Dentists in Delaware
1998

prepared for

Delaware Department of Health and Social Services
Division of Public Health

by

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Overview

This year, the Division of Public Health began an effort to measure the number and spatial distribution of dentists practicing in Delaware. The objective was to identify underserved areas and to understand any existing or developing trends that could impact the supply of dental services.

The method chosen to gather the information was an initial mail survey coupled with two follow-up mailings to non-respondents. By the conclusion of the project, 285 dentists had participated. Of those responding, 246 dentists (86%) were practicing dentistry either full or part-time.

Delaware currently has licensed 378 dentists to practice dentistry in Delaware. Of those, 347 have a Delaware address but it does not mean they are active or that they have a Delaware practice. Similarly, dentists living in other states may have an active practice in Delaware. Based on the survey results analyzed thus far, the number of dentists with an active practice in Delaware is approximately 302. This total is used to produce all estimates presented throughout this report.[1]

This report focuses on all dentists. This population includes dentists practicing general dentistry and pediactric dentistry along with specialists in nine areas. Using the survey data received to date, it is estimated that there are 243 dentists working in general or family practice and 59 dentists practicing in one of the nine specialties. In the balance of this report, most responses will be reported for these two major groups.

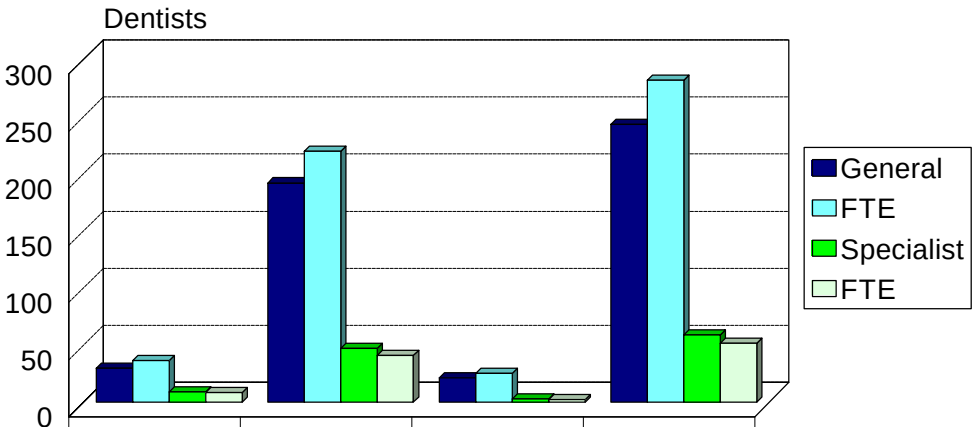
Not all dentists practice full-time. To give a more realistic view of the full-time equivalent (FTE) dentists available, a second calculation was required. A dentist who was engaged in delivering care directly to patients 40 or more hours per week was defined as a full-time dentist. Anything less than 40 hours was considered as less than full-time. For each four hours less than 40 hours, 0.1 FTE was deducted. Anything more than 40 hours was considered only as full-time.[2]

In other words, a dentist delivering 60 hours per week of primary care was still counted as one full-time equivalent dentist. The federal government also applies a productivity factor in determining

[1] On occasion, the data in the tables may not add to the total of 302 dentists because some information was not reported.

full-time equivalency. They increase the FTE according to the number of dental hygenists and dental assistants employed.[3] Further, they begin to decrease the FTE as the dentist reaches the age of 55. All of these factors are used in determing the FTE dentists in Delaware.

Figure 1.1
Dentists
by County



	Kent	New Castle	Sussex	Delaware
General	30	192	21	243
FTE	36.6	220	25.4	282
Specialist	9	47	3	59
FTE	8.6	40.8	2.3	51.7

Source: Center for Applied Demography & Survey Research, University of Delaware

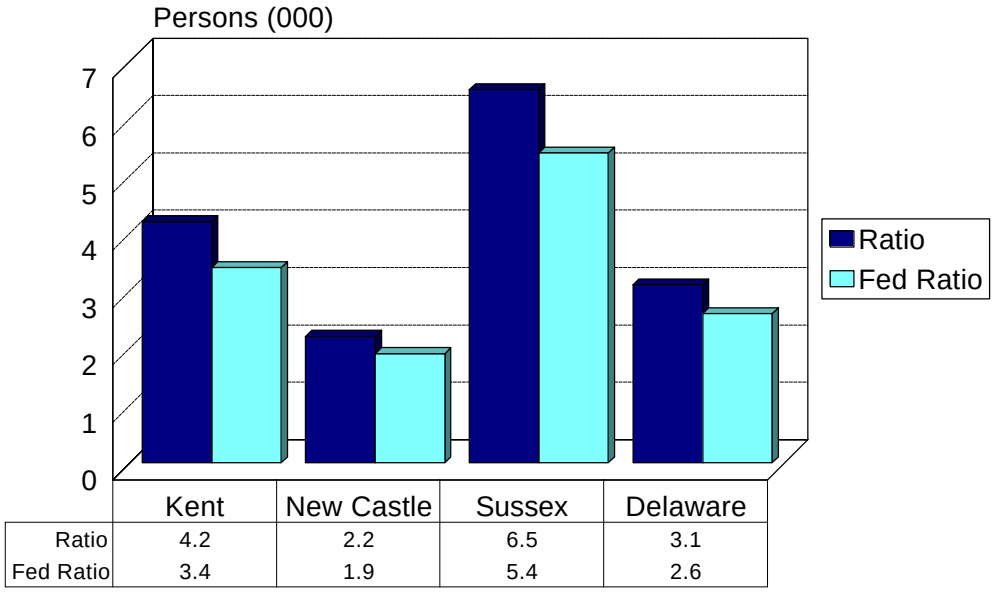
Figure 1.1 above summarizes the current number of dentists practicing in Delaware by county of practice. The number of dentists is provided in Figure 1.1 along with estimates of full-time equivalents. The category labeled ***General*** includes only those dentists practicing general/family dentistry or pediatric dentistry; and the FTE's are calculated using the federal guidelines. FTE's for specialists are computed based on 40 hours of direct patient care and do not reflect either the age adjustment or an adjustment for hygenists or dental assistants.

Given Delaware's 1998 population of 744,000, there are about 2,600 persons served by each FTE dentist (***Fed Ratio*** in Figure 1.2). These ratios reflect only those dentists in general/family or pediatric practice. For the three counties, the estimates are 3,400 persons for each FTE dentist in Kent County, 1,900 for New Castle County, and 5,400 for Sussex County.

[2] Federal Register/Vol.45, No.223/ Monday, November17, 1980, Part IV Department of Health and Human Services, 42 CFR Part 5, p.76004.
[3] For some sites it was impossible to determine if the reported auxilaries were supporting multiple dentists. An alternative calculation suggests 3 less FTE dentists statewide.

Currently, the standard ratio commonly accepted by the dental profession is one dentist for each 2,000 persons.[4] The federal government defines a dentally underserved area as one with more than 5,000 persons per FTE dentist. Clearly, the situation in Sussex County is far from optimal and exceeds the federal standard. The data labelled simply ***Ratio*** represents full-time equivalencies without making the federal productivity adjustments for age and auxilaries. Only the hours of direct patient care are considered.

Figure 1.2
Population to Dentist Ratios
by County



	Kent	New Castle	Sussex	Delaware
Ratio	4.2	2.2	6.5	3.1
Fed Ratio	3.4	1.9	5.4	2.6

Source: Center for Applied Demography & Survey Research, University of Delaware

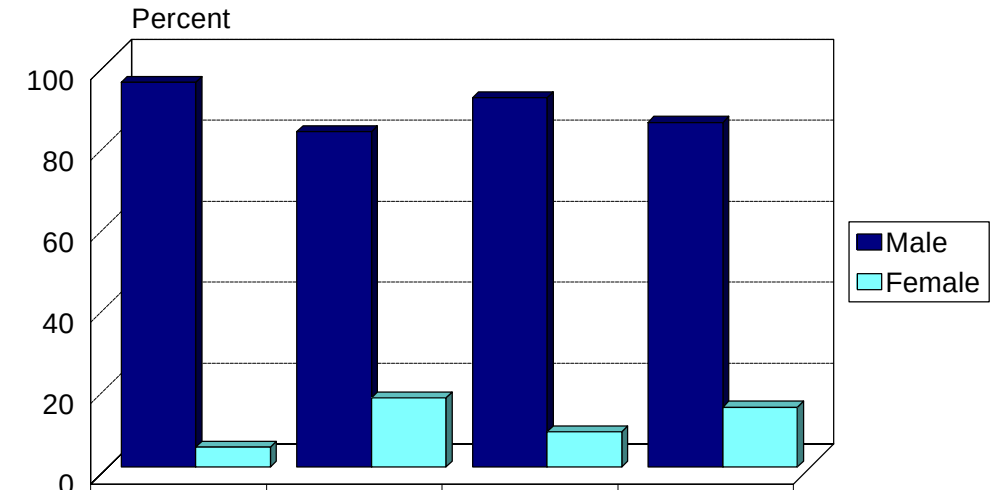
In the remainder of this report different aspects of dentists practicing in Delaware and his/her practices will be examined. Overall the objective is to touch on those attributes that affect the availability of dental services.

[4] Dental Health Administrative and Consulting Services, Inc. 1997. "Delivery of Dental Care to Medicaid Recipients and Uninsured Residents of Delaware":45.

Demographics

The topic of demographic diversity within the dental community may seem irrelevant. However, some patients may feel more comfortable with and are able to communicate better with dentists having particular characteristics.

Figure 2.1
Gender of Dentists
by County

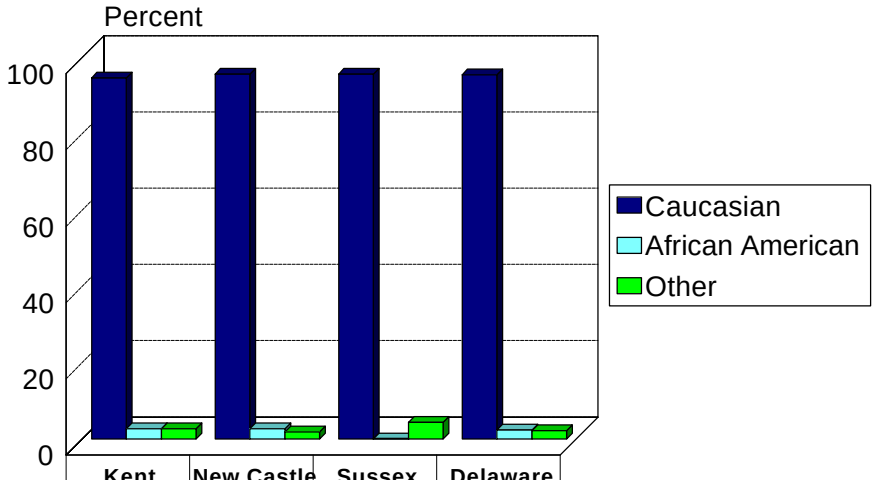


	Kent	New Castle	Sussex	Delaware
Male	95.1	82.9	91.3	85.2
Female	4.9	17.1	8.7	14.8

Source: Center for Applied Demography & Survey Research, University of Delaware

The dental community in Delaware is somewhat more than 85% male. There is however some variation between the counties. Kent County has almost 10% fewer female dentists than the state overall. The proportion of female dentists in New Castle County is significantly higher than that found in either of the two lower counties. It is interesting that women are slightly more likely (29% versus 23%) to choose one of the dental specialties (not general dentistry or pediatrics). At the same time those female dentists practicing a specialty are more likely to locate in Kent or New Castle counties.

