21: Medical Doctors employed by county, 2011

Data provided by WV Board of Medicine

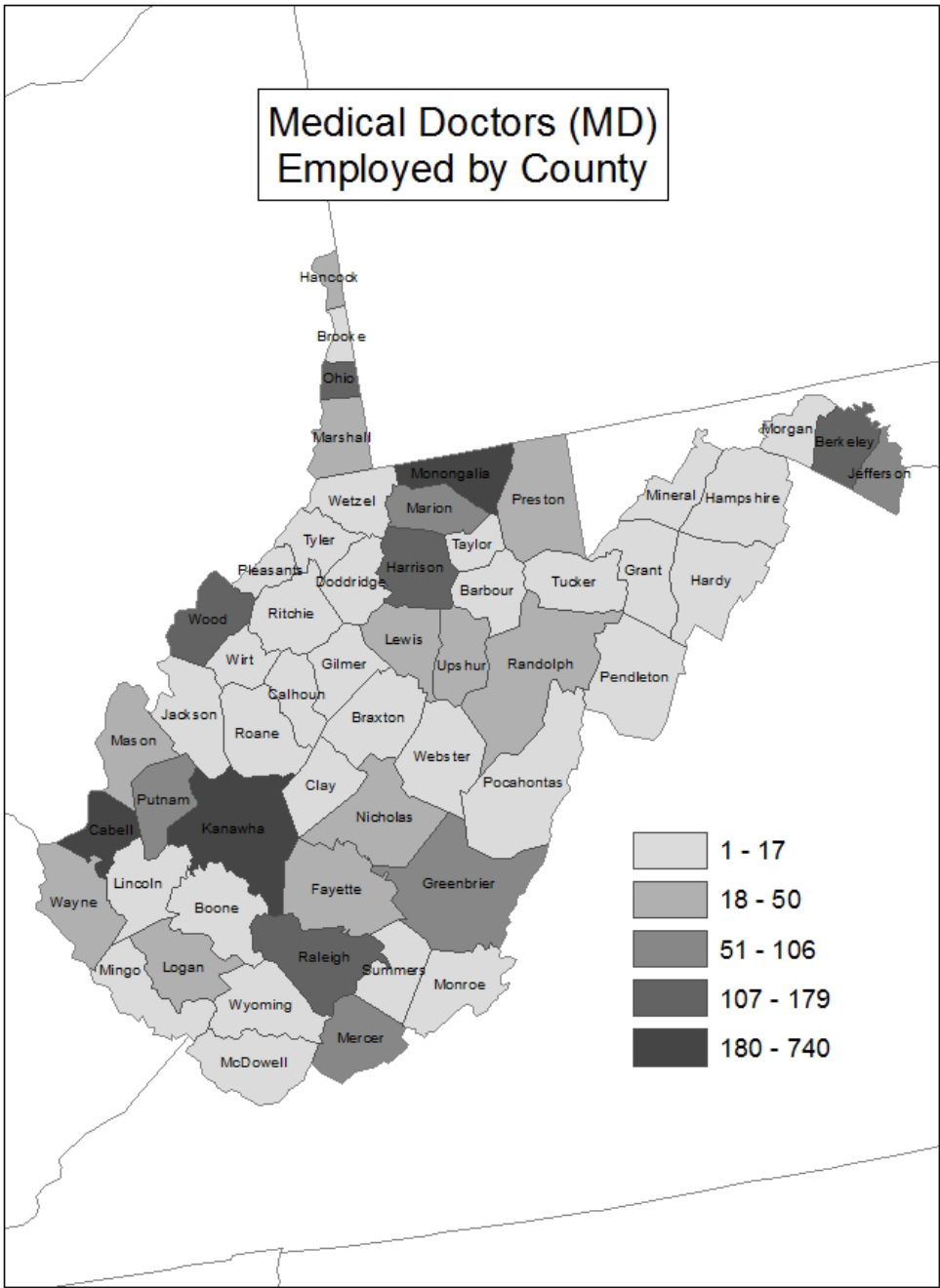


Figure 22: Medical Doctors employed by region, 2011

Data provided by WV Board of Medicine

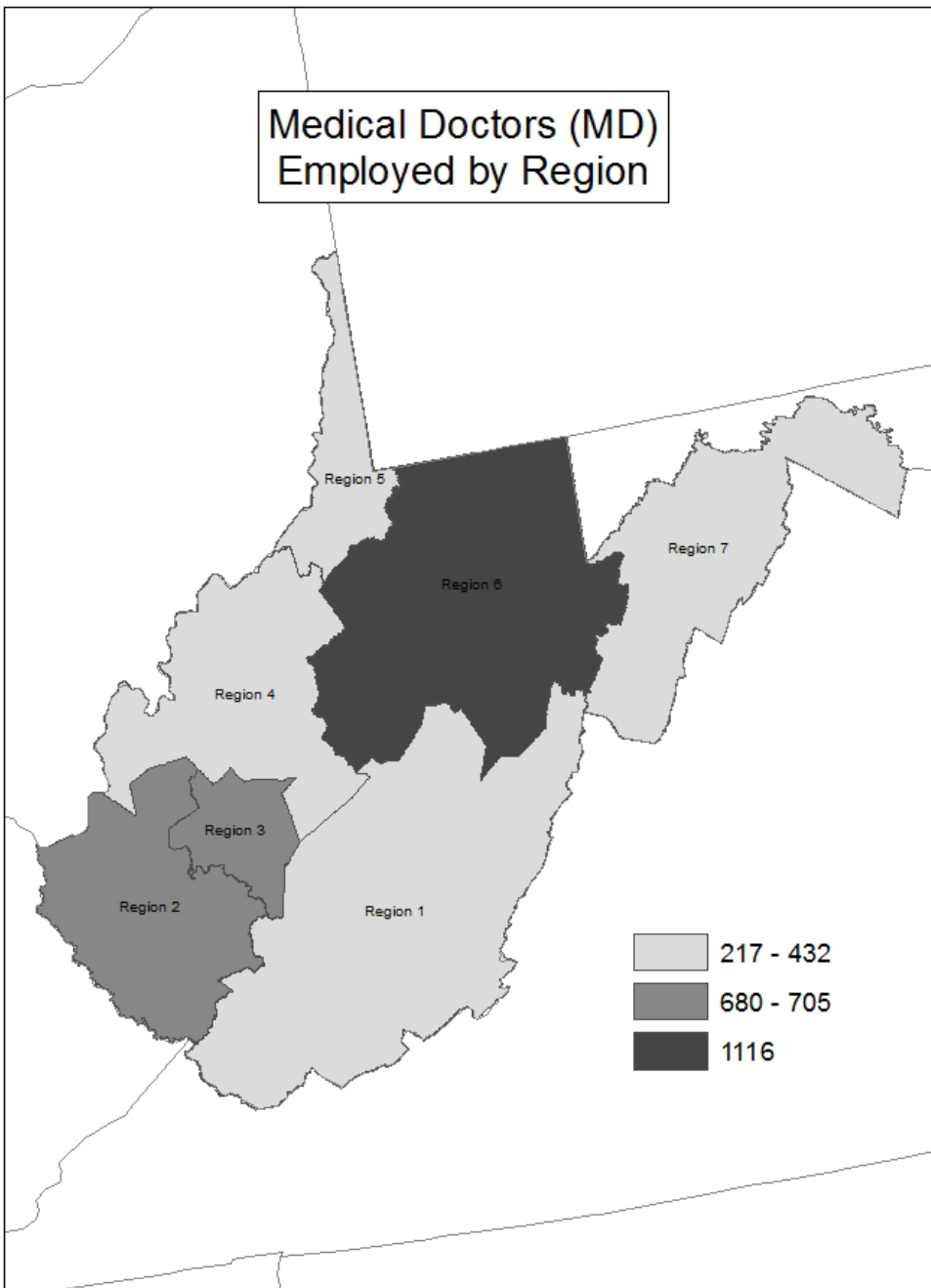
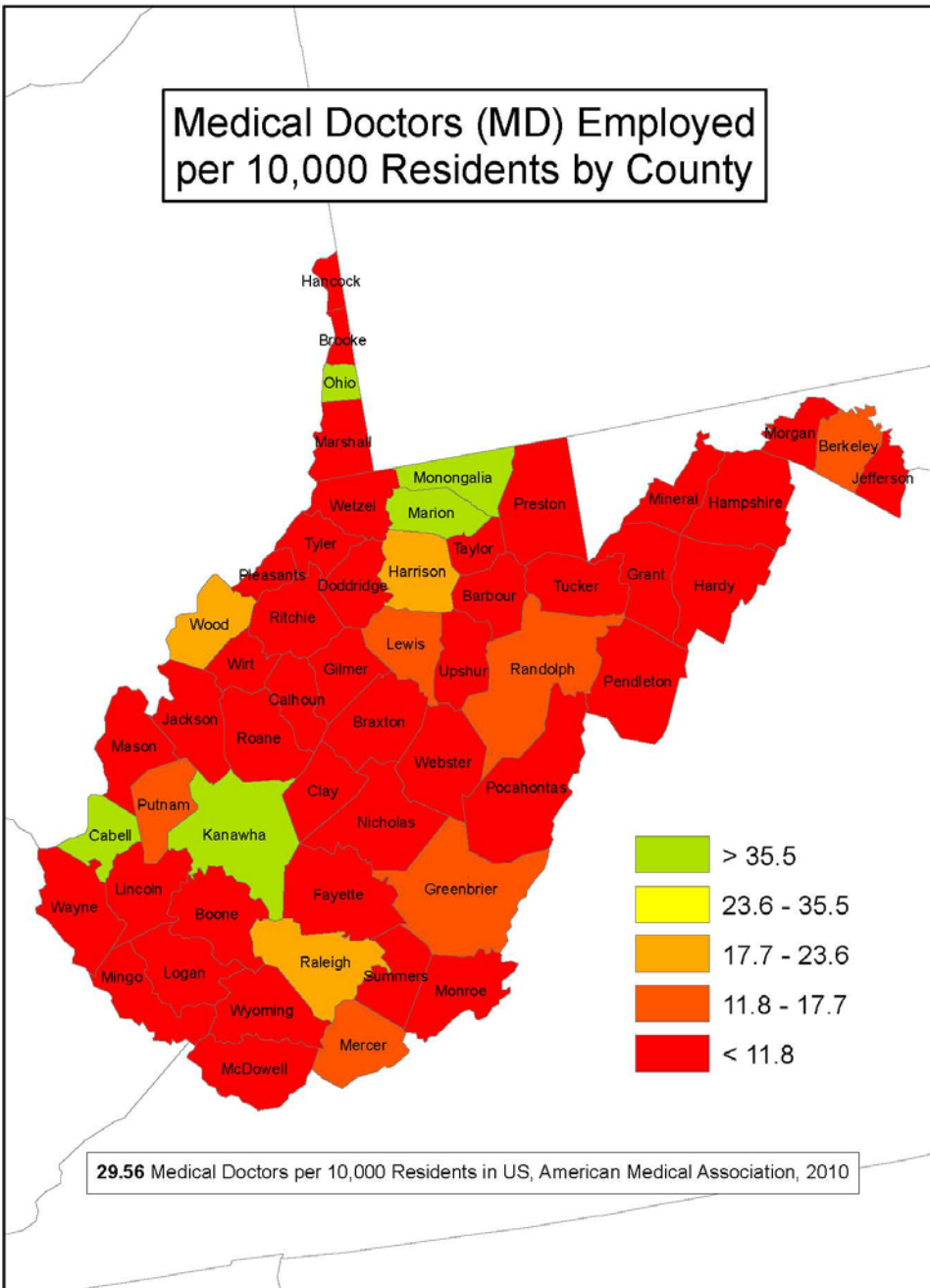


Figure 23 demonstrates the density of MDs by county as compared to national average density per 10,000 population. Five counties (those indicated in green below) are above the national average for density per 10,000 population. All other counties are below the national average for density per 10,000 population. However, these numbers should be considered in light of the total Physician workforce (DO and MD).

Figure 23: Density of Medical Doctors by county as compared to national average density per 10,000 population

Data provided by WV Board of Medicine



Physician Assistants

Similar to data provided for the Physician workforce, data for the Physician Assistant (PA) workforce is provided from two licensure boards: the WV Board of Osteopathic Medicine and the WV Board of Medicine. PAs are licensed by the WV Board of Medicine or the WV Board of Osteopathic Medicine and perform only under the supervision and control of a supervising Physician. Therefore, PAs are licensed by the WV Board that also licenses their supervising Physician. Frequency data will be reported for PAs licensed by each Board. However, since national density figures do not distinguish between licensure types, density data will be reported as a whole, combining the entire PA workforce in West Virginia into one map.

