

**Primary Care Physicians in Delaware  
2001**

**prepared for**

**Delaware Department of Health and Social Services  
Division of Public Health**

**by**

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## Overview

In 1995, the Division of Public Health began an effort to measure the number and spatial distribution of primary care physicians practicing in Delaware. The objective was to identify medically underserved areas and to understand any existing or developing trends that could impact the supply of primary care services.

The method chosen to gather the information was a mail survey combined with telephone follow-up of non-respondents. Subsequent surveys were conducted in 1997, 1998, and 2001. Each time the survey instrument was refined and shortened with the objective of reducing the burden on the responding physician and improving the quality and relevance of the data gathered. As new information was gathered, it would either replace information supplied by the physician at an earlier date or in the case of a first time respondent, it would extend the coverage of the database. At the same time, responses from physicians in prior years, who no longer had an active Delaware license as determined from the state license file, were eliminated from the database. The resulting database contains information gathered from 1995 through 2001 by mail and by telephone from physicians who currently hold a Delaware medical license and provide clinical medical services in Delaware.

At the conclusion of this years project, 1486 physicians have participated in the survey in some way. Approximately 82% of the physicians have responded to the full survey with the balance of those responding having provided some information via telephone. Of those responding, 1390 were practicing clinical medicine either full or part-time.

Delaware currently has licensed 2765 physicians to practice clinical medicine in Delaware. Of those, 1669 have a Delaware address but it does not mean they are active or that they have a Delaware practice. Similarly, physicians living in other states may have an active practice in Delaware. Based on the survey results over the past three years, the number of physicians with an active practice in Delaware is approximately 1719. This total is used to produce all estimates presented throughout this report.

Primary care physicians are the focus of this report. This group includes physicians practicing in five specialties: family practice, general practice, internal medicine, pediatrics, and obstetrics/gynecology. The survey to date has identified 651 physicians with these primary

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specialties. After weighting for non-respondents, the expected number of primary care physicians is 739.

Not all physicians practice full-time. Others practice full-time but do not deliver direct patient care on a full-time basis. To give a more realistic view of the full-time equivalent primary care physicians available, a second calculation was required. A physician who was engaged in delivering primary care directly to patients 40 or more hours per week was defined as a full-time primary care physician. 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.<sup>1</sup> In other words, a physician delivering 60 hours per week of primary care was still counted as one full-time equivalent physician.

Finally, it is important to note that the estimates provided here exclude the foreign doctors with J-1 visas who are permitted to practice primary care for three years.<sup>2</sup> A J-1 Exchange Visitor visa allows international medical graduates (IMG) the opportunity to obtain residency training at an American medical training institution which agrees to sponsor him/her. The graduate must return to his/her home country for a minimum of two years upon completing the residency program before he/she can apply for US citizenship. A J-1 visa waiver allows an IMG to remain in the US without having to return to his/her home country for the two-year period. In order to receive a J-1 visa waiver, an IMG must obtain employment to practice medicine full-time in a federally designated health professional shortage area or a medically underserved area. Physicians that obtain waivers are required to practice in these shortage areas for a minimum of three years. While these physicians have an impact on access to care, they cannot be counted since they are not required to remain in the area upon completing their three-year waiver requirement. Currently, a number of Delaware's practicing J-1 physicians are applying for permanent status. At the time the physician license file was examined, there were 44 such physicians currently practicing in Delaware and 23 of those had primary care specialties.

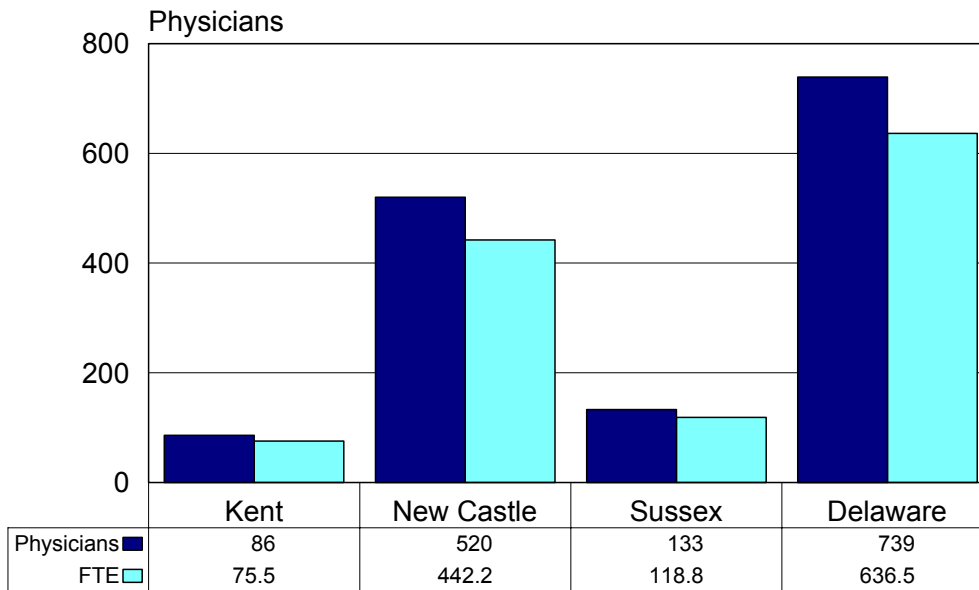
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<sup>1</sup> Federal Register/Vol.45, No.223/ Monday, November17, 1980, Part IV Department of Health and Human Services, 42 CFR Part 5, p.76002.

<sup>2</sup> Federal Register/Vol.45, No.223/ Monday, November17, 1980, Part IV Department of Health and Human Services, 42 CFR Part 5, p.76002.

When interviewed, physicians were asked for a Delaware address where they actually practiced. This address might or might not be the same as the address used when applying for a medical license. Clearly for those who applied from out-of-state, the Delaware practice address would never be the same. The telephone interview of non-respondents also revealed that physicians could and do periodically change practice addresses. Usually this happens because the business moves, but it can also reflect the fact that the physician joined a different practice. Overall, nearly 8% of physicians responding were at a different location than they were 12 months ago.

**Figure 1.1  
Primary Care Physicians  
by County**

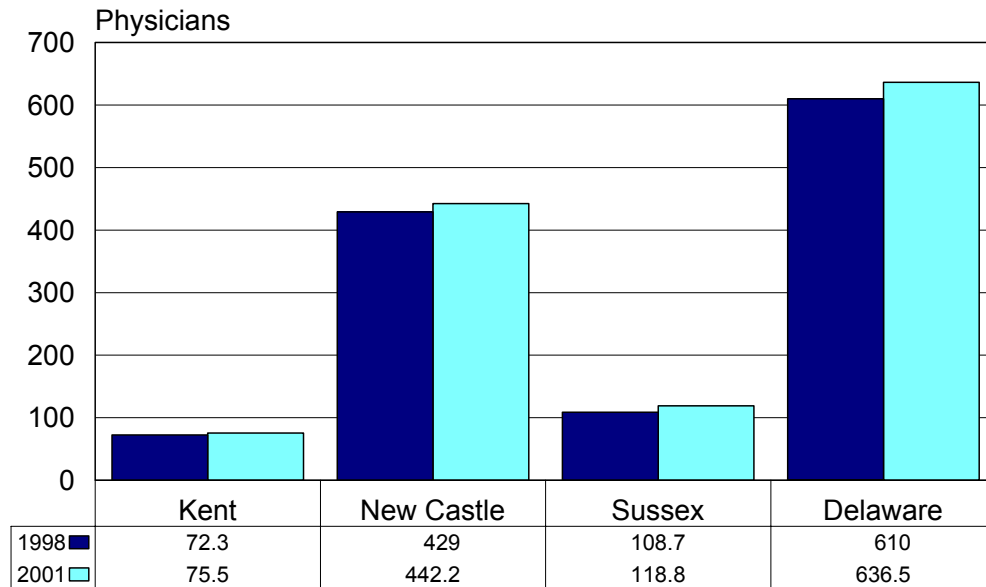


Source: Center for Applied Demography & Survey Research,  
University of Delaware

Figure 1.1 above summarizes the current number of primary care physicians in Delaware by county of practice. The number of physicians is provided in Figure 1.1 along with estimates of full-time equivalents (FTE). Given Delaware’s current population of 783,600, there are about 1,231 persons served by each full-time equivalent primary care physician. For the three counties, the estimates are 1,678 for Kent County, 1,130 for New Castle County, and 1,318 for Sussex County.

Since the survey began, 44 primary care physicians who were practicing in 1995 are no longer doing so. These losses included 23 in family/general practice, 13 in internal medicine, three in pediatrics, and five in obstetrics/gynecology. Twenty-three primary care physicians who were practicing in 1998 are not currently active including 13 in family/general practice, five in internal medicine, four in pediatrics, and one in obstetrics/gynecology. In spite of this, in Figure 1.2, the net number of primary physicians in the state and in each of the counties has increased slightly since the last survey in 1998.

**Figure 1.2  
Primary Care Physicians  
by County and Year**



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

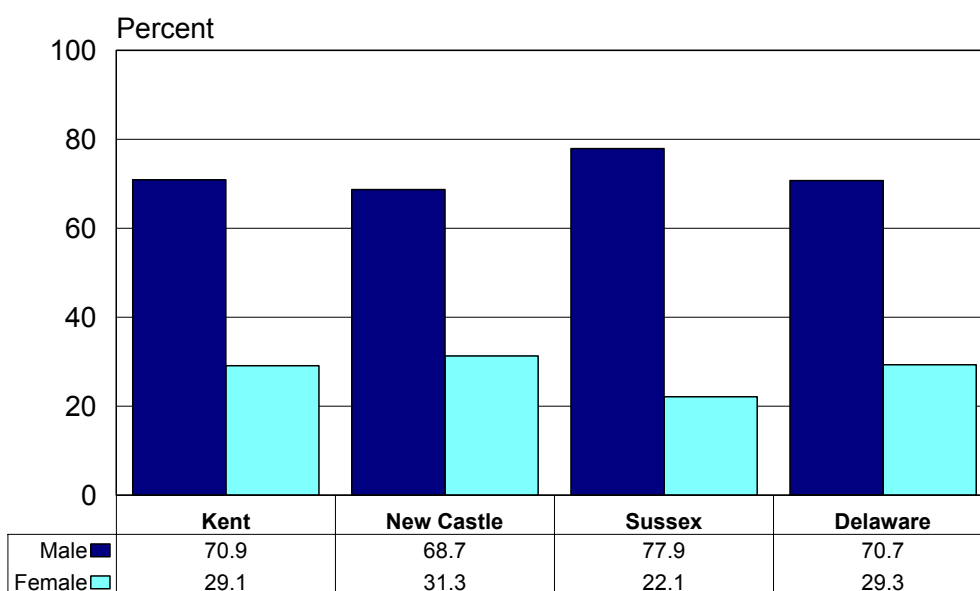
In the remainder of this report different aspects of primary care physicians and their practices will be examined. Overall the objective is to touch on those attributes that affect the availability of primary care. In the section that follows, the basic demographics of the primary care physician population are discussed. Of particular interest is the age structure and diversity of these practitioners. The next section deals with practice characteristics. Important issues such as waiting times for patient appointments and the acceptance of new patients are among the topics addressed. Finally, in the last section, the spatial distribution of primary care physicians at the sub-county level is addressed.