Figure 2.2
Race of Dentists
by County



	Kent	New Castle	Sussex	Delaware
Caucasian	94.7	95.6	95.7	95.5
African American	2.6	2.6	0	2.4
Other	2.7	1.8	4.3	2.1

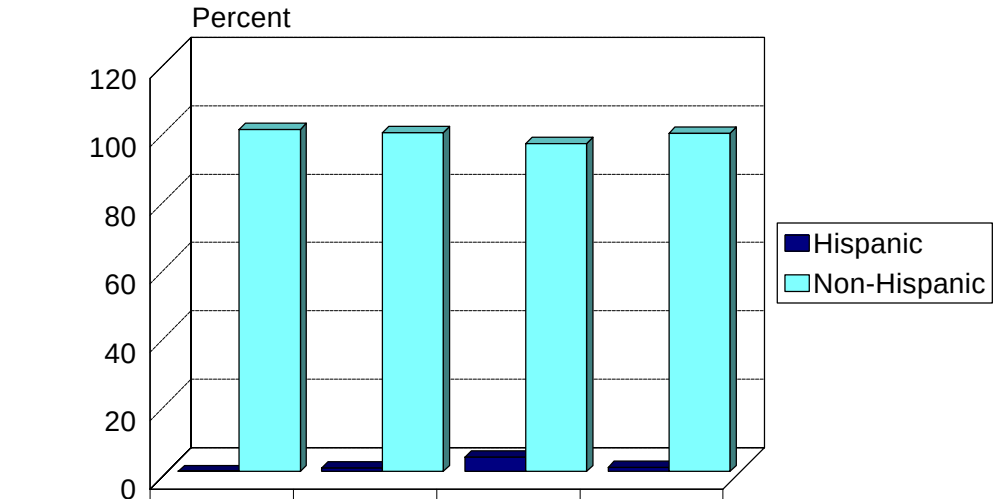
Source: Center for Applied Demography & Survey Research, University of Delaware

The racial distribution of primary care dentists by county is shown in Figure 2.2 above. Probably the most interesting aspect of this table is the lack of African American dentists. African Americans account for more than 17% of Delaware's population, yet only 2.4% of Delaware's dentists are African American.

Hispanic origin is of particular interest in Delaware given the rapid growth of that population in the 1990s, particularly in Sussex County. The distribution of dentists by Hispanic Origin is found in Figure 2.3, below.

Today, Delaware's population is approximately 4% Hispanic while the dentist population is about 1%. The highest proportion of Hispanic dentists is found in Sussex County (4.2%) where nearly 7% of the population is now Hispanic. Overall, just over 35% of the practice sites in the state had someone available who could speak another language and Spanish was the language reported most often. That proportion was highest in Sussex County where 40% of the sites reported speaking another language and all of those employed someone who spoke Spanish.

Figure 2.3
Hispanic Origin of Dentists
by County



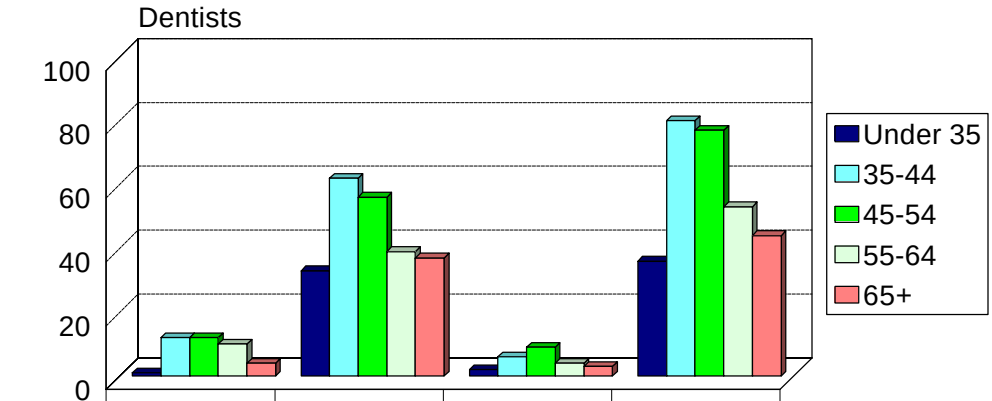
	Kent	New Castle	Sussex	Delaware
Hispanic	0	1	4.2	1.2
Non-Hispanic	100	99	95.8	98.8

Source: Center for Applied Demography & Survey Research, University of Delaware

The age of dentists is a factor in their availability. In calculating the productivity of dentists, the federal government begins reducing the full-time equivalency after age 55. The number of dentists by age and county is shown in Figure 2.4 followed by the age distribution (see Figure 2.5).

There are several points of interest in this display. First, a disproportionate share of the youngest dentists is found in New Castle County. This supports the assertion that there is a problem attracting newly graduated dentists into lower Delaware. On the other hand, New Castle County has a somewhat larger proportion of dentists in the 65+ age group who are less likely to remain active. The shortage of dentists in Sussex County will probably become more acute since it is the fastest growing county. At the same time, some would say that older people may be in less need of dental services and Sussex County residents are the oldest on average in the state. However, it would be reasonable to expect that the older population would need more specialized care. Kent County has a slightly different problem because their residents are the youngest and are more likely to utilize dental services. Yet Kent County has the most difficulty attracting younger dentists.

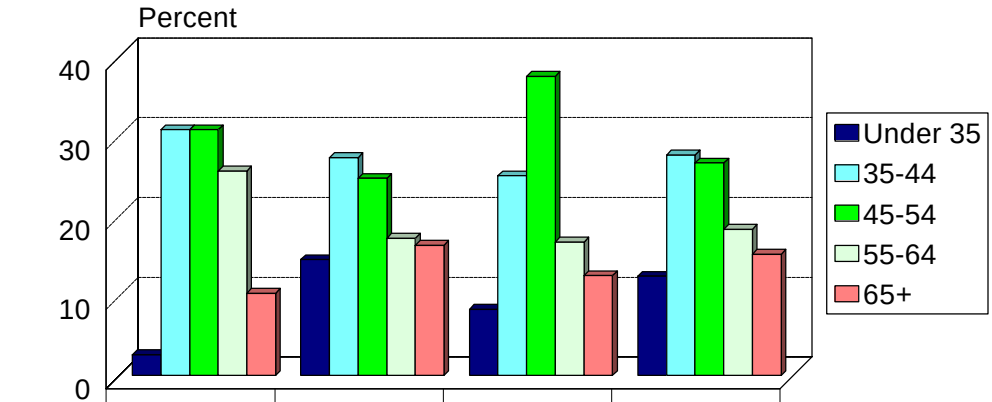
Figure 2.4
Dentists
by Age and County



	Kent	New Castle	Sussex	Delaware
Under 35	1	33	2	36
35-44	12	62	6	80
45-54	12	56	9	77
55-64	10	39	4	53
65+	4	37	3	44

Source: Center for Applied Demography & Survey Research, University of Delaware

Figure 2.5
Age Distribution of Dentists
by County

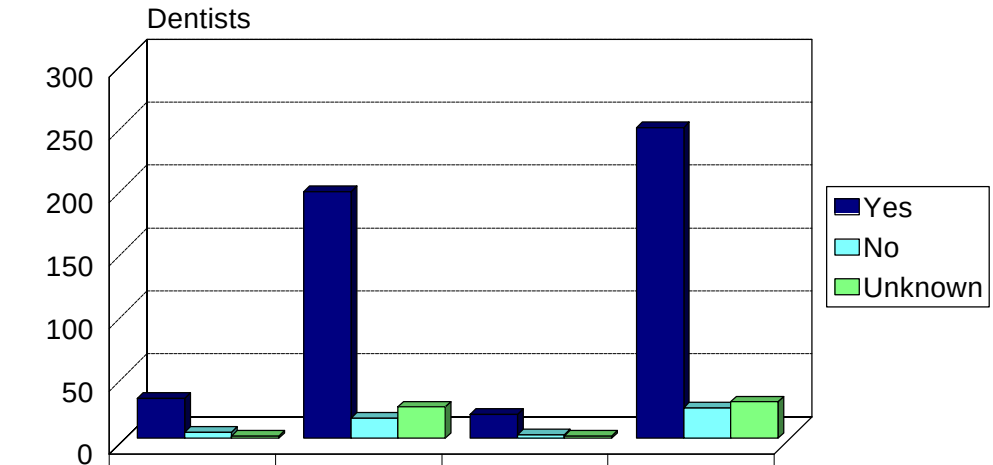


	Kent	New Castle	Sussex	Delaware
Under 35	2.6	14.5	8.3	12.4
35-44	30.8	27.3	25	27.6
45-54	30.8	24.7	37.5	26.6
55-64	25.6	17.2	16.7	18.3
65+	10.3	16.3	12.5	15.2

Source: Center for Applied Demography & Survey Research, University of Delaware

Dentists were asked if they planned to be active in dentistry five years from now. Those answers are summarized in Figure 2.6 and Figure 2.7, below. In general, more than 95% of the two younger age groups (under 45) expect to be active five years from now. That drops to 83% for the next two age groups and 40% for those already of age 65 and over. There are really two break points with respect to this data. The first occurs at about age 55 when the affirmative answers drop to about 80% and more become unsure. The second point is at about age 66.