West Virginia training programs for physician assistants are found in **Table 13**. The number of Physician Assistants (PA) licensed by the WV Board of Osteopathic Medicine employed in each West Virginia county at the time of licensure renewal in 2011 is found in **Table 14**. County populations for 2011 and the workforce region for each county are noted for reference.

Table 13: WV Physician Assistant training programs

West Virginia Physician Assistant Programs

<i>Data provided by the West Virginia Higher Education Policy Commission</i>				
Degree	Institution	County	Workforce Region	2010-11 Degrees Conferred
Master's	Alderson-Broaddus College	Barbour	6	47
Master's	Mountain State University*	Raleigh	1	38

*On June 28, 2012, the Board of Trustees of the Higher Learning Commission acted to withdraw accreditation from Mountain State University.

Table 14: Number of Physician Assistants licensed by the DO Board employed per WV County, 2011

Data provided by WV Board of Osteopathic Medicine

County	County Population 2011	West Virginia Workforce Region	Physician Assistants Registered with the Osteopathic Board Employed
Barbour	16520	6	1
Berkeley	105750	7	2
Boone	24444	2	3
Braxton	14485	6	1
Brooke	23844	5	3
Cabell	96653	2	3
Calhoun	7652	4	0
Clay	9357	4	0
Doddridge	8171	6	0
Fayette	45699	1	7
Gilmer	8705	6	1
Grant	11891	7	0
Greenbrier	35800	1	11
Hampshire	23812	7	1
Hancock	30571	5	0
Hardy	13912	7	2
Harrison	69436	6	12
Jackson	29241	4	0
Jefferson	54225	7	0
Kanawha	192315	3	23
Lewis	16416	6	3
Lincoln	21550	2	2
Logan	36457	2	8
Marion	21729	6	10
Marshall	56586	5	3
Mason	32800	4	0
McDowell	27298	1	1
Mercer	62465	1	24
Mineral	28192	7	0
Mingo	26563	2	1
Monongalia	98528	6	0
Monroe	13534	1	4
Morgan	17535	7	2

Nicholas	26268	1	0
Ohio	44246	5	12
Pendleton	7673	7	0
Pleasants	7611	4	0
Pocahontas	8786	1	4
Preston	33723	6	2
Putnam	56008	2	9
Raleigh	79127	1	10
Randolph	29465	6	3
Ritchie	10295	4	0
Roane	14858	4	0
Summers	13867	1	1
Taylor	16916	6	0
Tucker	7021	6	2
Tyler	9121	5	0
Upshur	24322	6	1
Wayne	42126	2	1
Webster	9143	1	0
Wetzel	16351	5	2
Wirt	5762	4	0
Wood	87120	4	4
Wyoming	23419	1	10

The frequency of PAs licensed by the WV Board of Osteopathic Medicine employed in each West Virginia county at the time of 2011 licensure renewal is found below in **Figure 24**. **Figure 25** demonstrates the frequency of PAs employed by West Virginia Workforce Investment Area. The Workforce Investment Area with the highest number of PAs licensed by the WV Board of Osteopathic Medicine employed is Region 1, and the lowest numbers employed are in Regions 4 and 7.

