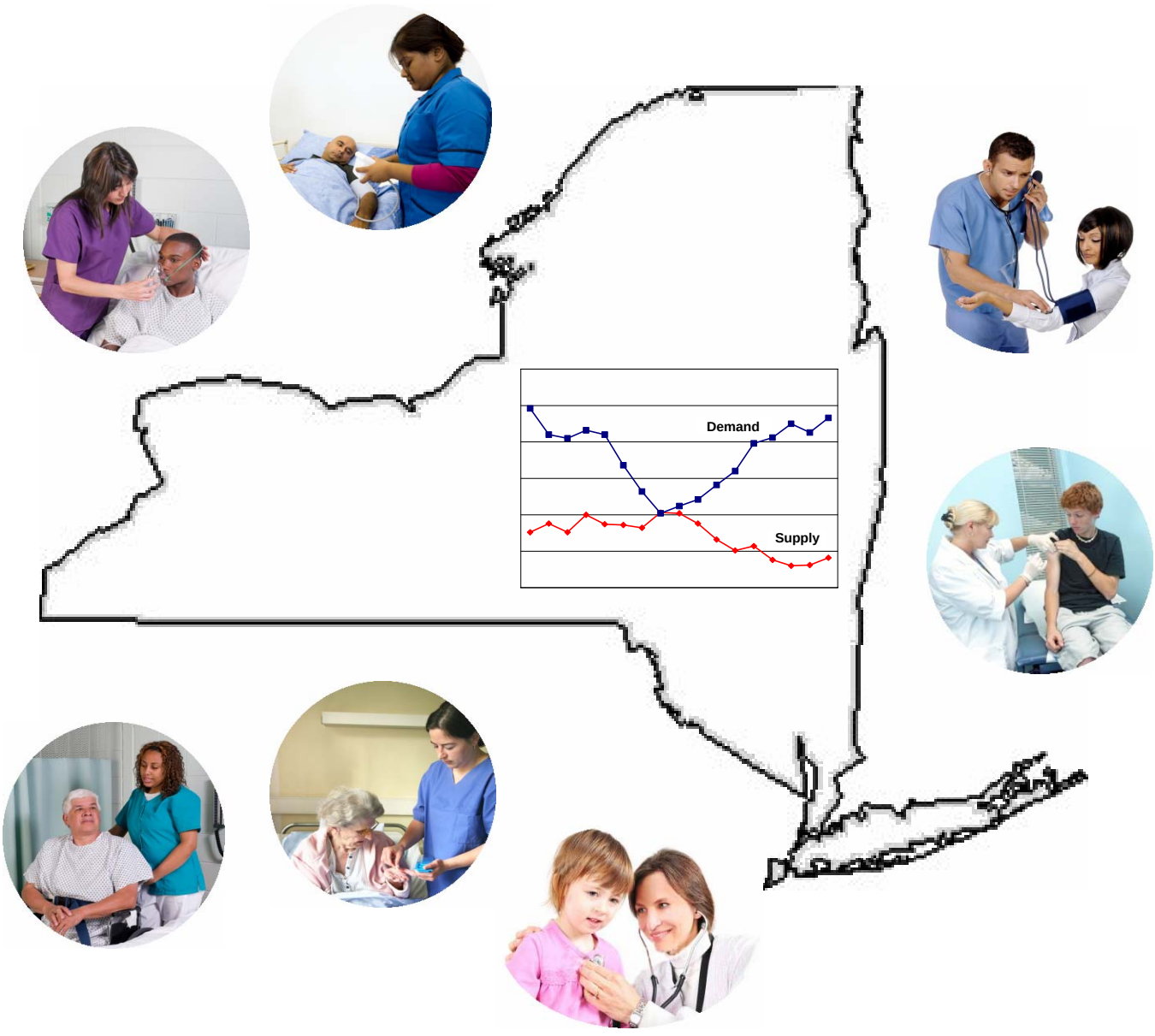
TOWARD A METHODOLOGY FOR SUBSTATE PROJECTIONS OF REGISTERED NURSE SUPPLY AND DEMAND IN NEW YORK:

Data, Methods, and Preliminary Findings for Counties and County Groups, 2005-2020



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PREFACE

To examine the nature and scope of registered nurse (RN) shortages in New York, this report describes a pilot study of an innovative and practical approach to projecting RN supply and demand at a sub-state level, i.e., counties or groups of small counties. The analyses use two-year averages from the 2005 and 2006 American Community Survey, as well as county-level sociodemographic, economic, and health care data from other sources. The model will be updated with more accurate data that will become available in the near future in order to produce more refined and reliable estimates.

This study was supported with funding from the 1199 Hospital League Health Care Industry Planning and Placement Fund, the Greater New York Hospital Association, the Healthcare Association of New York, the New York State Nurses Association, the New York Association of Nurse Executives and the Health and Hospitals Corporation. This report is designed to help these and other stakeholders better understand trends in the supply and demand for RNs in local labor market areas.

The Center for Health Workforce Studies at the School of Public Health, University at Albany, conducted the research and produced this report. The Center is a not-for-profit research organization dedicated to health workforce data collection and analysis. Sandra McGinnis conducted the analysis and prepared this report of findings.

EXECUTIVE SUMMARY

Background

New York has substantially fewer registered nurses (RNs) per capita than the national average, and compares even more unfavorably to states such as neighboring Massachusetts. Although New York nursing graduations have risen in recent years, evidence is accumulating that New York may face growing shortages of RNs over the next couple of decades. There are many drivers of this expected shortage, including growing demand for services as a result of population aging and public health issues, such as obesity and diabetes; increasing retirements from nursing as a result of an aging RN workforce; and challenges faced by colleges and universities in expanding their RN education program capacity.

While a number of sources support the case for statewide RN shortages in New York through 2020, it is clear from studies of physicians and other health workers that the health workforce is not evenly distributed throughout the state. Local social, demographic, and economic conditions drive both the supply of and demand for health workers. Policy efforts to address RN shortages may need to consider unique local conditions that can exacerbate shortages. A better understanding of the dynamics that drive substate labor markets for RNs is critical in order to allow stakeholders to work out an optimal allocation of scarce resources to address the problem.

Approach

To examine the nature and scope of RN shortages in New York, the Center for Health Workforce Studies, with support from the 1199 Hospital League Health Care Industry Planning and Placement Fund, the Greater New York Hospital Association, the Healthcare Association of New York, the New York State Nurses Association, the New York Association of Nurse Executives and the Health and Hospitals Corporation, developed a practical approach to projecting RN supply and demand at a sub-state level, i.e., counties or groups of small counties. The experimental model presented in this paper is based in large part upon the methodology used in the RN National Supply Model (NSM) and National Demand Model (NDM) published by the Health Resources and Services Administration (HRSA) to make supply and demand projections at the state level.

Methods

Supply was modeled according to the components used in the HRSA NSM, and is based on the simple demographic premise that a population changes through entries into the population and exits out of the population. RNs enter a workforce through graduation from an RN education program or in-migration from another geographical area. RNs exit a workforce through attrition due to career changes, retirement, or death, or out-migration to another geographical area. All of these mechanisms by which RNs enter or leave a workforce are related to age and educational level.

The ideal geographic unit for substate analysis is the county, because social, economic, demographic, and health data are available at the county level. While RN data are currently not

available by county, county groups can be created from the Public Use Microdata Areas (PUMAs) used by the U.S. Census Bureau.

Thirty-nine county groups were created in New York. Eighteen of these are multi-county PUMAs – usually two counties, but one PUMA in the North Country consists of four counties, and two other PUMAs consist of three counties. The remainder is either single-county PUMAs or aggregations of multiple PUMAs to correspond with counties (for example, New York County, which is Manhattan, consists of ten PUMAs, while Suffolk County on Long Island consists of twelve PUMAs).

Two components were used to predicted demand for RNs: predicted health care utilization and predicted RN staffing intensity. Each of these can be projected forward from baseline values using various assumptions about how the population and health care environment will change. The primary source of baseline data on utilization is the Area Resource File (ARF), a compendium of county-level socio-demographic and health system data compiled by HRSA. The primary source of baseline RN staffing intensity data is the industry of employment data from the ACS, aggregated from individual RNs to the county group level.

One of the largest barriers to making accurate and useful sub-state projections is a lack of appropriate data. This work draws from the U.S. Census Bureau's American Community Survey (ACS), averaged over 2005 and 2006, and the Area Resource File (ARF) produced by HRSA, as the primary data sources. Ideally, three years of ACS data could be used to produce estimates about the RN workforce at the level of county groups, but three years of data are not yet available.

This work is a preliminary attempt to quantify differences in the RN distribution at the sub-state level, and should be supplemented and validated with improved data as they become available.

Results

The analysis begins with an examination of the RN supply in New York overall, followed by regional analyses. The regional analyses are useful because they give a picture of how various broad areas of the state are faring, and knowledge of these broad areas may be more effective for targeting policy initiatives than individual counties. Also, given the preliminary nature of these data, the regional analyses may be more reliable than the analyses at the county group level.

County level analyses, however, are important because they show that even within regions, RNs are not equally distributed. In some regions, the primary urban area is well-supplied with RNs, while the outlying rural counties face shortages (even relative to the use of services in those counties).

In this summary, projected shortages are defined relative to the national ratios of RNs to units of service (e.g., inpatient days, home health visits, nursing home residents, etc.). As of 2005, New York already fell below the national benchmark for RN supply. It should be noted that the national benchmark was selected as a convenient and easily understandable benchmark, and not

necessarily because the national RN supply as of 2005 was considered adequate for optimal health care.

New York

- New York was estimated to have approximately 165,124 RNs employed within its boundaries in 2005. About 64% of them were in hospitals, with 82% of hospital RNs in inpatient care, 11% in emergency departments, and 6% in outpatient departments. Another 11% of New York RNs were estimated to be working in non-hospital and non-public ambulatory settings, and 10% in nursing facilities. An estimated 3% worked in nursing education, 3% in public health settings, 3% in school health, and 3% in other settings.

Table 1. Selected Characteristics of New York RNs

Employed RNs	165,124
Median Age	46
% 55+	16.9%
% Diploma/ADN	39.4%
% BSN	43.0%
% MSN	17.6%
% in Hospitals	64%

- In 2005-2006, an average of 1,616 RNs moved into geographic areas that supply New York with RNs, while an average of 1,923 RNs moved out of these areas (not including those who moved between supply areas), resulting in a net loss of approximately 307 RNs from the state's workforce.

- The supply of RNs in New York is projected to increase by approximately 0.41% per year between 2005 and 2020 – much slower than the 1% annual growth rate observed between 2000 and 2005. Growth in the supply of RNs is expected to peak in 2013-2014, and then begin to slowly decline. The overall growth projected between 2005 and 2015 is 6.35%.

- As shown below, New Yorkers use an average of approximately 0.946 inpatient days, 0.40 ED visits, 2.2 outpatient visits, and 3.23 non-hospital ambulatory visits per year. There are also an estimated 5.9 nursing facility residents for every 1,000 New York residents. This is higher than the rates of utilization in the U.S. overall.

Table 2. Demand for Services per 1,000 Population and RNs per Unit of Service, New York

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service
	New York	U.S.	
Hospital Inpatient Days	946 inpatient days	667 inpatient days	4.78
Hospital Emergency Department Visits	397 ED visits	383 ED visits	1.55
Hospital Outpatient Days	2,215 outpatient visits	1,702 outpatient visits	0.15
Nursing Facility Residents	5.9 residents	5.9 residents	0.14
Home Health Visits	320 visits	352 visits	1.07
Non-Hospital Ambulatory Care	3,233 visits	3,170 visits	0.28

- Demand for RNs in New York may change as a consequence of changing demand for services (from a growing and aging population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both.
  - The population of New York will continue to grow, albeit slowly, between 2005 and 2020. Furthermore, the percentage of the population that is age 65 and older will increase from less than 13% to about 16%.

- As shown in Table 3, RN supply in New York will need to increase by 8% in order to maintain current ratios, and even this will leave New York well below national ratios. Given that the RN supply in the state is only projected to increase 6%, a serious statewide RN shortage is likely in the future.

Table 3. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, New York

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
178,227	7.9%	178,506	8.1%	204,087	23.6%	270,450	63.8%	190,767	15.5%

- By the year 2020, New York will require 204,087 RNs in order to achieve consistency with national benchmarks. Estimated supply in 2020 is 195,678. New York will have a predicted RN shortage of 4% in 2020.

Capital District Region

- Nearly 11,000 RNs are employed in the Capital District of New York, which is composed of Albany, Columbia/Greene, Rensselaer, Saratoga, Schenectady, and Warren/Washington counties. RNs in this region are older on average than RNs statewide, and more likely to have a diploma or ADN and less likely to have a BSN as their highest degree.

Table 4. Selected Characteristics of Capital District RNs

	Capital District	New York
Employed RNs	10,855	165,124
Median Age	48	46
% 55+	20.3%	16.9%
% Diploma/ADN	57.8%	39.4%
% BSN	26.9%	43.0%
% MSN	15.8%	17.6%
% in Hospitals	60.0%	64.1%

- Between 2005 and 2006, the RN supply in the Capital District was estimated to grow by nearly 600 RNs, or about 5.5%.

Table 5. Projected Components of RN Supply Change, Capital District, 2005-2006

Capital District	2005-2006
Base	10,855
In-migration	513
Out-migration	191
Net migration	322
Graduates	445
Foreign	13
Attrition	187
	+593 (5.5%)

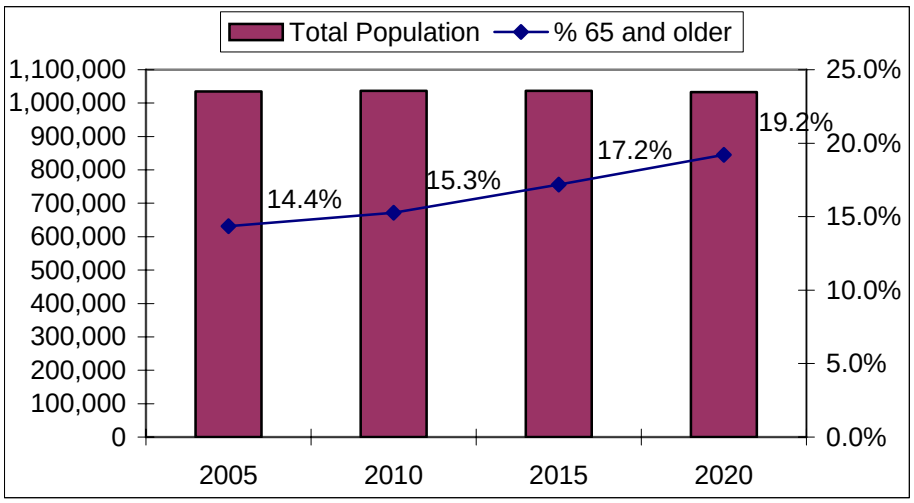
- The Capital District is very similar to the state overall in the utilization of services by residents, although nursing facility residents per capita are somewhat higher than the state average. The Capital District has more RNs per unit of service employed in hospital settings, particular in inpatient and emergency department settings.

Table 6. Demand for Services per 1,000 Population and RNs per Unit of Service, Capital District

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	Capital District	New York	Capital District	New York
Hospital Inpatient Days	923 inpatient days	946 inpatient days	5.20	4.78
Hospital Emergency Department Visits	400 ED visits	397 ED visits	2.48	1.55
Hospital Outpatient Days	2,536 outpatient visits	2,215 outpatient visits	0.14	0.15
Nursing Facility Residents	6.6 residents	5.9 residents	0.10	0.14
Home Health Visits	348 visits	320 visits	1.20	1.07
Non-Hospital Ambulatory Care	3,269 visits	3,233 visits	0.43	0.28
School Health	164 children	168 children	1.35	2.75
Public Health	1,000 people	1,000 people	0.59	0.51
Other	1,000 people	1,000 people	0.88	1.01

- The population of the Capital District is expected to remain relatively stable between the years 2005 and 2020. During this time, however, the proportion of the population that is age 65 or older will increase substantially as shown in Figure 2. By the year 2020, nearly one out of five Capital District residents is expected to be age 65 or older, making this one of the oldest regions of the state.

Figure 2. Projected Population of Capital District and Percent Age 65 and Older



- By the year 2020, the Capital District will require 9,964 RNs to achieve consistency with national ratios, and is projected to have an RN workforce of 11,896.

Table 7. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Capital District

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
11,450	5.4%	8,866	-18.3%	9,964	-8.2%	13,117	20.8%	12,297	13.3%

- There is not an even distribution of RNs between the various county groups that comprise the Capital District, however.
  - Albany, Columbia/Greene, and Warren/Washington counties are projected to have a supply of RNs that equals or exceeds the national average (Albany with a 47% surplus; Columbia/Greene with a 65% surplus, and Warren/Washington with a 4% surplus.)
  - Saratoga and Rensselaer counties may experience minor shortages (Saratoga 6%, and Rensselaer 9%).
  - Schenectady County is projected to face a severe shortage of RNs (26%) by 2020.

Central New York Region

- The Central New York region in this analysis is composed of Chenango/Cortland counties, Onondaga/Madison/Cayuga counties, and Oswego County. There are just over 8,000 RNs working in this region, and they are slightly older than the statewide average. They are also more likely to hold diplomas or associate degrees (ADNs) and less likely to hold BSNs as their highest degrees.

Table 8. Selected Characteristics of Central New York RNs

	Central New York	New York
Employed RNs	8,241	165,124
Median Age	47	46
% 55+	18.1%	16.9%
% Diploma/ADN	49.0%	39.4%
% BSN	34.6%	43.0%
% MSN	16.4%	17.6%
% in Hospitals	62.9%	64.1%

- Between 2005 and 2006, the RN supply in the Central New York region was estimated to grow by nearly 600 RNs, or about 5.5%.

Table 9. Projected Components of RN Supply Change, Central New York, 2005-2006

Central New York	2005-2006
Base	8,241
In-migration	271
Out-migration	23
Net migration	248
Graduates	359
Foreign	0
Attrition	163
	+444 (5.4%)

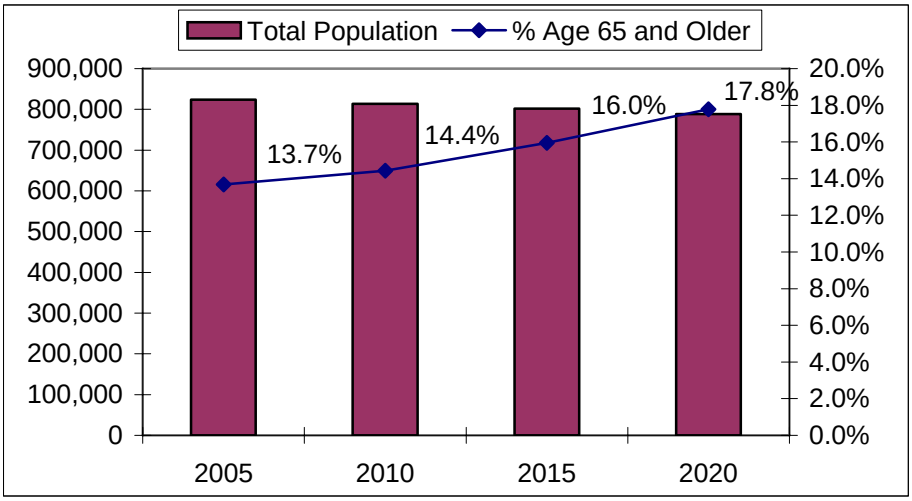
- Use of hospital service per capita is very similar in Central New York to the state overall, but there are slightly more nursing facility residents and also more school-age children per capita. Central New York has more RNs employed in hospital services, especially inpatient and emergency department, than the state overall, but there are fewer RNs employed in home health and school health.

Table 10. Demand for Services per 1,000 Population and RNs per Unit of Service, Central New York

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	Central New York	New York	Central New York	New York
Hospital Inpatient Days	922 inpatient days	946 inpatient days	5.43	4.78
Hospital Emergency Department Visits	382 ED visits	397 ED visits	2.36	1.55
Hospital Outpatient Days	2,283 outpatient visits	2,215 outpatient visits	0.13	0.15
Nursing Facility Residents	6.4 residents	5.9 residents	0.11	0.14
Home Health Visits	331 visits	320 visits	0.78	1.07
Non-Hospital Ambulatory Care	3,224 visits	3,233 visits	0.45	0.28
School Health	176 children	168 children	1.66	2.75
Public Health	1,000 people	1,000 people	0.32	0.51
Other	1,000 people	1,000 people	0.66	1.01

- The population of Central New York is projected to decline between 2005 and 2020, while the proportion of the population that is age 65 and older is expected to rise dramatically during the same period, as shown in Figure 3.

Figure 3. Projected Population of Central New York and Percent Age 65 and Older



- Because of this population decline, the use of many types of health care services is also projected to decline, although hospital inpatient days and nursing facility residents are projected to increase due to the continued aging of the population.

- Central New York will require 7,876 RNs by the year 2020 to meet national benchmarks, and is projected to have 10,460.

Table 11. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Central New York

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
8,342	1.2%	6,985	-15.2%	7,876	-4.4%	10,433	26.6%	8,946	8.6%

- The variations within Central New York, however, are quite stark.
  - Onondaga/Madison/Cayuga counties are not anticipated to experience a shortage by 2020, and in fact may experience a surplus of up to 51%.
  - Chenango/Cortland counties and Oswego County, on the other hand, are projected to experience serious shortages (25% and 36%, respectively).

Finger Lakes Region

- The Finger Lakes region of New York is comprised in this analysis of Genesee/Orleans counties, Livingston/Wyoming counties, Monroe/Wayne counties, and Ontario County. Almost 12,000 RNs are employed in this region, and they are slightly younger than RNs statewide. They are also slightly less likely to hold a bachelor's degree, and less likely to be employed in hospitals.

Table 12. Selected Characteristics of Finger Lakes RNs

	Finger Lakes	New York
Employed RNs	11,657	165,124
Median Age	46	46
% 55+	15.2%	16.9%
% Diploma/ADN	44.4%	39.4%
% BSN	37.3%	43.0%
% MSN	18.3%	17.6%
% in Hospitals	53.2%	64.1%

- Between 2005 and 2006, RN supply in the Finger Lakes region is estimated to have grown by 387 RNs, or 3.3%.

Table 13. Projected Components of RN Supply Change, Finger Lakes, 2005-2006

Finger Lakes Region	2005-2006
Base	11,657
In-migration	121
Out-migration	53
Net migration	68
Graduates	558
Foreign	0
Attrition	239
	+387 (3.3%)

- Although inpatient days and emergency department visits per capita were similar to statewide averages, outpatient visits per capita in the Finger Lakes were more than double those statewide. There were also many more nursing facility residents per capita, as well as more school-age children per 1,000 population.

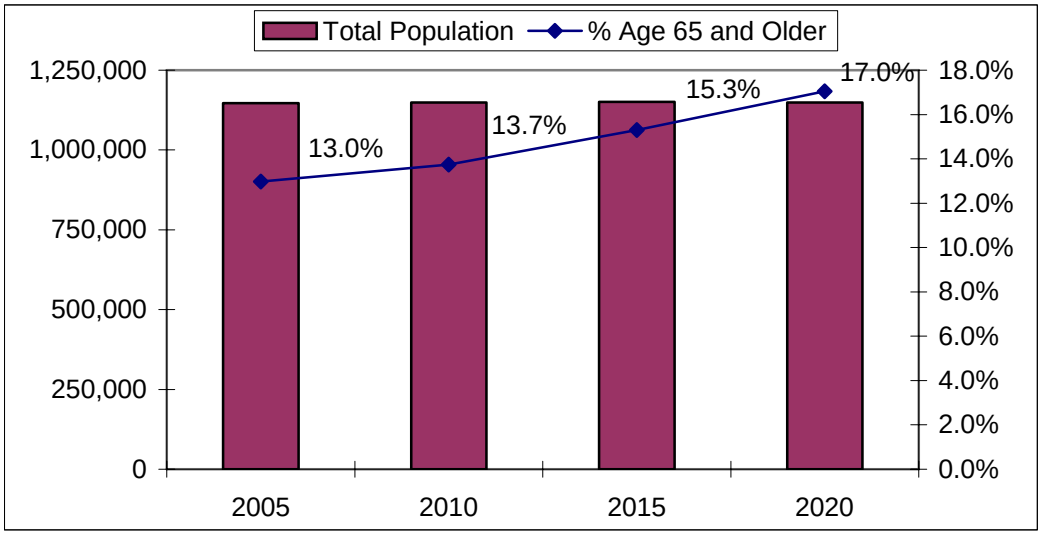
- Generally the ratios of RNs per unit of service were similar in the Finger Lakes to those statewide, with somewhat more RNs estimated to work in home health and non-hospital ambulatory care, and somewhat fewer in school health and public health.

Table 14. Demand for Services per 1,000 Population and RNs per Unit of Service, Finger Lakes

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	Finger Lakes	New York	Finger Lakes	New York
Hospital Inpatient Days	932 inpatient days	946 inpatient days	4.30	4.78
Hospital Emergency Department Visits	381 ED visits	397 ED visits	2.22	1.55
Hospital Outpatient Days	4,564 outpatient visits	2,215 outpatient visits	0.12	0.15
Nursing Facility Residents	6.8 residents	5.9 residents	0.18	0.14
Home Health Visits	333 visits	320 visits	1.88	1.07
Non-Hospital Ambulatory Care	3,257 visits	3,233 visits	0.52	0.28
School Health	177 children	168 children	1.34	2.75
Public Health	1,000 people	1,000 people	0.17	0.51
Other Health	1,000 people	1,000 people	0.82	1.01

- The projected population of the Finger Lakes is expected to remain fairly constant through 2020, while the proportion of the population that is age 65 and older is expected to increase, as shown in Figure 4.

Figure 4. Projected Population of Finger Lakes and Percent Age 65 and Older



- Generally, projected changes in the use of services in the Finger Lakes are consistent with the changes projected statewide.

- By the year 2020, the Finger Lakes region is projected to have a RN supply of 11,218, but will need 12,078 to meet national benchmarks, producing an estimated shortage of 7%.

Table 15. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Finger Lakes

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
12,156	4.3%	10,429	-10.5%	12,078	3.6%	15,622	34.0%	14,229	22.1%

- Again, however, all is not equal throughout the Finger Lakes region.
  - Ontario County is projected to have a 22% surplus of RNs through 2020, while Monroe/Wayne counties are projected to experience only a minor shortage (5%) relative to national benchmarks.
  - Genesee/Orleans counties and Livingston/Wyoming counties, in contrast, are expected to have many fewer RNs per units of service than the national average by the year 2020 (with a 36% and 48% shortage, respectively).

Hudson Valley Region

- Nearly 19,000 RNs are employed in the Hudson Valley region of New York, which is composed of Dutchess, Orange, Rockland, Sullivan/Ulster and Westchester/Putnam counties. RNs in this region are older on average than RNs statewide, but with similar levels of education.

Table 16. Selected Characteristics of Hudson Valley RNs

	Hudson Valley	New York
Employed RNs	18,722	165,124
Median Age	47	46
% 55+	22.2%	16.9%
% Diploma/ADN	39.9%	39.4%
% BSN	44.1%	43.0%
% MSN	16.0%	17.6%
% in Hospitals	62.0%	64.1%

- Between 2005 and 2006, the RN supply in the Hudson Valley was estimated to grow by nearly 1,400 RNs, or about 7%.

Table 17. Projected Components of RN Supply Change, Hudson Valley, 2005-2006

Hudson Valley Region	2005-2006
Base	18,722
In-migration	779
Out-migration	46
Net migration	733
Graduates	901
Foreign	175
Attrition	449
	+1,360 (7.3%)

- Use of hospital inpatient days per capita was much higher in the Hudson Valley than statewide, while use of outpatient visits per capita was much lower. The number of school-age children per capita was much higher in the Hudson Valley than statewide.

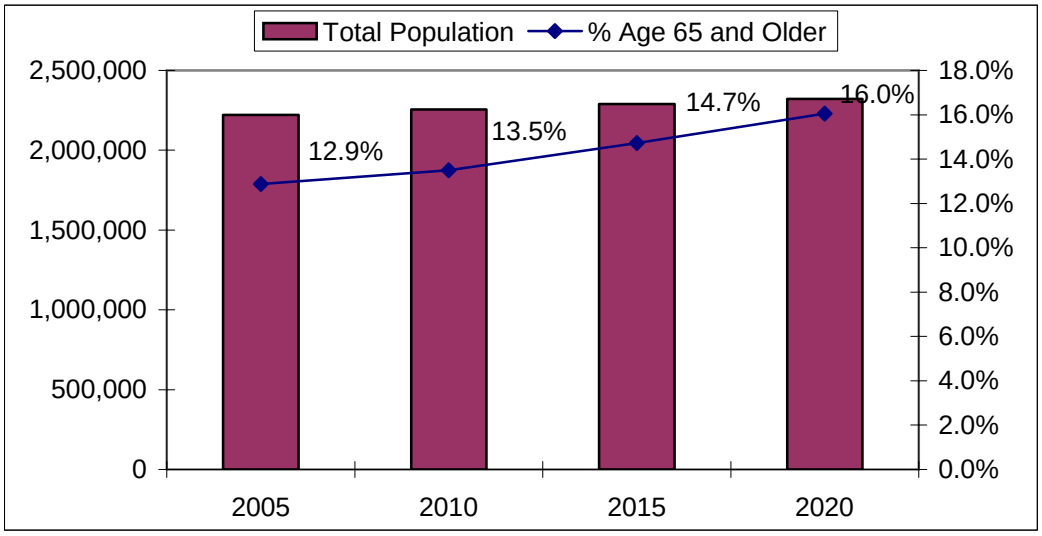
- It is estimated that there are fewer RNs per inpatient day but more RNs per outpatient visit in the Hudson Valley than statewide, but this may be based on assumptions about the distributions of hospital-employed RNs that may not hold true in Hudson Valley hospitals. It appears that there are fewer RNs per 1,000 home health visits than the statewide average, and fewer school RNs per 1,000 school-age children.

Table 18. Demand for Services per 1,000 Population and RNs per Unit of Service, Hudson Valley

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	Hudson Valley	New York	Hudson Valley	New York
Hospital Inpatient Days	1,175 inpatient days	946 inpatient days	3.77	4.78
Hospital Emergency Department Visits	343 ED visits	397 ED visits	1.73	1.55
Hospital Outpatient Days	1,318 outpatient visits	2,215 outpatient visits	0.94	0.15
Nursing Facility Residents	6.0 residents	5.9 residents	0.12	0.14
Home Health Visits	323 visits	320 visits	0.77	1.07
Non-Hospital Ambulatory Care	3,198 visits	3,233 visits	0.35	0.28
School Health	182 children	168 children	2.01	2.75
Public Health	1,000 people	1,000 people	0.40	0.51
Other	1,000 people	1,000 people	0.27	1.01

- The population of the Hudson Valley is expected to grow steadily between 2005 and 2020, while the percentage of the population age 65 and older is also expected to moderately increase during the same period, as shown in Figure 5.

Figure 5. Projected Population of Hudson Valley and Percent Age 65 and Older



- The growing population of the Hudson Valley ensures continued growth in demand for most health-related services through 2020, and poses a continuing challenge to the health care system in the Hudson Valley in terms of maintaining an adequate RN workforce.

- The region begins with ratios of RNs to units of services that are higher than the state average, and shows extremely strong growth in RN supply that should continue through 2020.

Table 19. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Hudson Valley

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
20,835		18,501		20,558		27,426		21,541	

- All of the counties and county groups of the Hudson Valley are projected to have a 42% surplus relative to national benchmarks in 2020. Dutchess County is projected to have a surplus of 61%, Orange County a surplus of 48%, Rockland County a surplus of 95%, Sullivan/Ulster counties a surplus of 125%, and Westchester/Putnam counties a surplus of 12%.

Long Island Region

- Nearly 11,000 RNs are employed in the Long Island region of New York, which is composed of Nassau and Suffolk counties. RNs in this region are slightly younger on average than RNs statewide, and somewhat more likely to have a bachelor's or master's degree as their highest degree.

Table 20. Selected Characteristics of Long Island RNs

	Long Island	New York
Employed RNs	26,282	165,124
Median Age	45	46
% 55+	15.1%	16.9%
% Diploma/ADN	33.7%	39.4%
% BSN	46.6%	43.0%
% MSN	19.7%	17.6%
% in Hospitals	66.6%	64.1%

- Between 2005 and 2006, the RN supply in Long Island was estimated to grow by about 2,500 RNs, or about 9.6%.

Table 21. Projected Components of RN Supply Change, Long Island, 2005-2006

Long Island Region	2005-2006
Base	26,282
In-migration	1,391
Out-migration	113
Net migration	1,278
Graduates	1,338
Foreign	388
Attrition	472
	+2,532 (9.6%)

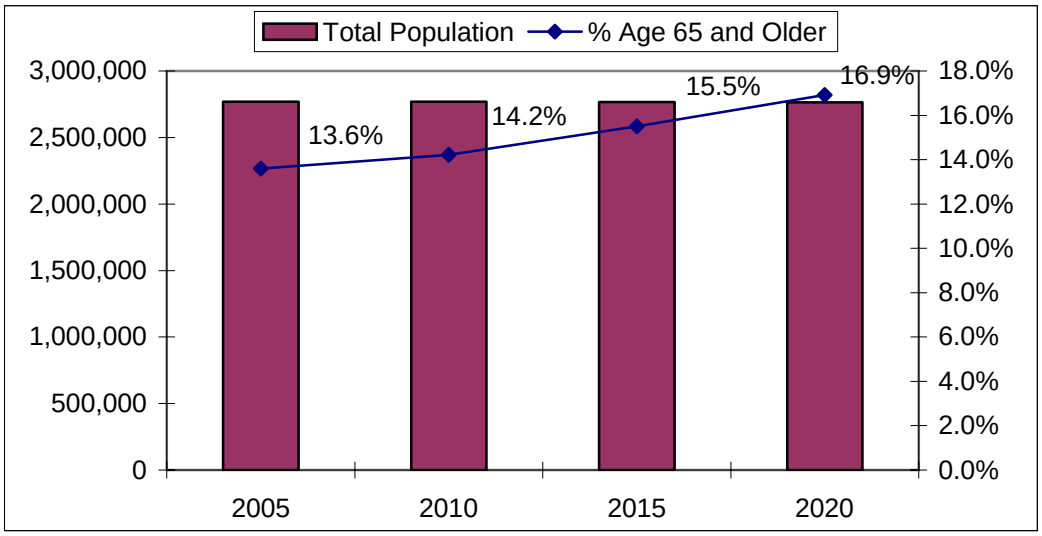
- There were substantially more inpatient days used per capita on Long Island, and fewer outpatient visits per capita. There were also more school-age children per 1,000 population. It appears that there are more RNs employed in home health on Long Island per 1,000 estimated home health visits, but somewhat fewer school RNs per 1,000 school-age children and somewhat fewer RNs employed in public health per 1,000 population.

Table 22. Demand for Services per 1,000 Population and RNs per Unit of Service, Long Island

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	Long Island	New York	Long Island	New York
Hospital Inpatient Days	1,115 inpatient days	946 inpatient days	4.80	4.78
Hospital Emergency Department Visits	337 ED visits	397 ED visits	2.05	1.55
Hospital Outpatient Days	1,515 outpatient visits	2,215 outpatient visits	0.11	0.15
Nursing Facility Residents	5.5 residents	5.9 residents	0.14	0.14
Home Health Visits	335 visits	320 visits	1.36	1.07
Non-Hospital Ambulatory Care	3,241 visits	3,233 visits	0.27	0.28
School Health	182 children	168 children	2.05	2.75
Public Health	1,000 persons	1,000 persons	0.21	0.51
Other	1,000 persons	1,000 persons	0.46	1.01

- The population of Long Island is projected to remain largely stable between 2005 and 2020, while the proportion of the population age 65 and older is expected to increase substantially during this time.

Figure 6. Projected Population of Long Island and Percent Age 65 and Older



- The projected growth in demand for most health care services is moderated by the lack of projected growth in the population of Long Island between 2005 and 2020. Use of some services is projected to grow, but in most cases more slowly than the growth projected statewide.

- The Long Island region already has a more favorable ratio of RNs to units of service than the state overall, and favorable patterns of migration position this region to maintain a strong RN supply relative to demand through the year 2020, with a surplus relative to national benchmarks potentially approaching 59%.

Table 23. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Long Island

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
28,522	8.5%	25,473	-3.1%	29,039	10.5%	38,806	147.7%	30,240	15.1%

- Both Nassau and Suffolk counties are expected to have strong supplies of RNs relative to national benchmarks through the year 2020, with potential surpluses of 28% and 93%, respectively.

Mohawk Valley Region

- Nearly 4,000 RNs are employed in the Mohawk Valley of New York, which is composed of Fulton/Montgomery and Herkimer/Oneida counties. RNs in this region are somewhat younger on average than RNs statewide, and much more likely to have a diploma or ADN and less likely to have a BSN as their highest degree.

Table 24. Selected Characteristics of Mohawk Valley RNs

	Mohawk Valley	New York
Employed RNs	3,610	165,124
Median Age	45	46
% 55+	14.5%	16.9%
% Diploma/ADN	68.4%	39.4%
% BSN	19.4%	43.0%
% MSN	12.2%	17.6%
% in Hospitals	57.4%	64.1%

- Due in part to out-migration of RNs, between 2005 and 2006, the RN supply in the Mohawk Valley was estimated to grow by only 88 RNs, or about 2.4%.

Table 25. Projected Components of RN Supply Change, Mohawk Valley, 2005-2006

Mohawk Valley Region	2005-2006
Base	3,610
In-migration	79
Out-migration	138
Net migration	-59
Graduates	223
Foreign	0
Attrition	76
	+88 (2.4%)

- There are many more inpatient days and hospital outpatient visits per capita in the Mohawk Valley than in New York statewide. There are also many more nursing facility residents per capita as well as somewhat more home health visits and school-age children.

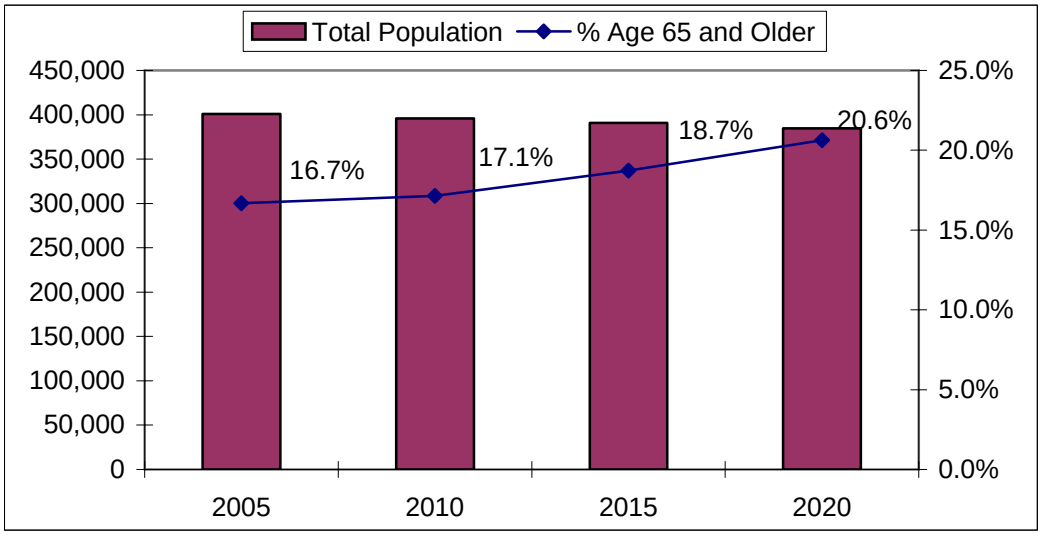
- The Mohawk Valley has very low ratios of RNs to units of service for all types of hospital-based care, and extremely low ratios of school RNs to school-age children.

Table 26. Demand for Services per 1,000 Population and RNs per Unit of Service, Mohawk Valley

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	Mohawk Valley	New York	Mohawk Valley	New York
Hospital Inpatient Days	1,837 inpatient days	946 inpatient days	2.52	4.78
Hospital Emergency Department Visits	399 ED visits	397 ED visits	1.00	1.55
Hospital Outpatient Days	3,142 outpatient visits	2,215 outpatient visits	0.05	0.15
Nursing Facility Residents	10.2 residents	5.9 residents	0.14	0.14
Home Health Visits	382 visits	320 visits	1.18	1.07
Non-Hospital Ambulatory Care	3,387 visits	3,233 visits	0.20	0.28
School Health	174 children	168 children	0.76	2.75
Public Health	1,000 persons	1,000 persons	0.43	0.51
Other	1,000 persons	1,000 persons	0.75	1.01

- The population of the Mohawk Valley is projected to decline slightly between 2005 and 2020, even as the already-high proportion of the population age 65 and older continues to climb. By the year 2020, it is estimated that more than one out of every five residents of the Mohawk Valley will be age 65 and older, making this the oldest region of the state.

Figure 7. Projected Population of Mohawk Valley and Percent Age 65 and Older



- The projected population decline in the Mohawk Valley will lead to a decline in demand for many types of health care services. Due to increased aging of the population, however, hospital inpatient days and nursing facility residents are expected to continue to increase.

- As of 2005, the region has ratios of RNs to units of service that are much lower than both statewide and national ratios, and this is only expected to continue as the population ages and the number of nursing graduates declines.

- It is projected that the Mohawk Valley will have an RN workforce of 4,064 by the year 2020, which falls short (by 18%) of the 4,951 RNs necessary to meet national benchmarks.

Table 27. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Mohawk Valley

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
3,720	3.1%	4,320	19.7%	4,951	37.2%	6,552	81.5%	3,943	9.2%

- While Herkimer/Oneida counties expected to experience a surplus of about 10%, Fulton/Montgomery counties may experience a shortage of 50% by 2020, relative to the national benchmarks.

New York City Region

- Nearly 63,000 RNs are employed in the New York City region, which is composed of the Bronx, Kings, New York, Queens, and Richmond counties. RNs in this region are

slightly younger on average than RNs statewide, and much more likely to have a bachelor's or master's degree. They are also substantially more likely to be employed in hospital settings.

Table 28. Selected Characteristics of New York City RNs

	New York City	New York
Employed RNs	62,548	165,124
Median Age	45	46
% 55+	16.6%	16.9%
% Diploma/ADN	27.7%	39.4%
% BSN	51.7%	43.0%
% MSN	20.6%	17.6%
% in Hospitals	70.6%	64.1%

- Between 2005 and 2006, the RN supply in New York City was estimated to grow by over 800 RNs, or about 1.4%.

Table 29. Projected Components of RN Supply Change, New York City, 2005-2006

New York City Region	2005-2006
Base	62,548
In-migration	1,955
Out-migration	2,578
Net migration	-623
Graduates	2,127
Foreign	692
Attrition	1,352
	+844 (1.4%)

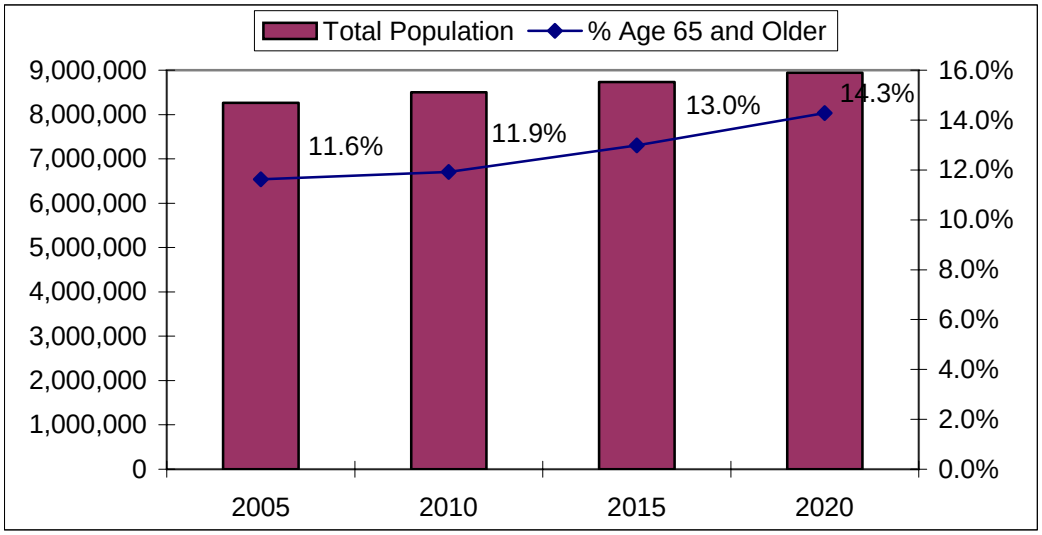
- There are more inpatient days and somewhat more emergency department visits per capita in New York City than statewide, but somewhat fewer nursing facility residents and home health visits. There are fewer hospital RNs per unit of service in New York City, and also fewer RNs per unit of service in non-hospital ambulatory care, school health, and public health.

Table 30. Projected Demand for Services and Annual and Historical Growth Rate by Setting, New York City

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	New York City	New York	New York City	New York
Hospital Inpatient Days	1,272 inpatient days	946 inpatient days	3.55	4.78
Hospital Emergency Department Visits	433 ED visits	397 ED visits	1.10	1.55
Hospital Outpatient Days	2,102 outpatient visits	2,215 outpatient visits	0.22	0.15
Nursing Facility Residents	5.2 residents	5.9 residents	0.14	0.14
Home Health Visits	299 visits	320 visits	1.11	1.07
Non-Hospital Ambulatory Care	3,226 visits	3,233 visits	0.18	0.28
School Health	172 children	168 children	0.57	2.75
Public Health	1,000 persons	1,000 persons	0.10	0.51
Other	1,000 persons	1,000 persons	0.44	1.01

- The population of New York City is projected to grow steadily between 2005 and 2020, and while the percent of the population that is age 65 and older will increase during that time, the percent of older adults will remain moderate compared to the rest of the state.

Figure 8. Projected Population of New York City and Percent Age 65 and Older



- Growth in almost every type of health service in New York City is expected to exceed growth in the state overall.

- There is very little chance that ratios of RNs to units of service in New York City will approach statewide or national ratios by 2020, as nursing graduations are projected to fall while demand for services continues to rise. The projected RN supply in 2020 is 61,093,

while an estimated 92,161 will be needed to meet national benchmarks, producing a possible shortage of 34%.

Table 31. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, New York City

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
69,967	11.9%	79,901	27.7%	92,161	47.3%	122,241	95.4%	74,635	19.3%

- Richmond County (the borough of Staten Island) is the only area of New York City not expected to experience any degree of shortage relative to national benchmarks by the year 2020, and may in fact have a surplus of 53%..

- New York County (the borough of Manhattan) is projected to experience a moderate shortage (24%); while Kings County, Queens County, and Bronx County are all projected to experience very serious shortages relative to national benchmarks (49%, 41%, and 44%, respectively).

North Country Region

- About 4,400 RNs are employed in the North Country region of New York, which is composed of Clinton/Essex/Franklin/Hamilton, Jefferson/Lewis, and St. Lawrence counties. RNs in this region are substantially younger on average than RNs statewide, and much more likely to have a diploma or ADN and less likely to have a BSN as their highest degree. They are also substantially less likely to work in hospitals.

Table 32. Selected Characteristics of North Country RNs

	North Country	New York
Employed RNs	4,433	165,124
Median Age	43	46
% 55+	8.5%	16.9%
% Diploma/ADN	65.8%	39.4%
% BSN	28.7%	43.0%
% MSN	5.4%	17.6%
% in Hospitals	51.8%	64.1%

- Between 2005 and 2006, the RN supply in the North Country was estimated to grow by about 100 RNs, or about 2.4%.

Table 33. Projected Components of RN Supply Change, North Country, 2005-2006

North Country Region	2005-2006
Base	4,433
In-migration	50
Out-migration	91
Net migration	-41
Graduates	211
Foreign	0
Attrition	64
	+106 (2.4%)

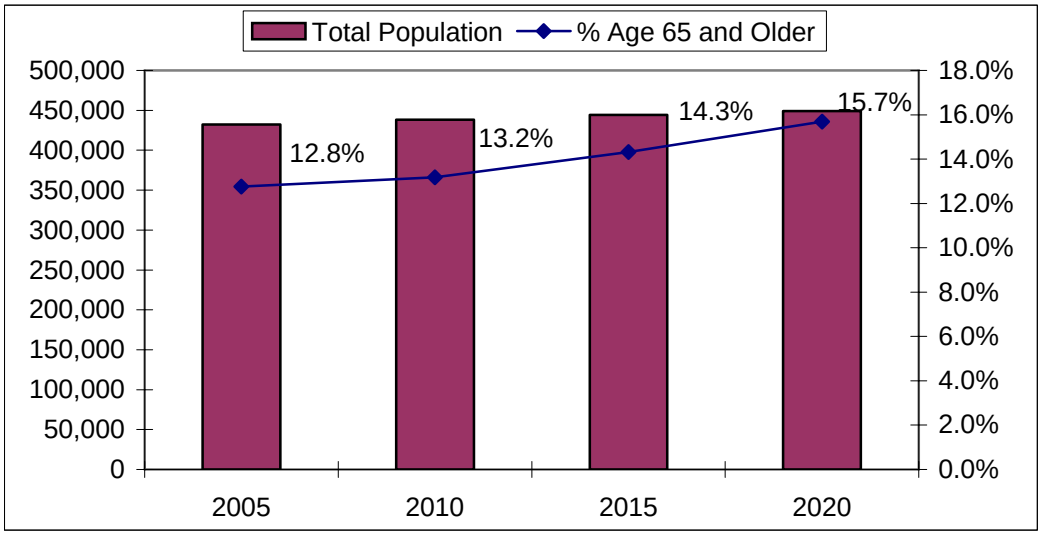
- Use of inpatient days per capita was lower in the North Country than statewide, but emergency department visits were higher. There were also fewer school-age children per 1,000 population than statewide. Generally, the ratios of RNs to units of service in the North Country are equal to or greater than statewide ratios, with home health being the notable exception.

Table 34. Demand for Services per 1,000 Population and RNs per Unit of Service, North Country

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	North Country	New York	North Country	New York
Hospital Inpatient Days	844 inpatient days	946 inpatient days	4.66	4.78
Hospital Emergency Department Visits	453 ED visits	397 ED visits	2.47	1.55
Hospital Outpatient Days	2,680 outpatient visits	2,215 outpatient visits	0.13	0.15
Nursing Facility Residents	6.1 residents	5.9 residents	0.22	0.14
Home Health Visits	311 visits	320 visits	0.23	1.07
Non-Hospital Ambulatory Care	3,213 visits	3,233 visits	0.34	0.28
School Health	163 children	168 children	2.65	2.75
Public Health	1,000 people	1,000 people	1.04	0.51
Other	1,000 people	1,000 people	1.00	1.01

- The population of the North Country is projected to grow between 2005 and 2020, and the percentage of the population age 65 and older will also increase during this time period, although the percent of older adults will remain relatively low compared to many other regions of the state.

Figure 9. Projected Population of North Country and Percent Older Than Age 64



- Growth in the use of hospital-based services in the North Country is projected to equal or exceed statewide growth, although growth in many other types of health care services will be slower.

- The North Country already has a higher ratio of RNs to units of service than observed statewide or nationwide, and should be in a strong position to maintain these ratios through the year 2020. An RN supply of 4,069 will be necessary by 2020 to meet national benchmarks and projected RN supply will be 5,292 (surplus of 30%).

Table 35. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, North Country

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
4,867	9.8%	3,627	-18.2%	4,069	-8.2%	5,363	21.0%	5,119	15.5%

- St. Lawrence and Jefferson/Lewis counties are both expected to have RN supplies that exceed national ratios of RNs to units of service by the year 2020 (43% and 80%, respectively.)

- Clinton/Essex/Franklin/Hamilton counties may have a minor shortage (4%) of RNs by the year 2020 relative to national benchmarks.

Southern Tier Region

- Nearly 6,000 RNs are employed in the Southern Tier region of New York, which is composed of Broome/Tioga, Chemung/Schuyler, Delaware/Otsego/Schoharie, Seneca/Tompkins, and Steuben/Yates counties. RNs in this region are older on average

than RNs statewide, and more likely to have a diploma or ADN and less likely to have a BSN as their highest degree.

Table 36. Selected Characteristics of Southern Tier RNs

	Southern Tier	New York
Employed RNs	5,780	165,124
Median Age	47	46
% 55+	19.0%	16.9%
% Diploma/ADN	59.6%	39.4%
% BSN	27.3%	43.0%
% MSN	13.1%	17.6%
% in Hospitals	56.9%	64.1%

- The Southern Tier region faces serious challenges as a result of RN migration patterns. Not only are many RNs moving out of the Southern Tier, but they are also moving out of other areas that supply the Southern Tier workforce with RNs, such as the Mohawk Valley and the Pennsylvania border counties. The Southern Tier is estimated to lose 366 RNs per year through net migration.

- Between 2005 and 2006, the RN supply in the Southern Tier was estimated to grow by only 12 RNs, or about 0.2%.

Table 37. Projected Components of RN Supply Change, Southern Tier, 2005-2006

Southern Tier Region	2005-2006
Base	5,780
In-migration	92
Out-migration	458
Net migration	-366
Graduates	506
Foreign	0
Attrition	128
	+12 (0.2%)

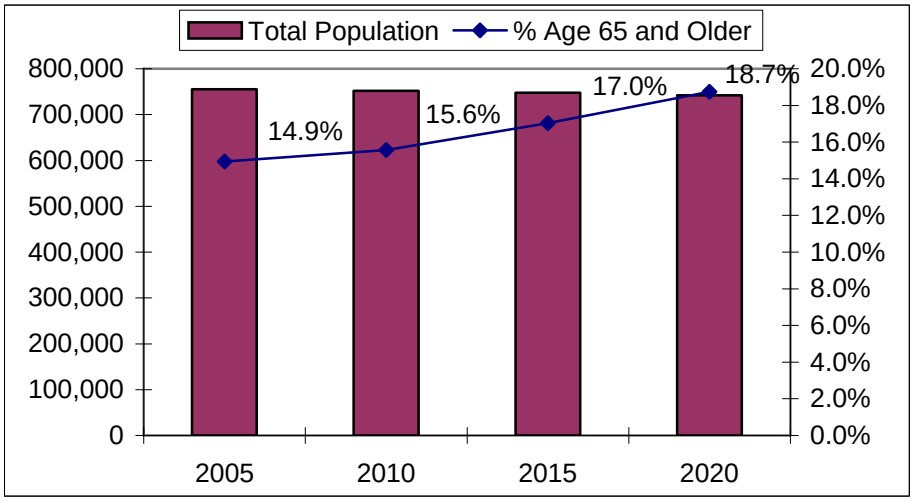
- More inpatient days are used in the Southern Tier per capita than the statewide average, as well as more emergency department visits and many more hospital outpatient days. There are also many more nursing facility residents per capita, although there are somewhat fewer school-age children. At the same time, there are fewer hospital RNs per inpatient day, fewer RNs per estimated home health visit, and fewer school RNs per 1,000 school-age children.

Table 38. Demand for Services per 1,000 Population and RNs per Unit of Service, Southern Tier

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	Southern Tier	New York	Southern Tier	New York
Hospital Inpatient Days	1,187 inpatient days	946 inpatient days	2.65	4.78
Hospital Emergency Department Visits	458 ED visits	397 ED visits	1.69	1.55
Hospital Outpatient Days	4,213 outpatient visits	2,215 outpatient visits	0.10	0.15
Nursing Facility Residents	6.7 residents	5.9 residents	0.12	0.14
Home Health Visits	350 visits	320 visits	0.80	1.07
Non-Hospital Ambulatory Care	3,322 visits	3,233 visits	0.25	0.28
School Health	164 children	168 children	2.21	2.75
Public Health	1,000 persons	1,000 persons	0.56	0.51
Other	1,000 persons	1,000 persons	0.47	1.01

- The population of the Southern Tier is expected to decline slightly between 2005 and 2020, while the proportion of the population age 65 and older continues to grow.

Figure 10. Projected Population of the Southern Tier and Percent Age 65 and Older



- Because of the declining population, projected growth in the use of most types of health care services in the Southern Tier will be slower than that statewide.

- No matter which benchmark of adequate supply is used, there appears to be very little likelihood that the Southern Tier will be able to achieve or maintain an adequate supply by the year 2020. Projected RN supply by 2020 is only 6,084, while 8,223 RNs will be needed to meet national benchmarks (a shortage of 26%).

Table 39. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Southern Tier

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
6,003	3.9%	7,143	23.6%	8,223	42.3%	10,731	85.7%	6,212	7.5%

- Broome/Tioga, Cheming/Schuyler, Seneca/Tompkins, and Steuben/Yates counties are all projected to face moderate shortages of RNs by the year 2020 (10%, 21%, 21%, and 23% respectively).

- Delaware/Otsego/Schoharie counties are projected to face a severe shortage of RNs (57%) by the year 2020.

Western New York Region

- Nearly 13,000 RNs are employed in the Western New York region, which is composed of Allegany/Cattaraugus, Chautauqua, Erie, and Niagara counties. RNs in this region are older on average than RNs statewide, and more likely to have a diploma or ADN and less likely to have a BSN as their highest degree. They are also less likely be employed in hospitals.