Figure 2.6
Number of Dentists Active in Five Years
by County

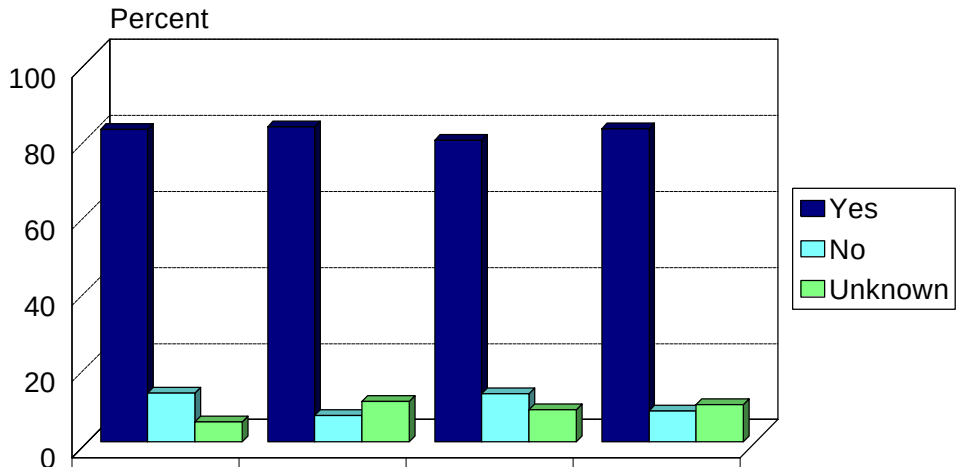


	Kent	New Castle	Sussex	Delaware
Yes	32	196	19	247
No	5	16	3	24
Unknown	2	25	2	29

Source: Center for Applied Demography & Survey Research, University of Delaware

New Castle County dentists are the least sure about their plans with more than 10% (Figure 2.7) expressing some reservation. However, dentists in Kent and Sussex counties were about twice as likely to say they would not be active in five years. Considering the calculated shortages in both those counties and in particular Sussex County, the current situation is not likely to improve anytime soon. More than 20% of the dentists currently active in Sussex County are less than positive about their status in five years. This is somewhat perplexing since there were proportionately fewer dentists in the oldest age groups than in either of the other two counties. Perhaps the current workload in Sussex County is having an impact.

Figure 2.7
Percentage of Dentists Active in Five Years
by County



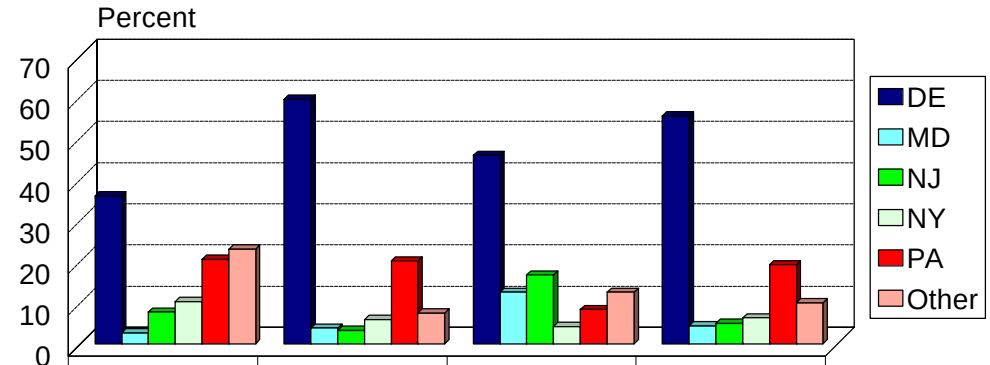
	Kent	New Castle	Sussex	Delaware
Yes	82.1	82.7	79.2	82.3
No	12.8	6.8	12.5	8
Unknown	5.1	10.5	8.3	9.7

Source: Center for Applied Demography & Survey Research, University of Delaware

To better understand why some dentists choose to practice in Delaware and others practice in other states, it is necessary to look at several factors. The way this choice is made determines the adequacy of the supply for serving Delaware's residents. Several pieces of information are useful for this purpose. First, where did this dentist originally reside as measured by the state from which he/she graduated high school? Second, in what state did the dentist attend dental school? Third, in what state did the dentist complete his/her residency?

In Figure 2.8 below, the distribution of the state of the dentists's high school graduation is shown. The first interesting aspect of this figure is that 90% of Delaware's dentists grew up in the region and approximately 55% are from Delaware. There also appears a different orientation by county as well. Dentists who grew up in Maryland or New Jersey are more likely to locate in Sussex County. In contrast, dentists from Pennsylvania are more oriented toward New Castle or Kent counties. Kent County hosts a far larger percentage of dentists who come from outside the region.

Figure 2.8
State of High School Graduation
by County



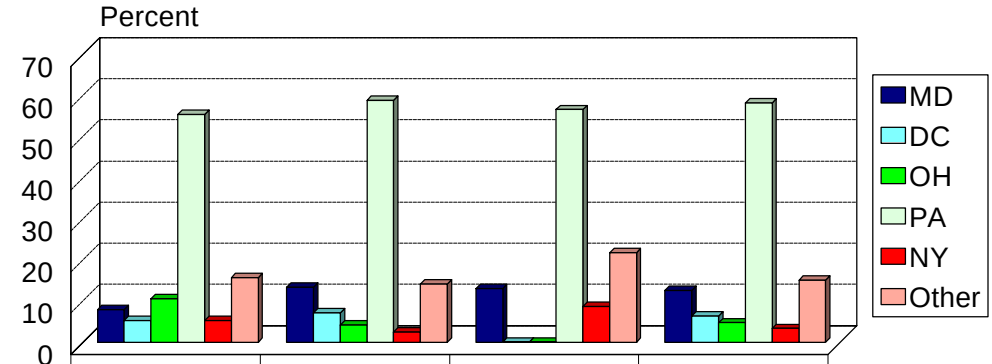
	Kent	New Castle	Sussex	Delaware
DE	35.9	59.4	45.8	55.3
MD	2.6	3.8	12.5	4.3
NJ	7.7	3.3	16.7	5
NY	10.3	5.9	4.2	6.3
PA	20.5	20.1	8.3	19.2
Other	23	7.5	12.5	9.9

Source: Center for Applied Demography & Survey Research, University of Delaware

The majority of Delaware dentists come from dental schools in Pennsylvania (see Figure 2.9). The distribution among the other states is not all that different among the counties. The same cannot be said for the state of dental residency (see Figure 2.10). Kent County dentists exhibit a very different pattern. More than half did their residency from outside the region and only 12.1% did their residency in Delaware. They were about twice as likely to have completed a residency in Pennsylvania. In contrast, dentists in New Castle and Sussex counties are much more alike with respect to this attribute.

There clearly is a geographic orientation exhibited by these responses. It is plausible to suggest that similar patterns might emerge with the state of the dentist's residency. In fact, that relationship might be even stronger. However, all of these findings also reflect the fact that most people go to college within several hundred miles of their homes and also go to dental school within several hundred miles of where they went to college. Eighty percent of those who graduated from high school in Delaware went to dental school in the region. Comparable percentages for other states in the region were: Maryland-92%, New Jersey-64%, Pennsylvania-92%, and New York-79%. Almost 80% of the dentists who graduated from high school outside

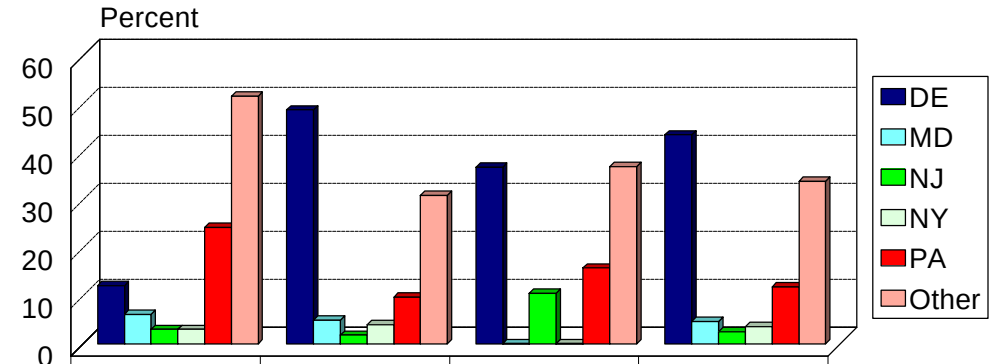
Figure 2.9
State of Dental School
by County



	Kent	New Castle	Sussex	Delaware
MD	7.9	13.3	13	12.6
DC	5.3	7.1	0	6.3
OH	10.5	4.2	0	4.7
PA	55.3	58.8	56.5	58.1
NY	5.3	2.5	8.7	3.3
Other	15.7	14.1	21.8	15

Source: Center for Applied Demography & Survey Research, University of Delaware

Figure 2.10
State of Dental Residency Program
by County

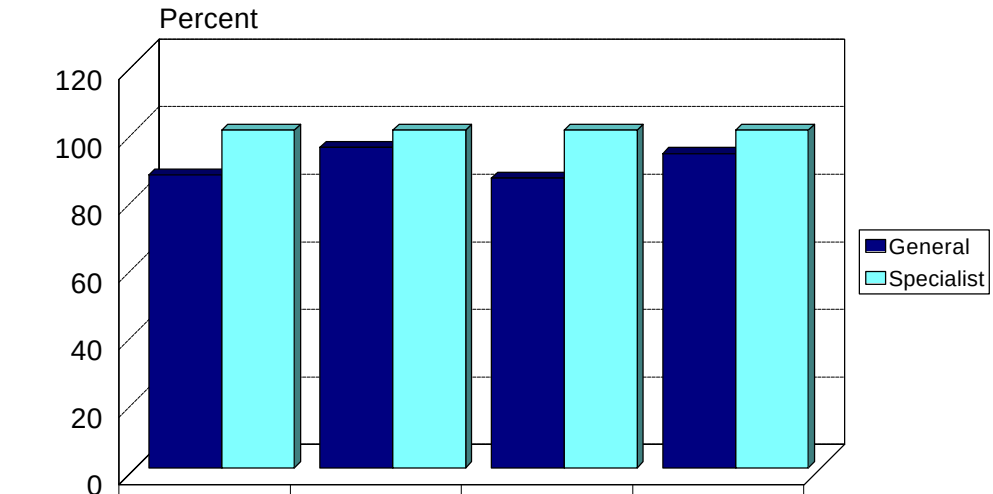


	Kent	New Castle	Sussex	Delaware
DE	12.1	48.7	36.8	43.5
MD	6.1	4.9	0	4.7
NJ	3	1.8	10.5	2.5
NY	3	4	0	3.6
PA	24.2	9.7	15.8	11.9
Other	51.6	30.9	36.9	33.8

Source: Center for Applied Demography & Survey Research, University of Delaware

of the region also went to dental school outside of the region. This information may prove valuable to those making an effort to recruit new dentists for Delaware.