Figure 24: Physician Assistants (DO Board) employed by county, 2011

Data provided by WV Board of Medicine

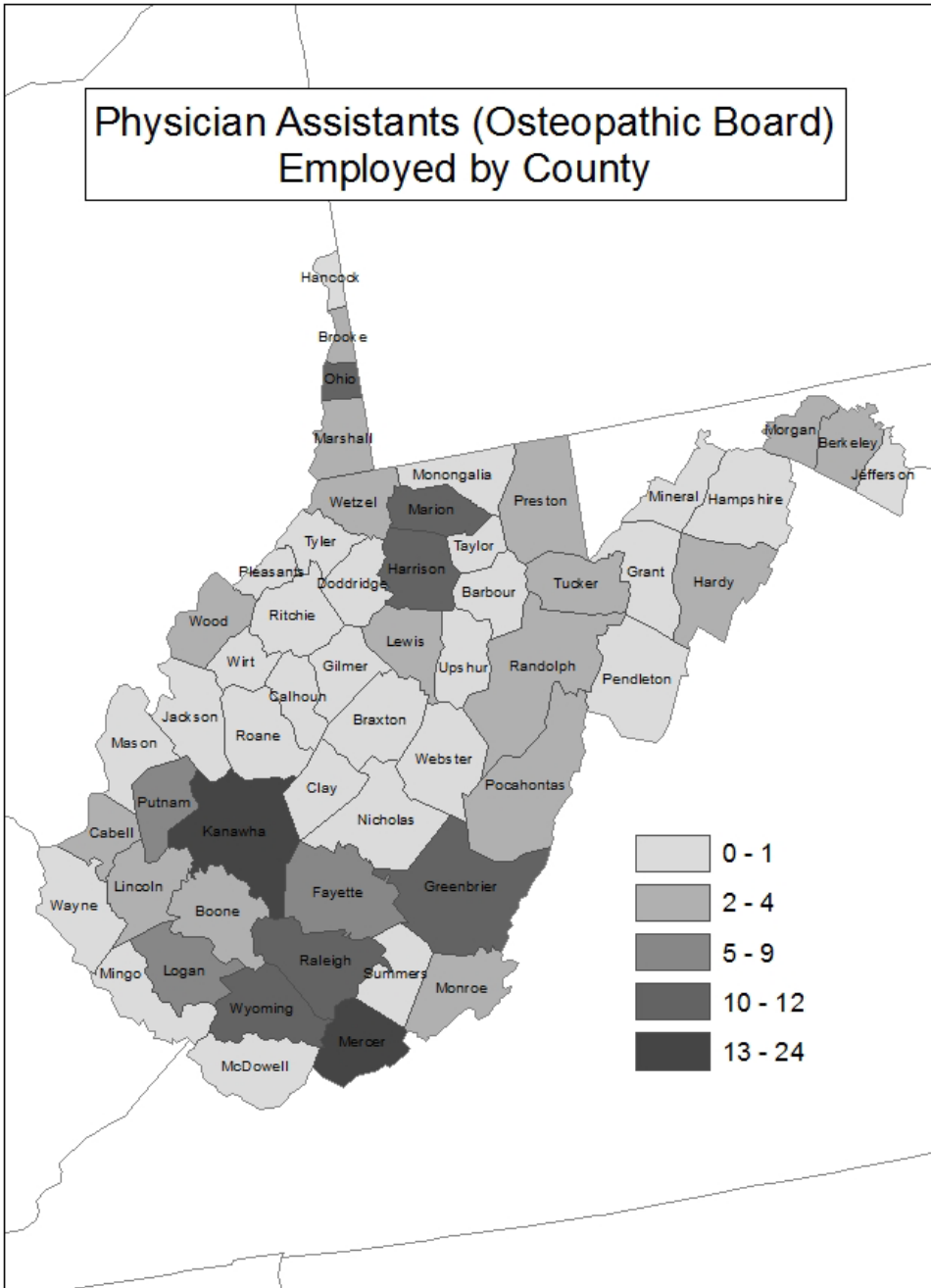
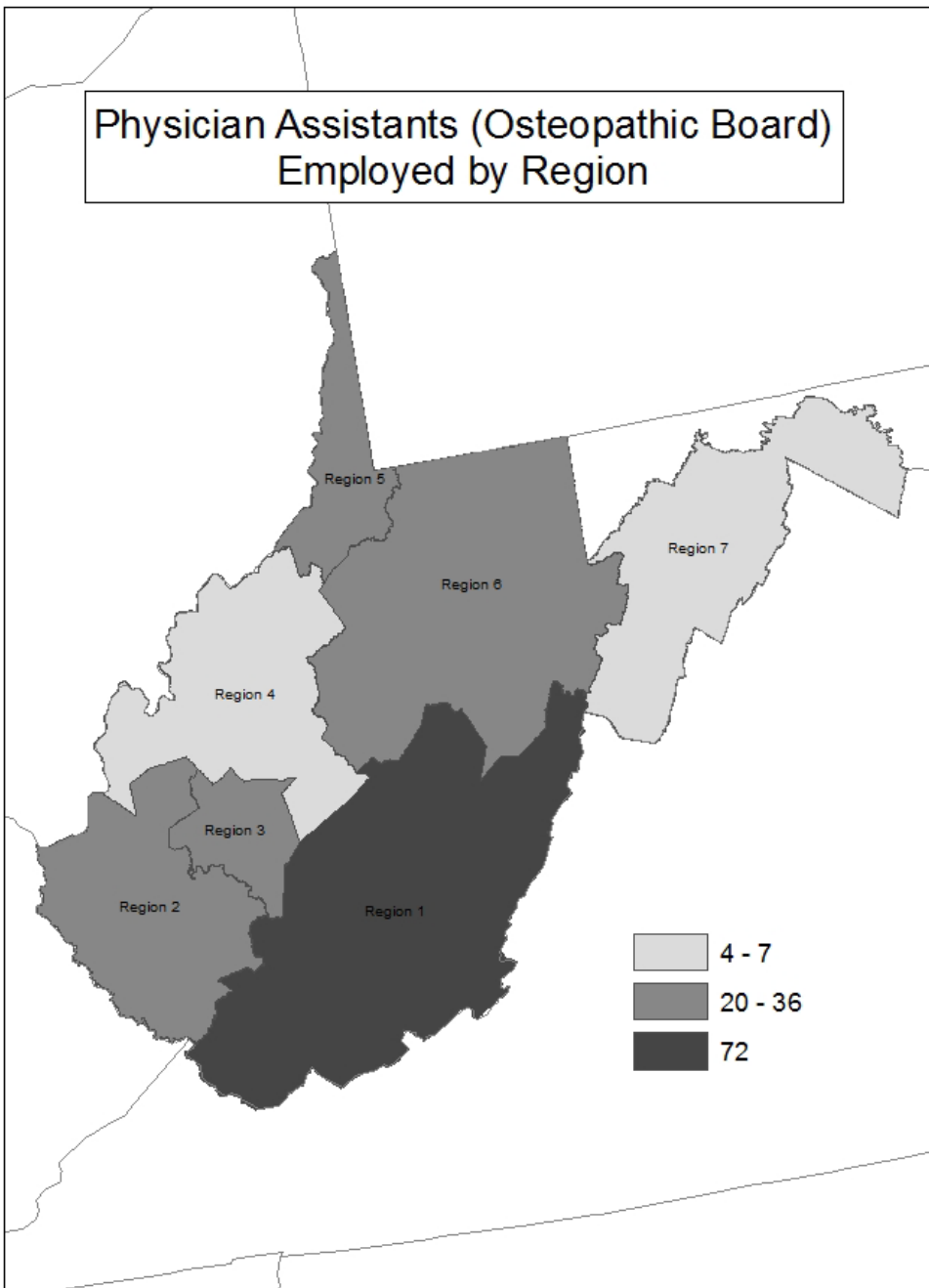


Figure 25: Physician Assistants (DO Board) employed by region, 2011

Data provided by WV Board of Osteopathic Medicine



The number of PAs licensed by the WV Board of Medicine employed in each West Virginia county at the time of licensure renewal in 2011 is found in **Table 15**. County populations for 2011 and the workforce region for each county are noted for reference.