Table 40. Selected Characteristics of Western New York RNs

	Western New York	New York
Employed RNs	12,584	165,124
Median Age	47	46
% 55+	15.1%	16.9%
% Diploma/ADN	54.0%	39.4%
% BSN	35.0%	43.0%
% MSN	11.1%	17.6%
% in Hospitals	53.5%	64.1%

- Between 2005 and 2006, the RN supply in Western New York was estimated to grow by 550 RNs, or about 4.4%.

Table 41. Projected Components of RN Supply Change, Western New York, 2005-2006

Western New York Region	2005-2006
Base	12,584
In-migration	161
Out-migration	2
Net migration	159
Graduates	611
Foreign	0
Attrition	220
	+550 (4.4%)

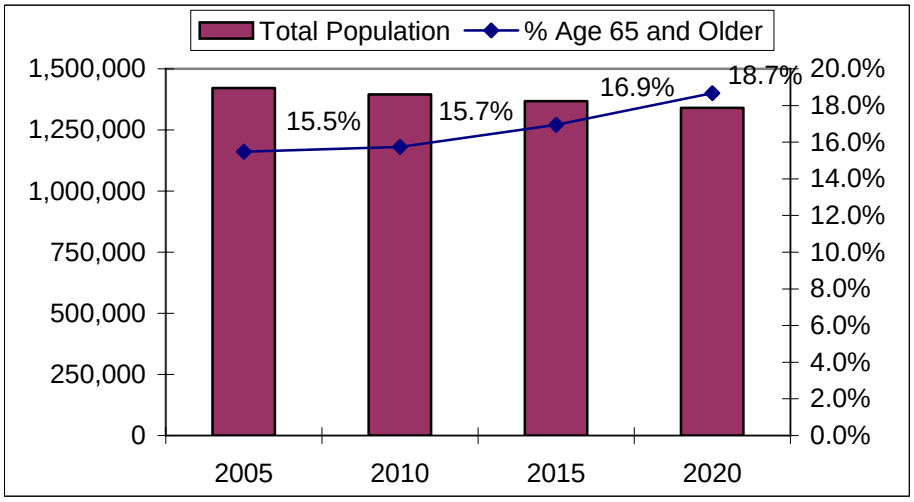
- Western New York residents used more inpatient days per capita than residents of the state overall, as well as more home health visits and slightly more ambulatory care visits. There were also more nursing facility residents per capita in Western New York than statewide. At the same time, there were fewer hospital RNs and fewer home health RNs per units of service, although there were somewhat more RNs working in non-hospital ambulatory care and school health.

Table 42. Demand for Services per 1,000 Population and RNs per Unit of Service, Western New York

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	Western New York	New York	Western New York	New York
Hospital Inpatient Days	1,255 inpatient days	946 inpatient days	3.23	4.78
Hospital Emergency Department Visits	381 ED visits	397 ED visits	1.40	1.55
Hospital Outpatient Days	2,158 outpatient visits	2,215 outpatient visits	0.08	0.15
Nursing Facility Residents	7.1 residents	5.9 residents	0.16	0.14
Home Health Visits	362 visits	320 visits	0.63	1.07
Non-Hospital Ambulatory Care	3,377 visits	3,233 visits	0.41	0.28
School Health	170 children	168 children	3.14	2.75
Public Health	1,000 persons	1,000 persons	0.33	0.51
Other	1,000 persons	1,000 persons	0.53	1.01

- The population of Western New York is projected to decline between 2005 and 2020, although the proportion of the population age 65 and older is expected to grow during this period, as shown in Figure 11.

Figure 11. Projected Population of Western New York and Percent Age 65 and Older



- Due to a projected decline in the population, projected demand for many types of health services will also decline between 2005 and 2020. Demand for other types of health services, such as hospital inpatient care and nursing facilities, will grow, but will do so much more slowly than projected statewide averages.

- Despite declining demand for health services, Western New York is expected to experience a shortage of RNs relative to national ratios by the year 2020. Supply is projected to be only 10,139 RNs, while 15,167 RNs are needed to meet national benchmarks (a shortage of 33%).

Table 43. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Western New York

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
12,364	-1.8%	13,241	5.2%	15,167	20.5%	20,157	60.2%	13,604	8.1%

- All of the component counties or county groups of Western New York are expected to experience RN shortages by 2020 (Allegany/Cattaraugus 66%, Chautauqua 25%, Erie 32%, and Niagara 31%.)

Limitations

These analyses have several limitations, the most serious related to the adequacy of the available data. It is not clear whether sample size is sufficient to produce reliable estimates of the characteristics, commuting patterns, and migration patterns of the RN workforce at the substate level, particularly for the smallest county groups. These analyses (and their results) should be regarded as experimental, and should be replicated and revised as better data become available.

The analyses could also be improved by adjustments for additional factors such as patient acuity, which are not currently accounted for in the present model and which may cause the RN workforce to look more adequate than it is in areas with major medical centers.

Conclusion

The key conclusion from this research is that substantial dfferences exist both between and within various regions of the state in regard to the supply of and demand for registered nurses. Studies similar to this one should be repeated periodically to monitor the substate distribution of RNs in order to effectively target policy interventions intended to address this important issue.

I. Introduction

New York has substantially fewer registered nurses (RNs) per capita than the national average, and compares even more unfavorably to states such as neighboring Massachusetts. Although New York nursing graduations have risen in recent years, evidence is accumulating that New York may face growing shortages of RNs over the next couple of decades. There are many drivers of this expected shortage, including growing demand for services as a result of population aging and public health issues, such as obesity and diabetes; increasing retirements from nursing as a result of an aging RN workforce; and challenges faced by colleges and universities in expanding their RN education program capacity.

While a number of sources support the case of statewide RN shortages for New York through 2020, it is clear from studies of physicians and other health workers that the health workforce is not evenly distributed throughout the state. Local social, demographic, and economic conditions drive both the supply of and demand for health workers. At the same time, many policy efforts to address RN shortages are made at the local level, while state and federal initiatives may be targeted by state policymakers to particular substate areas of critical shortage. A better understanding of the dynamics that drive substate labor markets for RNs is critical in order to allow stakeholders to work out an optimal allocation of scarce resources to address the problem. To examine the nature and scope of RN shortages in New York, the Center for Health Workforce Studies, with support from the 1199 Hospital League Health Care Industry Planning and Placement Fund, the Greater New York Hospital Association, the Healthcare Association of New York, the New York State Nurses Association, the New York Association of Nurse Executives and the Health and Hospitals Corporation, developed a practical approach to projecting RN supply and demand at a sub-state level, i.e., counties or groups of small counties.

One of the largest barriers to making accurate and useful substate projections has always been a lack of appropriate data. Most sources of RN data are not available below the state level, or the substate sample sizes are too low to make reliable inferences. This will soon change, however, particularly in New York. Two sources of substate data should be available by the end of 2008 that will allow researchers to implement a methodology for making reasonable substate projections about the RN workforce.

One of these, the American Community Survey or ACS (a project of the U.S. Census Bureau), was implemented in its entirety in 2005, but sample sizes at the substate level are small enough that at least three years of data should be averaged to be the basis for inferences. The third year of data, collected in 2007, should become available in October 2008. The second source of substate data is an RN Re-Registration Survey launched by the Center for Health Workforce Studies in partnership with the New York State Education Department. Based on the Center's very successful Physician Re-Registration Survey, this initiative will collect data from RNs as they re-register with the Education Department on a three-year-cycle. Every RN in New York will receive the survey, and over the course of three years, response rates of close to 90% are anticipated. This survey was launched at the beginning of 2008, and by the end of 2008, it is expected that data will be available on nearly one-third of New York's RNs.

The RN Re-Registration Survey is expected to be an excellent source of RN data in New York, but few other states will have comparable data. If the ACS proves to be a reasonable alternative, however, similar analyses could be done for other states using ACS data.

This paper uses two-year averages from the 2005 and 2006 ACS, as well as county-level sociodemographic, economic, and health care data from other sources, to pilot such a methodology in New York. As better data become available over the next several months, they will feed this model to produce more refined and reliable estimates.

The model presented in the paper is based in large part upon the methodology used in the Nurse Supply Model (NSM) and Nurse Demand Model (NDM) published by the Health Resources and Services Administration (HRSA) to make supply/demand projections at the state level. Efforts are also underway through a separate but related project to use the NSM and NDM software itself to produce substate estimates. The results of the analyses using the HRSA software will be published separately when available.

II. Nursing Supply Data

Supply is modeled according to the components used in the HRSA Nurse Supply Model (NSM), and is based on the simple demographic premise that a population changes through entries into the population and exits out of the population. RNs enter a workforce through graduation from an RN education program or in-migration from another geographical area. RNs exit a workforce through attrition due to career changes, retirement, or death, or out-migration to another geographical area. All of these mechanisms by which RNs enter or leave a workforce are related to age and educational level.

To predict such behaviors as graduations, attrition, and migration it is necessary to begin with some sense of the age and educational distribution of the existing RN workforce in a particular unit of geography (Step 1). This base supply is then adjusted for the projected migration of RNs across units of geography based on age- and education-specific patterns (Step 2). Because educational levels affect other supply-related behaviors, the expected RN educational upgrades are applied to the workforce population (Step 3), and then projected age- and education-specific attritions are subtracted (Step 4). The estimated RN workforce is then aged by one year (Step 5), and foreign-trained RNs are added (Step 6). Finally, new RN graduates are added to the supply (Step 7). These calculations are not necessarily difficult to understand, but require finding the necessary data at whatever geographical unit of analysis is being used.

The ideal geographic unit for substate analysis is the county, because social, economic, demographic, and health data are available at the county level. While RN data are currently not available by county, county groups can be created from the Public Use Microdata Areas (PUMAs) used by the U.S. Census Bureau.

PUMAs are geographical areas that consist of roughly 65,000 people. While PUMAs do not exactly correspond to counties, usually PUMAs can be aggregated up to single counties (in densely populated urban areas) or correspond with groups of counties (in sparsely populated rural areas). Many PUMAs in New York already correspond to a single county.

Thirty-nine county groups were created in New York. Eighteen of these are multi-county PUMAs – usually two counties, but one PUMA in the North Country consists of four counties, and two other PUMAs consist of three counties. The remainder is either single-county PUMAs or aggregations of multiple PUMAs to correspond with counties (for example, New York County, which is Manhattan, consists of ten PUMAs, while Suffolk County on Long Island consists of twelve PUMAs).

A. Base Year RN Supply by Age and Education

Base numbers of active RNs for each area of the state are taken from the 2005 and 2006 ACS Public Use Microdata files. Because of the small percentage of the population covered in these files (approximately one in 20 households), the average of 2005 and 2006 is taken as the base number of RNs employed in each area.

Individual-level data are available on each of the RNs sampled in the ACS, including age and highest level of education (this may not necessarily be in nursing). The size of the sample is not sufficient to accurately estimate the age and educational distribution within each substate area, so the substate areas are aggregated into regions that roughly correspond with the NYS Department of Labor regions[1]. Regional distributions of age and education are then applied to the base number of RNs working in each substate area. This is an important step because it is known that different areas of the state vary greatly in terms of RN age and education.

Table 1 shows the unweighted counts of RNs in each county group from the 2005 and 2006 ACS, and the weighted average number of RNs for the two years. Most county groups include at least 25 active RNs in the combined dataset, but a few (Fulton/Montgomery, Genesee/Orleans, Livingston/Wyoming, Oswego, Rensselaer, Saratoga, and Seneca/Tompkins) have fewer. Estimates for these county groups must be approached with caution.

[1] See Appendix for exact geographies included in each region.

Table 1. Unweighted Counts And Weighted Averages of RNs in 2005 and 2006 ACS

	Unweighted Count, 2005 and 2006	Weighted average, 2005/2006
Albany	100	5270
Allegany/Cattaraugus	30	551.5
Bronx	157	8819
Broome/Tioga	54	1960
Chautauqua	34	934.5
Chemung/Schuyler	40	1116.5
Chenango/Cortland	26	697
Clinton/Essex/Franklin/Hamilton	56	2030
Columbia/Greene	19	972
Delaware/Otsego/Schoharie	51	1256.5
Dutchess	53	2846.5
Erie	211	10071.5
Fulton/Montgomery	15	521.5
Genesee/Orleans	22	731
Herkimer/Oneida	88	3125
Jefferson/Lewis	38	1023.5
Kings	264	16919.5
Livingston/Wyoming	24	489.5
Monroe	198	8733.5
Nassau	262	13289.5
New York	405	22517.5
Niagara	27	1117.5
Onondaga/Madison/Cayuga	208	7185.5
Ontario	47	1652.5
Orange	46	2426
Oswego	9	369
Queens	202	10547
Rensselaer	19	1093.5
Richmond	79	3973
Rockland	55	2507
Saratoga	23	1024
Schenectady	38	1454
Seneca/Tompkins	24	687.5
St. Lawrence	41	1394.5
Steuben/Yates	37	758
Suffolk	253	13020
Sullivan/Ulster	42	2010.5
Warren/Washington	30	1078
Westchester/Putnam	167	8951
Total	3494	165124

When 2007 ACS data become available, a three-year average should be used to further minimize the issue of random error in the ACS data. Furthermore, preliminary estimates from a statewide re-registration survey of licensed RNs in New York should be available by the end of 2008,

providing the best source of data yet about where RNs work in New York. These data should positively confirm or disconfirm the utility of the ACS as a source of baseline data for RN supply. For a detailed comparison of the ACS data and other data sources, see Appendix A.

B. Migration Across County Groups

The ACS does not include data on location of employment one year previous to the survey, but has 1) location of current employment, 2) location of current residence, and 3) location of residence one year previous to the survey. Therefore, it is not possible to determine exactly the number of RNs who began working in a given area in the past year (or stopped working in a given area in the past year), but it is possible to determine RN residential migrations into and out of the areas where the RNs who work in a given area reside. These in-migrants or out-migrants can then be distributed across employment areas consistent with the distribution of RN employment within that residential area.

Example: Only 54% of RNs working in Albany County live in Albany County. Another 18% live in Rensselaer County. An estimated 32 RNs move into Rensselaer County per year, while an estimated 38 RNs move out. Sixty-four percent of the RNs who live in Rensselaer County work in Albany County. So 64% of the in-migrant RNs to Rensselaer County (21 RNs) are added to the Albany County workforce, and 64% of the out-migrant RNs from Rensselaer County (24 RNs) are subtracted from the Albany County workforce. The Albany County workforce is assumed to suffer a net loss of 3 RNs due to migration to and from Rensselaer County. The same procedure is carried out for all of the other counties or county groups that provide Albany County with RNs (including Albany County itself).

The resulting data do not actually reflect changes in the number of RNs working in a particular county group, but rather the change in the number of RNs living in that county group's "supply areas" (areas from which the RN workforce in that county commutes).[2]

Because the likelihood of changing residential location is known to vary by age and by degree, an estimation procedure was used to distribute migrating nurses across age and educational categories. Migrating nurses in New York were found in the ACS to have an age distribution as shown below in Table 2, and this distribution was applied to in-migrant and out-migrant RNs in each area of the state. Those who migrated appeared almost identical in educational background in the ACS data to those who did not, so the migrating nurses were distributed according to the educational distribution of the area that they were moving into or out of. The effect of this assumption is that migration patterns will not change the educational distribution of a given area in this model.

[2] It should be noted that an RN can move out of one of a county group's supply areas and into another one of the supply areas for that county group and continue to work in that county group, although she will be counted as both an in-migrant and an out-migrant for that county group's supply areas and her migration will thus have a net effect of zero (no change) on the estimated workforce in that supply area.

Table 2. Age Distribution of Migrating RNs in New York

<=22	1.90%	44	1.33%
23	4.40%	45	1.80%
24	3.27%	46	2.23%
25	2.23%	47	2.00%
26	1.80%	48	1.87%
27	2.83%	49	1.53%
28	4.67%	50	1.50%
29	7.97%	51	0.87%
30	7.00%	52	0.57%
31	5.27%	53	0.77%
32	2.17%	54	1.17%
33	3.13%	55	1.30%
34	3.83%	56	0.83%
35	3.20%	57	0.70%
36	2.07%	58	0.67%
37	5.23%	59	0.57%
38	6.13%	60	0.30%
39	6.27%	61	0.07%
40	1.87%	62	0.07%
41	1.27%	63	0.33%
42	0.83%	64	0.63%
43	1.23%	>=65	0.63%

Comparisons were made between RNs in the ACS, other groups in the ACS, and RNs in other data sources, and there were a small number of county groups for which ACS migration or commuting estimates for RNs appeared to be outliers and possibly influenced by random error. Most estimates, however, appeared reasonable compared to at least one other estimate from another data source or group. See Appendix B for more detail.

C. Education Upgrades

Little is known about the relationship between where an RN attends school for a BSN completion or MSN program and where she will ultimately work. RNs upgrading their education, however, are likely to have already established nursing careers in the local area. Data on graduates from BSN completion programs (from the Center's Nursing Deans and Directors Survey) and MSN programs (from the federal Department of Education's Integrated Post-Secondary Education Data System) in New York will be counted as educational upgrades within the NYSDOL labor market region where the graduation occurred. The combination of RN baseline data and graduation data by labor market region allow the construction of probabilities of education upgrades by RNs working in that labor market region. These probabilities are assumed to be equal among RNs working in all of the constituent counties in a labor market region.

Table 3. Estimated Probabilities of RN Educational Upgrades, by NYSDOL Labor Market Regions

	BSN Completers	Probability of Upgrade	MSNs	Probability of Upgrade
Capital District	8	0.1%	49	1.8%
Central New York	36	0.9%	30	1.1%
Finger Lakes	203	3.9%	66	1.6%
Hudson Valley	161	2.3%	74	0.9%
Long Island	95	1.1%	240	2.0%
Mohawk Valley	62	2.7%	18	2.1%
New York City	264	1.6%	501	1.6%
North Country	12	0.4%	0	0.0%
Southern Tier	13	0.4%	16	1.0%
Western New York	96	1.4%	105	2.4%

D. Attrition

There is little reason to believe that age-specific attrition rates are different in New York than in other areas of the country. Therefore, national age-specific attrition rates taken from the NSM were applied to RNs in New York. Overall attrition rates varied between county groups based on the current and projected age distribution of the RN population.

Table 4. 2005 and 2020 Estimated Attrition

	2005	2020
Albany	1.7%	1.8%
Allegany/Cattaraugus	1.8%	2.9%
Bronx	2.2%	3.6%
Broome/Tioga	2.2%	3.6%
Chautauqua	1.8%	3.9%
Chemung/Schuyler	2.2%	3.9%
Chenango/Cortland	2.0%	1.3%
Clinton/Essex/Franklin/ Hamilton	1.4%	4.2%
Columbia/Greene	1.7%	0.6%
Delaware/Otsego/ Schoharie	2.2%	4.4%
Dutchess	2.4%	3.1%
Erie	1.7%	4.0%
Fulton/Montgomery	2.1%	2.7%
Genesee/Orleans	2.1%	2.9%
Herkimer/Oneida	2.1%	2.8%
Jefferson/Lewis	1.4%	4.4%
Kings	2.1%	4.6%
Livingston/Wyoming	2.1%	3.5%
Monroe/Wayne	2.0%	4.1%
Nassau	1.8%	2.9%
New York	2.2%	4.2%
Niagara	1.8%	4.1%
Onondaga/Madison/ Cayuga	2.0%	2.6%
Ontario	2.1%	2.4%
Orange	2.4%	1.8%
Oswego	2.0%	3.0%
Queens	2.2%	4.1%
Rensselaer	1.6%	4.4%
Richmond	2.3%	2.2%
Rockland	2.4%	2.9%
Saratoga	1.6%	4.0%
Schenectady	1.6%	3.8%
Seneca/Tompkins	2.2%	4.4%
St. Lawrence	1.5%	3.8%
Steuben/Yates	2.3%	3.0%
Suffolk	1.8%	2.6%
Sullivan/Ulster	2.4%	2.0%
Warren/Washington	1.6%	3.6%
Westchester/Putnam	2.4%	3.0%

E. Net Immigration of Foreign-Trained RNs

It is estimated using ACS data that approximately 1,270 foreign-trained nurses enter the New York workforce each year (based on the average of 1,387 in 2005 and 1,154 in 2006). Because the unweighted numbers in the ACS were too small for detailed geographic breakdowns for these

two years, the distribution of employment location for these nurses is based on all RNs working in New York who entered the U.S. after 1999. The unweighted N for this group was 61, which should be sufficient to approximate geographic location.

As with other data elements used in these projections, more reliable estimates of foreign-trained RNs should become available with the data from the RN re-registration survey that is currently in the field.

Table 5. Employment Locations of New York RNs Entering the U.S. Since 1999

Albany	1.0%
Bronx	19.9%
Dutchess	.7%
Kings	13.6%
Monroe	.3%
Nassau	7.6%
New York	15.0%
Queens	4.7%
Richmond	1.2%
Suffolk	22.9%
Sullivan/Ulster	5.4%
Westchester/Putnam	7.7%

F. Graduates from New York Nursing Programs

Each year the Center surveys deans and directors of RN education programs in New York to collect data on the number of ADN and initial BSN graduates in the various regions of the state. It is not clear, however, the best way to apportion these graduates. While RNs upgrading their education are probably likely to be attending a local college, those working towards initial nursing degrees, especially initial BSNs, may be more likely to have come from outside the local area and to plan to return to their home towns after graduation. Even among commuter students (probably the majority of ADN students), it is impossible to know how many will enter the labor force in the county where they attended school and how many will enter the labor force in adjoining counties.

Table 6. Base Numbers of New Graduates by Labor Market Region

	ADN	Initial BSN
Capital District	406	39
Central New York	359	0
Finger Lakes	280	278
Hudson Valley	595	306
Long Island	724	614
Mohawk Valley	198	25
New York City	1261	866
North Country	155	56
Southern Tier	260	246
Western New York	462	149

There is little information available to guide decisions in this regard. The most sensible approach to ADN graduates seems to be to assume that they are largely commuters and to distribute them among counties in the region where they went to school proportionate to the distribution of working RNs among counties in this region. In other words, it is assumed that they will work in the labor market region where they graduated, and that within that region they will work in the counties or county groups where the RNs jobs are.

Table 7. Distribution of ADN and BSN Nursing Jobs Within Labor Market Regions

Capital District		Mohawk Valley	
Albany	48.4%	Fulton/Montgomery	14.3%
Columbia/Greene	8.9%	Herkimer/Oneida	85.7%
Rensselaer	10.0%	New York City	
Saratoga	9.4%	Bronx	14.0%
Schenectady	13.3%	Kings	27.0%
Warren/Washington	9.9%	New York	35.9%
Central New York		Queens	16.8%
Chenango/Cortland	8.4%	Richmond	6.3%
Onondaga/Madison/Cayuga	87.1%	North Country	
Oswego	4.5%	Clinton/Essex/Franklin/Hamilton	45.6%
Finger Lakes		Jefferson/Lewis	23.0%
Genesee/Orleans	6.3%	St. Lawrence	31.4%
Livingston/Wyoming	4.2%	Southern Tier	
Monroe	75.2%	Broome/Tioga	33.9%
Ontario	14.2%	Chemung/Schuyler	19.3%
Hudson Valley		Delaware/Otsego/Schoharie	21.7%
Dutchess	15.2%	Seneca/Tompkins	11.9%
Orange	12.9%	Steuben/Yates	13.1%
Rockland	13.4%	Western New York	
Sullivan/Ulster	10.7%	Allegany/Cattaraugus	4.4%
Westchester/Putnam	47.8%	Chautauqua	7.4%
Long Island		Erie	79.5%
Nassau	50.5%	Niagara	8.8%
Suffolk	49.5%		

It is much more difficult to decide how to distribute BSN graduates, especially because the percentage who are commuters or who are out-of-state students may vary substantially depending upon the location of the school. Four-year BSN programs in New York City, for example, may well attract students from all over the U.S., while such programs in the more economically challenged areas of upstate New York may attract primarily students from the local area. The data available to support such hypotheses are, however, limited.

One of the few options available is an examination of 2000 Census microdata in order to determine where college students in the various regions reported living in 1995[3]. If we then assume that students pursuing an initial BSN are no more or less likely to go "away" to school

[3] ACS data cannot be used for this purpose because it asks where respondents lived one year prior to the survey. This would make its usefulness limited for determining the local origins of all college students except freshman.

than other students, and if we assume that the typical college graduate will return to his or her hometown to look for a job, we can distribute initial BSN graduates by the locale where they were presumably raised[4].

Table 8. Estimated Location of Origin Among Initial BSN Graduates, by Region of Graduation

	Same region in NY		Different region in NY		Out of state	
Capital District	66.1%	25.78	19.5%	7.61	14.4%	5.62
Central New York	60.7%	0	22.5%	0	16.8%	0
Finger Lakes	63.6%	176.81	21.7%	60.33	14.7%	40.87
Hudson Valley	72.9%	223.07	10.8%	33.05	16.2%	49.57
Long Island	84.0%	515.76	8.8%	54.03	7.2%	44.21
Mohawk Valley	75.2%	18.80	11.7%	2.93	13.1%	3.28
New York City	80.6%	698.00	2.9%	25.11	16.5%	142.89
North Country	61.1%	34.22	21.8%	12.21	17.1%	9.58
Southern Tier	51.9%	127.67	28.2%	69.37	19.9%	48.95
Western New York	75.7%	112.79	13.7%	20.41	10.6%	15.79

Those initial BSN graduates who are presumed to be from a different region of the state than where they attended school (middle columns in Table 8, above) will be distributed in proportion to the hometown regions of all college students in the region where they attended school. BSNs who are presumed to be from outside of New York are simply excluded. BSN graduates who may be from New York but have attended college out-of-state do not need to be explicitly accounted for because if they return to New York to work they will be included among the in-migrants to each county or county group. National figures (the same used in the NSM) are used to distribute new graduates into age categories.

[4] One caveat is that four-year BSN students may be older on average than other baccalaureate students, and thus less likely to go to school a distance from their hometown because they may have already formed families and put down roots. The median age of initial BSN RNs at graduation (among those graduating in New York since 1995) is 26[4]. The median age of all college students in New York who have completed at least one year of college (e.g., non-freshman) is 23. Median age at graduation is therefore likely to be 24 or 25, which is close to but still younger than the median age for nursing graduates in the state. Another caveat is that the Census data will include students at two-year as well as four-year colleges, and may thus provide a higher estimate of local students than data that would allow analysis of four-year college students alone. This likely overestimate of local students may be partly balanced out by the likely underestimate of local students produced by the age differential described above and partially legitimized by the assumption that graduates who do not return to their hometowns to seek jobs are likely to stay in the area where they went to school (rather than in moving to an area where they neither grew up nor attended college).

III. Nursing Demand Data

There are two components to predicted demand for RNs: predicted health care utilization and predicted RN staffing intensity. Each of these can be projected forward from baseline values using various assumptions about how the population and health care environment will change. The primary source of baseline data on utilization is the Area Resource File (ARF), a compendium of county-level sociodemographic and health system data compiled by HRSA. The primary source of baseline RN staffing intensity data is the industry of employment data from the ACS, aggregated from individual RNs to the county group level.

A. Modeling Health Care Utilization

(1) The actual utilization of services in each county is the baseline data used in constructing initial estimates of demand for health care. (2) In subsequent years, changes in demand should be driven by demographic changes in the population served by each county or county group. Estimates of changes in health care demand are based on the age, gender, and rural/urban status of the population in each county/county group and through national utilization rates. (3) For hospital-based services, population-based estimates of demand are then distributed across the geographic areas where patients in that population are known to go for hospital-based care. (4) Finally, an adjustment factor is applied to reflect the difference between estimated and actual rates in the base year. (5) These projections can be further refined by making and applying various assumptions about other drivers of utilization.

1. Initial Estimates of Health Care Utilization

Utilization of hospital-based services. Actual hospital inpatient days, emergency department visits, and hospital outpatient visits are available for each county group from the ARF.

Utilization of nursing facilities. Nursing facility residents are difficult to pinpoint by county. What is more readily available is the number of skilled nursing facility beds by county. Statewide, occupancy rates in nursing homes average 93.9%. Assuming that this is relatively constant across geography, we can use 94% of the number of skilled beds to produce a reasonable estimate of nursing facility residents. At the state level, this works out well – 120,626 beds become 113,268 residents, a number very similar to the 113,456 nursing home residents given in national data sources for New York. In individual counties or county groups there may be more disparity, but these estimates are likely to be the closest available at the substate level.

Utilization of home health services. Numbers of home health visits are more difficult to obtain by county. The best way to approach estimated home health visits is to apply age- and sex-specific utilization rates at the national level to the population of the counties or county groups. The shortcoming of this approach is that it measures *need* for home health services in these county groups rather than actual *use* of home health services, and that estimated use cannot be distinguished from actual use.

Rates of utilization for home health will be measured by estimating current visits based on CMS data[5]. The data in currently published form are available by age and by sex, but not by both age and sex. Visits per person were calculated for each age group at the national level and then adjusted up for women by a factor of 1.06 and down for men by a factor of 0.97 (the difference between rates by gender and the national average for both genders).

Table 9. Age- and Gender-Specific Home Health Visits Per Person

Gender	Age	Average visit per person
F	0-64	0.053
M	0-64	0.049
F	65-74	1.28
M	65-74	1.17
F	75-84	3.13
M	75-84	2.86
F	85+	5.91
M	85+	5.41

The resulting estimate was approximately 1.89 times higher than the actual data for New York. An adjustment factor of 0.5293 brings the total to 6,182,175, which is close to the actual data reported by CMS of 6,186,000 home health visits in New York. This adjustment factor was then applied to the estimates for each county group.

Utilization of non-hospital ambulatory care. Although actual data are not available on non-hospital-based physician office visits, the population need for such visits will be estimated using the age- and gender-specific utilization rates for 2004 given in *Health, United States, 2006*.

Table 10. Age- and Gender-Specific Non-Hospital Physician Office Visits per Person, 2004

	Female	Male
Under 18	2.30	2.39
18-44	3.00	1.36
45-64	4.32	3.39
65-74	6.38	6.04
75+	7.10	7.71

Utilization of other RN services. Other rates that will be carried forward from the current population are the number of nurse educators per RN graduate, the number of school nurses per 10,000 population age 5-17, and the number of public health nurses per 10,000 population.

2. Projecting Future Health Care Utilization

The basic procedure for projecting future health care utilization is simply to apply utilization rates to the projected population.

[5] Includes Medicare-covered home health visits only, and will thus be an underestimate of overall home health visits.

Projected population data. Projected population by county by age and sex was available for every fifth year up until 2030 from the Cornell Institute for Social and Economic Research's New York Statistical Information System Data (http://www.ciser.cornell.edu/PAD/nysis_data.shtm). These data were aggregated into the 39 county groups being used in this model.

Utilization rates. National utilization rates for hospital inpatient days, hospital-based non-emergency visits, and nursing facility residents by age, gender, and urban/rural location were taken from the NDM.

Table 11. Hospital Inpatient Days, Non-Emergency Outpatient Visits, and Nursing Home Residents per Person, by Age, Gender, and Rurality

		0-4	5-17	18-24	25-44	45-64	65-74	74-85	85+
Hospital Inpatient Days	Urban Male	0.84	0.07	0.08	0.20	0.51	1.67	2.63	2.04
	Urban Female	0.57	0.06	0.35	0.52	0.41	1.34	1.92	1.97
	Rural Male	0.49	0.10	0.15	0.19	0.56	1.75	1.96	2.76
	Rural Female	0.33	0.08	0.54	0.38	0.49	1.14	1.72	1.07
Non-Emergency Hospital Outpatient Visits	Urban Male	3.82	2.50	2.05	3.30	6.38	10.14	11.68	9.66
	Urban Female	4.51	3.07	3.97	5.85	8.84	12.35	14.14	11.00
	Rural Male	3.95	2.55	2.36	3.60	6.13	9.79	11.20	8.72
	Rural Female	4.55	3.12	3.94	5.96	8.73	12.36	13.86	11.13
Nursing Home Residents	Urban Male	-	-	-	0.0003	0.0020	0.0131	0.0339	0.1170
	Urban Female	-	-	-	0.0003	0.0027	0.0115	0.0518	0.1807
	Rural Male	-	-	-	0.0017	0.0035	0.0204	0.0537	0.1576
	Rural Female	-	-	-	0.0011	0.0044	0.0148	0.0689	0.2919

National emergency department utilization rates were taken from *Health, United States, 2006,* and are shown below in Table 12. Utilization rates for home health and non-hospital ambulatory care were the same as presented in Tables 9 and 10.

Table 12. Emergency Department Visits per Person, by Age and Gender, 2004

	Female	Male
Younger than 18	0.36	0.38
18-44	0.47	0.36
45-64	0.31	0.30
65-74	0.34	0.34
75 and older	0.59	0.56

3. Adjustments for Patient Commuting

Projections are complicated, however, by the fact that the population using services in a county is not necessarily the population residing in the county.

For example, only 48% of inpatient days in Albany County hospitals can be attributed to Albany County residents, with the rest coming from surrounding counties (mainly Rensselaer [13%], Columbia/Greene [7%], Saratoga [7%], and Schenectady [5%]).

Adjustments to the baseline data based on demographic changes must therefore be based upon demographic changes in the county's entire service area. Data on patient commuting patterns for inpatient hospital care are available through New York's SPARCS data system, making it possible to estimate changes in demand for inpatient services by the population of each county, and then to distribute estimated demand to the counties where patients in that population are known to go for care[6].

Example: The population characteristics of Albany County in 2005, combined with national utilization rates, would produce an estimate of 162,683 inpatient days used by the population of Albany County. It is known, however, that 80.8% of hospital-based services used by Albany County residents are in Albany County hospitals, with most of the remainder going to Rensselaer County or Schenectady County hospitals (12.0% and 5.0%, respectively). So only 80.8% of this projected demand is applied to Albany County (131,448 inpatient days), while 12% is applied to Rensselaer County (19,522 inpatient days), and 5% is applied to Schenectady County (8,134).

The chart below shows how this logic is applied statewide (and then an estimate of inpatient days used by people residing outside of the state is added) to produce an estimate for Albany County of 281,567. This is much closer to the 353,412 actually observed in 2005 in Albany County than an estimate based just on Albany County residents.

An adjustment factor of 1.26 (353,412 / 281,567=1.26) is then applied to forecasts of Albany County demand for inpatient days.

[6] Discrepancies between the SPARCS data and data reported by the American Hospital Association raise questions about the reliability of SPARCS as the source of baseline data. SPARCS is used only to make geographic adjustments between counties, not to estimate demand.

Table 13. Geographic Adjustments Leading to Estimate of Inpatient Days in Albany County Hospitals

County/County Group	Predicted Inpatient Days	% in Albany County	# in Albany County
ALBANY	162682.7	80.8%	131435.2
ALLEGANY/CATTARAUGUS	69846.69	0.0%	8.495097
BRONX	657870.7	0.0%	80.23495
BROOME/TIOGA	142414.6	0.1%	202.9911
CHAUTAUQUA	73944.5	0.0%	0.955973
CHEMUNG/SCHUYLER	60878.01	0.0%	1.386648
CHENANGO/CORTLAND	51182.75	0.9%	437.436
CLINTON/ESSEX/FRANKLIN/HAMILTON	91009.39	3.1%	2865.844
COLUMBIA/GREENE	61945.05	39.9%	24725.08
DELAWARE/OTSEGO/SCHOHARIE	79127	10.5%	8294.189
DUTCHESS	149391.1	2.4%	3528.264
ERIE	530028.4	0.0%	73.8684
FULTON/MONTGOMERY	57079.61	11.9%	6819.205
GENESEE/ORLEANS	54647.6	0.0%	9.17872
HERKIMER/ONEIDA	172903.4	1.4%	2403.829
JEFFERSON/LEWIS	62963.59	0.1%	88.47778
KINGS	1257177	0.0%	122.017
LIVINGSTON/WYOMING	55554.38	0.0%	11.61254
MONROE/WAYNE	436959.8	0.0%	59.33196
NASSAU	738486.8	0.0%	221.1364
NEW YORK	835539.4	0.0%	101.8397
NIAGARA	124985.3	0.0%	2.304825
ONONDAGA/MADISON/CAYUGA	324111.4	0.1%	353.0399
ONTARIO	56091.69	0.0%	8.166597
ORANGE	172407.5	0.4%	660.4338
OSWEGO	62198.97	0.0%	9.595152
QUEENS	1214994	0.0%	74.84724
RENSSELAER	80673.82	42.7%	34417.39
RICHMOND	247199	0.0%	52.11102
ROCKLAND	153367.5	0.0%	55.36898
SARATOGA	107372.1	22.5%	24159.42
SCHENECTADY	82957.25	13.9%	11514.18
SENECA/TOMPKINS	62562.54	0.1%	75.22119
ST. LAWRENCE	56756.81	0.1%	69.57652
STEUBEN/YATES	65911.81	0.0%	11.89452
SUFFOLK	753605.3	0.0%	169.8416
SULLIVAN/ULSTER	138811.7	6.8%	9441.387
WARREN/WASHINGTON	72208.17	12.3%	8889.158
WESTCHESTER/PUTNAM	554930.8	0.0%	172.2886
Out of State			9940
TOTAL			281566.8

4. Adjustment Factor for Deviations Between Actual and Estimated Utilization

Because there are drivers of county-level utilization other than the size, age, and gender of the population, and because these other drivers are not captured in our base models, there is sometimes considerable deviation between estimated and actual utilization on a county-by-county basis. The size and direction of this deviation varies widely. To account for this in projections going forward, an adjustment factor reflecting this deviation in the base year will be applied to the projected estimates. Table 14, below, shows the adjustment factor for each county in the base year.

Table 14. Adjustment Factors Reflecting Difference Between Estimated Versus Actual Utilization

	Inpatient Days	ED Visits	Outpt Visits	Nursing Home Residents
ALBANY	1.25	1.45	0.549617	0.867512
ALLEGANY/CATTARAUGUS	1.20	0.85	0.323171	0.668026
BRONX	2.35	1.28	0.538774	1.601997
BROOME/TIOGA	0.95	0.94	0.843507	0.809572
CHAUTAUQUA	1.75	1.24	0.453266	0.835126
CHEMUNG/SCHUYLER	2.38	1.57	0.69922	0.765614
CHENANGO/CORTLAND	3.07	1.65	0.474229	0.933022
CLINTON/ESSEX/FRANKLIN/HAMILTON	1.73	1.26	0.455692	0.63023
COLUMBIA/GREENE	2.82	0.88	0.204428	0.602927
DELAWARE/OTSEGO/SCHOHARIE	1.74	2.0	1.014506	0.542898
DUTCHESS	1.27	0.873625	0.2217	0.947369
ERIE	2.033185	0.942999	0.365596	0.813077
FULTON/MONTGOMERY	4.199254	1.215915	0.702023	0.741843
GENESEE/ORLEANS	1.9451	1.402108	0.924657	0.784665
HERKIMER/ONEIDA	2.123263	0.98201	0.455933	0.994356
JEFFERSON/LEWIS	1.30483	0.987242	0.35914	0.820659
KINGS	2.32371	0.896361	0.265434	0.749351
LIVINGSTON/WYOMING	2.677884	0.678758	0.358711	0.604708
MONROE/WAYNE	1.171329	0.955904	0.685162	0.929555
NASSAU	1.774121	0.951984	0.319647	0.732043
NEW YORK	1.57195	1.795806	0.604599	0.683185
NIAGARA	1.41728	1.134908	0.298171	0.806025
ONONDAGA/MADISON/CAYUGA	1.41882	0.976302	0.390473	0.746866
ONTARIO	2.699544	1.231913	1.885553	0.798263
ORANGE	1.393678	1.195392	0.235873	0.695682
OSWEGO	0.840671	0.66031	0.374938	0.740629
QUEENS	1.710644	0.789891	0.227874	0.819668
RENSSELAER	1.200715	0.88577	0.576664	0.972219
RICHMOND	1.41866	1.009033	0.222933	0.992215
ROCKLAND	0.895718	0.428474	0.085331	0.827972
SARATOGA	1.623804	0.431971	0.100694	0.52879
SCHENECTADY	1.130789	1.601779	0.418562	0.926302
SENECA/TOMPKINS	0.925253	0.515698	0.228423	0.665875
ST. LAWRENCE	1.764382	1.251267	0.615542	0.788709
STEUBEN/YATES	3.494555	1.196866	0.591452	0.638156

SUFFOLK	1.756743	0.84355	0.205148	0.849589
SULLIVAN/ULSTER	1.564414	0.823568	0.147141	0.712479
WARREN/WASHINGTON	0.9841	0.935685	0.757193	0.679781
WESTCHESTER/PUTNAM	1.516053	0.989048	0.29251	0.903809

5. What Will Drive Changes In Utilization Beyond Population Size And Age?

Going forward, there are a number of potentially influential variables that may change beyond population size, age, and gender. The NDM has identified a number of them from the literature and assessed their effects with national data. They can be applied as follows to the projected estimates of demand to reflect the most likely assumptions of the health care system. These are not used in the analyses in this report, but are presented so that the reader can understand the potential for estimating alternate scenarios.

HMO Enrollment. Some analysts believe that rising health care costs will revive the upward trend in HMO enrollment rates after declines for the past few years. The authors of the NDM assume that HMO enrollment rates will increase at 0.5% annually. This would be expected to produce a 0.15% decrease in inpatient days, a 0.14% decrease in emergency department visits, and a 0.18% decrease in nursing facility residents each year.

Percent of hospital-based surgeries performed in an outpatient setting. There has been a steady trend toward more hospital-based surgeries performed on an outpatient basis. The NDM assumes that there will be a 2% increase per year on the percent of surgeries performed on an outpatient basis. This would be expected to result in a 0.94% decrease in inpatient days each year, a 3.32% increase in outpatient visits each year, and a 1.72% increase in home health visits each year.

Percent of population uninsured or Medicaid eligible. Neither of these variables is likely to change much before 2020 based on the age distribution of the population. Changes in these variables are most likely to result from policy changes at the level of state and federal government, and the extent of such changes in the future are difficult to judge. Models estimated in the NDM imply that for every percent increase in population uninsured would produce a 0.16% decrease in nursing facility residents, while every percent increase in those Medicaid eligible would produce a 0.26% increase in inpatient days, a 0.17% increase in outpatient visits, a 0.29% increase in emergency department visits, and a 0.34% increase in home health visits.

Percent of population nonwhite or Hispanic. A few areas of New York will experience dramatic changes in the racial/ethnic distribution of their populations. While projections of percent nonwhite and percent Hispanic are not available by county, state-level projections provided by the Census can be used to distribute the nonwhite and Hispanic population across counties as they are now distributed. Then, straight line projections can be calculated based on the average annual rate of growth in these groups in each county between 2000 and 2006, and used to make adjustments that reflect recent increases or decreases in the minority population in each county groups (i.e., accounting for counties where nonwhite or Hispanic populations are growing faster than the state averages).

Almost all counties are experiencing increases in the proportions of their populations that are nonwhite or Hispanic, but in many areas of New York, these changes are expected to only amount to one or two percentage points by the year 2020. In other counties, however, the changing racial/ethnic distribution is expected to be dramatic. In Orange County, for example, the Hispanic population is expected to increase from 15.5% to 32.9%, while in Westchester/Putnam Counties the Hispanic population is expected to increase from 17.6% to 28.5%. Similarly, Schenectady County is projected to change from 14.8% to 34.5% nonwhite; Orange County is projected to change from 15.2% to 29.5% nonwhite; and Seneca/Tompkins Counties are projected to change from 14.3% to 26.8% nonwhite.

This may result in some effects on health care demand in these counties with the largest changes. For every 1% increase in the percent of the population that is nonwhite, outpatient visits should increase by 0.06%, and for every 1% increase in the percent of the population that is Hispanic, emergency department visits should decrease by 0.05%.

Percent of population in an urban area. The state, overall, is urbanizing. Almost every county group had a greater percentage of its population living in urban areas in 2000 than in 1990. In some counties, the increase was minimal – one or two percentage points. But in some counties, urbanization had occurred rapidly – the population of Ontario County had gone from 26.2% to 49.5% urban, while the population of Saratoga County had gone from 49.7% to 68.7% urban, and the population of Sullivan/Ulster Counties had gone from 25.7% to 44.2% urban. It can be assumed that these counties/county groups will continue to urbanize consistently with their past rates. For every percentage point increase in urban population, it is expected that inpatient days will decrease by 0.25% and nursing facility residents will decrease by 0.17%.

B. Modeling Nurse Staffing Intensity

Given an acceptable working model of projected demand for services, it is necessary to calculate how many RNs will be needed per unit of service. The standard selected deserves careful consideration, because it reflects our basic assumptions about what constitutes an ample supply of RNs. Possible benchmarks include current ratios of RNs to units of service, equal geographic distribution of RNs throughout the state, national ratios of RNs to units of service, ratios based on an “ideal” scenario (the state of Massachusetts springs to mind), or a supply that would eliminate currently reported hospital vacancies for RNs.

1. Current Supply Benchmark

The most basic definition of “enough” RNs is enough to maintain current ratios of RNs to units of service in each county, which assumes that current ratios are adequate. Using the status quo as a benchmark, however, not only risks assuming that current RN supply is adequate when it may not be, but also risks skewing projections in favor of currently disadvantaged counties (who have a lower bar to meet in the future) and against currently advantaged counties (who must continue to meet their higher bar to avoid being labeled as having a shortage). In other words, the counties are held to an unequal standard going forward.

Nurse workforce data. The number of RNs estimated in each setting below is used to estimate the current ratio of RNs to units of service in a particular setting for each county group. The simplest measure of future shortages is simply whether or not a county is expected to maintain current ratios going forward.

Hospital RNs. The ACS uses the broad category of "hospitals," without distinguishing whether an individual works in an inpatient unit, emergency department, or other outpatient unit. It is a logical approach to distribute hospital RNs in the ACS across the different hospital settings proportionate with the amount of services provided in each hospital setting in that county group from the ARF. What the model loses through this approach is the ability to identify RN shortages in different types of hospital care at the substate level. While the analyses produce estimates of RNs per inpatient day, emergency department visit, or outpatient visit, they may be more or less accurate depending on how well the distribution of hospital RNs in that county matches the overall distribution used as a reference.

Hospital nurses in New York City in 2000 were distributed as follows: 84.9% were in inpatient units, 7.8% were in emergency departments, and 6.4% were in outpatient departments. The total services provided in the five counties were 8,231,213 inpatient days, 3,304,332 emergency department visits, and 16,515,260 outpatient visits. In these counties there were 0.20 emergency department visits for every inpatient day, and 2.01 outpatient visits for every inpatient day.

Hospital nurses in other areas of the state were distributed 84.8% in inpatient units, 9.5% in EDs, and 5.7% in outpatient departments. The total of services provided in all other counties was 10,840,309 inpatient days, 4,011,014 emergency department visits, and 24,839,711 outpatient visits. Thus, in upstate New York, there were 0.37 emergency department visits for every inpatient day, and 2.29 outpatient visits for every inpatient day.

These two distributions will be used to apportion nurses in New York City and in the other counties. The ratios of emergency department visits to inpatient days and outpatient visits to inpatient days were calculated for each county or county group. The ratio for each county was then divided by the ratio for that part of the state overall to determine how much higher or lower than average the ratio is in percentage terms.

> *For example, in Albany County there were 0.61 emergency department visits for every inpatient day, which was 1.64 times the average for all counties outside of New York City. There were 3.15 outpatient visits for every inpatient day, which was 1.37 times the average for all counties outside of New York City.*

These figures were then used to adjust the percentage of hospital RNs found in EDs or outpatient departments for that part of the state overall. The remainder was presumed to be working in inpatient care.

*Continuing with the example of Albany County, we took the (non-NYC) average of 9.5% of hospital RNs working in EDs and the (non-NYC) average of 5.7% of hospital RNs working in outpatient settings, and increased them by this factor (9.5% * 1.64 = 5.8% and 5.7% * 1.37 = 4.1%) in order to estimate the percentage of hospital RNs in Albany County in ED or outpatient care. The remainder (90.1%) should be working in inpatient care.*

The counties ranged from an estimated 94% of their hospital RNs in inpatient care (Oswego) to an estimated 72% of their hospital RNs in inpatient care (Steuben/Yates). Estimates of emergency department care ranged from 22% of hospital RNs (Steuben/Yates) to 3% (Bronx). Finally, estimates of outpatient care ranged from 20% of hospital RNs (Nassau) to 2% (Broome/Tioga).

Nursing facilities and home health. Nurses working in nursing care facilities and in home health care services are relatively easy to identify through the ACS.

Non-hospital, non-public ambulatory care. Non-hospital ambulatory care includes offices of physicians, chiropractors, and other health practitioners; outpatient care centers; and other health care services operated in the private sector. These settings can also be easily identified through the ACS.

School health. School health RNs are identified as those working in elementary or secondary schools.

Public health. Public health is a more difficult label. There is no ACS code for public health agencies, and while other data are available on local public health departments, they are incomplete. It is also not clear how RNs working in public health may have classified themselves as such. If they were working in a county health clinic, they might have identified themselves as working in an outpatient care clinic rather than in a government agency.

In this analysis, RNs working in public health are defined as those working either in governmental administrative agencies[7], or in ambulatory care settings operated by the local, state, or federal government. When public health is so defined, the percentage of RNs both upstate and in New York City who can be classified as public health mirror the percentages in the National Sample Survey of Registered Nurses (NSSRN), which is considered the best national source of data on RNs (1.8% and 3.6% compared to 1.6% and 3.6%, respectively).

Nursing education. Nursing education is also difficult to quantify. Nurses in the ACS who are working in a college or university are not necessarily teaching, but may be working in a university health service. Also, RNs teaching in a diploma or LPN program might report their setting as a vocational school or hospital. Furthermore, many RNs working as college faculty may be reporting their occupation as postsecondary teacher rather than RN and be missed

[7] Executive offices/legislative bodies; justice, public order, and safety; administration of human resource programs; administration of environmental quality and housing; and administration of economic programs and space research.

altogether. The ACS is therefore not an effective source for estimating RNs working in nursing programs.

The easiest alternative is to limit the category of nursing education to RN programs, and distribute RNs into nursing education based upon the number of graduations from RN nursing programs in a county. The problem with doing this is that supply estimates are tied to demand for this important setting – all counties will have the same ratio of estimated RNs in nursing education to nursing graduations, because there are no data available that provide a reasonable basis for adjusting this ratio up or down.

When educational upgrades are included, there are 9,328 graduations from RN education programs in New York, and an estimated 5,344 faculty in RN programs (based on the NSSRN[8]). This is 0.57 nursing faculty for every graduation from an RN program statewide. Graduations by county are therefore multiplied by 0.57 to produce rough estimates of nursing faculty per county.

Other health care. In the ACS, we might presume that all individuals reporting their occupation as RN are working in health care to some capacity, regardless of the industry in which they are working. Other health care is therefore the sum of all the other categories subtracted from the total number of estimated RNs in each county.

2. Equal Distribution Benchmark

Another common definition of "enough" RNs is based on principles of proportionate distribution – each county should have the same number of inpatient RNs per 1,000 inpatient days, for example. Using this definition, those who have fewer than the statewide average are said to be experiencing "shortage," while those who have more than the statewide average are said to be experiencing "surplus." This benchmark, however, is also predicated on the assumption that the current supply of RNs in New York is adequate and that any differences between counties simply reflect maldistribution.

3. National Ratio Benchmark

Similarly, national ratios can be used as the benchmark to determine whether counties in New York are in shortage. This can be fine-tuned to compare New York counties to their counterparts nationwide by measures of rurality to provide a more nuanced picture (although this is not done in this paper). A national benchmark takes into account the fact that New York currently has a greater shortage of RNs than the U.S. overall, but does not take into account that the U.S. overall may be in shortage as well.

4. Ideal Benchmark

One can also construct an "ideal" benchmark of how many RNs per unit of service are needed in order to provide optimum care. This ideal is open to tremendous theoretical debate, however, and is unlikely to be resolved by the current study. One advisor suggested that one might use ratios

[8] It should be noted that the number of faculty could be an underestimate because the NSSRN is known to undersample New York City, which has more nursing programs than upstate New York.

from a state widely regarded to have a good supply of RNs relative to other states – such as Massachusetts – as a benchmark for such an "ideal" scenario.

Table 15. Ratios of RNs to Units of Service for New York (Equal Distribution Benchmark), U.S. (National Ratio Benchmark), and Massachusetts (Ideal Benchmark)

	U.S.			Massachusetts			New York		
	RNs	Units of service	Ratio	RNs	Units of service	Ratios	RNs	Units of service	Ratios
School health	47,199	53,379,370	8.84	2,563	1,060,858	24.16	4,693	3,349,652	14.01
Nursing education	64,008	129,941	0.49	1,492	2,489	0.60	5,284	9,328/8,564*	0.57/0.62*
Non-hospital ambulatory	314,327	949,085,032	0.33	8,677	25,532,160	0.34	17,688	62,416,545	0.28
Home health	91,912	105,481,559	0.87	3,331	2,507,788	1.33	6,599	6,186,175	1.07
Hospital inpatient	1,245,462	199,774,948	6.23	35,517	4,187,199	8.48	87,307	18,261,252	4.78
Hospital emergency department	133,823	114,801,570	0.92	4,248	2,818,656	1.51	11,894	7,655,348	1.55
Hospital outpatient	141,426	509,543,305	0.28	4,029	16,014,473	0.25	6,596	42,764,755	0.15
Nursing facilities	169,620	1,774,442	0.10	7,000	53,971	0.13	15,699	113,269	0.14
Public health	79,852	299,398,484	2.67	1,015	6,437,193	1.58	4,885	19,306,183	2.53
Other settings	83,021	299,398,484	2.77	3,174	6,437,193	4.93	4,479	19,306,183	2.32
Total	2,370,649	299,398,484	79.18	71,045	6,437,193	110.37	165,124	19,306,183	85.53

*Two figures are presented for NY graduations – 9,328 from Center data available only for NY, and 8,564 from IPEDS, a national dataset and the source of the figures given for the U.S. and Massachusetts.

5. Vacancy-based Benchmark

A final possibility is to define shortages in terms of the RN vacancy rates reported by hospitals in those counties. Hospital staffing is likely to be a barometer for the adequacy of the RN workforce in the entire geographic area because hospitals tend to have an easier time recruiting RNs than other settings. If hospitals are having difficulties staffing all of their budgeted RN positions, then other types of providers almost certainly are also.

Unfortunately, good RN vacancy data are difficult to find. The data that are available, provided by the Healthcare Association of New York, were provided by only about 50% of hospitals. Some counties have no data available. Other counties are likely to be skewed because so few of their hospitals responded – for example, Albany County, with the highest estimated ratio of hospital RNs to inpatient days in the state, shows a moderately high vacancy rate of 11% (8th highest in the state), but this was based on the responses from a single hospital. Hospitals may also differ in the way they define budgeted and staffed position, or in the accuracy of their reporting.

Still, these vacancy rates are useful as a demonstration of how better data could inform a benchmark rooted in an inability to fill budgeted RN positions rather than comparisons with other geographies that may also be in shortage or that may be inappropriate points of reference because of demographic, economic, or policy differences. Such a methodology would simply use the RN vacancy rate as an adjustment factor to be applied to current supply ratios.

Table 16. Estimated Hospital RN Vacancy Rates by County Group

Albany	11.3%	New York	7.2%
Allegany/Cattaraugus	11.6%	Niagara	13.5%
Bronx	8.4%	Onondaga/Madison/Cayuga	5.4%
Broome/Tioga	N/A	Ontario	7.9%
Chautauqua	7.3%	Orange	4.1%
Chemung/Schuyler	14.4%	Oswego	12.0%
Chenango/Cortland	26.6%	Queens	6.9%
Clinton/Essex/Franklin/Hamilton	10.9%	Rensselaer	10.2%
Columbia/Greene	N/A	Richmond	N/A
Delaware/Otsego/Schoharie	1.4%	Rockland	2.8%
Dutchess	18.0%	Saratoga	N/A
Erie	10.1%	Schenectady	0.3%
Fulton/Montgomery	1.5%	Seneca/Tompkins	N/A
Genesee/Orleans	7.5%	St. Lawrence	-6.6%
Herkimer/Oneida	7.1%	Steuben/Yates	5.8%
Jefferson/Lewis	10.9%	Suffolk	4.9%
Kings	7.4%	Sullivan/Ulster	5.3%
Livingston/Wyoming	7.1%	Warren/Washington	10.8%
Monroe/Wayne	20.7%	Westchester/Putnam	-1.7%
Nassau	7.7%	All New York	7.2%

6. What Will Drive Changes in Staffing Ratios?

As with utilization, there are many factors that could affect the ratio of RNs per unit of service projected into the future. Some of these have already been discussed.

Economic, Demographic and Health Care Environment Changes

HMO enrollment. As previously noted, some commentators assume a slow gradual increase in HMO enrollment beginning in the next few years – perhaps a 0.5% increase per year. A 1% increase in HMO enrollment would be expected to increase RN staffing per inpatient days by 0.30%, RN staffing per outpatient visits by 0.67%, and RN staffing per home health visit by 0.97%. Furthermore, RN staffing per physician office visit would be expected to decrease by 0.51%.