Figure 2.11
Completion of Dental Residency Program
by County



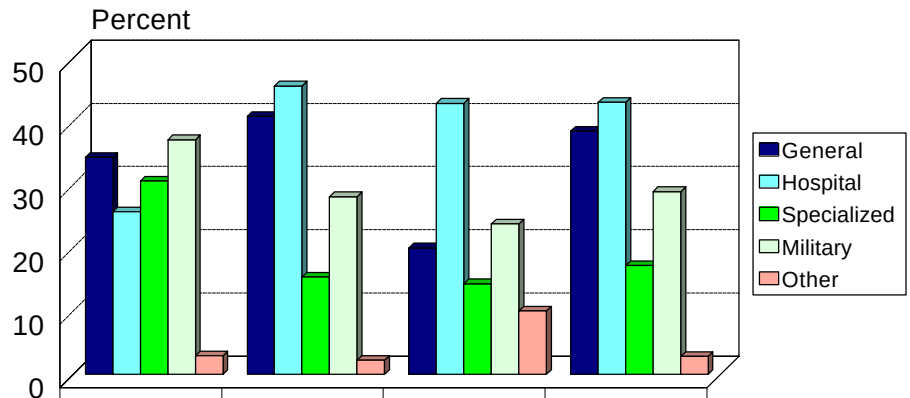
	Kent	New Castle	Sussex	Delaware
General	86.7	94.8	85.7	93
Specialist	100	100	100	100

Source: Center for Applied Demography & Survey Research, University of Delaware

Finally, the respondents provided other details about their dental residency program. Not all dentists have completed a residency. This might seem inaccurate since Delaware law requires that licensees have done so. However, there are two exceptions. Dentists that have practiced for five years elsewhere may be granted a waiver. In addition, there was a waiver for those that practiced dentistry for two years while on active military duty. That explains in part, the 93% completion rate among non-specialists reported in Figure 2.11, above. That proportion will increase over time since the waiver for military service dentistry was discontinued in 1990.

The types of residency programs respondents reported having completed are found in Figure 2.12, below. The totals will not add to 100% because some dentists reported more than one type of residency. This was particularly true for those with military service. The distribution of types of residency programs dentists reported having completed by county is different in several ways. First, fewer dentists in Sussex County reported doing a general/family dentistry residency than in either of the other two counties. Second, a larger proportion of dentists in Kent County reported doing some type of specialized residency. The proportion of dental specialists

Figure 2.12
Type of Dental Residency Program
by County



	Kent	New Castle	Sussex	Delaware
General	34.3	40.8	20	38.5
Hospital	25.7	45.6	42.9	43
Specialized	30.6	15.4	14.3	17.2
Military	37.1	28.1	23.8	28.9
Other	2.9	2.2	10	2.8

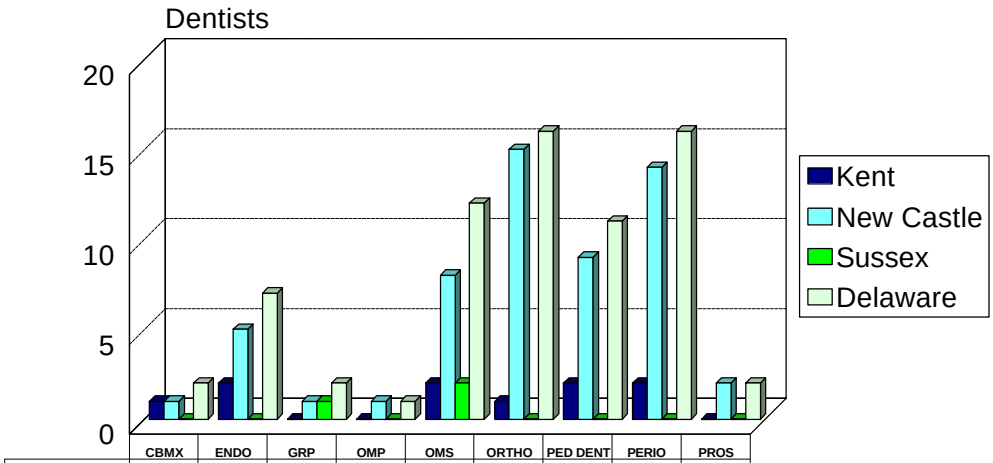
Source: Center for Applied Demography & Survey Research, University of Delaware

in Kent County is also the highest in the state. Finally, Kent County has the highest proportion reporting training associated with the military. Presumably this is related to Dover Air Force Base being located in Kent County.

The number of dentists by specialty[5], excluding those engaged in general dentistry, is found in Figure 2.13, below. (Those with a specialty in pediatric dentistry are shown here even though they are included in the general category for FTE calculation purposes). Probably the single most striking feature of this chart is the lack of so many specialties in Sussex County. This suggests that there is perhaps a shortage of specialists as well as generalists in the county. However, the relatively higher proportion of specialists located in Kent County may influence the perceived shortage of specialists in Sussex County.

[5] A more detailed description of the dental special codes is provided in the Appendix.

Figure 2.13
Dental Specialists
by County



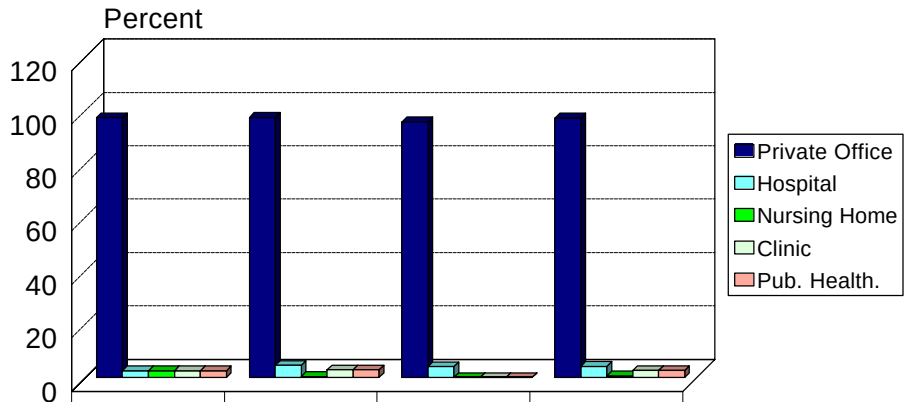
	CBMX	ENDO	GRP	OMP	OMS	ORTHO	PED DENT	PERIO	PROS
Kent	1	2	0	0	2	1	2	2	0
New Castle	1	5	1	1	8	15	9	14	2
Sussex	0	0	1	0	2	0	0	0	0
Delaware	2	7	2	1	12	16	11	16	2

Source: Center for Applied Demography & Survey Research, University of Delaware

Practice Characteristics

In this section, the practice characteristics of the 302 dentists actively practicing in Delaware are examined. These chracteristics can be roughly divided into three areas. First, some broad attributes of the practice are presented. Second, issues related to accessibility are reviewed. Finally, characteristics that affect payment for services are reported.

Figure 3.1
Type of Practice
by County



	Kent	New Castle	Sussex	Delaware
Private Office	97.4	97.5	95.8	97.3
Hospital	2.6	4.6	4.2	4.3
Nursing Home	2.6	0.4	0	0.7
Clinic	2.6	3	0	2.7
Pub. Health.	2.6	3	0	2.7

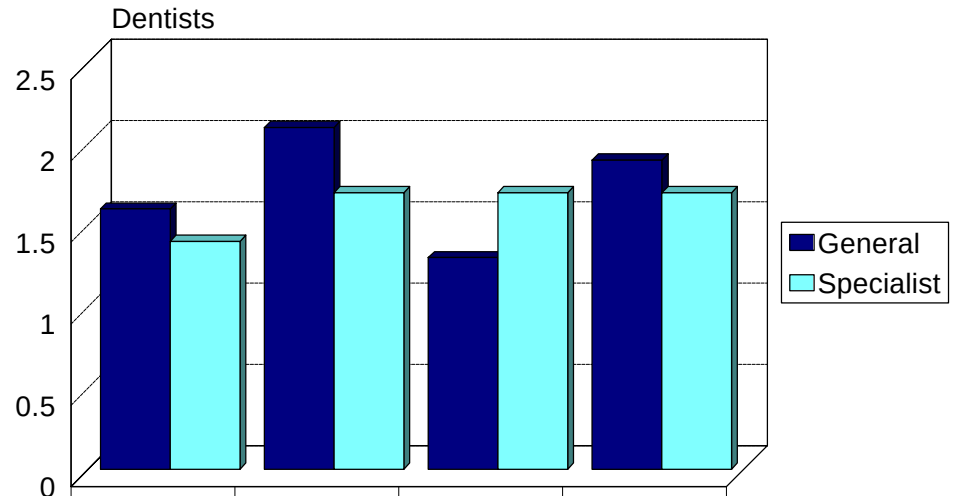
Source: Center for Applied Demography & Survey Research, University of Delaware

Respondents were asked about the setting of their primary employment. Those responses are summarized in Figure 3.1 above. (Since some dentists characterized the setting in more than one way the percentages will not add to 100%.) The overwhelming majority of dentists were operating in private practioner's offices. However, it is important to note that other types of settings were listed. This means that the responses supplied throughout the survey include elements outside the private sector. The diversity of settings was somewhat less in Sussex County when compared to either Kent or New Castle counties.

Dentist practices are generally small at least in terms of the number of dentists located at the practice site (see Figure 3.2). In general, one would expect to find one or two dentists in most

practices. Twenty-two percent of the practices in Kent County have more than one dentist. That percentage is somewhat higher in Sussex County (35%), and is considerably higher in New Castle County (55%). In general, the practice of specialists tends to be slightly smaller.

Figure 3.2
Average Dentists at the Primary Site
by County



	Kent	New Castle	Sussex	Delaware
General	1.6	2.1	1.3	1.9
Specialist	1.4	1.7	1.7	1.7

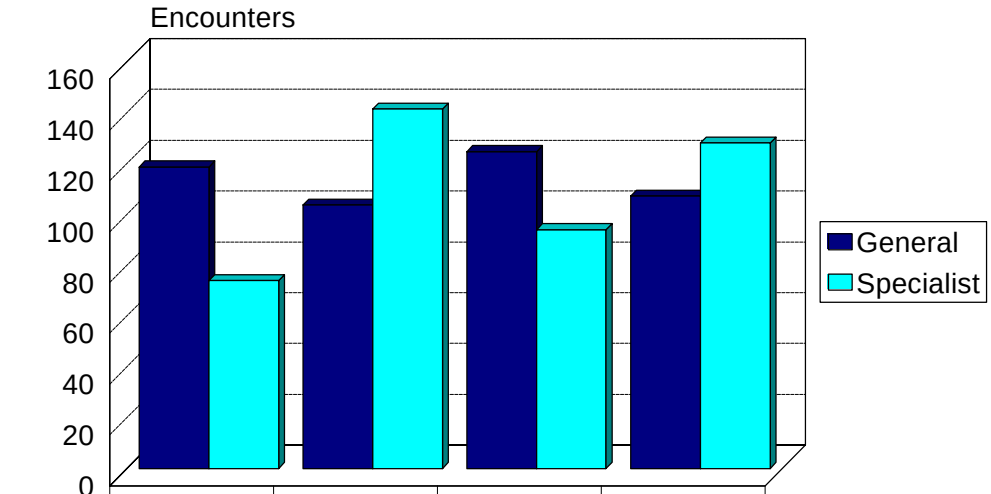
Source: Center for Applied Demography & Survey Research, University of Delaware

Another measure of size and capacity is the patient flow. The survey attempted to measure this by asking for the number of patients the dentist or associated hygenists served each week. Those results are found in Figure 3.3, below.

