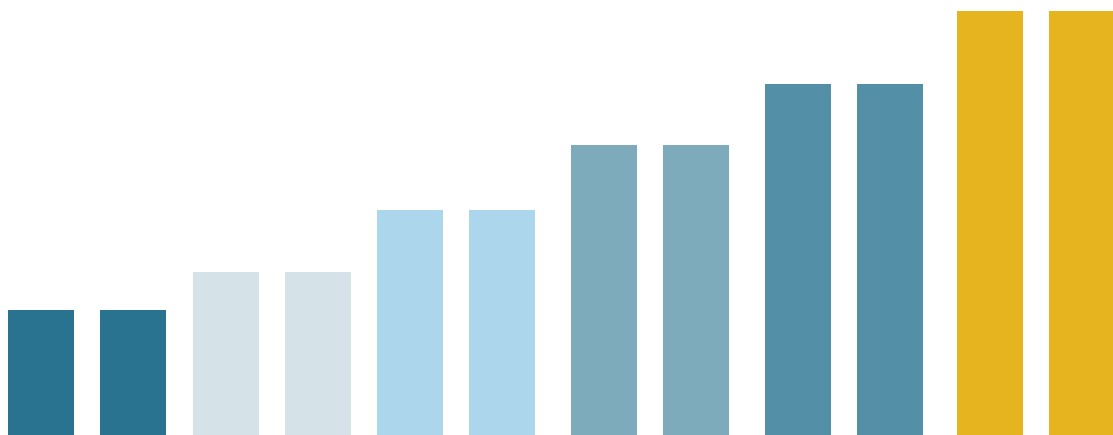




# *The Dentist Workforce in South Carolina*

*April 2012*



**The Office for Healthcare Workforce Analysis and Planning (OHW)** is a collaborative partnership of the South Carolina Area Health Education Consortium (AHEC), the South Carolina Budget and Control Board Office of Research and Statistics Health and Demographics Section, and the University of South Carolina College of Nursing Office of Healthcare Workforce Research for Nursing. We are dedicated to studying supply and demand issues affecting a wide variety of healthcare professions and occupations in South Carolina. Our primary purpose is the development and analysis of accurate, reliable data on the supply of healthcare professionals and the demand for health services, in order to support workforce planning efforts. Those efforts will help to ensure that the citizens of South Carolina will have the number and types of healthcare providers they will need in the future.

The OHW is housed within the South Carolina AHEC and currently funded through a grant from The Duke Endowment. The Duke Endowment, located in Charlotte, N.C., seeks to fulfill the legacy of James B. Duke by improving lives and communities in the Carolinas through higher education, health care, rural churches and children’s services. Since its inception, the Endowment has awarded \$2.8 billion in grants. The Principal Investigator is David Garr, MD, Executive Director of the South Carolina AHEC.

This report was prepared by: Linda M. Lacey, Director  
and  
Melanie Canterbury, Research Associate  
Office for Healthcare Workforce Analysis and Planning  
South Carolina Area Health Education Consortium  
Medical University of South Carolina  
19 Hagood Ave., Suite 802, Charleston, SC 29425

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# The Dentist Workforce in South Carolina

Dentists play an increasingly important role in our health care system. The body of evidence linking poor oral health to a wide range of acute and chronic diseases is growing quickly. Knowing the size and characteristics of the current Dentist workforce in the state is important baseline information for educators and policy makers concerned with ensuring an adequate supply of Dentists for South Carolinians. This report provides information about the number and type of Dentists practicing in the state, their demographic characteristics, and information about where they practice.

Dentists in South Carolina renew their license to practice every two years through the South Carolina Department for Labor, Licensing, and Regulation. The majority of information in this report is based on data gathered during the most recent license renewal period – October through December, 2010 - and from Dentists applying for an initial license to practice through April 30, 2011. Based on that information, there were a total of 2,637 Dentists licensed and practicing in the state as of May 1, 2011. Of those, 2,029 were available to the civilian population (see Table 1) and made up the Dentist workforce in the state. That is an increase of 3.2% over the 2009 dental workforce.

Table 1. The Dentist Workforce in South Carolina: 2009 - 2011

Licensed Dentists in South Carolina		2009	2011		
# with an active license to practice in SC as of May 1, 2011		2,554	2,637		
# who are licensed and actively practicing within SC		1,998	2,068		
<b>Of those who practice in SC:</b>					
# who practice in military facilities AND hold a South Carolina license		32	39		
Total # of Dentists in the South Carolina workforce		1,966	2,029		
# of Dentists in the workforce <u>and</u> in residency training		15	8		
<b>Primary specialties within the active Dentist workforce:</b>					
	National % 2009	SC 2009 #	SC 2009 %	SC 2011 #	SC 2011 %
General Dentistry	78.8	1,512	76.9	1,563	77.0
Orthodontics	5.6	125	6.4	123	6.1
Oral Surgery	3.9	96	4.9	94	4.6
Pediatric Dentistry	3.3	75	3.8	80	3.9
Periodontics	2.8	70	3.6	69	3.4
Endodontics	2.7	49	2.5	55	2.7
Prosthodontics	1.8	23	1.2	21	1.0
Other	1.2	16	0.8	18	0.9
Unknown	-	0	0	6	0.03
<b>Totals</b>	<b>100%</b>	<b>1,966</b>	<b>100%</b>	<b>2,029</b>	<b>100%</b>

A small number of Dentists practice in federal or military facilities and provide services only to military members and veterans. Because the goal of this report is to provide an overview of the Dentists available to treat South Carolinians, we do not include military-based Dentists in the count of the Dentist workforce. We do include Dentists who are still engaged in post-graduate training because they are fully licensed and available to provide patient care.

The American Dental Association reports that in 2009 there were 186,084 professionally active Dentists in the United States.<sup>1</sup> Based on the 2009 national population, the number of Dentists for each 10,000 people in the nation that year was 6.1. In South Carolina the ratio that year was 4.3 Dentists for each 10,000 persons in the state. In urban areas of the state it was 4.9 and in rural areas it was 2.7. Due to a general increase in the state’s population, these ratios did not change much by 2011, despite the increase in the total number of Dentists. In 2011 the statewide ratio of Dentists to population was 4.4 per 10,000. In urban areas the ratio was 5.0 per 10,000, and in rural areas the ratio remained at 2.7 per 10,000. National statistics for 2011 are not yet available for comparison.

## Who are South Carolina's Dentists?

### Gender and Race

The majority (79.7%) of South Carolina Dentists in the 2011 workforce are male - a level slightly higher than the national level of 77.8% male in 2009 – the most recent year national data is available. The racial makeup of the Dentist workforce is different from both the national profile, and that of the state's general population: the great majority of South Carolina Dentists (91%) are White, 6.1% are Black, 1.3% Asian, 0.3% Hispanic, 0.1% American Indian, and 1.3% reported race as “other.”<sup>2</sup> Nationally in 2006, 86.2% of Dentists were White, 3.4% Black, 6.9% Asian, 3.4% Hispanic, and 0.1% American Indian.<sup>3</sup> According to the 2010 Census, 48.6% of the South Carolina population is male and 66.2% of residents are White, 27.9% Black and 5.1% Hispanic. The two charts in Figure 1 compare the gender and racial makeup of Dentists and the general South Carolina population.

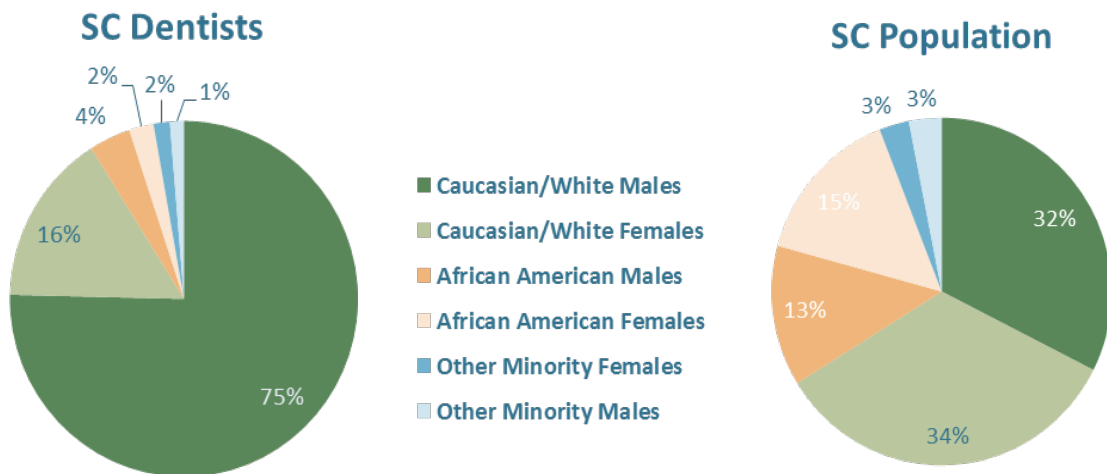


Figure 1. Gender and Racial Diversity in the South Carolina Dentist Workforce and the General Population

In addition, while about half of the state’s population is female, only 20% of all Dentists currently practicing in the state are women. However, this imbalance between the genders has been changing over the years. Among Dentists under the age of 30, 51.5% are women (see Figure 2). If this trend continues, then over time the gender gap in the workforce will diminish.

### Age

In 2011, the average age of practicing Dentists in South Carolina was 49.4, which is almost the same as the mean age of Dentists nationally - 49.8. A comparison of the age distribution in the Dentist workforce between 2009 and 2011 (see Figure 3) shows that the number of Dentists over the age of 60 has risen in recent years and the number of younger Dentists has not increased greatly. This aging trend may result in a large proportion of Dentists leaving the workforce within the next decade without an adequate number of younger Dentists available to replace them.

The aging in the Dentist workforce coincides with a similar aging trend in the general population. Because some health conditions or treatments which occur more often in older age groups, such as diabetes or chemotherapy, can affect oral health as well, an increase in the number of senior citizens over the next decade may result in increased demand for dental services at the same time that a sizeable number of Dentists will be retiring.

The age profile of Dentists also varies across the different clinical specialties.