Table 15: Number of Physician Assistants licensed by the MD Board employed per WV County, 2011

Data provided by WV Board of Medicine

County	County Population 2011	West Virginia Workforce Region	Physician Assistants Registered with the Medical Board Employed
Barbour	16520	6	13
Berkeley	105750	7	19
Boone	24444	2	5
Braxton	14485	6	1
Brooke	23844	5	0
Cabell	96653	2	20
Calhoun	7652	4	0
Clay	9357	4	1
Doddridge	8171	6	0
Fayette	45699	1	14
Gilmer	8705	6	0
Grant	11891	7	1
Greenbrier	35800	1	17
Hampshire	23812	7	2
Hancock	30571	5	3
Hardy	13912	7	8
Harrison	69436	6	29
Jackson	29241	4	7
Jefferson	54225	7	5
Kanawha	192315	3	108
Lewis	16416	6	3
Lincoln	21550	2	2
Logan	36457	2	5
Marion	21729	6	18
Marshall	56586	5	3
Mason	32800	4	3
McDowell	27298	1	1
Mercer	62465	1	18
Mineral	28192	7	0

Mingo	26563	2	3
Monongalia	98528	6	50
Monroe	13534	1	2
Morgan	17535	7	1
Nicholas	26268	1	11
Ohio	44246	5	30
Pendleton	7673	7	3
Pleasants	7611	4	0
Pocahontas	8786	1	2