Percent of hospital surgeries performed in outpatient setting. As previously noted, the NDM assumes an increase of 2 percentage points per year in the percent of hospital-based surgeries performed on an outpatient basis. Each percentage point increase should lead to a corresponding increase of 0.64% in RN staffing per inpatient visits (as patients presenting for more routine procedures are less likely to appear in inpatient settings, increasing average levels of acuity among inpatients).

Percent of population in urban area. The urbanization of the population is expected to continue to increase consistently with rates of change between 1990 and 2000 (shown in Table 26). For each 1% increase in urban population, an increase of 0.16% is expected in RNs per inpatient days, and an increase of 0.39% is expected in RNs per outpatient days.

Mean age of population. For every 1% increase in the mean age of an area's population, a 1.69% increase in RN staffing is expected in physician offices.

Nursing home resident acuity. For every 1% increase in the average number of ADL limitations of nursing facility residents, nursing home RN staffing is expected to increase by 0.63%.

Policy Changes

Average Medicare and Medicaid rates. It is difficult to predict how Medicare and Medicaid reimbursement rates will change in the future, but alternate scenarios can be estimated by making the following adjustments. A 1% increase in the average Medicare payment per home health visit is expected to result in a 1% increase in RN home health staffing, while a 1% increase in the average Medicaid nursing facility daily rate is expected to result in a 0.34% increase in RN nursing facility staffing.

Uninsured and Medicaid eligible. It is also difficult to predict the future insurance status of the population. Changes based simply on age distribution are expected to be minimal at the county level, but policy changes could have substantial effects.

A 1% increase in the percent of the population uninsured is expected to decrease RN staffing per inpatient day by 0.37% and RN staffing in non-hospital ambulatory care by 0.21%. A 1% increase in the percent of the population Medicaid eligible is expected to decrease RN staffing in EDs by 0.19% and decrease RN staffing in nursing facilities by 0.19%.

Ratio of RN to LPN hourly wages. When RN wages rise relative to LPN wages, there is expected to be an increase in the substitution of LPNs for RNs, so that a 1% increase in the ratio of RN to LPN wages results in a decrease of 0.65% in RN staffing for inpatient days, a 1.06% decrease in RN staffing for home health visits, and a 0.64% decrease in RN staffing in non-hospital ambulatory care. (This, of course, is contingent upon the availability of LPNs and their ability to perform necessary services under their legal scope of practice.)

IV. Results

New York

Supply. New York was estimated to have approximately 165,124 RNs employed within its boundaries in 2005. About 64% of them were in hospitals, with 82% of hospital RNs in inpatient care, 11% in EDs, and 6% in outpatient departments. Another 11% of NY RNs were estimated to be working in non-hospital and non-public ambulatory settings, and 10% in nursing facilities. An estimated 3% worked in nursing education, 3% in public health settings, 3% in school health, and 3% in other settings.

Table 17. Selected Characteristics of New York RNs

Employed RNs	165,124
Median Age	46
% 55+	16.9%
% Diploma/ADN	39.4%
% BSN	43.0%
% MSN	17.6%
% in Hospitals	64%

In 2005-2006, an average of 1,616 RNs moved into geographic areas that supply New York with nurses, while an average of 1,923 RNs moved out of these areas (not including those who moved between supply areas), resulting in a net loss of approximately 307 RNs from the New York workforce each year. As shown below, this resulted not only from RNs leaving New York in greater numbers than they are moving in, but also from RNs leaving areas in other states that supply New York with RNs. Losses of resident RNs in New Jersey alone are expected to reduce the RN workforce in New York by almost 100 RNs per year.

Table 18. Location of Residence of RNs Employed in New York, Residential Migration Patterns, and Estimated Effects of Residential Migration on NY RN Supply

New York Suppliers	% from supplier	In-migrants to supplier PUMAs	Out-migrants from supplier PUMAs	% of resident RNs commuting to New York	In-migrants to New York workforce	Out-migrants from New York workforce
New York	96.0%	1,568	1,767	98.5%	1,544	1,740
Connecticut						
Middlesex County	0.03%	122	139	2.5%	3	3
Fairfield County	0.14%	402	334	3.7%	15	12
Massachusetts (selected PUMAs)						
Middlesex/Worcester Counties	0.05%	31	0	5.9%	2	0
Norfolk/Plymouth Counties	0.03%	225	210	1.5%	3	3
New Jersey (selected PUMAs)						
Bergen County	1.6%	44	0	33.4%	15	0
Passaic County	0.04%	0	0	3.1%	0	0
Hudson County	0.4%	34	221	21.0%	7	46
Middlesex County	0.2%	35	178	6.3%	2	11
Somerset County	0.08%	46	88	12.3%	6	11
Monmouth County	0.08%	0	119	7.4%	0	9
Ocean County	0.05%	11	55	2.7%	0.3	1
Essex County	0.3%	0	88	12.3%	0	11
Morris County	0.2%	167	210	7.2%	12	15
Union County	0.3%	0	88	12.3%	0	11
Burlington County	0.02%	129	957	2.7%	3	26
Mercer County	0.03%	48	74	3.2%	2	2
Pennsylvania (selected PUMAs)						
Crawford/Warren Counties	0.01%	26	0	2.1%	1	0
Cameron/Elk/McKean/Potter Counties	0.05%	7	0	10.3%	1	0
Bradford/Sullivan/Tioga Counties	0.1%	0	80	19.3%	0	15
Pike/Susquehanna/Wayne Counties	0.3%	0	13	43.0%	0	6
Monroe County	0.06%	0	17	7.1%	0	1
Total		2,895	4,638		1,616	1,923

Note: Those migrating into or from another supplier PUMA have been removed – unlike the county-level charts, this chart only reflects ***net*** entries and departures into the geographic area from which New York draws RNs.

Table 19. Projected Components of RN Supply Change, New York, 2005-2020

New York	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Base	165,124	168,241	170,983	173,369	175,396	177,097	178,423	179,402	180,019	180,318	180,263	179,886	179,191	178,212	176,994
In-migration	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897
Out-migration	4,638	4,728	4,805	4,872	4,929	4,976	5,014	5,041	5,059	5,067	5,065	5,055	5,035	5,008	4,974
Net migration	-1,741	-1,831	-1,908	-1,975	-2,032	-2,079	-2,117	-2,144	-2,162	-2,170	-2,168	-2,158	-2,138	-2,111	-2,077
Graduates	6,934	6,881	6,851	6,801	6,763	6,726	6,714	6,701	6,690	6,687	6,677	6,680	6,679	6,665	6,663
Foreign	1,269	1,269	1,269	1,269	1,269	1,269	1,269	1,269	1,269	1,269	1,269	1,269	1,269	1,269	1,269
Attrition	3,345	3,577	3,827	4,068	4,299	4,590	4,887	5,209	5,499	5,841	6,154	6,487	6,788	7,041	7,240
Total	168,241	170,983	173,369	175,396	177,097	178,423	179,402	180,019	180,318	180,263	179,886	179,191	178,212	176,994	175,610

The supply of RNs in New York is projected to increase by approximately 0.41% per year between 2005 and 2020 – much slower than the 1% annual growth rate observed between 2000 and 2005. Growth in the supply of RNs is expected to peak in 2013-2014, and then begin to slowly decline. The overall projected rate of growth 2005-2015 is 6.35%.

Demand. As shown below, NY residents use an average of approximately 0.946 inpatient days, 0.40 emergency department visits, 2.2 outpatient visits, and 3.23 non-hospital ambulatory visits per year. There are also an estimated 5.9 nursing facility residents for every 1,000 NY residents. This is higher than the rates of utilization in the U.S. overall.

Table 20. Demand for Services per 1,000 Population and RNs per Unit of Service, New York

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service
	NYS	U.S.	
Hospital Inpatient Days	946 inpatient days	667 inpatient days	4.78
Hospital Emergency Department Visits	397 ED visits	383 ED visits	1.55
Hospital Outpatient Days	2,215 outpatient visits	1,702 outpatient visits	0.15
Nursing Facility Residents	5.9 residents	5.9 residents	0.14
Home Health Visits	320 visits	352 visits	1.07
Non-Hospital Ambulatory Care	3,233 visits	3,170 visits	0.28

Demand for RNs in NY may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both.

Figure 1 shows that the population of NY will continue to grow, albeit slowly, between 2005 and 2020. Furthermore, the percentage of the population that is age 65 and older will increase from less than 13% to about 16%.

Figure 1. Projected Population of NY and Percent Age 65 and Older

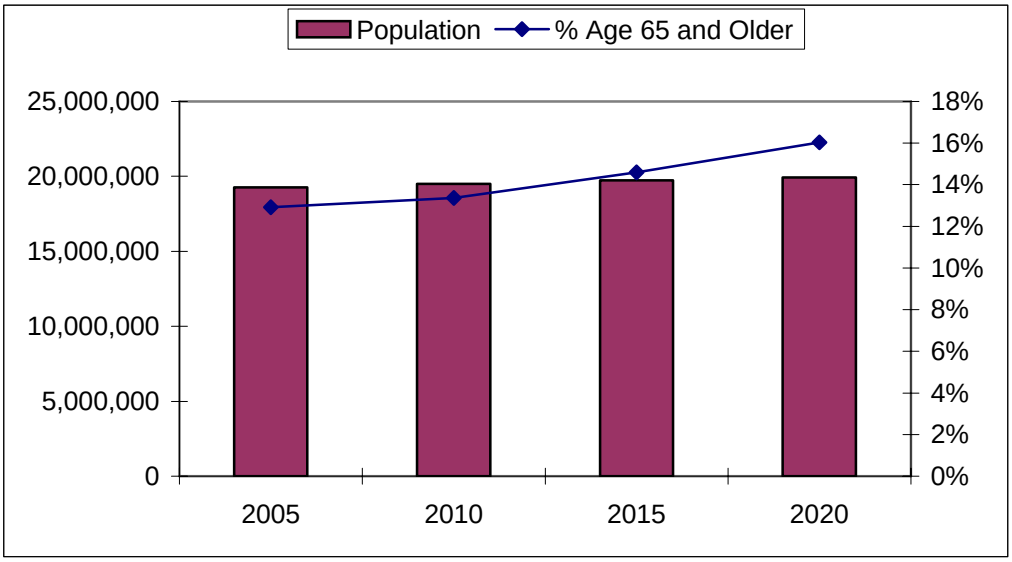


Table 21. Projected Demand for Services and Annual and Historical Growth Rate by Setting, NY

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Historical Annual Rate of Growth in Demand, 1990-2005
Hospital Inpatient Days	20,247,294	0.69%	-1.84%
Hospital Emergency Department Visits	7,961,482	0.17%	0.80%
Hospital Outpatient Days	45,593,478	0.43%	3.94%
Nursing Facilities	130,010	0.92%	-0.72
Home Health	6,659,425	0.49%	
Non-Hospital Ambulatory Care	67,024,001	0.47%	
Nursing Education	6,671	-0.26%	1.34%
Public Health	19,925,949	0.22%	0.47%
School Health	3,420,291	-0.22%	0.73%
Other	19,925,949	0.22%	

Note: It is not possible to estimate demand in 1990 for home health, non-hospital ambulatory care and other RN services because age-specific use of health services has changed substantially since 1990 and actual data are not available. The demand for public health and school health services are assumed to remain in proportion to the size of the populations using such services.

As shown in Table 22, RN supply in New York will need to increase by 8% in order to maintain current ratios, and even this will leave New York well below national ratios. Given that the RN supply in the state is only projected to increase 6%, a serious statewide RN shortage is likely in the future.

Table 22. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, New York

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
178,227	7.9%	178,506	8.1%	204,087	23.6%	270,450	63.8%	190,767	15.5%

Capital District Region

Nearly 11,000 RNs are employed in the Capital District of New York, which is composed of Albany, Columbia/Greene, Rensselaer, Saratoga, Schenectady, and Warren/Washington counties. RNs in this region are older on average than RNs statewide, and more likely to have a diploma or ADN and less likely to have a BSN as their highest degree.

Table 23. Selected Characteristics of Capital District RNs

	Capital District	New York
Employed RNs	10,855	165,124
Median Age	48	46
% 55+	20.3%	16.9%
% Diploma/ADN	57.8%	39.4%
% BSN	26.9%	43.0%
% MSN	15.8%	17.6%
% in Hospitals	60.0%	64.1%

Most RNs who work in the Capital District live in the Capital District, and the Capital District is an area that is gaining more resident RNs through migration than it is losing. Since most RNs who reside in the Capital District will also work there, this means most of these in-migrant RNs will join the Capital District workforce.

Table 24. Location of Residence of RNs Employed in the Capital District, Residential Migration Patterns, and Estimated Effects of Residential Migration on Capital District RN Supply

Capital District Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Capital District	In-migrants to Capital District workforce	Out-migrants from Capital District workforce
Capital District	96.1%	526	169	95.8%	504	162
Mohawk Valley	2.2%	84	155	7.2%	6	11
Southern Tier	1.7%	87	525	3.4%	3	18
					513	191

Between 2005 and 2006, the RN supply in the Capital District was estimated to have grown by nearly 600 RNs, or about 5.5%.

Table 25. Projected Components of RN Supply Change, Capital District, 2005-2006

Capital District	2005-2006
Base	10,855
In-migration	513
Out-migration	191
Net migration	322
Graduates	445
Foreign	13
Attrition	187
	+593 (5.5%)

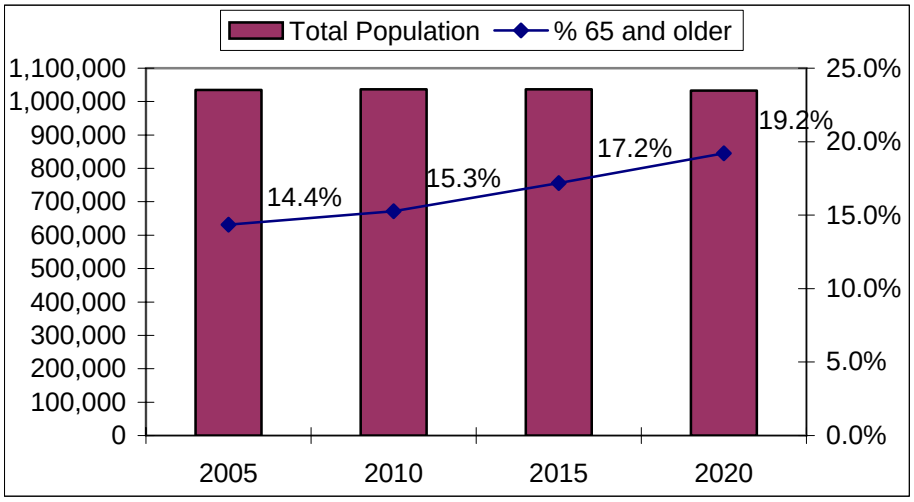
The Capital District is very similar to the state overall in the utilization of services by residents, although nursing facility residents per capita are somewhat higher than the state average. The Capital District has more RNs per unit of service employed in hospital settings, particularly in inpatient and emergency department settings, and more RNs per 1,000 non-hospital ambulatory care visits, but fewer RNs employed in school health per 1,000 school-age children.

Table 26. Demand for Services per 1,000 Population and RNs per Unit of Service, Capital District

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	Capital District	New York	Capital District	New York
Hospital Inpatient Days	923 inpatient days	946 inpatient days	5.20	4.78
Hospital Emergency Department Visits	400 ED visits	397 ED visits	2.48	1.55
Hospital Outpatient Days	2,536 outpatient visits	2,215 outpatient visits	0.14	0.15
Nursing Facility Residents	6.6 residents	5.9 residents	0.10	0.14
Home Health Visits	348 visits	320 visits	1.20	1.07
Non-Hospital Ambulatory Care	3,269 visits	3,233 visits	0.43	0.28
School Health	164 children	168 children	1.35	2.75
Public Health	1,000 people	1,000 people	0.59	0.51
Other	1,000 people	1,000 people	0.88	1.01

The population of the Capital District is expected to remain relatively stable between the years 2005 and 2020. During this time, however, the proportion of the population that is age 65 or older will increase substantially as shown in Figure 2. By the year 2020, nearly one out of five Capital District residents is expected to be age 65 or older, making this one of the oldest regions of the state.

Figure 2. Projected Population of Capital District and Percent Age 65 and Older



Hospital inpatient days in the Capital District are expected to increase only slightly more than the state average between 2005 and 2020. Hospital emergency department visits are projected to decline during this period and hospital outpatient visits are expected to increase more slowly in the region than statewide. Nursing facility residents are expected to increase, but not as rapidly as the state average, while home health and non-hospital ambulatory care are projected to increase more slowly. Due to projected declines in the population of school-age children and women between the ages of 18 and 44, demand for RNs in both school health and nursing education is projected to correspondingly decline during this period.

Table 27. Projected Demand for Services and Annual and Historical Growth Rate by Setting, Capital District

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, Capital District, 2005-2020	Projected Annual Growth Rate, New York
Hospital Inpatient Days	894,916	0.74%	0.69%
Hospital Emergency Department Visits	414,872	-0.11%	0.17%
Hospital Outpatient Days	2,769,186	0.24%	0.43%
Nursing Facilities	7,924	0.85%	0.92%
Home Health	381,242	0.27%	0.49%
Non-Hospital Ambulatory Care	3,622,795	0.33%	0.47%
Nursing Education	425	-0.31%	-0.26%
Public Health	1,033,195	-0.01%	0.22%
School Health	156,143	-0.57%	-0.22%
Other	1,033,195	-0.01%	0.22%

Compared to its current ratios and to both statewide and national averages, the Capital District region of New York should not face RN shortages by the year 2020. Indeed, the region should

not even face difficulties achieving the ratios seen in neighboring Massachusetts. Realizing such a "ideal" scenario would require growth of 20.8% between 2005 and 2020, or average annual growth of 1.3% per year. With estimated growth of 5.5% between 2005 and 2006, this seems like an easily achievable goal for the Capital District. As the following sections show, however, different counties within the Capital District region will benefit in other ways from the region's growing supply of RNs.

Table 28. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Capital District

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
11,450	5.4%	8,866	-18.3%	9,964	-8.2%	13,117	20.8%	12,297	13.3%

Albany County

Supply. Albany County's estimated base year RN population was 5,252 RNs in 2005. Albany County is favored by a relatively young RN supply (average age of 45 compared to 46 statewide). An estimated 54% of RNs working in Albany County are diploma/ADN nurses (compared to 40% statewide), while 30% are BSNs (compared to 42% statewide), and 16% have a MSN or doctorate (versus 17% statewide).

Table 29. Selected Characteristics of Albany County RNs

	Albany County	New York	Ranking
Employed RNs	5,252	165,124	11/39
Median Age	45	46	--
% 55+	12.9%	16.9%	33/39
% Diploma/ADN	53.4%	39.4%	19/39
% BSN	30.2%	43.0%	24/39
% MSN	16.4%	17.6%	14/39
% in Hospitals	71.4%	64.1%	3/39

Seventy-one percent of the RNs employed in Albany County work in hospitals (versus 64% statewide), while 8% work in physician offices or outpatient care centers (versus 11% statewide), 4% work in nursing homes (versus 10% statewide), and 1.4% work in home health (versus 4.0% statewide). Three percent of Albany County RNs work in public health settings (the same as statewide), and four percent work in school health (compared to 3% statewide). It is worth noting that Albany County ranks third in the state for the percentage of RNs employed in hospitals.

Although about 85% of RNs residing in Albany County also work there, only about 54% of RNs working in Albany County live in Albany County. The largest RN supplier counties are Rensselaer County (18%), Saratoga County (8%), and Schenectady County (7%). An estimated 649 RNs per year move into the areas that supply Albany County with RNs and an estimated 323 of these RNs will work in Albany County. At the same time, an estimated 225 RNs who work in Albany County will relocate out of Albany County supply areas (4.3% of Albany County RNs).

Table 30. Location of Residence of RNs Employed in Albany County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Albany County RN Supply

Albany County Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Albany	In-migrants to Albany workforce	Out-migrants from Albany workforce
Albany	54.3%	271	163	85.0%	230	139
Columbia/Greene	5.8%	134	0	20.5%	27	0
Delaware/Otsego/Schoharie	2.6%	43	232	9.0%	4	21
Fulton/Montgomery	3.7%	0	0	23.5%	0	0
Rensselaer	17.7%	32	38	64.2%	20	24
Saratoga	7.7%	99	73	19.1%	19	14
Schenectady	6.9%	70	82	33.2%	23	27
Warren/Washington	1.3%	0	0	5.4%	0	0
		649	588		323	225

During the 2005-2006 period, an estimated 13 RNs entered Albany County from abroad, and 220 new RNs graduates entered the Albany County workforce. Attrition of existing RNs due to death, disability, or retirement was estimated at 87 RNs in 2005-06 (1.7% of the workforce), but this is projected to grow (to 4.3% of the workforce) as the workforce ages.

Indeed, the number of new graduates entering the Albany County workforce is expected to decline. Despite growing attrition and out-migration, Albany County's RN workforce is estimated to continue growing up until 2017-2018.

Table 31. Projected Components of RN Supply Change, Albany County, 2005-2020

Albany County	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Base	5252	5555	5831	6067	6269	6439	6584	6701	6783	6856	6901	6937	6952	6960	6954
In-migration	499	499	499	499	499	499	499	499	499	499	499	499	499	499	499
Out-migration	342	361	379	394	407	419	428	436	441	446	449	451	452	452	452
Net migration	157	138	120	105	92	80	71	63	58	53	50	48	47	47	47
Graduates	220	220	218	218	216	216	214	214	214	211	211	211	211	209	209
Foreign	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Attrition	87	95	115	134	150	164	181	207	212	233	239	258	264	274	286
Total	5555	5831	6067	6269	6439	6584	6701	6783	6856	6901	6937	6952	6960	6954	6937

In sum, Albany County is among the top ten county groups for both in-migration and out-migration, but also for projected attrition. This projected annual increase of 1.9% per year in Albany County's RN supply is higher than the 1.1% growth in RN supply observed between 2000 and 2005 in Albany County, but appears to be a realistic projection.

Table 32. Relative Rankings of Key Components of Supply Projections, Albany County

	Albany County Ranking
% of resident RNs working in county	11/39
% of RN workforce that lives in county	34/39
In-migration	6/39
Out-migration	10/39
Net migration	11/39
Projected attrition, 2020	8/39
Projected supply growth, 2005-2020	20/39

Demand. The use of hospital services per capita in Albany County is relatively high, with the county ranking in the top ten county groups for hospital inpatient days and emergency department visits. This is not surprising since hospitals in Albany provide services to residents of many surrounding counties.

Despite this high level of demand, Albany County ranks second highest in the state for estimated RNs per 1,000 inpatient days (8.6 versus 4.8 statewide) and the highest for RNs per 1,000 emergency department visits (3.3 versus 1.6 statewide), while ranking sixth for RNs per 1,000 outpatient visits. However, RNs per nursing facility resident and RNs per home health visit are lower than the statewide ratios.

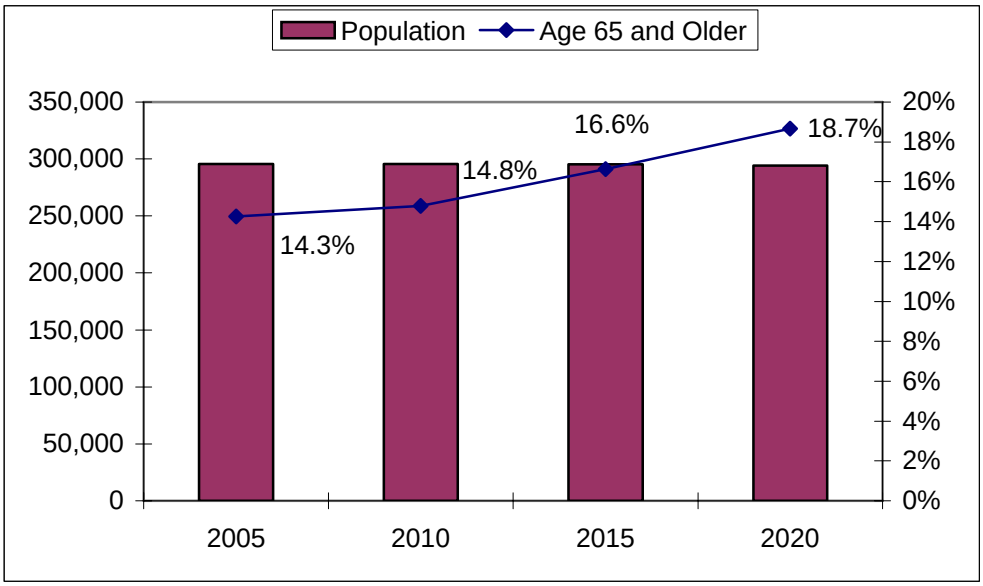
Table 33. Demand for Services per 1,000 Population and RNs per Unit of Service, Albany County and New York

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Albany County	New York	Ranking	Albany County	New York	Ranking
Hospital Inpatient Days	1,196 inpatient days	946 inpatient days	7/39	8.61	4.78	2/39
Hospital Emergency Department Visits	560 ED visits	397 ED visits	6/39	3.30	1.55	1/39
Hospital Outpatient Days	3,244 visits	2,215 visits	13/39	0.18	0.15	6/39
Nursing Facilities	7.3 residents	5.9 residents	11/39	0.09	0.14	26/39
Home Health	355 visits	320 visits	14/39	0.72	1.07	23/39
Non-Hospital Ambulatory Care	3,320 visits	3,233 visits	15/39	0.43	0.28	11/39
Public Health	1,000 people	1,000 people	--	5.58	2.53	13/39
School Health	161 children	168 children	30/39	41.72	14.01	4/39
Other	1,000 people	1,000 people	--	8.42	2.32	2/39

Demand for RNs in Albany County may shift as a consequence of changing demand for services (by growth of and an aging population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Albany County is projected to decline slightly in the coming years, but the population age 65 and older will

become a larger proportion of the population (from about 14% to almost 19%). Albany County's ranking for population age will increase from 16th out of 39 to 13th out of 39.

Figure 3. Projected Population of Albany County and Percent Age 65 and Older



In coming years, care in many settings is expected to increase to meet the needs of an aging population. Less demand is anticipated for public health and school health services as the population of Albany County, particularly of school-age children, declines.

Table 34. Projected Demand for Services and Annual Growth Rate by Setting, Albany County and New York

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, Albany County, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	390,957	0.67%	0.69%	19/39
Hospital Emergency Department Visits	164,415	-0.04%	0.17%	25/39
Hospital Outpatient Days	996,951	0.26%	0.43%	22/39
Nursing Facilities	2,420	0.78%	0.92%	23/39
Home Health	106,528	0.10%	0.49%	24/39
Non-Hospital Ambulatory Care	1,020,607	0.26%	0.47%	23/39
Nursing Education	209	-0.34%	-0.26%	20/39
Public Health	294,248	-0.03%	0.22%	25/39
School Health	44,604	-0.43%	-0.22%	21/39
Other	294,248	-0.03%	0.22%	25/39

The supply of RNs in Albany County increased by 68% between 1990 and 2005. Supply from 2005 to 2020 is expected to increase by only 20%. This should, however, be adequate to cover increases in demand using almost any benchmark.

Table 35. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Albany County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
5,548	-5.6%	3,352	-36.2%	3,843	-26.8%	5,108	-2.7%	6,163	17.4%

Despite the projected decline in the number of RNs starting after 2016-2017, Albany County should not face serious problems in meeting its demand by the year 2020.

Columbia/Greene Counties

Supply. Columbia/Greene's estimated base year RN population was 969 RNs in 2005. RNs in Columbia/Greene counties are older than RNs statewide (with a median age of 50 versus 46). These counties rank first in the state for the percent of RNs that are diploma/ADN nurses (87% compared to 39% statewide), and last in the state for the percent of RNs with BSNs (8%compared to 27% statewide). Just 5% of RNs working in Columbia/Greene counties have an MSN or doctorate (versus 18% statewide).

Table 36. Selected Characteristics of RNs, Columbia/Greene Counties and New York

	Columbia/Greene Counties	New York	Rankings
Employed RNs	969	165,124	30/39
Median Age	50	46	--
% 55+	14.3%	16.9%	27/39
% Diploma/ADN	86.5%	39.4%	1/39
% BSN	8.3%	43.0%	39/39
% MSN	5.2%	17.6%	34/39
% in Hospitals	32.5%	64.1%	38/39

Few RNs in Columbia/Greene are employed in hospitals (33% versus 64% statewide). An estimated 29% work in non-hospital ambulatory care (compared to 11% statewide), and an estimated 14% percent work in nursing facilities (versus 10% statewide). An estimated 12% work in home health care and an estimated 7% work in public health (both higher than the 4% and 3% statewide, respectively).

The vast majority of the RNs working in Columbia/Greene (92%) live in these two counties, while 8% percent come from Albany County. An estimated 404 RNs per year move into the areas that supply Columbia/Greene with RNs, and an estimated 86 of these RNs will work in Columbia/Greene counties. At the same time, an estimated four RNs who work in Columbia/Greene counties will relocate out of Columbia/Greene supply areas (0.4% of the RN workforce).

Table 37. Location of Residence of RNs Employed in Columbia/Greene Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Columbia/Greene RN Supply

Columbia/Greene Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Columbia/Greene	In-migrants to Columbia/Greene workforce	Out-migrants from Columbia/Greene workforce
Albany	8.4%	271	163	2.4%	7	4
Columbia/Greene	91.6%	134	0	59.5%	79	0
		405	163		86	4

During the 2005-2006 period, an estimated 41 new RNs graduates entered the Columbia/Greene counties workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women declines. Attrition of existing RNs due to death, disability, or retirement was estimated at 16 RNs in 2005-06 (1.7% of the workforce), but this is projected to grow to 10.3% of the workforce as the workforce ages. Favored by steady in-migration (the second-highest in the state), the RN workforce in Columbia/Greene counties is expected to continue to grow until about 2016.

Table 38. Projected Components of RN Supply Change, Columbia/Greene Counties, 2005-2020

Columbia/ Greene	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	969	1074	1176	1273	1361	1442	1516	1585	1641	1686	1712	1724	1721	1707	1677	73%
In-migration	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	0%
Out-migration	4	4	5	5	5	6	6	6	7	7	7	7	7	7	7	73%
Net migration	81	81	80	80	80	79	79	79	78	78	78	78	78	78	78	-3%
Graduates	41	40	40	39	39	38	38	38	37	37	37	37	37	36	36	-12%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	16	19	24	30	38	43	48	60	71	90	103	118	129	144	173	952%
Total	1074	1176	1273	1361	1442	1516	1585	1641	1686	1712	1724	1721	1707	1677	1618	51%

This is robust annual growth of 3.4%, which exceeds the 1.3% growth observed between 2000 and 2005.

Table 39. Relative Rankings of Key Components of Supply Projections, Columbia/Greene Counties

	Columbia/Greene Ranking
% of resident RNs working in county	24/39
% of RN workforce that lives in county	8/39
In-migration	2/39
Out-migration	34/39
Net migration	1/39
Projected attrition, 2020	3/39
Projected supply growth, 2005-2020	7/39

Demand. There are fewer inpatient days per capita in Columbia/Greene counties than in New York overall, and substantially fewer outpatient days. Many residents of Columbia/Greene counties go outside these counties for their hospital care. There are, however, more nursing facility residents than the statewide average, and the counties rank second in the state for both home health visits and non-hospital ambulatory care visits per 1,000 population.

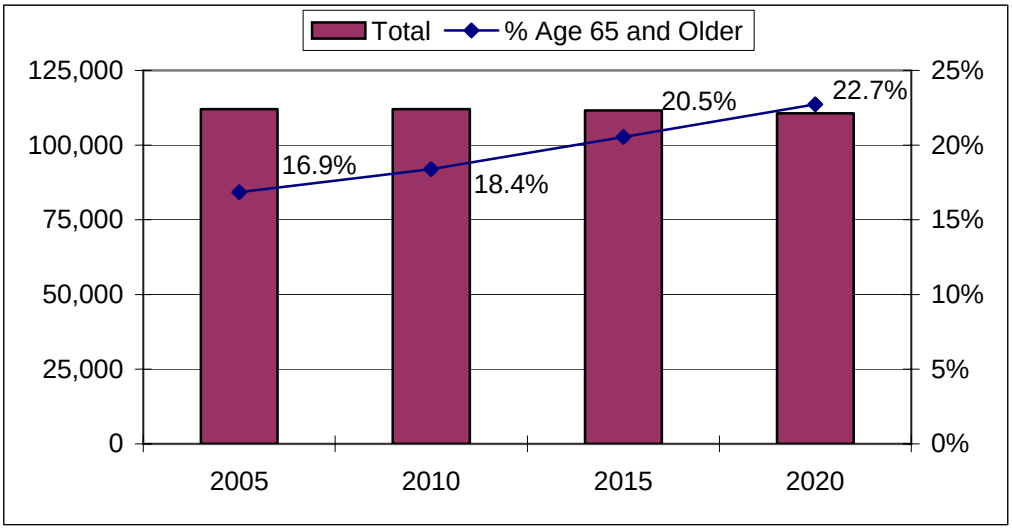
Columbia/Greene counties have fewer RNs per unit of service in hospital settings, but more in community-based settings (except for school health). In particular, the counties rank second in the state for RNs per home health visit and RNs per non-hospital ambulatory care visit.

Table 40. Projected Demand for Services and Annual Growth Rate by Setting, Columbia/Greene Counties

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Columbia/ Greene Counties	New York	Rankings	Columbia/ Greene Counties	New York	Rankings
Hospital Inpatient Days	695 inpatient	946 inpatient	25/39	3.19	4.78	30/39
Hospital Emergency Department Visits	335 ED visits	397 ED visits	29/39	1.50	1.55	22/39
Hospital Outpatient Days	1,258 visits	2,215 visits	34/39	0.08	0.15	29/39
Nursing Facilities	7.1 residents	5.9 residents	14/39	0.17	0.14	13/39
Home Health	386 visits	320 visits	2/39	2.68	1.07	2/39
Non-Hospital Ambulatory Care	3,432 visits	3,233 visits	2/39	0.73	0.28	2/39
Public Health	1,000 people	1,000 people	--	6.34	2.53	10/39
School Health	141 children	168 children	36/39	0	14.01	39/39
Other	1,000 people	1,000 people	--	1.98	2.32	18/39

Demand for RNs in Columbia/Greene counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Columbia/Greene counties is projected to decline slightly in the coming years, but the population age 65 or older will become a progressively larger proportion of the population (from 17% to almost 23%). Columbia/Greene counties currently rank second in the state in their proportion of the population age 65 and older, and are expected to maintain this ranking through 2020.

Figure 4. Projected Population of Columbia/Greene Counties and Percent Age 65 and Older



Growth in demand for nursing facility services will rise substantially in Columbia/Greene counties, as will demand for hospital inpatient services. Hospital outpatient services, home health, and non-hospital ambulatory care will rise more moderately, and emergency department utilization is expected to decline. Growth is projected to be among the lowest in the state for nursing education and school health.

Table 41. Projected Demand for Services and Annual Growth Rate by Setting, Columbia/Greene Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	88,033	0.82%	0.69%	13/39
Hospital Emergency Department Visits	37,254	-0.05%	0.17%	26/39
Hospital Outpatient Days	147,787	0.32%	0.43%	19/39
Nursing Facilities	942	1.14%	0.92%	13/39
Home Health	45,820	0.38%	0.49%	17/39
Non-Hospital Ambulatory Care	402,638	0.31%	0.47%	20/39
Nursing Education	36	-0.87%	-0.29%	35/39
Public Health	110,709	-0.08%	0.22%	27/39
School Health	13,574	-1.00%	-0.22%	36/39
Other	110,709	-0.08%	0.22%	27/39

The RN supply in Columbia/Greene counties will need to increase an estimated 7% in order to maintain current ratios. However, the current RN ratios are higher than those statewide and comparable to those for the U.S. overall.

Table 42. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Columbia/Greene Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
1,039	7.2%	890	-8.2%	980	1.1%	1,298	34.0%	1,037	7.0%

The RN supply in Columbia/Greene counties is expected to increase an estimated 51%, due primarily to continuing in-migration of RNs. This will be more than sufficient to meet statewide and national benchmarks and to continue current ratios of RNs. Columbia/Greene counties will even have higher ratios of RNs per unit of service than Massachusetts, which is probably the most RN-dense state in the U.S.

Rensselaer County

Supply. Rensselaer County's base year RN population was estimated at 1,090 RNs in 2005. RNs in Rensselaer County are dramatically older than RNs statewide (with a median age of 56 versus 46), and are estimated to be the oldest RN workforce in the state (although the small sample size in Rensselaer County requires that the estimates be approached with caution). Given the age of the workforce, it is perhaps not surprising that RNs in Rensselaer County are the third most likely in the state to have diplomas or ADNs as their highest degree. An estimated 74% of RNs working in Rensselaer County are diploma/ADN nurses (compared to 39% statewide), while 14% are BSNs (compared to 43% statewide), and 12% have a MSN or doctorate (versus 18% statewide).

Table 43. Selected Characteristics of RNs, Rensselaer County and New York

	Rensselaer County	New York	Rankings
Employed RNs	1,090	165,124	26/39
Median Age	56	46	--
% 55+	50.0%	16.9%	1/39
% Diploma/ADN	74.4%	39.4%	3/39
% BSN	13.8%	43.0%	36/39
% MSN	11.8%	17.6%	25/39
% in Hospitals	55.2%	64.1%	23/39

About 55% of RNs in Rensselaer County are employed in hospitals (versus 64% statewide). An estimated 16% work in non-hospital ambulatory care (compared to 11% statewide), and an estimated 9% percent work in nursing facilities (versus 10% statewide). An estimated 5% work in home health (compared to 4% statewide).

A minority of the RNs working in Rensselaer County (33%) lives in the county, while 44% percent come from Saratoga County, and 16% come from Albany County. The remainder comes from Warren/Washington counties (4%), and Columbia/Greene counties (3%). An estimated 535 RNs per year move into the areas that supply Rensselaer County with RNs, and an estimated 47 of these RNs will work in Rensselaer County. At the same time, an estimated 34 RNs who work

in Rensselaer County will relocate out of Rensselaer County supply areas (3.1% of the RN workforce).

Table 44. Location of Residence of RNs Employed in Rensselaer County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Rensselaer County RN Supply

Rensselaer County Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Rensselaer	In-migrants to Rensselaer workforce	Out-migrants from Rensselaer workforce
Albany	15.8%	271	163	5.1%	14	8
Columbia/Greene	3.3%	134	0	2.4%	3	0
Rensselaer	33.1%	32	38	24.7%	8	9
Saratoga	43.9%	99	73	22.3%	22	16
Warren/Washington	3.9%	0	0	3.3%	0	0
		535	274		47	34

During the 2005-2006 period, an estimated 46 new RNs graduates entered the Rensselaer County workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women declines. Attrition of existing RNs due to death, disability, or retirement was estimated at 18 RNs in 2005-06 (1.7% of the workforce), but this is projected to grow to 2.4% as the workforce ages. Overall supply growth during this period is projected at 24%.

Table 45. Projected Components of RN Supply Change, Rensselaer County, 2005-2020

Rensselaer	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	1090	1131	1169	1203	1232	1258	1282	1302	1319	1335	1349	1363	1374	1385	1397	28%
In-migration	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	0%
Out-migration	34	35	36	38	38	39	40	41	41	42	42	43	43	43	44	28%
Net migration	13	12	11	9	9	8	7	6	6	5	5	4	4	4	3	-74%
Graduates	46	45	45	44	44	43	43	43	42	42	42	42	42	42	41	-10%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	18	19	22	24	26	28	30	33	32	34	33	35	34	34	34	91%
Total	1131	1169	1203	1232	1258	1282	1302	1319	1335	1349	1363	1374	1385	1397	1407	24%

The estimated growth in Rensselaer County's RN workforce between 2005 and 2020 is quite robust, at 1.7% annually. The estimated average annual growth rate between 2000 and 2005 was –6.4%, although sample sizes were small enough to make both of these estimates difficult to interpret.

Table 46. Relative Rankings of Key Components of Supply Projections, Rensselaer County

	Rensselaer County Ranking
% of resident RNs working in county	39/39
% of RN workforce that lives in county	38/39
In-migration	17/39
Out-migration	14/39
Net migration	14/39
Projected attrition, 2020	37/39
Projected supply growth, 2005-2020	16/39

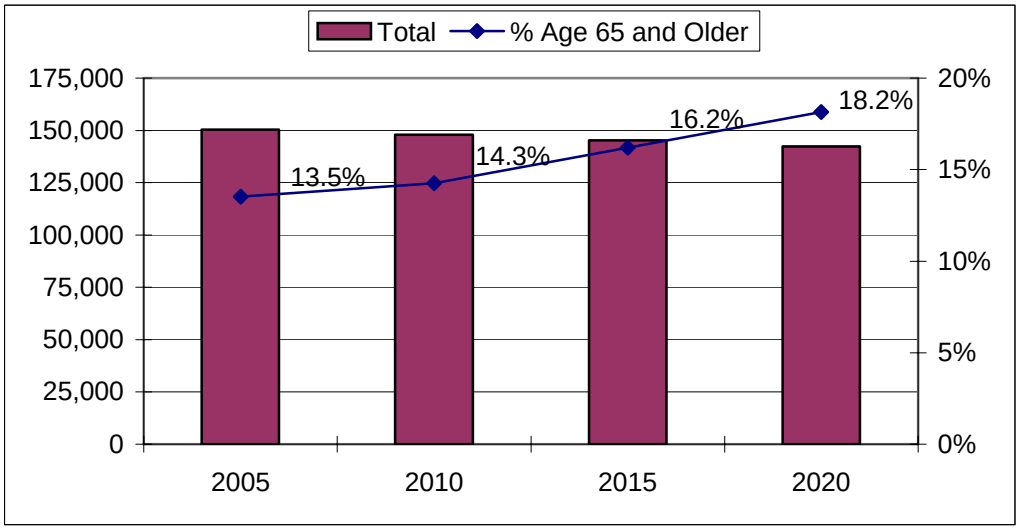
Demand. While the use of hospital inpatient services per capita in Rensselaer County is lower than that statewide, the use of non-emergency outpatient services is higher. There are also more nursing facility residents per capita in Rensselaer County. RN staffing is comparable to statewide ratios in most settings and higher in hospital EDs.

Table 47. Projected Demand for Services and Annual Growth Rate by Setting, Rensselaer County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Rensselaer County	New York	Rankings	Rensselaer County	New York	Rankings
Hospital Inpatient Days	632 inpatient days	946 inpatient days	29/39	4.40	4.78	21/39
Hospital Emergency Dept. Visits	339 ED visits	397 ED visits	28/39	2.34	1.55	9/39
Hospital Outpatient Days	3,371 visits	2,215 visits	12/39	0.13	0.15	14/39
Nursing Facilities	7.8 residents	5.9 residents	7/39	0.08	0.14	28/39
Home Health	334 visits	320 visits	22/39	0.99	1.07	16/39
Non-Hospital Ambulatory Care	3,281 visits	3,233 visits	22/39	0.35	0.28	16/39
Public Health	1,000 people	1,000 people	--	4.31	2.53	16/39
School Health	174 children	168 children	21/39	8.18	14.01	28/39
Other	1,000 people	1,000 people	--	1.34	2.32	22/39

Demand for RNs in Rensselaer County may change as a consequence of shifting demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Rensselaer County is projected to decline slightly in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 14% to 18%).

Figure 5. Projected Population of Rensselaer County and Percent Age 65 and Older



Demand for most health care services is projected to decline in Rensselaer County as the population declines. Nursing facility residents and hospital inpatient days are projected to increase, however, with the aging of the population.

Table 48. Projected Demand for Services and Annual Growth Rate by Setting, Rensselaer County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	104,305	0.61%	0.69%	24/39
Hospital Emergency Department Visits	48,238	-0.38%	0.17%	34/39
Hospital Outpatient Days	505,878	-0.03%	0.43%	32/39
Nursing Facilities	1,253	0.45%	0.92%	31/39
Home Health	48,918	-0.20%	0.49%	33/39
Non-Hospital Ambulatory Care	492,120	-0.03%	0.47%	32/39
Nursing Education	41	-0.70%	-0.29%	31/39
Public Health	142,502	-0.37%	0.22%	34/39
School Health	23,481	-0.75%	-0.22%	30/39
Other	142,502	-0.37%	0.22%	34/39

Projected robust growth in the RN supply in Rensselaer County, coupled with declining projected demand for many services, should put Rensselaer County in a comfortable position moving forward. Ratios of RNs to units of service should remain above state and national benchmarks, although they will still not be as high as ratios observed in Massachusetts.

Table 49. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Rensselaer County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
1,085	-0.5%	1,145	5.1%	1,285	17.9%	1,666	52.8%	1,193	9.5%

Saratoga County

Supply. Saratoga County's estimated base year RN population was 1,021 RNs in 2005. RNs in Saratoga County are older than RNs statewide (with a median age of 49 versus 46), and are more likely to be older than age 55 (30% versus 17%). Saratoga County ranks third in the state in the percent of RNs who have a bachelor's degree. An estimated 48% of RNs working in Saratoga County are diploma/ADN nurses (compared to 39% statewide), while 29% are BSNs (compared to 43% statewide), and 24% have a MSN or doctorate (versus 18% statewide).

Table 50. Selected Characteristics of RNs, Saratoga County and New York

	Saratoga County	New York	Rankings
Employed RNs	1,021	165,124	28/39
Median Age	49	46	--
% 55+	29.8%	16.9%	4/39
% Diploma/ADN	47.9%	39.4%	33/39
% BSN	28.6%	43.0%	3/39
% MSN	23.6%	17.6%	22/39
% in Hospitals	54.2%	64.1%	13/39

About 54% of RNs in Saratoga County are employed in hospitals (versus 64% statewide). An estimated 27% work in non-hospital ambulatory care (compared to 11% statewide), and an estimated 5% percent work in nursing facilities (versus 10% statewide).

Most of the RNs working in Saratoga County live in the county (68%), while 18% come from Warren/Washington counties and 6% from Albany County. The remainder comes from Rensselaer County (5%) and Fulton/Montgomery counties (3%). An estimated 401 RNs per year move into the areas that supply Saratoga County with RNs, and an estimated 38 of these RNs will work in Saratoga County. At the same time, an estimated 28 RNs who work in Saratoga County will relocate out of Saratoga County supply areas (2.7% of the RN workforce).

Table 51. Location of Residence of RNs Employed in Saratoga County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Saratoga County RN Supply

Saratoga Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Saratoga	In-migrants to Saratoga workforce	Out-migrants from Saratoga workforce
Albany	6.0%	271	163	1.8%	5	3
Fulton/Montgomery	3.2%	0	0	3.9%	0	0
Rensselaer	4.8%	32	38	3.3%	1	1
Saratoga	68.3%	99	73	32.5%	32	24
Warren/Washington	17.8%	0	0	14.2%	0	0
		401	274		38	28

During the 2005-2006 period, an estimated 43 new RNs graduates entered the Saratoga County workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women wanes. Attrition of existing RNs due to death, disability, or retirement was estimated at 17 RNs in 2005-06 (1.7% of the workforce), but this is projected to grow to 2.7% of the workforce as the workforce ages. Overall supply growth in Saratoga County during this period could reach 23%. This is an estimated average annual increase of 1.6%, which is in sharp contrast to the rate of –1.4% observed between 2000 and 2005.

Table 52. Projected Components of RN Supply Change, Saratoga County, 2005-2020

Saratoga	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	1,021	1,057	1,091	1,121	1,147	1,170	1,191	1,209	1,223	1,237	1,249	1,261	1,271	1,281	1,291	26%
In-migration	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	0%
Out-migration	28	29	30	31	31	32	33	33	33	34	34	34	35	35	35	26%
Net migration	10	9	8	7	7	6	5	5	5	4	4	4	3	3	3	-73%
Graduates	43	42	42	42	42	42	42	42	42	42	42	42	42	42	42	-1%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	17	18	21	23	25	27	29	32	32	34	34	35	35	35	35	111%
Total	1,057	1,091	1,121	1,147	1,170	1,191	1,209	1,223	1,237	1,249	1,261	1,271	1,281	1,291	1,301	23%

Table 53. Relative Rankings of Key Components of Supply Projections, Saratoga County

	Saratoga County Ranking
% of resident RNs working in county	37/39
% of RN workforce that lives in county	25/39
In-migration	21/39
Out-migration	16/39
Net migration	15/39
Projected attrition, 2020	33/39
Projected supply growth, 2005-2020	17/39

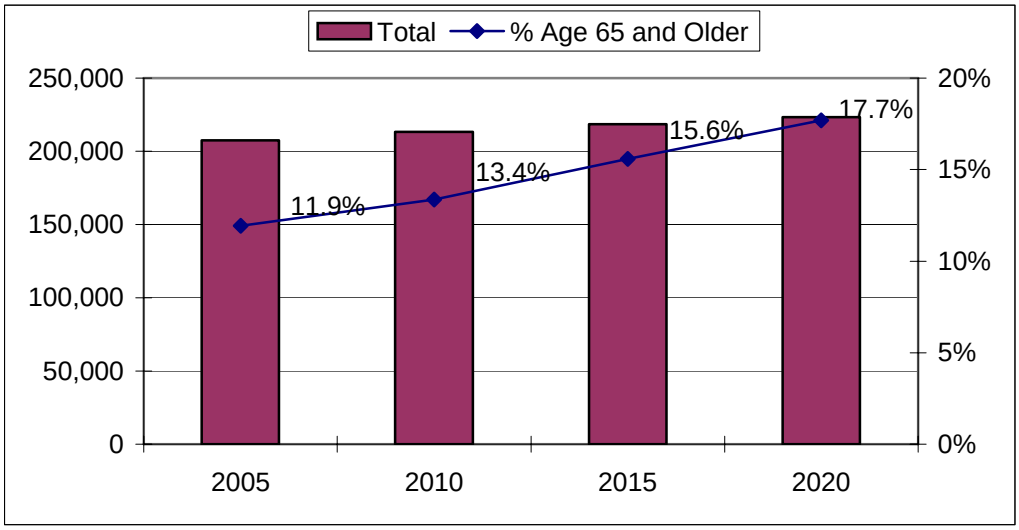
Demand. The use of all hospital-based services per capita in Saratoga County is among the lowest in the state, as is the use of nursing facilities. RN staffing in hospital inpatient and emergency department settings is much higher than statewide (ranking fifth and second, respectively), while nursing facility staffing and home health staffing are lower.

Table 54. Projected Demand for Services and Annual Growth Rate by Setting, Saratoga County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Saratoga County	New York	Rankings	Saratoga County	New York	Rankings
Hospital Inpatient Days	326 inpatient days	946 inpatient days	37/39	6.38	4.78	5/39
Hospital Emergency Dept. Visits	164 ED visits	397 ED visits	38/39	3.03	1.55	2/39
Hospital Outpatient Days	586 visits	2,215 visits	38/39	0.17	0.15	7/39
Nursing Facilities	3.7 residents	5.9 residents	39/39	0.06	0.14	34/39
Home Health	323 visits	320 visits	25/39	0.75	1.07	22/39
Non-Hospital Ambulatory Care	3,229 visits	3,233 visits	26/39	0.40	0.28	14/39
Public Health	1,000 people	1,000 people	--	3.57	2.53	19/39
School Health	166 children	168 children	26/39	0	14.01	37/39
Other	1,000 people	1,000 people	--	2.27	2.32	17/39

Demand for RNs in Saratoga County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Saratoga County is projected to grow in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 12% to 18%).

Figure 6. Projected Population of Saratoga County and Percent Age 65 and Older



Demand for most health care services is projected to increase in Saratoga County as the population grows and ages. Growth in hospital inpatient settings is projected to be second in the state, while growth in nursing facilities and home health is projected to rank third, and growth in non-hospital ambulatory care is expected to rank fourth. Demand for RNs working in nursing education and schools, however, is expected to shrink as declines are projected in the population of women age 25-44, the typical nursing student age, and also in the population of children age 5-17.

Table 55. Projected Demand for Services and Annual Growth Rate by Setting, Saratoga County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	83,772	1.42%	0.69%	2/39
Hospital Emergency Department Visits	36,569	0.49%	0.17%	7/39
Hospital Outpatient Days	140,456	0.97%	0.43%	7/39
Nursing Facilities	1,037	1.94%	0.92%	3/39
Home Health	78,645	1.06%	0.49%	3/39
Non-Hospital Ambulatory Care	773,794	0.96%	0.47%	4/39
Nursing Education	42	-0.07%	-0.29%	12/39
Public Health	223,274	0.49%	0.22%	7/39
School Health	33,162	-0.24%	-0.22%	16/39
Other	223,274	0.49%	0.22%	7/39

Robust growth in the RN supply is projected in Saratoga County, while the growth and aging of the population will also substantially increase demand. Still, the county should be able to maintain current ratios of RNs to units of service, although just barely. An already-high ratios of

RNs to units of service, however, means that these ratios will remain above state and national benchmarks in the future.

Table 56. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Saratoga County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
1,260	23.4%	1,107	8.4%	1,193	16.9%	1,568	53.6%	1,258	23.2%

Schenectady County

Supply. Schenectady County's estimated base year RN population was 1,449 RNs in 2005. RNs in Schenectady County are the fifth oldest RN workforce in the state (with a median age of 49 versus 46), and are more likely to be older than age 55 (26% versus 17% statewide). An estimated 45% of RNs working in Schenectady County are diploma/ADN nurses (compared to 39% statewide), while 37% are BSNs (compared to 43% statewide), and 19% have a MSN or doctorate (versus 18% statewide).

Table 57. Selected Characteristics of RNs, Schenectady County and New York

	Schenectady County	New York	Rankings
Employed RNs	1,449	165,124	21/39
Median Age	49	46	--
% 55+	25.7%	16.9%	5/39
% Diploma/ADN	44.5%	39.4%	27/39
% BSN	36.9%	43.0%	16/39
% MSN	18.7%	17.6%	9/39
% in Hospitals	53.0%	64.1%	28/39

About 53% of RNs in Schenectady County are employed in hospitals (versus 64% statewide). An estimated 21% work in non-hospital ambulatory care (compared to 11% statewide), and an estimated 3% percent work in nursing facilities (versus 10% statewide). An estimated 7% work in home health (compared to 4% statewide).

Barely half of the RNs working in Schenectady County live in the county (51%), while 24% come from Saratoga County and 13% from Albany County. The remainder comes from Delaware/Otsego/Schoharie counties (5%), Fulton/Montgomery counties (4%) and Rensselaer County (3%). An estimated 514 RNs per year move into the areas that supply Schenectady County with RNs, and an estimated 81 of these RNs will work in Schenectady County. At the same time, an estimated 87 RNs who work in Schenectady County will relocate out of Schenectady County supply areas (6.0% of the RN workforce).

Table 58. Location of Residence of RNs Employed in Schenectady County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Schenectady County RN Supply

Schenectady Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Schenectady	In-migrants to Schenectady workforce	Out-migrants from Schenectady workforce
Albany	13.3%	271	163	5.7%	15	9
Delaware/Otsego/Schoharie	4.7%	43	232	4.5%	2	10
Fulton/Montgomery	4.3%	0	0	7.5%	0	0
Rensselaer	3.3%	32	38	3.2%	1	1
Saratoga	23.5%	99	73	15.9%	16	12
Schenectady	51.0%	70	82	66.8%	47	54
		514	587		81	87

During the 2005-2006 period, an estimated 61 new RNs graduates entered the Schenectady County workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women dwindles. Attrition of existing RNs due to death, disability, or retirement was estimated at 61 RNs in 2005-06 (1.7% of the workforce), but this is projected to grow to 3.6% of the workforce as the workforce ages. These factors will keep the supply growth of RNs in Schenectady County at very minimal levels (1%) between 2005 and 2020. This projected supply growth equals an average annual growth rate of 0.2%, which is an improvement over the estimated decline of 2.9% observed annually between 2000 and 2005.

Table 59. Projected Components of RN Supply Change, Schenectady County, 2005-2020

Schenectady	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	1,449	1,480	1,507	1,527	1,542	1,552	1,558	1,560	1,556	1,552	1,545	1,539	1,530	1,520	1,511	4%
In-migration	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	0%
Out-migration	87	89	90	92	93	93	93	94	93	93	93	92	92	91	91	4%
Net migration	-6	-8	-9	-11	-12	-12	-12	-13	-12	-12	-12	-11	-11	-10	-10	63%
Graduates	61	60	60	59	58	58	57	57	57	56	56	55	55	55	54	-11%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	24	25	30	34	37	40	43	48	48	51	51	53	53	54	54	128%
Total	1,480	1,507	1,527	1,542	1,552	1,558	1,560	1,556	1,552	1,545	1,539	1,530	1,520	1,511	1,502	1%

Table 60. Relative Rankings of Key Components of Supply Projections, Schenectady County

	Schenectady County Ranking
% of resident RNs working in county	19/39
% of RN workforce that lives in county	35/39
In-migration	10/39
Out-migration	7/39
Net migration	26/39
Projected attrition, 2020	25/39
Projected supply growth, 2005-2020	29/39

Demand. The use of hospital inpatient services and non-emergency outpatient services per capita in Schenectady County is similar to that statewide, while the use of emergency department services is fourth highest in the state. The county ranks third in estimated home health utilization, fourth in estimated non-hospital ambulatory care utilization, and fifth in nursing facility utilization.