## Demographics

The topic of demographic diversity within the primary care physician community may seem irrelevant. However, some patients may feel more comfortable with and are able to communicate better with physicians having particular characteristics. In addition, physicians with particular demographic characteristics may be more likely to train in one of the primary care specialties.

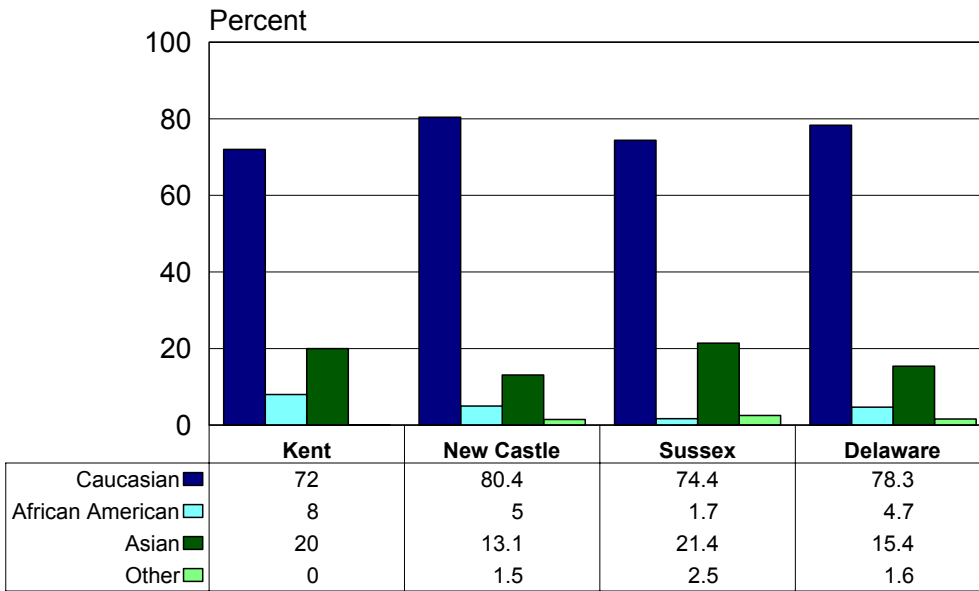
**Figure 2.1**  
**Gender of Primary Care Physicians**  
**by County**



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

The primary care physician community in Delaware is somewhat more than 70% male. There is however some variation between the counties. Kent and Sussex Counties have more male primary care physicians than does New Castle County. The data provide no readily apparent explanation for this difference from looking at the other characteristics. It is interesting that women are more likely to choose one of the primary care specialties. When looking at the entire physician database, 59% of women were in one of those specialties while only 39% of men chose primary care.

**Figure 2.2**  
**Race of Primary Care Physicians**  
**by County**



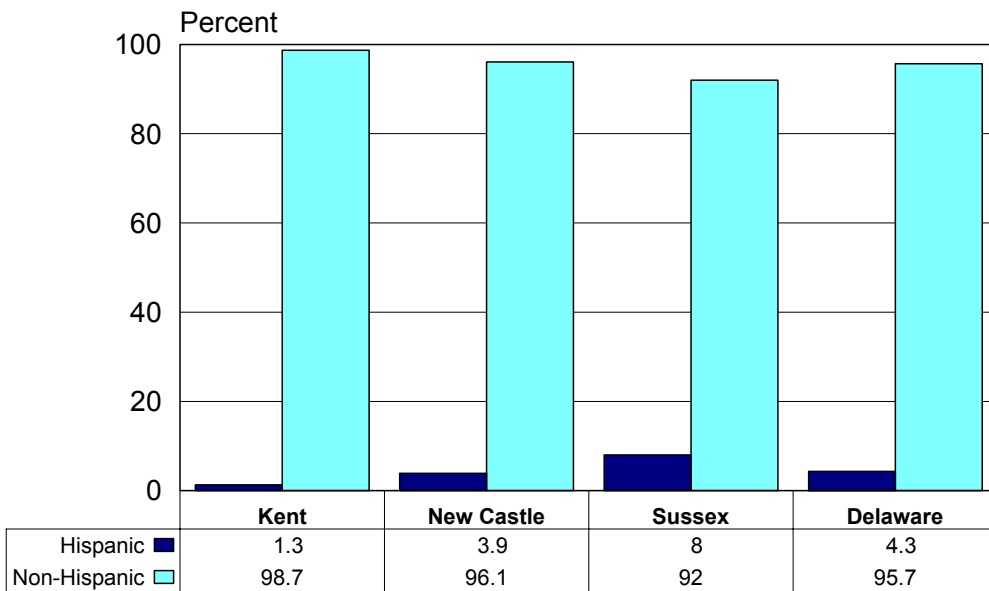
Source: Center for Applied Demography & Survey Research,  
 University of Delaware

The racial distribution of primary care physicians by county is shown in Figure 2.2 above. Probably the most interesting aspect of this table is the lack of African American primary care physicians and the preponderance of Asian physicians.

The paucity of African American physicians in Sussex County is a puzzle. While the proportion of African Americans in Sussex County is slightly lower than for the state as a whole, one would expect to see 3.5% rather than 1% of physicians falling into this group. On the average, African American physicians are more likely to choose a primary care specialty (63%) in comparison with Caucasians (41%) and Asians (48%).

Hispanic origin has taken on a particular interest in Delaware with the rapid growth of that population in the 1990s, particularly in Sussex County. The distribution of primary care physicians by Hispanic origin is found in Figure 2.3, below.

**Figure 2.3**  
**Hispanic Origin of Primary Care Physicians**  
**by County**



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

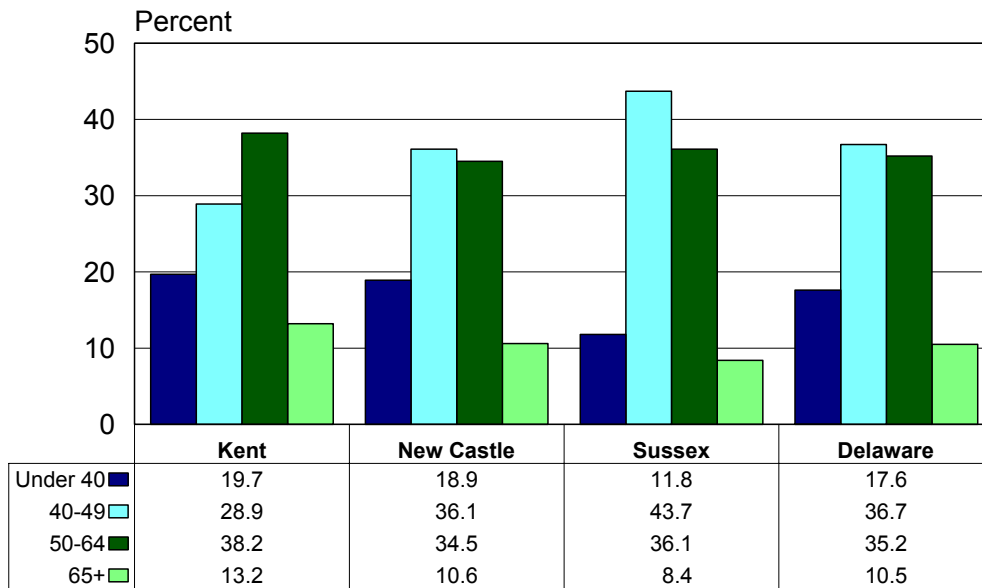
Today, Delaware’s population is nearly 5% Hispanic and the physician population essentially mirrors that. The highest proportion of Hispanic physicians is found in Sussex County (8%) where nearly 7% of the population is now Hispanic. (None was Asian Hispanic.) Overall, just over 37% of the practice sites in the state had someone available who could speak Spanish. That proportion was slightly lower in Sussex County where the need is increasing.

The age of primary care physicians is ultimately a factor in their availability. In addition, there are differences in primary care specialties related to age. A physician who is currently age 40 or less is more likely to have a primary care specialty when compared to those that are older. This suggests that physicians training today are more likely to choose one of the primary care specialties than they were ten years ago. Over the next ten years then, it would be reasonable to expect an increase in primary care physicians even if the total number of physicians in the state were constant.

The age distribution of primary care physicians is found in Figure 2.4, below. There are several points of interest in this display. First, a smaller proportion of younger primary care physicians is found in Kent County (48%). Overall, about 54% of physicians are under the age of 50. This will change over time as the physicians in the “baby boomer” bracket age. This is likely

to produce a shortage as the population ages and grows. The problem will probably become more acute in Sussex County first, since it is the fastest growing county and at the same time its residents are the oldest on average. Kent County has a slightly different problem. While their residents are the youngest, they have a higher concentration of physicians in the 50 and over age group and thus have a larger proportion of physicians who are in their less active years.

**Figure 2.4**  
**Age of Primary Care Physicians**  
**by County**

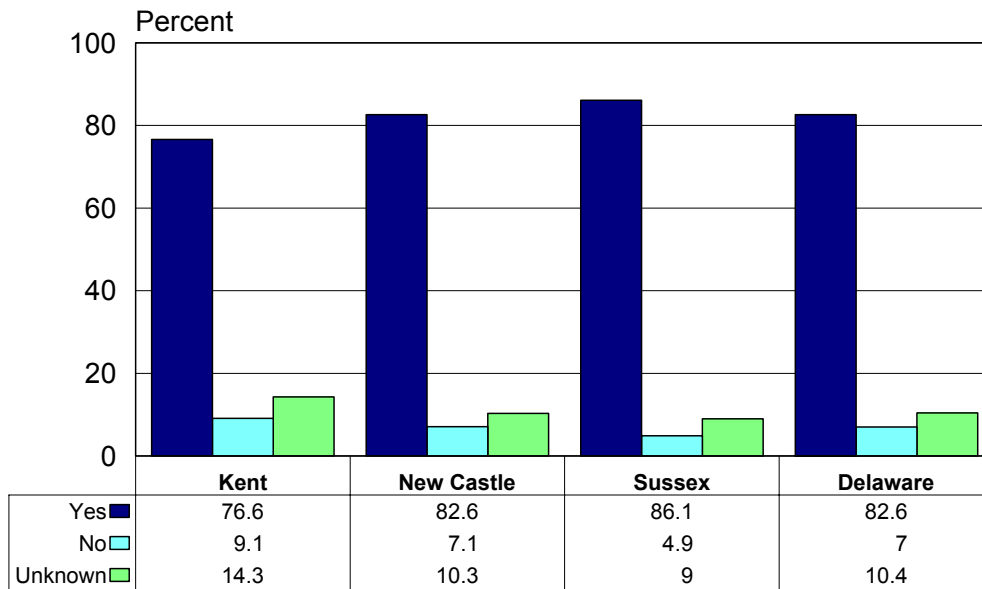


Source: Center for Applied Demography & Survey Research, University of Delaware

Physicians were asked if they planned to be active in clinical medicine five years from now. Those answers are summarized in Figure 2.5, below. In general, 90% of physicians expect to be active in five years. The lowest proportion is found in Kent County.

