

HS&S Strategy OUTLOOK

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Geographic Variation in Physician Supply: What We Found, What It Means

Whether the United States has too many physicians or too few has been debated for many years. The prevailing opinion in the 1980s and 1990s was that there was a looming surplus of specialists and a serious shortage of primary care physicians. Now, many experts agree that the nation is facing a shortage of both specialists and primary care physicians, a shortage that will worsen as the population grows and ages.

Shortage or surplus, there is no debating the fact that there is a significant geographic variation in per capita

physician supply nationwide. Many studies have documented the variability in physician supply from region to region and from state to state. The severe shortage of physicians in rural areas and inner cities is another facet of this issue. An analysis of physician-to-population ratios for counties in Florida and North Carolina reveals the expected degree of variability. At the same time, there is a surprising degree of consistency in the mix of physicians by specialty cluster across dissimilar markets with wide variances in per capita physician supply in both states.

Florida and North Carolina: Similarities and Contrasts

There are 67 counties in Florida—35 counties in 21 metropolitan areas and 32 counties in non-metropolitan areas. Statewide, there were 248 physicians active in patient care per 100,000 population in 2005. Figure 1, which divides the 67 counties into quartiles according to the size of the resident population, demonstrates how much the per capita physician supply varies from county to county, even among counties of similar size.

There are 100 counties in North Carolina—34 counties in 11 metropolitan areas and 66 counties in non-metropolitan areas. Figure 2, which divides the 100 counties into quartiles according to population size, indicates much more variability in physician supply within and across the quartiles than is seen in Florida, even though the statewide supply ratios are quite similar.

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Figure 1

Variation in Per Capita Physician Supply in Florida Counties, 2005
67 Counties Grouped into Quartiles According to Population Size

	Mean Population	Physicians per 100,000		
		Minimum	Mean	Maximum
1st Quartile	797,000	141	260	316
2nd Quartile	185,000	107	249	729
3rd Quartile	49,000	82	102	263
4th Quartile	15,000	0	58	107
Florida	266,000	0	248	729

Figure 2

Variation in Per Capita Physician Supply in North Carolina Counties, 2005
100 Counties Grouped into Quartiles According to Population Size

	Mean Population	Physicians per 100,000		
		Minimum	Mean	Maximum
1st Quartile	225,000	60	294	1,254
2nd Quartile	70,000	37	147	353
3rd Quartile	37,000	22	114	252
4th Quartile	15,000	0	81	204
North Carolina	86,800	0	236	1,254

Figure 3 compares the mix of physicians by specialty cluster across the four groups of Florida counties identified in Figure 1. The specialty mix is virtually identical in quartiles 1 and 2, despite the significant difference in population size. Even in quartile 3, where the mean number of physicians per capita is less than half the statewide mean, the percentages of surgical, hospital-based and other specialists are only slightly below the statewide averages.

Figure 3

Variation in Percentage of Physicians by Specialty Cluster in Florida Counties, 2005
67 Counties Grouped into Quartiles According to Population Size

	Mean Population	Primary Care ⁽¹⁾	Medical Specialties	Surgical Specialties	Hosp-Based Specialties	Other Specialties
1st Quartile	797,000	35%	16%	21%	17%	11%
2nd Quartile	185,000	35%	15%	22%	18%	10%
3rd Quartile	49,000	44%	11%	19%	16%	10%
4th Quartile	15,000	68%	5%	9%	6%	11%
Florida	266,000	35%	16%	21%	17%	11%

⁽¹⁾ Includes family/general practice, internal medicine, and general pediatrics

Figure 4 examines the specialty mix across the four groups of North Carolina counties identified in Figure 2. In contrast to Florida, there is a steady increase in the percentage of primary care physicians as the average population gets smaller and the per capita physician supply declines. Nevertheless, even in quartile 3, where there are only 114 physicians per 100,000 population, the percentages of surgical specialists and hospital-based physicians are almost identical to the statewide averages.