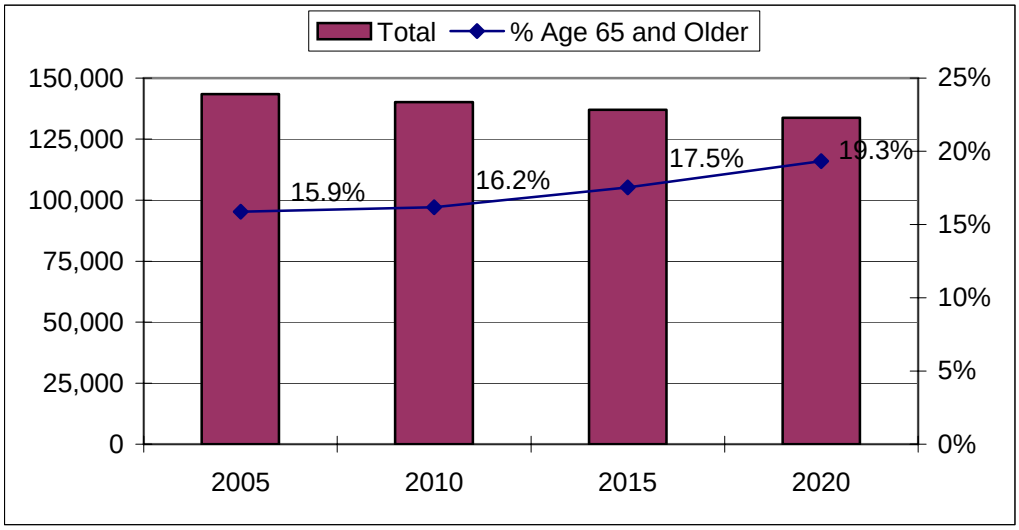
RN staffing in hospital inpatient settings and emergency departments is comparable to statewide, but staffing is lower in outpatient settings and nursing facilities. Staffing in non-hospital ambulatory care settings ranks fourth in the state.

Table 61. Projected Demand for Services and Annual Growth Rate by Setting, Schenectady County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Schenectady County	New York	Rankings	Schenectady County	New York	Rankings
Hospital Inpatient Days	931 inpatient days	946 inpatient days	15/39	4.80	4.78	18/39
Hospital Emergency Dept. Visits	617 ED visits	397 ED visits	4/39	1.20	1.55	29/39
Hospital Outpatient Days	2,543 visits	2,215 visits	19/39	0.07	0.15	31/39
Nursing Facilities	8.4 residents	5.9 residents	5/39	0.04	0.14	35/39
Home Health	380 visits	320 visits	3/39	0	1.07	32/39
Non-Hospital Ambulatory Care	3,408 visits	3,233 visits	4/39	0.61	0.28	4/39
Public Health	1,000 people	1,000 people	--	6.07	2.53	11/39
School Health	180 children	168 children	11/39	0	14.01	34/39
Other	1,000 people	1,000 people	--	5.77	2.32	5/39

Demand for RNs in Schenectady County may change as a consequence of changing demands for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Schenectady County is projected to decrease in the coming years, but the population age 65 and older will become a progressively larger proportion of the population (from about 16% to 19%). In 2005 the county ranked fifth in the state for the percent of the population age 65 and older, but that ranking is expected to fall to 10th by 2020 as other counties age more quickly.

Figure 7. Projected Population of Schenectady County and Percent Age 65 and Older



Demand for most health care services is projected to decline in Schenectady County as the population decreases. The exception is the demand for RNs working hospital inpatient settings, which will increase as the population ages.

Table 62. Projected Demand for Services and Annual Growth Rate by Setting, Schenectady County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	141,642	0.39%	0.69%	31/39
Hospital Emergency Department Visits	82,151	-0.50%	0.17%	36/39
Hospital Outpatient Days	352,587	-0.22%	0.43%	37/39
Nursing Facilities	1,163	-0.25%	0.92%	39/39
Home Health	50,063	-0.57%	0.49%	39/39
Non-Hospital Ambulatory Care	471,046	-0.24%	0.47%	37/39
Nursing Education	54	-0.78%	-0.29%	33/39
Public Health	133,795	-0.46%	0.22%	36/39
School Health	22,609	-0.88%	-0.22%	34/39
Other	133,795	-0.46%	0.22%	36/39

Although RN supply in Schenectady County is projected to increase only slightly, the steep decrease in the population means that Schenectady County will be able to maintain current ratios and even remain above statewide benchmarks. The county is still projected to be below national benchmarks for RN supply.

Table 63. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Schenectady County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
1,328	-8.4%	1,337	-7.7	1,491	2.9%	1,983	36.9%	1,330	8.2%

Warren/Washington Counties

Supply. Warren/Washington's estimated base year RN population was 1,074 RNs in 2005. RNs in Warren/Washington counties are considerably older than RNs statewide (with a median age of 50 versus 46). An estimated 64% of RNs working in Warren/Washington counties are diploma/ADN nurses (compared to 39% statewide), while 26% are BSNs (compared to 43% statewide), and 10% have a MSN or doctorate (versus 18% statewide).

Table 64. Selected Characteristics of RNs, Warren/Washington Counties and New York

	Warren/Washington Counties	New York	Rankings
Employed RNs	1,074	165,124	27/39
Median Age	50	46	--
% 55+	16.0%	16.9%	20/39
% Diploma/ADN	64.4%	39.4%	11/39
% BSN	25.8%	43.0%	30/39
% MSN	9.7%	17.6%	29/39
% in Hospitals	48.9%	64.1%	32/39

About 49% of RNs in Warren/Washington counties are employed in hospitals (versus 64% statewide). An estimated 3% work in non-hospital ambulatory care (compared to 11% statewide), and an estimated 19% percent work in nursing facilities (versus 10% statewide). An estimated 5% work in home health (compared to 4% statewide).

Most of the RNs working in Warren/Washington counties (84%) live in these counties, while 17% come from Saratoga County. An estimated 99 RNs per year move into the areas that supply Warren/Washington counties with RNs, and an estimated eight of these RNs will work in Warren/Washington counties. At the same time, an estimated six RNs who work in Warren/Washington counties will relocate out of Warren/Washington supply areas (0.6% of the RN workforce).

Table 65. Location of Residence of RNs Employed in Warren/Washington Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Warren/Washington Counties RN Supply

Warren/Washington	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Warren/Washington	In-migrants to Warren/Washington workforce	Out-migrants from Warren/Washington workforce
Saratoga	16.5%	99	73	8.3%	8	6
Warren/Washington	83.5%	0	0	69.8%	0	0
		99	73		8	6

During the 2005-2006 period, an estimated 45 new RNs graduates entered the Warren/Washington workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women wanes. Attrition of existing RNs due to death, disability, or retirement was estimated at 18 RNs in 2005-06 (1.7% of the workforce), but this is projected to grow to 3.3% of the workforce as the workforce ages. Overall supply growth between 2005 and 2020 is projected to be about 14%, or just under 1.1% annually, on average. While moderate, this is an improvement over the average annual decline of 0.6% observed between 2000 and 2005.

Table 66. Projected Components of RN Supply Change, Warren/Washington Counties, 2005-2020

Warren	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	1,074	1,103	1,131	1,155	1,175	1,192	1,207	1,220	1,228	1,236	1,242	1,247	1,251	1,254	1,257	17%
In-migration	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	0%
Out-migration	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7	17%
Net migration	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	-52%
Graduates	45	45	44	44	44	43	43	43	43	43	42	42	42	42	42	-6%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	18	19	22	25	28	30	32	36	36	38	38	40	40	41	41	132%
Total	1,103	1,131	1,155	1,175	1,192	1,207	1,220	1,228	1,236	1,242	1,247	1,251	1,254	1,257	1,259	14%

Table 67. Relative Rankings of Key Components of Supply Projections, Warren/Washington Counties

	Warren/Washington Ranking
% of resident RNs working in county	18/39
% of RN workforce that lives in county	15/39
In-migration	32/39
Out-migration	31/39
Net migration	19/39
Projected attrition, 2020	28/39
Projected supply growth, 2005-2020	23/39

Demand. The use of hospital inpatient and emergency department services per capita in Warren/Washington counties is lower than that statewide, but the counties rank fifth in their per capita hospital outpatient visits. Use of most other services is somewhat higher than statewide averages.

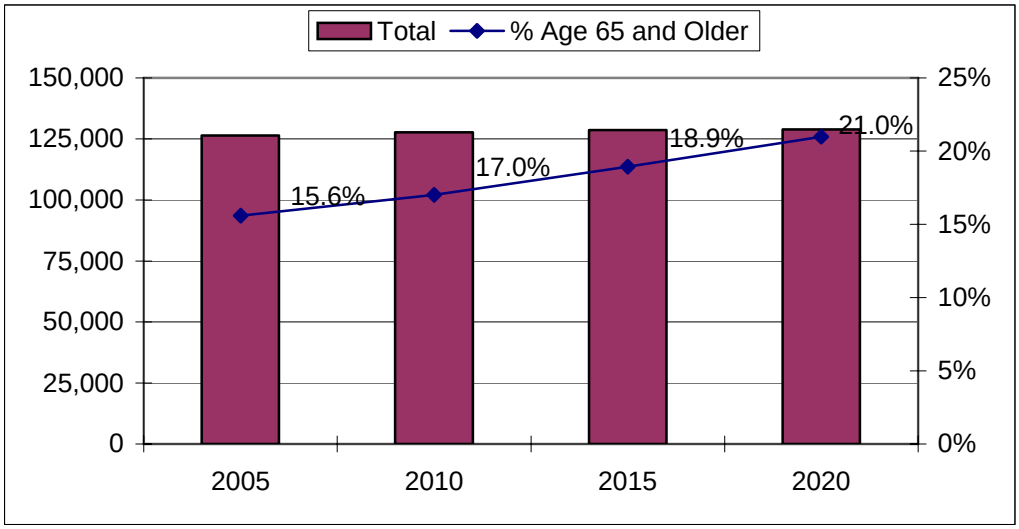
RN staffing in hospital inpatient settings is much higher than statewide in some settings, with Warren/Washington counties ranking third in their estimated public health RN staffing, fourth in their estimated nursing facility RN staffing, and fifth in their estimated emergency department RN staffing. RN staffing in non-hospital ambulatory care is estimated to be markedly low.

Table 68. Projected Demand for Services and Annual Growth Rate by Setting, Warren/Washington Counties

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Warren/ Washington Counties	New York	Ranking	Warren/ Washington Counties	New York	Ranking
Hospital Inpatient Days	582 inpatient days	946 inpatient days	32/39	4.40	4.78	20/39
Hospital Emergency Department Visits	357 ED visits	397 ED visits	26/39	2.65	1.55	5/39
Hospital Outpatient Days	4,579 visits	2,215 visits	5/39	0.15	0.15	9/39
Nursing Facilities	6.9 residents	5.9 residents	16/39	0.24	0.14	4/39
Home Health	365 visits	320 visits	10/39	1.23	1.07	12/39
Non-Hospital Ambulatory Care	3,377 visits	3,233 visits	9/39	0.06	0.28	37/39
Public Health	1,000 people	1,000 people	--	11.86	2.53	3/39
School Health	160 children	168 children	31/39	4.95	14.01	30/39
Other	1,000 people	1,000 people	--	3.76	2.32	9/39

Demand for RNs in Warren/Washington counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Warren/Washington counties is projected to increase in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 16% to 21%). Currently the counties rank 10th in the state for percentage of the population age 65 and older, but are expected to rank fifth by 2020.

Figure 8. Projected Population of Warren/Washington Counties and Percent Age 65 and Older



Demand for most health care services is projected to increase in Warren/Washington counties as the population ages. The exceptions are the demand for RNs working in nursing education and schools, as declines are projected in the population of women age 25-44, the typical nursing student age, and also in the population of children age 5-17.

Table 69. Projected Demand for Services and Annual Growth Rate by Setting, Warren/Washington Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	86,207	1.06%	0.69%	8/39
Hospital Emergency Department Visits	46,246	0.16%	0.17%	14/39
Hospital Outpatient Days	625,526	0.51%	0.43%	12/39
Nursing Facilities	1,110	1.58%	0.92%	7/39
Home Health	51,268	0.71%	0.49%	10/39
Non-Hospital Ambulatory Care	462,591	0.53%	0.47%	11/39
Nursing Education	42	-0.41%	-0.29%	25/39
Public Health	128,855	0.12%	0.22%	16/39
School Health	18,713	-0.52%	-0.22%	24/39
Other	128,855	0.12%	0.22%	16/39

The moderate projected growth in the RN supply in Warren/Washington counties means that the counties should be able to maintain their current ratios of RNs, as well as meeting state and national benchmarks for RN ratios. Growth will still be insufficient, however, to resolve reported vacancies, and the ratios will remain lower than those observed in neighboring Massachusetts.

Table 70. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Warren/Washington Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
1,191	10.9%	1,035	-3.6%	1,172	9.1%	1,495	39.2%	1,317	22.6%

Central New York Region

The Central New York region, in this analysis, is composed of Chenango/Cortland counties, Onondaga/Madison/Cayuga counties, and Oswego County. There are just over 8,000 RNs working in this region, and they are slightly older than the statewide average. They are also more likely to hold diplomas or ADNs and less likely to hold BSNs as their highest degrees.

Table 71. Selected Characteristics of Central New York RNs

	Central New York	New York
Employed RNs	8,241	165,124
Median Age	47	46
% 55+	18.1%	16.9%
% Diploma/ADN	49.0%	39.4%
% BSN	34.6%	43.0%
% MSN	16.4%	17.6%
% in Hospitals	62.9%	64.1%

The majority of RNs who work in Central New York also live in Central New York, and the region is gaining resident RNs and losing few. Most resident RNs stay in Central New York to work, resulting in a large net gain to the Central New York workforce.

Table 72. Location of Residence of RNs Employed in Central New York, Residential Migration Patterns, and Estimated Effects of Residential Migration on Central New York RN Supply

Central New York Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Central New York	In-migrants to Central New York workforce	Out-migrants from Central New York workforce
Central New York	93.5%	280	0	93.5%	262	0
Mohawk Valley	2.8%	84	155	7.4%	6	11
Southern Tier	1.6%	87	525	2.0%	2	11
Finger Lakes	0.8%	105	18	0.5%	1	0
North Country	0.8%	52	94	0.6%	0	0
Out of State	0.4%	14	59	1.9%	0	1
					271	23

Between 2005 and 2006, the RN supply in the Central New York region grew by an estimated 600 RNs, or about 5.5%

Table 73. Projected Components of RN Supply Change, Central New York, 2005-2006

Central New York	2005-2006
Base	8,241
In-migration	271
Out-migration	23
Net migration	248
Graduates	359
Foreign	0
Attrition	163
	+444 (5.4%)

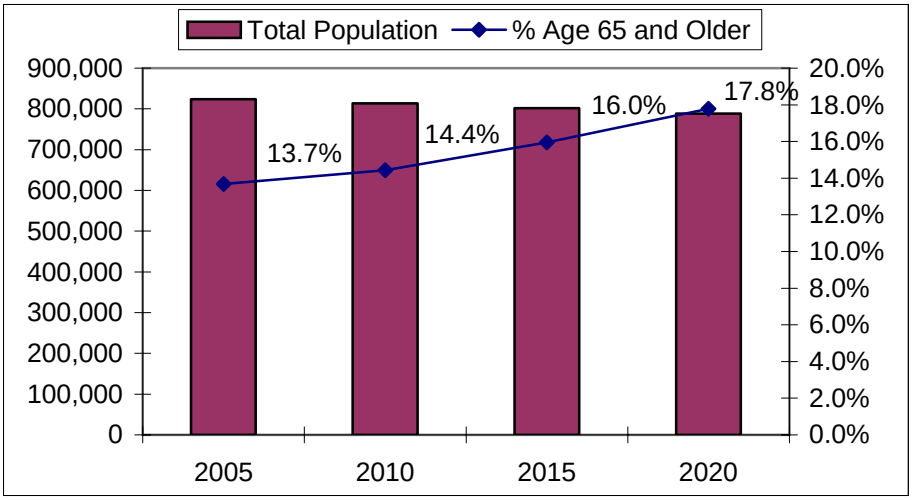
Use of hospital service per capita is very similar in Central New York to the state overall, but there are slightly more nursing facility residents and also more school-age children per capita. Central New York has more RNs employed in hospital services, especially inpatient and emergency department, than the state overall, but there are fewer RNs estimated to be employed in home health and school health.

Table 74. Demand for Services per 1,000 Population and RNs per Unit of Service, Central New York

Total Units of Service	Units of Service per 1,000 Population		RNs per Unit of Service	
	Central New York	New York	Central New York	New York
Hospital Inpatient Days	922 inpatient days	946 inpatient days	5.43	4.78
Hospital Emergency Department Visits	382 ED visits	397 ED visits	2.36	1.55
Hospital Outpatient Days	2,283 outpatient visits	2,215 outpatient visits	0.13	0.15
Nursing Facility Residents	6.4 residents	5.9 residents	0.11	0.14
Home Health Visits	331 visits	320 visits	0.78	1.07
Non-Hospital Ambulatory Care	3,224 visits	3,233 visits	0.45	0.28
School Health	176 children	168 children	1.66	2.75
Public Health	1,000 people	1,000 people	0.32	0.51
Other	1,000 people	1,000 people	0.66	1.01

The population of Central New York is projected to decline between 2005 and 2020, while the proportion of the population that is age 65 and older is expected to rise dramatically during the same period, as shown in Figure 9.

Figure 9. Projected Population of Central New York and Percent Age 65 and Older



Because of this population decline, the use of many types of health care services is also projected to decline, although hospital inpatient days and nursing facility residents are projected to increase due to the aging of the population.

Table 75. Projected Demand for Services and Annual and Historical Growth Rate by Setting, Central New York

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, Central New York, 2005-2020	Projected Annual Growth Rate, New York
Hospital Inpatient Days	739,907	0.35%	0.69%
Hospital Emergency Department Visits	305,649	-0.29%	0.17%
Hospital Outpatient Days	1,905,066	-0.00%	0.43%
Nursing Facilities	6,036	0.78%	0.92%
Home Health	275,927	-0.02%	0.49%
Non-Hospital Ambulatory Care	2,696,149	-0.01%	0.47%
Nursing Education	348	0.00%	-0.26%
Public Health	788,807	-0.29%	0.22%
School Health	131,837	-0.64%	-0.22%
Other	788,807	-0.29%	0.22%

Central New York currently has more RNs relative to demand than national averages, and because of the minimal projected increases in demand over the next 15 years, the Central New York region should maintain an adequate supply of RNs through 2020. The following sections show in more detail, however, which county groups in Central New York will benefit the most from the growing supply of RNs and which may face continued difficulties.

Table 76. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Central New York

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
8,342	1.2%	6,985	-15.2%	7,876	-4.4%	10,433	26.6%	8,946	8.6%

Chenango/Cortland Counties

Supply. Chenango/Cortland's estimated base year RN population was 696 RNs in 2005. RNs in Chemung/Schuyler counties are much older than RNs statewide (with a median age of 50 versus 46), and are more likely to be age 55 or older (22% versus 17%). An estimated 75% of RNs working in Chemung/Schuyler counties are diploma/ADN nurses (compared to 39% statewide), while 21% are BSNs (compared to 43% statewide), and 4% have a MSN or doctorate (versus 18% statewide).

Table 77. Selected Characteristics of RNs, Chenango/Cortland Counties and New York

	Chenango/Cortland Counties	New York	Rankings
Employed RNs	696	165,124	34/39
Median Age	47	46	--
% 55+	22.9%	16.9%	8/39
% Diploma/ADN	54.6%	39.4%	17/39
% BSN	35.9%	43.0%	17/39
% MSN	9.5%	17.6%	30/39
% in Hospitals	66.5%	64.1%	8/39

Sixty-six percent of RNs in Chenango/Cortland counties are employed in hospitals (versus 64% statewide). An estimated 8% percent work in non-hospital ambulatory care (compared to 11% statewide), while an estimated 5% work in public health (much higher than 3% statewide), and an estimated 5% work in school health (versus 3% statewide).

The majority of the RNs working in Chenango/Cortland (82%) live in these two counties, while 8% come from Seneca/Tompkins, 7% come from Delaware/Otsego/Schoharie, and 4% come from Onondaga/Madison/Cayuga. An estimated 247 RNs per year move into the areas that supply Chenango/Cortland with RNs and an estimated eight of these RNs will work in Chenango/Cortland counties. At the same time, an estimated 11 RNs who work in Chenango/Cortland counties will relocate out of Chenango/Cortland supply areas (1.6% of the RN workforce).

Table 78. Location of Residence of RNs Employed in Chenango/Cortland Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Chenango/Cortland RN Supply

Chenango/Cortland Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Chenango/ Cortland	In-migrants to Chenango/ Cortland workforce	Out-migrants from Chenango/ Cortland workforce
Chenango/Cortland	81.90%	114.5	0	0.528	0	0
Delaware/Otsego/Schoharie	6.60%	42.5	231.5	0.032	0	0
Onondaga/Madison/Cayuga	4.00%	90	30	0.005	6.979	9.716
Seneca/Tompkins	7.50%	0	78.5	0.08	0.546	1.155
		247	340		7.525	10.871

Between 2005 and 2006, an estimated 78 new RNs graduates entered the Chenango/Cortland counties' workforce. The number of new graduates entering the workforce is expected to remain relatively constant. Attrition of existing RNs due to death, disability, or retirement was estimated at 14 RNs in 2005-06 (2.0% of the workforce), but this is projected to grow 6.7% of the workforce as the workforce ages. By 2020, these counties will rank fourth statewide for attrition. The RN workforce in Chenango/Cortland counties is expected to continue to grow until about

2015. This is a projected annual growth of 0.9%, which is slower than the estimated growth rate of 2.6% between 2000 and 2005.

Table 79. Projected Components of RN Supply Change, Chenango/Cortland Counties, 2005-2020

Chenango	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	696	721	744	766	786	804	819	831	840	846	848	847	842	833	819	18%
In-migration	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	0%
Out-migration	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18%
Net migration	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	-3%
Graduates	33	32	32	32	31	31	31	31	31	31	31	31	30	30	30	-7%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	14	16	17	18	20	22	25	28	31	35	38	42	47	50	54	283%
Total	721	744	766	786	804	819	831	840	846	848	847	842	833	819	802	11%

Table 80. Relative Rankings of Key Components of Supply Projections, Chenango/Cortland Counties

	Chenango/Cortland Ranking
% of resident RNs working in county	32/39
% of RN workforce that lives in county	17/39
In-migration	29/39
Out-migration	26/39
Net migration	28/39
Projected attrition, 2020	4/39
Projected supply growth, 2005-2020	25/39

Demand. Hospital-based care in Chenango/Cortland counties is much more focused on outpatient services (especially emergency services) than on inpatient services. The counties rank third in emergency department utilization. These counties also rank second statewide in nursing facility residents.

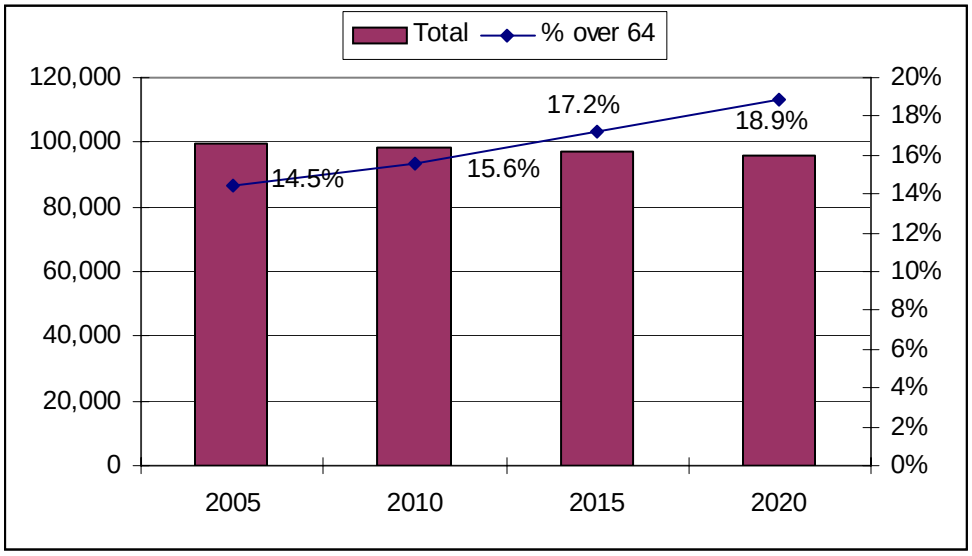
In Chenango/Cortland counties, it is estimated there are fewer hospital inpatient RNs per inpatient day than statewide, but more emergency department RNs per emergency department visit. Few RNs work in nursing facilities or home health (with RN staffing in nursing facilities ranking next to last in the state), but there is a relatively high ratio of RNs working in non-hospital ambulatory care and public health settings, as well as in school health.

Table 81. Projected Demand for Services and Annual Growth Rate by Setting, Chenango/Cortland Counties

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Chenango/ Cortland Counties	New York	Rankings	Chenango/ Cortland Counties	New York	Rankings
Hospital Inpatient Days	891 inpatient	946 inpatient	17/39	3.53	4.78	27/39
Hospital Emergency Department Visits	630 ED visits	397 ED visits	3/39	1.93	1.55	14/39
Hospital Outpatient Days	2,780 visits	2,215 visits	15/39	0.11	0.15	18/39
Nursing Facilities	9.1 residents	5.9 residents	2/39	0.01	0.14	38/39
Home Health	341 visits	320 visits	18/39	0	1.07	34/39
Non-Hospital Ambulatory Care	3,662 visits	3,233 visits	16/39	0.62	0.28	30/39
Public Health	1,000 people	1,000 people	--	7.64	2.53	22/39
School Health	153 children	168 children	22/39	55.08	14.01	17/39
Other	1,000 people	1,000 people	--	6.20	2.32	3/39

Demand for RNs in Chenango/Cortland counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Chenango/Cortland counties is projected to decline slightly in the coming years, but the population age 65 and older will become a progressively larger proportion (from almost 15% to 19%). Chenango/Cortland counties currently rank 15th in the percent of the population age 65 and older, and are expected to rise to 11th by 2020.

Figure 10. Projected Population of Chenango/Cortland Counties and Percent Age 65 and Older



In Chenango/Cortland counties, increases are projected in the demand for hospital inpatient and nursing facility services. Demand for other types of services is projected to decline or to rise only slightly, consistent with an overall decrease in population.

Table 82. Projected Demand for Services and Annual Growth Rate by Setting, Chenango/Cortland County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	95,199	0.48%	0.69%	27/39
Hospital Emergency Department Visits	60,874	-0.19%	0.17%	29/39
Hospital Outpatient Days	276,357	0.04%	0.43%	29/39
Nursing Facilities	1,032	0.86%	0.92%	21/39
Home Health	37,739	-0.34%	0.49%	22/39
Non-Hospital Ambulatory Care	332,183	0.08%	0.47%	28/39
Nursing Education	30	-0.64%	-0.29%	28/39
Public Health	95,901	-0.24%	0.22%	32/39
School Health	16,288	-0.45%	-0.22%	22/39
Other	95,901	-0.24%	0.22%	32/39

The RN supply in Chenango/Cortland counties grew slowly (2%) between 1990 and 2005. It is estimated that the current supply could remain the same or even shrink slightly and the counties would still maintain current ratios of RNs to units of service. In order for statewide or national ratios to be in reach, however, the RN supply in Chenango/Cortland counties must grow 37-51% between 2005 and 2020.

Table 83. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Chenango/Cortland Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
689	-1.01%	955	37.21%	1,051	51.01%	1,391	99.86%	871	25.14%

It is projected that the growth of the RN supply in Chenango/Cortland counties between 2005 and 2020 will be approximately 11%. This will be more than sufficient to maintain current ratios, but these counties are currently short of RNs relative to the state or the nation. It is unlikely that supply will be sufficient to improve this situation substantially by the year 2020.

Onondaga/Madison/Cayuga Counties

Supply. Onondaga/Madison/Cayuga's estimated base year RN population was 7,176 RNs in 2005. RNs in Onondaga/Madison/Cayuga counties have the same median age as RNs statewide (45 years). An estimated 48% of RNs working in Onondaga/Madison/Cayuga counties are diploma/ADN nurses (compared to 39% statewide), while 34% are BSNs (compared to 43% statewide), and 18% have a MSN or doctorate (versus 18% statewide).

Table 84. Selected Characteristics of RNs, Onondaga/Madison/Cayuga Counties and New York

	Onondaga/Madison/ Cayuga Counties	New York	Rankings
Employed RNs	7,176	165,124	10/39
Median Age	46	46	--
% 55+	17.8%	16.9%	18/39
% Diploma/ADN	48.0%	39.4%	23/39
% BSN	34.1%	43.0%	20/39
% MSN	17.9%	17.6%	12/39
% in Hospitals	64.0%	64.1%	11/39

About 64% of RNs in Onondaga/Madison/Cayuga counties are employed in hospitals, consistent with statewide figures. An estimated 16% of these RNs work in non-hospital ambulatory care (compared to 11% statewide), an estimated 6% percent work in nursing facilities (versus 10% statewide), and an estimated 3% work in home health (compared to 4% statewide).

Most of the RNs working in Onondaga/Madison/Cayuga counties (86%) live in these three counties, while 7% come from Oswego County and 4% come from Herkimer/Oneida counties. The remainder comes from Chenango/Cortland counties (2%), Monroe/Wayne counties (1%), Clinton/Essex/Franklin/Hamilton counties (<1%), Jefferson/Lewis counties (<1%), Seneca/Tompkins counties (<1%), and Pike/Susquehanna/Wayne counties in Pennsylvania. An estimated 357 RNs per year move into the areas that supply Onondaga/Madison/Cayuga counties with RNs, and an estimated 106 of these RNs will work in Onondaga/Madison/Cayuga counties. At the same time, an estimated 43 RNs who work in Onondaga/Madison/Cayuga counties will relocate out of Onondaga/Madison/Cayuga supply areas (<1% of the RN workforce).

Table 85. Location of Residence of RNs Employed in Onondaga/Madison/Cayuga Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Onondaga/Madison/Cayuga RN Supply

Onondaga/Madison/Cayuga Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of Res. RNs commuting to Onondaga/ Madison/ Cayuga	In-migrants to Onondaga/ Madison/ Cayuga workforce	Out-migrants from Onondaga/ Madison/ Cayuga workforce
Chenango/Cortland	1.9%	115	0	12.0%	14	0
Clinton/Essex/Franklin/Hamilton	0.1%	0	58	0.4%	0	0
Herkimer/Oneida	4.1%	52	105	9.3%	5	10
Jefferson/Lewis	0.3%	38	0	1.8%	1	0
Monroe	0.7%	49	251	0.6%	0	2
Onondaga/Madison/Cayuga	85.6%	90	30	95.9%	86	29
Oswego	6.8%	0	0	64.3%	0	0
Seneca/Tompkins	0.2%	0	79	1.9%	0	1
Pike/Susquehanna/Wayne Co., Pennsylvania	0.3%	14	59	1.9%	0	1
		357	581		106	43

Between 2005 and 2006, an estimated 335 new RNs graduates entered the Onondaga/Madison/ Cayuga counties' workforce. The number of new graduates entering the RN workforce is expected to decline somewhat as the population of working-age women dwindles. Attrition of existing RNs due to death, disability, or retirement was estimated at 142 RNs in 2005-06 (2.0% of the workforce), but this is projected to grow to 3.7% of the workforce as the workforce ages. Onondaga/Madison/Cayuga counties are benefited by strong in-migration into their supply areas, and the supply of RNs is projected to steadily grow between 2005 and 2020. Overall supply growth during this period could reach 24%, or an average annual growth of 1.7% between 2005 and 2020, which is slow compared to the 2.6% average annual growth observed between 2000 and 2005.

Table 86. Projected Components of RN Supply Change, Onondaga/Madison/Cayuga Counties, 2005-2020

O/M/C counties	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	7,176	7,432	7,669	7,892	8,109	8,305	8,482	8,634	8,774	8,893	8,994	9,080	9,145	9,182	9,205	28%
In-migration	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	0%
Out-migration	43	45	46	47	49	50	51	52	53	53	54	54	55	55	55	28%
Net migration	63	61	60	59	57	56	55	54	53	53	52	52	51	51	51	-19%
Graduates	335	332	329	325	322	319	315	315	312	312	309	309	305	305	302	-10%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Attrition	142	157	165	167	183	198	218	230	246	263	275	296	319	333	339	139%
Total	7,432	7,669	7,892	8,109	8,305	8,482	8,634	8,774	8,893	8,994	9,080	9,145	9,182	9,205	9,219	24%

Table 87. Relative Rankings of Key Components of Supply Projections, Onondaga/Madison/Cayuga Counties

	Onondaga/Madison/Cayuga Ranking
% of resident RNs working in county	2/39
% of RN workforce that lives in county	13/39
In-migration	28/39
Out-migration	30/39
Net migration	16/39
Projected attrition, 2020	22/39
Projected supply growth, 2005-2020	15/39

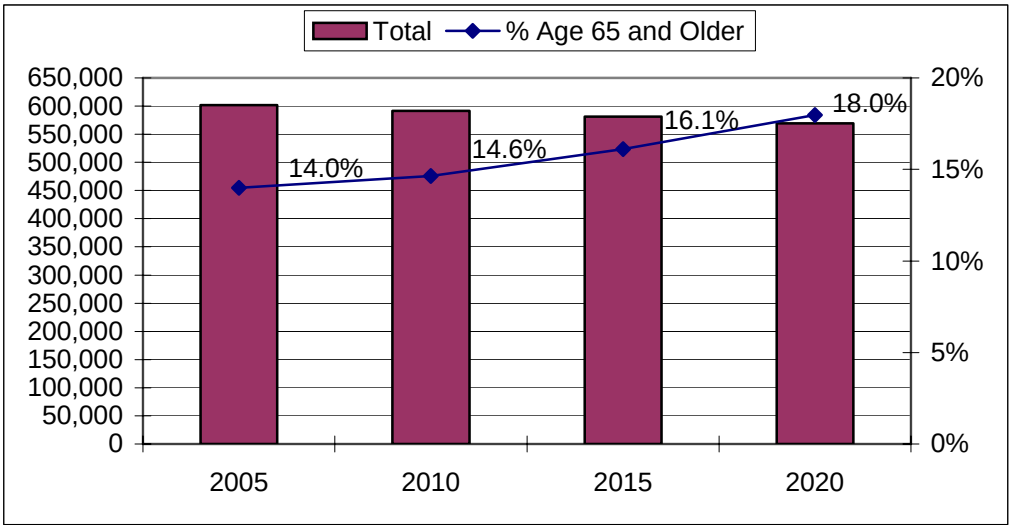
Demand. Health care use in Onondaga/Madison/Cayuga counties is very similar to health care use statewide. RN staffing in these counties is also robust in most settings compared to statewide averages. These counties had the fourth highest RN inpatient staffing and the fifth highest non-hospital ambulatory care staffing in New York.

Table 88. Projected Demand for Services and Annual Growth Rate by Setting, Onondaga/Madison/Cayuga Counties

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Onondaga/Madison/ Cayuga Counties	New York	Rankings	Onondaga/ Madison/ Cayuga Counties	New York	Rankings
Hospital Inpatient Days	956 inpatient days	946 inpatient days	14/39	6.62	4.78	4/39
Hospital Emergency Department Visits	375 ED visits	397 ED visits	21/39	2.64	1.55	6/39
Hospital Outpatient Days	2,283 visits	2,215 visits	20/39	0.14	0.15	12/39
Nursing Facilities	6.3 residents	5.9 residents	24/39	0.11	0.14	23/39
Home Health	342 visits	320 visits	17/39	1.04	1.07	14/39
Non-Hospital Ambulatory Care	3,290 visits	3,233 visits	19/39	0.59	0.28	5/39
Public Health	1,000 people	1,000 people	--	3.81	2.53	18/39
School Health	175 children	168 children	18/39	12.99	14.01	22/39
Other	1,000 people	1,000 people	--	2.91	2.32	13/39

Demand for RNs in Onondaga/Madison/Cayuga counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Onondaga/Madison/Cayuga counties is projected to decline in the coming years, while the population age 65 and older will become a progressively larger proportion of the population (from about 14% to 18%). These counties rank 18th in the percentage of older adults in the population, and are projected to rank 19th by 2020.

Figure 11. Projected Population of Onondaga/Madison/Cayuga Counties and Percent Age 65 and Older



Demand for most health care services is projected to decrease in Onondaga/Madison/Cayuga counties as the population declines. Nursing facility residents and hospital inpatient days are projected to increase, however, with the aging of the population. Growth in hospital outpatient days and non-hospital ambulatory care visits is projected to be among the slowest in the state.

Table 89. Projected Demand for Services and Annual Growth Rate by Setting, Onondaga/Madison/Cayuga Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	602,906	0.31%	0.69%	33/39
Hospital Emergency Department Visits	213,606	-0.37%	0.17%	33/39
Hospital Outpatient Days	1,353,783	-0.10%	0.43%	36/39
Nursing Facilities	4,208	0.72%	0.92%	26/39
Home Health	202,897	-0.10%	0.49%	29/39
Non-Hospital Ambulatory Care	1,951,666	-0.10%	0.47%	36/39
Nursing Education	302	-0.70%	-0.29%	30/39
Public Health	569,315	-0.37%	0.22%	33/39
School Health	93,956	-0.77%	-0.22%	32/39
Other	569,315	-0.37%	0.22%	33/39

Robust growth projected in the RN supply in Onondaga/Madison/Cayuga counties, coupled with projected declining demand for many services, should put these counties in a comfortable position moving forward. Ratios of RNs to units of service may even exceed the ratios observed in Massachusetts by the year 2020.

Table 90. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Onondaga/Madison/Cayuga Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
7,253	1.1%	5,371	-25.2%	6,117	-14.8%	8,130	13.3%	7,629	6.3%

Oswego County

Supply. Oswego County's estimated base year RN population was 369 RNs in 2005, making it the smallest RN workforce in the state. RNs in Oswego County are considerably younger than RNs statewide (with a median age of 39 versus 46). An estimated 58% of RNs working in Oswego County are diploma/ADN nurses (compared to 39% statewide), while 42% are BSNs (compared to 43% statewide). None of the RNs picked up in this dataset had a MSN or doctorate (versus 18% statewide). About 35% of RNs in Oswego County are employed in hospitals (versus 64% statewide) and an estimated 38% work in nursing facilities (versus 10% statewide).

Table 91. Selected Characteristics of RNs, Oswego County and New York

	Oswego County	New York	Rankings
Employed RNs	369	165,124	39/39
Median Age	39	46	--
% 55+	13.7%	16.9%	29/39
% Diploma/ADN	58.1%	39.4%	15/39
% BSN	41.9%	43.0%	12/39
% MSN	0%	17.6%	39/39
% in Hospitals	34.6%	64.1%	37/39

Most of the RNs working in Oswego County live in the county (75%), while 26% come from Onondaga/Madison/Cayuga counties. An estimated 90 RNs per year move into the areas that supply Oswego County with RNs, and it is estimated that just one of these RNs will work in Oswego County. Furthermore, less than one RN per year is expected to leave the Oswego County workforce due to migration out of Oswego County's supply areas.

Table 92. Location of Residence of RNs Employed in Oswego County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Oswego County RN Supply

Oswego Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Oswego	In-migrants to Oswego workforce	Out-migrants from Oswego workforce
Onondaga/Madison/Cayuga	25.5%	90	30	1.5%	1	0.5
Oswego	74.5%	0	0	35.7%	0	0
		90	30		1	0.5

Between 2005 and 2006, an estimated 17 new RNs graduates entered the Oswego County workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women dwindles. Attrition of existing RNs due to death, disability, or retirement was estimated at seven RNs in 2005-06 (1.9% of the workforce), but this is projected to grow to 3.3% of the workforce as the workforce ages. Overall supply growth in Oswego County from 2005-2020 is estimated at 20%.

Despite high levels of out-migration, this 20% growth translates to an estimated 1.4% average annual growth rate for Oswego County between 2005 and 2020. This is in sharp contrast to the estimated 2.8% average annual decline observed between 2000 and 2005. (It should be noted, however, that the sample size for Oswego County was extremely small and that all estimates must be approached cautiously.)

Table 93. Projected Components of RN Supply Change, Oswego County, 2005-2020

Oswego	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	369	380	389	398	407	415	422	428	434	439	444	447	450	452	454	23%
In-migration	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0%
Out-migration	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	23%
Net migration	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	-18%
Graduates	17	17	17	17	17	16	16	16	16	16	16	16	16	16	16	-6%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	7	8	8	8	9	10	11	11	12	12	13	14	15	15	15	111%
Total	380	389	398	407	415	422	428	434	439	444	447	450	452	454	455	20%

Table 94. Relative Rankings of Key Components of Supply Projections, Oswego County

	Oswego County Ranking
% of resident RNs working in county	36/39
% of RN workforce that lives in county	22/39
In-migration	34/39
Out-migration	35/39
Net migration	18/39
Projected attrition, 2020	27/39
Projected supply growth, 2005-2020	21/39

Demand. While the use of hospital inpatient and emergency department services per capita in Oswego County is substantially lower than statewide, the use of non-emergency outpatient services is comparable. There are more school-age children per capita in Oswego County than the statewide average.

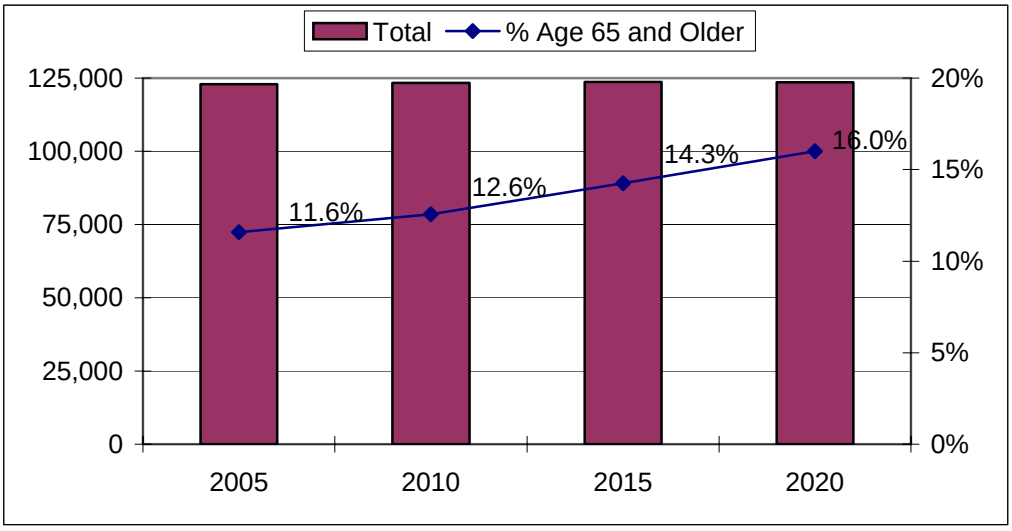
RNs per hospital inpatient days are much lower than in the state overall, while staffing in other settings are comparable. No RNs in home health, non-hospital ambulatory care, or public health were captured in the two years of ACS data.

Table 95. Projected Demand for Services and Annual Growth Rate by Setting, Oswego County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Oswego County	New York	Rankings	Oswego County	New York	Rankings
Hospital Inpatient Days	312 inpatient days	946 inpatient days	38/39	1.87	4.78	37/39
Hospital Emergency Dept Visits	251 ED visits	397 ED visits	36/39	1.23	1.55	28/39
Hospital Outpatient Days	2,111 visits	2,215 visits	22/39	0.07	0.15	32/39
Nursing Facilities	5.6 residents	5.9 residents	30/39	0.21	0.14	6/39
Home Health	301 visits	320 visits	34/39	0	1.07	38/39
Non-Hospital Ambulatory Care	3,172 visits	3,233 visits	33/39	0	0.28	39/39
Public Health	1,000 people	1,000 people	--	0	2.53	39/39
School Health	181 children	168 children	9/39	31.69	14.01	9/39
Other	1,000 people	1,000 people	--	1.46	2.32	21/39

Demand for RNs in Oswego County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Oswego County is projected to increase very slightly in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 12% to 16%).

Figure 12. Projected Population of Oswego County and Percent Age 65 and Older



Demand for most health care services is projected to decrease in Oswego County as the population declines. The exception is the demand for RNs working in nursing education, as the population of women who are the typical nursing student age of 35-44 declines.

Table 96. Projected Demand for Services and Annual Growth Rate by Setting, Oswego County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	41,802	0.57%	0.69%	26/39
Hospital Emergency Department Visits	31,170	0.05%	0.17%	19/39
Hospital Outpatient Days	273,379	0.33%	0.43%	18/39
Nursing Facilities	796	1.00%	0.92%	17/39
Home Health	38,507	0.26%	0.49%	20/39
Non-Hospital Ambulatory Care	412,300	0.36%	0.47%	18/39
Nursing Education	16	-0.41%	-0.29%	24/39
Public Health	123,778	0.03%	0.22%	18/39
School Health	21,593	-0.20%	-0.22%	13/39
Other	123,778	0.03%	0.22%	18/39

Robust growth is projected for the RN supply in Oswego County, but in the face of a current shortage relative to the rest of the state, coupled with increasing projected demand for many services, supply growth needs to be even higher. Oswego County should be able to maintain current ratios of RNs per units of service, but is likely to remain below state and national benchmarks, and may not be able to fill all of the vacancies that occur at current rates.

Table 97. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Oswego County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
399	8.1%	659	78.6%	709	92.1%	912	147.2%	446	20.9%

Finger Lakes Region

The Finger Lakes region of New York is comprised in this analysis of Genesee/Orleans counties, Livingston/Wyoming counties, Monroe/Wayne counties, and Ontario County. Almost 12,000 RNs are employed in this region. They are slightly younger than RNs statewide, slightly less likely to hold a bachelor's degree, and less likely to be employed in hospitals.

Table 98. Selected Characteristics of Finger Lakes RNs

	Finger Lakes	New York
Employed RNs	11,657	165,124
Median Age	46	46
% 55+	15.2%	16.9%
% Diploma/ADN	44.4%	39.4%
% BSN	37.3%	43.0%
% MSN	18.3%	17.6%
% in Hospitals	53.2%	64.1%

While most RNs in the Finger Lakes region live in the region, about one in 10 commutes from either the Southern Tier or Western New York region. The Finger Lakes is mostly experiencing a net gain of resident RNs, almost all of whom (98%) work in the Finger Lakes. While the loss of RNs who reside in the Southern Tier will have some effect on the Finger Lakes workforce, this workforce should overall experience a net gain due to the residential migration of RNs.

Table 99. Location of Residence of RNs Employed in the Finger Lakes, Residential Migration Patterns, and Estimated Effects of Residential Migration on Finger Lakes RN Supply

Finger Lakes Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Finger Lakes	In-migrants to Finger Lakes workforce	Out-migrants from Finger Lakes workforce
Finger Lakes	88.7%	105	18	98.0%	103	18
Southern Tier	6.1%	87	525	6.6%	6	35
Western New York	4.1%	169	0	3.7%	6	0
Long Island	0.3%	1,669	0	0.1%	2	0
Out of State	0.7%	106	0	4.0%	4	0
					121	53

Between 2005 and 2006, RN supply in the Finger Lakes region is estimated to have grown by 387 RNs, or 3.3%.

Table 100. Projected Components of RN Supply Change, Finger Lakes, 2005-2006

Finger Lakes Region	2005-2006
Base	11,657
In-migration	121
Out-migration	53
Net migration	68
Graduates	558
Foreign	0
Attrition	239
	+387 (3.3%)

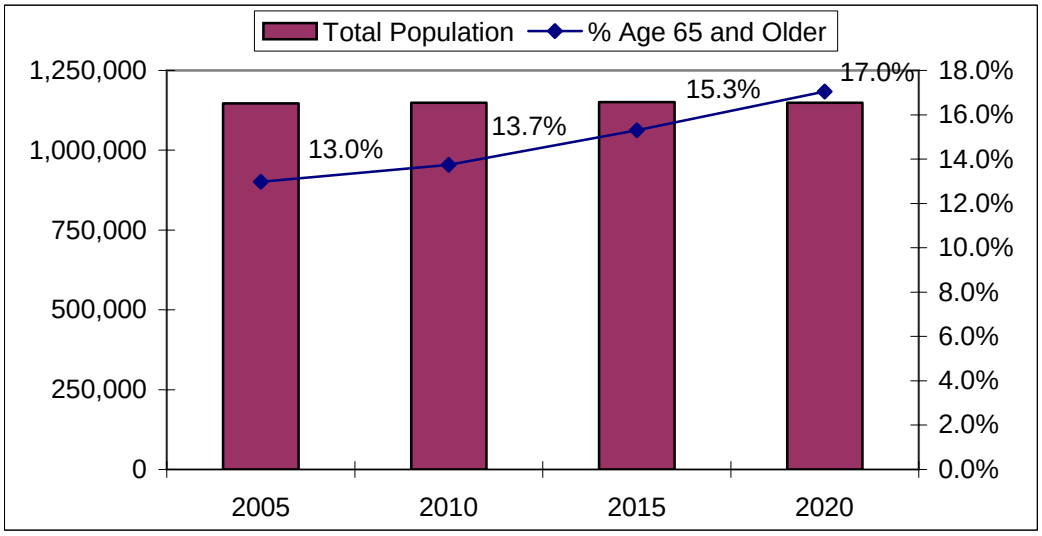
Although inpatient days and emergency department visits per capita were similar to New York averages, outpatient visits per capita in the Finger Lakes region were much higher than statewide. There were also many more nursing facility residents per capita, as well as more school-age children per 1,000 population. Generally the ratios of RNs per unit of service were similar in the Finger Lakes to those statewide, with somewhat more RNs estimated to work in home health and non-hospital ambulatory care, and somewhat fewer in school health and public health.

Table 101. Demand for Services per 1,000 Population and RNs per Unit of Service, Finger Lakes Region

Total Units of Service	Units of Service per 1,000 population		RNs per Unit of Service	
	Finger Lakes	New York	Finger Lakes	New York
Hospital Inpatient Days	932 inpatient days	946 inpatient days	4.30	4.78
Hospital Emergency Department Visits	381 ED visits	397 ED visits	2.22	1.55
Hospital Outpatient Days	3,624 outpatient visits	2,215 outpatient visits	0.12	0.15
Nursing Facility Residents	6.8 residents	5.9 residents	0.18	0.14
Home Health Visits	333 visits	320 visits	1.88	1.07
Non-Hospital Ambulatory Care	3,257 visits	3,233 visits	0.52	0.28
School Health	177 children	168 children	1.34	2.75
Public Health	1,000 people	1,000 people	0.17	0.51
Other Health	1,000 people	1,000 people	0.82	1.01

The projected population of the Finger Lakes region is expected to remain fairly constant through 2020, while the proportion of the population that is age 65 and older is expected to increase, as shown in Figure 13.

Figure 13. Projected Population of Finger Lakes and Percent Age 65 and Older



Generally, projected changes in the use of services in the Finger Lakes region are consistent with the changes projected statewide. The Finger Lakes will experience greater declines than New York overall in the number of elementary and high school students and the number of nursing students as the number of school-age children and the number of women age 18-44 decreases in the population. These groups' population will grow much less rapidly than the state (0.02% annually, on average, compared to 0.22% statewide).

Table 102. Projected Demand for Services and Annual and Historical Growth Rate by Setting, Finger Lakes

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, Finger Lakes, 2005-2020	Projected Annual Growth Rate, New York
Hospital Inpatient Days	1,058,841	0.66%	0.69%
Hospital Emergency Department Visits	437,655	0.02%	0.17%
Hospital Outpatient Days	5,503,517	0.35%	0.43%
Nursing Facilities	8,735	0.78%	0.92%
Home Health	391,096	0.18%	0.49%
Non-Hospital Ambulatory Care	3,898,747	0.30%	0.47%
Nursing Education	456	-1.34%	-0.26%
Public Health	1,149,146	0.02%	0.22%
School Health	189,496	-0.44%	-0.22%
Other	1,149,146	0.02%	0.22%

The Finger Lakes is an area that appears to be doing fairly well for RN supply relative to demand, currently exceeding both state and national ratios of RNs to units of services. This is

expected to continue through the year 2020, although the next sections will show that some county groups within the Finger Lakes region will do better than others.

Table 103. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Finger Lakes

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
12,156		10,429		12,078		15,622		14,229	

Genesee/Orleans County

Supply. Genesee/Orleans's estimated base year RN population was 734 RNs in 2005. RNs in Genesee/Orleans counties are older than RNs statewide (with a median age of 48 versus 46); 24% were older than age 55 versus 17% statewide. An estimated 72% of RNs working in Genesee/Orleans counties are diploma/ADN nurses (compared to 39% statewide), while just 14% are BSNs (compared to 43% statewide), and 15% have a MSN or doctorate (versus 18% statewide).

Table 104. Selected Characteristics of RNs, Genesee/Orleans Counties and New York

	Genesee/Orleans Counties	New York	Rankings
Employed RNs	734	165,124	33/39
Median Age	48	46	--
% 55+	23.9%	16.9%	7/39
% Diploma/ADN	72.0%	39.4%	5/39
% BSN	13.5%	43.0%	37/39
% MSN	14.5%	17.6%	18/39
% in Hospitals	50.3%	64.1%	31/39

About 50% of RNs in Genesee/Orleans counties are employed in hospitals (versus 64% statewide). An estimated 10% work in non-hospital ambulatory care (compared to 11% statewide), and an estimated 35% percent work in nursing facilities (versus 10% statewide).

Most of the RNs working in Genesee/Orleans counties (65%) live in these two counties, while 29% percent come from Niagara County and the remainder comes from Erie County. An estimated 499 RNs per year move into the areas that supply Genesee/Orleans counties with RNs, but only an estimated two of them will work in Genesee/Orleans counties. At the same time, an estimated three RNs who work in Genesee/Orleans counties will relocate out of Genesee/Orleans supply areas.

Table 105. Location of Residence of RNs Employed in Genesee/Orleans Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Genesee/Orleans RN Supply

Genesee/Orleans Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Genesee/Orleans	In-migrants to Genesee/Orleans workforce	Out-migrants from Genesee/Orleans workforce
Erie	6.3%	499	694	0.5%	2	3
Genesee/Orleans	65.0%	0	0	57.1%	0	0
Niagara	28.7%	0	0	12.4%	0	0
		499	694		2	3

Between 2005 and 2006, an estimated 30 new RNs graduates entered the Genesee/Orleans counties workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women declines. Attrition of existing RNs due to death, disability, or retirement was estimated at 15 RNs in 2005-06 (2.0% of the workforce), but this is projected to grow to 5.2% of the workforce as the workforce ages. The significant projected growth in attrition – the fifth highest in the state – may prove to be the largest challenge faced by these counties. Overall, the RN workforce in Genesee/Orleans counties is projected to decrease by approximately 1%. This is an average annual decline of only 0.07%. This may be an improvement, however, when compared to the estimated supply decline of 2.0% per year for the period of 2000-2005.

Table 106. Projected Components of RN Supply Change, Genesee/Orleans Counties, 2005-2020

Genesee/ Orleans	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	734	747	759	769	777	785	790	794	795	795	791	786	777	767	755	3%
In-migration	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0%
Out-migration	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3%
Net migration	-1	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	7%
Graduates	30	30	29	29	29	29	29	28	28	28	28	28	28	28	28	-6%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	15	17	17	19	20	22	23	25	27	30	32	35	36	39	39	156%
Total	747	759	769	777	785	790	794	795	795	791	786	777	767	755	742	-1%

Table 107. Relative Rankings of Key Components of Supply Projections, Genesee/Orleans Counties

	Genesee/Orleans Ranking
% of resident RNs working in county	27/39
% of RN workforce that lives in county	30/39
In-migration	36/39
Out-migration	33/39
Net migration	24/39
Projected attrition, 2020	5/39
Projected supply growth, 2005-2020	31/39

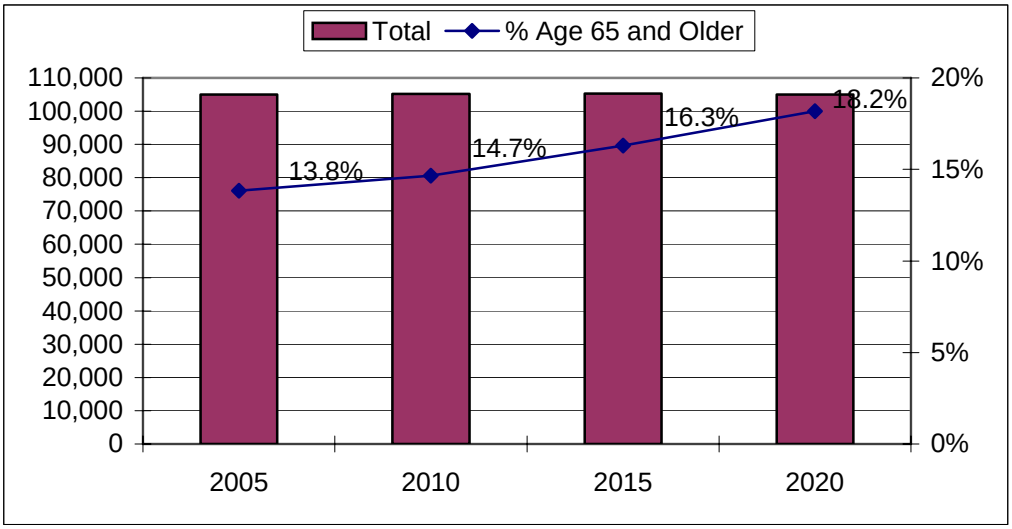
Demand. The use of hospital inpatient services per capita in Genesee/Orleans counties is lower than that statewide, but the use of emergency and non-emergency outpatient services is much higher. RN staffing in hospital inpatient and school health settings are markedly lower than the statewide averages.