On average, the typical dentist sees more than one hundred patients per week. One of the more interesting features of this figure is that the encounters are almost 20% higher in Kent and Sussex counties where the dentist to population ratio is more than double that found in New Castle County. This information also suggests that dentists operating in Kent and Sussex counties are more likely to be operating closer to their maximum capacity for service delivery.

The same relationships do not hold for specialists. Specialists seem to have smaller practices in Kent and Sussex counties, at least relative to New Castle County. However, this result is probably also related to differences in the types of dental specialties in each county.

Figure 3.3
Weekly Patient Encounters
by County



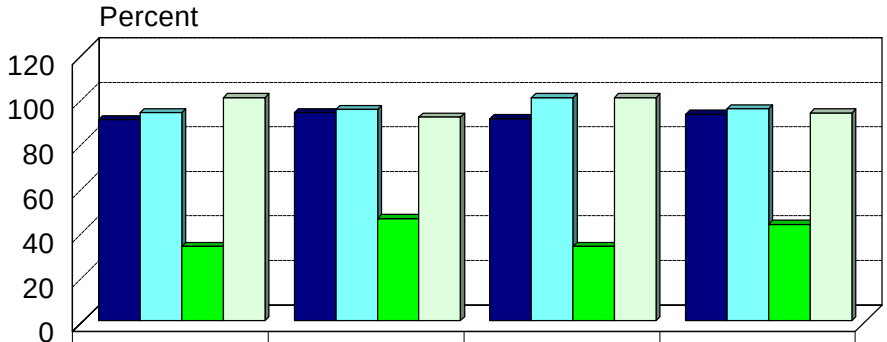
	Kent	New Castle	Sussex	Delaware
General	118.6	103.6	124.6	107.2
Specialist	73.9	141.4	94	128.1

Source: Center for Applied Demography & Survey Research, University of Delaware

The calculation of full-time equivalencies discussed in the first section made allowances for "auxiliaries" (dental hygenists and dental assistants) in determining the productivity of a dentist. These non-dentist resources are used to provide services that might otherwise have to be performed by the dentist. The utilization of such resources is quite high as is shown in Figure 3.4, below.

More than 90% of those practicing general dentistry use both dental assistants and hygenists to provide the necessary services expected of a general practioner. In fact, there is little, if any difference in the distributions between the counties. The lower utilization of hygenists by dental specialists reflects differences between the specialties and not a lack of interest in using non-dentist resources. For example, a prosthedonist would rely heavily on hygenists, while a endodonist would not. Their use of dental assistants is comparable to that for those in general dentistry.

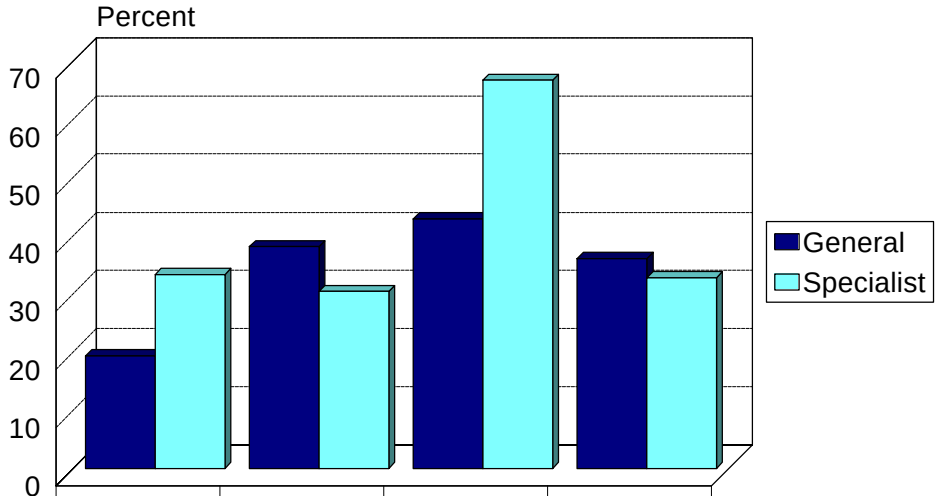
Figure 3.4
Use of Non-Dentist Resources
by County[6]



	Kent	New Castle	Sussex	Delaware
Gen. Hygenists	90	93.2	90.5	92.5
Gen. Assistants	93.3	94.7	100	95
Spec. Hygenists	33.3	45.7	33.3	43.1
Spec. Assistants	100	91.3	100	93.1

Source: Center for Applied Demography & Survey Research, University of Delaware

Figure 3.5
Languages Other than English Spoken
by County



	Kent	New Castle	Sussex	Delaware
General	19.4	38.1	42.9	36.1
Specialist	33.3	30.4	66.7	32.8

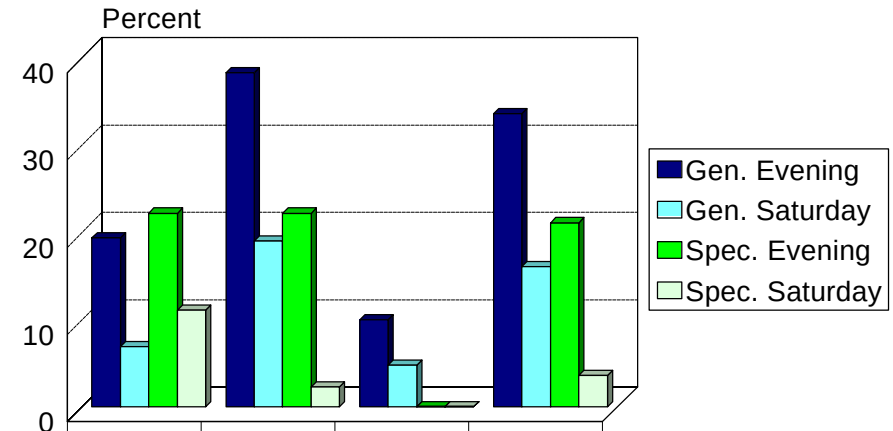
Source: Center for Applied Demography & Survey Research, University of Delaware

[6] The abbreviations ***Gen*** refers to dentists in general practice in contrast to ***Spec*** which refers to those practicing a dental specialty.

The population of Delaware is becoming more diverse. For example, there has been a significant increase in the number of Hispanic Delawareans, particularly in Sussex County. For many of these new arrivals, English is a second language or is not spoken at all. This presents a challenge for the dental community as they try to provide service to this population. Respondents were asked if languages other than English were spoken at their practice site. The results are detailed in Figure 3.5, above.

Across the state, about one third of general dentists and dental specialists have the capability of dealing in a language other than English. Spanish was by far the most frequently mentioned language. There are clearly differences between the counties. Sussex County has the largest need and dentists in Sussex have reacted to that need. Kent County has a much smaller population of Hispanics and the growth rate is much lower than that observed in Sussex County. For that reason, only half as many general dentists provide that capability.

Figure 3.6
Saturday and/or Evening Hours
by County[7]



	Kent	New Castle	Sussex	Delaware
Gen. Evening	19.4	38.3	10	33.6
Gen. Saturday	6.9	19	4.8	16.1
Spec. Evening	22.2	22.2	0	21.1
Spec. Saturday	11.1	2.3	0	3.6

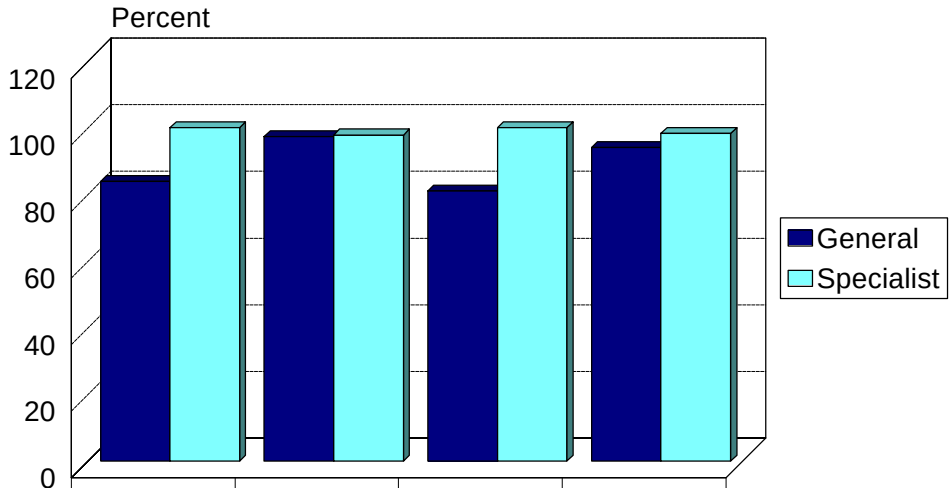
Source: Center for Applied Demography & Survey Research, University of Delaware

[7] The abbreviations ***Gen*** refers to those in general practice in contrast to ***Spec*** which refers to dental specialists.

Accessibility to dental services has many dimensions. One of those dimensions is flexible office hours, i.e. hours other than the typical hours that people are working. Respondents were asked if they provided either Saturday or evening office hours. Their responses are tabulated in Figure 3.6, above.

General dentists are more likely to offer flexible office hours than specialists. Offering evening hours is roughly twice as popular as providing Saturday hours. Dentists in New Castle County are much more likely to offer flexible hours than dentists located in Kent or Sussex counties. This difference is probably driven by capacity. The weekly encounters are much higher downstate and the population ratios are certainly less favorable than those found in New Castle County.

Figure 3.7
Accepting New Patients
by County



	Kent	New Castle	Sussex	Delaware
General	83.9	97.3	81	94.1
Specialist	100	97.8	100	98.3

Source: Center for Applied Demography & Survey Research, University of Delaware

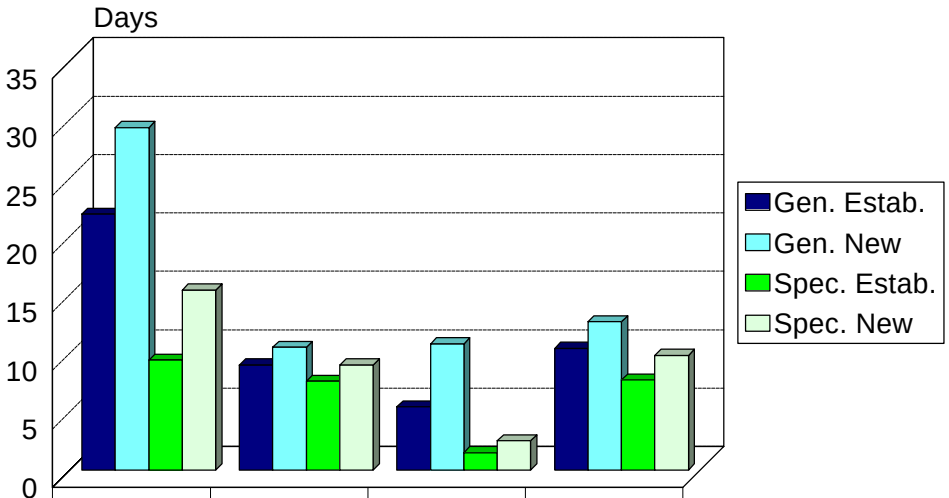
A more direct measure of accessibility is whether dentists are accepting new patients. Respondents were asked this question and the results are found in Figure 3.7, above.