Nearly 95% of the two younger age groups (under 50) expect to be active five years from now. That drops to 80% for the next age group and 29% 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 57 when the affirmative answers drop to about 80% and more become unsure. The second point is at about age 68.

**Figure 2.5**  
**Active Five Years from Now**  
**by County**



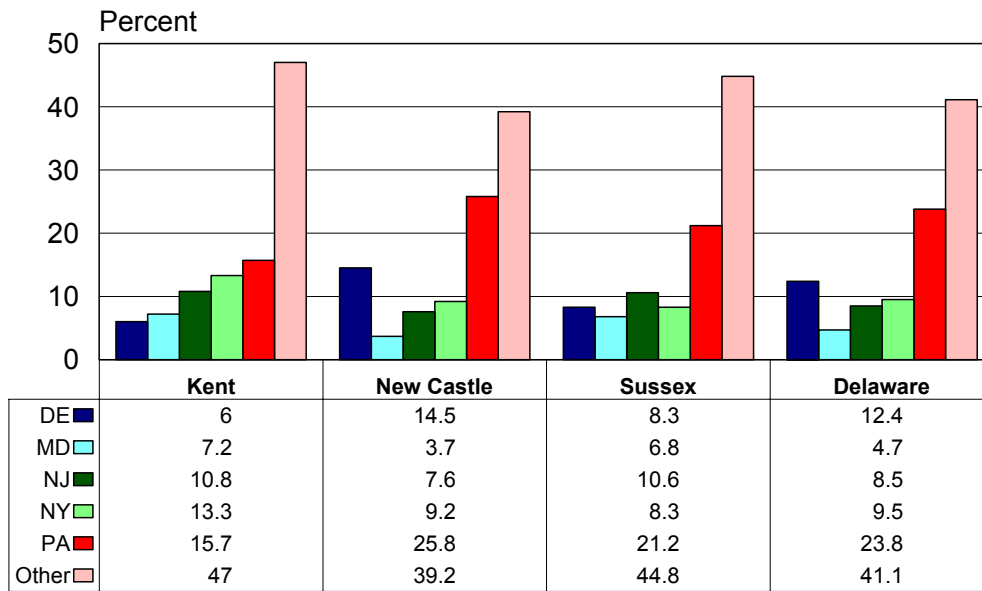
Source: Center for Applied Demography & Survey Research, University of Delaware

The data for Kent County show a large group who is *unsure*. This undoubtedly relates to the large group in the 50-64 age group and 65+ group shown in Figure 2.4. In contrast, physicians in Sussex County are both much more positive and less unsure than those practicing in the other counties. These results serve to lessen some, but not all of the concern about the future adequacy of primary care physicians in Sussex County.

Some primary care physicians choose to practice clinical medicine in Delaware and others practice in other states. 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 physician originally reside as measured by the state from which they graduated high school. Second, in what state did the physician attend medical school. A third key variable, which is not presented here, is the state in which the physician did his/her residency. (This information will be available in later surveys as sufficient data is gathered.)

In Figure 2.6, the distribution of the state of the physician’s high school graduation is shown. The first interesting aspect of this figure is that two thirds of Delaware’s primary care physicians grew up in the region and approximately 12% are from Delaware. There also appears

**Figure 2.6**  
**State of High School Graduation**  
**by County**



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

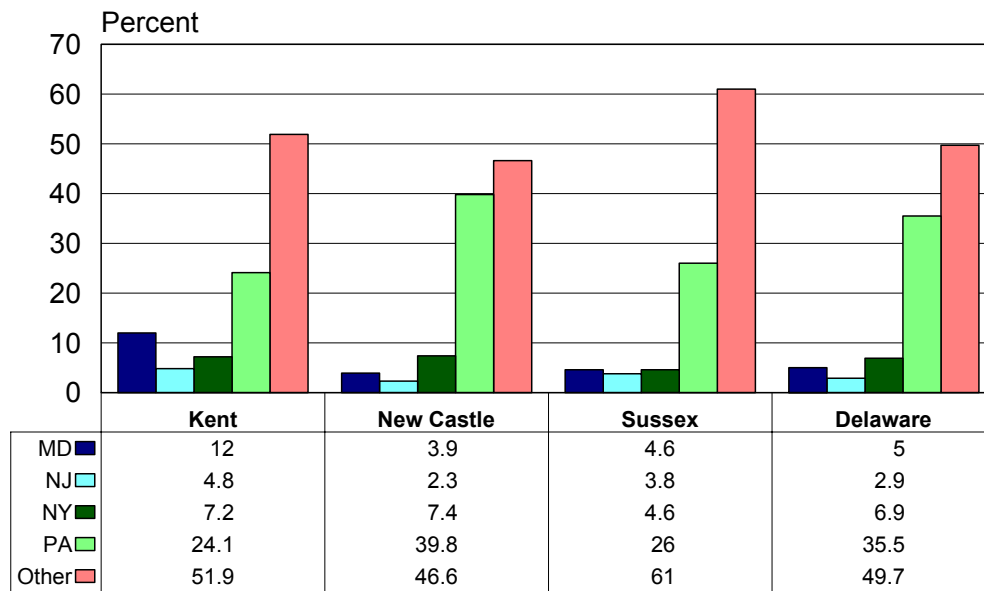
to be a different orientation by county as well. Physicians who grew up in Maryland are more likely to locate in Kent or Sussex counties. In contrast, physicians from Pennsylvania are more oriented toward New Castle County.

The pattern observed for the state of high school graduation is replicated in part for the state of medical school graduation (Figure 2.7). Significantly more primary care physicians graduating from medical schools in Maryland locate in Kent and Sussex counties. Also, those from medical schools in Pennsylvania are more likely to locate in New Castle County.

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 physician’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 home and also go to medical school within several hundred miles of where they went to college. Eighty five percent of those who graduated from high school in Delaware went to medical school in the region. Comparable percentages for other states in the region were; Maryland-70%, New Jersey-65%, Pennsylvania-86%, and New York-70%. Almost 90% of the physicians who graduated from high school

outside of the region also went to medical school outside of the region. This information may prove valuable to those making an effort to recruit new primary care physicians for Delaware.

**Figure 2.7**  
**State of Medical School Graduation**  
**by County**



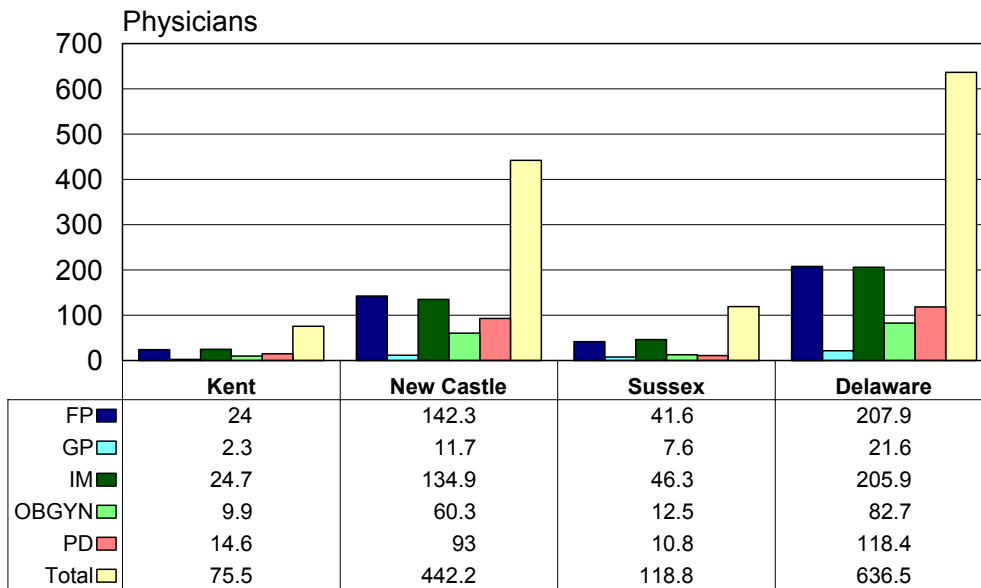
Source: Center for Applied Demography & Survey Research,  
 University of Delaware

## Practice Characteristics

The 739 primary care physicians in Delaware are distributed across different specialties and have different types of practices. In this section, some of the key characteristics of those practices are discussed. The attributes selected for analysis largely relate to capacity and availability for patient care.

While in theory primary care physicians deliver similar services, they also practice in their reported specialties. Figure 3.1 contains the estimates for these specialties by county.

**Figure 3.1**  
**Specialty of Primary Care Physicians**  
**by County**

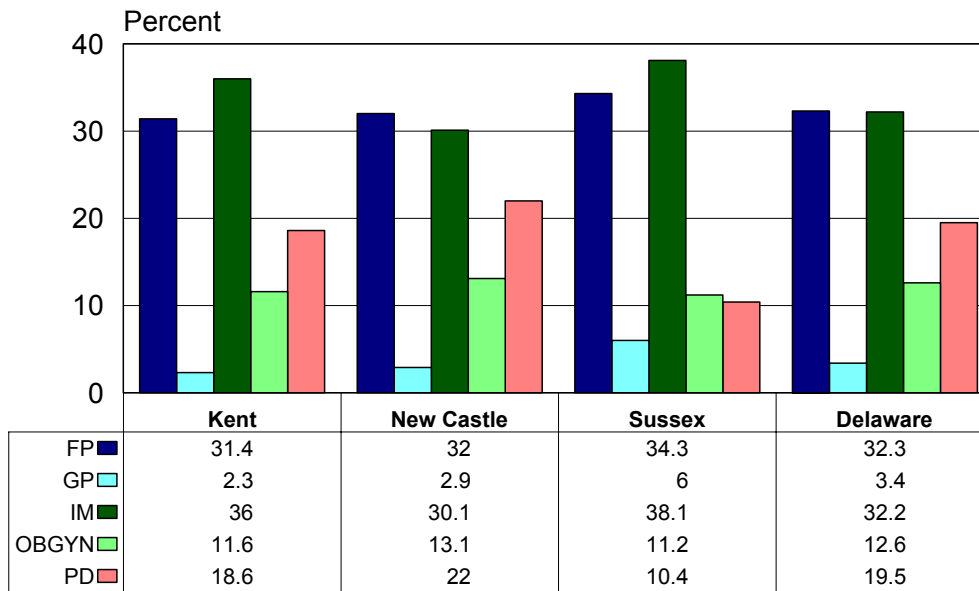


**Source: Center for Applied Demography & Survey Research,  
University of Delaware**

No one specialization really dominates the distribution. In general the number of physicians in internal medicine is roughly equivalent to those in family practice. Those classified as general practitioners are declining and the vast majority of those are over the age of 65. The number of OBGYNs and pediatricians in Kent and Sussex counties is clearly showing a different pattern. Some of this can be attributed to different demographics in the two counties in that residents of Kent County are generally younger. The differences in the percentage distribution shown in Figure 3.2 below also reflect these findings.