Figure 4

Variation in Percentage of Physicians by Specialty Cluster in North Carolina Counties, 2005
100 Counties Grouped into Quartiles According to Population Size

	Mean Population	Primary Care ⁽¹⁾	Medical Specialties	Surgical Specialties	Hosp-Based Specialties	Other Specialties
1st Quartile	225,000	34%	15%	22%	17%	11%
2nd Quartile	70,000	41%	11%	25%	17%	6%
3rd Quartile	37,000	48%	9%	22%	16%	6%
4th Quartile	15,000	60%	5%	17%	11%	7%
North Carolina	86,800	36%	14%	23%	17%	10%

⁽¹⁾ Includes family/general practice, internal medicine, and general pediatrics

Implications for Medical Staff Planning

The above findings, supplemented by analyses of physician need for hospitals and health systems in many different markets, have important implications for medical staff planning.

No single set of physician-to-population ratios can be used to determine physician need by specialty, by specialty cluster, or overall in all markets. Nor are there ratios that work for all metropolitan areas, all non-metropolitan areas, or all areas of a given population size or density.

In the absence of normative ratios, it is best to use a benchmark approach to establish a reasonable range for the overall physician-to-population need ratio in any given market. A reasonable range can usually be determined by examining current physician-to-population ratios in comparable markets—usually counties or

metropolitan areas in the same state or census region that are similar in population size, demographics, and medical sophistication.

Once a reasonable range has been established, selecting the appropriate physician-to-population ratio for a county, a metropolitan area, or the service area of a hospital or health system requires consideration of local market conditions, including

- The age mix and health status of the population
- The number, size, and sophistication of the hospitals and large medical groups in the region
- The tendency of patients to migrate into or out of the region for specialty physician services and tertiary hospital services
- The tendency of non-emergent and non-

urgent patients to use hospital emergency rooms as a substitute for physician office care

In situations where the overall physician-to-population ratio is greater than or equal to 150 per 100,000 population, it is reasonable to assume that physicians will be distributed by specialty cluster in the following manner:

- 35 percent primary care
- 16 percent medical specialties
- 22 percent surgical specialties
- 17 percent hospital-based specialties
- 10 percent other specialties

In situations where the overall physician ratio is below 150 physicians per 100,000 population, primary care physicians will often account for more

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Client Spotlight:



The Project

In 2005, Health Strategies & Solutions assisted AtlantiCare Regional Medical Center in the decision-making process for establishing a new tertiary partnership for oncology services. AtlantiCare Regional Medical Center is part of the AtlantiCare Health System, an award-winning integrated system located in southeastern New Jersey.

HS&S profiled seven well-respected academic cancer programs within a 150-mile radius of AtlantiCare to assess each organization's distinctive competencies and potential contribution to the AtlantiCare Cancer Care Institute.

Profiles were based on extensive market research and in-depth interviews with representatives from each potential partner. Each organization was evaluated on its ability to:

- Provide additional clinical depth in oncology services
- Offer cutting-edge cancer research in the community setting
- Enhance the AtlantiCare Cancer Care Institute image
- Offer cancer program infrastructure and program development support

Four organizations showed reasonable potential to meet AtlantiCare needs, but Fox Chase Cancer Center in Philadelphia was the clear front-runner. Consideration was given to undertaking a formal request for proposal process with the finalists, but the robust assessment performed by HS&S provided AtlantiCare leadership with sufficient confidence to proceed directly to discussions with the front-runner.

The Outcome

In November 2006, AtlantiCare Regional Medical Center was named as a member of the Fox Chase Cancer Center Network. Fox Chase Cancer Center is a National Cancer Institute-designated comprehensive cancer center and is one of the few facilities in the country devoted entirely to cancer care. Fox Chase researchers and physicians work together to turn new research discoveries into the latest, most effective cancer treatments for their patients. AtlantiCare joins 28 other community hospitals in Pennsylvania, New Jersey, and Delaware that work cooperatively to promote timely translation of research findings so that patients across the region have access to the latest advances in cancer care and treatment and top-notch cancer care. The partnership gives AtlantiCare access to state-of-the-art technology, clinical trials, and leading cancer specialists.

Health Strategies & Solutions' involvement helped AtlantiCare leaders be well prepared to initiate talks with Fox Chase Cancer Center, and able to make a well-informed decision regarding the partnership agreement. This partnership is an important cornerstone of AtlantiCare's robust and growing program offering world-class cancer care to the southeastern New Jersey community.