Almost all dental specialists are accepting new patients and this situation is similar across the counties. However, conditions for general dentists are different in New Castle County than they are in the rest of the state. More than 97% of general dentists in New Castle County are accepting

new patients. This is about 15% higher than the percentage found in either Kent or Sussex counties. That corresponds quite well with the fact that weekly encounters (see Figure 3.3) were 20% higher in Kent and Sussex counties than they were in New Castle County.

Another measure of capacity is the "wait time" or how long a person has to wait for an appointment once they have called the dentist's office. This time will vary significantly depending on whether the problem can be characterized as an emergency. Most dentists leave openings to handle emergency cases. Respondents were asked about "wait time" for non-emergency cases. The results are found in Figure 3.8, below.

Figure 3.8
Average Wait Time for New and Established Patients by County[8]



	Kent	New Castle	Sussex	Delaware
Gen. Estab.	21.9	9	5.4	10.4
Gen. New	29.3	10.5	10.8	12.7
Spec. Estab.	9.4	7.6	1.5	7.7
Spec. New	15.4	9	2.5	9.8

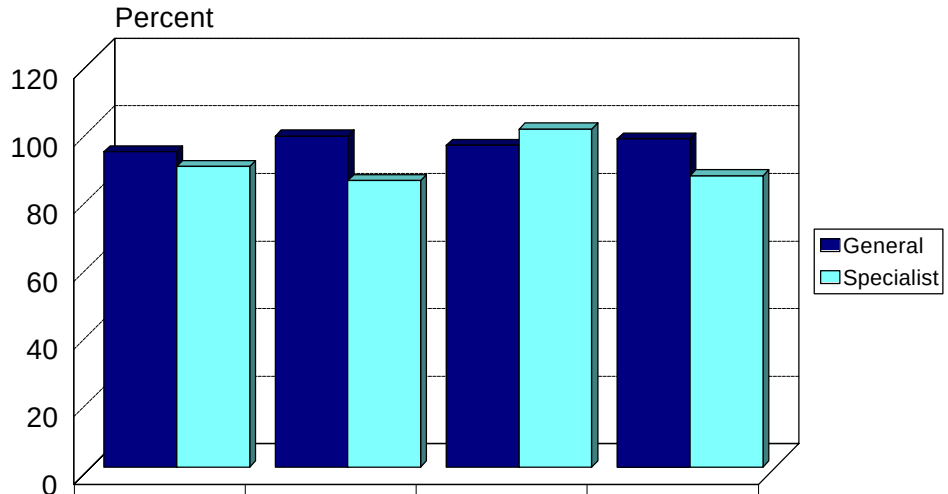
Source: Center for Applied Demography & Survey Research, University of Delaware

[8] The abbreviations ***Gen*** refers to those in general practice in contrast to ***Spec*** which refers to dental specialists. ***Estab*** refers to established patients in contrast to ***New*** patients.

Wait times are in general less for dental specialists than they are for general dentists. This result is consistent with the proportions that are accepting new patients. The estimates for Kent County relative to New Castle County are consistent both with the weekly encounter estimates and the proportion accepting new patients. Kent County ***wait times*** are more than double those provided by New Castle County dentists.

The surprise result is that Sussex County dentists have the highest number of weekly encounters and a larger proportion of those dentists are not accepting new patients. However, the ***wait times*** are the lowest in the state. The only piece of information that is consistent, is the fact that new patients must wait twice as long as established patients. In contrast, the ***wait time*** is about the same in New Castle County for both new and established patients.

Figure 3.9
Serving Pediatric Patients
by County

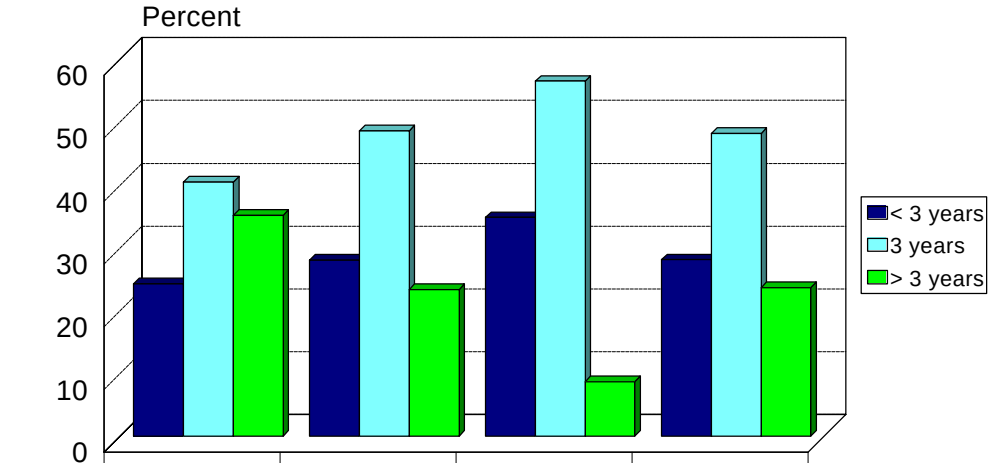


	Kent	New Castle	Sussex	Delaware
General	93.3	97.9	95.2	97.1
Specialist	88.9	84.8	100	86.2

Source: Center for Applied Demography & Survey Research, University of Delaware

Another area of interest is that of pediatric patients. According to the results found in Figure 3.9, above, most dentists do serve pediatric patients. This result holds across counties and between general dentists and specialists. The age of the child is important as is shown in Figure 3.10, below. About a quarter of dentists will serve a child under three years of age. The distribution is also reasonably consistent among the counties.

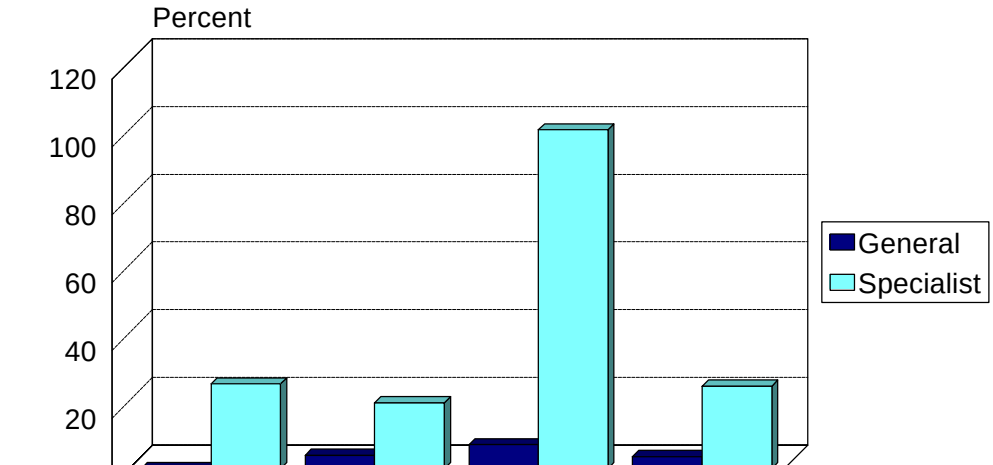
Figure 3.10
Youngest Age of Pediatric Patients
by County



	Kent	New Castle	Sussex	Delaware
< 3 years	24.3	28	34.8	28.1
3 years	40.5	48.6	56.5	48.2
> 3 years	35.2	23.4	8.7	23.7

Source: Center for Applied Demography & Survey Research, University of Delaware

Figure 3.11
Participate in Medicaid
by County



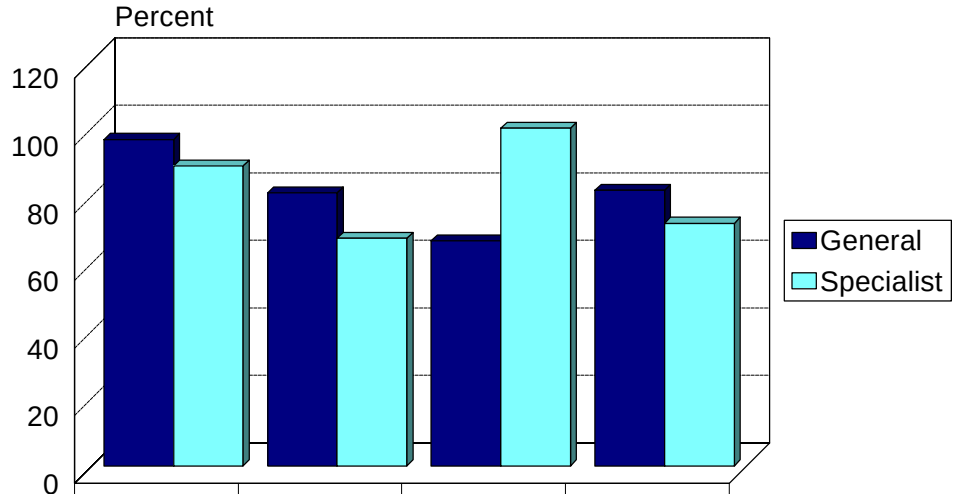
	Kent	New Castle	Sussex	Delaware
General	0	4	7.1	3.6
Specialist	25	19.4	100	24.4

Source: Center for Applied Demography & Survey Research, University of Delaware

Accessibility of dental services can also be affected by the way the patient pays for services rendered. This has been an issue for those qualifying for Medicaid dental coverage who have traditionally had difficulty in accessing dental care. For that reason, respondents were asked what types of insurance plans they accepted. One of the potential responses was Medicaid. The results are shown in Figure 3.11, above.

At the time of this survey, less than 4% of general dentists statewide indicated they accepted Medicaid. The proportion accepting Medicaid among dental specialists was much higher, almost 25%. Since October 1998, more than 50 dentists have agreed to serve Medicaid patients. This would suggest that the proportion is now closer to 25% rather than 4%.