**Figure 3.2**  
**Distribution of Primary Care Specialties**  
**by County**



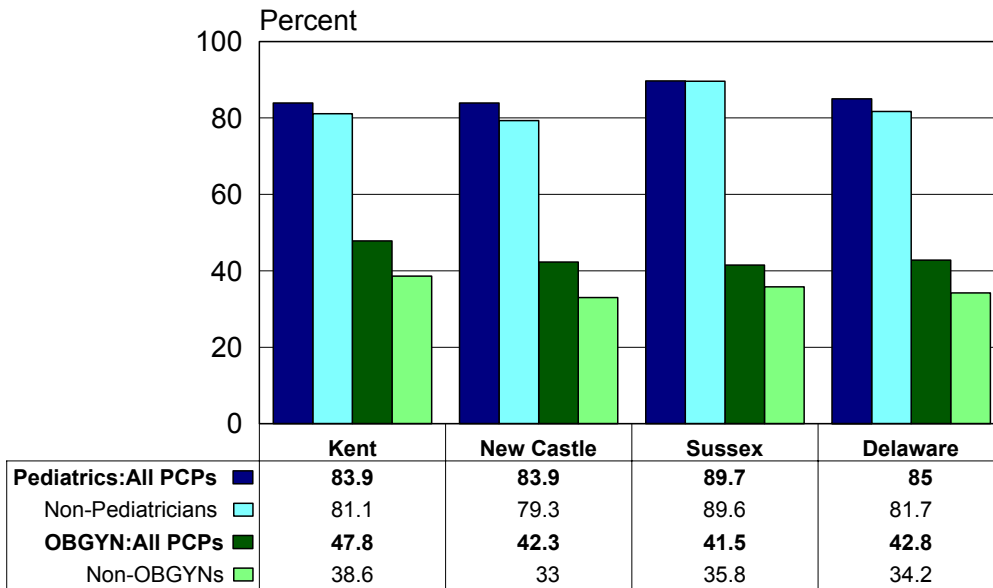
Source: Center for Applied Demography & Survey Research, University of Delaware

The distribution in Figure 3.2 shows that primary care physicians are distributed essentially in three major groups. One third are family/general practitioners; one third are internists who focus on adults; and one third are primary care physicians focused on smaller groups of patients. About 50% of pediatricians stop seeing patients when the patients reach 18 years of age and the balance will cease treatment by age 21. Similarly, OBGYNs are generally concerned with female patients. It is interesting to see that Sussex County has a significantly larger proportion of primary care physicians in the “full-service” group.

Primary care physicians with family practice or internal medicine specialties may provide pediatric and OBGYN services. The extent of this crossover between the specialties is shown in Figure 3.3, below. First of all, the table needs some explanation. The lines labeled *Pediatric* and *OBGYN* include all primary care physicians. The lines directly beneath exclude the specialists in those areas. Thus, 83.9% of primary care physicians in Kent County provide pediatric services and 81.1% of non-pediatric primary care physicians provide those services. Perhaps the most interesting part of this information is that a larger proportion of non-OBGYN physicians are providing OBGYN services in Kent County. This is consistent with the much smaller proportion of OBGYNs available in Kent County. In contrast, the same cannot be said for pediatric services in

Kent County. There are relatively more pediatricians in Kent County than elsewhere, however the proportion of non-pediatric physicians providing those services is not lower as would be expected. Clearly this is a more complex issue than can be adequately addressed here, however it certainly relates to the younger age distribution in Kent County.

**Figure 3.3**  
**Provide Selected Specialty Services**  
**by County**



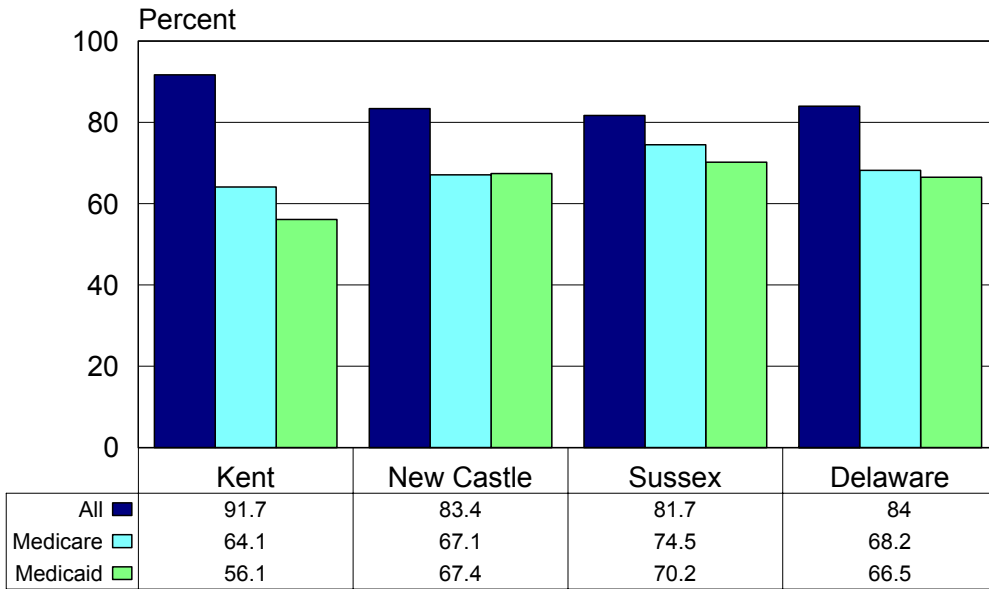
Source: Center for Applied Demography & Survey Research, University of Delaware

One of the most critical issues with respect to the capacity of primary care physicians is whether they are accepting new patients. The data with respect to this question is found in Figure 3.4 below. Between 81% and 92% of primary care physicians report that they are accepting new patients. The proportion is lowest in Sussex County. The more interesting point is which specialties are accepting new patients. More than 90% of OBGYNs and pediatricians are accepting new patients. In contrast, 81% of family and general practitioners are accepting them, while about 84% of Internists currently are accepting new patients.

Primary care physicians were also asked if they were accepting new Medicare and/or Medicaid patients. Those results are also found in Figure 3.4, below. A cautionary note is needed for interpreting the Medicare results. Pediatricians comprise almost 20% of primary care physicians. However, they only see a very small set of Medicare patients, i.e. those situations

where one of the special programs allows a child to have access to Medicare through SSI (Social Security Insurance). In reality, about 80% of non-pediatric primary care physicians are accepting new Medicare patients in contrast to the 68% indicated in the table. Still, that is well below the estimates for all patients. This may reflect the fact that older patients will occupy substantially more of a given physicians time than younger patients. There are significant differences between the specialties. The acceptance rate ranges from 75% for family practice to 81% for OBGYN.

**Figure 3.4**  
**Accepting New Primary Care Patients**  
**by County**

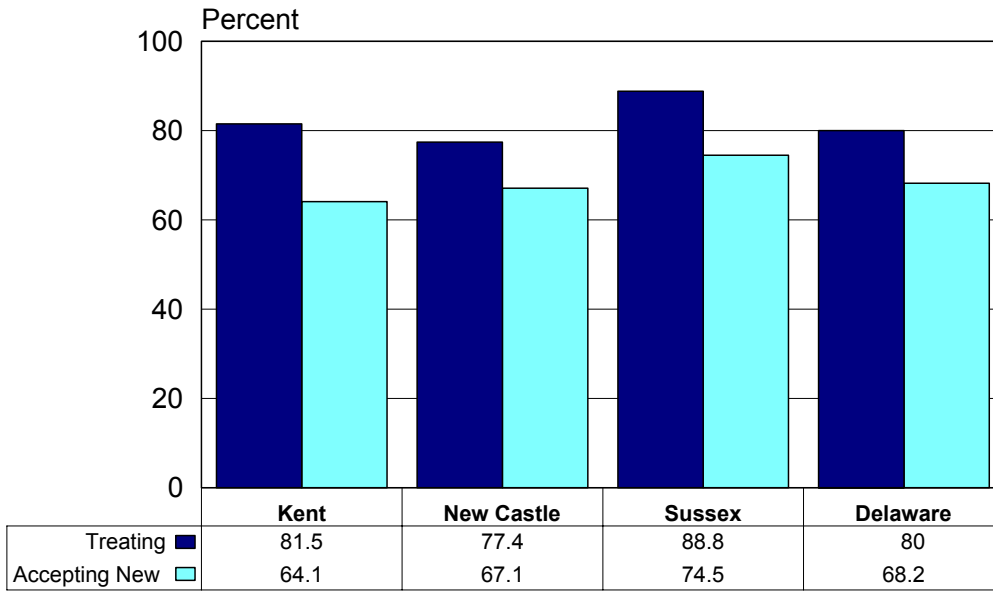


Source: Center for Applied Demography & Survey Research, University of Delaware

The results regarding the acceptance of new Medicaid patients are similar to those for Medicare but without the cautionary note. There are differences between the counties and with physicians in Kent County being the least willing to accept new patients of this type. The fact that Kent County has the fewest primary care physicians per person undoubtedly influences this result. Further, there is a significant difference between the specialties with acceptance of new Medicaid patients varying from 63% for family practice to 89% for pediatricians.

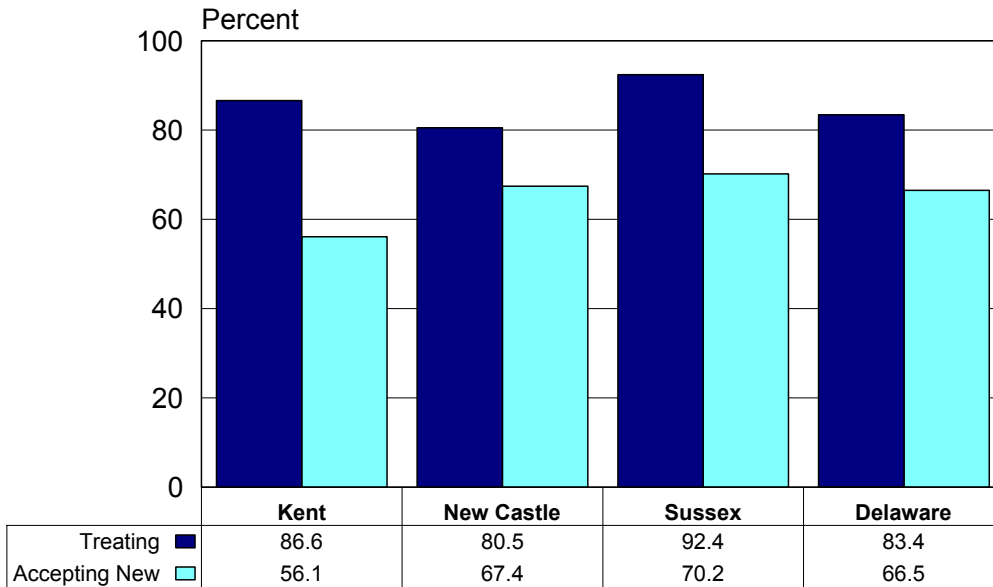
The difference between primary care physicians who are currently treating Medicare patients and accepting new Medicare patients is shown in Figure 3.5, below. The spread between