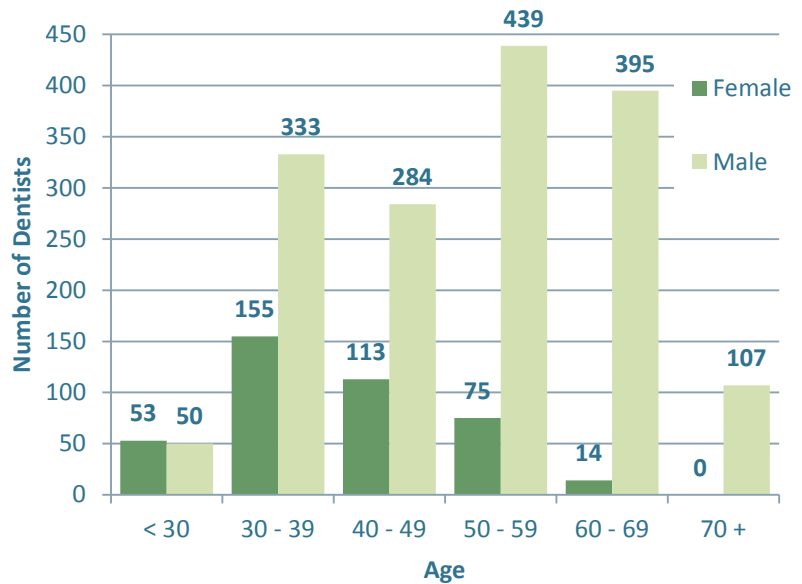


Figure 2. Age and Gender Distributions in the SC Dentist Workforce

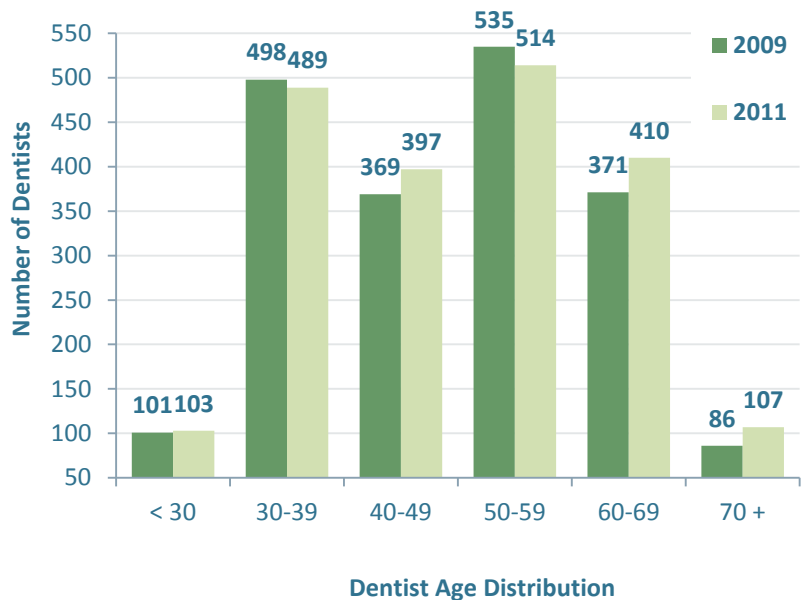


Figure 3. Changes in the Age Distribution of SC Dentists 2009 to 2011

Figure 4 shows the percent of Dentists in each age group by practice specialty. The largest age group among periodontists is age 60 and over which could signal an impending shortage in that field due to significant retirement losses in the next decade.

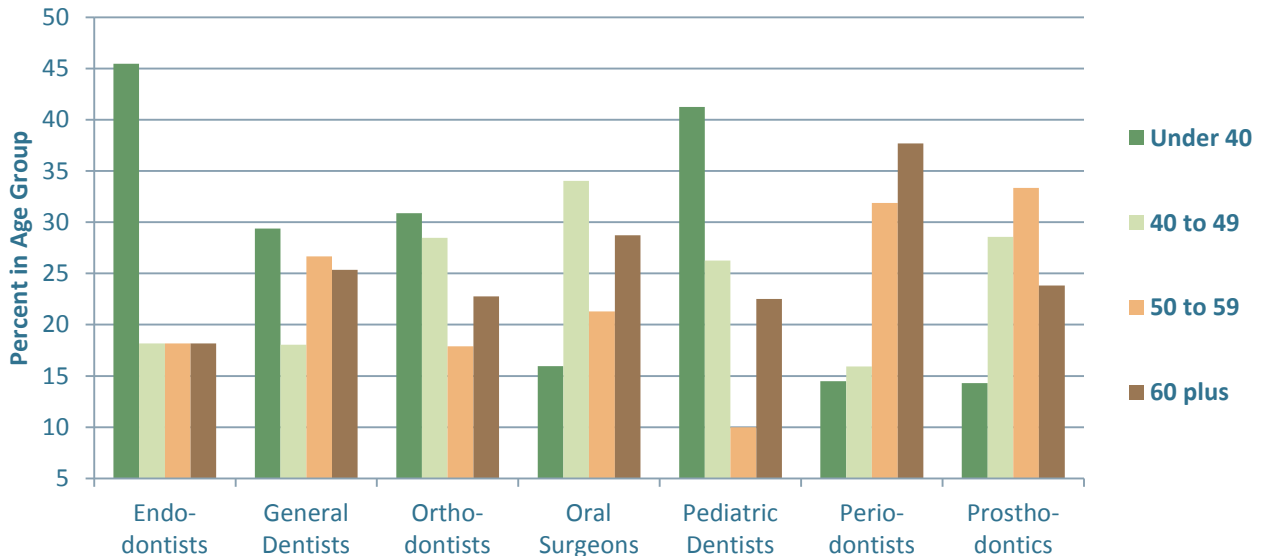


Figure 4. Percentage of Dentists by Age Group and Clinical Specialty

The effect of an aging workforce may have greater impact in rural areas of the state, as Dentists age 60 and older make up 24.1% of the workforce in urban areas of the state, but 33.5% in rural areas. Table 2 illustrates the intersection of age, clinical specialty and geographic location in the Dentist workforce. The number of Dentists who have their primary practice located in rural counties is much smaller in general, and for most of the specialties the proportion of Dentists age 60 or over is larger in rural areas as a result.

Table 2. Dentists by primary specialty, age and rural/urban practice location in South Carolina in 2011.

Specialty	Rural Counties			Urban Counties		
	Total #	# age 60 and older	% age 60 and older	Total #	# age 60 and older	% age 60 and older
Endodontists	3	1	33.3%	52	9	17.3%
General Dentists	288	97	33.7%	1,257	299	23.8%
Orthodontists	9	3	33.3%	114	25	21.9%
Oral Surgeons	5	3	60.0%	89	24	27.0%
Pediatric Dentists	6	0	0.0%	74	18	24.3%
Periodontists	6	2	33.3%	63	24	38.1%
Prosthodontics	5	2	40.0%	16	3	18.8%
<b>Total Workforce</b>	<b>322</b>	<b>108</b>	<b>33.5%</b>	<b>1,665</b>	<b>402</b>	<b>24.1%</b>

## Education

As of 2011, most of the active Dentists in South Carolina (n=1,161, 59.1%) were graduates of the state's only dental program—the James B. Edwards College of Dental Medicine at the Medical University of South Carolina (MUSC). The remainder of Dentists in the state graduated from dental schools outside of South Carolina, with the largest contributing states including Georgia (n=122, 6.2%), Virginia and the District of Columbia (each with n=73, 3.7%), Kentucky (n=69, 3.5%), and Pennsylvania (n=55, 2.8%).<sup>4</sup>

The dental school at MUSC is a critical resource for South Carolina, and entry into the program is competitive. The American Dental Association released a series of reports in April 2011 containing information from their annual survey of dental education programs across the country. These reports contain information, most recently, about the 2009-10 academic year.<sup>5</sup> For the 2009-10 application cycle, MUSC received a total of 792 applications to its dental program for approximately 55 available seats (the following year the class size was increased to 70). The applicants were almost equally divided among men (395) and women (397). The reported race/ethnicity of the total applicant pool was 64.5% White, 14.4% Asian, 6.9% Black, 4.3% Hispanic, less than 1% American Indian, and 9.1% where race was unspecified. Of those 792 applicants, 121 were evaluated and considered for admission by the school's admissions committee. At the end of the application cycle, 58 students accepted admission into the program, 52 of whom were South Carolina residents. The ADA reports that only 8 students from South Carolina enrolled in a dental program that year outside of South Carolina. Table 3 summarized the gender and racial characteristics of the 2009-10 applicant pool and enrollees.

**Table 3. Gender and Race Percentages in the 2009-10 Academic Year Dental School Applicant Pool : SC and the US**

2009-2010	Dental School Location	Male	Female	White	Non-White	Under-represented Minority	Race Not Specified
<b>Applicants</b>							
	SC	49.9%	50.1%	64.5%	26.4%	12.0%	9.1%
	US	55.1%	44.9%	48.0%	42.2%	9.6%	9.7%
<b>Offered Admission</b>							
	SC	57.9%	42.1%	88.4%	9.1%	5.0%	2.5%
	US	55.6%	44.4%	48.2%	42.4%	9.4%	9.4%
<b>Enrolled</b>							
	SC	50.0%	50.0%	87.9%	10.3%	6.9%	1.7%
	US	54.3%	45.7%	58.5%	37.2%	12.7%	4.3%

*Note: Non-White includes those reporting their race as Black, Hispanic, American Indian, or Asian. The figures in the column "Under-represented Minority" group includes Blacks, Hispanics and American Indians. Asians are not proportionately underrepresented in the healthcare workforce.*

The ADA also reports statistics for all students enrolled in dental programs the 2009-10 academic year. The next two figures show percentages of all enrolled dental students for the 2009-10 academic year in South Carolina and the United States, plus two neighboring states: North Carolina and Georgia. Figure 5 displays the percentages of males and females enrolled in dental programs in each state and nationally.