AtlantiCare is more than pleased with their newly established relationship with Fox Chase. "When it comes to treating cancer, it takes a team of hundreds of people—backed by thousands of researchers," said David P. Tilton, president and CEO of AtlantiCare Health System. "The most important partner on our team is the patient. We're proud to welcome Fox Chase to our team in our quest to cure—and some day—prevent cancer."

Implications continued from previous page

than 50 percent of the overall physician supply (70 percent or higher is not uncommon in rural areas). The percentage of physicians in the medical specialty cluster tends to decline the most as the primary care percentage increases, especially if the overall physician ratio is below 100 per 100,000.

If the overall physician-to-population ratio is greater than or equal to 150 per 100,000 population, it is reasonable to use current national patterns as the starting point for allocating physicians to individual specialties within the medical, surgical, and hospital-based clusters, since these patterns seem to be repeated in most markets where the full range of specialties is found.

If the overall physician-to-population ratio is less than 150 per 100,000, it is likely that the population base will be too small to support many medical and surgical specialties, so a higher percentage of physicians should be allocated to the more prevalent specialties within these clusters

Case Study – Hickory, North Carolina

The Hickory-Morganton-Lenoir MSA (Hickory) is one of 11 metropolitan areas in North Carolina. The metropolitan area includes four counties: Alexander, Burke, Caldwell and Catawba. The resident population of the four counties totaled 355,700 persons in 2005, making Hickory the fourth most populous metropolitan area in North Carolina.

In 2005, there were 624 MDs, DOs, and residents active in patient care in the four counties, equivalent to a physician-to-population ratio of 175 per 100,000 population. This ratio was well below the average for all 11 metropolitan areas in the state (281 physicians per 100,000), as well as the statewide average of 236 per 100,000. The disparity in physician supply was greatest in the medical specialty cluster. There were only 22 medical specialists per 100,000 population in Hickory compared to 42 per 100,000 across the 11 metropolitan areas.

The apparent undersupply of physicians in the area was reinforced by a medical staff survey at one of the area hospitals, a series of interviews with practicing physicians and hospital management staff, and service line-specific inpatient market share data. Interviewees identified several medical

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Blue Mountain Health System

Lehighton, Pennsylvania

Crozer-Keystone Health System

Springfield, Pennsylvania

Fox Chase Cancer Center

Philadelphia, Pennsylvania

Hunterdon Healthcare System

Flemington, New Jersey

Thomas Jefferson University

Philadelphia, Pennsylvania

Lower Bucks Hospital

Bristol, Pennsylvania

Mercy Suburban Hospital

East Norriton, Pennsylvania

St. Peter's Hospital

Albany, New York

Wake Forest University Baptist Medical Center

Winston-Salem, North Carolina

St. Jude Children's Research Hospital

Memphis, Tennessee

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specialties as the areas of greatest need, corroborating the benchmarking results.

An analysis of the Hickory market indicated that an overall need of 200 physicians per 100,000 population (14 percent higher than the current ratio) was appropriate for the area. By way of comparison, the physician supply in the Charlotte MSA (with four times the resident population) was 218 per 100,000 in 2005.

The recommended distribution by specialty cluster was the distribution shown above for markets with more than 150 physicians per 100,000. The analysis identified a need for a 35 percent increase in the supply of medical specialists, the

cluster where physician shortages were known be most acute. At the same time, the analysis indicated much smaller deficits in the surgical and hospital-based specialty clusters (5 percent and 6 percent, respectively), where need and supply were most in balance.

With ongoing changes in physician supply and demand and the potential for physician shortages, at least regionally if not nationally, health care organizations must be willing to dedicate substantial effort toward monitoring the composition of their medical staffs. As our analyses illustrate, medical staff planning is more than an exercise in plugging numbers into a static formula. Careful analysis of local

and regional market conditions ensures that health care organizations have the number and mix of physicians they need to care for their patients.

A recognized expert in quantitative analysis and demand forecasting, Hugo Finarelli has more than 30 years of systems analysis and hospital planning experience.

He directs the firm's data activities, specializing in the development of customized computer models and population-based demand forecasts to support strategic, program, and facilities planning. He can be reached at hfinarelli@hss-inc.com or 215-636-3500, ext. 104.



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