**Figure 3.5**  
**Accepting New Medicare Patients**  
**by County**



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

**Figure 3.6**  
**Accepting New Medicaid Patients**  
**by County**

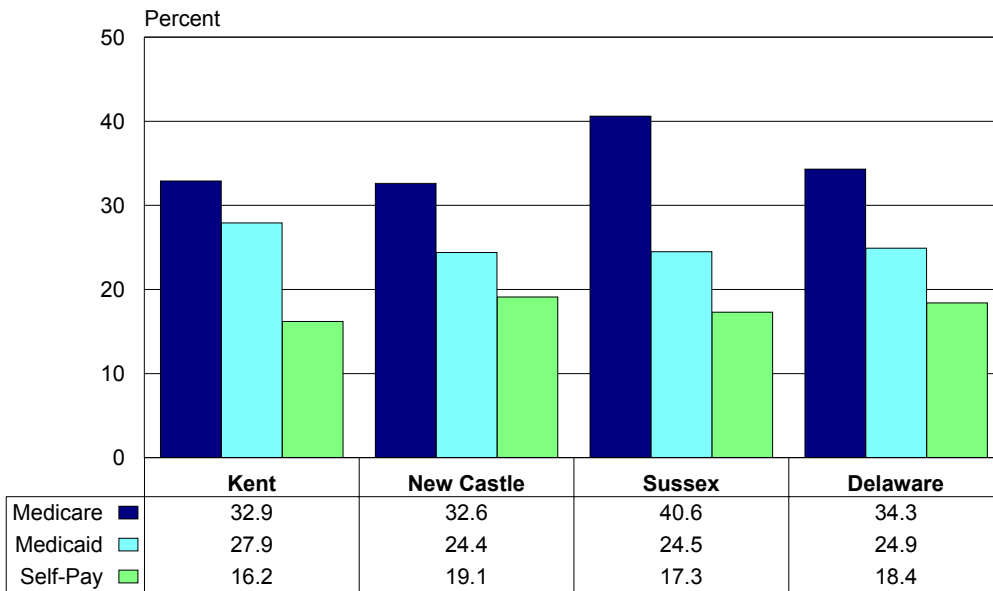


Source: Center for Applied Demography & Survey Research,  
 University of Delaware

these two estimates is on the average twelve percentage points. These differences are most severe in Kent County where the difference is almost 30 %. The difference is also about 30% for family practice physicians statewide. This suggests that those migrating to the state to retire or those who lose their current physician for any of a number of reasons could have a difficult time finding a new one.

The situation for Medicaid patients is probably even more difficult (Figure 3.6). There is a difference of 17 percentage points between those that are currently treating Medicaid patients and those that will accept new ones. For family practitioners, the difference is almost 40 percentage points. This contrasts with a fifteen-percentage point difference for all patients.

**Figure 3.7**  
**Percent of Time Serving Selected Patient Groups**  
**by County**



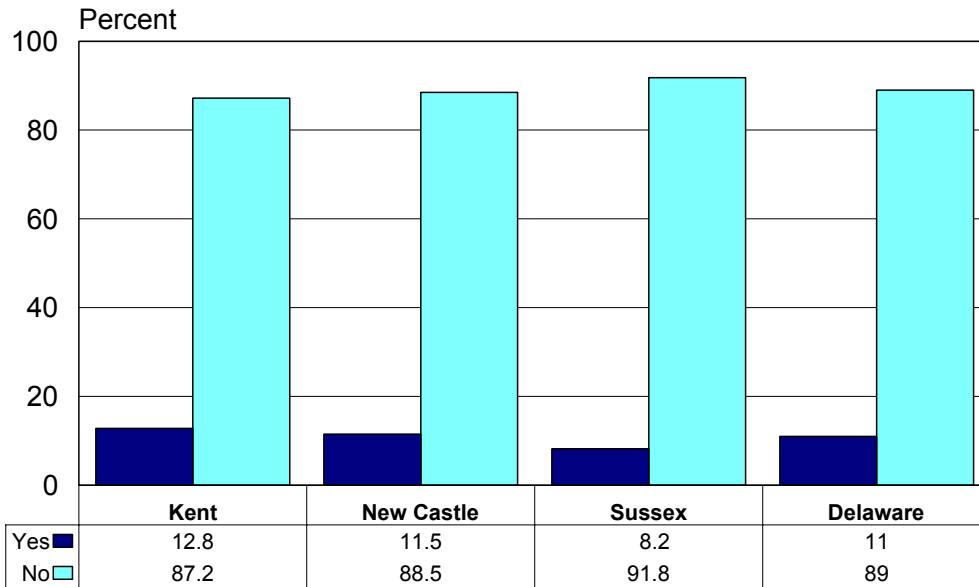
Source: Center for Applied Demography & Survey Research, University of Delaware

Part of the explanation for this less than enthusiastic response about taking on new Medicare and Medicaid patients may lie in the current amount of time devoted by primary care physicians to these two populations (Figure 3.7). About one third of physician time is devoted to Medicare patients. This is about 2.5 times more than would be expected given their share of the population. However, older people obviously need significantly larger amounts of physician time. As a typical physician’s clientele ages, his/her ability to absorb new patients declines. The estimates in Sussex County are highest because the older population is relatively higher there.

The estimates for time spent on providing care to Medicaid patients is somewhat surprising although it is consistent across all three counties. Medicaid patients use about 25% of physician’s time although 12% of the population uses Medicaid sometime during the year. Since children are a significant part of that population perhaps that explains part of the difference.

The estimates for *self-pay* patients appear elevated at first glance. Assuming the uninsured is the bulk of those patients, an estimate of about 18% would not be expected. However, if one considers those that might be without health insurance some time during the year, the estimate is probably reasonable. Further, children are both more likely to be uninsured and in need of medical attention.

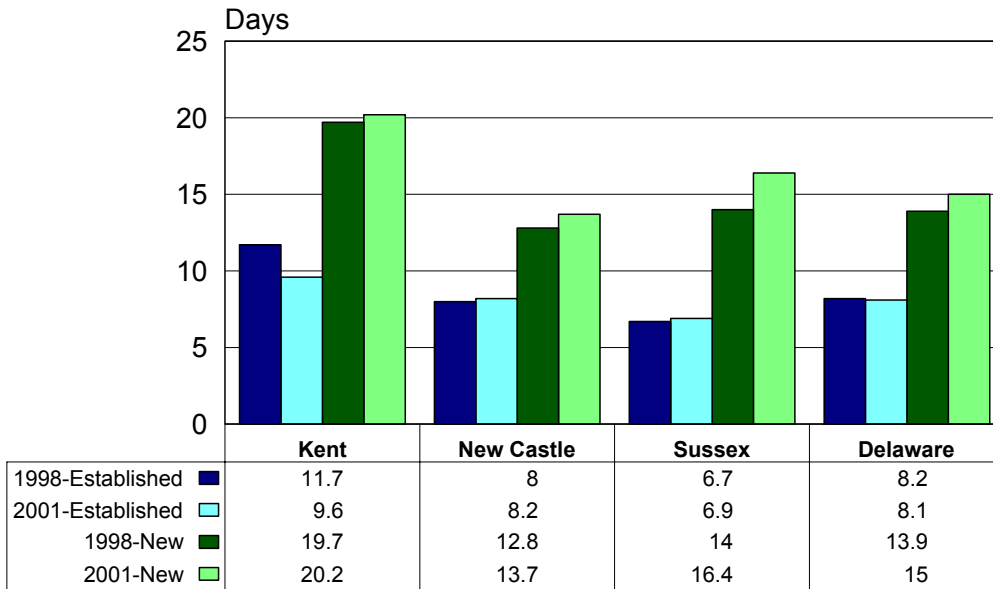
**Figure 3.8**  
**Practice Geriatrics as a Sub-specialty**  
**by County**



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

Finally, a question was added in this year’s version of the survey inquiring about geriatrics. This sub-specialty is likely to take on even greater importance in the years to come with the aging of the baby boomers. Overall 11% of primary care physicians have this sub-specialty (see Figure 3.8, above). Given the age of Sussex County’s population one might hope for a greater prevalence there rather than in Kent County, which has the youngest population.

**Figure 3.9**  
**Average Wait Time for Types of Patients**  
**by County**

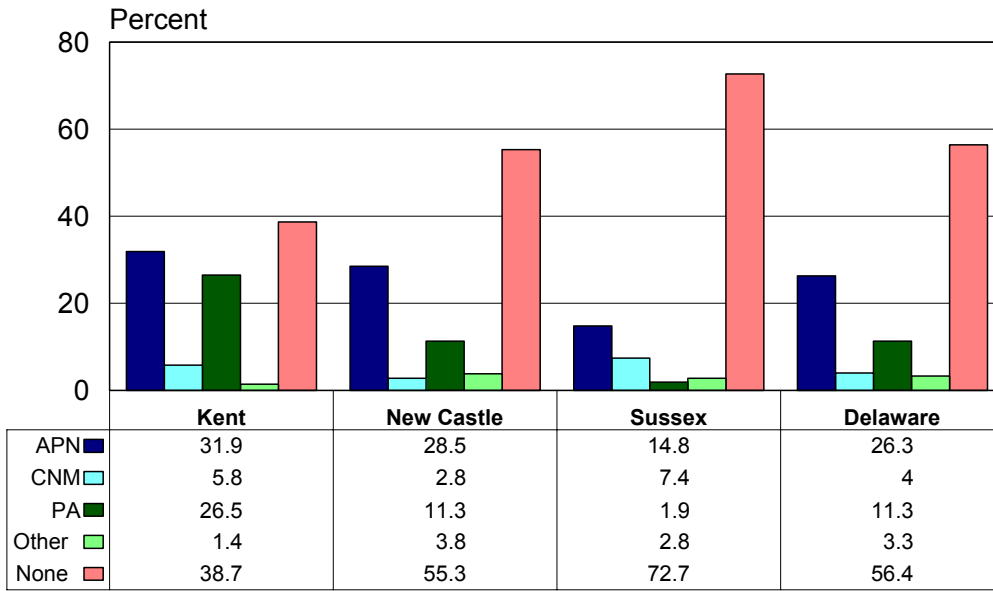


**Source: Center for Applied Demography & Survey Research, University of Delaware**

Primary care physicians were also asked how long a person would have to wait for an appointment in a non-emergency situation (Figure 3.9). On the average an established patient will wait a bit more than a week. In contrast, the new patient will wait two weeks. The situation for established patients is similar in New Castle and Sussex counties but is significantly longer in Kent County where the ratio of people per physician is the highest. Sussex County appears to be in the best condition, which is consistent with the favorable distribution of primary care physicians discussed earlier.

There are significant differences in wait times by area of specialization. For established patients, family practice, general practice, and internal medicine specialties have wait times of from 4 to 6 days while OBGYNs are more than 20 days. Pediatricians require about 8 days. New patients will wait about 35 days to see an OBGYN and between 9 and 14 days to see the others.