Figure 3.12
Participate in Dental Insurance Plans
by County



	Kent	New Castle	Sussex	Delaware
General	96.7	80.9	66.7	81.6
Specialist	88.9	67.4	100	71.9

Source: Center for Applied Demography & Survey Research, University of Delaware

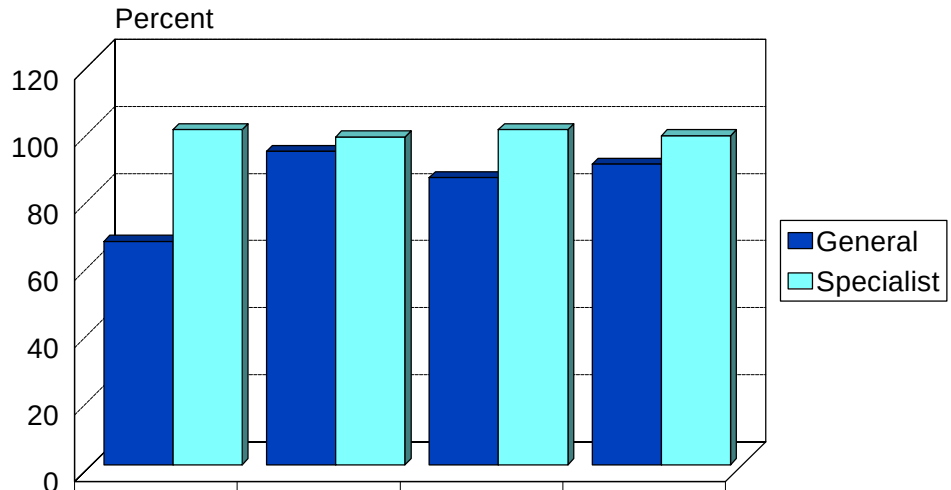
Accessibility can also be affected by the acceptance of dental insurance plans. Respondents were asked if they participated in such plans. The responses are found in Figure 3.12, above.

General dentists are somewhat more likely to participate in dental insurance plans than are specialists. This result may have more to do with the benefits than any difference in behavior between the two groups. Overall, slightly more than 20% of all dentists do not accept some form of

dental insurance. There are differences between the counties. Kent County dentists are much more likely to accept these plans than dentists located in New Castle County. General dentists in Sussex County are the least likely to accept dental insurance plans. These data are not really consistent with any information presented thus far. These results may be driven by the particular types of plans found in each county.

Respondents were also asked if they provided flexible payment plans. Those responses are summarized in Figure 3.13, below. Specialists are more likely to offer such plans than are general dentists. However over 90% of all dentists provide this option. The difference is probably related to the likelihood of the service being covered by dental insurance. Specialists are less likely to accept dental insurance plans.

Figure 3.13
Provide Flexible Payment Plans
by County



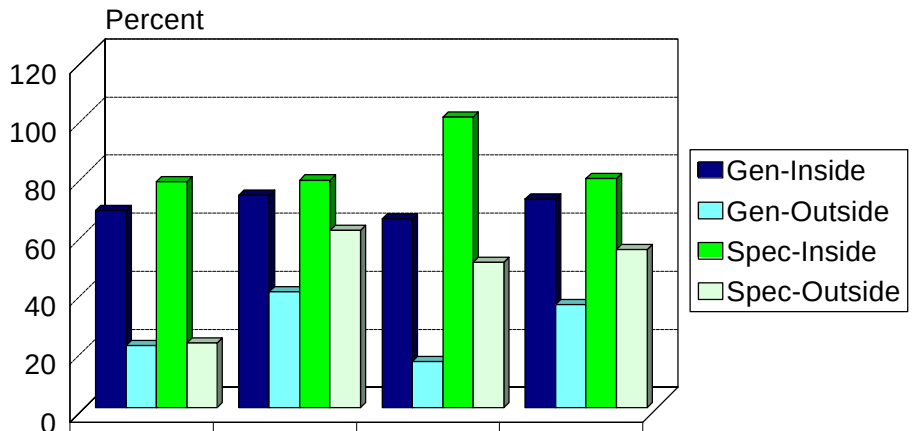
	Kent	New Castle	Sussex	Delaware
General	66.7	93.5	85.7	89.7
Specialist	100	97.8	100	98.2

Source: Center for Applied Demography & Survey Research, University of Delaware

While dental care is usually much more of an elective procedure than many medically related problems, there will still be people who need services and cannot pay for them. Respondents were asked if they provided any type of charity care. Charity care was defined as providing a service for which the dentist understood that he/she would not be paid. Bad debt was excluded from the definition of charity care. The results are found in Figure 3.14, below.

Almost three-quarters of all dentists provide some charity care in their offices. This holds true for general dentists and dental specialists. About 40% of dentists provide some charity care outside of their offices, presumably in clinics and other like settings. The pattern is similar across the counties with the proportions generally lower in Kent and Sussex counties. This finding is probably influenced by the higher workload. Given the lower incomes and higher poverty rates in the lower counties, one might expect that the need is even greater.

Figure 3.14
Provide Charity Care In/Out of Office
by County[9]



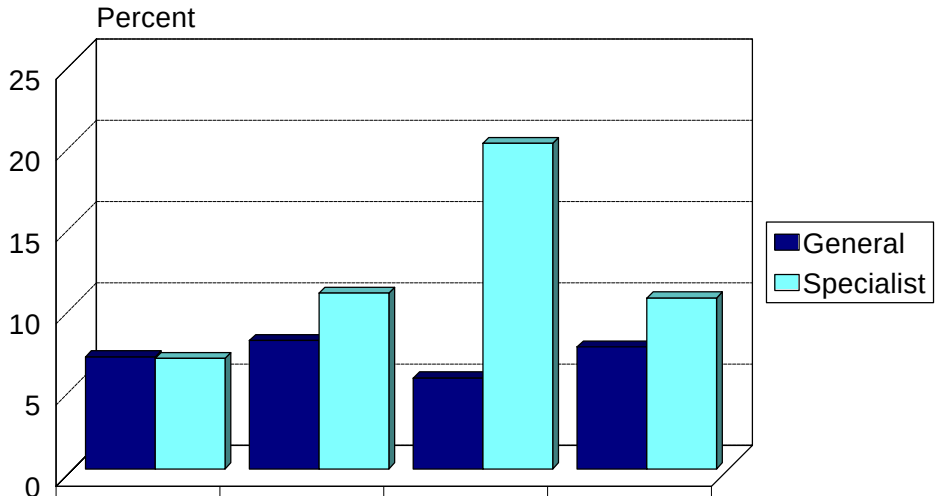
	Kent	New Castle	Sussex	Delaware
Gen-Inside	67.9	73.1	65	71.7
Gen-Outside	21.4	39.8	15.8	35.5
Spec-Inside	77.8	78.3	100	78.9
Spec-Outside	22.2	60.9	50	54.4

Source: Center for Applied Demography & Survey Research, University of Delaware

Finally, respondents were asked what proportion of their gross fees were unreimbursed. Those results are found in Figure 3.15, below and they are consistent with those provided by other health professionals.

[9] The abbreviations ***Gen*** refers to those in general practice in contrast to ***Spec***,which refers to dental specialists. ***Inside*** refers to charity care provided within the dentist's primary office. ***Outside*** refers to dental services provided at a location other than the dentist's primary office.

Figure 3.15
Percent of Gross Fees Unreimbursed
by County



	Kent	New Castle	Sussex	Delaware
General	6.9	7.9	5.6	7.5
Specialist	6.8	10.8	20	10.5

Source: Center for Applied Demography & Survey Research, University of Delaware

Spatial Distribution

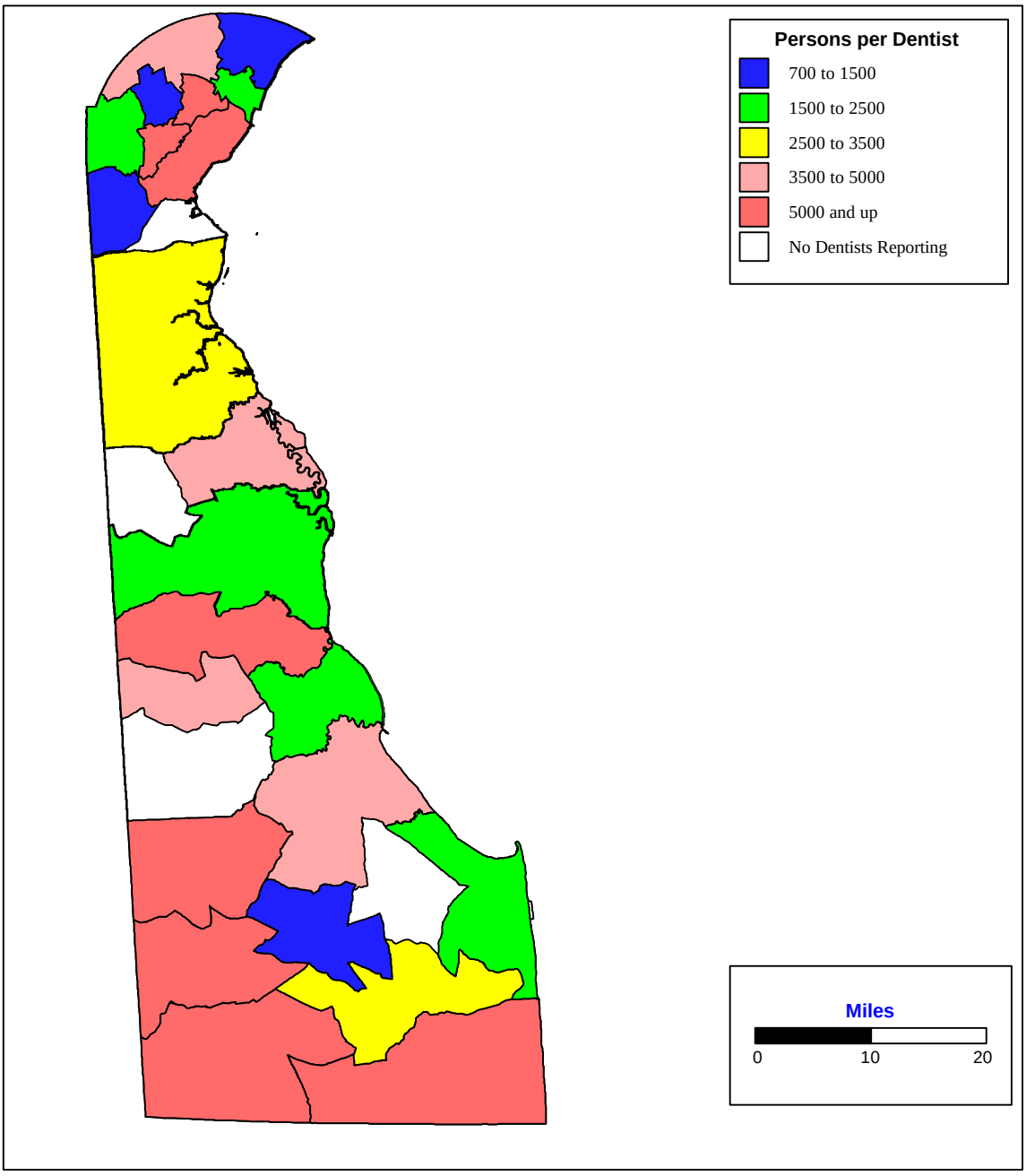
In the first section of this report, Sussex County was identified as an area that does not have a sufficient supply of general/family practice dentists using the federal definition of one FTE dentist for 5000 persons. Further, the situation Kent County is far from optimal. Only New Castle County meets both the criteria of the federal government and the commonly accepted criteria of one dentist per 2,000 persons.