Preston	33723	6	3
Putnam	56008	2	39
Raleigh	79127	1	43
Randolph	29465	6	15
Ritchie	10295	4	1
Roane	14858	4	3
Summers	13867	1	1
Taylor	16916	6	8
Tucker	7021	6	2
Tyler	9121	5	2
Upshur	24322	6	8
Wayne	42126	2	3
Webster	9143	1	4
Wetzel	16351	5	2
Wirt	5762	4	1
Wood	87120	4	22
Wyoming	23419	1	2

The frequency of PAs licensed by the WV Board of Medicine employed in each West Virginia county at the time of 2011 licensure renewal is found below in **Figure 26**. **Figure 27** demonstrates the frequency of PAs employed by West Virginia Workforce Investment Area. The Workforce Investment Areas with the highest number of PAs licensed by the WV Board of Medicine are employed in Regions 1, 3 and 6, and the lowest numbers employed are in Regions 4, 5 and 7.

Figure 26: Physician Assistants (MD Board) employed by county, 2011

Data provided by WV Board of Medicine

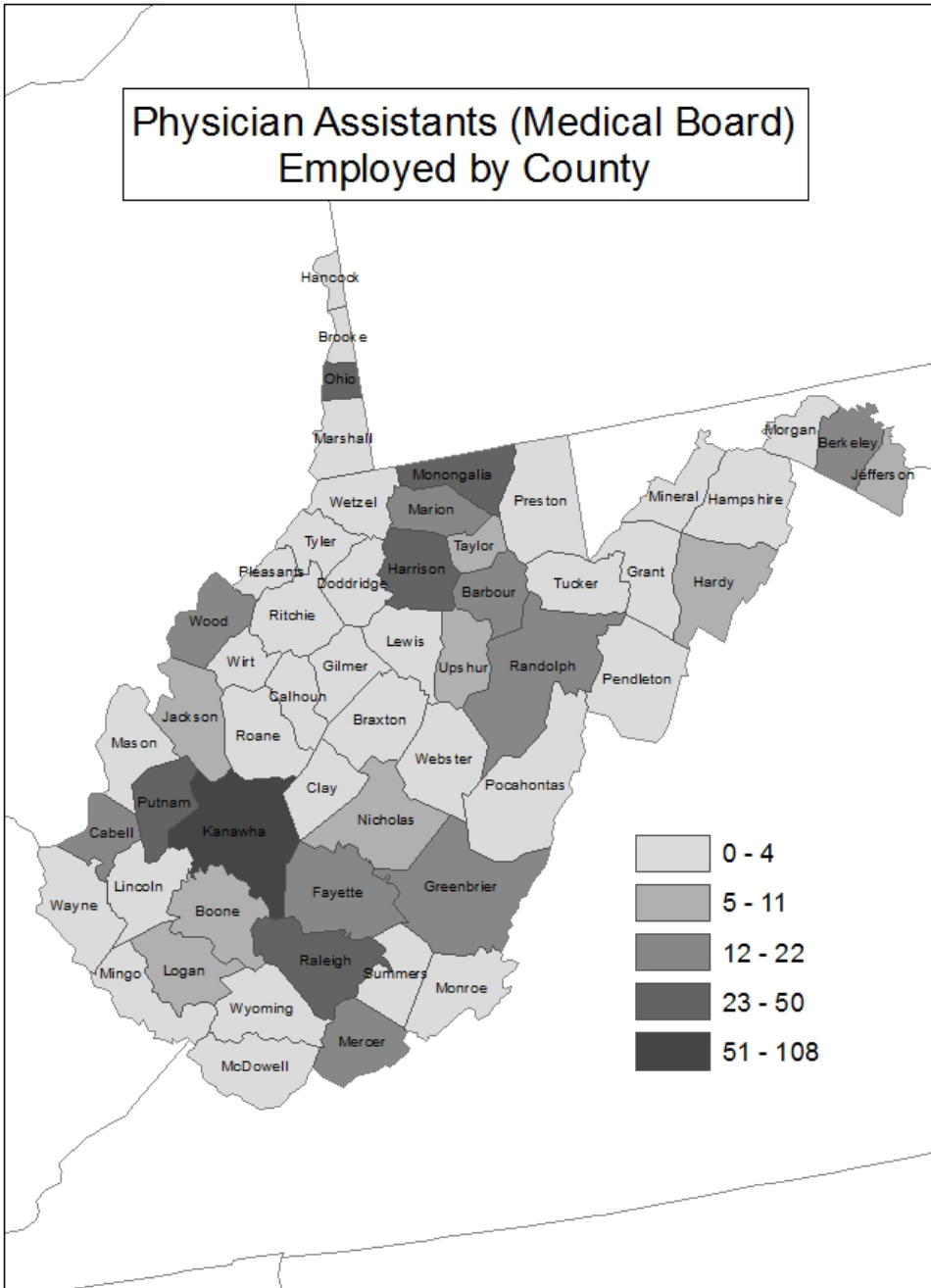
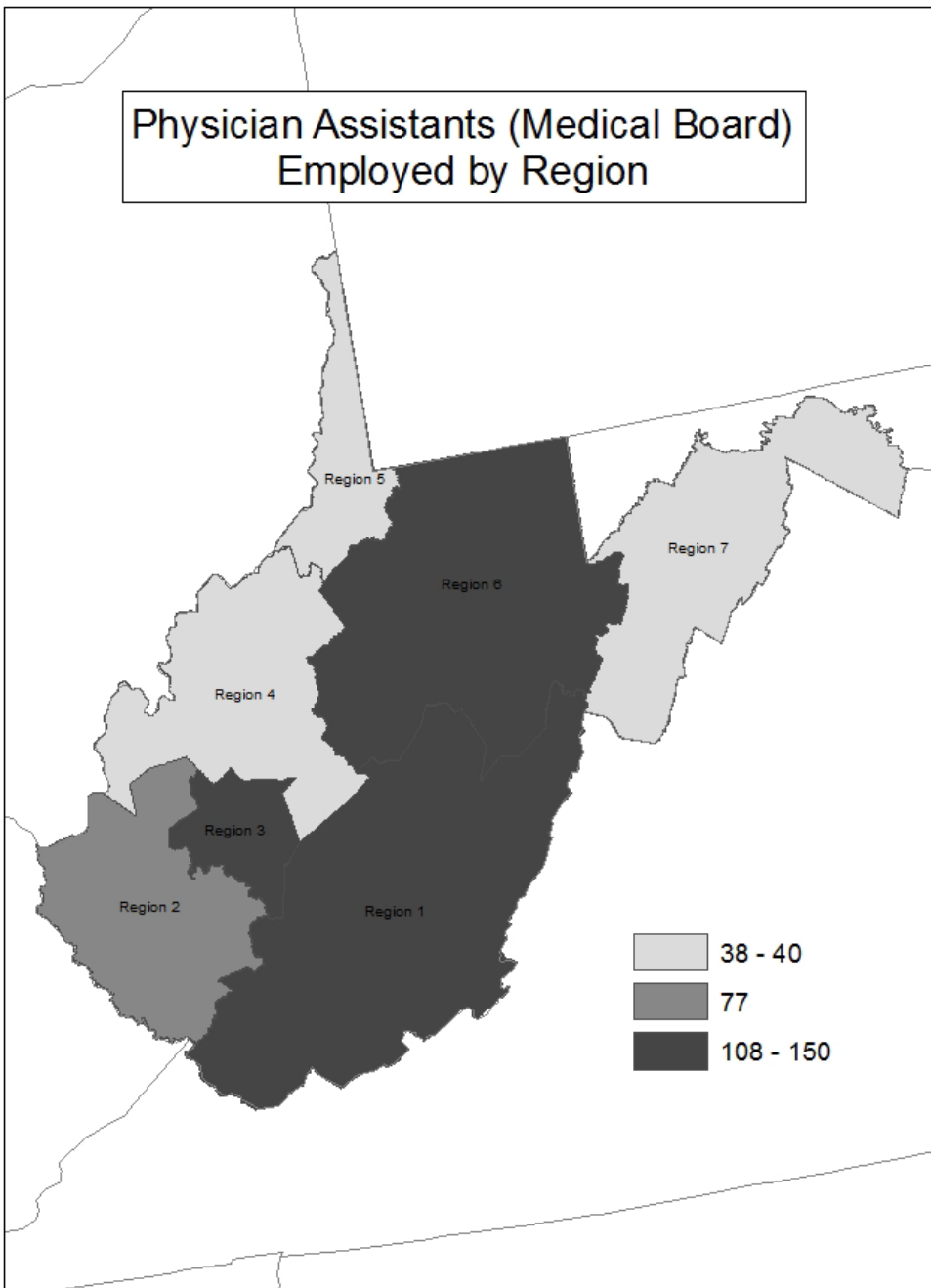