**Figure 3.10**  
**Use of Non-Physician Resources**  
**by County**



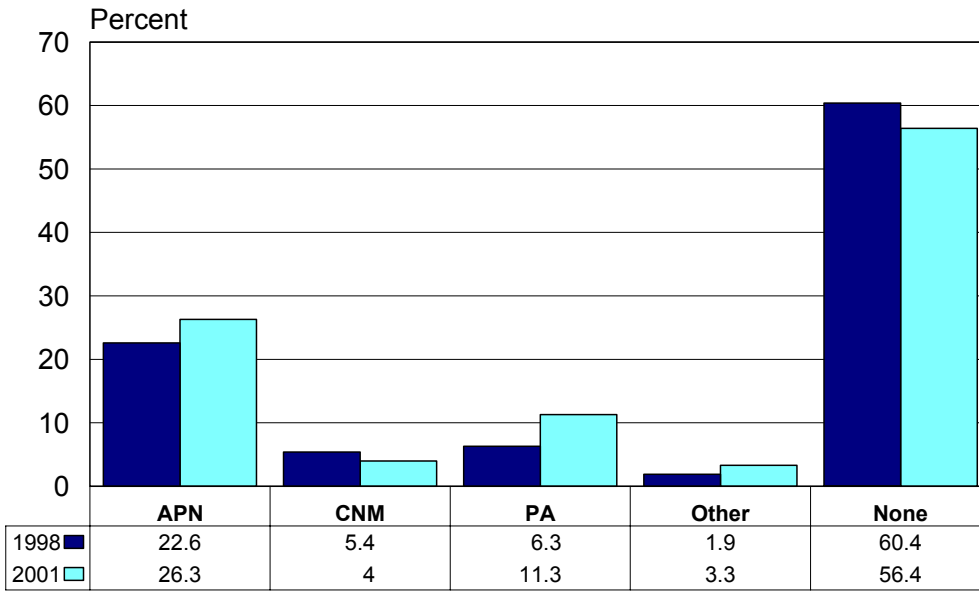
Source: Center for Applied Demography & Survey Research, University of Delaware

Primary care physicians have available to them resources to extend their own abilities to serve patients. The advanced practice nurse (APN), the certified nurse midwife (CNM), and the physician’s assistant (PA) are the most typical such resources. The responses of the primary care physicians responding are tabulated in Figure 3.10, above. There are differences between the counties and those differences are consistent with the relative need for primary care physicians. Kent County has the greatest need and is using alternative resources to the greatest extent. Sussex County primary care physicians are using the alternative resources the least. There are significant differences between the specialties where the OBGYN and pediatric primary care physicians are far more likely to employ any and all of these alternative resources.

A comparison of non-physician clinicians for the last two survey periods is shown in Figure 3.11, below. The differences are not large enough to draw any real conclusions although there does seem to be indications of movement toward these resources. With the exception of CNMs, all the percentages are positive with a relatively large move in the use of physician assistants. Still, the majority of physicians are not using these resources.

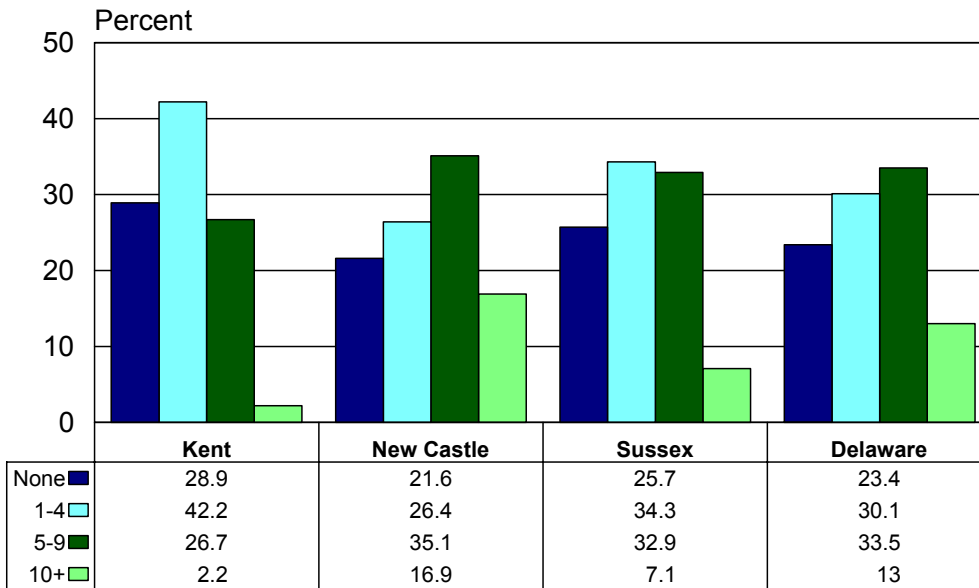


**Figure 3.11**  
**Use of Non-Physician Resources**  
**by Year**



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

**Figure 3.12**  
**Member of Managed Care Networks**  
**by County**



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

Finally, access to primary care is impacted by the coverage that a patient presents to the physician. Membership in one or more managed care networks allows a primary care physician to extend services to a wider range of patients. The responses to this question are found in Figure 3.12, above. Twenty three percent of Delaware's primary care physicians do not belong to one of the networks. The largest contingent is found in Kent County where 24% of the primary care physicians do not belong to a managed care network. Among the specialties, OBGYNs and pediatricians are more likely to be members and general practitioners are the least likely. This latter finding is also consistent with the lower rate of participation in Sussex County, where a higher proportion of GPs practice.

## Spatial Distribution

Delaware probably has a sufficient supply of primary care physicians if they were spatially distributed with the population. According to the Council on Graduate Medical Education, a ratio of 1250:1 of persons per primary care physician corresponds to the lower end of the acceptable range for supply of primary care providers. Delaware currently has a ratio of 1231:1 without considering nonphysician providers or international medical school graduates holding J-1 visas. The ratios are 1678:1, 1130:1, and 1318:1 for Kent, New Castle, and Sussex counties respectively.

The federal government recognizes the importance of having an adequate number of primary care physicians in areas smaller than states or even counties. In their program for medically underserved areas and populations (MUA/P), “rational areas for the delivery of primary medical care services” can be counties, parts of counties, and even neighborhoods within metropolitan areas with a strong identity and a population of 20,000.<sup>3</sup> In general, an underserved area will have a ratio of 3500:1 (in special cases 3000:1) or higher to qualify. Obviously, none of the counties would qualify if that were the spatial area considered.

The distance criterion, which defines such areas in Delaware, is roughly 20 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 since they both have town centers. 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 useful for this spatial examination. Before looking at these sub-county differences, some caveats are in order.

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<sup>3</sup> In the September 1, 1998 Federal Register DHHS proposed new regulations for medically underserved populations (MUP) and health professional shortage areas (HPSA), the Department of Health and Human Services generally recognizes a ratio of 3000:1 as sufficient for an area to be classified as a HPSA. To be classified as an MUP an index of primary care shortage (IPCS) is computed utilizing a number of factors: (1) population to primary care ratio, (2) percent below 200% of the poverty level, (3) infant mortality rate, (4) low birth weight rate, (5) percent of a racial minority, (6) percent of Hispanic ethnicity, (7) percent linguistically isolated, and (8) population density.

The characteristics of the population do matter. Two areas with equal populations and equal numbers of primary care physicians are not necessarily in the same condition. For example, one area may have a much larger proportion of persons who are over the age of 74. Recent survey data suggests that this elderly group will require three times as many physician encounters as do those who are 18 to 64. Similarly the very young, less than 5 years of age, will require twice as much medical care compared to those in the 5-17 age group.<sup>4</sup> When the populations of the counties are adjusted to reflect the age distribution, the adjusted population is actually lower in all three counties. This suggests that, at least at the county level, the ratios are even more favorable.

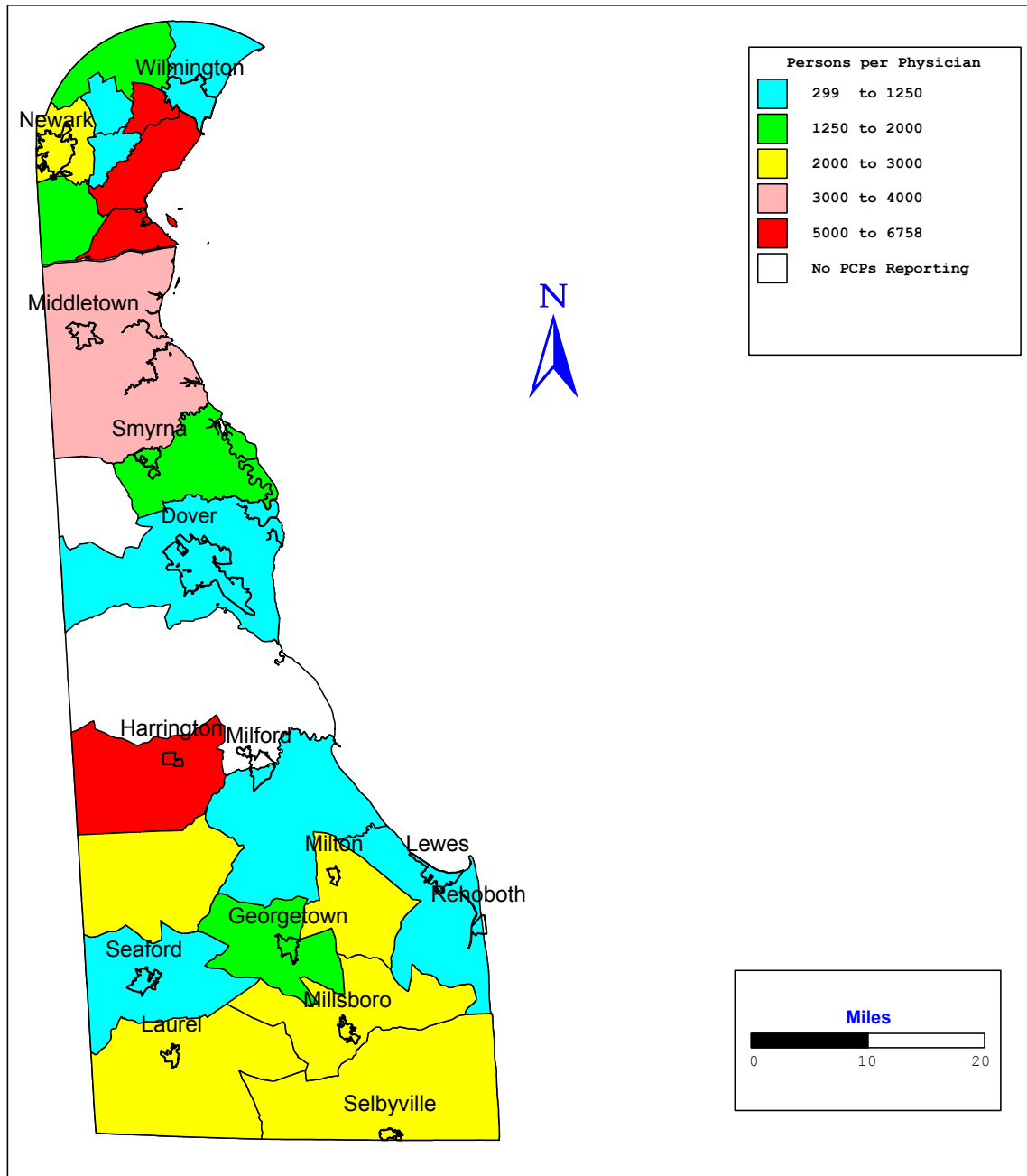
Age is not the only demographic area that can make a difference. Traditionally, people who live in households that are under the poverty line will likely need more medical care than those who are above it. Further, higher infant mortality in an area may suggest less access to primary care physicians. Additional variables currently being considered are low birth weight births, percent of a racial minority, percent Hispanic, percent linguistically isolated, and population density. Many of these variables are also correlated with poverty and infant mortality. Even if everything else is equal (i.e. population, population characteristics, and the number of primary care physicians), the more spread out the population is in the medical service area, the harder they are to serve.