Table 108. Projected Demand for Services and Annual Growth Rate by Setting, Genesee/Orleans Counties

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Genesee/Orleans Counties	New York	Rankings	Genesee/ Orleans Counties	New York	Rankings
Hospital Inpatient Days	882 inpatient days	946 inpatient days	18/39	1.95	4.78	34/39
Hospital Emergency Department Visits	535 ED visits	397 ED visits	7/39	1.47	1.55	23/39
Hospital Outpatient Days	5,425 visits	2,215 visits	3/39	0.08	0.15	26/39
Nursing Facilities	7.3 residents	5.9 residents	12/39	0.33	0.14	1/39
Home Health	339 visits	320 visits	19/39	0	1.07	35/39
Non-Hospital Ambulatory Care	3,286 visits	3,233 visits	20/39	0.21	0.28	27/39
Public Health	1,000 people	1,000 people	--	2.09	2.53	26/39
School Health	188 children	168 children	5/39	7.61	14.01	29/39
Other	1,000 people	1,000 people	--	0	2.32	35/39

Demand for RNs in Genesee/Orleans counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Genesee/Orleans counties is projected to remain constant in the coming years, but the population age 65 and older will become a progressively larger proportion of the population (from about 14% to over 18%). In 2005, these counties ranked 19th for the percentage of the population age 65 and older, but by 2020 are expected to rank 15th.

Figure 14. Projected Population of Genesee/Orleans Counties and Percent Age 65 and Older



Demand for most health care services is projected to increase somewhat in Genesee/Orleans counties even as the population remains constant due to the aging of the population. Demand for school health services may decrease as children become a smaller proportion of the population, and demand for nursing education may decrease as women in the age groups that typically attend nursing school also become a smaller proportion of the population.

Table 109. Projected Demand for Services and Annual Growth Rate by Setting, Genesee/Orleans Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	98,336	0.43%	0.69%	32/39
Hospital Emergency Department Visits	56,186	-0.01%	0.17%	22/39
Hospital Outpatient Days	604,044	0.38%	0.43%	15/39
Nursing Facilities	857	0.77%	0.92%	24/39
Home Health	37,728	0.37%	0.49%	18/39
Non-Hospital Ambulatory Care	364,931	0.37%	0.47%	17/39
Nursing Education	28	-0.41%	-0.29%	27/39
Public Health	105,112	0%	0.22%	22/39
School Health	17,590	-0.76%	-0.22%	31/39
Other	105,112	0%	0.22%	22/39

The RN supply in Genesee/Orleans counties must increase by more than 8% in order to maintain current ratios, but would still be below the statewide averages for staffing ratios. In this context, the projected decrease of approximately 1% in RN supply for these counties is troubling.

Table 110. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Genesee/Orleans Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
796	8.45%	1,006	37.06%	1,161	58.2%	1,492	103.3%	854	16.4%

Livingston/Wyoming Counties

Livingston/Wyoming's estimated base year RN population was 492 RNs in 2005, the second smallest RN workforce in the state. Because of the very small sample of RNs from these counties, all data for this county group must be approached with caution.

Supply. RNs in Livingston/Wyoming counties appear less likely than RNs in any other counties in the state to be age 55 and older, and also appear to be among the least likely to work in a hospital setting.

Table 111. Selected Characteristics of RNs, Livingston/Wyoming Counties and New York

	Livingston/Wyoming Counties	New York	Rankings
Employed RNs	492	165,124	38/39
Median Age	47	46	--
% 55+	1.8%	16.9%	39/39
% Diploma/ADN	44.1%	39.4%	28/39
% BSN	42.7%	43.0%	11/39
% MSN	13.2%	17.6%	19/39
% in Hospitals	36.9%	64.1%	36/39

Fewer than half of the RNs working in Livingston/Wyoming counties (45%) live in these two counties, while 13% come from Ontario County and 11% percent come from Erie County. The remainder comes from Steuben/Yates counties (10%), Suffolk County (9%), Chautauqua County (8%), and Allegany/Cattaraugus counties (5%). An estimated 1,550 RNs per year move into the areas that supply Livingston/Wyoming counties with RNs, and an estimated 10 of these RNs will work in Livingston/Wyoming counties. At the same time, an estimated 12 RNs who work in Livingston/Wyoming counties will relocate out of Livingston/Wyoming supply areas (2.4% of the RN workforce).

Table 112. Location of Residence of RNs Employed in Livingston/Wyoming Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Livingston/Wyoming RN Supply

Livingston/Wyoming Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Livingston/Wyoming	In-migrants to Livingston/Wyoming workforce	Out-migrants from Livingston/Wyoming workforce
Allegany/Cattaraugus	4.8%	0	0	3.6%	0	0
Chautauqua	8.4%	0	0	5.1%	0	0
Erie	11.0%	499	694	0.5%	2	3
Livingston/Wyoming	44.6%	0	21	29.4%	0	6
Ontario	12.6%	99	18	0.4%	4	1
Steuben/Yates	9.6%	27	14	4.1%	1	1
Suffolk	9.0%	926	283	0.3%	3	1
		1,550	1,028		10	12

Between 2005 and 2006, an estimated 20 new RNs graduates entered the Livingston/Wyoming workforce. Attrition of existing RNs due to death, disability, or retirement was estimated at 10 RNs in 2005-06 (2.0% of the workforce), but this is projected to grow to 4.3% of the workforce as the workforce ages. Attrition is probably the greatest challenge for Livingston/Wyoming counties and will contribute to the growth of the RN supply being only a very moderate 2% between 2005 and 2020.

Table 113. Projected Components of RN Supply Change, Livingston/Wyoming Counties, 2005-2020

Livingston/ Wyoming	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	492	500	507	514	519	524	527	530	531	531	530	528	524	519	514	5%
In-migration	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	0%
Out-migration	12	12	12	12	12	12	12	13	13	13	13	12	12	12	12	5%
Net migration	-2	-2	-2	-2	-2	-2	-2	-3	-3	-3	-3	-2	-2	-2	-2	32%
Graduates	20	20	20	20	19	19	19	19	19	19	19	19	19	19	19	-5%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	10	11	11	12	13	14	14	15	16	18	19	21	21	22	22	116%
Total	500	507	514	519	524	527	530	531	531	530	528	524	519	514	509	2%

Livingston/Wyoming counties lose many of their resident RNs to the workforce in neighboring counties. This county group ranks among the lowest in the state for the percent of resident RNs that work in the counties, and also ranks among the lowest in the state for the percent of their RNs that live in the counties. The workforce is projected to grow, but only slowly (an annual average of 0.2% per year), between 2005 and 2020. This is much slower than the 2.6% average annual growth estimated between 2000 and 2005.

Table 114. Relative Rankings of Key Components of Supply Projections, Livingston/Wyoming Counties

	Livingston/Wyoming Ranking
% of resident RNs working in county	38/39
% of RN workforce that lives in county	37/39
In-migration	26/39
Out-migration	19/39
Net migration	24/39
Projected attrition, 2020	9/39
Projected supply growth, 2005-2020	28/39

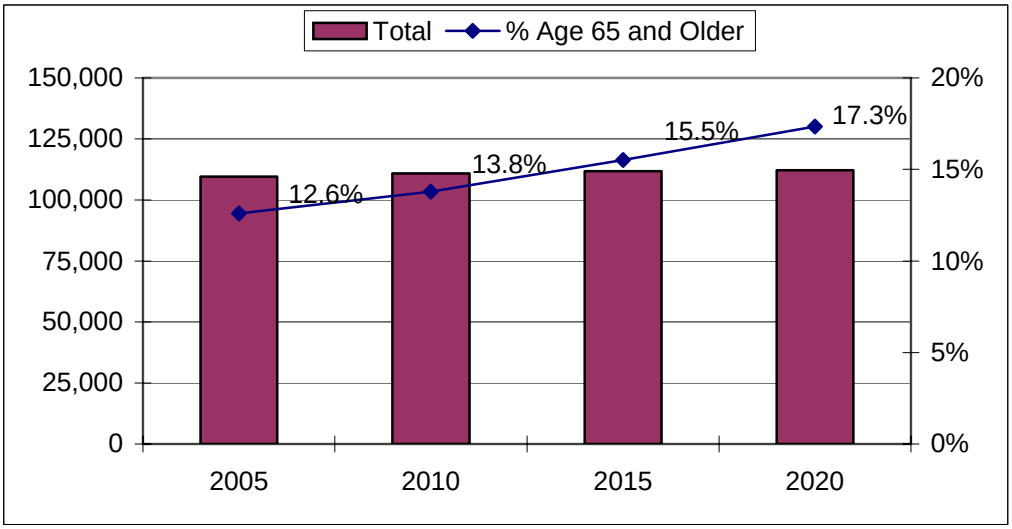
Demand. While the use of hospital inpatient services and emergency outpatient services per capita in Livingston/Wyoming counties is lower than that statewide, the use of non-emergency outpatient services is almost comparable. RN staffing in most settings is lower than statewide ratios, ranking among the bottom five for all county groups in the state for hospital-based services.

Table 115. Projected Demand for Services and Annual Growth Rate by Setting, Livingston/Wyoming Counties

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Livingston/ Wyoming Counties	New York	Rankings	Livingston/ Wyoming Counties	New York	Rankings
Hospital Inpatient Days	768 inpatient days	946 inpatient days	22/39	1.76	4.78	38/39
Hospital Emergency Department Visits	259 ED visits	397 ED visits	35/39	0.79	1.55	37/39
Hospital Outpatient Days	2,029 visits	2,215 visits	23/39	0.04	0.15	38/39
Nursing Facilities	5.1 residents	5.9 residents	33/39	0.08	0.14	31/39
Home Health	317 visits	320 visits	30/39	0.89	1.07	19/39
Non-Hospital Ambulatory Care	3,165 visits	3,233 visits	34/39	0.43	0.28	12/39
Public Health	1,000 people	1,000 people	--	3.28	2.53	21/39
School Health	153 children	168 children	35/39	0	14.01	38/39
Other	1,000 people	1,000 people	--	2.77	2.32	14/39

Demand for RNs in Livingston/Wyoming counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Livingston/Wyoming counties is projected to increase slightly in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 13% to over 17%). While these counties currently rank 29th in the state for the percentage of older adults, they are expected to climb to 22nd by 2020.

Figure 15. Projected Population of Livingston/Wyoming Counties and Percent Age 65 and Older



Demand for most health care services is projected to increase in Livingston/Wyoming counties as the population continues to grow and age. Nursing facility residents in particular are expected to increase dramatically. Demand for school health services may decrease as children become a smaller proportion of the population, and demand for nursing education may decrease as women in the age groups that typically attend nursing school also become a smaller proportion of the population.

Table 116. Projected Demand for Services and Annual Growth Rate by Setting, Livingston/Wyoming Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	96,828	0.92%	0.69%	10/39
Hospital Emergency Department Visits	29,187	0.18%	0.17%	12/39
Hospital Outpatient Days	239,084	0.46%	0.43%	13/39
Nursing Facilities	699	1.50%	0.92%	9/39
Home Health	38,054	0.59%	0.49%	14/39
Non-Hospital Ambulatory Care	373,483	0.48%	0.47%	13/39
Nursing Education	19	-0.41%	-0.29%	23/39
Public Health	112,378	0.15%	0.22%	14/39
School Health	15,831	-0.41%	-0.22%	20/39
Other	112,378	0.15%	0.22%	14/39

The RN supply in Livingston/Wyoming counties must increase by 8% between 2005 and 2020 even to maintain current ratios, and must increase by 78% in order to be consistent with

statewide benchmarks. Projected supply growth, however, is only 2% during this period. Livingston/Wyoming counties are at high risk of shortages during the coming years.

Table 117. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Livingston/Wyoming Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
531	7.9%	877	78.3%	1,008	104.9%	1,322	168.7%	568	15.5%

Monroe/Wayne Counties

Supply. Monroe/Wayne's estimated base year RN population was 8,771 RNs in 2005. RNs in Monroe/Wayne counties are slightly younger than RNs statewide (with a median age of 45 versus 46). An estimated 40% of RNs working in Monroe/Wayne counties are diploma/ADN nurses (compared to 39% statewide), while 40% are BSNs (compared to 43% statewide), and 20% have a MSN or doctorate (versus 18% statewide).

Table 118. Selected Characteristics of RNs, Monroe/Wayne Counties and New York

	Monroe/Wayne Counties	New York	Rankings
Employed RNs	8,771	165,124	9/39
Median Age	45	46	--
% 55+	15.1%	16.9%	24/39
% Diploma/ADN	39.6%	39.4%	30/39
% BSN	40.3%	43.0%	13/39
% MSN	20.1%	17.6%	6/39
% in Hospitals	54.3%	64.1%	24/39

About 54% of RNs in Monroe/Wayne counties are employed in hospitals (versus 64% statewide). An estimated 14% work in non-hospital ambulatory care (compared to 11% statewide), an estimated 12% percent work in nursing facilities (versus 10% statewide), and an estimated 7% work in home health (compared to 4% statewide). In addition, an estimated 2% of Monroe/Wayne counties RNs work in school health and an estimated 1% work in public health.

Most of the RNs working in Monroe/Wayne counties (86%) live in these two counties, while 5% percent come from Livingston/Wyoming counties. The remainder come from Erie County (1%), Genesee/Orleans counties(3%), Ontario County (3%), Steuben/Yates counties(1%), Niagara County (<1%), and Seneca/Tompkins counties (<1%). An estimated 680 RNs per year move into the areas that supply Monroe/Wayne counties with RNs, and an estimated 68 of these RNs will work in Monroe/Wayne. At the same time, an estimated 268 RNs who work in Monroe/Wayne counties will relocate out of Monroe/Wayne supply areas (3.1% of the RN workforce).

Table 119. Location of Residence of RNs Employed in Monroe/Wayne Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Monroe/Wayne RN Supply

Monroe/Wayne Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Monroe/Wayne	In-migrants to Monroe/Wayne workforce	Out-migrants from Monroe/Wayne workforce
Erie	1.0%	499	694	0.8%	4	6
Genesee/Orleans	2.7%	0	0	28.8%	0	0
Livingston/Wyoming	5.4%	0	21	6.4%	0	13
Monroe	86.0%	49	251	97.5%	48	244
Niagara	0.4%	0	0	0.2%	0	0
Ontario	2.7%	99	18	15.1%	15	3
Seneca/Tompkins	0.2%	0	79	2.7%	0	2
Steuben/Yates	0.7%	27	14	0.5%	1	1
Cameron/Elk/McKean/Potter, PA	0.5%	7	0	5.6%	0	0
		680	1,075		68	268

Between 2005 and 2006, an estimated 358 new RNs graduates entered the workforce in Monroe/Wayne counties. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women declines. Attrition of existing RNs due to death, disability, or retirement was estimated at 179 RNs in 2005-06 (2.0% of the workforce), but this is projected to grow to 4.0% of the workforce as the workforce ages. The greatest challenge for this group of counties is increasing attrition, which is already causing declines in the RN workforce that are expected to continue through 2020. Between 2005 and 2020, the RN supply in Monroe/Wayne counties could decline by 14%.

Table 120. Projected Components of RN Supply Change, Monroe/Wayne Counties, 2005-2020

Monroe	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	8,771	8,753	8,724	8,692	8,642	8,592	8,527	8,461	8,377	8,287	8,178	8,068	7,938	7,811	7,676	-12%
In-migration	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	0%
Out-migration	268	268	267	266	264	263	261	259	256	254	250	247	243	239	235	-12%
Net migration	-200	-200	-199	-198	-196	-195	-193	-191	-188	-186	-182	-179	-175	-171	-167	-17%
Graduates	358	354	354	351	351	347	347	347	347	347	347	347	347	347	344	-4%
Foreign	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0%
Attrition	179	188	191	206	209	221	225	243	254	274	279	302	304	315	307	71%
Total	8,753	8,724	8,692	8,642	8,592	8,527	8,461	8,377	8,287	8,178	8,068	7,938	7,811	7,676	7,550	-14%

Monroe/Wayne counties rank first in the state for the percentage of their resident RNs who work within their boundaries, but despite this, the decline in supply is projected to average 1% annually between 2005 and 2020. This is in contrast to the estimated supply growth of 1.4% annually between 2000 and 2005.

Table 121. Relative Rankings of Key Components of Supply Projections, Monroe/Wayne Counties

	Monroe/Wayne Ranking
% of resident RNs working in county	1/39
% of RN workforce that lives in county	12/39
In-migration	31/39
Out-migration	15/39
Net migration	34/39
Projected attrition, 2020	15/39
Projected supply growth, 2005-2020	34/39

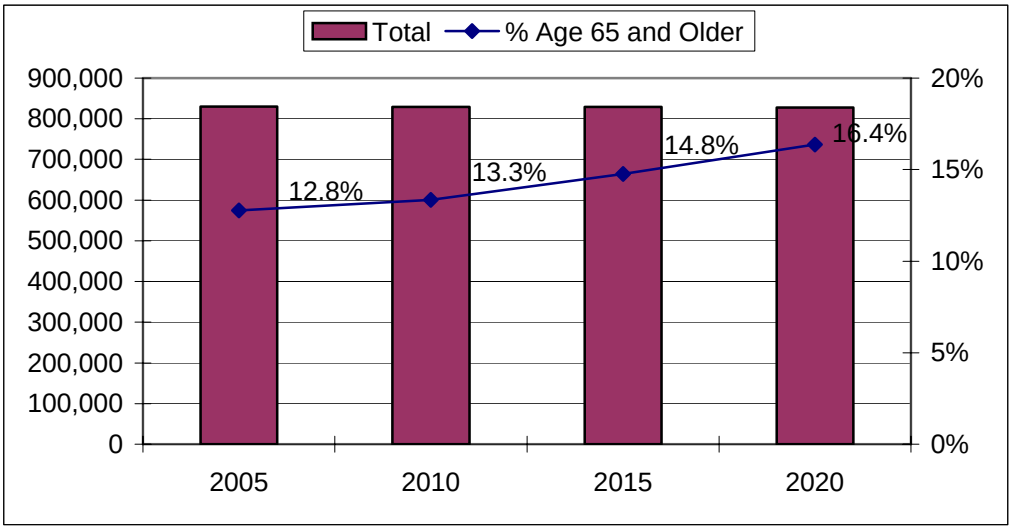
Demand. While the use of hospital inpatient services per capita in Monroe/Wayne counties is lower than that statewide, the use of non-emergency outpatient services is much higher. RN staffing is higher than statewide ratios in most settings, especially in home health, where this county group ranks fourth in the state.

Table 122. Projected Demand for Services and Annual Growth Rate by Setting, Monroe/Wayne Counties

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Monroe/ Wayne Counties	New York	Rankings	Monroe/ Wayne Counties	New York	Rankings
Hospital Inpatient Days	739 inpatient days	946 inpatient days	24/39	5.66	4.78	9/39
Hospital Emergency Department Visits	366 ED visits	397 ED visits	22/39	2.62	1.55	7/39
Hospital Outpatient Days	3,958 visits	2,215 visits	8/39	0.14	0.15	11/39
Nursing Facilities	6.9 residents	5.9 residents	17/39	0.18	0.14	11/39
Home Health	331 visits	320 visits	23/39	2.23	1.07	4/39
Non-Hospital Ambulatory Care	3,245 visits	3,233 visits	24/39	0.44	0.28	10/39
Public Health	1,000 people	1,000 people	--	1.22	2.53	31/39
School Health	180 children	168 children	12/39	12.78	14.01	23/39
Other	1,000 people	1,000 people	--	5.21	2.32	6/39

Demand for RNs in Monroe/Wayne counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Monroe/Wayne counties is projected to decline slightly in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 13% to over 16%). Monroe/Wayne counties currently rank 26th out of 39 for the percentage of older adults; this is projected to fall to 31st by 2020.

Figure 16. Projected Population of Monroe/Wayne Counties and Percent Age 65 and Older



Demand for many health care services is projected to increase in Monroe/Wayne counties as the population continues to age, but the slight projected decline in population will lead to lessened demand for other services.

Table 123. Projected Demand for Services and Annual Growth Rate by Setting, Monroe/Wayne Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	669,721	0.58%	0.69%	10/39
Hospital Emergency Department Visits	302,920	-0.02%	0.17%	24/39
Hospital Outpatient Days	3,402,256	0.24%	0.43%	24/39
Nursing Facilities	6,237	0.59%	0.92%	28/39
Home Health	275,655	0.03%	0.49%	26/39
Non-Hospital Ambulatory Care	2,784,841	0.22%	0.47%	25/39
Nursing Education	344	-0.27%	-0.29%	18/39
Public Health	827,766	-0.02%	0.22%	14/39
School Health	140,352	-0.40%	-0.22%	19/39
Other	827,766	-0.02%	0.22%	14/39

Monroe/Wayne counties currently have higher RN staffing ratios than many other county groups in the state, but hospitals in this area still report substantial vacancies. A 14% projected decline in supply may or may not be problematic depending upon the benchmark used. Such a decline will bring current ratios down to below national benchmarks, but Monroe/Wayne counties will still have higher ratios than the averages for New York.

Table 124. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Monroe/Wayne Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
8,959	2.1%	6,956	-20.7%	7,941	-9.5%	10,306	17.5%	10,793	23.1%

Ontario County

Supply. Ontario County's estimated base year RN population was 1,660 RNs in 2005. RNs in Ontario County are substantially older than RNs statewide (with a median age of 49 versus 46). An estimated 57% of RNs working in Ontario County are diploma/ADN nurses (compared to 39% statewide), while 31% are BSNs (compared to 43% statewide), and 18% have a MSN or doctorate (the same as statewide).

Table 125. Selected Characteristics of RNs, Ontario County and New York

	Ontario County	New York	Rankings
Employed RNs	1,660	165,124	20/39
Median Age	49	46	--
% 55+	15.8%	16.9%	21/39
% Diploma/ADN	57.4%	39.4%	16/39
% BSN	30.5%	43.0%	23/39
% MSN	17.9%	17.6%	23/39
% in Hospitals	53.7%	64.1%	27/39

About 54% of RNs in Ontario County are employed in hospitals (versus 64% statewide). An estimated 32% work in non-hospital ambulatory care (compared to 11% statewide), an estimated 3% percent work in nursing facilities (versus 10% statewide), and an estimated 4% work in home health (the same as statewide).

Most of the RNs working in Ontario County live in the county (75%), while 13% come from Steuben/Yates counties, and 9% come from Monroe/Wayne counties. The remainder comes from Seneca/Tompkins counties (3%). An estimated 175 RNs per year move into the areas that supply Ontario County with RNs, and an estimated 86 of these RNs will work in Ontario County. At the same time, an estimated 28 RNs who work in Ontario County will relocate out of Ontario County supply areas (1.7% of the RN workforce).

Table 126. Location of Residence of RNs Employed in Ontario County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Ontario County RN Supply

Ontario Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Ontario	In-migrants to Ontario workforce	Out-migrants from Ontario workforce
Monroe/Wayne	8.7%	49	251	1.9%	1	5
Ontario	74.8%	99	18	80.9%	80	14
Seneca/Tompkins	3.2%	0	79	7.6%	0	6
Steuben/Yates	13.3%	27	14	19.5%	5	3
		175	360		86	28

Between 2005 and 2006, an estimated 68 new RNs graduates entered the Ontario County workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women declines. Attrition of existing RNs due to death, disability, or retirement was estimated at 35 RNs in 2005-06 (2.1% of the workforce), but is projected to grow to 4.4% of the workforce as the workforce ages. Ontario County is benefited by strong in-migration into its supply areas, and the supply of RNs is projected to steadily grow between 2005 and 2020. Overall supply growth during this period could reach 37%. This is an average annual growth rate of 2.5%, down from an estimated 11.6% per year between 2000 and 2005.

Table 127. Projected Components of RN Supply Change, Ontario County, 2005-2020

Ontario	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	1660	1751	1837	1919	1993	2064	2128	2189	2241	2287	2324	2354	2376	2393	2401	45%
In-migration	86	86	86	86	86	86	86	86	86	86	86	86	86	86	86	0%
Out-migration	28	29	30	32	33	34	35	36	37	38	39	39	39	40	40	45%
Net migration	58	57	56	54	53	52	51	50	49	48	47	47	47	46	46	-21%
Graduates	68	67	67	66	66	66	65	65	65	65	65	65	65	65	65	-4%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	35.0	38.2	40.8	45.8	48.3	52.8	55.6	62.3	67.9	76.3	81.6	90.4	95.1	102.5	105.4	201%
Total	1751	1837	1919	1993	2064	2128	2189	2241	2287	2324	2354	2376	2393	2401	2407	37%

Table 128. Relative Rankings of Key Components of Supply Projections, Ontario County

	Ontario County Ranking
% of resident RNs working in county	12/39
% of RN workforce that lives in county	21/39
In-migration	12/39
Out-migration	31/39
Net migration	9/39
Projected attrition, 2020	7/39
Projected supply growth, 2005-2020	12/39

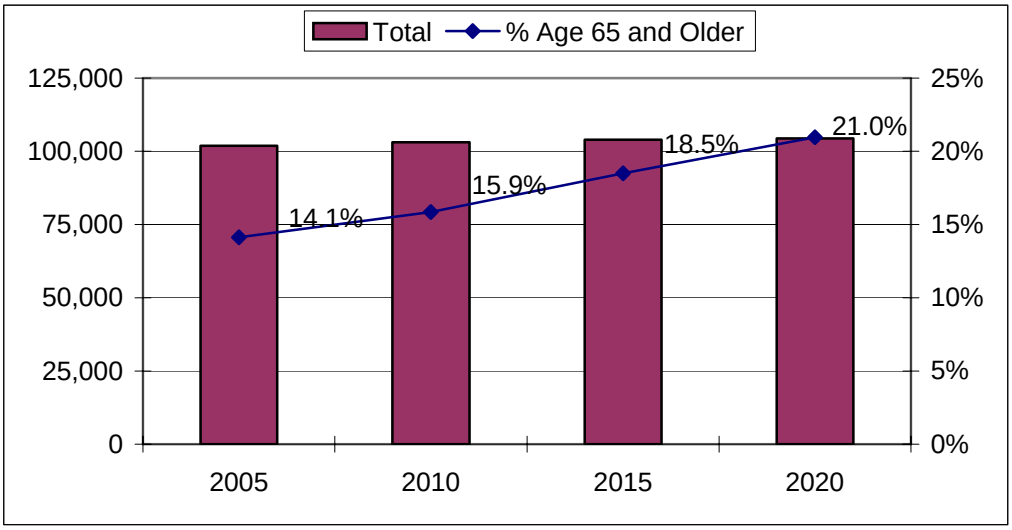
Demand. There are dramatically more hospital services per capita consumed in Ontario County than statewide. The county ranks third in the state for the use of inpatient services. There are also more nursing facility residents in Ontario County. RN staffing per unit of service is lower in hospital inpatient, non-emergency outpatient, and nursing facility settings, but the county ranks first in the state for non-hospital ambulatory care staffing.

Table 129. Projected Demand for Services and Annual Growth Rate by Setting, Ontario County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Ontario County	New York	Rankings	Ontario County	New York	Rankings
Hospital Inpatient Days	1,649 inpatient days	946 inpatient days	3/39	4.30	4.78	22/39
Hospital Emergency Department Visits	469 ED visits	397 ED visits	12/39	1.50	1.55	6/39
Hospital Outpatient Days	11,227 visits	2,215 visits	20/39	0.08	0.15	25/39
Nursing Facilities	7.3 residents	5.9 residents	13/39	0.07	0.14	33/39
Home Health	352 visits	320 visits	15/39	2.01	1.07	7/39
Non-Hospital Ambulatory Care	3,340 visits	3,233 visits	14/39	1.53	0.28	1/39
Public Health	1,000 people	1,000 people	--	3.48	2.53	20/39
School Health	165 children	168 children	27/39	39.14	14.01	22/39
Other	1,000 people	1,000 people	--	0.13	2.32	13/39

Demand for RNs in Ontario County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Ontario County is projected to increase in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 14% to 21%). Ontario County ranked 17th out of the 39 county groups in the proportion of the population age 65 and older in 2005; by 2020 it is expected to rank sixth in the state.

Figure 17. Projected Population of Ontario County and Percent Age 65 and older



Demand for most health care services is projected to increase in Ontario County as the population increases. As the population ages, the greatest increases are projected for hospital inpatient days and nursing facilities.

Table 130. Projected Demand for Services and Annual Growth Rate by Setting, Ontario County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	193,956	0.96%	0.69%	9/39
Hospital Emergency Department Visits	49,363	0.21%	0.17%	33/39
Hospital Outpatient Days	1,258,135	0.63%	0.43%	9/39
Nursing Facilities	942	1.62%	0.92%	6/39
Home Health	39,659	0.67%	0.49%	12/39
Non-Hospital Ambulatory Care	375,492	0.66%	0.47%	9/39
Nursing Education	65	-0.27%	-0.29%	17/39
Public Health	104,320	0.16%	0.22%	33/39
School Health	15,722	-0.47%	-0.22%	32/39
Other	104,320	0.16%	0.22%	33/39

Projected robust growth in the RN supply in Ontario County should put the county in a comfortable position moving forward. Ratios of RNs to units of service should remain above state and national benchmarks, although they will still not be as high as ratios observed in Massachusetts.

Table 131. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Ontario County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
1,870	12.7%	1,590	-4.2%	1,968	18.6%	2,502	50.7%	2,014	21.3%

Hudson Valley Region

Nearly 19,000 RNs are employed in the Hudson Valley region of New York, which is composed of Dutchess, Orange, Rockland, Sullivan/Ulster and Westchester/Putnam counties. RNs in this region are older on average than RNs statewide, but with similar levels of education.

Table 132. Selected Characteristics of Hudson Valley RNs

	Hudson Valley	New York
Employed RNs	18,722	165,124
Median Age	47	46
% 55+	22.2%	16.9%
% Diploma/ADN	39.9%	39.4%
% BSN	44.1%	43.0%
% MSN	16.0%	17.6%
% in Hospitals	62.0%	64.1%

Most RNs who work in the Hudson Valley region live in the Hudson Valley (90.8%), and the area is gaining more resident RNs through migration than it is losing. Since most RNs who reside in the Hudson Valley will also work there (75.5%), this means three-quarters of in-migrant RNs will join the Hudson Valley workforce.

Table 133. Location of Residence of RNs Employed in the Hudson Valley, Residential Migration Patterns, and Estimated Effects of Residential Migration on Hudson Valley RN Supply

Hudson Valley Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Hudson Valley	In-migrants to Hudson Valley workforce	Out-migrants from Hudson Valley workforce
Hudson Valley	90.8%	949	0	75.5%	716	0
New York City	2.4%	1,238	2,413	1.0%	12	24
Capital District	1.1%	526	169	0.8%	4	0
Long Island	0.3%	1,669	0	0.1%	2	0
North Country	0.3%	52	94	0.6%	0	1
Southern Tier	0.3%	87	525	0.6%	1	3
Out of State	4.9%	1,031	243			
Connecticut		268	167	4.0%	11	7
New Jersey		749	0	4.2%	31	0
Pennsylvania		14	76	14.3%	2	11
					779	46

Between 2005 and 2006, the RN supply in the Hudson Valley was estimated to have grown by nearly 1,400 RNs, or about 7%.

Table 134. Projected Components of RN Supply Change, Hudson Valley, 2005-2006

Hudson Valley Region	2005-2006
Base	18,722
In-migration	779
Out-migration	46
Net migration	733
Graduates	901
Foreign	175
Attrition	449
	+1,360 (7.3%)

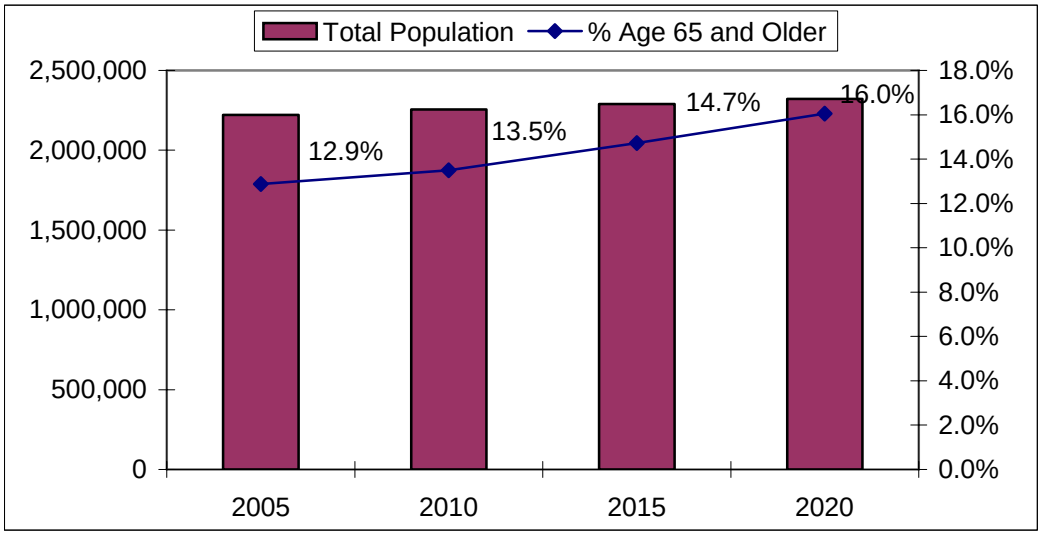
Use of hospital inpatient days per capita was much higher in the Hudson Valley than statewide, while use of outpatient visits per capita was much lower. The number of school-age children per capita was also much higher in the Hudson Valley than statewide. It is estimated that there are fewer RNs per inpatient day but more RNs per outpatient visit in the Hudson Valley than statewide, but this may be based on assumptions about the distributions of hospital-employed RNs that may not hold true for Hudson Valley hospitals. It appears that there are fewer RNs per 1,000 home health visits than the statewide average, and fewer school RNs per 1,000 school-age children.

Table 135. Demand for Services per 1,000 Population and RNs per Unit of Service, Hudson Valley

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	Hudson Valley	New York	Hudson Valley	New York
Hospital Inpatient Days	1,175 inpatient days	946 inpatient days	3.77	4.78
Hospital Emergency Department Visits	343 ED visits	397 ED visits	1.73	1.55
Hospital Outpatient Days	1,318 outpatient visits	2,215 outpatient visits	0.94	0.15
Nursing Facility Residents	6.0 residents	5.9 residents	0.12	0.14
Home Health Visits	323 visits	320 visits	0.77	1.07
Non-Hospital Ambulatory Care	3,198 visits	3,233 visits	0.35	0.28
School Health	182 children	168 children	2.01	2.75
Public Health	1,000 people	1,000 people	0.40	0.51
Other	1,000 people	1,000 people	0.27	1.01

The population of the Hudson Valley is expected to grow steadily between 2005 and 2020, while the percentage of the population age 65 and older is also expected to moderately increase during the same period, as shown in Figure 18.

Figure 18. Projected Population of Hudson Valley and Percent Age 65 and older



The growing population of the Hudson Valley ensures continued growth in demand for most health-related services through 2020. The demand for RNs in nursing education and school health are expected to decline somewhat during this period, however, as the numbers of both nursing students and elementary/high school students decline as well as the numbers of women between the age of 18 and 44 and the numbers of school-age children in the population. These declines are consistent with those projected throughout New York.

Table 136. Projected Demand for Services and Annual and Historical Growth Rate by Setting, Hudson Valley

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, Hudson Valley, 2005-2020	Projected Annual Growth Rate, New York
Hospital Inpatient Days	1,920,252	0.81%	0.69%
Hospital Emergency Department Visits	813,140	0.32%	0.17%
Hospital Outpatient Days	3,219,154	0.52%	0.43%
Nursing Facilities	16,452	1.27%	0.92%
Home Health	801,427	0.62%	0.49%
Non-Hospital Ambulatory Care	7,827,239	0.54%	0.47%
Nursing Education	861	-0.30%	-0.26%
Public Health	2,321,384	0.29%	0.22%
School Health	389,171	-0.26%	-0.22%
Other	2,321,384	0.29%	0.22%

The continuing growth of the population in the Hudson Valley poses a challenge to the health care system in that region in terms of maintaining an adequate RN workforce. Yet, the Hudson Valley begins with ratios of RNs to units of services that are higher than the state averages, and shows extremely strong growth in RN supply that should continue through 2020.

Table 137. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Hudson Valley

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
20,835		18,501		20,558		27,426		21,541	

Dutchess County

Supply. Dutchess County's estimated base year RN population was 2,844 RNs in 2005. RNs in Dutchess County are less likely than RNs statewide to be older than age 55 (13.1% versus 16.9%). An estimated 46% of RNs working in Dutchess County are diploma/ADN nurses (compared to 39% statewide), while 38% are BSNs (compared to 27% statewide), and 16% have a MSN or doctorate (versus 18% statewide).

Table 138. Selected Characteristics of RNs, Dutchess County and New York

	Dutchess County	New York	Rankings
Employed RNs	2,844	165,124	14/39
Median Age	46	46	--
% 55+	13.1%	16.9%	32/39
% Diploma/ADN	46.2%	39.4%	26/39
% BSN	37.9%	43.0%	14/39
% MSN	15.9%	17.6%	15/39
% in Hospitals	52.3%	64.1%	29/39

About 52% of RNs in Dutchess County are employed in hospitals (versus 64% statewide). An estimated 15% work in non-hospital ambulatory care (compared to 11% statewide), and an estimated 12% percent work in nursing facilities (versus 10% statewide). An estimated 2% of RNs in Dutchess County work in home health (compared to 4% statewide), but an estimated 14% work in public health (compared to 3% statewide).

Most RNs working in Dutchess County (66%) also live in Dutchess County, while 18% percent come from Sullivan/Ulster counties and 12% come from Orange County. The remainder comes from Columbia/Greene and Westchester/Putnam counties. An estimated 1,038 RNs per year move into the areas that supply Dutchess County with RNs, and an estimated 125 of these RNs will work in Dutchess County. At the same time, an estimated 303 RNs who work in Dutchess County will relocate out of Dutchess County supply areas (10.7% of the RN workforce).

Table 139. Location of Residence of RNs Employed in Dutchess County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Dutchess County RN Supply

Dutchess County Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Dutchess	In-migrants to Dutchess workforce	Out-migrants from Dutchess workforce
Columbia/Greene	2.4%	134	0	4.5%	6	0
Dutchess	65.9%	87	76	66.7%	58	50
Orange	11.6%	217	0	10.8%	23	0
Sullivan/Ulster	18.4%	215	0	16.7%	36	0
Westchester/Putnam	1.8%	387	228	0.5%	2	1
		1,038	304		125	51

Between 2005 and 2006, an estimated 129 new RNs graduates entered the Dutchess County workforce. The number of new graduates entering the workforce is expected to increase somewhat as the population of working-age women increases. Attrition of existing RNs due to death, disability, or retirement was estimated at 68 RNs in 2005-06 (2.4% of the workforce), but this is projected to grow to 3.9% of the workforce as the workforce ages. If the current trends continue, between 2005 and 2020, the RN supply in Dutchess County could increase by 37%. This is an average annual growth rate of 2.4%, which represents a decline from the annual growth rate of 4.0% estimated between 2000 and 2005.

Table 140. Projected Components of RN Supply Change, Dutchess County, 2005-2020

Dutchess	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	2844	2988	3122	3251	3371	3481	3580	3670	3753	3825	3886	3938	3984	4025	4061	43%
In-migration	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	0%
Out-migration	51	54	57	59	61	63	65	66	68	69	70	71	72	73	74	43%
Net migration	74	71	68	66	64	62	60	59	57	56	55	54	53	52	51	-30%
Graduates	129	129	129	128	128	128	128	129	129	129	129	131	131	132	132	2%
Foreign	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	0%
Attrition	68	75	78	84	91	100	107	115	123	134	141	147	151	158	159	134%
Total	2988	3122	3251	3371	3481	3580	3670	3753	3825	3886	3938	3984	4025	4061	4094	37%

Table 141. Relative Rankings of Key Components of Supply Projections, Dutchess County

	Dutchess Ranking
% of resident RNs working in county	20/39
% of RN workforce that lives in county	28/39
In-migration	16/39
Out-migration	23/39
Net migration	10/39
Projected attrition, 2020	17/39
Projected supply growth, 2005-2020	11/39

Demand. The use of hospital services per capita in Dutchess County is lower than statewide, but there are more nursing home residents per capita. Demand for services in other settings is similar to per capita demand statewide.

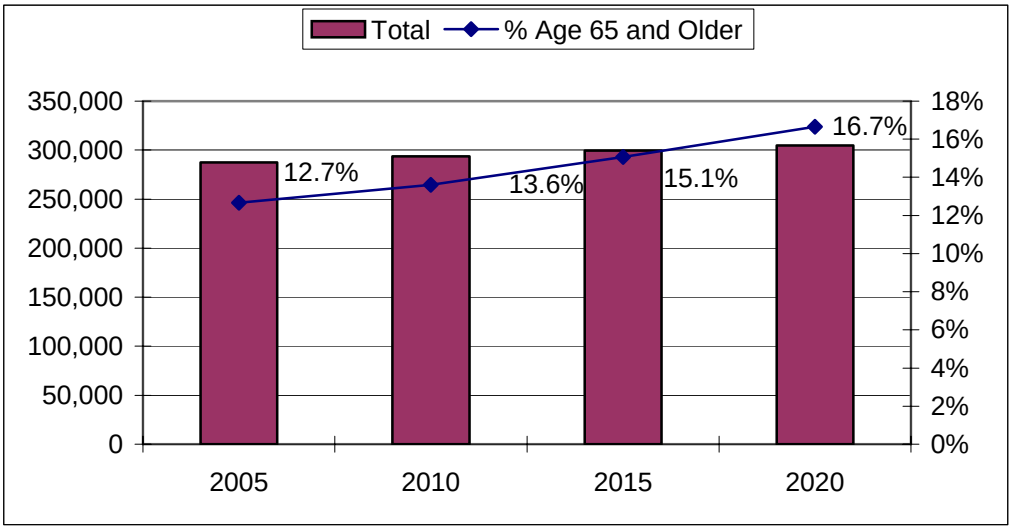
Dutchess County has more inpatient hospital RNs per inpatient day than the statewide average, but fewer home health RNs per estimated home health visit. Public health and school health appear to be better staffed relative to the size of the populations they serve than the statewide averages.

Table 142. Projected Demand for Services and Annual Growth Rate by Setting, Dutchess County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Dutchess County	New York	Rankings	Dutchess County	New York	Rankings
Hospital Inpatient Days	631 inpatient days	946 inpatient days	27/39	7.00	4.78	3/39
Hospital Emergency Department Visits	323 ED visits	397 ED visits	30/39	1.59	1.55	18/39
Hospital Outpatient Days	1,240 visits	2,215 visits	33/39	0.09	0.15	24/39
Nursing Facilities	6.8 residents	5.9 residents	15/39	0.17	0.14	14/39
Home Health	311 visits	320 visits	28/39	0.71	1.07	24/39
Non-Hospital Ambulatory Care	3,130 visits	3,233 visits	28/39	0.45	0.28	9/39
Public Health	1,000 people	1,000 people	--	14.06	2.53	2/39
School Health	170 children	168 children	19/39	16.54	14.01	20/39
Other	1,000 people	1,000 people	--	0.60	2.32	29/39

Demand for RNs in Dutchess County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Dutchess County is projected to increase in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 13% to almost 17%). Dutchess County ranks 27th in the percentage of older adults, and is expected to rank 28th by 2020.

Figure 19. Projected Population of Dutchess County and Percent Age 65 and older



Demand for most health care services is projected to increase in Dutchess County as the population continues to grow and age. In particular, the county ranks fifth out of 39 for projected growth demand for RNs in nursing facilities and nursing education. Demand for school health services is expected to decrease as children become a smaller proportion of the population.

Table 143. Projected Demand for Services and Annual Growth Rate by Setting, Dutchess County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	219,230	1.08%	0.69%	6/39
Hospital Emergency Department Visits	101,921	0.43%	0.17%	8/39
Hospital Outpatient Days	407,306	0.71%	0.43%	8/39
Nursing Facilities	2,601	1.74%	0.92%	5/39
Home Health	91,897	0.86%	0.49%	7/39
Non-Hospital Ambulatory Care	1,027,110	0.70%	0.47%	8/39
Nursing Education	133	0.15%	-0.29%	5/39
Public Health	304,815	0.39%	0.22%	8/39
School Health	50,273	-0.15%	-0.22%	12/39
Other	304,815	0.39%	0.22%	8/39

The RN supply in Dutchess County grew 4% annually between 2000 and 2005, and is projected to grow 37% between 2005 and 2020. This should be more than adequate to meet any benchmark of adequate RN supply. Dutchess County is, therefore, not projected to be in danger of serious shortages.

Table 144. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Dutchess County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
3,315	16.6%	2,332	-18.0%	2,536	-10.8%	3,381	18.9%	3,904	37.3%

Orange County

Supply. Orange County's estimated base year RN population was 2,424 RNs in 2005. RNs in Orange County have a slightly younger median age than RNs statewide (44 versus 46 years), but are more likely to be older than age 55 (19% versus 17%). An estimated 61% of RNs working in Orange County are diploma/ADN nurses (compared to 39% statewide), while 26% are BSNs (compared to 43% statewide), and 13% have a MSN or doctorate (versus 18% statewide).

Table 145. Selected Characteristics of RNs, Orange County and New York

	Orange County	New York	Rankings
Employed RNs	2,424	165,124	16/39
Median Age	44	46	--
% 55+	19.4%	16.9%	12/39
% Diploma/ADN	61.0%	39.4%	13/39
% BSN	26.2%	43.0%	28/39
% MSN	12.8%	17.6%	21/39
% in Hospitals	69.1%	64.1%	5/39

About 69% of RNs in Orange County are employed in hospitals (versus 64% statewide); hospital employment among RNs in Orange County ranks fifth in the state. An estimated 12% work in non-hospital ambulatory care (compared to 11% statewide).

Many of the RNs working in Orange County live in the county (67%), while 23% percent come from Sullivan/Ulster counties, and 7% come from Pike/Susquehanna/Wayne counties. The remainder comes from Dutchess County (1%). An estimated 532 RNs per year move into the areas that supply Orange County with RNs, and an estimated 157 of these RNs will work in Orange County. At the same time, an estimated nine RNs who work in Orange County will relocate out of Orange County supply areas (<1% of the RN workforce).

Table 146. Location of Residence of RNs Employed in Orange County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Orange County RN Supply

Orange County Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Orange	In-migrants to Orange workforce	Out-migrants from Orange workforce
Dutchess	1.1%	87	76	1.0%	1	1
Orange	67.3%	217	0	53.1%	115	0
Sullivan/Ulster	23.4%	215	0	18.1%	39	0
Pike/Susquehanna/Wayne Co., Pennsylvania	6.8%	14	59	14.6%	2	9
		532	135		157	9

Between 2005 and 2006, an estimated 110 new RNs graduates entered the Orange County workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women declines. Attrition of existing RNs due to death, disability, or retirement was estimated at 59 RNs in 2005-06 (2.4% of the workforce), but this is projected to grow to 4.3% of the workforce as the workforce ages. Orange County is benefited by strong in-migration into its supply areas, and the supply of RNs is projected to steadily grow between 2005 and 2020. Overall supply growth during this period could reach as high as 71%.

Table 147. Projected Components of RN Supply Change, Orange County, 2005-2020

Orange	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	2,424	2,625	2,818	3,005	3,185	3,356	3,515	3,665	3,805	3,935	4,048	4,151	4,244	4,329	4,401	82%
In-migration	157	157	157	157	157	157	157	157	157	157	157	157	157	157	157	0%
Out-migration	9	10	11	12	12	13	14	14	15	15	16	16	17	17	17	82%
Net migration	148	147	146	145	145	144	143	143	142	142	141	141	140	140	140	-5%
Graduates	110	110	111	111	112	112	114	115	116	116	117	118	119	120	121	10%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%0
Attrition	59	66	70	76	84	94	103	113	123	138	148	159	167	179	188	219%
Total	2,623	2,816	3,005	3,185	3,358	3,518	3,669	3,810	3,940	4,055	4,158	4,251	4,336	4,410	4,474	71%

Orange County ranks third in the state for net migration. This strong migration flow undoubtedly contributes to the estimated average annual growth rate of 4% per year. This growth rate is much higher than the 0.9% average annual growth rate observed between 2000 and 2005.

Table 148. Relative Rankings of Key Components of Supply Projections, Orange County

	Orange County Ranking
% of resident RNs working in county	31/39
% of RN workforce that lives in county	27/39
In-migration	4/39
Out-migration	34/39
Net migration	3/39
Projected attrition, 2020	10/39
Projected supply growth, 2005-2020	5/39

Demand. While the use of hospital inpatient and non-emergency outpatient services per capita in Orange County is lower than that statewide, the use of emergency department services is higher. Orange County has fewer nursing facility residents per capita than the statewide average, and more school-aged children. Use of home health and non-hospital ambulatory care services are estimated to be among the lowest in the state.

RN staffing is comparable to statewide ratios in most settings, but higher in hospital inpatient and home health settings. RN staffing in nursing facilities appears to rank last in the state, but this is probably a product of random error resulting from a small sample size.

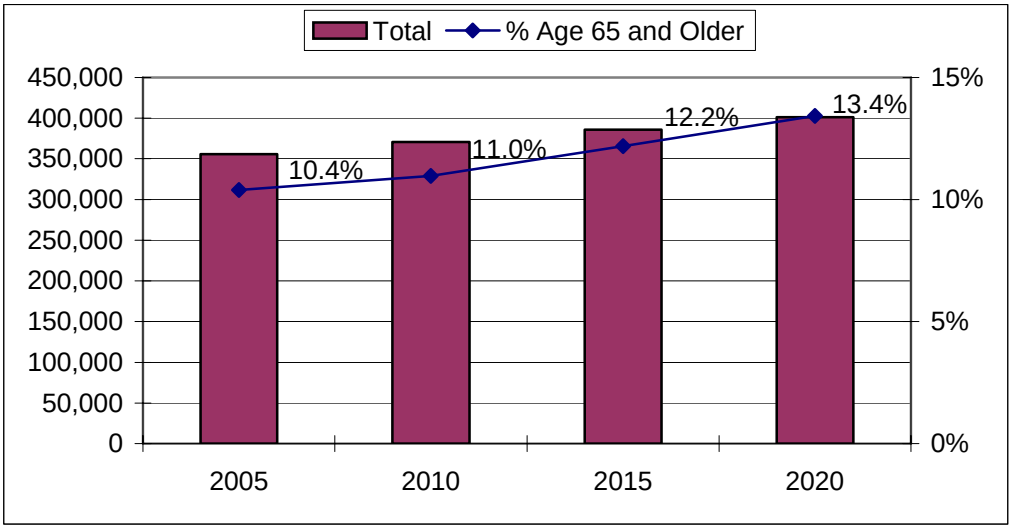
Table 149. Projected Demand for Services and Annual Growth Rate by Setting, Orange County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Orange County	New York	Rankings	Orange County	New York	Rankings
Hospital Inpatient Days	615 inpatient days	946 inpatient days	30/39	6.15	4.78	6/39
Hospital Emergency Department Visits	455 ED visits	397 ED visits	15/39	1.76	1.55	16/39
Hospital Outpatient Days	1,301 visits	2,215 visits	31/39	0.10	0.15	20/39
Nursing Facilities	4.3 residents	5.9 residents	36/39	0	0.14	39/39
Home Health	290 visits	320 visits	35/39	2.03	1.07	6/39
Non-Hospital Ambulatory Care	3,106 visits	3,233 visits	36/39	0.27	0.28	21/39
Public Health	1,000 people	1,000 people	--	0	2.53	38/39
School Health	202 children	168 children	2/39	24.06	14.01	14/39
Other	1,000 people	1,000 people	--	0.54	2.32	30/39

Demand for RNs in Orange County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Orange County is projected to increase in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 10% to 13%). Orange

County will remain a relatively young county compared to other county groups in New York, however, ranking 38th out of 39 in the percentage of older adults in 2005, and projected to rank 37th in 2020.

Figure 20. Projected Population of Orange County and Percent Age 65 and older



Demand for most health care services is projected to increase in Orange County as the population increases. Nursing facility residents and hospital inpatient days are projected to increase the most as a result of the aging of the population. Projected growth in hospital services, non-hospital ambulatory care, and public health ranks third in the state, while projected growth in nursing education ranks second and demand for school health ranks fourth.

Table 150. Projected Demand for Services and Annual Growth Rate by Setting, Orange County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	202,526	1.21%	0.69%	3/39
Hospital Emergency Department Visits	182,932	0.82%	0.17%	3/39
Hospital Outpatient Days	540,207	1.03%	0.43%	3/39
Nursing Facilities	1,942	1.58%	0.92%	8/39
Home Health	117,324	0.85%	0.49%	8/39
Non-Hospital Ambulatory Care	1,285,702	1.01%	0.47%	3/39
Nursing Education	122	0.70%	-0.29%	2/39
Public Health	401,414	0.81%	0.22%	3/39
School Health	76,777	0.44%	-0.22%	4/39
Other	401,414	0.81%	0.22%	3/39

Projected robust growth in the RN supply in Orange County should put the county in a comfortable position moving forward. Ratios of RNs to units of service should remain above state and national benchmarks, and will even exceed the ratios observed in Massachusetts.

Table 151. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Orange County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
2,852	17.7%	2,757	13.7%	3,020	24.6%	4,040	66.7%	2,962	22.2%

Rockland County

Supply. Rockland County's estimated base year RN population was 2,504 RNs in 2005. RNs in Rockland County are considerably older than other RNs in New York (with a median age of 50 versus 46), and are more likely to be older than age 55 (29% versus 17%). An estimated 34% of RNs working in Rockland County are diploma/ADN nurses (compared to 39% statewide), while 54% are BSNs (compared to 43% statewide), and 12% have a MSN or doctorate (versus 18% statewide).

Table 152. Selected Characteristics of RNs, Rockland County and New York

	Rockland County	New York	Rankings
Employed RNs	2,504	165,124	15/39
Median Age	50	46	--
% 55+	29.3%	16.9%	4/39
% Diploma/ADN	34.1%	39.4%	33/39
% BSN	53.5%	43.0%	3/39
% MSN	12.4%	17.6%	22/39
% in Hospitals	62.5%	64.1%	13/39

About 63% of RNs in Rockland County are employed in hospitals (versus 64% statewide). An estimated 14% of Rockland County RNs work in non-hospital ambulatory care (compared to 11% statewide), an estimated 8% percent work in nursing facilities (versus 10% statewide), and an estimated 2% work in home health (compared to 4% statewide).

Most of the RNs working in Rockland County live in the county (70%), while 10% comes from Sullivan/Ulster counties and 5% from Bergen County, New Jersey. The remainder comes from Orange County (4%), Dutchess County (3%), Westchester/Putnam counties (3%), and Clinton/Essex/Franklin/Hamilton counties (1%). An estimated 1,942 RNs per year move into the areas that supply Rockland County with RNs and an estimated 142 of these RNs will work in Rockland County. At the same time, an estimated 47 RNs who work in Rockland County will relocate out of Rockland County supply areas (1.9% of the RN workforce).

Table 153. Location of Residence of RNs Employed in Rockland County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Rockland County RN Supply

Rockland Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Rockland	In-migrants to Rockland workforce	Out-migrants from Rockland workforce
Clinton/Essex/Franklin/Hamilton	1.0%	0	58	1.2%	0	1
Dutchess	2.6%	87	76	2.5%	2	2
Orange	3.8%	217	0	3.3%	7	0
Rockland	70.4%	209	45	44.6%	93	20
Sullivan/Ulster	9.9%	215	0	8.5%	18	0
Westchester/Putnam	3.2%	387	228	0.9%	3	2
Bergen, NJ	5.3%	828	1,013	2.2%	18	22
		1,942	1,419		142	47

Between 2005 and 2006, an estimated 114 new RNs graduates entered the Rockland County workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women declines. Attrition of existing RNs due to death, disability, or retirement was estimated at 60 RNs in 2005-06 (2.4% of the workforce), but this is projected to grow to 3.9% as the workforce ages. Rockland County is benefited by strong in-migration into its supply areas, and the supply of RNs is projected to steadily grow between 2005 and 2020. Overall supply growth during this period could reach 44%.