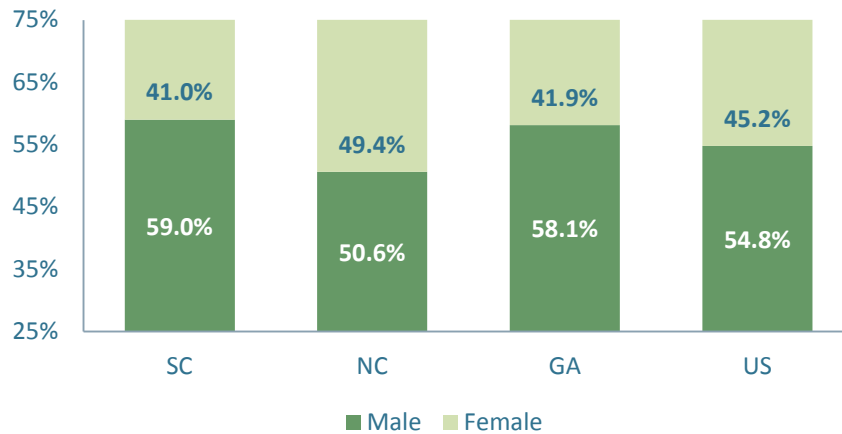


Figure 5. Gender distribution among enrolled dental school students by state in 2009-10.

Figure 6 shows the race/ethnic background of all dental students enrolled during the 2009-10 academic year for the three states and nationally. Whites and Asians are grouped together in this figure because, while Asians are a minority in general population, they are not proportionately under-represented in the dental workforce.

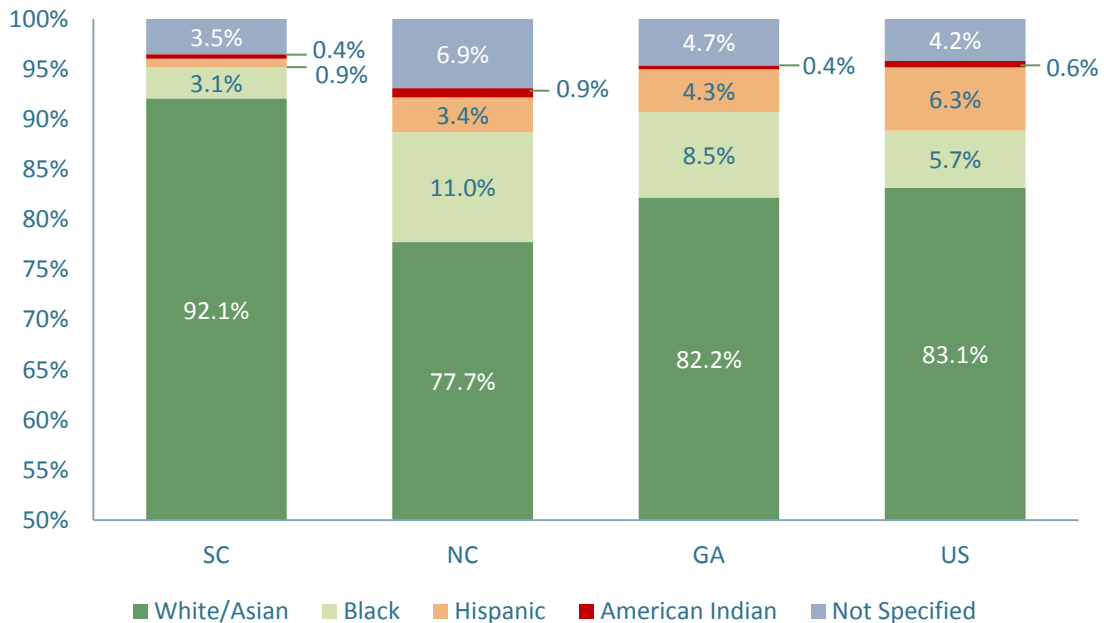


Figure 6. Race and ethnicity distribution among enrolled dental school students by state in 2009-10.



Research has shown that many patients prefer to seek care from providers who share their racial or ethnic background, and that minority providers are more likely to practice in underserved areas.<sup>6</sup> The relative lack of minority Dentists in our current workforce may be a contributing factor to low use of preventive dental services and reduced access to care experienced within some minority communities. To address the lack of minority Dentists in the state, the South Carolina Dental Association has outlined several ways in which they support efforts to increase the racial and ethnic diversity of the dental workforce.<sup>7</sup> The Medical University of South Carolina established a Diversity Task Force in 2008 to address the challenges of minority recruitment.<sup>8</sup> In addition, The George C. McTeer Scholarship Fund has been endowed at MUSC to support minority student recruitment, but is not yet fully funded, and thus will not be available to support incoming students for several more years.<sup>9</sup>

## What are the work characteristics of South Carolina's Dentists?

### Hours Worked per Week

The total number of hours worked per week by practicing Dentists in South Carolina is, on average, 36.5 hours, based on information provided by Dentists during the license renewal process. The average number of hours per week did not vary by gender: males worked an average of 36.5 hours per week and women an average of 36.4 hours per week. The ADA reports that in 2009, 85.8% of all Dentists in the nation worked a full-time schedule (30 hours or more) and 14.3% worked a part-time schedule (less than 30 hours). Dentists practicing in South Carolina in 2011 tended to work a bit more: 88.5% reported working full-time, and 11.5% part-time. Figure 7 shows the distribution of weekly work hours in the South Carolina Dentist workforce.

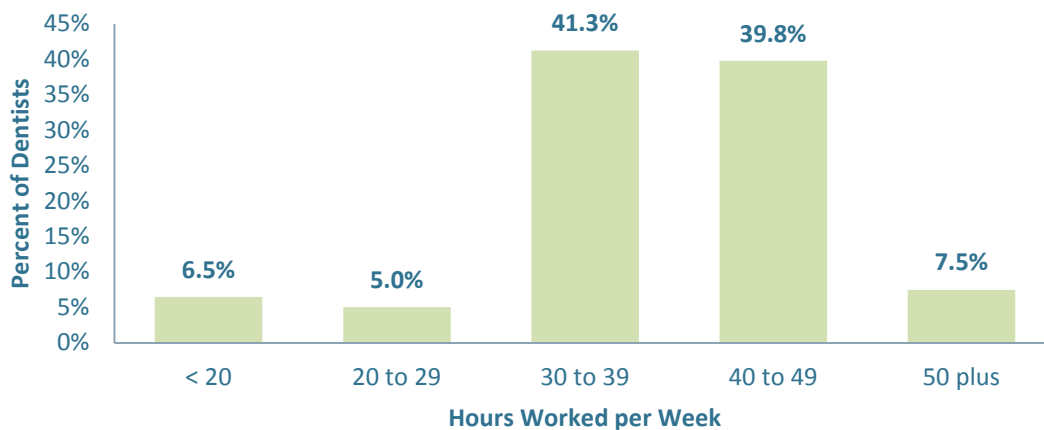


Figure 7. Distribution of Weekly Work Hours Among South Carolina Dentists in 2011

The figure to the right (Figure 8) shows how Dentists’ work patterns differ based on the rural or urban location of their primary practice setting. Overall, there is little difference: a slightly larger proportion of Dentists located in rural areas work fewer than 40 hours in a normal week (62.9%), compared to those who practice in urban areas (54.7%). The average number of weekly work hours for rural Dentists is 35.5, while for urban Dentists it is 36.7. The great majority of a Dentist’s work week is spent in direct patient care activities regardless of practice location: 32.1 hours for rural Dentists and 31.9 hours for urban Dentists, on average.

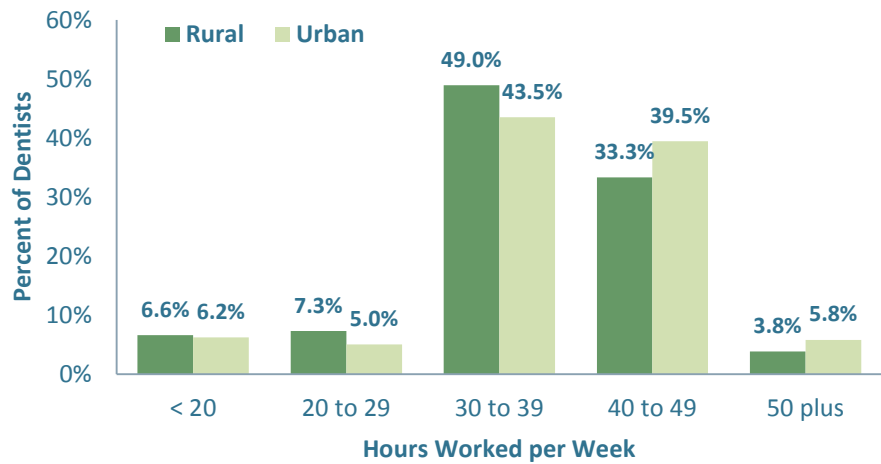


Figure 8. Distribution of Weekly Work Hours by the Primary Practice Location of Dentists in Rural or Urban Areas.

The number of hours worked in a typical week varies more by age. The average length of the work week is similar for Dentists up to age 50 when it begins to shorten slightly (see Table 4). After age 60 there is a significant decrease in the average length of the work week. When this relationship between age and work hours was examined in a multivariate regression with other characteristics of the Dentist such as gender, specialty (General Dentists compared to Dentists in all other specialties), or the rural/urban nature of the practice setting, age was the dominant predictor of work hours. Whether this reduction of hours at later ages is voluntary or the result of a reduction in patient panel size is unknown.

Table 4. Average Work Hours by Dentist Age in 2011

Age	# of Dentists	Average Hours per Week
< 30	103	38.59
30-39	489	38.38
40-49	397	38.82
50-59	514	37.46
60-69	410	33.14
70 +	107	24.87
All Ages	2,020	36.5

This information about how work patterns change with age is important because, as noted earlier, the number of Dentists over the age of 60 has increased over recent years, and approximately one-third of Dentists in rural areas of the state are currently age 60 or older. Assuming that work hours are reduced voluntarily, this means that even if older Dentists remain in practice, we need to take changes in work habits into account when estimating the effective size of the Dentist workforce in an area of the state and how that might change over time as the Dentist workforce ages.

Note: Nine Dentists did not report either age or work hours.

Work patterns also vary by practice specialty. Figure 9 makes clear that the majority of Dentists in each of the clinical specialty groups work between 30 and 49 hours in a typical week. However, some groups have larger or smaller percentages in the lowest or highest hours categories. It may be easier to compare the groups by looking at the average number of hours reported in a week: Endodontists – 38.7 hours; General Dentists – 35.9 hours; Orthodontists – 36.0 hours; Oral Surgeons – 44.0 hours; Pediatric Dentists – 38.9 hours; Periodontists – 36.7 hours; Prosthodontists – 38.0 hours.