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

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<sup>4</sup> 1992 National Health Interview Survey.

**Figure 4.1**  
**Number of Persons per Primary Care Physician**  
**by Census County Division**



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

The spatial distribution of primary care physicians 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 may be crossing the 3000:1 threshold. Those in red are already too high with too few primary care physicians per population. One of those, the Red Lion census county division, currently has a population of about 5,600 people, which is too few to be considered a rational primary care medical service area. All of the other divisions meet the 20,000+ population criteria. The Elsmere area and the New Castle area are both in need of additional primary care physicians. This map primarily shows that physicians are unevenly distributed across New Castle County. The areas in light red are above the 3000:1 ratio indicating a physician shortage although not as severe as those that are in red.

Every area, which is potentially short of primary care physicians, is adjacent to one that has an abundance of primary care physicians. While the distances are short and certainly within the federal 20-mile criteria there may still be reason for concern as transportation, personal finances and convenience of physician office hours may be a barrier to access in some areas and populations.

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

Kent County has a very different profile. Most of the primary care physicians appear to be focused around Dover and Smyrna. None of the physicians surveyed reported working in two of the census county divisions (Kenton and Central Kent); those were the only CCDs in the state without any primary care physicians reporting. With the exception of Dover (the blue area in the middle of Kent County with a population of 66,500), none of the other census county divisions reach a population of 20,000. Central Kent (the white area just south of Dover) contains almost 18,300 persons but is so close to Dover, physicians are more likely to locate in the city. The southern areas of north Milford and Harrington are clearly lacking in primary care physicians but are small (8,700 and 10,400 respectively) and are adjacent to areas with more physicians.

Primary care physicians are sufficient and are reasonably well distributed throughout Sussex County. The Seaford, Milford, Georgetown, and Lewes CCDs are all well supplied with

primary care physicians. It should be noted that the Milton, Selbyville, and Millsboro CCDs have adequate resources although their summertime populations could well place strain on that supply.

Figures 4.2 through 4.4 show the distribution by primary care specialty. There are no specific standards related to these specialties like there are for primary care physicians in general. Therefore the coloring of the map does not have quite the same meaning and the scale used varies between maps and differs from Figure 4.1, above.

Family practice physicians, who are about one third of all primary care physicians, are distributed similarly to primary care physicians in general (Figure 4.2). Thus, one would expect a general movement from a blue/green map to a yellow/light red map. There are a few interesting exceptions. Lewes, Wilmington, Lower Christina, and Georgetown CCDs stayed the same color (blue or green) indicating that family practice physicians are more prevalent than the one third that might have been expected. Overall however, the distribution was as expected.

OBGYNs are spatially much more concentrated than all other primary care physicians according to this survey. Only 13 of the 27 CCDs had OBGYN practice sites. These practice sites were likely to be associated with a CCD that had a hospital. There were a few exceptions in New Castle County, but the ratios were low. Undoubtedly, both the type of practice and the need to have immediate access to a hospital influences this spatial relationship. It also suggests that women requiring the services of an OBGYN can expect to travel. The unevenness of the spatial distribution will also impact the accessibility of OBGYNs as primary care physicians of which they are 12.6%.

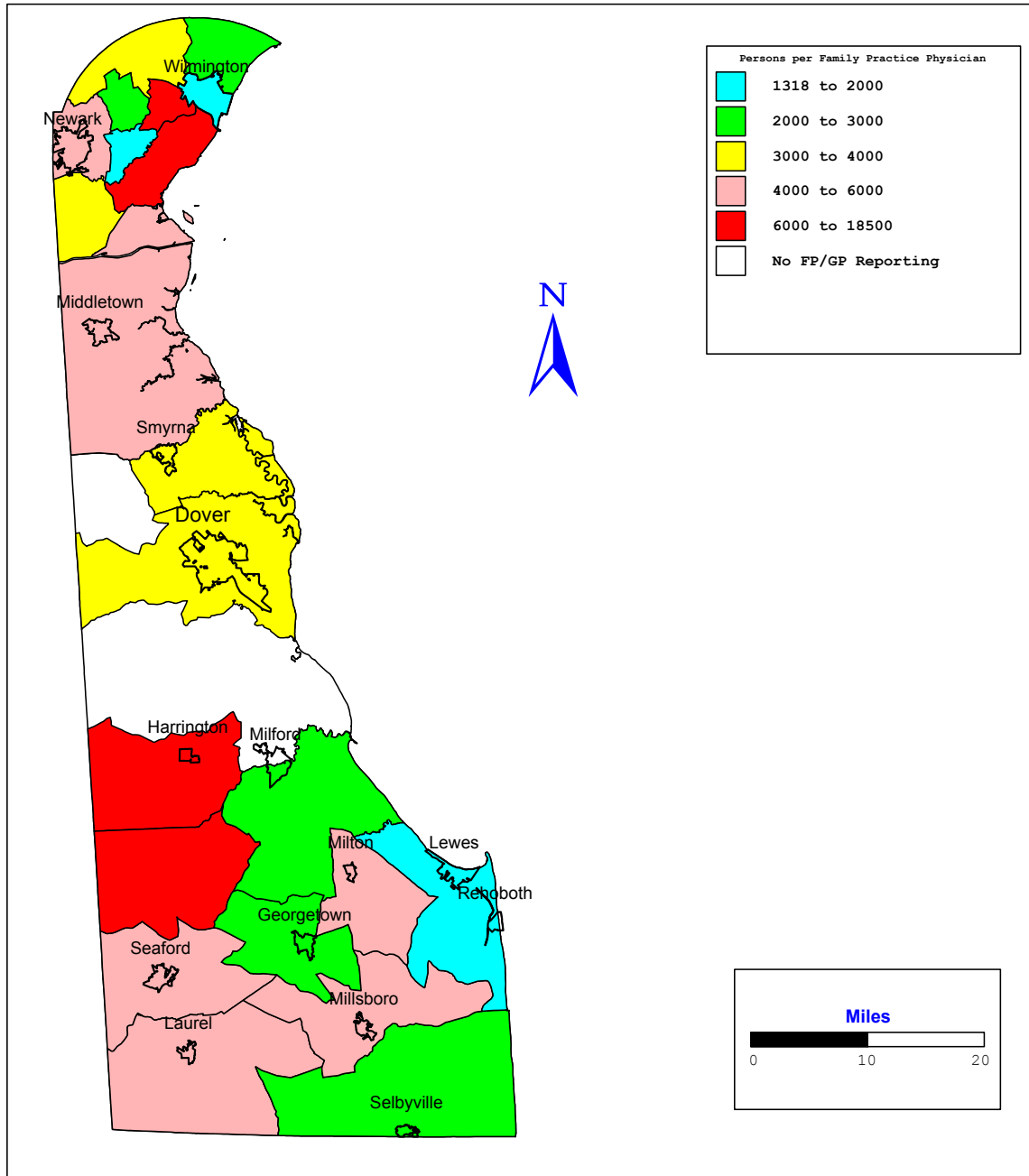
In Figure 4.4, the ratio of pediatricians to the youth population is displayed. Pediatricians are almost 20% of the primary care physicians. They are spatially distributed more broadly than OBGYNs (15 CCDs compared to 13) but less so than primary care physicians in general. There is an orientation toward hospitals but not anywhere near the degree of OBGYNs. In fact, there are fewer than one might expect in the Lewes CCD. This probably reflects the older population living in the area. Probably the most underserved areas with respect to this specialty are southern Kent (34,000 people) and southern Sussex counties (65,000 people).

Finally, the population per internist is found in Figure 4.5, below. The distribution is similar to that for family practice specialists. The notable exception is in western Sussex County where internists are more prevalent than family practice physicians.

These differing spatial distributions coupled with the differences by county shown in Figure 3.2 earlier add to the complexity of the recruiting process intended to increase primary care physicians in Delaware.