Table 154. Projected Components of RN Supply Change, Rockland County, 2005-2020

Rockland	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	2,504	2,654	2,793	2,927	3,052	3,168	3,272	3,367	3,453	3,530	3,594	3,651	3,700	3,744	3,782	51%
In-migration	142	142	142	142	142	142	142	142	142	142	142	142	142	142	142	0%
Out-migration	47	50	53	55	57	60	62	63	65	66	68	69	70	70	71	51%
Net migration	95	92	89	87	85	82	80	79	77	76	74	73	72	72	71	-25%
Graduates	114	113	113	112	112	110	110	110	110	110	110	110	112	112	112	-2%
Foreign	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0%
Attrition	60	66	70	75	81	90	97	104	112	123	129	136	140	147	149	148%
Total	2,654	2,793	2,927	3,052	3,168	3,272	3,367	3,453	3,530	3,594	3,651	3,700	3,744	3,782	3,816	44%

This is estimated average annual growth of 2.8%, which is consistent with the 3% annual growth rate observed between 2000 and 2005.

Table 155. Relative Rankings of Key Components of Supply Projections, Rockland County

	Rockland County Ranking
% of resident RNs working in county	34/39
% of RN workforce that lives in county	23/39
In-migration	9/39
Out-migration	22/39
Net migration	7/39
Projected attrition, 2020	18/39
Projected supply growth, 2005-2020	8/39

Demand. The use of all hospital-based services per capita in Rockland County is among the lowest in the state, while the use of other services is comparable. The exception is that Rockland County has many more children per capita than the statewide average, ranking third in the state.

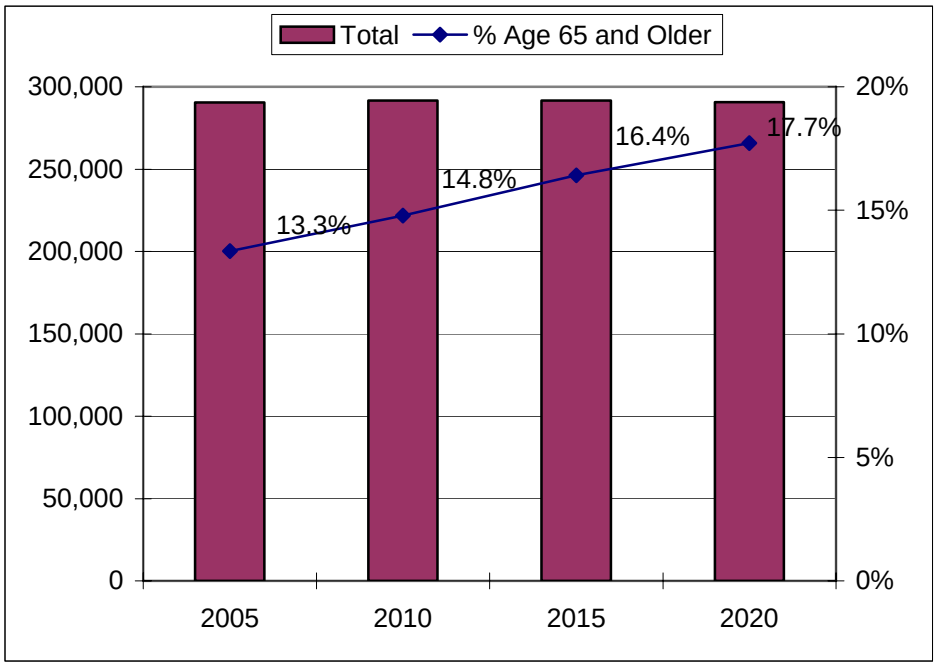
Rockland County is estimated to have the highest rate of inpatient staffing in the state, but has low rates of hospital outpatient staffing and home health staffing.

Table 156. Projected Demand for Services and Annual Growth Rate by Setting, Rockland County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Rockland County	New York	Ranking	Rockland County	New York	Ranking
Hospital Inpatient Days	468 inpatient days	946 inpatient days	35/39	11.03	4.78	1/39
Hospital Emergency Dept. Visits	163 ED visits	397 ED visits	39/39	1.15	1.55	31/39
Hospital Outpatient Days	495 visits	2,215 visits	39/39	0.06	0.15	36/39
Nursing Facilities	5.6 residents	5.9 residents	28/39	0.13	0.14	20/39
Home Health	329 visits	320 visits	24/39	0	1.07	37/39
Non-Hospital Ambulatory Care	3,266 visits	3,233 visits	23/39	0.37	0.28	15/39
Public Health	1,000 people	1,000 people	--	2.35	2.53	25/39
School Health	201 children	168 children	3/39	31.56	14.01	10/39
Other	1,000 people	1,000 people	--	0.32	2.32	31/39

Demand for RNs in Rockland County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Rockland County is projected to remain relatively constant in size in the coming years, but the population age 65 and older will become a progressively larger proportion of the population (from about 13% to 18%).

Figure 21. Projected Population of Rockland County and Percent Age 65 and older



Demand for most health care services is projected to increase in Rockland County as the population ages. The county ranks second in the state in projected growth in nursing facility residents, and fourth in the state in projected use of home health services. Demand is expected to decline, however, for RNs working in nursing education and schools, due to projected decreases in the population of women of the typical nursing student (age 25-44) and also in the population of children age 5-17.

Table 157. Projected Demand for Services and Annual Growth Rate by Setting, Rockland County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	154,001	0.81%	0.69%	14/39
Hospital Emergency Department Visits	47,901	0.07%	0.17%	17/39
Hospital Outpatient Days	152,516	0.38%	0.43%	16/39
Nursing Facilities	2,234	2.09%	0.92%	2/39
Home Health	110,834	0.98%	0.49%	4/39
Non-Hospital Ambulatory Care	1,006,578	0.38%	0.47%	16/39
Nursing Education	112	-0.13%	-0.29%	13/39
Public Health	291,117	0	0.22%	20/39
School Health	53,219	-0.63%	-0.22%	27/39
Other	291,117	0	0.22%	20/39

Projected robust growth in the RN supply in Rockland County should put the county in a comfortable position moving forward, even given increasing demand. Ratios of RNs to units of service that are already high mean that these ratios will not only remain above state and national benchmarks in the future, but will be even higher than those observed in Massachusetts.

Table 158. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Rockland County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
2,742	9.5%	1,833	-26.8%	1,955	-21.9%	2,617	4.5%	2,813	12.3%

Sullivan/Ulster Counties

Supply. Sullivan/Ulster's estimated base year RN population was 2,008 RNs in 2005. RNs in Sullivan/Ulster counties are older than RNs statewide (with a median age of 48 versus 46). An estimated 41% of RNs working in Sullivan/Ulster counties are diploma/ADN nurses (compared to 39% statewide), while 43% are BSNs (the same as statewide), and 16% have a MSN or doctorate (versus 18% statewide).

Table 159. Selected Characteristics of RNs, Sullivan/Ulster Counties and New York

	Sullivan/Ulster Counties	New York	Rankings
Employed RNs	2,008	165,124	18/39
Median Age	48	46	--
% 55+	18.6%	16.9%	16/39
% Diploma/ADN	41.1%	39.4%	29/39
% BSN	43.3%	43.0%	10/39
% MSN	15.6%	17.6%	16/39
% in Hospitals	43.2%	64.1%	34/39

About 43% of RNs in Sullivan/Ulster counties are employed in hospitals (versus 64% statewide). An estimated 18% of RNs in Sullivan/Ulster counties work in non-hospital ambulatory care (compared to 11% statewide), an estimated 15% percent work in nursing facilities (versus 10% statewide), and an estimated 3% work in home health (compared to 4% statewide).

Most of the RNs working in Sullivan/Ulster counties live in these counties (87%), while 9% come from Pike/Susquehanna/Wayne counties, Pennsylvania. The remainder comes from Delaware/Otsego/Schoharie counties (2%), Dutchess County (1%), and Columbia/Greene counties (1%). An estimated 491 RNs per year move into the areas that supply Sullivan/Ulster counties with RNs and an estimated 125 of these RNs will work in Sullivan/Ulster counties. At the same time, an estimated 15 RNs who work in Sullivan/Ulster counties will relocate out of Sullivan/Ulster supply areas (0.8% of the RN workforce).

Table 160. Location of Residence of RNs Employed in Sullivan/Ulster Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Sullivan/Ulster Counties RN Supply

Sullivan/Ulster Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Sullivan/Ulster	In-migrants to Sullivan/Ulster workforce	Out-migrants from Sullivan/Ulster workforce
Columbia/Greene	0.9%	134	0	1.2%	2	0
Delaware/Otsego/Schoharie	1.7%	43	232	2.2%	1	5
Dutchess	1.4%	87	76	1.0%	1	1
Sullivan/Ulster	86.7%	215	0	55.7%	119	0
Pike/Susquehanna/Wayne, PA	9.2%	14	59	16.3%	2	10
		491	366		125	15

Between 2005 and 2006, an estimated 91 new RNs graduates entered the Sullivan/Ulster counties' workforce. The number of new graduates entering the workforce is expected to rise as the population of working-age women moving into the area increases. Attrition of existing RNs due to death, disability, or retirement was estimated at 48 RNs in 2005-06 (2.4% of the workforce), but this is projected to grow to 3.1% of the workforce as the workforce ages. Sullivan/Ulster counties are benefited by strong in-migration into their supply areas, and the supply of RNs is projected to steadily grow between 2005 and 2020. Overall supply growth during this period could reach 105%.

Table 161. Projected Components of RN Supply Change, Sullivan/Ulster Counties, 2005-2020

Sullivan	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	2,008	2,228	2,442	2,652	2,855	3,051	3,237	3,417	3,590	3,754	3,908	4,054	4,192	4,325	4,450	122%
In-migration	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	0%
Out-migration	15	17	19	20	22	23	25	26	28	29	30	31	32	33	34	122%
Net migration	110	108	106	105	103	102	100	99	97	96	95	94	93	92	91	-17%
Graduates	91	91	92	92	92	92	93	94	95	96	96	97	98	99	99	8%
Foreign	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	0%
Attrition	48	54	57	61	67	75	81	88	96	106	113	120	125	133	138	184%
Total	2,228	2,442	2,652	2,855	3,051	3,237	3,417	3,590	3,754	3,908	4,054	4,192	4,325	4,450	4,570	105%

Due to the high levels of net migration, Sullivan/Ulster counties are projected to experience greater growth in RN supply than any other county group in the state (5.5% per year, on average). While extremely high, this is consistent with the 4.3% average annual growth observed between 2000 and 2005.

Table 162. Relative Rankings of Key Components of Supply Projections, Sullivan/Ulster Counties

	Sullivan/Ulster Ranking
% of resident RNs working in county	29/39
% of RN workforce that lives in county	10/39
In-migration	5/39
Out-migration	29/39
Net migration	4/39
Projected attrition, 2020	29/39
Projected supply growth, 2005-2020	1/39

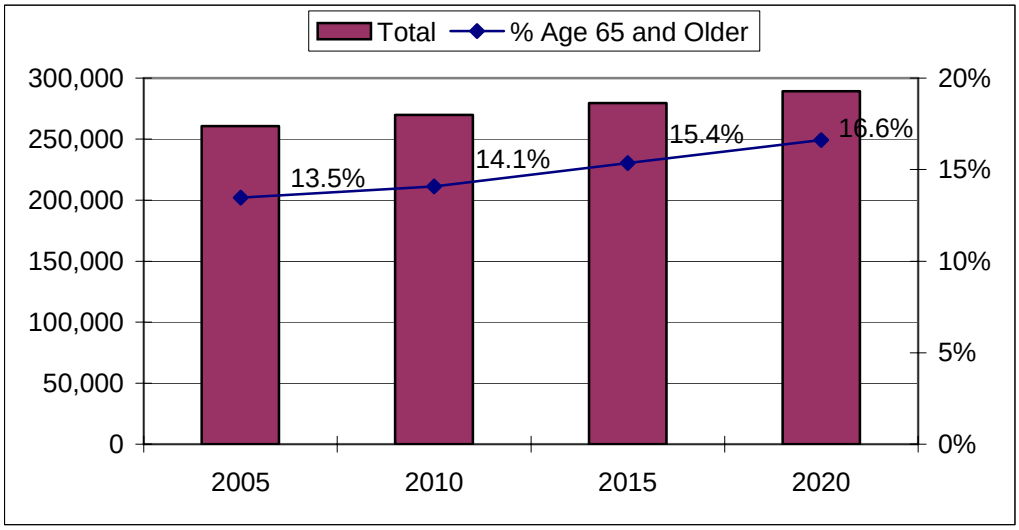
Demand. The use of all hospital-based services per capita in Sullivan/Ulster counties is much lower than that statewide, especially outpatient services. Use of other services is comparable, except that Sullivan/Ulster counties have somewhat fewer children per capita than the statewide average. RN staffing is generally high compared to statewide figures, with the numbers of RNs estimated to work in public health being particularly high.

Table 163. Projected Demand for Services and Annual Growth Rate by Setting, Sullivan/Ulster Counties

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Sullivan/Ulster Counties	New York	Ranking	Sullivan/ Ulster Counties	New York	Ranking
Hospital Inpatient Days	537 inpatient days	946 inpatient days	34/39	4.66	4.78	19/39
Hospital Emergency Dept. Visits	313 ED visits	397 ED visits	33/39	2.29	1.55	10/39
Hospital Outpatient Days	867 visits	2,215 visits	37/39	0.13	0.15	15/39
Nursing Facilities	6.1 residents	5.9 residents	26/39	0.19	0.14	10/39
Home Health	336 visits	320 visits	21/39	0.67	1.07	25/39
Non-Hospital Ambulatory Care	3,283 visits	3,233 visits	21/39	0.41	0.28	13/39
Public Health	1,000 people	1,000 people	--	8.25	2.53	5/39
School Health	156 children	168 children	34/39	33.72	14.01	8/39
Other	1,000 people	1,000 people	--	1.04	2.32	8/39

Demand for RNs in Sullivan/Ulster counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Sullivan/Ulster counties is projected to increase markedly in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 14% to 17%).

Figure 22. Projected Population of Sullivan/Ulster Counties and Percent Age 65 and Older



Demand for most health care services is projected to increase in Sullivan/Ulster counties as the population ages. Indeed this county group ranks third in projected growth in nursing education; fourth in projected growth in hospital inpatient days, hospital emergency department visits, and public health services; and fifth in projected growth in hospital outpatient services and non-hospital ambulatory care.

Table 164. Projected Demand for Services and Annual Growth Rate by Setting, Sullivan/Ulster Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	165,994	1.14%	0.69%	4/39
Hospital Emergency Department Visits	90,844	0.71%	0.17%	4/39
Hospital Outpatient Days	257,840	0.88%	0.43%	5/39
Nursing Facilities	1,928	1.23%	0.92%	11/39
Home Health	96,060	0.61%	0.49%	13/39
Non-Hospital Ambulatory Care	976,116	0.88%	0.47%	5/39
Nursing Education	100	0.57%	-0.29%	3/39
Public Health	289,383	0.70%	0.22%	4/39
School Health	42,807	0.35%	-0.22%	7/39
Other	289,383	0.70%	0.22%	4/39

Projected robust growth in the RN supply in Sullivan/Ulster counties should put the county in a comfortable position moving forward, even given increasing demand. Ratios of RNs to units of

service that are already high mean that these ratios will not only remain above state and national benchmarks in the future, but will be even higher than those observed in Massachusetts.

Table 165. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Sullivan/Ulster Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
2,322	15.6%	1,883	-6.2%	2,030	1.1%	2,703	34.6%	2,440	21.5%

Westchester/Putnam Counties

Supply. Westchester/Putnam's estimated base year RN population was 8,942 RNs in 2005. RNs in Westchester/Putnam counties are older than RNs statewide (with a median age of 48 versus 46), and are more likely to be older than age 55 (25% versus 17%). An estimated 34% of RNs working in Westchester/Putnam counties are diploma/ADN nurses (compared to 39% statewide), while 48% are BSNs (compared to 43% statewide), and 18% have a MSN or doctorate (the same as statewide).

Table 166. Selected Characteristics of RNs, Westchester/Putnam Counties and New York

	Westchester/ Putnam Counties	New York	Rankings
Employed RNs	8,942	165,124	7/39
Median Age	48	46	--
% 55+	24.6%	16.9%	6/39
% Diploma/ADN	33.6%	39.4%	34/39
% BSN	48.4%	43.0%	7/39
% MSN	18.0%	17.6%	11/39
% in Hospitals	67.3%	64.1%	7/39

About 67% of RNs in Westchester/Putnam counties are employed in hospitals (versus 64% statewide). An estimated 13% Westchester Putnam counties' RNs work in non-hospital ambulatory care (compared to 11% statewide), an estimated 9% percent work in nursing facilities (versus 10% statewide), and an estimated 2% work in home health (compared to 4% statewide).

Most of the RNs working in Westchester/Putnam counties live in these counties (69%), while 11% come from Rockland County and 7% from Dutchess County. Four percent of the RNs come from Orange County, 3% from Bronx County, and 2% from Queens County. The remainder comes from Connecticut, Pennsylvania, or New Jersey (2%) and from Nassau County (<1%). An estimated 3,546 RNs per year move into the areas that supply Westchester/Putnam counties with RNs and an estimated 378 of these RNs will work in Westchester/Putnam. At the same time, an

estimated 230 RNs who work in Westchester/Putnam counties will relocate out of Westchester/Putnam supply areas (2.6% of the RN workforce).

Table 167. Location of Residence of RNs Employed in Westchester/Putnam Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Westchester/Putnam Counties RN Supply

Westchester/Putnam	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Westchester/Putnam	In-migrants to Westchester/Putnam workforce	Out-migrants from Warren/Washington workforce
Bronx	3.4%	280	638	4.1%	11	26
Dutchess	6.9%	87	76	22.1%	19	17
Nassau	0.4%	806	559	0.3%	2	2
Orange	4.3%	217	0	12.7%	28	0
Queens	2.3%	514	457	1.3%	7	6
Rockland	10.8%	209	45	22.9%	48	10
Westchester/Putnam	68.7%	387	228	63.7%	247	145
Litchfield, CT	0.8%	188	221	5.1%	10	11
Hartford , CT (part)	0.4%	33	156	3.7%	1	6
Bergen, NJ	0.5%	828	1,013	0.7%	6	7
Monroe, PA	0.7%	0	17	4.2%	0	1
		3,546	3,408		378	230

Between 2005 and 2006, an estimated 407 new RNs graduates entered the Westchester/Putnam workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women decreases. Attrition of existing RNs due to death, disability, or retirement was estimated at 214 RNs in 2005-06 (2.4% of the workforce), but this is projected to grow to 4.1% of the workforce as the workforce ages. Westchester/Putnam counties are benefited by strong in-migration into their supply areas, and the supply of RNs is projected to steadily grow between 2005 and 2020. Overall supply growth during this period could reach 31%. This is an average annual growth rate of 2.1%, which is in contrast to the average annual decline of 0.5% per year between 2000 and 2005.

Table 168. Projected Components of RN Supply Change, Westchester/Putnam Counties, 2005-2020

Westchester	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	8,942	9,380	9,783	10,162	10,512	10,827	11,105	11,353	11,571	11,758	11,906	12,029	12,127	12,211	12,273	37%
In-migration	378	378	378	378	378	378	378	378	378	378	378	378	378	378	378	0%
Out-migration	231	242	252	262	271	279	287	293	299	303	307	310	313	315	317	37%
Net migration	147	136	126	116	107	99	91	85	79	75	71	68	65	63	61	-58%
Graduates	407	403	403	399	394	394	394	394	394	394	394	394	394	394	394	-3%
Foreign	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	0%
Attrition	214	234	246	263	285	313	336	360	384	420	441	462	473	494	498	133%
Total	9,380	9,783	10,162	10,512	10,827	11,105	11,353	11,571	11,758	11,906	12,029	12,127	12,211	12,273	12,328	31%

Table 169. Relative Rankings of Key Components of Supply Projections, Westchester/Putnam Counties

	Westchester/Putnam Ranking
% of resident RNs working in county	22/39
% of RN workforce that lives in county	24/39
In-migration	18/39
Out-migration	18/39
Net migration	12/39
Projected attrition, 2020	14/39
Projected supply growth, 2005-2020	13/39

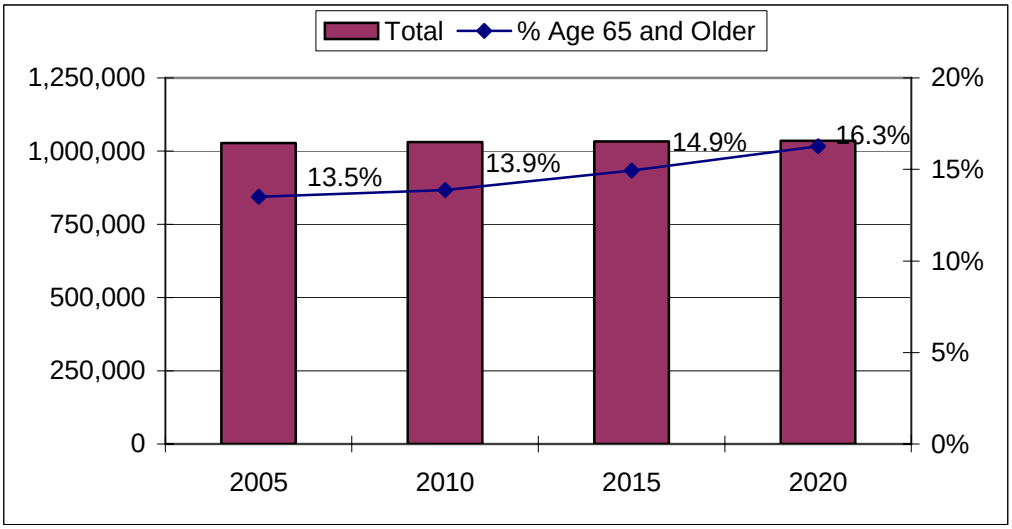
Demand. The use of health care services per capita in Westchester/Putnam counties is comparable to that statewide. RN staffing per unit of service is also relatively similar to statewide patterns.

Table 170. Projected Demand for Services and Annual Growth Rate by Setting, Westchester/Putnam Counties

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Westchester/ Putnam Counties	New York	Ranking	Westchester/ Putnam Counties	New York	Ranking
Hospital Inpatient Days	993 inpatient days	946 inpatient days	10/39	5.10	4.78	16/39
Hospital Emergency Dept. Visits	378 ED visits	397 ED visits	19/39	1.70	1.55	17/39
Hospital Outpatient Days	1,729 visits	2,215 visits	28/39	0.09	0.15	23/39
Nursing Facilities	6.7 residents	5.9 residents	21/39	0.12	0.14	21/39
Home Health	342 visits	320 visits	16/39	0.50	1.07	27/39
Non-Hospital Ambulatory Care	3,295 visits	3,233 visits	18/39	0.34	0.28	17/39
Public Health	1,000 people	1,000 people	--	2.02	2.53	27/39
School Health	178 children	168 children	14/39	13.54	14.01	21/39
Other	1,000 people	1,000 people	--	0.84	2.32	28/39

Demand for RNs in Westchester/Putnam Counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Westchester/Putnam counties is projected to remain relatively constant in size in the coming years, but the population age 65 and older will become a progressively larger proportion of the population (from about 14% to 16%).

Figure 23. Projected Population of Westchester/Putnam Counties and Percent Age 65 and Older



Demand for most health care services is projected to increase in Westchester/Putnam counties as the population ages. The exceptions are the demand for RNs working in nursing education and schools, as declines are projected in the population of women of the typical nursing student age (25-44) and also in the population of children age 5-17.

Table 171. Projected Demand for Services and Annual Growth Rate by Setting, Westchester/Putnam Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	1,118,502	0.61%	0.69%	23/39
Hospital Emergency Department Visits	389,541	0.02%	0.17%	21/39
Hospital Outpatient Days	1,860,989	0.31%	0.43%	20/39
Nursing Facilities	7,766	0.84%	0.92%	22/39
Home Health	372,689	0.38%	0.49%	16/39
Non-Hospital Ambulatory Care	3,385,391	0.28%	0.47%	22/39
Nursing Education	394	-0.20%	-0.29%	16/39
Public Health	1,035,040	0.05%	0.22%	17/39
School Health	167,248	-0.61%	-0.22%	25/39
Other	1,035,040	0.05%	0.22%	17/39

Projected robust growth in the RN supply in Westchester/Putnam counties should put these counties in a comfortable position moving forward, even given increasing demand. Ratios of RNs to units of service that are already high mean that these ratios will remain above state and national benchmarks in the future.

Table 172. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Westchester/Putnam Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
9,604	7.4%	9,696	8.4%	11,016	23.2%	14,685	64.2%	9,421	5.4%

Long Island Region

Nearly 11,000 RNs are employed in the Long Island region of New York, which is composed of Nassau and Suffolk Counties. RNs in this region are slightly younger on average than RNs statewide, and somewhat more likely to have a bachelor's or master's as their highest degree.

Table 173. Selected Characteristics of Long Island RNs

	Long Island	New York
Employed RNs	26,282	165,124
Median Age	45	46
% 55+	15.1%	16.9%
% Diploma/ADN	33.7%	39.4%
% BSN	46.6%	43.0%
% MSN	19.7%	17.6%
% in Hospitals	66.6%	64.1%

Most RNs who work in Long Island also live in Long Island, and Long Island is an area that is gaining more resident RNs through migration than it is losing. Since most RNs who reside in Long Island will also work there, this means most of these in-migrant RNs will join the Long Island workforce.

Table 174. Location of Residence of RNs Employed in Long Island, Residential Migration Patterns, and Estimated Effects of Residential Migration on Long Island RN Supply

Long Island Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Long Island	In-migrants to Long Island workforce	Out-migrants from Long Island workforce
Long Island	92.3%	1,669	0	78.8%	1,315	0
New York City	6.1%	1,238	2,413	4.6%	57	111
Hudson Valley	0.2%	949	0	0.1%	1	0
Mohawk Valley	0.2%	84	155	0.4%	0	1
Southern Tier	0.2%	87	525	0.1%	0	1
Out of State	1.0%	417	0	4.2%	18	0
					1,391	113

Between 2005 and 2006, the RN supply in Long Island was estimated to have grown by about 2,500 RNs, or 9.6%.

Table 175. Projected Components of RN Supply Change, Long Island, 2005-2006

Long Island Region	2005-2006
Base	26,282
In-migration	1,391
Out-migration	113
Net migration	1,278
Graduates	1,338
Foreign	388
Attrition	472
	+2,532 (9.6%)

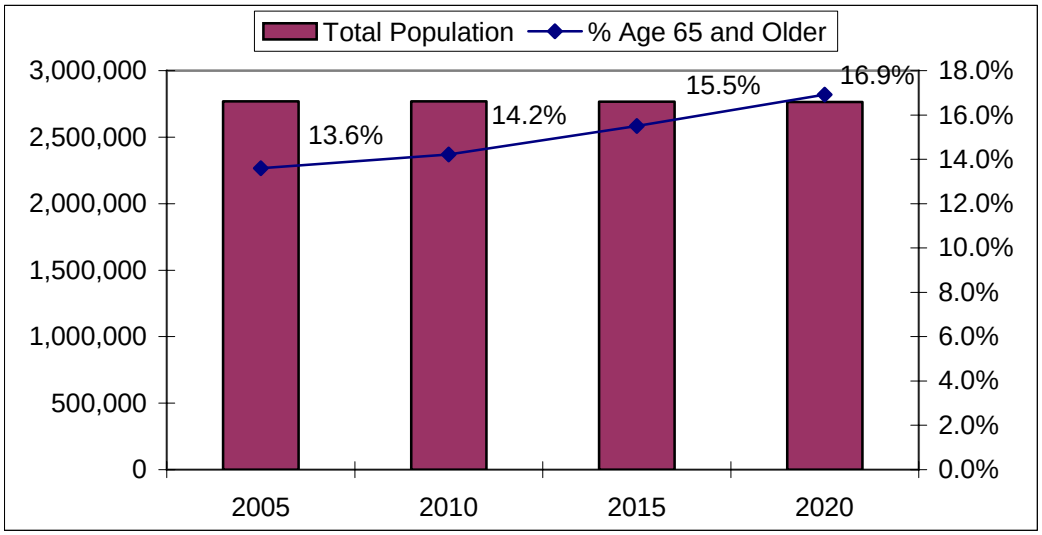
There are substantially more inpatient days used per capita in the Long Island region, and fewer outpatient visits per capita. There are also more school-age children per 1,000 population. It appears that there are more RNs employed in home health per 1,000 estimated home health visits on Long Island, but somewhat fewer school RNs per 1,000 school-age children and fewer RNs employed in public health per 1,000 population.

Table 176. Demand for Services per 1,000 Population and RNs per Unit of Service, Long Island

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	Long Island	NYS	Long Island	NYS
Hospital Inpatient Days	1,115 inpatient days	946 inpatient days	4.80	4.78
Hospital Emergency Department Visits	337 ED visits	397 ED visits	2.05	1.55
Hospital Outpatient Days	1,515 outpatient visits	2,215 outpatient visits	0.11	0.15
Nursing Facility Residents	5.5 residents	5.9 residents	0.14	0.14
Home Health Visits	335 visits	320 visits	1.36	1.07
Non-Hospital Ambulatory Care	3,241 visits	3,233 visits	0.27	0.28
School Health	182 children	168 children	2.05	2.75
Public Health	1,000 persons	1,000 persons	0.21	0.51
Other	1,000 persons	1,000 persons	0.46	1.01

The population of Long Island is projected to remain largely stable between 2005 and 2020, while the proportion of the population age 65 and older is expected to increase substantially during this time.

Figure 24. Projected Population of Long Island and Percent Age 65 and Older



The projected growth in demand for most health care services is moderated by the lack of projected growth in the population of Long Island between 2005 and 2020. Indeed, emergency departments are expected to decline slightly during this period. Use of some services is projected to grow, but in most cases more slowly than the growth projected statewide. The single exception to this is nursing facility residents. The number of nursing facility residents on Long Island is expected to increase 1.2% per year between 2005 and 2020, compared to an annual projected increase of only 0.9% statewide.

Table 177. Projected Demand for Services and Annual and Historical Growth Rate by Setting, Long Island

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, Long Island, 2005-2020	Projected Annual Growth Rate, New York
Hospital Inpatient Days	2,977,129	0.63%	0.69%
Hospital Emergency Department Visits	944,054	-0.02%	0.17%
Hospital Outpatient Days	4,416,220	0.23%	0.43%
Nursing Facilities	18,525	1.22%	0.92%
Home Health	1,007,519	0.45%	0.49%
Non-Hospital Ambulatory Care	9,500,751	0.27%	0.47%
Nursing Education	1,261	-0.40%	-0.26%
Public Health	2,765,074	-0.01%	0.22%
School Health	451,598	-0.71%	-0.22%
Other	2,765,074	-0.01%	0.22%

The Long Island region already has a more favorable ratio of RNs to units of service than the state overall, and favorable patterns of migration position this region to maintain a strong RN supply relative to demand through the year 2020.

Table 178. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Long Island

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
28,522	8.5%	25,473	-3.1%	29,039	10.5%	38,806	147.7%	30,240	15.1%

Nassau County

Supply. Nassau County's estimated base year RN population was 13,276 RNs in 2005, the third largest RN workforce in the state. RNs in Nassau County are slightly younger than RNs statewide (with a median age of 45 versus 46). An estimated 32% of RNs working in Nassau County are diploma/ADN nurses (compared to 39% statewide), while 46% are BSNs (compared to 43% statewide), and 22% have a MSN or doctorate (versus 18% statewide).

Table 179. Selected Characteristics of RNs, Nassau County and New York

	Nassau County	New York	Rankings
Employed RNs	13,276	165,124	3/39
Median Age	45	46	--
% 55+	14.4%	16.9%	26/39
% Diploma/ADN	31.9%	39.4%	35/39
% BSN	45.8%	43.0%	9/39
% MSN	22.4%	17.6%	5/39
% in Hospitals	73.4%	64.1%	2/39

About 73% of RNs in Nassau County are employed in hospitals (versus 64% statewide). An estimated 9% of Nassau County RNs work in non-hospital ambulatory care (compared to 11% statewide), an estimated 4% percent work in nursing facilities (versus 10% statewide), and an estimated 4% work in home health (the same as statewide). Five percent of Nassau County RNs are estimated to work in school health and 1% works in public health.

Most of the RNs working in Nassau County live in the county (64%), while 16% percent come from Suffolk County and 13% come from Queens County. The remainder come from Kings County (4%), New York County (1%), and even as far away as Delaware/Otsego/Schoharie (<1%) and Fulton/Montgomery counties (<1%). An estimated 926 RNs per year move into the areas that supply Nassau County with RNs and an estimated 127 of these RNs will work in Nassau County. At the same time, an estimated 39 RNs who work in Nassau County will relocate out of Nassau County supply areas (<1% of the RN workforce).

Table 180. Location of Residence of RNs Employed in Nassau County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Nassau County RN Supply

Nassau Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Nassau	In-migrants to Nassau workforce	Out-migrants from Nassau workforce
Delaware/Otsego/Schoharie	0.1%	43	232	0.6%	0	1
Fulton/Montgomery	0.1%	0	0	1.7%	0	0
Kings	4.4%	105	1,145	3.5%	4	40
Nassau	64.3%	806	559	59.4%	478	332
New York	0.6%	639	423	1.4%	9	6
Queens	12.9%	514	457	10.7%	55	49
Suffolk	16.2%	926	283	13.7%	127	39
Bergen, NJ	0.6%	828	1,013	1.3%	11	13
		3,859	4,110		684	480

Between 2005 and 2006, an estimated 647 new RNs graduates entered the Nassau County workforce. The number of new graduates entering the workforce is expected to decrease somewhat as the population of working-age women declines. Attrition of existing RNs due to death, disability, or retirement was estimated at 238 RNs in 2005-06 (1.8% of the workforce), but this is projected to grow to 2.7% of the workforce as the workforce ages. Nassau County is benefited by strong in-migration into its supply areas, and the supply of RNs is projected to steadily grow between 2005 and 2020. Overall supply growth during this period could reach 41%. This projected average annual growth rate of 2.6% per year between 2005 and 2020 is somewhat higher than the 2.0% annual growth rate estimated between 2000 and 2005.

Table 181. Projected Components of RN Supply Change, Nassau County, 2005-2020

Nassau	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	13,276	13,985	14,641	15,247	15,814	16,341	16,835	17,287	17,717	18,099	18,452	18,762	19,047	19,286	19,491	47%
In-migration	684	684	684	684	684	684	684	684	684	684	684	684	684	684	684	0%
Out-migration	479	505	529	550	571	590	608	624	640	653	666	677	688	696	704	47%
Net migration	205	179	155	134	113	94	76	60	44	31	18	7	-4	-12	-20	-110%
Graduates	647	640	640	634	627	627	627	627	627	627	634	634	634	634	640	-1%
Foreign	96	96	96	96	96	96	96	96	96	96	96	96	96	96	96	0%
Attrition	238	259	286	297	310	324	347	353	386	401	437	451	488	513	523	120%
Total	13,985	14,641	15,247	15,814	16,341	16,835	17,287	17,717	18,099	18,452	18,762	19,047	19,286	19,491	19,685	41%

Table 182. Relative Rankings of Key Components of Supply Projections, Nassau County

	Nassau County Ranking
% of resident RNs working in county	25/39
% of RN workforce that lives in county	31/39
In-migration	12/39
Out-migration	12/39
Net migration	13/39
Projected attrition, 2020	32/39
Projected supply growth, 2005-2020	10/39

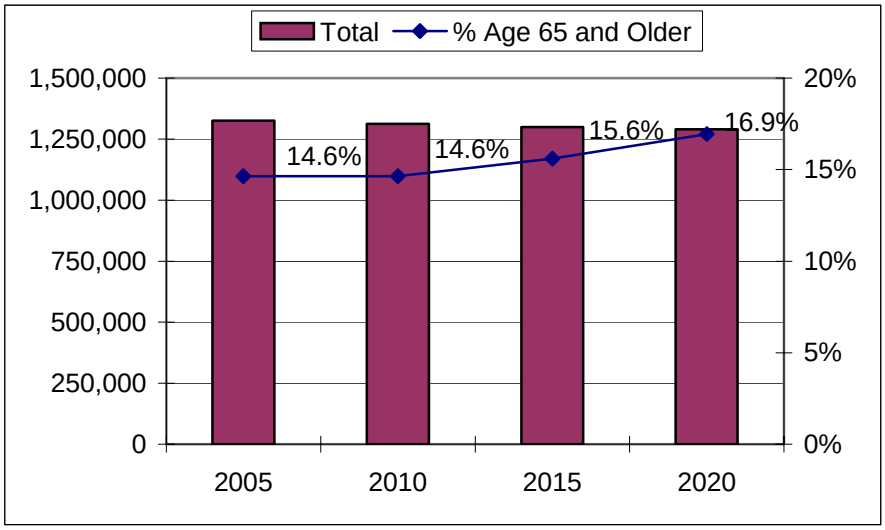
Demand. While the use of hospital inpatient services per capita in Nassau County is higher than that statewide, the use of emergency and non-emergency outpatient services is lower. RN staffing in Nassau County is comparable to statewide ratios in most settings.

Table 183. Projected Demand for Services and Annual Growth Rate by Setting, Nassau County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Nassau County	New York	Ranking	Nassau County	New York	Ranking
Hospital Inpatient Days	1,155 inpatient days	946 inpatient days	8/39	5.47	4.78	11/39
Hospital Emergency Department Visits	365 ED visits	397 ED visits	23/39	2.20	1.55	11/39
Hospital Outpatient Days	1,922 visits	2,215 visits	25/39	0.12	0.15	16/39
Nursing Facilities	5.6 residents	5.9 residents	29/39	0.08	0.14	30/39
Home Health	361 visits	320 visits	12/39	1.06	1.07	13/39
Non-Hospital Ambulatory Care	3,359 visits	3,233 visits	13/39	0.26	0.28	22/39
Public Health	1,000 people	1,000 people	--	0.97	2.53	33/39
School Health	177 children	168 children	16/39	27.33	14.01	11/39
Other	1,000 people	1,000 people	--	5.98	2.32	25/39

Demand for RNs in Nassau County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Nassau County is projected to decline slightly in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 15% to 17%). This growth is much slower than that projected for other county groups in New York. Nassau County ranked 13th in the percentage of older adults in 2005, but is expected to fall to 25th by 2020.

Figure 25. Projected Population of Nassau County and Percent Age 65 and Older



Demand for most health care services is projected to decline in Nassau County as the population decreases. Nursing facility residents and hospital inpatient days are projected to increase, however, with the aging of the population.

Table 184. Projected Demand for Services and Annual Growth Rate by Setting, Nassau County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	1,635,363	0.44%	0.69%	29/39
Hospital Emergency Department Visits	468,814	-0.21%	0.17%	32/39
Hospital Outpatient Days	2,555,111	0.02%	0.43%	31/39
Nursing Facilities	8,086	0.56%	0.92%	29/39
Home Health	475,815	-0.04%	0.49%	28/39
Non-Hospital Ambulatory Care	4,449,511	-0.01%	0.47%	31/39
Nursing Education	640	-0.07%	-0.29%	11/39
Public Health	1,290,328	-0.18%	0.22%	28/39
School Health	207,775	-0.81%	-0.22%	33/39
Other	1,290,328	-0.18%	0.22%	28/39

Projected robust growth in the RN supply in Nassau County, coupled with declining projected demand for many services, should put Nassau County in a comfortable position moving forward. Ratios of RNs to units of service should remain above state and national benchmarks, although they will still not be as high as ratios observed in Massachusetts.

Table 185. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Nassau County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
13,843	4.3%	13,144	-1.0%	15,232	14.7%	20,343	53.2%	14,874	12.0%

Suffolk County

Supply. Suffolk County's estimated base year RN population was 13,006 RNs in 2005, making it the fourth largest RN workforce in New York. RNs in Suffolk County are slightly younger than RNs statewide (with a median age of 45 versus 46). An estimated 36% of RNs working in Suffolk County are diploma/ADN nurses (compared to 39% statewide), while 47% are BSNs (compared to 43% statewide), and 17% have a MSN or doctorate (versus 18% statewide).

Table 186. Selected Characteristics of RNs, Suffolk County and New York

	Suffolk County	New York	Rankings
Employed RNs	13,006	165,124	4/39
Median Age	45	46	--
% 55+	15.7%	16.9%	22/39
% Diploma/ADN	35.7%	39.4%	32/39
% BSN	47.4%	43.0%	8/39
% MSN	16.9%	17.6%	13/39
% in Hospitals	59.6%	64.1%	15/39

About 60% of RNs in Suffolk County are employed in hospitals (versus 64% statewide). An estimated 10% of Suffolk County RNs work in non-hospital ambulatory care (compared to 11% statewide), an estimated 12% percent work in nursing facilities (versus 10% statewide), and an estimated 6% work in home health (compared to 4% statewide).

A vast majority of the RNs working in Suffolk County (96%) live in the county, while about 4% come from Nassau County and less than 1% come from Kings and Rockland Counties. An estimated 2,045 RNs per year move into the areas that supply Suffolk County with RNs and an estimated 766 of these RNs will work in Suffolk County. At the same time, an estimated 246 RNs who work in Suffolk County will relocate out of Suffolk County supply areas (1.9% of the RN workforce).

Table 187. Location of Residence of RNs Employed in Suffolk County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Suffolk County RN Supply

Suffolk Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Suffolk	In-migrants to Suffolk workforce	Out-migrants from Suffolk workforce
Kings	0.0%	105	1,145	0.2%	0	2
Nassau	4.0%	806	559	3.3%	27	18
Rockland	0.0%	209	45	0.8%	2	0
Suffolk	96.0%	926	283	79.6%	737	225
		2,045	2,031		766	246

Between 2005 and 2006, an estimated 634 new RNs graduates entered the Suffolk County workforce. The number of new graduates entering this workforce is expected to decrease somewhat as the population of working-age women declines. Attrition of existing RNs due to death, disability, or retirement was estimated at 234 RNs in 2005-06 (1.8% of the workforce), but this is projected to grow to 4.3% of the workforce as the workforce ages. Suffolk County is benefited by strong in-migration into its supply areas, and the supply of RNs is projected to steadily grow between 2005 and 2020. Overall supply growth during this period could reach 87%. This is the second highest projected supply growth in the state, equaling 4.8% average annual growth between 2005 and 2020. This is consistent with the estimated 4.5% average annual supply growth observed between 2000 and 2005.

Table 188. Projected Components of RN Supply Change, Suffolk County, 2005-2020

Suffolk	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	13,006	14,216	15,374	16,476	17,545	18,573	19,559	20,500	21,416	22,278	23,106	23,879	24,626	25,318	25,968	100%
In-migration	766	766	766	766	766	766	766	766	766	766	766	766	766	766	766	0%
Out-migration	246	269	291	311	332	351	370	387	405	421	437	451	465	479	491	100%
Net migration	520	497	475	455	434	415	396	379	361	345	329	315	301	287	275	-47%
Graduates	634	627	621	621	615	608	608	608	608	608	608	615	615	615	615	-3%
Foreign	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	0%
Attrition	234	256	284	297	311	328	353	361	397	416	455	472	513	542	558	138%
Total	14,216	15,374	16,476	17,545	18,573	19,559	20,500	21,416	22,278	23,106	23,879	24,626	25,318	25,968	26,590	87%

Table 189. Relative Rankings of Key Components of Supply Projections, Suffolk County

	Suffolk County Ranking
% of resident RNs working in county	14/39
% of RN workforce that lives in county	3/39
In-migration	8/39
Out-migration	21/39
Net migration	5/39
Projected attrition, 2020	11/39
Projected supply growth, 2005-2020	2/39

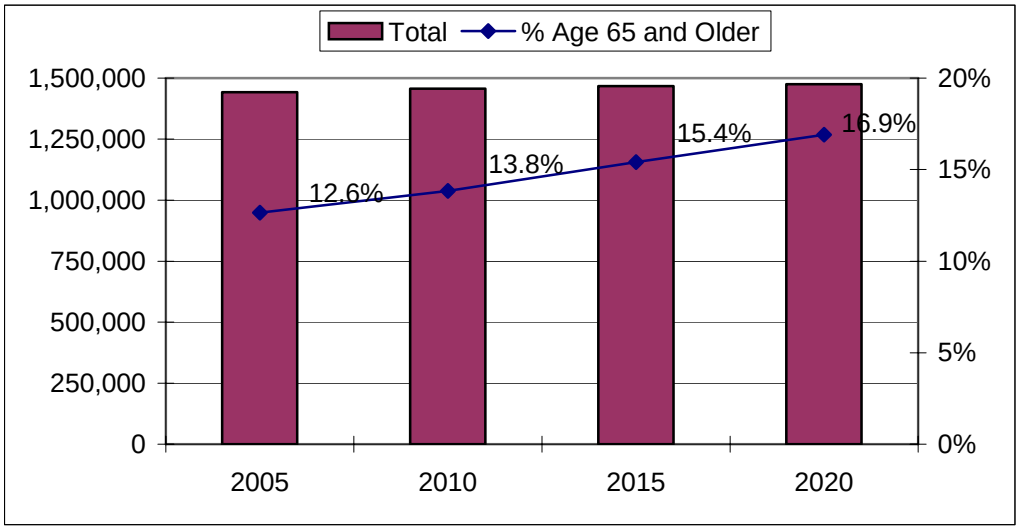
Demand. The use of all hospital-based services per capita in Suffolk County is somewhat lower than that statewide, particularly hospital-based outpatient services. Use of most other services is comparable. The exception is that Suffolk County has many more children per capita than the statewide average. RN staffing in most settings is somewhat higher than statewide.

Table 190. Projected Demand for Services and Annual Growth Rate by Setting, Suffolk County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Suffolk County	New York	Ranking	Suffolk County	New York	Ranking
Hospital Inpatient Days	815 inpatient days	946 inpatient days	20/39	5.69	4.78	8/39
Hospital Emergency Department Visits	321 ED visits	397 ED visits	32/39	1.91	1.55	15/39
Hospital Outpatient Days	1,189 visits	2,215 visits	36/39	0.10	0.15	21/39
Nursing Facilities	5.5 residents	5.9 residents	32/39	0.20	0.14	9/39
Home Health	321 visits	320 visits	27/39	1.66	1.07	10/39
Non-Hospital Ambulatory Care	3,237 visits	3,233 visits	25/39	0.28	0.28	20/39
Public Health	1,000 people	1,000 people	--	3.14	2.53	23/39
School Health	186 children	168 children	7/39	14.57	14.01	18/39
Other	1,000 people	1,000 people	--	2.43	2.32	16/39

Demand for RNs in Suffolk County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Suffolk County is projected to increase somewhat in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 13% to 17%).

Figure 26. Projected Population of Suffolk County and Percent Age 65 and Older



Demand for most health care services is projected to increase in Suffolk County as the population ages. The county ranks fourth in projected growth in nursing facility residents, and fifth in projected growth in home health visits. Demand for RNs working in nursing education and schools is expected to decrease, consistent with declines projected in the population of women of the typical nursing student age (25-44) and also in the population of children age 5-17.

Table 191. Projected Demand for Services and Annual Growth Rate by Setting, Suffolk County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	1,341,766	0.88%	0.69%	11/39
Hospital Emergency Department Visits	475,240	0.16%	0.17%	13/39
Hospital Outpatient Days	1,861,109	0.54%	0.43%	11/39
Nursing Facilities	10,439	1.78%	0.92%	4/39
Home Health	531,704	0.92%	0.49%	5/39
Non-Hospital Ambulatory Care	5,052,240	0.52%	0.47%	12/39
Nursing Education	621	-0.13%	-0.29%	14/39
Public Health	243,824	0.15%	0.22%	15/39
School Health	1,474,746	-0.63%	-0.22%	28/39
Other	243,824	0.15%	0.22%	15/39

Projected robust growth in the RN supply in Suffolk County should put the county in a comfortable position moving forward, even given increasing demand. Ratios of RNs to units of service that are already high mean that these ratios will not only remain above state and national benchmarks in the future, but will be even higher than those observed in Massachusetts.

Table 192. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Suffolk County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
14,680	12.9%	12,329	5.2%	13,807	6.2%	18,463	42.0%	15,367	18.2%

Mohawk Valley Region

Nearly 4,000 RNs are employed in the Mohawk Valley of New York, which is composed of Fulton/Montgomery and Herkimer/Oneida counties. RNs in this region are somewhat younger on average than RNs statewide, and much more likely to have a diploma or ADN and less likely to have a BSN as their highest degree.

Table 193. Selected Characteristics of Mohawk Valley RNs

	Mohawk Valley	New York
Employed RNs	3,610	165,124
Median Age	45	46
% 55+	14.5%	16.9%
% Diploma/ADN	68.4%	39.4%
% BSN	19.4%	43.0%
% MSN	12.2%	17.6%
% in Hospitals	57.4%	64.1%

Most RNs who work in the Mohawk Valley also live in the Mohawk Valley, but the Mohawk Valley is an area that is losing more resident RNs through migration than it is gaining. Since most RNs who reside in the Mohawk Valley will also work there, RNs moving out of the Mohawk Valley are overwhelmingly losses to the Mohawk Valley workforce.

Table 194. Location of Residence of RNs Employed in the Mohawk Valley, Residential Migration Patterns, and Estimated Effects of Residential Migration on Mohawk Valley RN Supply

Mohawk Valley Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Mohawk Valley	In-migrants to Mohawk Valley workforce	Out-migrants from Mohawk Valley workforce
Mohawk Valley	90.4%	84	155	84.8%	71	131
Central New York	3.8%	280	0	1.3%	4	0
North Country	2.9%	52	94	1.1%	1	1
Southern Tier	1.9%	87	525	1.0%	1	5
Capital District	1.0%	526	169	0.4%	2	1
					79	138

Between 2005 and 2006, the RN supply in the Mohawk Valley grew by only about 88 RNs, or 2.4%.

Table 195. Projected Components of RN Supply Change, Mohawk Valley, 2005-2006

Mohawk Valley Region	2005-2006
Base	3,610
In-migration	79
Out-migration	138
Net migration	-59
Graduates	223
Foreign	0
Attrition	76
	+88 (2.4%)

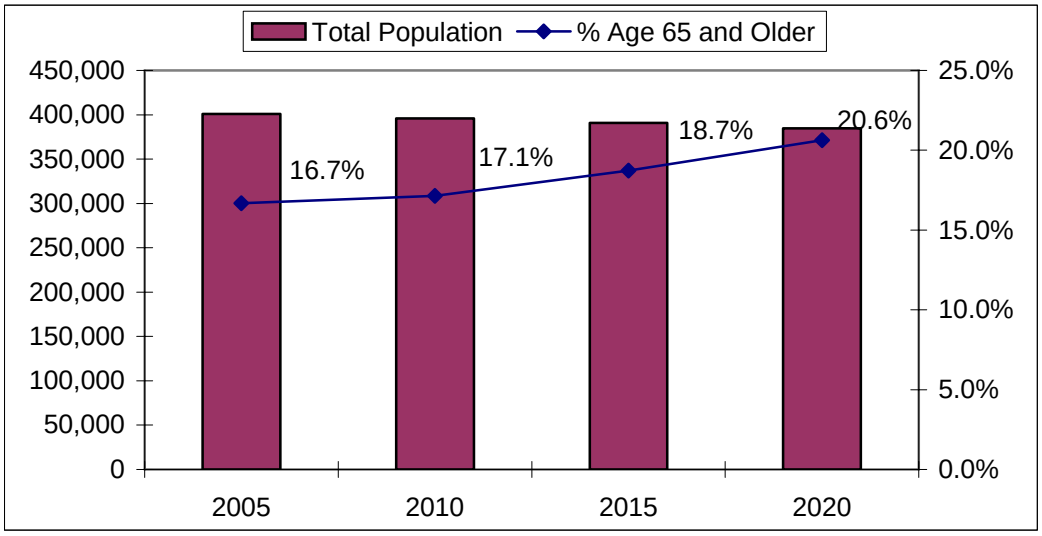
There are many more inpatient days and hospital outpatient visits per capita in the Mohawk Valley than in New York as a whole. There are also many more nursing facility residents per capita as well, and somewhat more home health visits and school-age children. Yet the Mohawk Valley has very low ratios of RNs to units of service for all types of hospital-based care, and extremely low ratios of school RNs to school-age children.

Table 196. Demand for Services per 1,000 Population and RNs per Unit of Service, Mohawk Valley

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	Mohawk Valley	NYS	Mohawk Valley	NYS
Hospital Inpatient Days	1,837 inpatient days	946 inpatient days	2.52	4.78
Hospital Emergency Department Visits	399 ED visits	397 ED visits	1.00	1.55
Hospital Outpatient Days	3,142 outpatient visits	2,215 outpatient visits	0.05	0.15
Nursing Facility Residents	10.2 residents	5.9 residents	0.14	0.14
Home Health Visits	382 visits	320 visits	1.18	1.07
Non-Hospital Ambulatory Care	3,387 visits	3,233 visits	0.20	0.28
School Health	174 children	168 children	0.76	2.75
Public Health	1,000 persons	1,000 persons	0.43	0.51
Other	1,000 persons	1,000 persons	0.75	1.01

The population of the Mohawk Valley is projected to decline slightly between 2005 and 2020, even as the already-high proportion of the population age 65 and older continues to climb. By the year 2020, it is estimated that more than one out of every five residents of the Mohawk Valley will be age 65 and older, making this the oldest region in the state.

Figure 27. Projected Population of Mohawk Valley and Percent Age 65 and Older



The projected population decline in the Mohawk Valley will lead to a decrease in demand for many types of health care services. Due to increased aging of the population, however, hospital inpatient days and nursing facility residents are expected to continue to increase. Even these increases will not be as rapid as those observed elsewhere in the state, though, as the Mohawk Valley already has a much older population than many other areas.

Table 197. Projected Demand for Services and Annual and Historical Growth Rate by Setting, Mohawk Valley

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, Mohawk Valley, 2005-2020	Projected Annual Growth Rate, New York
Hospital Inpatient Days	494,403	0.45%	0.69%
Hospital Emergency Department Visits	153,527	-0.31%	0.17%
Hospital Outpatient Days	1,265,412	-0.01%	0.43%
Nursing Facilities	4,282	0.29%	0.92%
Home Health	149,874	-0.19%	0.49%
Non-Hospital Ambulatory Care	1,365,664	-0.01%	0.47%
Nursing Education	207	-0.49%	-0.26%
Public Health	384,753	-0.27%	0.22%
School Health	62,006	-0.80%	-0.22%
Other	384,753	-0.27%	0.22%

Despite relatively low levels of projected demand, the Mohawk Valley is the region of the state likely facing the largest RN shortage. As of 2005, the region has ratios of RNs to units of service that are much lower than both statewide and national ratios, and this is only expected to continue as the population ages and the number of nursing graduates declines.

Table 198. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Mohawk Valley

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
3,720	3.1%	4,320	19.7%	4,951	37.2%	6,552	81.5%	3,943	9.2%

Fulton/Montgomery Counties

Supply. Fulton/Montgomery's estimated base year RN population was 516 RNs in 2005. RNs in Fulton/Montgomery counties are slightly older than RNs statewide (with a median age of 47 versus 46). An estimated 73% of RNs working in Fulton/Montgomery counties are diploma/ADN nurses (compared to 39% statewide), while 11% are BSNs (compared to 43% statewide), and 16% have a MSN or doctorate (versus 18% statewide).

Table 199. Selected Characteristics of RNs, Fulton/Montgomery Counties and New York

	Fulton/Montgomery Counties	New York	Rankings
Employed RNs	516	165,124	37/39
Median Age	47	46	--
% 55+	19.4%	16.9%	11/39
% Diploma/ADN	73.4%	39.4%	4/39
% BSN	11.1%	43.0%	38/39
% MSN	15.5%	17.6%	17/39
% in Hospitals	56.5%	64.1%	19/39

About 57% of RNs in Fulton/Montgomery counties are employed in hospitals (versus 64% statewide). An estimated 18% of Fulton/Montgomery RNs work in non-hospital ambulatory care (compared to 11% statewide), an estimated 5% percent work in nursing facilities (versus 10% statewide), and an estimated 15% work in home health (compared to 4% statewide).

The vast majority of RNs working in Fulton/Montgomery counties live in these two counties (92%), while 8% percent come from Saratoga County. The effect of migration into and out of the areas that supply Fulton/Montgomery with RNs is virtually negligible.

Table 200. Location of Residence of RNs Employed in Fulton/Montgomery Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Fulton/Montgomery RN Supply

Fulton/Montgomery Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Fulton/Montgomery	In-migrants to Fulton/Montgomery workforce	Out-migrants from Fulton/Montgomery workforce
Fulton/Montgomery	91.6%	0	0	57.2%	0	0
Saratoga	8.4%	99	73	0.2%	0.2	0.1
		99	73		0.2	0.1

Between 2005 and 2006, an estimated 33 new RN graduates entered the Fulton/Montgomery counties' workforce. The number of new graduates entering the workforce is expected to decline markedly as the population of working-age women decreases. Attrition of existing RNs due to death, disability, or retirement was estimated at 11 RNs in 2005-06 (2.1% of the workforce), and this is projected to grow to 2.5% of the workforce as the workforce ages. Increasing projected attrition and decreasing projected graduations will progressively slow the growth in supply between 2005 and 2020, although these two counties may still increase their RNs by 41% during this time period because graduations will continue to outstrip attritions (although by a decreasing ratio). This is projected annual growth of 2.6%, which is in stark contrast to the 8.2% decline observed between 2000 and 2005. The very limited sample size in Fulton/Montgomery counties requires that the analysis of this county group be interpreted with caution[9].