Figure 27: Physician Assistants (MD Board) employed by region, 2011

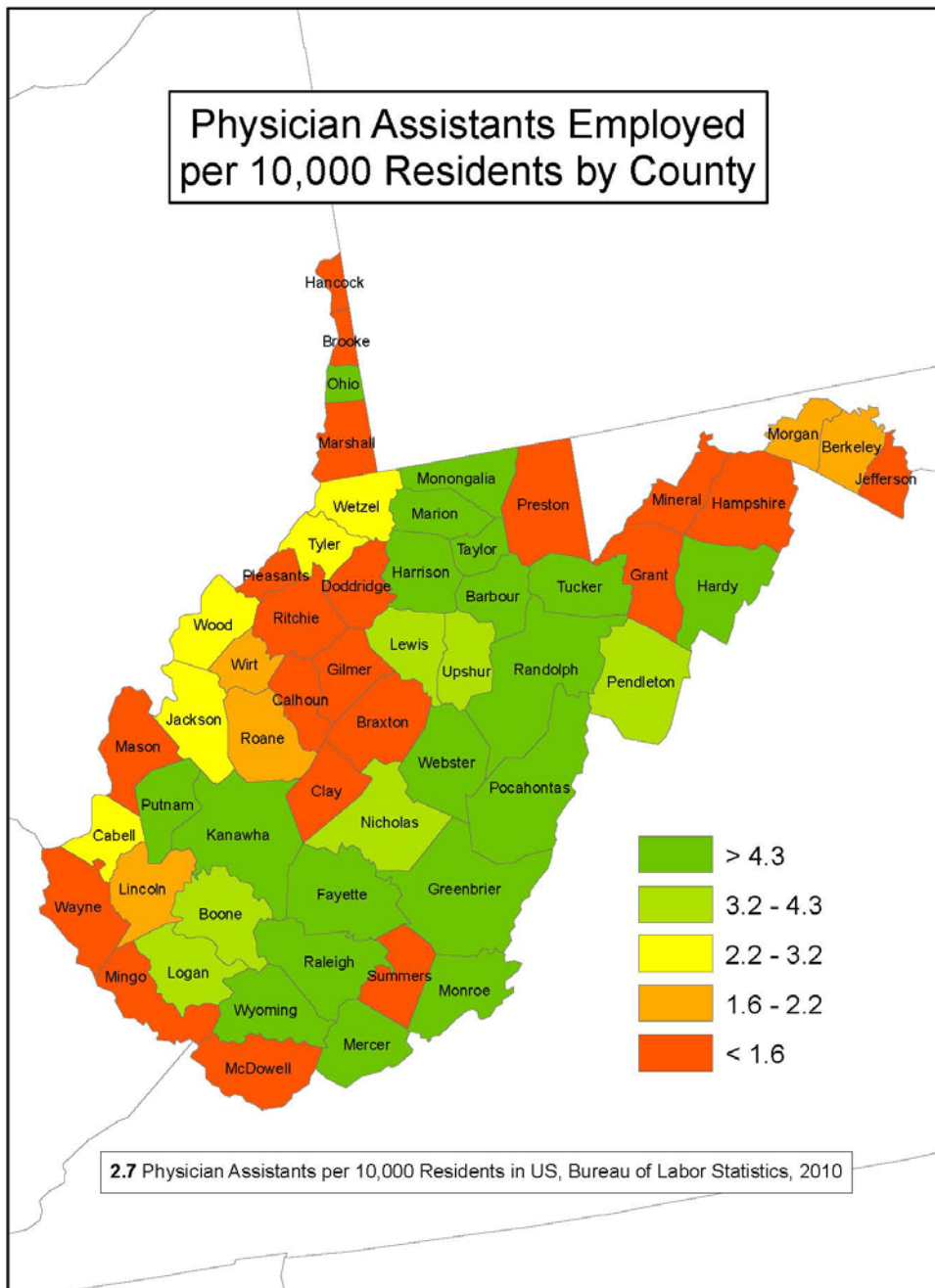
Data provided by WV Board of Medicine



As noted earlier, national figures for PA density per 10,000 population do not distinguish between type of licensure, therefore **Figure 28** demonstrates the density of PAs licensed by the WV Board of Osteopathic Medicine and the WV Board of Medicine by county as compared to national average density per 10,000 population. Twenty five counties (those indicated in red and orange below) are below the national average for density per 10,000 population.

Figure 28: Density of Physician Assistants (DO and MD Board) by county as compared to national average density per 10,000 population

Data provided by WV Board of Medicine and WV Board of Osteopathic Medicine



Pharmacists

As noted earlier, the Board of Pharmacy could only provide residence data for Licensed Pharmacists. Pharmacy business locations were provided, however there was no way to match providers to their pharmacy work location. **Therefore, data presented for Pharmacists indicate place of residence only. Data should be interpreted with caution as no assumptions can be made regarding place of employment as it relates to place of residence. No density map is provided for Pharmacists, as comparisons of place of residence to national density figures for employment would be misleading.**

West Virginia training programs for Pharmacists are found in **Table 16**. The number of pharmacists licensed by the WV Board of Pharmacy **residing** in each West Virginia county at the time of licensure renewal in 2011 is found in **Table 17**. County populations for 2011 and the workforce region for each county are noted for reference.

Table 16: WV Pharmacist training programs

West Virginia Pharmacy Programs

Data provided by the West Virginia Higher Education Policy Commission

Degree	Institution	County	Workforce Region	2010-11 Degrees Conferred
Doctoral	Marshall University	Cabell	2	0*
Doctoral	West Virginia University	Kanawha, Monongalia	3, 6	87
Doctoral	University of Charleston	Kanawha	3	81

*The Marshall University School of Pharmacy did not admit its first class until 2012.

Table 17: Number of Pharmacists residing per WV County, 2011

Data provided by WV Board of Pharmacy

County	County Population 2011	West Virginia Workforce Region	Pharmacists Residing in County
Barbour	16520	6	9
Berkeley	105750	7	73
Boone	24444	2	15
Braxton	14485	6	7
Brooke	23844	5	78
Cabell	96653	2	134
Calhoun	7652	4	3
Clay	9357	4	4

Doddridge	8171	6	4
Fayette	45699	1	29
Gilmer	8705	6	8
Grant	11891	7	9
Greenbrier	35800	1	38
Hampshire	23812	7	12
Hancock	30571	5	7
Hardy	13912	7	4
Harrison	69436	6	84
Jackson	29241	4	29
Jefferson	54225	7	17
Kanawha	192315	3	281
Lewis	16416	6	14
Lincoln	21550	2	1
Logan	36457	2	28
Marion	21729	6	64
Marshall	56586	5	23
Mason	32800	4	25
McDowell	27298	1	9
Mercer	62465	1	61
Mineral	28192	7	20
Mingo	26563	2	24
Monongalia	98528	6	233
Monroe	13534	1	3
Morgan	17535	7	9
Nicholas	26268	1	26
Ohio	44246	5	75
Pendleton	7673	7	7
Pleasants	7611	4	5
Pocahontas	8786	1	8
Preston	33723	6	19
Putnam	56008	2	110
Raleigh	79127	1	138
Randolph	29465	6	33
Ritchie	10295	4	4
Roane	14858	4	15
Summers	13867	1	8
Taylor	16916	6	14
Tucker	7021	6	1
Tyler	9121	5	3
Upshur	24322	6	20
Wayne	42126	2	12
Webster	9143	1	1

Wetzel	16351	5	9
Wirt	5762	4	2
Wood	87120	4	104
Wyoming	23419	1	12

The frequency of Pharmacists residing in each West Virginia county at the time of 2011 licensure renewal is found below in **Figure 29**. **Figure 30** demonstrates the frequency of Pharmacists residing by West Virginia Workforce Investment Area.