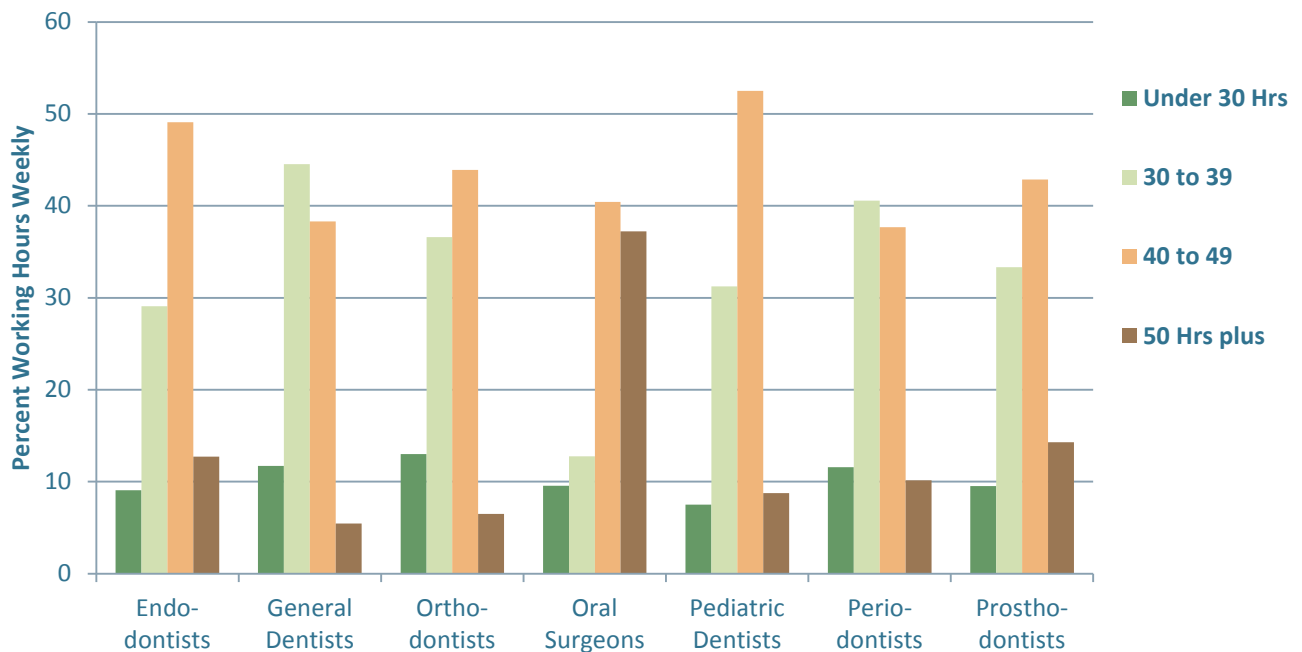


Figure 9. Distribution of Weekly Work Hours by Specialty among South Carolina Dentists in 2011

## Work Settings

As part of the licensing process, each Dentist reports information about their practice, such as the type of setting in which they work, whether they work in more than one setting, and the type of employment arrangement they work under.

The great majority of Dentists in South Carolina (94.1%, n=1,909) work in a private dental office. Of those that do, most (53.7%) are solo practitioners who are self-employed. About one-third (32.9%) are self-employed within a group practice, and the remainder (13.4%) are employed by either a group practice or another individual practitioner.

The relatively small number of Dentists who do not practice in private offices (n=120, 5.9% of the total) are spread across a variety of settings: see Figure 10. The largest proportion (47.5% of the 120 or 2.8% of the total) are practicing in a university setting. A few are affiliated with junior or technical colleges (3.3% of 120 or 0.2% of the total). Slightly more than one-third (37.5% of the 120 or 2.2% of the total) practice in community health centers or other types of free-standing clinics. The remainder (11.7% of 120 or 0.6% of the total) are practicing in hospitals, nursing homes, schools, or other types of institutional settings.

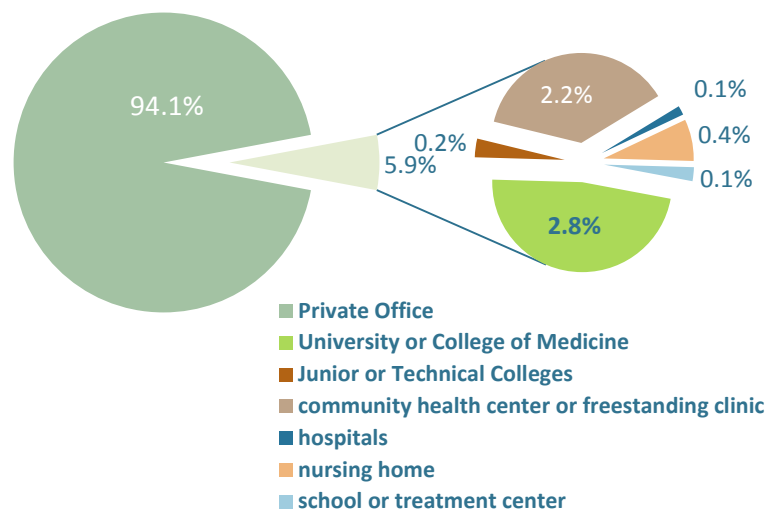


Figure 10. Types of Practice Settings Among Active Dentists in South Carolina, 2011

Of the 2,029 Dentists who were actively practicing in South Carolina in 2011, a total of 336 (16.6%) reported practicing in more than one location. Most of them reported having only a second additional location beyond their primary practice site, but 61 Dentists reported having 3 or more practice locations. The number of hours spent in secondary practice locations each week totals to 4,297 hours across the 336 Dentists who reported having a secondary practice location in 2011. The majority (62.2%) of the Dentists reporting more than one practice location were working in more than one county. A slightly larger proportion (21%) of younger Dentists (those who graduated after 1992) reported working in multiple locations compared to their older colleagues (13%).

## Full-Time Equivalents in the Dentist Workforce

The fact that the work patterns of Dentists in South Carolina differ by age, clinical specialty, and the rural or urban location of their primary practice means that simply knowing how many Dentists we have in an area or practicing in a clinical specialty is not sufficient information for understanding the true size of the available workforce. One way to do that, and the most common approach in workforce analysis, is to standardize the count of Dentists by assigning each a measure of full-time equivalency (FTE), based on the number of hours they work in a typical week. Forty hours per week is the most commonly reported value (mode value) among South Carolina Dentists, so we are using that as the basis of an FTE measure. A Dentist reporting a typical work week of 20 hours is assigned an FTE value of 0.5, while one reporting 40 hours per week is assigned a value of 1.0 FTE. Someone reporting a 60 hour week equates to 1.5 FTEs. Table 6 displays the number of Dentists in South Carolina by their clinical specialties in 2009 and 2011. The table shows both the total number of Dentists (head count) and the number of full-time equivalents (FTEs) in each area of dental practice.

Table 5. Number of Active Dentists and FTEs in the Workforce in South Carolina by Specialty: 2009 and 2011

Active Dentists by Primary Specialty	Number of Active Dentists		Dentist FTEs	
	2009	2011	2009	2011
General Dentistry	1,512	1,563	1364.6	1401.5
Orthodontics	125	123	115.2	110.6
Oral Surgery	96	94	109.4	103.3
Pediatric Dentistry	75	80	70.7	77.7
Periodontics	70	69	62.9	63.3
Endodontics	49	55	48.8	53.2
Prosthodontics	23	21	21.5	19.9
Other	16	18	14.5	15.2
Unknown	0	6	0	6
<b>Totals:</b>	<b>1,966</b>	<b>2,029</b>	<b>1,807.6</b>	<b>1,850.7</b>

In order to gain a more detailed understanding of the workforce in different areas of the state, we calculated the total number of FTE Dentists in each county, combining time spent in both primary and secondary practice locations, and standardized it by population size within the region. The results are displayed in Figure 11.

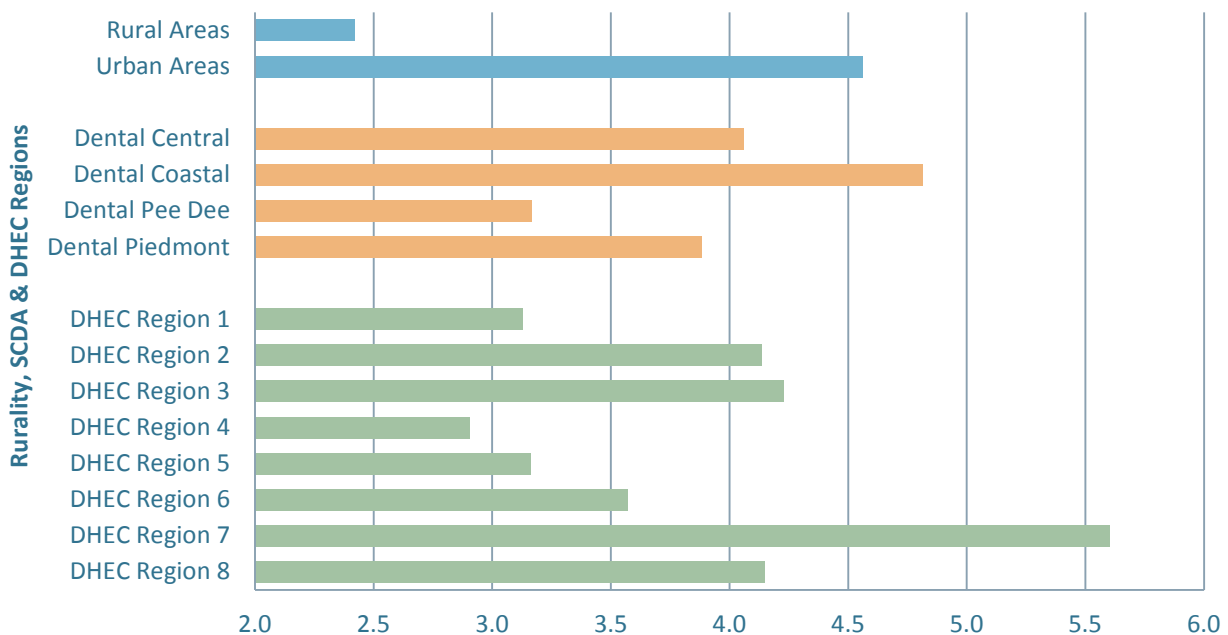


Figure 11. Dentist FTEs per 10,000 persons available within different regions of South Carolina in 2011