Table 201. Projected Components of RN Supply Change, Fulton/Montgomery Counties, 2005-2020

Fulton	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	516	538	559	580	600	620	638	656	674	690	704	717	730	740	749	45%
In-migration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Out-migration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Net migration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Graduates	33	32	32	31	31	30	30	29	29	28	28	28	27	27	27	-19%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	11	11	11	11	11	11	11	12	13	14	15	15	17	18	19	74%
Total	538	559	580	600	620	638	656	674	690	704	717	730	740	749	757	41%

[9] The estimated change between 2000 and 2005 is not necessarily the more accurate figure as it is also based on a small sample, but the variation between the two figures requires that both be approached with caution.

Table 202. Relative Rankings of Key Components of Supply Projections, Fulton/Montgomery Counties

	Fulton/Montgomery Ranking
% of resident RNs working in county	26/39
% of RN workforce that lives in county	7/39
In-migration	38/39
Out-migration	37/39
Net migration	20/39
Projected attrition, 2020	35/39
Projected supply growth, 2005-2020	9/39

Demand. The use of all hospital-based services per capita in Fulton/Montgomery counties is surprisingly higher than that statewide (ranking fifth in the state), and there are more nursing facility residents per capita. The county group ranks first in the state for estimated number of home health visits and non-hospital ambulatory care visits per 1,000 population.

RNs per unit of services, however, are lower in Fulton/Montgomery counties than statewide averages in most settings, particularly hospital-based settings. Estimated RN supply in the hospital inpatient setting is the lowest in the state, while RN supply in hospital emergency departments is the second lowest and RN supply in hospital outpatient settings is the third lowest. Fulton/Montgomery counties also rank in the bottom five county groups for the supply of RNs in nursing facilities and schools.

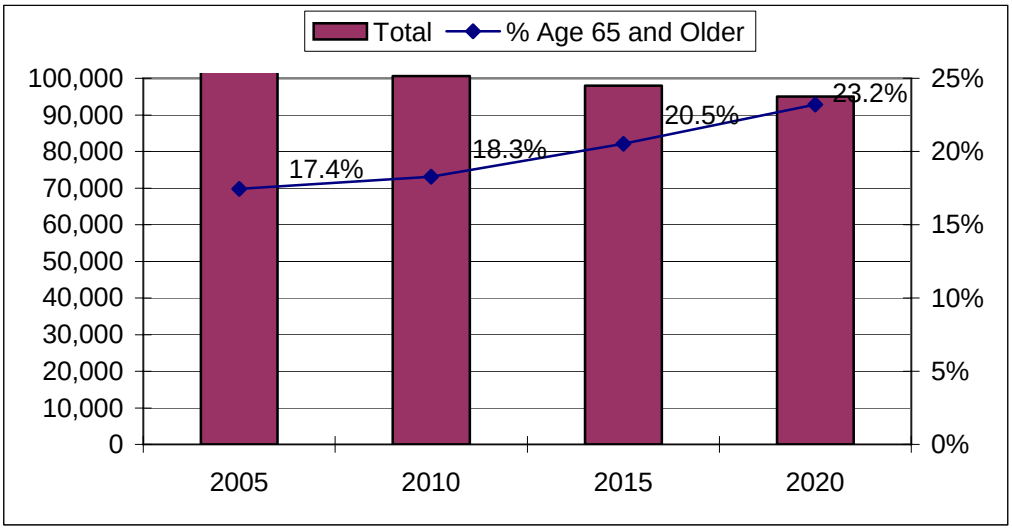
Table 203. Projected Demand for Services and Annual Growth Rate by Setting, Fulton/Montgomery Counties

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Fulton/ Montgomery Counties	New York	Rankings	Fulton/ Montgomery Counties	New York	Rankings
Hospital Inpatient Days	1,416 inpatient	946 inpatient days	5/39	1.65	4.78	39/39
Hospital Emergency Department Visits	468 ED visits	397 ED visits	13/39	0.75	1.55	38/39
Hospital Outpatient Days	4,348 visits	2,215 visits	6/39	0.04	0.15	37/39
Nursing Facilities	8.7 residents	5.9 residents	3/39	0.03	0.14	36/39
Home Health	399 visits	320 visits	1/39	1.96	1.07	8/39
Non-Hospital Ambulatory Care	3,478 visits	3,233 visits	1/39	0.26	0.28	24/39
Public Health	1,000 people	1,000 people	--	1.50	2.53	28/39
School Health	178 children	168 children	15/39	0	14.01	36/39
Other	1,000 people	1,000 people	--	0.09	2.32	33/39

Demand for RNs in Fulton/Montgomery Counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Fulton/Montgomery counties is projected to decrease slightly in the coming years, but the population age 65 and older will become a progressively larger proportion of the population

(from about 17% to over 23%). Fulton/Montgomery counties have a higher percentage of older adults in the population than any other county groups in the state, and are expected to continue to hold this distinction through 2020.

Figure 28. Projected Population of Fulton/Montgomery Counties and Percent Age 65 and Older



Demand for most health care services is projected to decrease with the expected population loss in Fulton/Montgomery counties, and this county group ranks among the bottom five in New York for demand growth in most settings. The projected rapid aging of the population, however, will continue to increase demand for hospital inpatient services. Demand for school health services may decrease as children become a smaller proportion of the population, and demand for nursing education may decrease as women in the age groups that typically attend nursing school also become a smaller proportion of the population.

Table 204. Projected Demand for Services and Annual Growth Rate by Setting, Fulton/Montgomery Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	163,167	0.74%	0.69%	16/39
Hospital Emergency Department Visits	44,212	-0.58%	0.17%	38/39
Hospital Outpatient Days	442,780	-0.08%	0.43%	35/39
Nursing Facilities	903	-0.08%	0.92%	36/39
Home Health	39,869	-0.21%	0.49%	34/39
Non-Hospital Ambulatory Care	353,648	-0.09%	0.47%	35/39
Nursing Education	26	-1.49%	-0.29%	38/39
Public Health	95,131	-0.53%	0.22%	38/39
School Health	14,998	-1.34%	-0.22%	39/39
Other	95,131	-0.53%	0.22%	38/39

Although it would appear that the substantial projected increase in RN supply (41%) and the projected decreases in demand for most types of services would put Fulton/Montgomery counties in a good position, the fact is that ongoing growth of demand in hospital inpatient services will mean continued increased demand for RNs. Furthermore, while these counties should be able to comfortably maintain their current ratios, and even fill their current level of vacancies, they are substantially understaffed compared to even New York staffing ratios. Growth of 146% would be necessary to bring Fulton/Montgomery counties even up to this benchmark, while growth of 283% would be necessary to bring these counties up to national benchmarks.

Table 205. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Fulton/Montgomery Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
548	6.2%	1,268	145.7%	1,502	191.1%	1,974	282.6%	554	7.4%

Herkimer/Oneida Counties

Supply. Herkimer/Oneida's estimated base year RN population was 3,094 RNs in 2005. RNs in Herkimer/Oneida counties are younger than RNs statewide (with a median age of 44 versus 46). An estimated 67% of RNs working in Herkimer/Oneida counties are diploma/ADN nurses (compared to 39% statewide), while 21% are BSNs (compared to 43% statewide), and 12% have a MSN or doctorate (versus 18% statewide). The percentage of RNs with bachelor's degrees is among the lowest in the state.

Table 206. Selected Characteristics of RNs, Herkimer/Oneida Counties and New York

	Herkimer/Oneida Counties	New York	Rankings
Employed RNs	3,094	165,124	13/39
Median Age	44	46	--
% 55+	13.7%	16.9%	30/39
% Diploma/ADN	67.6%	39.4%	9/39
% BSN	20.8%	43.0%	35/39
% MSN	11.7%	17.6%	26/39
% in Hospitals	57.2%	64.1%	16/39

About 57% of RNs in Herkimer/Oneida counties are employed in hospitals (versus 64% statewide). An estimated 6% of Herkimer/Oneida counties' RNs work in non-hospital ambulatory care (compared to 11% statewide), an estimated 17% percent work in nursing facilities (versus 10% statewide), and an estimated 3% work in home health (compared to 4% statewide).

The vast majority of the RNs working in Herkimer/Oneida counties live in these two counties (91%), while 3% percent come from Onondaga/Madison/Cayuga counties, and 2% come from Delaware/Otsego/Schoharie counties. The remainder comes from Fulton/Montgomery and Jefferson/Lewis county groups. An estimated 222 RNs per year move into the areas that supply Herkimer/Oneida counties with RNs, and an estimated 52 of these RNs will work in there. At the same time, an estimated 105 RNs who work in Herkimer/Oneida counties will relocate out of Herkimer/Oneida supply areas (3.4% of the RN workforce).

Table 207. Location of Residence of RNs Employed in Herkimer/Oneida Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Herkimer/Oneida RN Supply

Herkimer/Oneida Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Herkimer/Oneida	In-migrants to Herkimer/Oneida workforce	Out-migrants from Herkimer/Oneida workforce
Delaware/Otsego/Schoharie	2.0%	43	232	4.1%	2	9
Fulton/Montgomery	1.6%	0	0	6.1%	0	0
Herkimer/Oneida	91.4%	52	105	0.4%	47	95
Jefferson/Lewis	1.6%	38	0	4.8%	2	0
Onondaga/Madison/Cayuga	3.3%	90	30	1.6%	1	0
		222	367		52	105

Between 2005 and 2006, an estimated 197 new RNs graduates entered the Herkimer/Oneida counties' workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women wanes. Attrition of existing RNs due to death, disability, or retirement was estimated at 65 RNs in 2005-06 (2.1% of the workforce), and this is projected to grow to 2.5% of the workforce as the workforce ages. The RN supply in these counties is projected to increase an estimated 21% between 2005 and 2020.

Table 208. Projected Components of RN Supply Change, Herkimer/Oneida Counties, 2005-2020

Herkimer	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	3094	3172	3249	3319	3387	3453	3514	3571	3625	3670	3711	3747	3777	3800	3815	23%
In-migration	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	0%
Out-migration	105	108	110	113	115	117	119	121	123	124	126	127	128	129	129	23%
Net migration	-53	-56	-58	-61	-63	-65	-67	-69	-71	-72	-74	-75	-76	-77	-77	46%
Graduates	197	195	193	191	191	189	187	187	185	185	185	183	183	181	181	-8%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Attrition	65	63	64	62	62	63	63	64	69	72	75	77	84	90	94	43%
Total	3172	3249	3319	3387	3453	3514	3571	3625	3670	3711	3747	3777	3800	3815	3825	21%

Herkimer/Oneida counties have among the highest levels of both in-migration and out-migration in the state, and most of their resident RNs work within the two counties. As a result, supply growth will remain steady, with an average annual growth rate of 1.4% between 2005 and 2020. This is an improvement from the 0.9% average annual decline in supply observed between 2000 and 2005.

Table 209. Relative Rankings of Key Components of Supply Projections, Herkimer/Oneida Counties

	Herkimer/Oneida Ranking
% of resident RNs working in county	7/39
% of RN workforce that lives in county	9/39
In-migration	4/39
Out-migration	3/39
Net migration	38/39
Projected attrition, 2020	36/39
Projected supply growth, 2005-2020	19/39

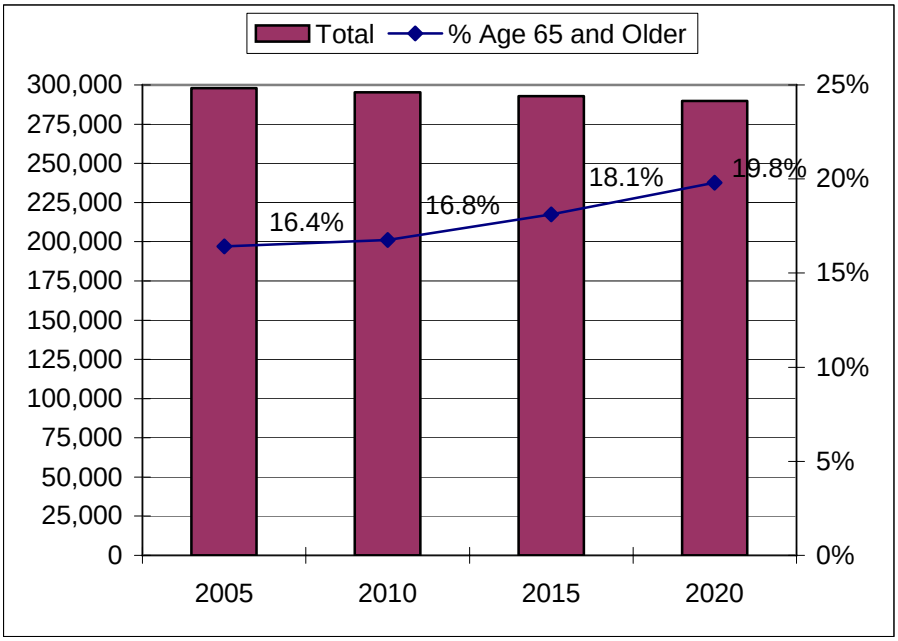
Demand. While the use of hospital inpatient and non-emergency outpatient services per capita in Herkimer/Oneida counties is higher than statewide, the use of emergency services is lower. These counties rank first in the state for nursing facility residents per 1,000 population, and fourth in the state for estimated home health visits per 1,000 population. RN staffing is fairly comparable to statewide ratios in most settings, but school health staffing appears relatively low.

Table 210. Projected Demand for Services and Annual Growth Rate by Setting, Herkimer/Oneida Counties

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Herkimer/Oneida Counties	New York	Rankings	Herkimer/ Oneida Counties	New York	Rankings
Hospital Inpatient Days	1,062 inpatient	946 inpatient days	9/39	5.13	4.78	15/39
Hospital Emergency Department Visits	378 ED visits	397 ED visits	18/39	1.12	1.55	32/39
Hospital Outpatient Days	2,752 visits	2,215 visits	16/39	0.06	0.15	35/39
Nursing Facilities	10.8 residents	5.9 residents	1/39	0.17	0.14	12/39
Home Health	379 visits	320 visits	4/39	0.90	1.07	18/39
Non-Hospital Ambulatory Care	3,390 visits	3,233 visits	7/39	0.18	0.28	28/39
Public Health	1,000 people	1,000 people	--	5.39	2.53	14/39
School Health	173 children	168 children	23/39	10.29	14.01	25/39
Other	1,000 people	1,000 people	--	4.54	2.32	7/39

Demand for RNs in Herkimer/Oneida counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Herkimer/Oneida counties is projected to decline in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 16% to 20%). Despite this projected growth, the ranking of these counties in the proportion of older adults is expected to fall from third in 2005 to ninth in 2020.

Figure 29. Projected Population of Herkimer/Oneida Counties and Percent Age 65 and Older



Demand for most health care services is projected to decline in Herkimer/Oneida counties as the population declines. Nonetheless, accelerating aging will increase demand for hospital inpatient services by an average of 0.30% annually (although this is still one of the lowest rates of increase in hospital inpatient days the state), non-emergency outpatient services, nursing facilities, and non-hospital ambulatory care.

Table 211. Projected Demand for Services and Annual Growth Rate by Setting, Herkimer/Oneida Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	331,236	0.30%	0.69%	35/39
Hospital Emergency Department Visits	109,315	-0.20%	0.17%	30/39
Hospital Outpatient Days	822,633	0.02%	0.43%	30/39
Nursing Facilities	3,379	0.34%	0.92%	32/39
Home Health	110,005	-0.18%	0.49%	32/39
Non-Hospital Ambulatory Care	1,012,016	0.01%	0.47%	30/39
Nursing Education	181	-0.56%	-0.29%	29/39
Public Health	289,735	-0.19%	0.22%	29/39
School Health	47,009	-0.61%	-0.22%	26/39
Other	289,735	-0.19%	0.22%	29/39

The RN supply in Herkimer/Oneida counties is projected to grow 21% between 2005 and 2020. This should be sufficient to not only maintain current staffing ratios, but to exceed state and national benchmarks for RN staffing.

Table 212. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Herkimer/Oneida Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
3,173	2.6%	3,072	-0.7%	3,449	11.5%	4,578	48.0	3,388	9.5%

New York City Region

Nearly 63,000 RNs are employed in New York City, New York, which is composed of Bronx, Kings, New York, Queens, and Richmond counties. RNs in this region are slightly younger on average than RNs statewide (median age of 45 versus 46), and much more likely to have a bachelor's or master's degree. They are also more likely to be employed in hospital settings.

Table 213. Selected Characteristics of New York City and New York RNs

	New York City	New York
Employed RNs	62,548	165,124
Median Age	45	46
% 55+	16.6%	16.9%
% Diploma/ADN	27.7%	39.4%
% BSN	51.7%	43.0%
% MSN	20.6%	17.6%
% in Hospitals	70.6%	64.1%

Most RNs who work in New York City also live in New York City (72.6%), although this percentage is much lower than for most other regions. New York City is losing more resident RNs through migration outside of its commuting areas than it is gaining. This is partially balanced by strong in-migration into areas such as Long Island and the Hudson Valley which provide New York City with many RNs, but only about one out of every five RNs who migrates into Long Island or the Hudson Valley will work in New York City. In contrast, over 90% of RNs living in New York City are part of the New York City workforce, so almost five RNs must migrate into Long Island or the Hudson Valley to cancel out a single RN moving out of New York City itself. In sum, the New York City workforce is estimated to have lost more than 2,500 RNs through residential migration between 2005 and 2006, while gaining just less than 2,000 RNs through residential migration during the same period (a net loss of more than 500 RNs per year).

Table 214. Location of Residence of RNs Employed in New York City, Residential Migration Patterns, and Estimated Effects of Residential Migration on New York City RN Supply

New York City Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to New York City	In-migrants to New York City workforce	Out-migrants from New York City workforce
New York City	72.6%	1,238	2,413	93.1%	1,153	2,247
Long Island	9.5%	1,669	0	20.5%	342	0
Hudson Valley	8.2%	949	0	20.5%	195	0
Capital District	0.1%	526	169	0.1%	1	0
Central New York	0.1%	280	0	0.1%	0	0
Out of State	9.6%					
Connecticut		175	208	3.1%	5	6
Massachusetts		256	210	2.7%	7	6
Pennsylvania		0	17	2.9%	0	0
New Jersey					0	0
Bergen County		263	275	26.9%	71	74
Hudson County		116	482	21.0%	24	101
Union County		496	228	12.3%	61	28
Essex County		359	541	10.1%	36	55
Morris County		342	349	5.6%	19	20
Somerset County		244	305	5.2%	13	16
Middlesex County		276	203	4.2%	12	9
Monmouth County		137	189	2.4%	3	5
Mercer County		48	217	2.2%	1	5
Ocean County		226	89	2.0%	5	2
Passaic County		291	118	1.3%	4	2
Burlington County		409	527	0.7%	3	4
					1,955	2,578

Between 2005 and 2006, the RN supply in New York City was estimated to have grown by more than 800 RNs, or about 1.4%.

Table 215. Projected Components of RN Supply Change, New York City, 2005-2006

New York City Region	2005-2006
Base	62,548
In-migration	1,955
Out-migration	2,578
Net migration	-623
Graduates	2,127
Foreign	692
Attrition	1,352
	+844 (1.4%)

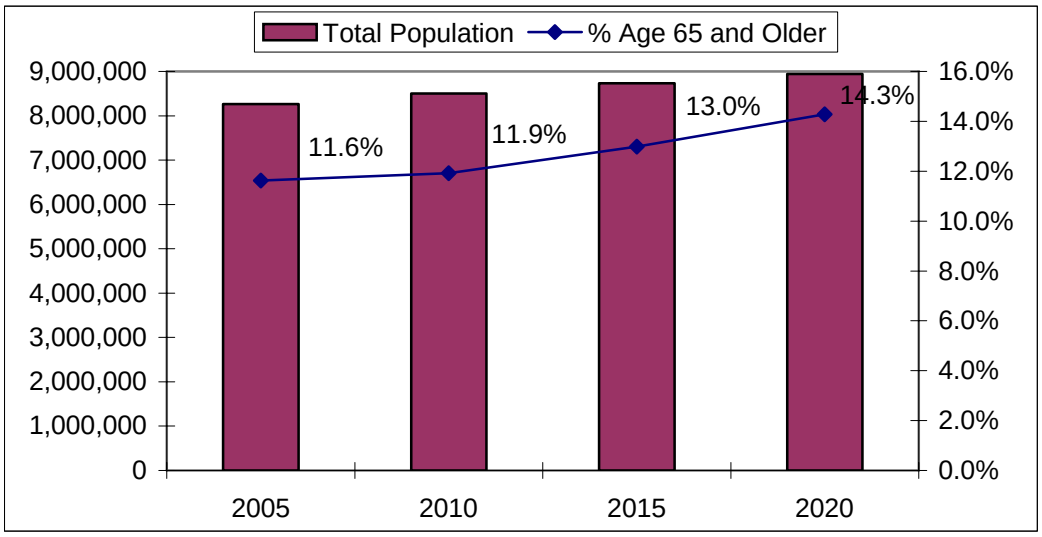
There are more inpatient days and somewhat more emergency department visits per capita in New York City than statewide, but somewhat fewer nursing facility residents and home health visits. There are fewer hospital RNs per unit of service, and also fewer RNs per unit of service in non-hospital ambulatory care, school health, and public health.

Table 216. Projected Demand for Services and Annual and Historical Growth Rate by Setting, New York City

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	New York City	New York	New York City	New York
Hospital Inpatient Days	1,272 inpatient days	946 inpatient days	3.55	4.78
Hospital Emergency Department Visits	433 ED visits	397 ED visits	1.10	1.55
Hospital Outpatient Days	2,102 outpatient visits	2,215 outpatient visits	0.22	0.15
Nursing Facility Residents	5.2 residents	5.9 residents	0.14	0.14
Home Health Visits	299 visits	320 visits	1.11	1.07
Non-Hospital Ambulatory Care	3,226 visits	3,233 visits	0.18	0.28
School Health	172 children	168 children	0.57	2.75
Public Health	1,000 persons	1,000 persons	0.10	0.51
Other	1,000 persons	1,000 persons	0.44	1.01

The population of New York City is projected to grow steadily between 2005 and 2020, and while the percent of the population that is age 65 and older will increase during that time, the percent of older adults will remain very moderate compared to the rest of the state.

Figure 30. Projected Population of New York City and Percent Age 65 and Older



Growth in almost every type of health service in New York City is expected to exceed health service growth in the state overall. The exception to this is nursing education. The decrease of women age 18-44 in the population is actually expected to be larger than the decrease of women age 18-44 in the statewide population. But generally, demand for health care in New York City is poised to explode between 2005 and 2020.

Table 217. Projected Demand for Services and Annual and Historical Growth Rate by Setting, New York City

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, New York City, 2005-2020	Projected Annual Growth Rate, New York
Hospital Inpatient Days	9,501,328	1.14%	0.69%
Hospital Emergency Department Visits	3,739,860	0.42%	0.17%
Hospital Outpatient Days	19,042,582	0.74%	0.43%
Nursing Facilities	49,299	1.02%	0.92%
Home Health	2,760,054	0.87%	0.49%
Non-Hospital Ambulatory Care	29,406,415	0.78%	0.47%
Nursing Education	1,999	-0.41%	-0.26%
Public Health	8,944,484	0.53%	0.22%
School Health	1,457,263	0.18%	-0.22%
Other	8,944,484	0.53%	0.22%

There is very little chance that ratios of RNs to units of service in New York City will approach statewide or national ratios by 2020, as nursing graduations are projected to fall while demand

for services continues to rise. New York City may face severe shortages going forward, although as the following sections indicate, these shortages will not be equally felt amongst the five boroughs.

Table 218. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, New York City

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
69,967	11.9%	79,901	27.7%	92,161	47.3%	122,241	95.4%	74,635	19.3%

Bronx County

Supply. Bronx County's estimated base year RN population was 8,787 RNs in 2005. RNs in Bronx County are similar in age to RNs statewide (both with a median age of 46). The RN workforce in Bronx County ranks among the top 10 counties in the state for percentage of RNs with bachelor's or master's degrees. An estimated 31% of RNs working in Bronx County are diploma/ADN nurses (compared to 39% statewide), while 50% are BSNs (compared to 43% statewide), and 19% have a MSN or doctorate (versus 18% statewide).

Table 37. Selected Characteristics of Bronx County RNs

	Bronx County	New York	Ranking
Employed RNs	8,787	165,124	8/39
Median Age	46	46	--
% 55+	16.0%	16.9%	19/39
% Diploma/ADN	31.1%	39.4%	37/39
% BSN	50.0%	43.0%	5/39
% MSN	19.4%	17.6%	8/39
% in Hospitals	69.1%	64.1%	4/39

Sixty-nine percent of the RNs employed in Bronx County work in hospitals (versus 64% statewide), ranking Bronx County fourth in the state for RNs working in hospitals. Twelve percent of Bronx County RNs work in nursing homes (compared to 10% statewide), nearly 8% work in home health (versus 4.0%), less than 5% work in physician offices or outpatient care centers (versus 11% statewide), and just a small percentage work in school health (1.5% versus 3% statewide).

Less than half of the RNs working in Bronx County live in the Bronx. The largest RN supplier counties are Westchester/Putnam counties (providing 21% of Bronx County's RNs), Bergen County, New Jersey (5%), and Kings County (5%). An estimated 5,503 RNs per year move into the areas that supply Bronx County with RNs and an estimated 392 of these RNs will work in Bronx County. At the same time, an estimated 563 RNs who work in Bronx County will relocate out of Bronx County supply areas (6.4% of Bronx County RNs).

Table 38. Location of Residence of RNs Employed in Bronx County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Bronx County RN Supply

Bronx County Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Bronx	In-migrants to Bronx workforce	Out-migrants from Bronx workforce
Bronx	48.2%	280	638	56.1%	157	358
Columbia/Greene	0.1%	134	0	0.7%	1	0
Dutchess	1.4%	87	76	4.5%	4	3
Kings	4.9%	105	1,145	2.6%	3	30
Nassau	2.0%	806	559	1.2%	10	7
New York	2.9%	639	423	4.3%	27	18
Orange	1.6%	217	0	4.6%	10	0
Queens	3.2%	514	457	1.8%	9	8
Rockland	3.6%	209	45	7.5%	16	3
Suffolk	3.4%	926	283	1.9%	18	5
Westchester/Putnam	21.2%	387	228	19.4%	75	44
Fairfield County, CT	0.4%	0	177	5.2%	0	9
Bergen County, NJ	5.2%	828	1,013	7.1%	59	72
Ocean County, NJ	1.0%	375	403	1.2%	4	5
Monroe County, PA	0.5%	0	17	2.9%	0	0.5
		5,503	5,460		392	563

Between 2005 and 2006, an estimated 252 RNs entered Bronx County from abroad, and 289 new RNs graduates entered the Bronx County workforce. The number of new graduates entering the Bronx County workforce is expected to remain fairly constant. Attrition of existing RNs due to death, disability, or retirement was estimated at 189 RNs in 2005-06 (2.2% of the workforce), but this is projected to grow (to 3.5% of the workforce) as the workforce ages. Despite growing attrition and out-migration, Bronx County's RN workforce is estimated to continue growing until around 2017.

Table 39. Projected Components of RN Supply Change, Bronx County, 2005-2020

Bronx	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Base	8,787	8,968	9,127	9,263	9,380	9,482	9,566	9,633	9,684	9,723	9,751	9,766	9,766	9,752	9,733
Out-migrants	563.2	574.8	585	593.8	601.3	607.8	613.2	617.5	620.8	623.2	625.1	626	626	625.1	623.9
In-migrants	392	392	392	392	392	392	392	392	392	392	392	392	392	392	392
Net migrants	-171.2	-183	-193	-201.8	-209.3	-216	-221	-225	-229	-231	-233	-234	-234	-233	-231.9
Foreign	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252
Grads	289	289	286	286	286	286	286	286	286	289	289	289	289	289	289
Attrition	189	199	209	219	227	238	250	261	271	281	293	307	321	327	338
	8,968	9,127	9,263	9,380	9,482	9,566	9,633	9,684	9,723	9,751	9,766	9,766	9,752	9,733	9,704

Between 2000 and 2005/06, the estimated RN supply in Bronx County declined by an estimated 0.3% annually. The supply projection given above (0.06% growth per year) is relatively optimistic compared to this historical trend, but still does not represent robust growth.

Table 40. Relative Rankings of Key Components of Supply Projections, Bronx County

	Bronx County Ranking
% of resident RNs working in county	28/39
% of RN workforce that lives in county	36/39
In-migration	15/39
Out-migration	6/39
Net migration	33/39
Projected attrition, 2020	26/39
Projected supply growth, 2005-2020	26/39

Demand. More hospital and nursing facility services are used in Bronx County per capita than the statewide average, although fewer home health services are estimated to be used based on the age of residents. The Bronx is eighth in the state for emergency department visits and sixth for nursing facility residents. Bronx County has more children per capita than any other county or county group in the state.

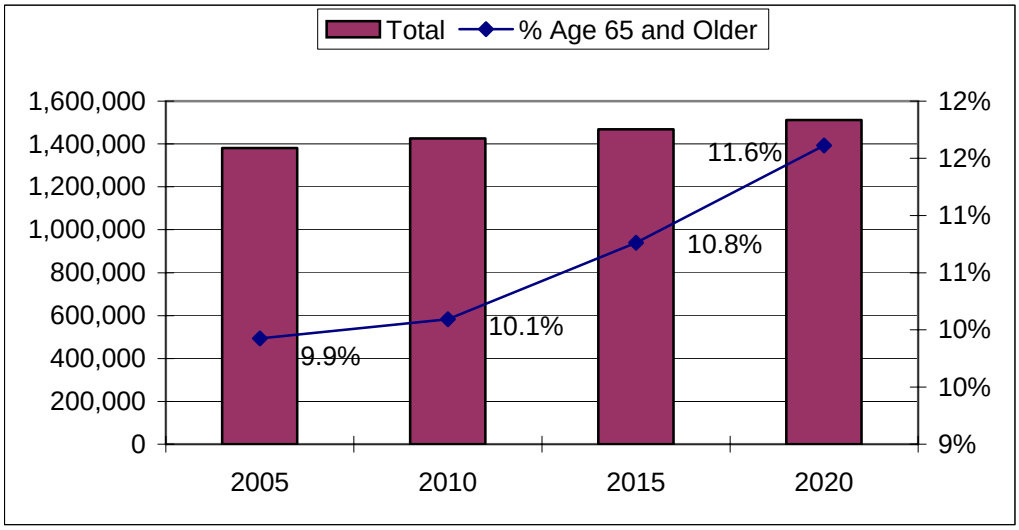
Bronx County ranks high for RNs per hospital outpatient day and per home health visit, but among the bottom 10 county groups in the state for RNs per emergency department visits, non-hospital ambulatory care visits, and school-age children.

Table 41. Demand for Services per 1,000 Population and RNs per Unit of Service, Bronx County and New York

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Bronx County	New York	Ranking	Bronx County	New York	Ranking
Hospital Inpatient Days	958 inpatient days	946 inpatient days	13/39	3.47	4.78	29/39
Hospital Emergency Department Visits	492 ED visits	397 ED visits	8/39	0.99	1.55	36/39
Hospital Outpatient Days	2,909 visits	2,215 visits	14/39	0.20	0.15	5/39
Nursing Facilities	8.1 residents	5.9 residents	6/39	0.09	0.14	25/39
Home Health	259 visits	320 visits	39/39	1.87	1.07	9/39
Non-Hospital Ambulatory Care	3,058 visits	3,233 visits	39/39	0.10	0.28	33/39
Public Health	1,000 people	1,000 people	--	1.32	2.53	29/39
School Health	213 children	168 children	1/39	4.92	14.01	31/39
Other	1,000 people	1,000 people	--	0.97	2.32	27/39

Demand for RNs in Bronx County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Bronx County is projected to steadily rise in the coming years. Compared to other areas of the state the population of Bronx County is young, but the percentage age 65 and older will increase steadily between 2005 and 2020. Still, Bronx County is expected to retain its ranking as the New York county with the smallest percentage of older residents through the year 2020.

Figure 31. Projected Population of Bronx County and Percent Age 65 and older



Demand for services in Bronx County is expected to continue to grow in all settings between 2005 and 2020; the largest growth will be in nursing facility demand followed by home health. Bronx County is in the top 10 county groups for projected growth in emergency department visits, hospital outpatient visits, home health visits, non-hospital ambulatory visits, nursing education, public health, and school health, as well as other RN services.

Table 42. Projected Demand for Services and Annual Growth Rate by Setting, Bronx County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	1,500,059	0.83	0.69%	12/39
Hospital Emergency Department Visits	740,127	0.56	0.17%	5/39
Hospital Outpatient Visits	4,521,521	0.78	0.43%	6/39
Nursing Facilities	12,932	0.97	0.92%	18/39
Home Health	408,386	0.87	0.49%	6/39
Non-Hospital Ambulatory Care	4,740,750	0.76	0.47%	6/39
Nursing Education	292	0.07	-0.29%	6/39
Public Health	1,513,615	0.60	0.22%	5/39
School Health	314,496	0.44	-0.22%	3/39
Other	1,513,615	0.60	0.22%	5/39

Bronx County experienced a decline in RN supply (-0.03%n annually) between 2000 and 2005/06, and is expected to experience slow growth (0.06% annually) between 2005 and 2020. Growth must be much faster than this in order to simply maintain current ratios of RNs to units of service in the Bronx. The supply of RNs will need to grow 13% to maintain current ratios,

59% to match average ratios statewide, and 79% to match national ratios. Bronx County is already short of RNs compared to other areas within New York, and is at serious risk of even greater shortages in the years to come.

Table 43. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Bronx County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
9,892	12.58%	13,947	58.72%	15,748	79.22%	20,818	136.92%	10,707	21.85%

Kings County

Supply. Kings County's estimated base year RN population was 16,858 RNs in 2005, making it the second-largest RN labor force in the state. RNs in Kings County are slightly older than RNs statewide (with a median age of 47 versus 46). An estimated 32% of RNs working in Kings County are diploma/ADN nurses (compared to 39% statewide), 49% are BSNs (compared to 43% statewide), and 20% have a MSN or doctorate (versus 18% statewide).

Table 132. Selected Characteristics of RNs, Kings County and New York

	Kings County	New York	Rankings
Employed RNs	16,858	165,124	2/39
Median Age	47	46	--
% 55+	18.6%	16.9%	15/39
% Diploma/ADN	31.5%	39.4%	36/39
% BSN	48.9%	43.0%	6/39
% MSN	19.6%	17.6%	7/39
% in Hospitals	68.7%	64.1%	6/39

About 69% of RNs in Kings County are employed in hospitals (versus 64% statewide). An estimated 8% of Kings County RNs work in non-hospital ambulatory care (compared to 11% statewide), an estimated 12% percent work in nursing facilities (versus 10% statewide), an estimated 4% work in home health (compared to 4% statewide), and fewer than 1% are believed to work in school health.

Sixty-eight percent of the RNs working in Kings County live in the county (the borough of Brooklyn), while 14% come from Queens County, and 8% come from Richmond County (Staten Island). Seven percent come from Nassau County, and the remainder comes from New York County (Manhattan), Suffolk County, and even Onondaga/Madison/Cayuga counties. A small percent (1.5%) come from Massachusetts or New Jersey.

An estimated 5,144 RNs per year move into the areas that supply Kings County with RNs and an estimated 394 of these RNs will work in Kings County. At the same time, an estimated 968 RNs who work in Kings County will relocate out of Kings County supply areas (5.7% of the RN workforce).

Table 133. Location of Residence of RNs Employed in Kings County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Kings County RN Supply

Kings County Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Kings	In-migrants to Kings workforce	Out-migrants from Kings workforce
Bronx	1.2%	280	638	2.8%	8	18
Kings	67.8%	105	1,145	70.4%	74	806
Nassau	6.6%	806	559	7.9%	64	44
New York	0.6%	639	423	1.7%	11	7
Onondaga/Madison/Cayuga	0.0%	90	30	0.1%	0	0
Queens	13.5%	514	457	14.6%	75	67
Richmond	7.8%	570	29	25.3%	144	7
Suffolk	0.3%	926	283	0.4%	4	1
Norfolk (part)/Plymouth (part), MA	0.3%	225	377	1.5%	3	6
Middlesex, NJ	1.0%	991	991	1.2%	12	12
Essex, NJ (part)	0.2%	0	0	0.6%	0	0
		5,144	4,930		394	968

Between 2005 and 2006, an estimated 554 new RNs graduates entered the Kings County workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women decreases. Attrition of existing RNs due to death, disability, or retirement was estimated at 360 RNs in 2005-06 (2.1% of the workforce), but this is projected to grow to 3.8% of the workforce as the workforce ages. The greatest challenge for this county is the steady projected out-migration, which is already causing declines in the RN workforce that are expected to continue through 2020. Between 2005 and 2020, the RN supply in Kings County could decline by 19%.

Table 134. Projected Components of RN Supply Change, Kings County, 2005-2020

Kings	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	16,858	16,651	16,437	16,221	16,000	15,782	15,558	15,332	15,104	14,880	14,651	14,422	14,190	13,956	13,729	-19%
In-migration	394	394	394	394	394	394	394	394	394	394	394	394	394	394	394	0%
Out-migration	968	956	943	931	918	906	893	880	867	854	841	828	814	801	788	-19%
Net migration	-574	-562	-549	-537	-524	-512	-499	-486	-473	-460	-447	-434	-420	-407	-394	-31%
Graduates	554	548	548	543	543	537	537	537	537	532	532	532	532	526	526	-5%
Foreign	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	0%
Attrition	360	372	387	399	408	421	437	451	461	472	486	502	517	518	527	46%
Total	16,651	16,437	16,221	16,000	15,782	15,558	15,332	15,104	14,880	14,651	14,422	14,190	13,956	13,729	13,506	-19%

Kings County has one of the lowest rates of net migration in the state, and also one of the lowest rates of projected supply growth. Although the average annual growth in RN supply between

2000 and 2005 was estimated at 3.3%, this is not likely to continue. The average annual growth rate between 2005 and 2020 is projected at –1.5%.

Table 135. Relative Rankings of Key Components of Supply Projections, Kings County

	Kings County Ranking
% of resident RNs working in county	17/39
% of RN workforce that lives in county	26/39
In-migration	25/39
Out-migration	8/39
Net migration	36/39
Projected attrition, 2020	19/39
Projected supply growth, 2005-2020	35/39

Demand. While the use of hospital inpatient services per capita in Kings County is comparable to that statewide, the use of emergency and non-emergency outpatient services is lower. The county also ranks among the bottom five in the state for use of nursing facilities, home health services, and non-hospital ambulatory care. RN staffing is comparable to statewide ratios in most settings, but lower in home health, public health, and school health. The county ranks second in estimated RNs per hospital outpatient days.

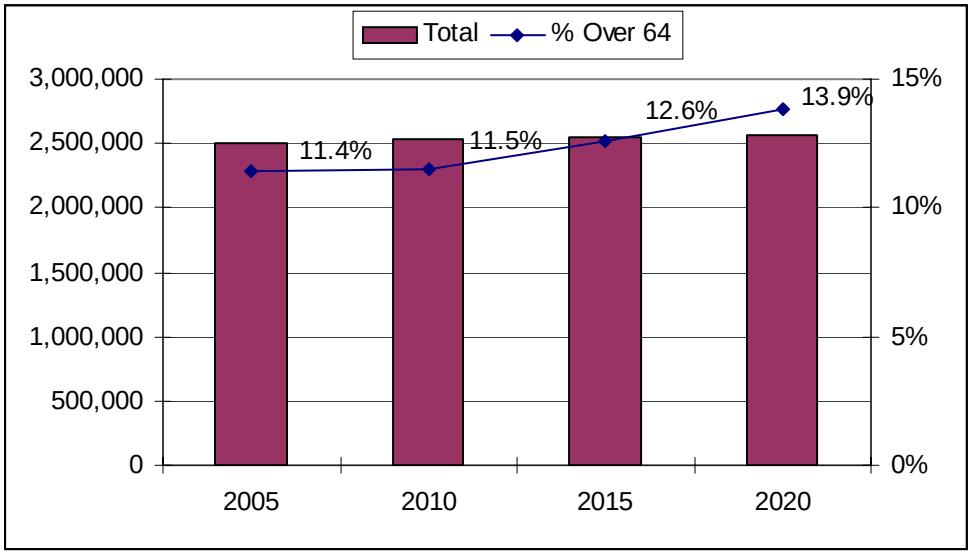
Table 136. Projected Demand for Services and Annual Growth Rate by Setting, Kings County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Kings County	New York	Rankings	Kings County	New York	Rankings
Hospital Inpatient Days	958 inpatient days	946 inpatient days	12/39	4.04	4.78	24/39
Hospital Emergency Department Visits	343 ED visits	397 ED visits	27/39	1.19	1.55	30/39
Hospital Outpatient Days	1,493 visits	2,215 visits	28/39	0.25	0.15	2/39
Nursing Facilities	4.1 residents	5.9 residents	38/39	0.21	0.14	7/39
Home Health	283 visits	320 visits	37/39	0.84	1.07	21/39
Non-Hospital Ambulatory Care	3,146 visits	3,233 visits	35/39	0.16	0.28	29/39
Public Health	1,000 people	1,000 people	--	1.24	2.53	30/39
School Health	187 children	168 children	6/39	2.53	14.01	33/39
Other	1,000 people	1,000 people	--	1.66	2.32	20/39

Demand for RNs in Kings County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Kings County is projected to increase in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 11% to 14%). Still, the

percentage of older adults in the population of Kings County will remain among the lowest in the state (35th out of 39 in 2005, down to 36th in 2020).

Figure 32. Projected Population of Kings County and Percent Age 65 and older



Demand for most health care services is projected to increase in Kings County as the population continues to grow and age. Demand for school health services may decrease as children become a smaller proportion of the population, and demand for nursing education may decrease as women in the age groups that typically attend nursing school also become a smaller proportion of the population.

Table 137. Projected Demand for Services and Annual Growth Rate by Setting, Kings County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	2,630,860	0.62%	0.69%	22/39
Hospital Emergency Department Visits	875,571	0.12%	0.17%	15/39
Hospital Outpatient Days	3,994,784	0.45%	0.43%	14/39
Nursing Facilities	10,940	0.50%	0.92%	30/39
Home Health	761,106	0.47%	0.49%	15/39
Non-Hospital Ambulatory Care	8,391,328	0.42%	0.47%	14/39
Nursing Education	526	-0.34%	-0.29%	21/39
Public Health	2,571,602	0.18%	0.22%	10/39
School Health	458,053	-0.14%	-0.22%	11/39
Other	2,571,602	0.18%	0.22%	10/39

The RN supply in Kings County must grow by nearly 8% between 2005 and 2020 just to maintain current ratios, and would need to grow by 27% to reach state benchmarks and 48% to reach national benchmarks. Yet, it is projected that supply will actually decrease by about 19% during this period. Kings County thus stands to face serious shortages by 2020.

Table 138. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Herkimer/Oneida Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
18,160	7.7%	21,474	27.4%	24,907	47.8%	33,183	96.8%	19,476	15.5%

New York County

Supply. New York County's estimated base year RN population was 22,435 RNs in 2005; making it the largest RN workforce in the state. RNs in New York County are younger than RNs statewide (with a median age of 43 versus 46). An estimated 22% of RNs working in New York County are diploma/ADN nurses (compared to 39% statewide), while 53% are BSNs (compared to 43% statewide), and 25% have a MSN or doctorate (versus 18% statewide).

Table 160. Selected Characteristics of RNs, New York County and New York

	New York County	New York	Rankings
Employed RNs	22,435	165,124	1/39
Median Age	43	46	--
% 55+	15.5%	16.9%	23/39
% Diploma/ADN	22.3%	39.4%	39/39
% BSN	52.9%	43.0%	4/39
% MSN	24.8%	17.6%	2/39
% in Hospitals	76.2%	64.1%	1/39

About 76% of RNs in New York County are employed in hospitals (versus 64% statewide). An estimated 7% of New York County RNs work in non-hospital ambulatory care (compared to 11% statewide), an estimated 4% percent work in nursing facilities (versus 10% statewide), an estimated 2% work in home health (compared to 4% statewide), and only 1% are estimated to work in each of school health and public health.

Less than one-quarter of the RNs working in New York County also live in the county (23%). Twenty percent come from Queens County, 13% from Kings County, and 11% come from Bronx County. A number of RNs who work in New York County also come from Nassau County (6%), Westchester/Putnam counties (5%), and Bergen County, New Jersey (6%). The remainder come from Dutchess County (<1%), Orange County (2%), Rockland County (3%),

Richmond County (1%), Suffolk County (2%), and Sullivan/Ulster counties (<1%), as well as from New Jersey (7%), Connecticut (1%), and Massachusetts (<1%).

An estimated 8,139 RNs per year move into the areas that supply New York County with RNs and an estimated 1,373 of these RNs will work in New York County. At the same time, an estimated 1,500 RNs who work in New York County will relocate out of New York County supply areas (6.7% of the RN workforce).

Table 161. Location of Residence of RNs Employed in New York County, Residential Migration Patterns, and Estimated Effects of Residential Migration on New York County RN Supply

New York Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to New York	In-migrants to New York workforce	Out-migrants from New York workforce
Bronx	11.1%	280	638	34.3%	96	219
Dutchess	0.3%	87	76	2.2%	2	2
Kings	12.5%	105	1,145	17.7%	18	203
Nassau	5.7%	806	559	9.4%	76	52
New York	22.9%	639	423	89.4%	571	378
Orange	1.5%	217	0	11.3%	24	0
Queens	19.8%	514	457	29.2%	150	133
Richmond	1.2%	570	29	5.1%	29	1
Rockland	2.5%	209	45	13.8%	29	6
Suffolk	1.5%	926	283	2.2%	20	6
Sullivan/Ulster	0.1%	215	0	0.7%	2	0
Westchester/Putnam	4.9%	387	228	11.9%	46	27
Middlesex County, CT	0.2%	38	189	3.1%	1	6
Fairfield Co, CT (part)	0.2%	88	0	1.6%	1	0
Fairfield Co, CT (part)	0.2%	0	177	6.7%	0	12
Middlesex/Norfolk/Plymouth Co., MA	0.4%	31	53	5.9%	2	3
Bergen County, NJ	5.7%	828	1,013	20.9%	173	212
Hudson County, NJ (part)	1.0%	141	0	21.0%	30	0
Hudson County, NJ (part)	1.0%	0	577	15.4%	0	89
Somerset County, NJ	1.0%	141	305	5.2%	7	16
Monmouth County, NJ	0.3%	94	353	1.2%	1	4
Ocean County, NJ	1.0%	544	1,014	7.5%	41	76
Morris County, NJ	1.0%	472	592	1.9%	9	11
Union County, NJ	1.0%	558	414	7.5%	42	31
Burlington County, NJ	0.2%	207	1,080	0.7%	1	8
Mercer County, NJ	0.2%	48	250	2.2%	1	5
		8,139	9,895		1,373	1,500

Between 2005 and 2006, an estimated 737 new RNs graduates entered the New York County workforce. The number of new graduates entering the workforce is expected to diminish somewhat as the population of working-age women declines. Attrition of existing RNs due to death, disability, or retirement was estimated at 486 RNs in 2005-06 (2.2% of the workforce), but this is projected to grow to 4.0% of the workforce as the workforce ages. The supply of RNs in New York County through this period is projected to decline very moderately.

Table 162. Projected Components of RN Supply Change, New York County, 2005-2020

New York	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	22,435	22,748	23,007	23,212	23,369	23,492	23,570	23,602	23,591	23,548	23,477	23,371	23,225	23,050	22,860	2%
In-migration	1,373	1,373	1,373	1,373	1,373	1,373	1,373	1,373	1,373	1,373	1,373	1,373	1,373	1,373	1,373	0%
Out-migration	1,501	1,522	1,539	1,553	1,563	1,572	1,577	1,579	1,578	1,575	1,571	1,563	1,554	1,542	1,529	2%
Net migration	-128	-149	-166	-180	-190	-199	-204	-206	-205	-202	-198	-190	-181	-169	-156	-22%
Graduates	737	730	722	715	715	707	700	693	685	685	678	671	671	663	663	-10%
Foreign	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	0%
Attrition	486	512	541	567	592	621	655	687	714	743	777	816	855	874	903	86%
Total	22,748	23,007	23,212	23,369	23,492	23,570	23,602	23,591	23,548	23,477	23,371	23,225	23,050	22,860	22,653	0%

New York County ranks fourth in the state for out-migration of RNs from its supply areas. This is one driver of New York County's very slow projected annual growth rate (0.06%) between 2005 and 2020. Nonetheless, this is an improvement from the decline of 0.9% observed between 2000 and 2005.

Table 163. Relative Rankings of Key Components of Supply Projections, New York County

	New York County Ranking
% of resident RNs working in county	8/39
% of RN workforce that lives in county	39/39
In-migration	7/39
Out-migration	4/39
Net migration	28/39
Projected attrition, 2020	16/39
Projected supply growth, 2005-2020	30/39

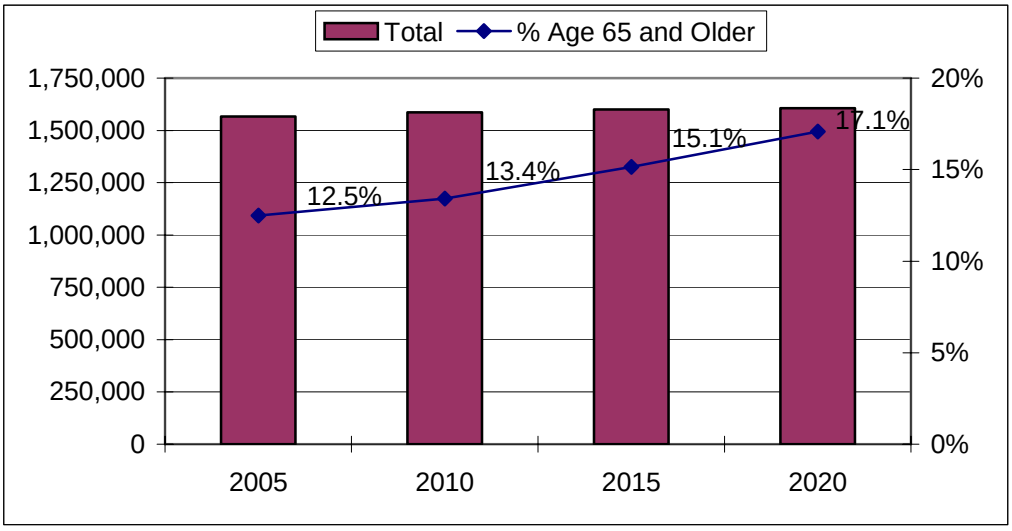
Demand. Given the many major medical centers in New York County that draw patients from the entire Northeast, it is not a surprise that use of all hospital-based services per capita is much higher than the state average. New York County ranks second in the state for use of both hospital inpatient services and emergency department services. Other units of service are similar to statewide averages, except that New York County has many fewer children per capita. Inpatient RN staffing is higher than statewide, while New York County ranks third in the state for hospital outpatient staffing.

Table 164. Projected Demand for Services and Annual Growth Rate by Setting, New York County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	New York County	New York	Rankings	New York County	New York	Rankings
Hospital Inpatient Days	1,728 inpatient days	946 inpatient days	2/39	5.43	4.78	13/39
Hospital Emergency Department Visits	690 ED visits	397 ED visits	2/39	1.10	1.55	33/39
Hospital Outpatient Days	3,567 visits	2,215 visits	10/39	0.23	0.15	3/39
Nursing Facilities	4.1 residents	5.9 residents	37/39	0.14	0.14	18/39
Home Health	312 visits	320 visits	32/39	0.96	1.07	17/39
Non-Hospital Ambulatory Care	3,220 visits	3,233 visits	29/39	0.33	0.28	18/39
Public Health	1,000 people	1,000 people	--	1.09	2.53	32/39
School Health	124 children	168 children	39/39	14.35	14.01	19/39
Other	1,000 people	1,000 people	--	5.98	2.32	4/39

Demand for RNs in New York County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of New York County is projected to increase slightly in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 13% to 17%). The ranking of New York County in percent of older adults is expected to climb from 30th out of 39 to 24th between 2005 and 2020.

Figure 33. Projected Population of New York County and Percent Age 65 and older



Demand for most health care services is projected to increase in New York County as the population increases. The demand for RNs in nursing education and school health may decline, however, as the population ages and younger people are a smaller proportion of the population.

Table 165. Projected Demand for Services and Annual Growth Rate by Setting, New York County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	3,038,000	0.77%	0.69%	15/39
Hospital Emergency Department Visits	1,098,289	0.11%	0.17%	16/39
Hospital Outpatient Days	6,108,236	0.59%	0.43%	10/39
Nursing Facilities	7,661	1.10%	0.92%	14/39
Home Health	554,087	0.84%	0.49%	9/39
Non-Hospital Ambulatory Care	5,525,707	0.61%	0.47%	10/39
Nursing Education	656	-0.78%	-0.29%	32/39
Public Health	1,606,718	0.17%	0.22%	11/39
School Health	187,324	-0.23%	-0.22%	15/39
Other	1,606,718	0.17%	0.22%	11/39

New York County is expected to have relatively little change in RN supply between 2005 and 2020. If this is the case, the county will not be able to maintain current ratios, but it may still stay slightly above statewide averages. Staffing ratios will continue, however, to be considerably below national ratios and it is likely that substantial hospital RN vacancies will persist.

Table 166. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, New York County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
24,337	8.5%	21,837	-2.7%	26,113	16.4%	34,661	54.5%	26,054	16.1%

Queens County

Supply. Queens County's estimated base year RN population was 10,509 RNs in 2005, making it the fifth largest RN workforce in the state. RNs in Nassau County are slightly older than RNs statewide (with a median age of 47 versus 46). Queens County has more BSN RNs than any other county in the state. An estimated 27% of RNs working in Nassau County are diploma/ADN nurses (compared to 39% statewide), while 54% are BSNs (compared to 43% statewide), and 18% have a MSN or doctorate (the same as statewide).

Table 202. Selected Characteristics of RNs, Queens County and New York

	Queens County	New York	Rankings
Employed RNs	10,509	165,124	5/39
Median Age	47	46	--
% 55+	18.7%	16.9%	14/39
% Diploma/ADN	27.3%	39.4%	38/39
% BSN	54.4%	43.0%	1/39
% MSN	18.3%	17.6%	10/39
% in Hospitals	66.4%	64.1%	9/39

About 66% of RNs in Queens County are employed in hospitals (versus 64% statewide). An estimated 10% of Queens County RNs work in non-hospital ambulatory care (compared to 11% statewide), an estimated 10% percent work in nursing facilities (the same as statewide), an estimated 6% work in home health (compared to 4% statewide), an estimated 2% work in school health, and 1% are believed to work in public health.

Many of the RNs working in Queens County live in the county (63%), while 24% percent come from Nassau County, 6% from Kings County, and 3% from Suffolk County. A small number come from Bronx County (<1%), New York County (<1%), Richmond County (<1%), Sullivan/Ulster counties (<1%), Westchester/Putnam counties (<1%), and Bergen and Essex counties in New Jersey (1%). An estimated 5,268 RNs per year move into the areas that supply Queens County with RNs and an estimated 399 of these RNs will work in Queens County. At the same time, an estimated 358 RNs who work in Queens County will relocate out of Queens County supply areas (3.4% of the RN workforce).

Table 203. Location of Residence of RNs Employed in Queens County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Queens County RN Supply

Queens Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Queens	In-migrants to Queens workforce	Out-migrants from Queens workforce
Bronx	0.6%	280	638	0.8%	2	5
Kings	6.2%	105	1,145	0.4%	4	46
Nassau	24.0%	806	559	17.8%	143	99
New York	0.4%	639	423	0.8%	5	3
Queens	63.2%	514	457	42.0%	216	192
Richmond	0.5%	570	29	1.0%	6	0
Suffolk	2.5%	926	283	1.7%	16	5
Sullivan/Ulster	0.1%	215	0	0.4%	1	0
Westchester/Putnam	0.4%	387	228	0.4%	2	1
Bergen County, NJ	0.4%	828	1,013	0.6%	5	6
Essex County, NJ	1.0%	0	0	2.9%	0	0
		5,268	4,773		399	358

Between 2005 and 2006, an estimated 345 new RNs graduates entered the Queens County workforce. Unlike many counties, the number of new graduates entering the workforce is expected to increase somewhat as the population of working-age women increases. Attrition of existing RNs due to death, disability, or retirement was estimated at 228 RNs in 2005-06 (2.2% of the workforce), but this is projected to grow to 3.6% of the workforce as the workforce ages. Overall supply growth during this period is estimated at 12%. This is an estimated average annual growth rate of 0.9%, which is a decline from the 1.5% average annual growth rate observed between 2000 and 2005 for Queens County.