Figure 29: Pharmacists residing by county, 2011

Data provided by WV Board of Pharmacy

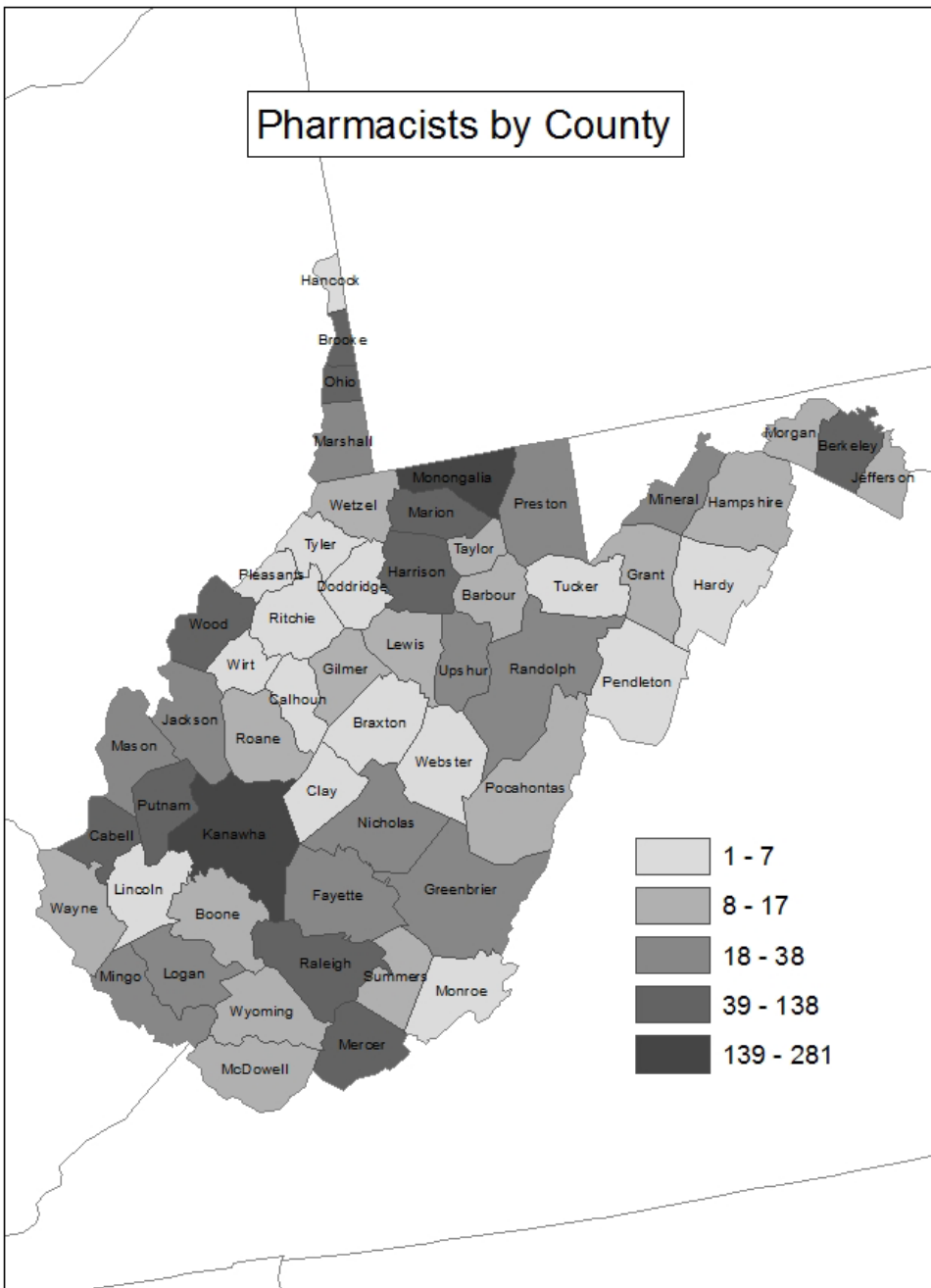
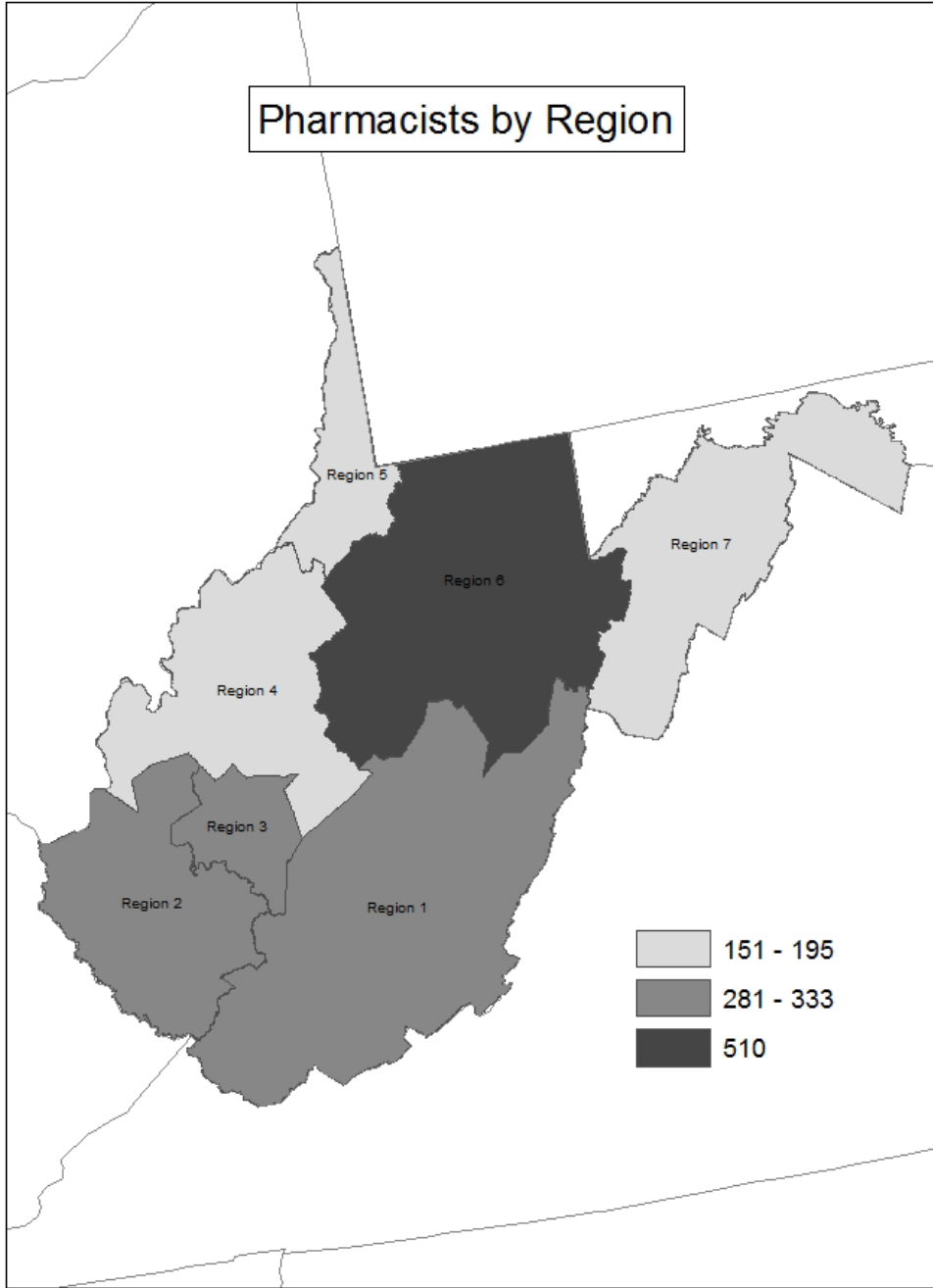


Figure 30: Pharmacists residing by region, 2011

Data provided by WV Board of Pharmacy



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