Table 6. Number of Dentist FTEs practicing in each county in 2011 by specialty and total density per 10,000 population

Count	Endo-dontics	General Dentistry	Ortho-dontics	Oral Surgery	Pedia-trics	Perio-dontics	Prostho-dontics	Other	Total FTEs	FTEs Per 10,000
Abbeville	0	3.7	0	0	0	0	0	0	3.7	1.45
Aiken	2.3	46.5	4.0	4.4	2.4	1.3	0	0	60.9	3.80
Allendale	0	2.5	0	0	0.8	0	0	0	3.3	3.19
Anderson	2.4	53.0	4.5	2.5	2.0	1.6	0.9	0	66.8	3.57
Bamberg	0	3.6	0	0	0	0	0	0	3.6	2.24
Barnwell	0	4.0	0.4	0	0	0	0	0	4.3	1.91
Beaufort	4.9	63.5	4.2	5.1	2.4	3.2	1.8	0	84.9	5.23
Berkeley	0.3	31.8	1.9	1.2	2.7	0.2	0	0	38.0	2.14
Calhoun	0	2.6	0	0	0	0	0	0	2.6	1.71
Charleston	9.3	188.5	20.6	15.4	15.6	15.6	6.2	3.9	275.1	7.85
Cherokee	0	8.9	0.4	0	0	0	0	0	9.3	1.68
Chester	0	4.8	0	0	0	0	0	0	4.8	1.43
Chesterfield	0	7.1	0.1	0	0	1.0	0	0	8.2	1.74
Clarendon	0	5.6	0.2	0	0	0	0	0	5.8	1.67
Colleton	0.1	6.9	0.6	0.4	0.2	0	0	0	8.2	2.10
Darlington	0	11.1	0.6	0	1.0	0	0	0.2	12.8	1.87
Dillon	0	6.9	0.03	0	0	0	0	0	6.9	2.15
Dorchester	2.0	39.0	3.9	4.9	2.3	2.9	0.3	1.0	56.2	4.12
Edgefield	0	4.8	0	0	0	0	0	0	4.8	1.79
Fairfield	0	2.2	0	0	0	0	0	0	2.2	0.92
Florence	1.9	48.0	3.2	8.1	2.0	1.3	0	1.8	66.3	4.84
Georgetown	1.3	22.9	0.7	1.9	1.0	1.0	0.3	0	29.0	4.81
Greenville	5.8	166.3	17.5	13.8	13.5	7.7	2.5	3.0	230.0	5.10
Greenwood	0.2	20.9	2.3	2.7	1.0	2.0	0.8	0	29.9	4.29
Hampton	0	3.3	0.1	0	0	0	0	0	3.4	1.61
Horry	3.6	72.0	4.0	6.7	3.2	3.3	1.3	0	94.1	3.49
Jasper	0	5.0	0	0	0	0	0	1.0	6.0	2.43
Kershaw	0	16.0	0.5	0.1	0	0.5	0	0	17.0	2.76
Lancaster	0	18.5	0.8	1.4	0	0	0.8	0	21.5	2.80
Laurens	0	12.6	1.1	0.1	0	0	0	0	13.7	2.06
Lee	0	2.7	0	0	0	0	0	0	2.7	1.42
Lexington	3.9	82.6	6.0	5.5	7.9	3.0	1.0	0	111.8	4.26
Marion	0	5.5	0.1	0	0	0	0	0	5.6	1.69
Marlboro	0	5.6	0	0	0	0	0	0	5.6	1.94
McCormick	0	1.4	0	0	0	0	0	0	1.4	1.34
Newberry	0	8.7	0	0.6	0	0	0	0	9.3	2.47
Oconee	0	21.3	1.8	0	1.3	0	2.1	0	26.5	3.57
Orangeburg	1.1	19.8	1.7	0.7	1.0	1.3	0	0	25.5	2.75
Pickens	1.9	28.0	2.8	2.6	0	1.8	0	0	37.2	3.12
Richland	4.7	148.2	10.0	11.2	9.0	7.0	1.0	0.4	191.5	4.98
Saluda	0	3.4	0	0	0	0	0	0	3.4	1.71
Spartanburg	2.7	80.7	6.5	5.4	5.3	3.4	1.1	1.0	106.0	3.73
Sumter	1.1	27.0	1.7	2.5	1.0	1.3	0	0	34.6	3.22
Union	0	5.1	0.2	0	0	0	0	0	5.2	1.80
Williamsburg	0	5.9	0	0	0	0	0	0	5.9	1.71
York	3.8	73.6	8.6	6.3	2.2	4.1	0	1.1	99.7	4.41

Looking at the distribution of Dentists across different counties also can shed light on how well our Dentist workforce is distributed in South Carolina. Table 6 on the previous page reports the number of Dentist FTEs by specialty who have a primary or secondary practice within each county, and the total number of Dentist FTEs per 10,000 residents in that county. The figures in the table illustrate how the size of the dental workforce varies across the state, and how that workforce is distributed across the various specialty areas of care. The final column in Table 6 standardizes the size of the entire Dentist workforce in a county relative to the size of the population in that county. Looking at the workforce in this way provides a means of identifying those areas of the state with an unusually high or low supply of Dentists. (Note: The information in Table 6 has been translated into geographic maps which can be found in Appendix A.)

There is no standard definition of how many Dentists constitute an adequate supply. However, the South Carolina Dental Association position paper on Oral Health, published in April, 2011, reports that a ratio of one Dentist to every 5,000 persons may be adequate, given the efficiency of the modern dental office.<sup>10</sup> The figures in Table 6 illustrate that most of our counties have at least two Dentist FTEs available for each 10,000 persons. However, 18 counties had fewer than 2.0 Dentist FTEs in 2011. When this analysis is restricted to the supply of general dentists (see Map 8 in the Appendix A), a total of 20 counties in the state have fewer than 2 general Dentist FTEs for each 10,000 county residents.

## The Rural / Urban Distribution of the Dentist Workforce

The results displayed in Figure 11, Table 6 and the maps in Appendix A make clear two points: General Dentists can be found in every county in the state, although they tend to be concentrated in urban areas; and Dentists that have pursued a specialty focus almost all practice in the urban areas of the state. Table 7 summarizes the number and percentage of Dentist FTEs by their practice locations (rural or urban counties) and by specialty area.

Table 7. The FTE Dentist workforce in rural and urban areas of the state in 2011 by specialty

Dentist Specialty	FTEs in Rural Counties		FTEs in Urban Counties	
	#	%	#	%
<b>General Dentists</b>	253.0	18.0	1148.5	82.0
<b>Endodontists</b>	2.9	5.4	50.3	94.6
<b>Orthodontists</b>	11.4	10.3	99.3	89.7
<b>Oral Surgeons</b>	7.7	7.5	95.6	92.5
<b>Pediatric Dentists</b>	6.3	8.0	71.5	92.0
<b>Periodontists</b>	5.8	9.1	57.6	90.9
<b>Prosthodontists</b>	4.0	19.9	16.0	80.1

Note: Dentists whose specialty areas fall outside of those named in the table have been omitted from this analysis.

The uneven distribution of Dentists in the state means that access to dental care is more difficult in rural areas. Recent research has demonstrated that among very young children (under age 4) who are Medicaid beneficiaries, those that reside in rural areas of the state have significantly poorer access to dental services, as measured by having a dental home and by utilization of preventive care.<sup>11</sup> It is important to note that the authors concluded that simply increasing the size of the dental workforce in rural areas would not, in itself, be a sufficient solution for improving dental outcomes for young children in those areas, since additional factors such as patient race and special health needs also influenced the results. But the problem of a limited Dentist workforce in the rural areas of our state is one that has been acknowledged and addressed through a number of programs directed toward children over the past decade.

Beginning in 1999, the South Carolina Department of Education was able to develop a comprehensive system of oral health services for school-aged children in the state, made possible by funding from the Centers for Disease Control and Prevention. This was followed by the creation of the Division of Oral Health in the state Department of Health and Environmental Control (DHEC) in 2000. That office has been instrumental in developing public-private partnerships between the state's dental associations, dental training programs, and child advocacy organizations which have resulted in a significant improvement in the dental health of children across the state<sup>12</sup>, so much so that these partnership programs have been recognized as models for other states to follow.<sup>13</sup> In addition, a recent grant from the Oral Health 2014 Initiative of the DentaQuest Foundation will establish a statewide dental screening initiative that will enhance our ability to provide oral health services to underserved children.<sup>14</sup>

While the success of these programs is to be celebrated, the maldistribution of Dentists still presents problems for adults in the rural areas of our state.

## Conclusions

The Dentist workforce in South Carolina faces several challenges: lack of racial and ethnic diversity; the likelihood that a significant portion of the workforce will retire in the next decade; and finding ways to provide access to dental services in rural communities where Dentists are scarce.

The diversity of South Carolina's population is not reflected in our current Dentist workforce, either in terms of gender or race. Much progress has been made in recent years to increase the number of female Dentists graduating from our single College of Dental Medicine within the Medical University of South Carolina. In the 2009-10 academic year fully 50% of the first year enrollees were women. But less progress has been made in increasing the racial diversity among dental school graduates. Because such a large share of our active workforce is produced by our state dental school, it is important that our education programs strive to increase the racial diversity of the profession in a way that reflects our citizens

One quarter (25.5%) of the Dentists currently practicing in the state are age 60 or older. In addition, Dentists in that age group tend to work fewer hours per week than their younger colleagues. It is



reasonable to assume that a significant number of them will choose to retire from practice altogether in the coming decade. Whether or not this will result in a shortage of Dentists is unclear, and will largely depend on the productivity of our College of Dental Medicine, the number of Dentists moving in from out of state, the deployment of assistive personnel such as dental hygienists and dental assistants, and changes in technology which affect efficiency in the delivery of oral health care. Some clinical specialties may be more affected than others by the aging of the workforce: periodontists and oral surgeons are the clinical specialties in which more than 25% of active practitioners are currently age 60 or older. It also anticipated that the aging of the Dentist workforce will have a greater impact in rural counties where Dentists over the age of 60 make up a larger proportion of the workforce compared to urban areas.