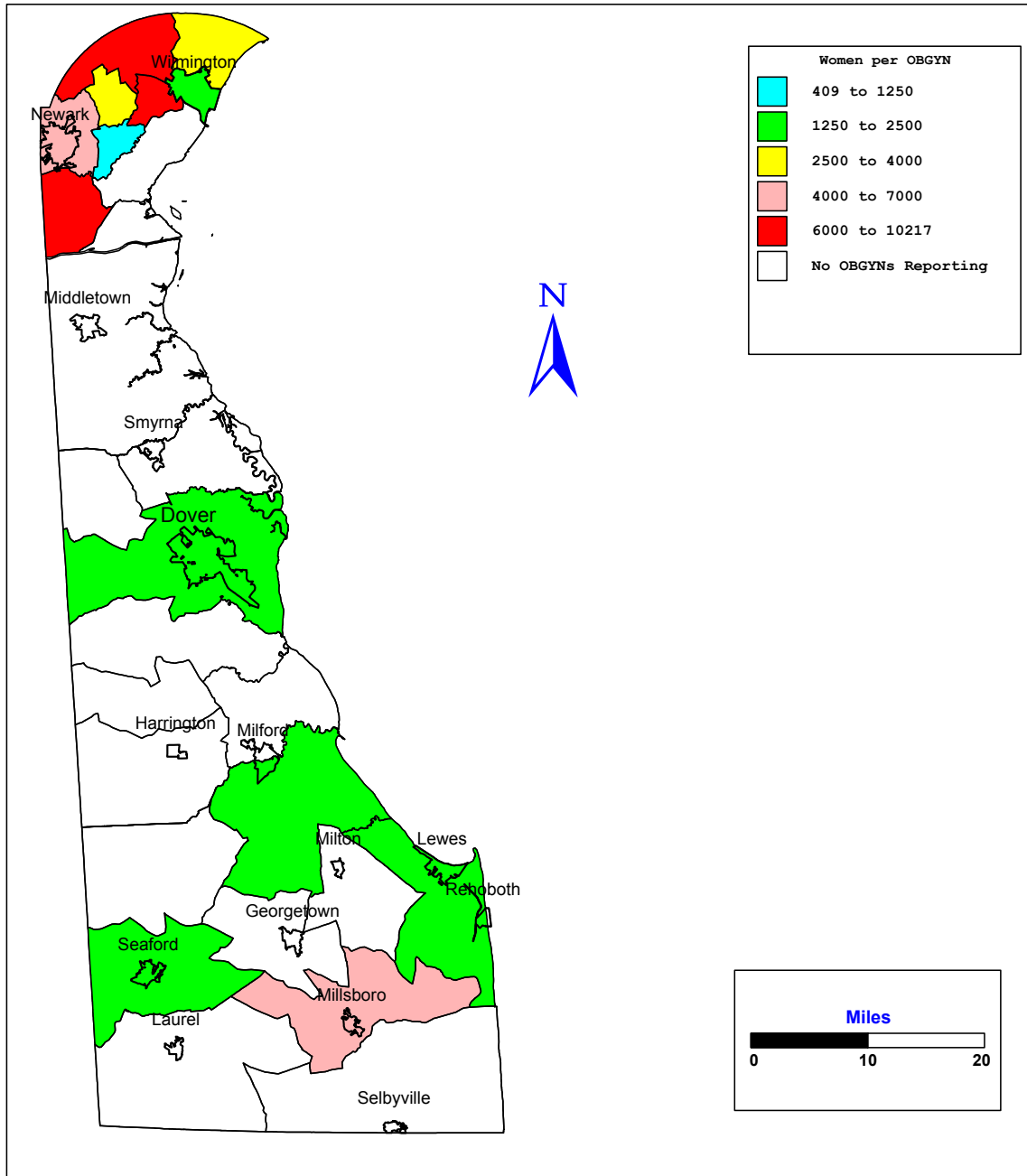


**Figure 4.2**  
**Number of Persons per Family Practice Physician**  
**by Census County Division**



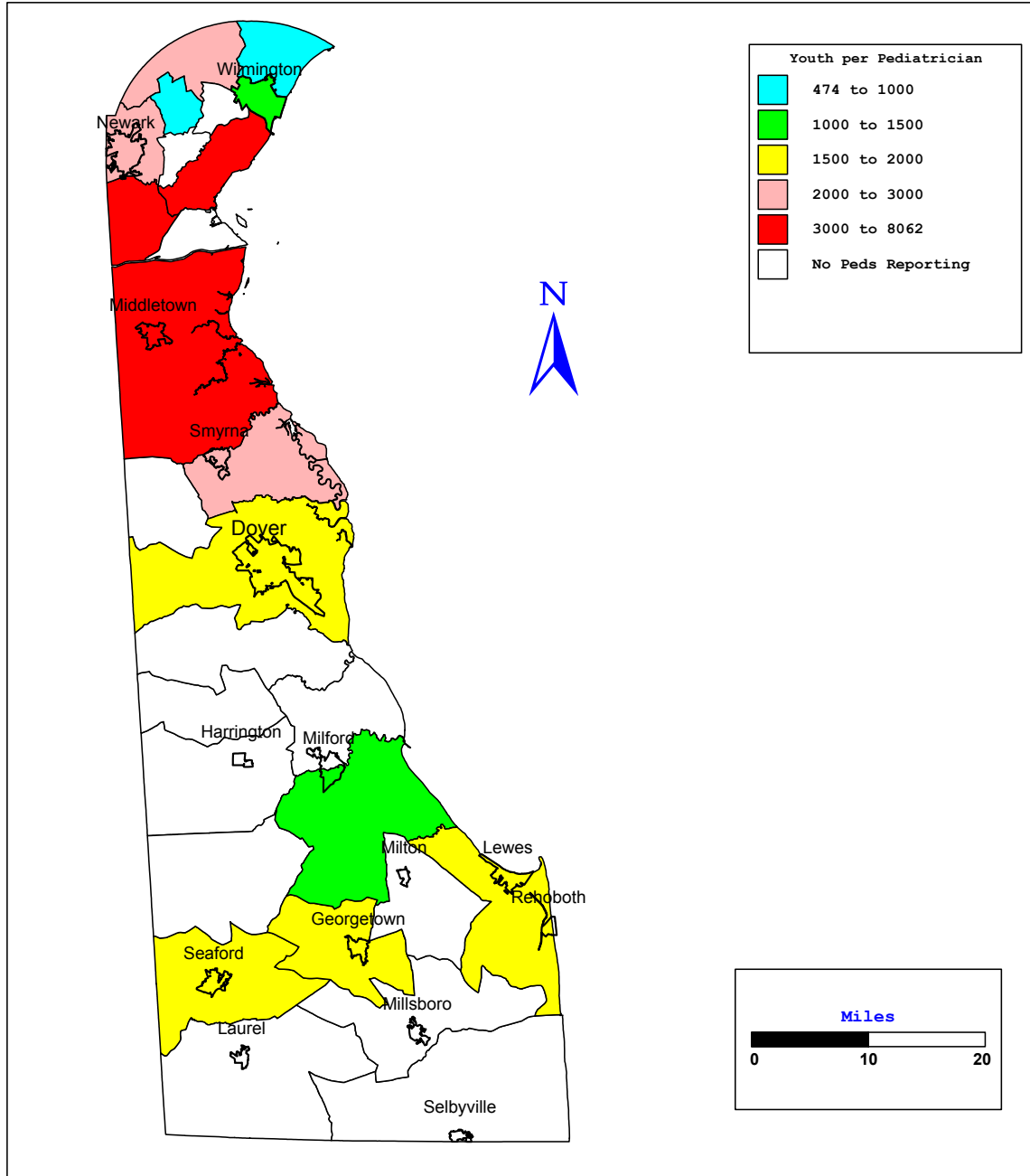
Source: Center for Applied Demography & Survey Research,  
University of Delaware

**Figure 4.3**  
**Number of Women (15-64) per OBGYN**  
**by Census County Division**



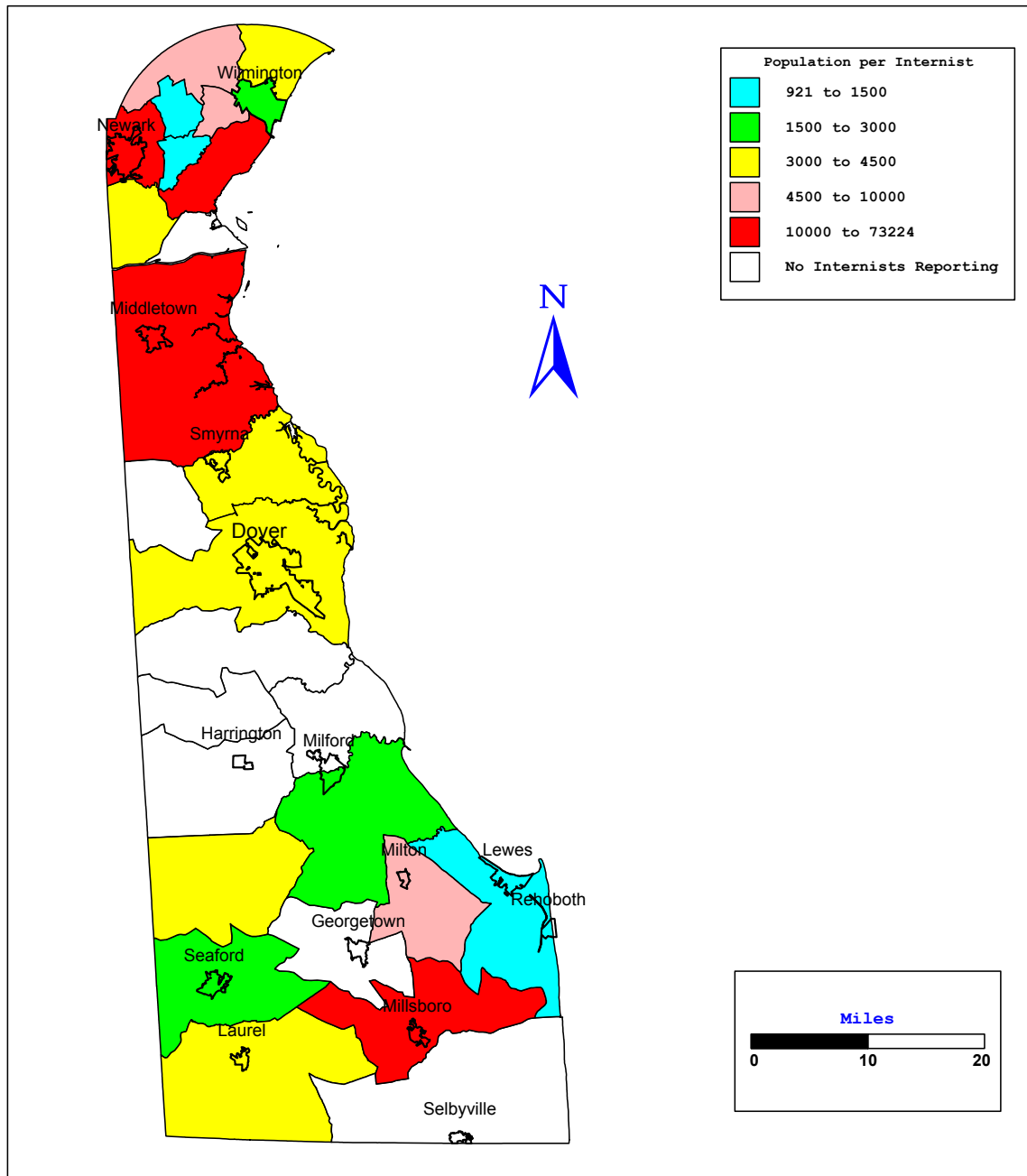
Source: Center for Applied Demography & Survey Research,  
University of Delaware

**Figure 4.4**  
**Number of Youth (0-19) per Pediatrician**  
**by Census County Division**



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

**Figure 4.5**  
**Number of Persons per Internist**  
**by Census County Division**



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

## Observations

The Delaware Physicians Survey in its third year is beginning to provide the information that is needed to guide policy-makers in the State of Delaware. With approximately 90% of the primary care physicians participating along with nearly 70% of the specialists, the database is becoming more complete all the time. 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 physician's burden without adding to needed knowledge. Even without complete reporting a number of findings can be drawn from the data.

- There are probably sufficient primary care physicians in Delaware (1231:1) although their location and specialty is probably not optimal.
- While there are currently sufficient numbers today, those numbers are at the upper range of what is desirable (1250:1) and Kent County (1678:1) is well above that target now.
- There may be a need to encourage more Hispanic physicians and Spanish-speaking physicians and staff, as that population grows more numerous in the state particularly in Sussex County.
- There are distinct patterns in both the state in which the physician graduated from high school and medical school and the state in which they currently practice. Additional information is needed on the state where they did their residency.
- About 84% of primary care physicians are accepting new patients but the proportion accepting new Medicare and Medicaid patients (67%) is significantly lower. This also varies by practice specialty.
- More than half of primary care physician's time is devoted to serving Medicare and Medicaid patients while they represent less than 20% of the population.
- Wait times for appointments vary significantly between established and new patients and also by county. There are also significant differences between the specialties.
- Only about 45% of primary care physicians employ non-physician services from advanced practice nurses, physician assistants, and others.
- About 23% of Delaware's primary care physicians do not belong to any managed care network. The rate is highest in Kent County (29%).
- Primary care physicians are fairly well distributed in sub-areas of the county. The only exception to this finding is for OBGYNs.

## **APPENDIX**