The federal government recognizes the importance of having an adequate number of dentists in areas smaller than states or even counties. In their program for dentally underserved areas and populations, "rational areas for the delivery of primary dental care services" can be counties, parts of counties, and even neighborhoods within metropolitan areas with a strong identity and a population of 20,000. In general, an underserved area will have a ratio of 5000:1 (in special cases 4000:1) or higher to qualify. Obviously, only Sussex County would qualify if that were the spatial area considered.

The distance criterion, which defines such areas in Delaware, is roughly 25 miles between centers. Good examples for such markets in Sussex County would include Lewes/Rehoboth, Georgetown, Milford, Millsboro, and Seaford. In Delaware, these general areas are census county divisions. These work well in Sussex County because of the number of distinct town centers. The distinctions are not quite as clear in Kent County where Dover and its suburbs are paramount. The Smyrna and Harrington areas are the best examples. The issue is just as murky in New Castle County because of the dominance of population in unincorporated areas. Wilmington, Newark, New Castle, and Middletown are the most distinct areas although their suburban fringes are not well defined. Still, the census county division of which there are 27 in Delaware is the most useful for this spatial examination.

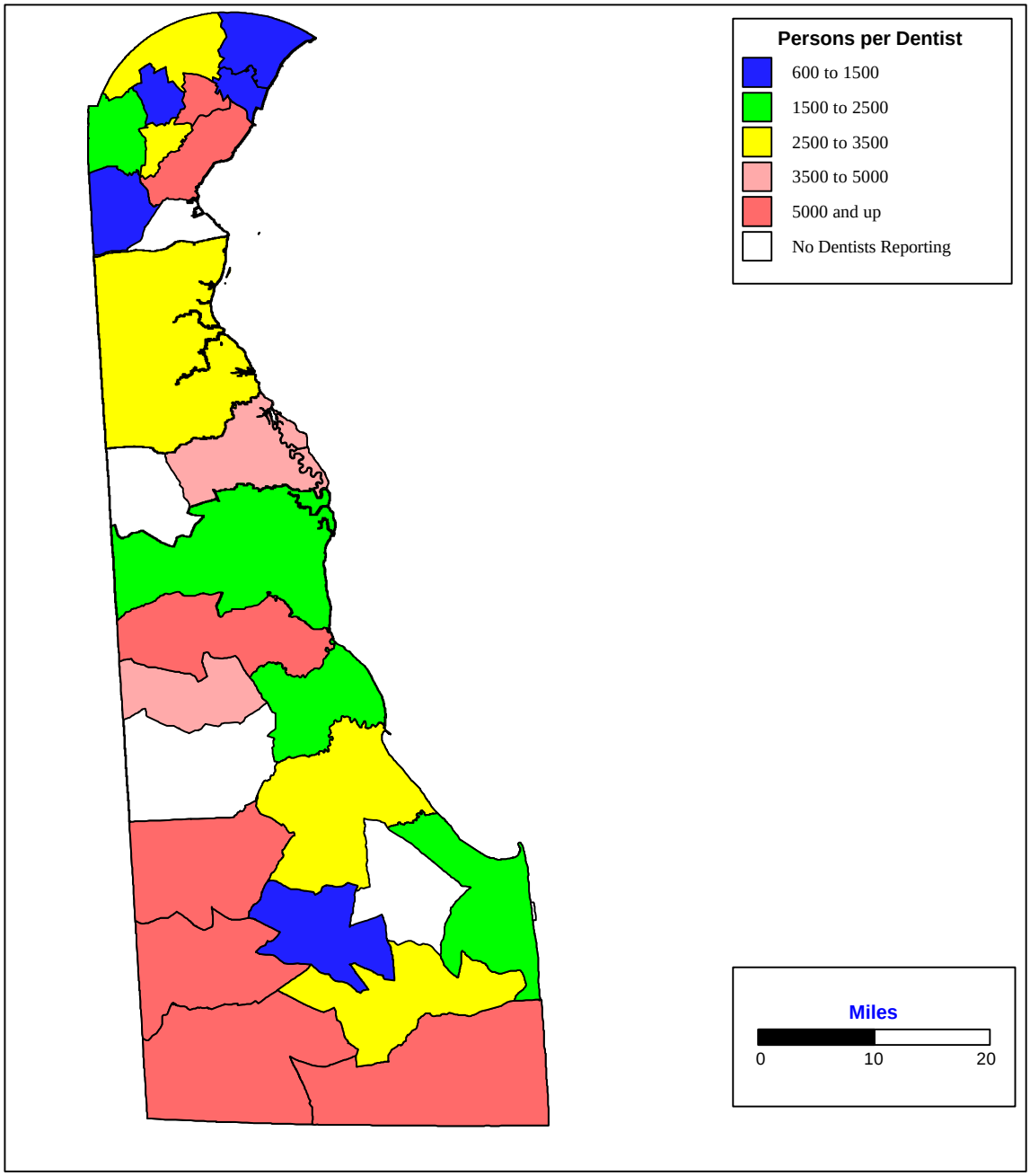
There is one other factor that is potentially important especially in Sussex County. There are a significant number of part-year residents who live in their vacation homes during the summer. For most, this is largely weekend activity; for others it may be full-time during the summer or during their vacation. In addition, there are a very large number of tourists who come on the weekends or perhaps for a week. All of these are potentially in need of dental services at some point, although at a much lower frequency than are full-time residents. These populations are not considered in the spatial distributions that follow.

Figure 4.1
Persons per FTE General/Family/Pediatric Dentist
By Census County Division



Source: Center for Applied Demography & Survey Research, University of Delaware

Figure 4.2
Persons per FTE Dentist
By Census County Division



Source: Center for Applied Demography & Survey Research, University of Delaware

The spatial distribution of general/family/pedatric dentists relative to population by census county division in Delaware is found in Figure 4.1 above. The important areas to look at are those in yellow and shades of red. The yellow areas have crossed the optimal 2000:1 threshold. Those in dark red are already too high with too few FTE dentists for the resident population. This map shows that dentists are unevenly distributed across New Castle County. Every area, which is potentially short of dentists, is adjacent to one that has an abundance of dentists. While the distances are short and certainly within the federal 25-mile criteria there may still be reason for concern as transportation, personal finances and convenience of dentist office hours may be a barrier to access in some areas and populations. The areas in dark red are above the 5000:1 ratio indicating a potential dental shortage area. One of those, the Red Lion census county division, currently has a population of about 5,000 people with no dentists reporting, but that population is too few to be considered a rational dental service area. All of the other divisions meet the 20,000+ population criteria.

This does not mean that there may not be isolated pockets within the other census county divisions that are dentally underserved. Wilmington, for example, seemingly has a sufficient supply of dentists but those dentists also see patients from outside the city. This may leave the minority community with too few dentists to meet their needs.

Kent County has a very different profile. Most of the dentists appear to be focused around Dover and Smyrna. None of the dentists surveyed reported working in two of the census county divisions (Kenton, and Harrington); those along with Red Lion in New Castle County and Milton in Sussex County were the only CCDs in the state without any dentists reporting. With the exception of Dover (the green area in the middle of Kent County with a population of 66,000), none of the other census county divisions reach a population of 20,000. Central Kent (the red area just south of Dover) contains almost 18,000 persons but is so close to Dover that dentists are more likely to locate in the city. The southern areas of Felton and Harrington are clearly short of dentists but are small (7,000 and 11,000 respectively).

With the exception of Georgetown and Lewes, dentists are in short supply throughout Sussex County. While the Lewes CCD has an adequate supply, the significant part-year resident population has not even been considered. Under normal circumstances, The Millsboro and Selbyville CCD’s might not be considered a problem since they are adjacent to both Georgetown and Lewes. However that ignores the part-year resident population problem as well. The real

shortage appears to be in the western part of Sussex County from Bridgeville to Laurel where the ratios exceed even the federal guideline of 5000:1 and are certainly far above the optimal level of 2000:1.

In Figure 4.2 above, ratios are calculated by pooling the generalists and the specialists. Suggestions have been made that there are more dental specialists in Delaware relative to general dentists. Further, the argument has been advanced that the 59 dental specialists are fully trained and capable of providing the same services as those practicing general dentistry. That does not mean that are in fact doing so but that they could do so. This is particularly true in those cases where auxilaries working in specialist's offices perform many of the same tasks as those working in the office of a general dentist. However, the conclusions reached by pooling both types of dentists are essentially the same. A few of the green areas are now blue and some of the light red areas are now yellow. However, all but one of the dark red areas remains dark red.

OBSERVATIONS

The Survey of Delaware Dentists is its first year and is intended to provide information that is needed to guide policy-makers in the State of Delaware. With approximately 87% of the 302 active dentists responding, the database, while not complete, is substantial. There are still refinements to be made to better measure the key items and, at the same time, to eliminate those items that add to the dentist's burden without adding to needed knowledge. Even without complete reporting a number of findings can be drawn from the data.

- The number of dentists in Sussex County are such that the area is considered dentally underserved according to federal guidelines. Kent County is far above the optimal level. There are a sufficient number of dentists in New Castle County.

- There may be a need to encourage more African American and Spanish speaking dentists and/or staff, as the population becomes more diverse particularly in Sussex County.

- Almost 20% of Delaware's dentists will either not be active in five years or are at this point unsure. Younger dentists are more likely to locate in New Castle County.

- There are distinct patterns in both the state in which the dentist graduated from high school and dental school and the state in which he/she currently practice. Similar patterns are found with respect to the state where they completed residency program.

- More than 90% of general dentists and specialists statewide are accepting new patients. That proportion is lower in Kent and Sussex counties.

- Weekly patient encounters are significantly higher in both Kent and Sussex counties.

- Waiting times for both new and established patients are much higher in Kent County. Waiting times are higher to see a general dentist than to see a specialist.

- Until recently Medicaid was acceptable to 4% of general dentists and 25% of dental specialists. That percentage has been increased from 4% to 25% in early 1999.

- Almost all dentists use non-dentists resources provided by hygenists and dental assistants. (Dental technicians were not addressed in this survey).

- Many of Delaware's dentists offer flexible hours by remaining open at night and on Saturday. General dentists are more likely to offer such hours than are specialists. Such hours are much more likely to be found in New Castle County.

- Most dentists in Delaware participate in dental insurance plans, offer flexible payment plans, and provide charity care.

APPENDIX