Not only are more Dentists approaching retirement age in our rural counties, but there are fewer of them in those areas to begin with. People living in the urban areas of our state have much greater access to all types of dental care. Rural areas are especially affected by the low number of specialist Dentists practicing in rural counties. Solutions to that problem are beyond the scope of this report, but it is hoped that having the detailed description of the Dentist workforce presented here will help to inform policy makers in our state as they seek solutions.

## End Notes

<sup>1</sup> Distribution of Dentists in the United States by Region and State, 2009. A report by the American Dental Association, April 2011.

<sup>2</sup> Note that about 5% of SC Dentists did not report race in 2011. The percentages reported here are based on all those that did report race information.

<sup>3</sup> American Dental Association, 2008, as cited in “Current Demographics and Future Trends of the Dentist Workforce” a presentation to the Institute of Medicine workshop: The U.S. Oral Health Workforce in the Coming Decade. February 9, 2009 by Richard W. Valachovic, D.M.D., M.P.H. Accessed online April 4, 2012 at: <http://www.iom.edu/~media/Files/Activity%20Files/Workforce/oralhealthworkforce/2009-Feb-09/1%20-%20Valachovic.ashx>

<sup>4</sup> The dental school location was unknown for 66 of the active Dentists in 2011.

<sup>5</sup> The American Dental Association (ADA) administers a survey to accredited dental programs each year as part of the accreditation process. The applicant and admissions data reported here are from the 2009-10 Survey of Dental Education released in 2011.

<sup>6</sup> Missing Persons: Minorities in the Health Professions. A Report by the Sullivan Commission on Diversity in the Healthcare Workforce. 2004. This report can be downloaded from: <http://health-equity.pitt.edu/40/>

<sup>7</sup> South Carolina Dental Association’s Position Paper on Oral Health, April 28, 2011. Downloaded from the SCDA website: [http://scda.org/associations/5602/files/SCDA\\_Position\\_Paper%20FINAL%20for%20HOD%204-28-11.doc](http://scda.org/associations/5602/files/SCDA_Position_Paper%20FINAL%20for%20HOD%204-28-11.doc)

<sup>8</sup> Ibid.

<sup>9</sup> Personal communication with the MUSC Office of Diversity, April 28, 2012.

<sup>10</sup> South Carolina Dental Association’s Position Paper on Oral Health, April 28, 2011. Downloaded from the SCDA website: [http://scda.org/associations/5602/files/SCDA\\_Position\\_Paper%20FINAL%20for%20HOD%204-28-11.doc](http://scda.org/associations/5602/files/SCDA_Position_Paper%20FINAL%20for%20HOD%204-28-11.doc)

<sup>11</sup> Martin, AB; Vyavaharkar, M; Veschusio, C; Kirby, H. (2010). Rural–Urban Differences in Dental Service Utilization Among an Early Childhood Population Enrolled in South Carolina Medicaid. *Maternal and Child Health Journal*, Online First.

<sup>12</sup> University of South Carolina Arnold School of Public Health newsletter, March 1, 2012. “HSPM doctoral student among speakers in D.C. to discuss improving oral, dental health for nation’s children.” Downloaded from: <http://sph.sc.edu/news/dentalhealth.htm>

<sup>13</sup> Report from the Center for Health Care Strategies and the Robert Wood Johnson Foundation. Catalyzing Improvements in Oral Health Care: Best Practices from the State Action for Oral Health Access Initiative by Carolyn Ballard and Nikki Highsmith. August 2006.

<sup>14</sup> University of South Carolina Arnold School of Public Health newsletter, March 1, 2012. “HSPM doctoral student among speakers in D.C. to discuss improving oral, dental health for nation’s children.” Downloaded from: <http://sph.sc.edu/news/dentalhealth.htm>

# Appendix A

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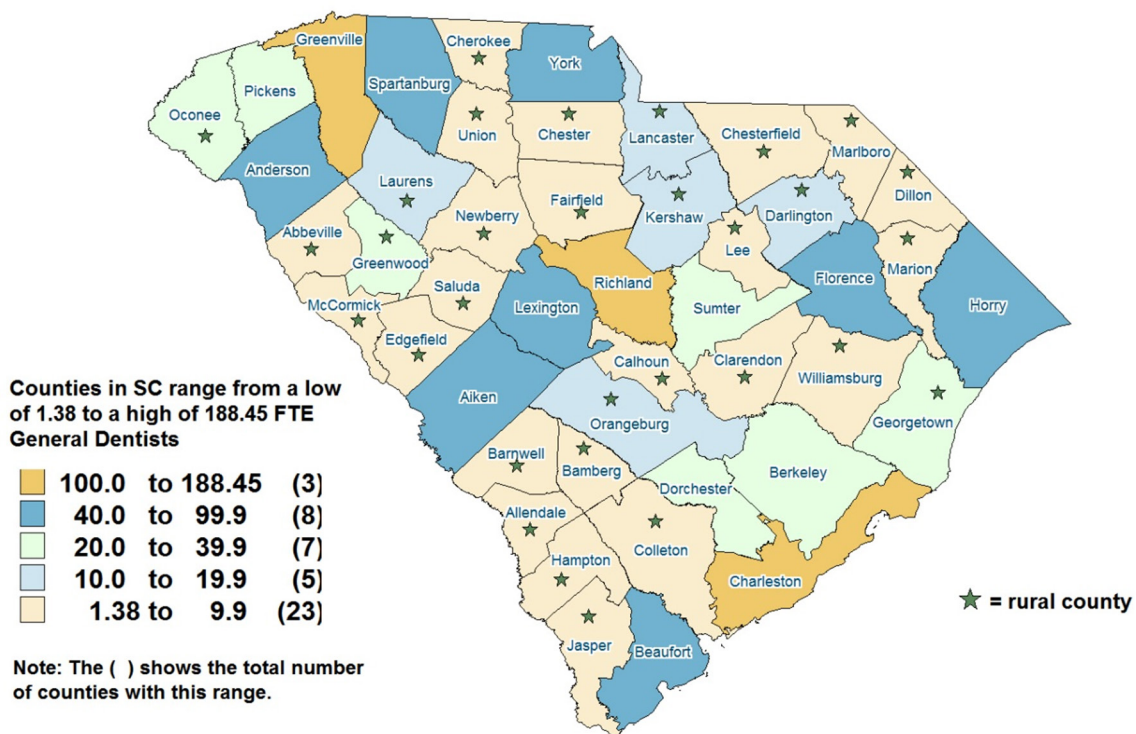
## Appendix A

### Maps Showing the Size of the Dentist Workforce by Specialty and County Location

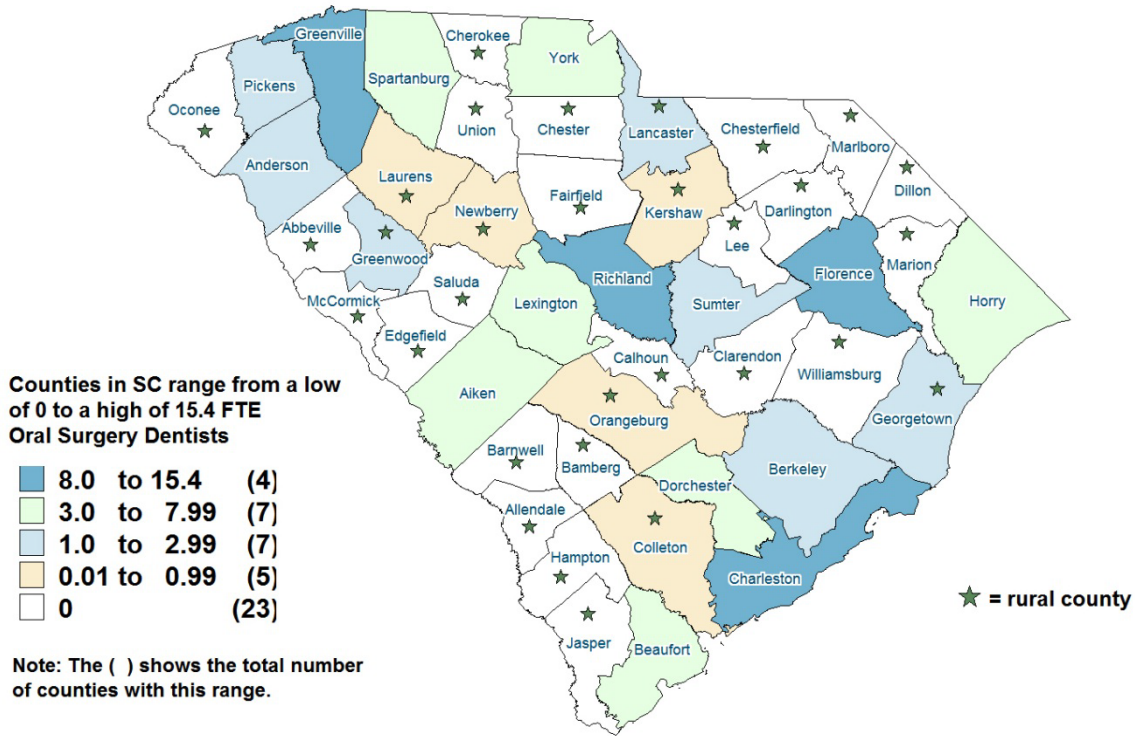
These maps are based on information provided by Dentists during the license renewal process about the number of hours they work in a typical week and in what locations. We have summed the total hours worked by Dentists within a specific specialty and within a specific county, and divided that total by 40 to arrive at an estimate of the total number of full time equivalent Dentists in that specialty in that county. An FTE estimate of the workforce is a more accurate estimate than a head count, since many dentists work fewer than 40 hours a week within a single practice location. Among Dentists who reported having a secondary practice location this is especially true.

Counties marked as rural in these maps are counties in which the population density was 155 persons or fewer per square mile in 2009.

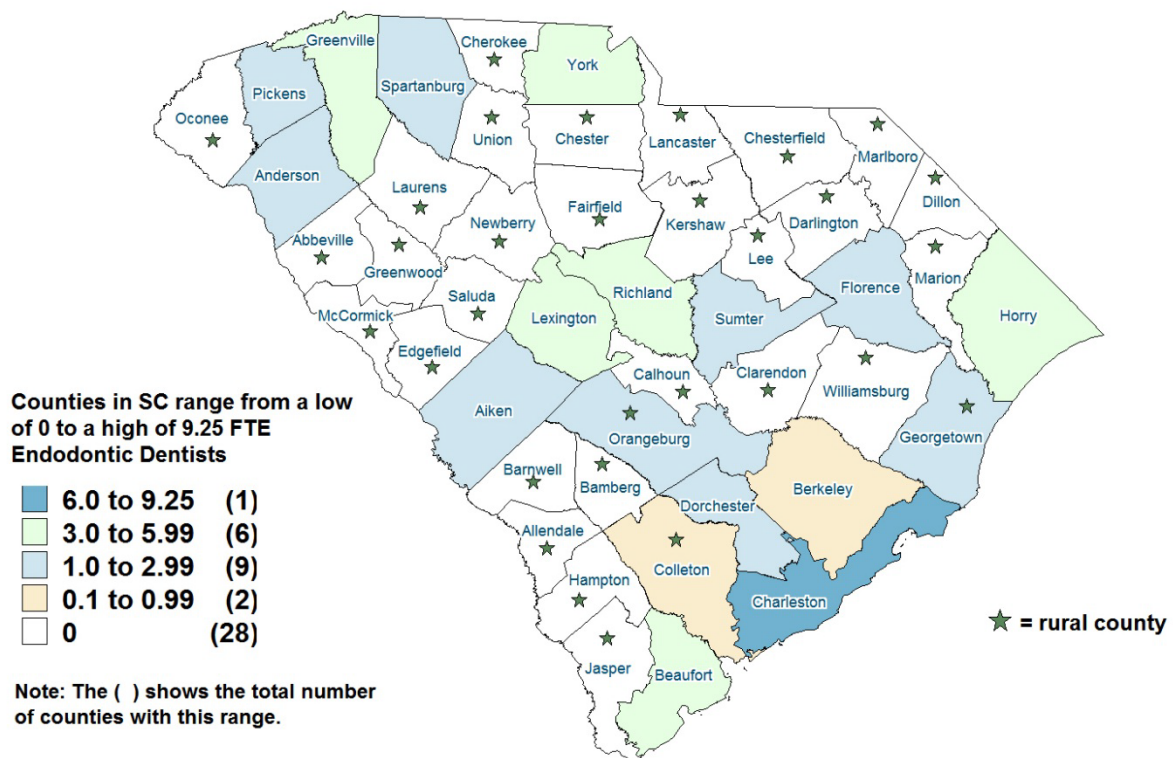
**Map 1. General Dentist Full Time Equivalent (FTE) Workforce Distribution in South Carolina**



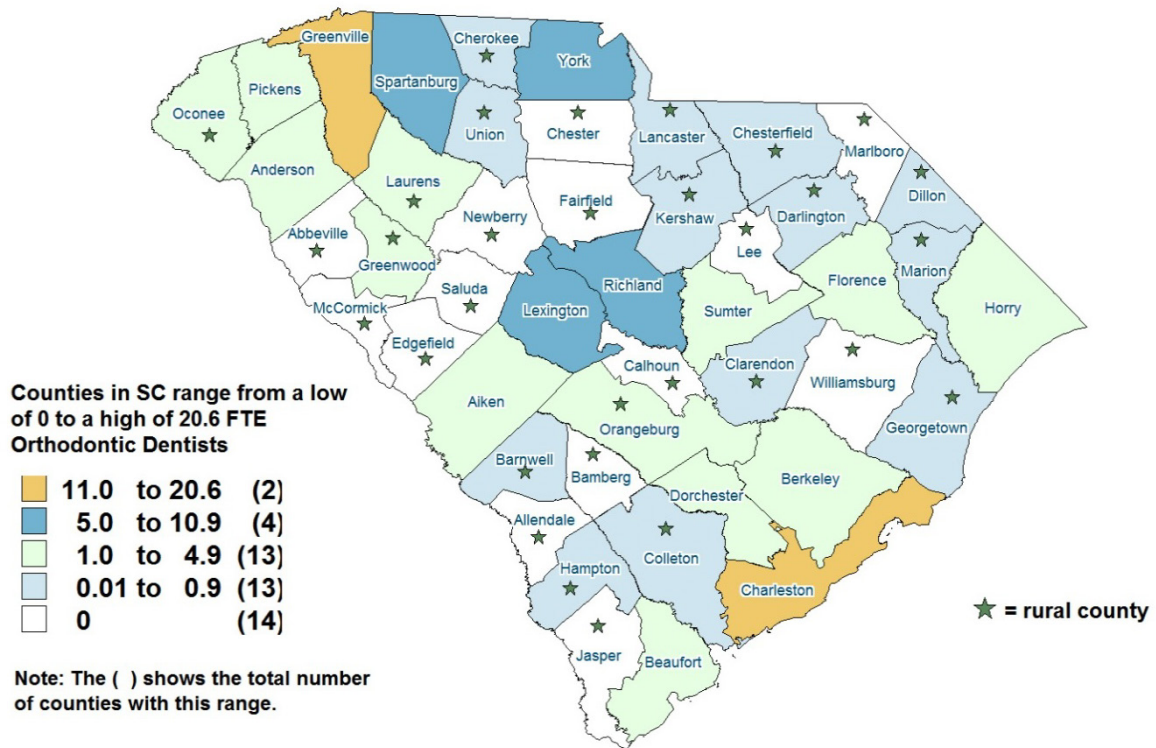
Map 2. Oral Surgeon Full Time Equivalent (FTE) Workforce Distribution in South Carolina



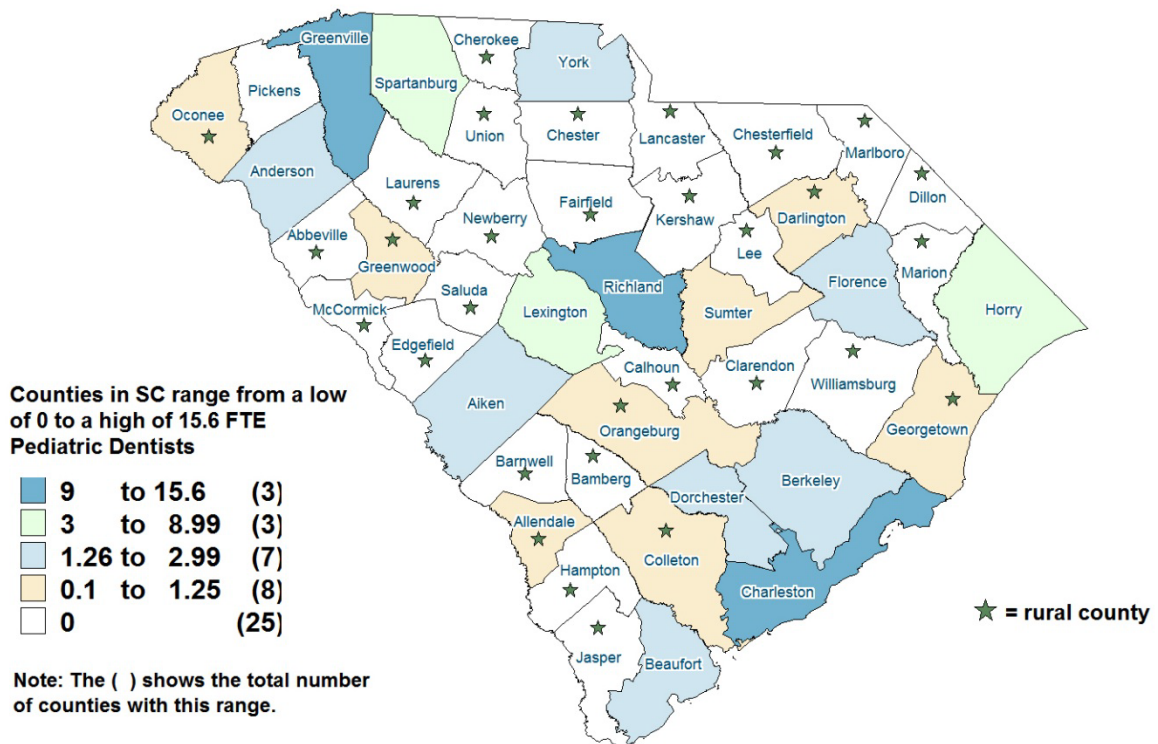
Map 3. Endodontic Dentist Full Time Equivalent (FTE) Workforce Distribution in South Carolina



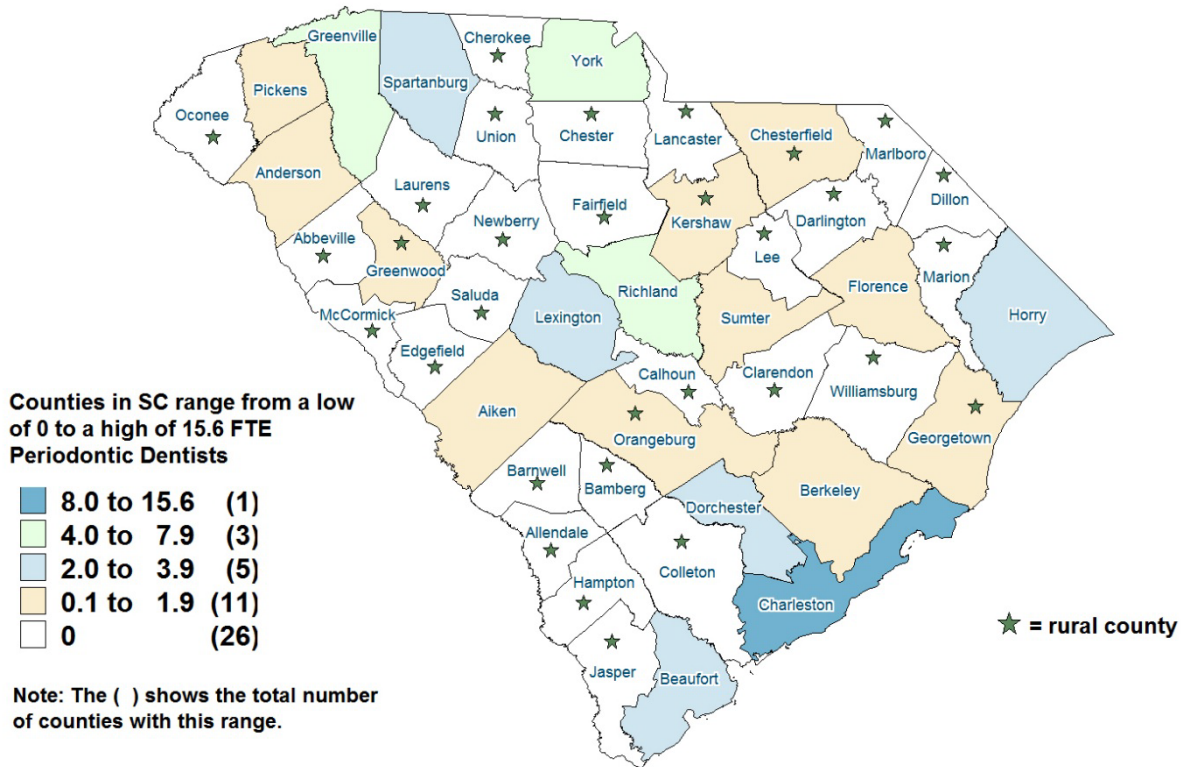
Map 4. Orthodontic Dentist Full Time Equivalent (FTE) Workforce Distribution in South Carolina



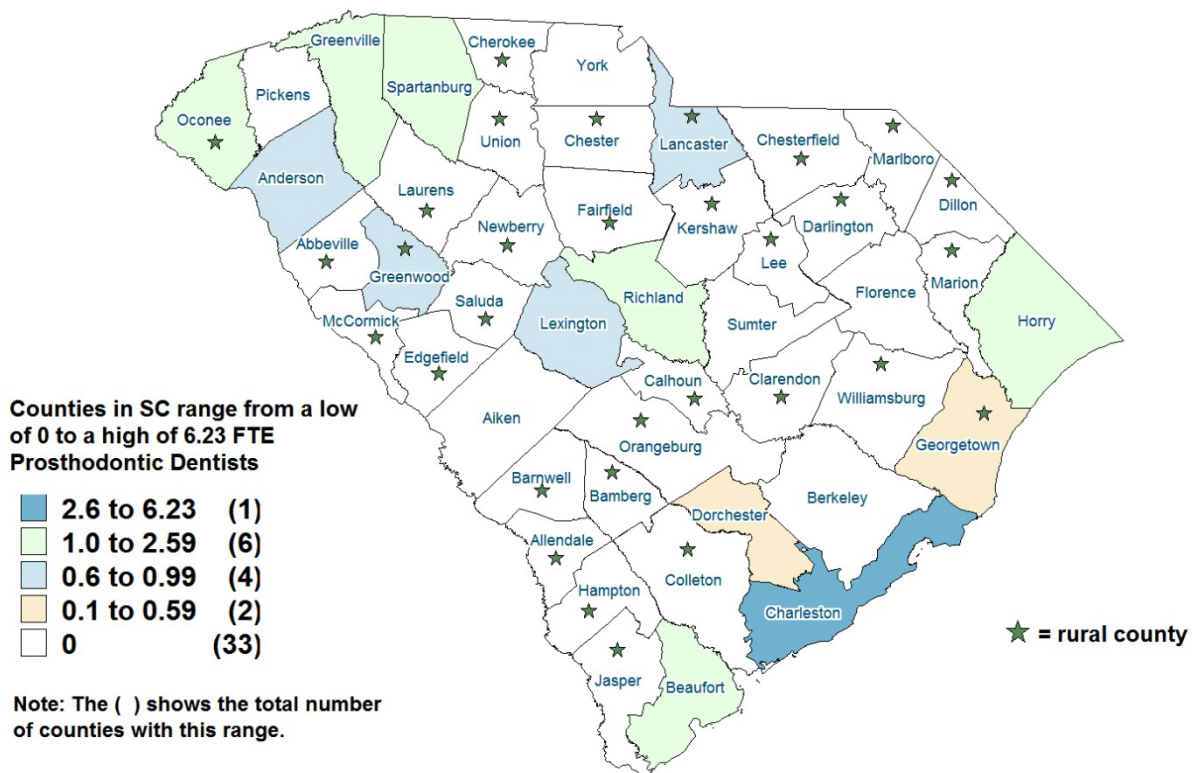
Map 5. Pediatric Dentist Full Time Equivalent (FTE) Workforce Distribution in South Carolina



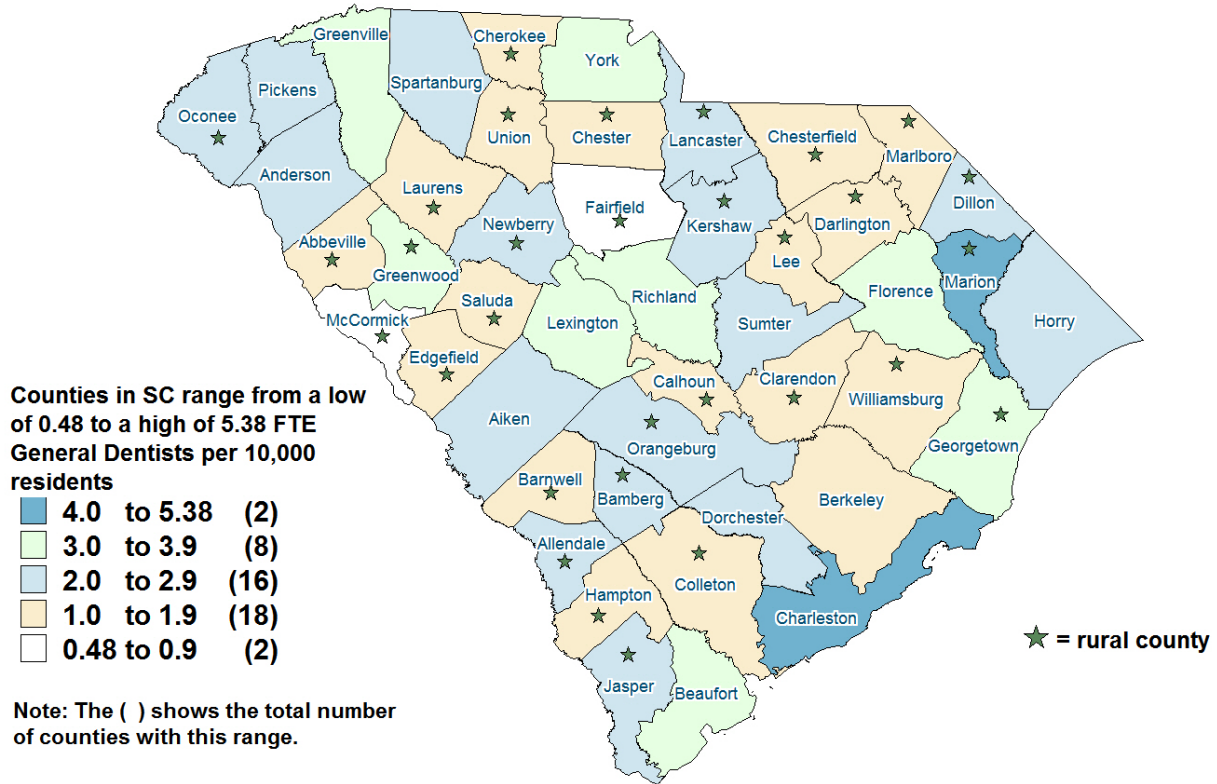
Map 6. Periodontic Dentist Full Time Equivalent (FTE) Workforce Distribution in South Carolina



Map 7. Prosthodontic Dentist Full Time Equivalent (FTE) Workforce Distribution in South Carolina



**Map 8. General Dentist Full Time Equivalent (FTE) Workforce per County Adjusted for County Population Size: Number per 10,000 County Residents**





# Appendix B

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## Appendix B

### Definitions of Recognized Dental Specialties

**Dental Public Health:** Dental public health is the science and art of preventing and controlling dental diseases and promoting dental health through organized community efforts. It is that form of dental practice which serves the community as a patient rather than the individual. It is concerned with the dental health education of the public, with applied dental research, and with the administration of group dental care programs as well as the prevention and control of dental diseases on a community basis.

**Endodontics:** Endodontics is the branch of dentistry which is concerned with the morphology, physiology and pathology of the human dental pulp and periradicular tissues. Its study and practice encompass the basic and clinical sciences including biology of the normal pulp, the etiology, diagnosis, prevention and treatment of diseases and injuries of the pulp and associated periradicular conditions.

**Oral and Maxillofacial Pathology:** Oral pathology is the specialty of dentistry and discipline of pathology that deals with the nature, identification, and management of diseases affecting the oral and maxillofacial regions. It is a science that investigates the causes, processes, and effects of these diseases. The practice of oral pathology includes research and diagnosis of diseases using clinical, radiographic, microscopic, biochemical, or other examinations.

**Oral and Maxillofacial Radiology:** Oral and maxillofacial radiology is the specialty of dentistry and discipline of radiology concerned with the production and interpretation of images and data produced by all modalities of radiant energy that are used for the diagnosis and management of diseases, disorders and conditions of the oral and maxillofacial region.

**Oral and Maxillofacial Surgery:** Oral and maxillofacial surgery is the specialty of dentistry which includes the diagnosis, surgical and adjunctive treatment of diseases, injuries and defects involving both the functional and esthetic aspects of the hard and soft tissues of the oral and maxillofacial region.

**Orthodontics and Dentofacial Orthopedics:** Orthodontics and dentofacial orthopedics is the dental specialty that includes the diagnosis, prevention, interception, and correction of malocclusion, as well as neuromuscular and skeletal abnormalities of the developing or mature orofacial structures.

**Pediatric Dentistry:** Pediatric Dentistry is an age-defined specialty that provides both primary and comprehensive preventive and therapeutic oral health care for infants and children through adolescence, including those with special health care needs.

**Periodontics:** Periodontics is that specialty of dentistry which encompasses the prevention, diagnosis and treatment of diseases of the supporting and surrounding tissues of the teeth or their substitutes and the maintenance of the health, function and esthetics of these structures and tissues.

**Prosthodontics:** Prosthodontics is the dental specialty pertaining to the diagnosis, treatment planning, rehabilitation and maintenance of the oral function, comfort, appearance and health of patients with clinical conditions associated with missing or deficient teeth and/or oral and maxillofacial tissues using biocompatible substitutes.

*These definitions were downloaded from the American Dental Association website: <http://www.ada.org/495.aspx> on April 10, 2012.*

*officeforhealthcareworkforce.org*