Table 204. Projected Components of RN Supply Change, Queens County, 2005-2020

Queens	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	10509	10728	10927	11109	11272	11417	11547	11660	11753	11833	11900	11948	11979	11993	11997	14%
In-migration	399	399	399	399	399	399	399	399	399	399	399	399	399	399	399	0%
Out-migration	357	365	372	378	383	388	393	396	400	402	405	406	407	408	408	14%
Net migration	42	34	27	21	16	11	6	3	-1	-3	-6	-7	-8	-9	-9	-121%
Graduates	345	345	349	349	349	352	356	356	359	362	362	366	369	369	373	8%
Foreign	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	0%
Attrition	228	240	254	267	279	293	309	325	338	352	369	388	407	417	431	89%
Total	10728	10927	11109	11272	11417	11547	11660	11753	11833	11900	11948	11979	11993	11997	11989	12%

Table 205. Relative Rankings of Key Components of Supply Projections, Queens County

	Queens County Ranking
% of resident RNs working in county	35/39
% of RN workforce that lives in county	32/39
In-migration	19/39
Out-migration	13/39
Net migration	17/39
Projected attrition, 2020	24/39
Projected supply growth, 2005-2020	24/39

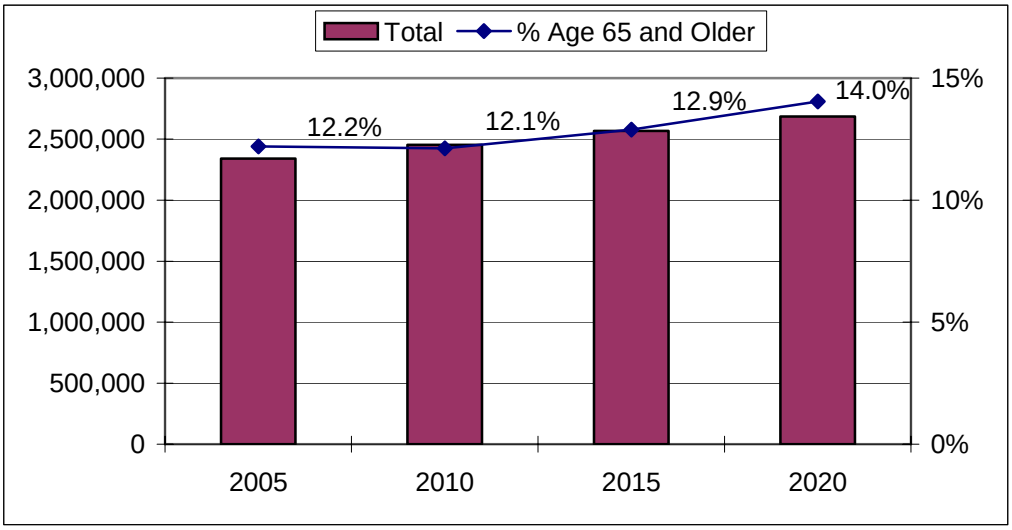
Demand. The use of all types of hospital services per capita are lower in Queens County than in the state overall, which is not surprising given the proximity of major medical centers in neighboring New York County. Demand for other types of services is estimated to be lower than statewide averages as well. RN staffing ratios in Queens County tend to be lower than state averages, with the single exception of RNs in hospital non-emergency outpatient services (estimated to be the fourth highest in the state).

Table 206. Projected Demand for Services and Annual Growth Rate by Setting, Queens County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Queens County	New York	Rankings	Queens County	New York	Rankings
Hospital Inpatient Days	673 inpatient days	946 inpatient	26/39	3.59	4.78	26/39
Hospital Emergency Dept. Visits	303 ED visits	397 ED visits	34/39	1.00	1.55	35/39
Hospital Outpatient Days	1,313 visits	2,215 visits	30/39	0.21	0.15	4/39
Nursing Facilities	4.9 residents	5.9 residents	34/39	0.09	0.14	27/39
Home Health	306 visits	320 visits	33/39	0.88	1.07	20/39
Non-Hospital Ambulatory Care	3,190 visits	3,233 visits	32/39	0.14	0.28	32/39
Public Health	1,000 people	1,000 people	--	0.54	2.53	37/39
School Health	162 children	168 children	29/39	4.47	14.01	32/39
Other	1,000 people	1,000 people	--	1.23	2.32	24/39

Demand for RNs in Queens County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Queens County is projected to increase in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 12% to 14%).

Figure 34. Projected Population of Queens County and Percent Age 65 and older



Demand for most health care services is projected to increase in Queens County as the population increases. Nursing facility residents and hospital inpatient days are projected to increase the most, however, with the aging of the population. Queens County is among the top five counties in the state for projected growth in almost every setting (except for nursing facilities).

Table 207. Projected Demand for Services and Annual Growth Rate by Setting, Queens County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	1,859,487	1.11%	0.69%	5/39
Hospital Emergency Department Visits	805,963	0.86%	0.17%	2/39
Hospital Outpatient Days	3,642,525	1.13%	0.43%	2/39
Nursing Facilities	13,492	1.01%	0.92%	16/39
Home Health	840,785	1.07%	0.49%	2/39
Non-Hospital Ambulatory Care	8,812,664	1.11%	0.47%	2/39
Nursing Education	376	0.57%	-0.29%	4/39
Public Health	2,685,206	0.92%	0.22%	2/39
School Health	406,328	0.45%	-0.22%	2/39
Other	2,685,206	0.92%	0.22%	2/39

Projected moderate growth in the RN supply in Queens County will not be sufficient to maintain current ratios, due to the projected robust growth in the population. Furthermore, Queens County already has staffing ratios of RNs per unit of service that are considerably lower than state or

national benchmarks. Queens County may face increased difficulties with RN supply in the coming years.

Table 208. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Queens County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
12,291	17.0%	18,065	71.9%	20,326	93.4%	26,833	155.3%	13,119	24.8%

Richmond County

Supply. Richmond County's estimated base year RN population was 3,959 RNs in 2005. RNs in Richmond County are younger than RNs statewide (with a median age of 44 versus 46), and much less likely to be older than age 55 (10% versus 17%). The RNs who work in Richmond County are the second most likely in the state to have bachelor's degrees. An estimated 36% of RNs working in Richmond County are diploma/ADN nurses (compared to 39% statewide), while 54% are BSNs (compared to 43% statewide), and 10% have a MSN or doctorate (versus 18% statewide).

Table 216. Selected Characteristics of RNs, Richmond County and New York

	Richmond County	New York	Rankings
Employed RNs	3,959	165,124	12/39
Median Age	44	46	--
% 55+	9.8%	16.9%	36/39
% Diploma/ADN	36.1%	39.4%	31/39
% BSN	54.0%	43.0%	2/39
% MSN	9.9%	17.6%	28/39
% in Hospitals	60.5%	64.1%	14/39

About 61% of RNs in Richmond County are employed in hospitals (versus 64% statewide). An estimated 8% of Richmond County RNs work in non-hospital ambulatory care (compared to 11% statewide), an estimated 19% percent work in nursing facilities (versus 10% statewide), an estimated 8% work in home health (compared to 4% statewide), an estimated 3% work in school health, and 1% are believed to work in public health.

Most of the RNs working in Richmond County (Staten Island) live in the county (86%), while 10% come from counties in New Jersey and the remainder comes from Kings County (2%) or New York County (1%). An estimated 2,982 RNs per year move into the areas that supply Richmond County with RNs and an estimated 410 of these RNs will work in Richmond County. At the same time, an estimated 82 RNs who work in Richmond County will relocate out of Richmond County supply areas (2.1% of the RN workforce).

Table 217. Location of Residence of RNs Employed in Richmond County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Richmond County RN Supply

Richmond Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Richmond	In-migrants to Richmond workforce	Out-migrants from Richmond workforce
Kings	2.4%	105	1,145	0.6%	1	7
New York	1.3%	639	423	0.9%	6	4
Richmond	86.2%	570	29	64.6%	368	19
Hudson, NJ	0.8%	0	577	1.9%	0	11
Middlesex, NJ	2.4%	497	991	1.4%	7	14
Somerset, NJ	0.8%	141	305	0.5%	1	2
Morris, NJ	3.5%	472	592	2.4%	11	14
Union, NJ	2.6%	558	414	3.0%	17	12
		2,982	4,475		410	82

Between 2005 and 2006, an estimated 130 new RNs graduates entered the Richmond County workforce. The number of new graduates entering the workforce is expected to grow somewhat as the population of working-age women increases. Attrition of existing RNs due to death, disability, or retirement was estimated at 89 RNs in 2005-06 (2.3% of the workforce), but this is projected to grow to 4.1% of the workforce as the workforce ages. Richmond County is benefited by strong in-migration into its supply areas, and the supply of RNs is projected to steadily grow between 2005 and 2020. Overall supply growth during this period could be as high as 79%. This is estimated average annual growth of 4.5%, which makes Richmond County the fourth fastest growing RN workforce in the state, and is a sharp increase over the 0.2% average annual increase estimated between 2000 and 2005. The fact that Richmond County has the highest levels of RN in-migration and the second-highest levels of RN net migration in the state can account for much of this projected increase.

Table 218. Projected Components of RN Supply Change, Richmond County, 2005-2020

Richmond	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	3,959	4,343	4,710	5,061	5,394	5,712	6,012	6,292	6,553	6,795	7,016	7,213	7,388	7,537	7,662	94%
In-migration	410	410	410	410	410	410	410	410	410	410	410	410	410	410	410	0%
Out-migration	82	90	98	105	112	119	125	131	136	141	146	150	154	157	159	94%
Net migration	328	320	312	305	298	291	285	279	274	269	264	260	256	253	251	-24%
Graduates	130	131	131	133	134	135	137	138	139	140	142	144	146	147	148	14%
Foreign	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	0%
Attrition	89	98	108	119	129	142	156	171	186	203	223	244	268	290	315	253%
Total	4,343	4,710	5,061	5,394	5,712	6,012	6,292	6,553	6,795	7,016	7,213	7,388	7,537	7,662	7,762	79%

Table 219. Relative Rankings of Key Components of Supply Projections, Richmond County

	Richmond County Ranking
% of resident RNs working in county	21/39
% of RN workforce that lives in county	11/39
In-migration	1/39
Out-migration	20/39
Net migration	2/39
Projected attrition, 2020	13/39
Projected supply growth, 2005-2020	4/39

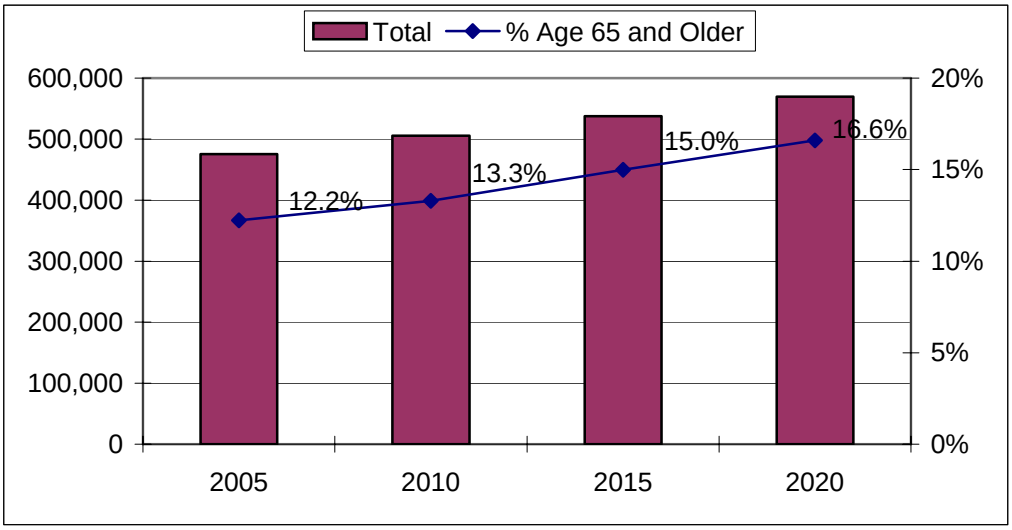
Demand. While the use of hospital inpatient services and non-emergency outpatient services per capita in Richmond County is lower than that statewide, the use of emergency services and other services are comparable. RN staffing in Richmond County is higher than statewide ratios in most settings, ranking it first in the state in estimated hospital outpatient staffing, third in estimated nursing facility staffing, and fifth in home health staffing.

Table 220. Projected Demand for Services and Annual Growth Rate by Setting, Richmond County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Richmond County	New York	Rankings	Richmond County	New York	Rankings
Hospital Inpatient Days	768 inpatient days	946 inpatient days	23/39	5.46	4.78	12/39
Hospital Emergency Department Visits	385 ED visits	397 ED visits	17/39	1.34	1.55	25/39
Hospital Outpatient Days	1,291 visits	2,215 visits	32/39	0.28	0.15	1/39
Nursing Facilities	6.2 residents	5.9 residents	25/39	0.25	0.14	3/39
Home Health	320 visits	320 visits	29/39	2.09	1.07	5/39
Non-Hospital Ambulatory Care	3,227 visits	3,233 visits	27/39	0.21	0.28	26/39
Public Health	1,000 people	1,000 people	--	0.89	2.53	34/39
School Health	175 children	168 children	20/39	16.20	14.01	17/39
Other	1,000 people	1,000 people	--	0	2.32	34/39

Demand for RNs in Richmond County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Richmond County is projected to grow steadily in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 12% to 17%).

Figure 35. Projected Population of Richmond County and Percent Age 65 and Older



Richmond County ranks first in New York in projected growth for all types of health services. Nursing facility residents are projected to increase the most as the population ages.

Table 221. Projected Demand for Services and Annual Growth Rate by Setting, Richmond County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	472,921	1.73%	0.69%	1/39
Hospital Emergency Department Visits	219,909	1.23%	0.17%	1/39
Hospital Outpatient Days	775,516	1.56%	0.43%	1/39
Nursing Facilities	4,333	2.55%	0.92%	1/39
Home Health	195,690	1.69%	0.49%	1/39
Non-Hospital Ambulatory Care	1,935,966	1.56%	0.47%	1/39
Nursing Education	150	0.93%	-0.29%	1/39
Public Health	569,636	1.21%	0.22%	1/39
School Health	91,064	0.62%	-0.22%	1/39
Other	569,636	1.21%	0.22%	1/39

Even given the projected increases in demand for services, projected robust growth in the RN supply in Richmond County should put the county in a comfortable position moving forward. Ratios of RNs to units of service should remain above state and national benchmarks, and may even exceed ratios observed in Massachusetts.

Table 222. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Richmond County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
5,287	33.5%	4,577	15.6%	5,067	28.0%	6,747	70.4%	5,280	33.4%

North Country Region

About 4,400 RNs are employed in the North Country region of New York, which is composed of Clinton/Essex/Franklin/Hamilton, Jefferson/Lewis, and St. Lawrence counties. RNs in this region are notably younger on average than RNs statewide (median age 43 versus 46), and much more likely to have a diploma or ADN and less likely to have a BSN as their highest degree. They are also substantially less likely to work in hospitals.

Table 223. Selected Characteristics of North Country RNs

	North Country	New York
Employed RNs	4,433	165,124
Median Age	43	46
% 55+	8.5%	16.9%
% Diploma/ADN	65.8%	39.4%
% BSN	28.7%	43.0%
% MSN	5.4%	17.6%
% in Hospitals	51.8%	64.1%

Most of the RNs who work in the North Country region live in the Capital District, and the North Country is an area that is losing more resident RNs through migration than it is gaining. Most RNs who reside in the North Country also work there, but will no longer do so when they have moved away. The North Country workforce is estimated to suffer a net loss of about 40 RNs per year due to residential migration.

Table 224. Location of Residence of RNs Employed in the North Country, Residential Migration Patterns, and Estimated Effects of Residential Migration on North Country RN Supply

North Country Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to North Country	In-migrants to North Country workforce	Out-migrants from North Country workforce
North Country	99.3%	52	94	93.8%	49	88
Southern Tier	0.7%	87	525	0.6%	1	3
					50	91

Between 2005 and 2006, the RN supply in the North Country grew by an estimated 100 RNs, or about 2.4%.

Table 225. Projected Components of RN Supply Change, North Country, 2005-2006

North Country Region	2005-2006
Base	4,433
In-migration	50
Out-migration	91
Net migration	-41
Graduates	211
Foreign	0
Attrition	64
	+106 (2.4%)

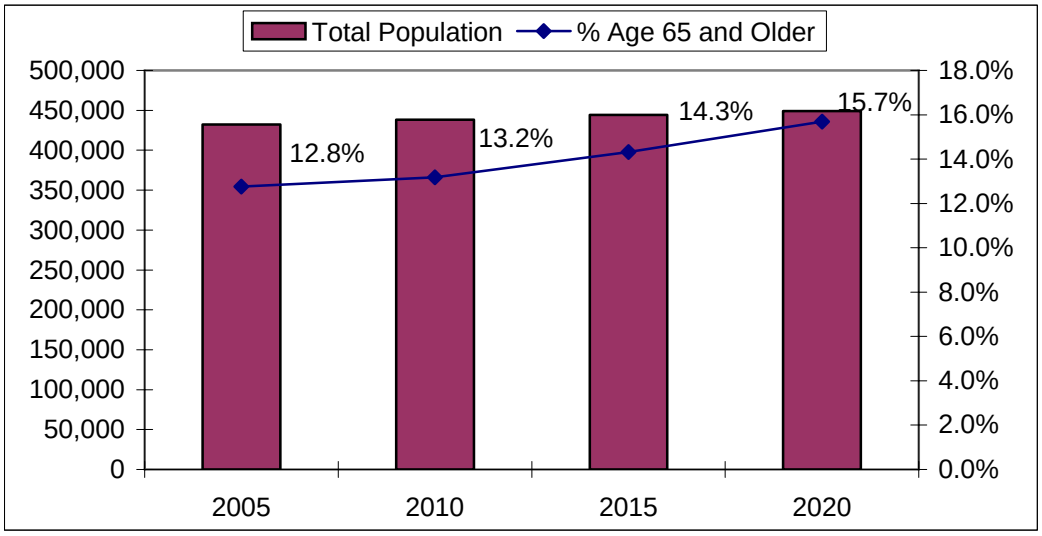
Use of inpatient days per capita was lower in the North Country than statewide, but emergency department visits were higher. There were also fewer school-age children per 1,000 population than statewide. Generally, the ratios of RNs to units of service in the North Country were equal to or greater than statewide ratios, with home health being the notable exception.

Table 226. Demand for Services per 1,000 Population and RNs per Unit of Service, North Country

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	North Country	NYS	North Country	NYS
Hospital Inpatient Days	844 inpatient days	946 inpatient days	4.66	4.78
Hospital Emergency Department Visits	453 ED visits	397 ED visits	2.47	1.55
Hospital Outpatient Days	2,680 outpatient visits	2,215 outpatient visits	0.13	0.15
Nursing Facility Residents	6.1 residents	5.9 residents	0.22	0.14
Home Health Visits	311 visits	320 visits	0.23	1.07
Non-Hospital Ambulatory Care	3,213 visits	3,233 visits	0.34	0.28
School Health	163 children	168 children	2.65	2.75
Public Health	1,000 people	1,000 people	1.04	0.51
Other	1,000 people	1,000 people	1.00	1.01

The population of the North Country is projected to grow between 2005 and 2020, and the percentage of the population age 65 and older will also increase during this time period, although the percent of older adults will remain relatively low compared to many other regions in New York.

Figure 36. Projected Population of North Country and Percent Age 65 and older



Growth in the use of hospital-based services is projected to equal or exceed statewide growth, although expansion in many other types of health care services will be slower.

Table 227. Projected Demand for Services and Annual and Historical Growth Rate by Setting, North Country

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, North Country, 2005-2020	Projected Annual Growth Rate, New York
Hospital Inpatient Days	359,768	0.79%	0.69%
Hospital Emergency Department Visits	201,627	0.28%	0.17%
Hospital Outpatient Days	1,219,079	0.43%	0.43%
Nursing Facilities	2,945	0.82%	0.92%
Home Health	137,892	0.27%	0.49%
Non-Hospital Ambulatory Care	1,459,703	0.42%	0.47%
Nursing Education	194	-0.56%	-0.26%
Public Health	449,158	0.26%	0.22%
School Health	70,169	-0.01%	-0.22%
Other	449,158	0.26%	0.22%

The North Country already has a higher ratio of RNs to units of service than ratios observed statewide or nationwide, and the region should be in a strong position to maintain these ratios through the year 2020. As the following sections show, all three of the county groups that comprise the North Country appear to be doing fairly well in terms of their RN supply relative to demand.

Table 228. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, North Country

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
4,867	9.8%	3,627	-18.2%	4,069	-8.2%	5,363	21.0%	5,119	15.5%

Clinton/Essex/Franklin/Hamilton Counties

Supply. Clinton/Essex/Franklin/Hamilton's estimated base year RN population was 2,023 RNs in 2005. RNs in Clinton/Essex/Franklin/Hamilton counties are younger than RNs statewide (with a median age of 44 versus 46), and are especially less likely to be older than age 55 (6% versus 17%). An estimated 68% of RNs working in Clinton/Essex/Franklin/Hamilton counties are diploma/ADN nurses (compared to 39% statewide), while 21% are BSNs (compared to 27% statewide), and 6% have a MSN or doctorate (versus 18% statewide).

Table 229. Selected Characteristics of RNs, Clinton/Essex/Franklin/Hamilton Counties and New York

	Clinton/Essex/Franklin/Hamilton Counties	New York	Rankings
Employed RNs	2,023	165,124	17/39
Median Age	44	46	--
% 55+	6.2%	16.9%	38/39
% Diploma/ADN	67.5%	39.4%	10/39
% BSN	27.0%	43.0%	26/39
% MSN	5.5%	17.6%	33/39
% in Hospitals	57.3%	64.1%	17/39

Fifty-seven percent of RNs in Clinton/Essex/Franklin/Hamilton counties are employed in hospitals (versus 64% statewide). An estimated 16% percent of the counties' RNs work in nursing facilities (versus 10% statewide), an estimated 9% work in non-hospital ambulatory care (compared to 11% statewide), an estimated 4% work in public health (much higher than 3% statewide), an estimated 6% work in school health (versus 3% statewide), and a few work in home health (an estimated 1% versus 4% statewide).

This county group ranks second in the state for the percentage of RNs working in the counties who also live there (98%), while fewer than 2% come from Steuben/Yates counties and about one-half a percent come from St. Lawrence County. An estimated 27 RNs per year move into the areas that supply Clinton/Essex/Franklin/Hamilton counties with RNs and an estimated one (1) of these RNs will work in Clinton/Essex/Franklin/Hamilton counties. At the same time, an estimated 52 RNs who work in Clinton/Essex/Franklin/Hamilton counties will relocate out of Clinton/Essex/Franklin/Hamilton supply areas (2.6% of the RN workforce).

Table 230. Location of Residence of RNs Employed in Clinton/Essex/ Franklin/Hamilton Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Clinton/Essex/Franklin/Hamilton RN Supply

Clinton/Essex/ Franklin/Hamilton Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Clinton/Essex/ Franklin/Hamilto	In-migrants to Clinton/Essex/ Franklin/Hamilton workforce	Out-migrants from Clinton/Essex/ Franklin/Hamilton workforce
Clinton/Essex/Franklin/Hamilt	97.8%	0	58	91.2%	0	52
St. Lawrence	0.5%	0	0	0.7%	0	0
Steuben/Yates	1.7%	27	14	2.9%	1	0
		27	71		1	53

Between 2005 and 2006, an estimated 90 new RNs graduates entered the Clinton/Essex/Franklin/Hamilton counties workforce. The number of new graduates entering the workforce is expected to remain relatively constant. Attrition of existing RNs due to death, disability, or retirement was estimated at 29 RNs in 2005-06 (1.4% of the workforce), but this is projected to grow 3.7% of the workforce as the workforce ages. The RN workforce in Clinton/Essex/Franklin/Hamilton counties is expected to continue to grow until about 2010, but then will begin a decline for the subsequent decade. Projected is a moderate annual loss of 0.7%, but this would still be a decline from the 2.8% annual growth observed 2000-2005.

Table 231. Projected Components of RN Supply Change, Clinton/Essex/Franklin/Hamilton Counties, 2005-2020

Clinton	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	2023	2032	2040	2046	2046	2043	2036	2026	2009	1992	1969	1945	1914	1885	1858	-8%
In-migration	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0%
Out-migration	53	53	53	53	53	53	53	53	52	52	51	51	50	49	48	-8%
Net migration	-52	-52	-52	-52	-52	-52	-52	-52	-51	-51	-50	-50	-49	-48	-47	-8%
Graduates	90	90	90	89	89	89	89	89	90	90	90	90	90	91	91	1%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	29	30	32	37	40	44	47	55	56	62	65	71	70	70	70	141%
Total	2032	2040	2046	2046	2043	2036	2026	2009	1992	1969	1945	1914	1885	1858	1832	-10%

Table 232. Relative Rankings of Key Components of Supply Projections, Clinton/Essex/Franklin/Hamilton Counties

	Clinton/Essex/Franklin/Hamilton Ranking
% of resident RNs working in county	6/39
% of RN workforce that lives in county	2/39
In-migration	38/39
Out-migration	18/39
Net migration	36/39
Projected attrition, 2020	21/39
Projected supply growth, 2005-2020	33/39

Demand. As in many rural counties, hospital-based care in Clinton/Essex/Franklin/Hamilton counties is more heavily focused on outpatient care than statewide hospital-based care often is. There is lower per capita demand in these counties for nursing facility, home health, non-hospital ambulatory, and school health services than seen statewide. In particular, this county group ranks near the bottom statewide in the number of school-age children per 1,000 population.

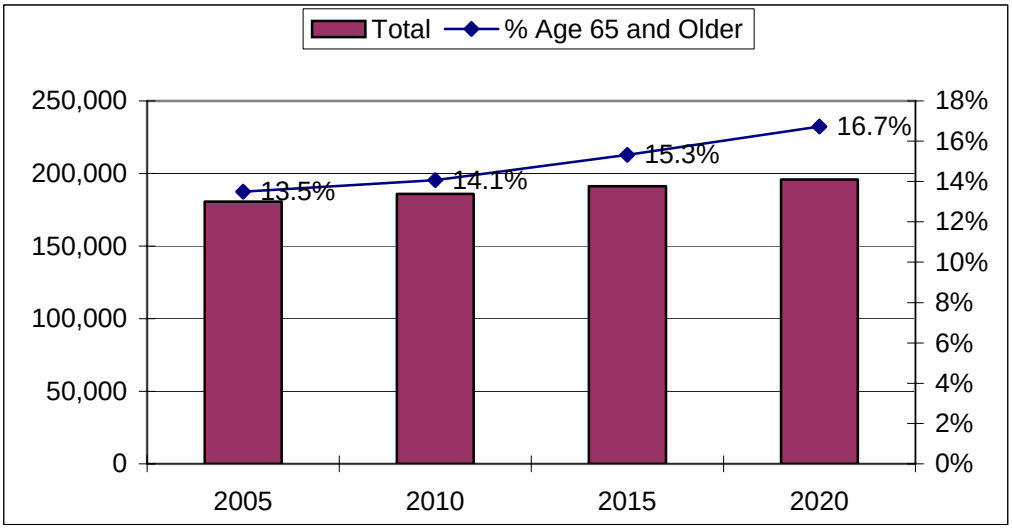
Nursing staffing in this group of counties also appears relatively robust. The county group ranks third statewide for RNs per emergency department visit, second for RNs per nursing facility, and third for RNs per school-age children. Compared to New York as a whole, however, there are fewer home health RNs per estimated home health visit.

Table 233. Projected Demand for Services and Annual Growth Rate by Setting, Clinton/Essex/Franklin/Hamilton Counties

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Clinton/Essex/ Franklin/ Hamilton Counties	New York	Rankings	Clinton/Essex/ Franklin/Hamilton Counties	New York	Rankings
Hospital Inpatient Days	840 inpatient days	946 inpatient days	19/39	5.55	4.78	10/39
Hospital Emergency Department Visits	481 ED visits	397 ED visits	9/39	2.83	1.55	3/39
Hospital Outpatient Days	2,631 visits	2,215 visits	18/39	0.16	0.15	8/39
Nursing Facilities	5.6 residents	5.9 residents	31/39	0.32	0.14	2/39
Home Health	321 visits	320 visits	26/39	0.34	1.07	30/39
Non-Hospital Ambulatory Care	3,206 visits	3,233 visits	31/39	0.33	0.28	19/39
Public Health	1,000 people	1,000 people	--	4.29	2.53	17/39
School Health	139 children	168 children	37/39	46.29	14.01	3/39
Other	1,000 people	1,000 people	--	3.73	2.32	10/39

Demand for RNs in Clinton/Essex/Franklin/Hamilton counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Clinton/Essex/Franklin/Hamilton counties is projected to increase in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from less than 14% to almost 17%). Currently, these counties rank 22nd in the percentage of older adults, but this is expected to decline to 27th by 2020.

Figure 37. Projected Population of Clinton/Essex/Franklin/Hamilton Counties and Percent Age 65 and older



As the population of Clinton/Essex/Franklin/Hamilton counties continues to increase, demand for services will increase in all settings except school health. Demand for nursing facilities will increase the most, followed by demand for hospital inpatient services.

Table 234. Projected Demand for Services and Annual Growth Rate by Setting, Clinton/Essex/Franklin/Hamilton Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	178,060	1.07%	0.69%	7/39
Hospital Emergency Department Visits	94,155	0.53%	0.17%	6/39
Hospital Outpatient Days	531,563	0.75%	0.43%	7/39
Nursing Facilities	1,211	1.25%	0.92%	10/39
Home Health	64,329	0.68%	0.49%	11/39
Non-Hospital Ambulatory Care	646,957	0.74%	0.47%	7/39
Nursing Education	91	0.07%	-0.29%	8/39
Public Health	195,813	0.54%	0.22%	6/39
School Health	24,948	-0.06%	-0.22%	10/39
Other	195,813	0.54%	0.22%	6/39

Estimated ratios of RNs to units of service in Clinton/Essex/Franklin/Hamilton counties currently exceed state and national averages. Although, the RN supply in these counties will need to increase 13% between 2005 and 2020 in order to maintain current ratios, these counties could lose almost 6% of their RNs and still have as many RNs per units of service as the U.S. ratio overall, and could lose almost 17% of their RNs and still match New York ratios.

Compared to an ideal ratio as seen in Massachusetts and reported RN vacancies by hospitals in this area, however, a 25% increase in the RN supply could be absorbed.

Table 235. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Clinton/Essex/Franklin/Hamilton Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
2,291	13.25%	1,686	-16.66%	1,911	-5.54%	2,520	24.57%	2,535	25.31%

Clinton/Essex/Franklin/Hamilton counties are projected to lose 10% of their RN workforce between 2005 and 2020. While they will still have more RNs per unit of service than New York overall, they will have fewer RNs per unit of service than the U.S. average and many fewer than they currently do.

Jefferson/Lewis Counties

Supply. Jefferson/Lewis's estimated base year RN population was 1,020 RNs in 2005. RNs in Jefferson/Lewis counties are older than RNs statewide (with a median age of 48 versus 46). An estimated 59% of RNs working in Jefferson/Lewis counties are diploma/ADN nurses (compared to 39% statewide), while 37% are BSNs (compared to 43% statewide), and 4% have a MSN or doctorate (versus 18% statewide). The percentage of RNs with master's degrees is one of the lowest in the state.

Table 236. Selected Characteristics of RNs, Jefferson/Lewis Counties and New York

	Jefferson/Lewis Counties	New York	Rankings
Employed RNs	1,020	165,124	29/39
Median Age	48	46	--
% 55+	11.9%	16.9%	34/39
% Diploma/ADN	58.7%	39.4%	14/39
% BSN	37.2%	43.0%	15/39
% MSN	4.1%	17.6%	37/39
% in Hospitals	57.2%	64.1%	18/39

About 57% of RNs in Jefferson/Lewis counties are employed in hospitals (versus 64% statewide). An estimated 11% of Jefferson/Lewis counties' RNs work in non-hospital ambulatory care (the same as statewide), an estimated 12% percent work in nursing facilities (versus 10% statewide), and an estimated 1% work in home health (compared to 4% statewide).

The vast majority of the RNs working in Jefferson/Lewis counties live in these two counties (94%), while the remainder comes from St. Lawrence County. An estimated 38 RNs per year move into the areas that supply Jefferson/Lewis with RNs and an estimated 33 of these RNs will work in Jefferson/Lewis counties. Out-migration from Jefferson/Lewis supply counties is projected to be inconsequential.

Table 237. Location of Residence of RNs Employed in Jefferson/Lewis Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Jefferson/Lewis Counties RN Supply

Jefferson/Lewis Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Jefferson/Lewis	In-migrants to Jefferson/Lewis workforce	Out-migrants from Jefferson/Lewis workforce
Jefferson/Lewis	93.5%	38	0	89.1%	33	0
St. Lawrence	6.5%	0	0	4.6%	0	0
		38	0		33	0

Between 2005 and 2006, an estimated 46 new RNs graduates entered the Jefferson/Lewis counties workforce. The number of new graduates entering the workforce is expected to decline slightly as the population of working-age women wanes. Attrition of existing RNs due to death, disability, or retirement was estimated at 15 RNs in 2005-06 (1.5% of the workforce), and is projected to grow to 1.9% of the workforce as the workforce ages. These projected declines in graduates and increases in attrition are moderate, however. Overall, the RN supply in these counties is expected to increase by 66%.

Table 238. Projected Components of RN Supply Change, Jefferson/Lewis Counties, 2005-2020

Jefferson/ Lewis	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	1,020	1,084	1,147	1,209	1,268	1,325	1,381	1,435	1,485	1,534	1,581	1,627	1,669	1,713	1,756	72%
In-migration	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	0%
Out-migration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Net migration	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	0%
Graduates	46	45	45	45	44	44	44	44	44	44	44	44	44	44	44	-4%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	15	15	16	18	20	22	23	27	27	30	31	34	33	33	33	126%
Total	1,084	1,147	1,209	1,268	1,325	1,381	1,435	1,485	1,534	1,581	1,627	1,669	1,713	1,756	1,800	66%

The projected attrition among RNs in Jefferson/Lewis counties by 2020 is the lowest in the state, contributing to the projected average annual growth rate of 3.8% per year. This is very similar to the 4.0% average annual growth rate observed between 2000 and 2005.

Table 239. Relative Rankings of Key Components of Supply Projections, Jefferson/Lewis Counties

	Jefferson/Lewis Ranking
% of resident RNs working in county	9/39
% of RN workforce that lives in county	4/39
In-migration	22/39
Out-migration	39/39
Net migration	9/39
Projected attrition, 2020	39/39
Projected supply growth, 2005-2020	6/39

Demand. The use of hospital inpatient services per capita in Jefferson/Lewis counties is much lower than that statewide, while the use of emergency and non-emergency outpatient services is comparable. The estimated home health visits and non-hospital ambulatory care visits are among the lowest in the state, but Jefferson/Lewis counties have the fourth highest proportion of children in their population in the state.

RN staffing is comparable to statewide ratios in most settings, but Jefferson/Lewis counties' RN staffing for emergency departments and public health ranks fourth in the state.

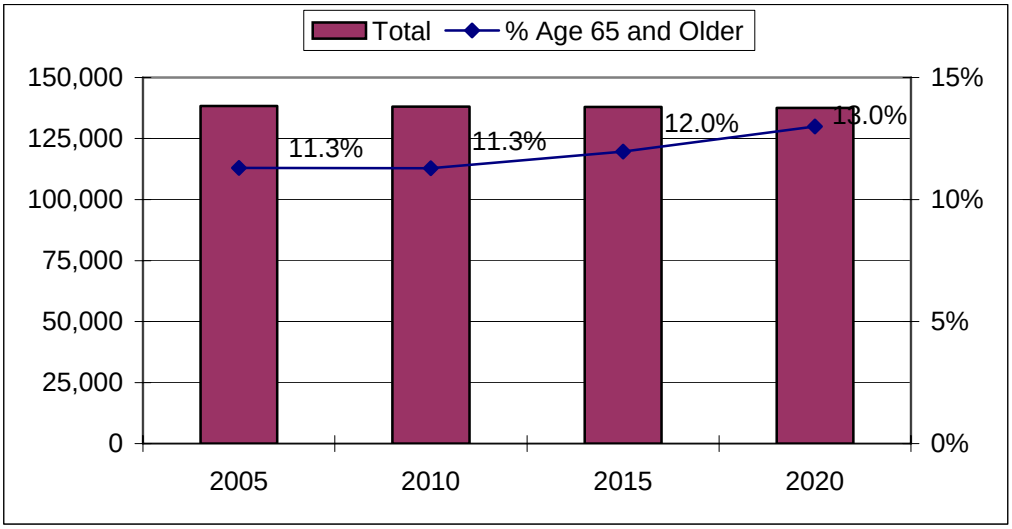
Table 240. Projected Demand for Services and Annual Growth Rate by Setting, Jefferson/Lewis Counties

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Jefferson/Lewis Counties	New York	Rankings	Jefferson/ Lewis Counties	New York	Rankings
Hospital Inpatient Days	582 inpatient days	946 inpatient days	33/39	5.16	4.78	14/39
Hospital Emergency Department Visits	374 ED visits	397 ED visits	20/39	2.81	1.55	4/39
Hospital Outpatient Days	1,964 visits	2,215 visits	24/39	0.15	0.15	10/39
Nursing Facilities	5.9 residents	5.9 residents	27/39	0.15	0.14	17/39
Home Health	278 visits	320 visits	38/39	0.26	1.07	31/39
Non-Hospital Ambulatory Care	3,078 visits	3,233 visits	37/39	0.26	0.28	23/39
Public Health	1,000 people	1,000 people	--	8.82	2.53	4/39
School Health	198 children	168 children	4/39	11.86	14.01	24/39
Other	1,000 people	1,000 people	--	1.30	2.32	23/39

Demand for RNs in Jefferson/Lewis counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Jefferson/Lewis counties is projected to decline very slightly in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 11% to 13%). This increase is small, however, compared to the increases in many

other counties. Jefferson/Lewis counties rank 36th out of 39 county groups in the percentage of older adults in the population, and will fall to 38th by 2020.

Figure 38. Projected Population of Jefferson/Lewis Counties and Percent Age 65 and older



Demand for most health care services is projected to decline in Jefferson/Lewis counties as the population declines; only hospital inpatient and non-emergency outpatient services will grow in demand. Projected growth in nursing facility residents and home health visits are among the lowest in the state.

Table 241. Projected Demand for Services and Annual Growth Rate by Setting, Jefferson/Lewis Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	80,524	0.31%	0.69%	34/39
Hospital Emergency Department Visits	51,696	-0.06%	0.17%	27/39
Hospital Outpatient Days	274,591	0.07%	0.43%	28/39
Nursing Facilities	812	-0.11%	0.92%	38/39
Home Health	36,814	-0.28%	0.49%	35/39
Non-Hospital Ambulatory Care	429,457	-0.06%	0.47%	29/39
Nursing Education	44	-0.27%	-0.29%	19/39
Public Health	137,599	-0.03%	0.22%	26/39
School Health	26,582	-0.20%	-0.22%	14/39
Other	137,599	-0.03%	0.22%	26/39

Jefferson/Lewis counties already have higher RN staffing ratios than the New York average, and the projected increases in supply put these counties in a good position between 2005 and 2020.

Table 131. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Jefferson/Lewis Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
1,044	2.4%	912	-10.6%	1,001	1.9%	1,324	29.8%	1,155	13.2%

St. Lawrence County

Supply. St. Lawrence County's estimated base year RN population was 1,390 RNs in 2005. RNs in St. Lawrence County are considerably younger than RNs statewide (with a median age of 39 versus 46), and are less likely to be older than age 55 (9% versus 17%). An estimated 69% of RNs working in St. Lawrence County are diploma/ADN nurses (compared to just 39% statewide), while only 25% are BSNs (compared to 43% statewide), and 6% have a MSN or doctorate (versus 18% statewide).

Table 242. Selected Characteristics of RNs, St. Lawrence County and New York

	St. Lawrence County	New York	Rankings
Employed RNs	1,390	165,124	22/39
Median Age	39	46	--
% 55+	9.4%	16.9%	37/39
% Diploma/ADN	68.7%	39.4%	7/39
% BSN	25.0%	43.0%	31/39
% MSN	6.3%	17.6%	32/39
% in Hospitals	40.1%	64.1%	35/39

About 40% of RNs in St. Lawrence County are employed in hospitals (versus 64% statewide). An estimated 12% work in non-hospital ambulatory care (compared to 11% statewide), and an estimated 9% percent work in nursing facilities (versus 10% statewide).

Virtually all of the RNs working in St. Lawrence County (99%) live in the county, while fewer than 1% come from Clinton/Essex/Franklin/Hamilton and from Jefferson/Lewis. There is little migration of RNs either into or out of St. Lawrence County, and therefore little expected change in the RN supply due to migration.

Table 243. Location of Residence of RNs Employed in St. Lawrence County, Residential Migration Patterns, and Estimated Effects of Residential Migration on St. Lawrence County RN Supply

St. Lawrence Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to St. Lawrence	In-migrants to St. Lawrence workforce	Out-migrants from St. Lawrence workforce
Clinton/Essex/Franklin/Hamilton	0.6%	0	58	0.4%	0.0	0.2
Jefferson/Lewis	0.6%	38	0	0.8%	0.3	0.0
St. Lawrence	98.7%	0	0	94.7%	0.0	0.0
		38	58		0.3	0.2

Between 2005 and 2006, an estimated 62 new RNs graduates entered the St. Lawrence County workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of women of working-age declines. Attrition of existing RNs due to death, disability, or retirement was estimated at 20 RNs in 2005-06 (1.4% of the workforce), but this is projected to grow to 3.8% of the workforce as the workforce ages. The RN supply of St. Lawrence County is projected to grow moderately (16%) between 2005 and 2020. This is average annual growth of 1.1%, which is a marked slowdown from the estimated 7.2% average annual growth estimated for the 2000-2005 period.

Table 244. Projected Components of RN Supply Change, St. Lawrence County, 2005-2020

St. Lawrence	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	1,390	1,432	1,472	1,510	1,543	1,573	1,599	1,623	1,639	1,654	1,663	1,668	1,667	1,666	1,664	20%
In-migration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Out-migration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Net migration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Graduates	62	61	61	61	60	60	60	60	60	60	59	59	59	59	59	-5%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	20	21	23	28	30	34	36	43	45	51	54	60	60	61	63	211%
Total	1,432	1,472	1,510	1,543	1,573	1,599	1,623	1,639	1,654	1,663	1,668	1,667	1,666	1,664	1,660	16%

Table 245. Relative Rankings of Key Components of Supply Projections, St. Lawrence County

	St. Lawrence County Ranking
% of resident RNs working in county	3/39
% of RN workforce that lives in county	1/39
In-migration	39/39
Out-migration	39/39
Net migration	20/39
Projected attrition, 2020	20/39
Projected supply growth, 2005-2020	22/39

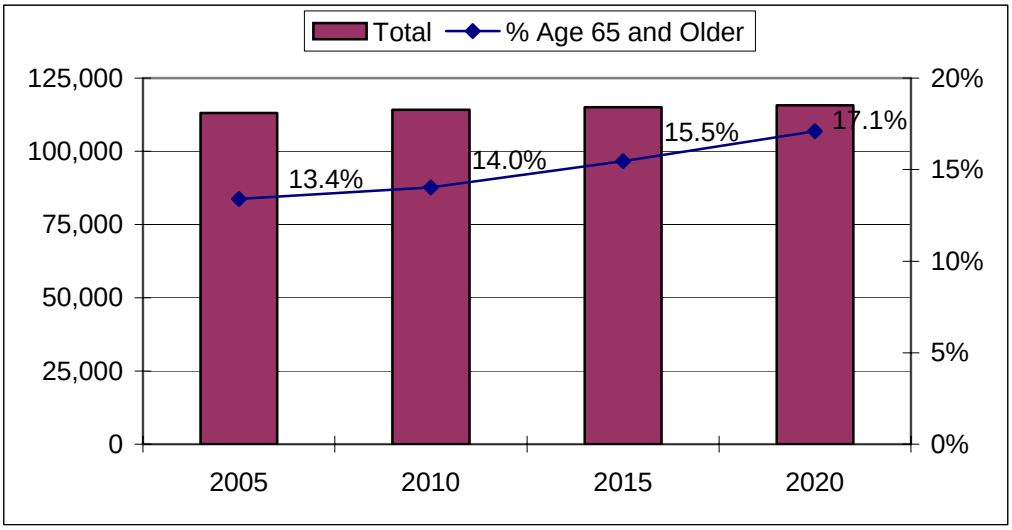
Demand. The use of hospital inpatient days per capita in St. Lawrence County is lower than that statewide, while use of other hospital-based services is higher. St. Lawrence County has slightly more nursing facility residents and slightly fewer children than statewide averages. RN staffing in most settings is comparable to statewide averages, but St. Lawrence County ranks first in the state for RN staffing in home health and public health.

Table 246. Projected Demand for Services and Annual Growth Rate by Setting, St. Lawrence County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	St. Lawrence County	New York	Ranking	St. Lawrence County	New York	Ranking
Hospital Inpatient Days	803 inpatient days	946 inpatient days	21/39	4.82	4.78	17/39
Hospital Emergency Dept. Visits	479 ED visits	397 ED visits	10/39	1.57	1.55	19/39
Hospital Outpatient Days	3,493 visits	2,215 visits	11/39	0.09	0.15	22/39
Nursing Facilities	6.8 residents	5.9 residents	19/39	0.17	0.14	15/39
Home Health	317 visits	320 visits	31/39	2.88	1.07	1/39
Non-Hospital Ambulatory Care	3,211 visits	3,233 visits	30/39	0.46	0.28	8/39
Public Health	1,000 people	1,000 people	--	22.06	2.53	1/39
School Health	156 children	168 children	33/39	20.64	14.01	15/39
Other	1,000 people	1,000 people	--	12.93	2.32	1/39

Demand for RNs in St. Lawrence County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of St. Lawrence County is projected to increase just slightly in the coming years, but the population age 65 and older will become a progressively larger proportion of the population (from about 13% to 17%).

Figure 39. Projected Population of St. Lawrence County and Percent Age 65 and Older



Demand for most health care services is projected to increase in St. Lawrence County as the population grows and ages. The exception is demand for RNs working in nursing education, as declines are projected in the population of women who are 25-44 years old, the typical nursing student age group.

Table 247. Projected Demand for Services and Annual Growth Rate by Setting, St. Lawrence County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	101,184	0.70%	0.69%	31/39
Hospital Emergency Department Visits	55,776	0.18%	0.17%	11/39
Hospital Outpatient Days	412,924	0.28%	0.43%	21/39
Nursing Facilities	922	1.16%	0.92%	12/39
Home Health	36,749	0.16%	0.49%	21/39
Non-Hospital Ambulatory Care	383,289	0.35%	0.47%	19/39
Nursing Education	59	-0.34%	-0.29%	22/39
Public Health	115,930	0.15%	0.22%	13/39
School Health	18,638	0.35%	-0.22%	6/39
Other	115,930	0.15%	0.22%	13/39

Projected growth in the RN supply in St. Lawrence County is moderate, but still exceeds that necessary to maintain current ratios of RNs to units of service. Furthermore, ratios in St. Lawrence County are already high enough that they would remain higher than state and national benchmarks even in the event of supply decline. The ratios in St. Lawrence County should continue to be higher than those in Massachusetts.

Table 248. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, St. Lawrence County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
1,533	10.3%	1,029	-26.0%	1,158	-16.7%	1,519	9.3%	1,429	2.8%

Southern Tier Region

Nearly 6,000 RNs are employed in the Southern Tier of New York, which is composed of Broome/Tioga, Chemung/Schuyler, Delaware/Otsego/Schoharie, Seneca/Tompkins, and Steuben/Yates counties. RNs in this region are older on average than RNs statewide, and more likely to have a diploma or ADN and less likely to have a BSN as their highest degree.

Table 249. Selected Characteristics of Southern Tier RNs

	Southern Tier	New York
Employed RNs	5,780	165,124
Median Age	47	46
% 55+	19.0%	16.9%
% Diploma/ADN	59.6%	39.4%
% BSN	27.3%	43.0%
% MSN	13.1%	17.6%
% in Hospitals	56.9%	64.1%

The Southern Tier region faces serious challenges as a result of RN migration patterns. Not only are many RNs moving out of the Southern Tier, but they are also moving out of other areas that supply the Southern Tier workforce with RNs, such as the Mohawk Valley and the Pennsylvania border counties. The Southern Tier is estimated to lose 366 RNs per year through net migration.

Table 250. Location of Residence of RNs Employed in the Southern Tier, Residential Migration Patterns, and Estimated Effects of Residential Migration on Southern Tier RN Supply

Southern Tier Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Southern Tier	In-migrants to Southern Tier workforce	Out-migrants from Southern Tier workforce
Southern Tier	83.4%	87	525	84.2%	73	442
Central New York	5.7%	280	0	4.6%	13	0
Western New York	1.9%	169	0	0.4%	1	0
Mohawk Valley	0.5%	84	155	0.2%	0	0
Out of State	8.5%	50	148	10.8%	5	16
					92	458

Between 2005 and 2006, the RN supply in the Southern Tier was estimated to have grown by only 12 RNs, or about 0.2%.

Table 251. Projected Components of RN Supply Change, Southern Tier, 2005-2006

Southern Tier Region	2005-2006
Base	5,780
In-migration	92
Out-migration	458
Net migration	-366
Graduates	506
Foreign	0
Attrition	128
	+12 (0.2%)

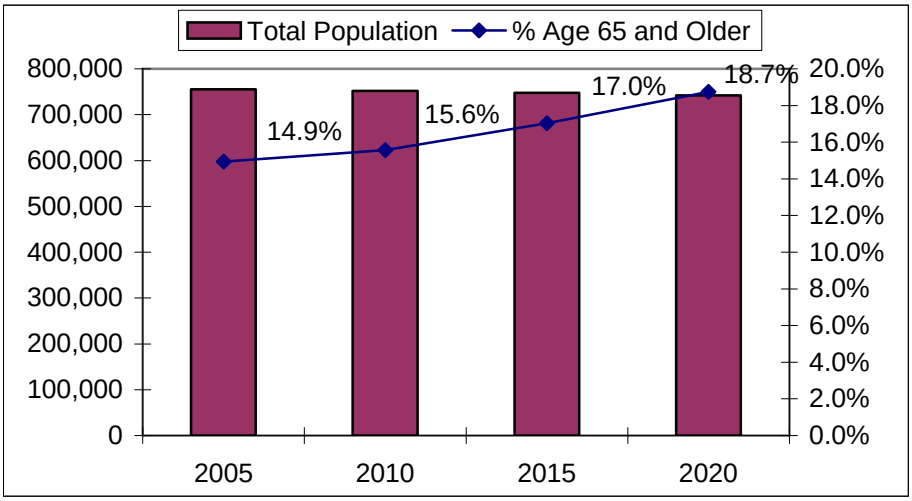
More inpatient days are used in the Southern Tier per capita than the statewide average, as well as more emergency department visits and many more hospital outpatient days. The Southern Tier also has many more nursing facility residents per capita, although there are somewhat fewer children per capita. Meanwhile, there are fewer hospital RNs per inpatient day, fewer RNs per estimated home health visit, and fewer school RNs per 1,000 school-age children.

Table 252. Demand for Services per 1,000 Population and RNs per Unit of Service, Southern Tier

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	Southern Tier	New York	Southern Tier	New York
Hospital Inpatient Days	1,187 inpatient days	946 inpatient days	2.65	4.78
Hospital Emergency Department Visits	458 ED visits	397 ED visits	1.69	1.55
Hospital Outpatient Days	4,213 outpatient visits	2,215 outpatient visits	0.10	0.15
Nursing Facility Residents	6.7 residents	5.9 residents	0.12	0.14
Home Health Visits	350 visits	320 visits	0.80	1.07
Non-Hospital Ambulatory Care	3,322 visits	3,233 visits	0.25	0.28
School Health	164 children	168 children	2.21	2.75
Public Health	1,000 persons	1,000 persons	0.56	0.51
Other	1,000 persons	1,000 persons	0.47	1.01

The population of the Southern Tier is expected to decline slightly between 2005 and 2020, while the proportion of the population age 65 and older continues to grow.

Figure 40. Projected Population of the Southern Tier and Percent Age 65 and Older



Because of the declining population, projected growth in the use of most types of health care services in the Southern Tier will be slower than that statewide.

Table 253. Projected Demand for Services and Annual and Historical Growth Rate by Setting, Southern Tier

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, Southern Tier, 2005-2020	Projected Annual Growth Rate, New York
Hospital Inpatient Days	747,807	0.46%	0.69%
Hospital Emergency Department Visits	340,739	-0.13%	0.17%
Hospital Outpatient Days	3,257,975	0.12%	0.43%
Nursing Facilities	5,520	0.57%	0.92%
Home Health	263,943	-0.03%	0.49%
Non-Hospital Ambulatory Care	2,570,754	0.13%	0.47%
Nursing Education	381	-1.89%	-0.26%
Public Health	742,164	-0.12%	0.22%
School Health	117,588	-0.36%	-0.22%
Other	742,164	-0.12%	0.22%

No matter which benchmark of adequate supply is used, there appears to be very little likelihood that the Southern Tier will be able to achieve or maintain an adequate supply of RNs by the year 2020.

Table 254. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Southern Tier

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
6,003	3.9%	7,143	23.6%	8,223	42.3%	10,731	85.7%	6,212	7.5%

Broome/Tioga Counties

Supply. Broome/Tioga's estimated base year RN population was 1,960 RNs in 2005. RNs in Broome/Tioga counties are similar in median age to RNs statewide (both 46), but rank10th in the state in the percent of RNs older than age 55 (21% versus 17% statewide). An estimated 53% of RNs working in Broome/Tioga counties are diploma/ADN nurses (compared to 39% statewide), while 34% are BSNs (compared to 43% statewide), and 13% have a MSN or doctorate (versus 18% statewide).

Table 255. Selected Characteristics of Broome/Tioga County RNs

	Broome/Tioga Counties	New York	Rankings
Employed RNs	1,960	165,124	19/39
Median Age	46	46	--
% 55+	21.4%	16.9%	10/39
% Diploma/ADN	53.1%	39.4%	20/39
% BSN	33.8%	43.0%	21/39
% MSN	13.1%	17.6%	20/39
% in Hospitals	65.9%	64.1%	10/39

Broome/Tioga counties rank 10th in the percentage of RNs working in hospitals (69% versus 64% statewide), while 3% work in physician offices or outpatient care centers (versus 11% statewide). Ten percent work in nursing facilities (the same as statewide), while an estimated 8% work in public health (higher than the 3% statewide average). Few RNs in Broome/Tioga counties work in home health care (2% versus 4% statewide).

Most of the RNs working in Broome/Tioga counties live in Broome/Tioga counties (85%). Nine percent come from Chenango/Cortland counties and nearly 6% come from Pennsylvania. An estimated 166 RNs per year move into areas that supply Broome/Tioga with RNs, and an estimated 54 of these RNs will work in Broome/Tioga counties. At the same time, an estimated 86 RNs who work in Broome/Tioga counties will relocate out of the Broome/Tioga supply areas (4.4% of Broome/Tioga RNs).

Table 256. Location of Residence of RNs Employed in Broome/Tioga Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Broome/Tioga RN Supply

Broome/Tioga County Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Broome/Tioga	In-migrants to Broome/Tioga workforce	Out-migrants from Broome/Tioga workforce
Broome/Tioga	85.1%	37	85	94.5%	35	80
Chenango/Cortland	9.3%	115	0	15.9%	18	0
Bradford/Sullivan/Tioga Counties, PA	0.7%	0	89	1.3%	0	1
Pike/Susquehanna/Wayne Counties, PA	4.9%	14	59	8.6%	1	5
		166	233		54	86

Between 2005 and 2006, an estimated 137 new RNs graduates entered the Broome/Tioga workforce. The number of new graduates entering the workforce is expected to remain fairly constant. Attrition of existing RNs due to death, disability, or retirement was estimated at 44 RNs in 2005-06 (2.2% of the workforce), but this is projected to grow (to 2.8% of the workforce) as the workforce ages. Despite growing attrition and out-migration, Broome/Tioga's RN workforce is estimated to continue to grow through 2020.

Table 257. Projected Components of RN Supply Change, Broome/Tioga Counties, 2005-2020

Broome/Tioga Counties	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	1960	2021	2077	2129	2175	2216	2251	2281	2307	2334	2359	2380	2397	2414	2433	24%
In-migration	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	0%
Out-migration	86	89	91	93	95	97	99	100	101	102	104	104	105	106	107	24%
Net migration	-32	-35	-37	-39	-41	-43	-45	-46	-47	-48	-50	-50	-51	-52	-53	65%
Graduates	137	137	137	136	136	136	136	136	137	137	137	137	139	139	139	1%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	44	46	48	50	53	58	61	63	63	64	67	70	70	68	68	55%
Total	2021	2077	2129	2175	2216	2251	2281	2307	2334	2359	2380	2397	2414	2433	2451	21%

The projected growth of 1.5% per year is an improvement over the supply loss of -2.8% per year between 2000 and 2005. Broome/Tioga counties rank fourth in the state for the percent of resident RNs who also work in the county and in the bottom ten for projected attrition, but these counties also rank in the bottom ten for net migration.

Table 258. Relative Rankings of Key Components of Supply Projections, Broome/Tioga Counties

	Broome/Tioga Ranking
% of resident RNs working in county	4/39
% of RN workforce that lives in county	14/39
In-migration	24/39
Out-migration	11/39
Net migration	31/39
Projected attrition, 2020	31/39
Projected supply growth, 2005-2020	18/39

Demand. Broome/Tioga counties rank 31st highest out of 39 for inpatient hospital days per capita, but rank fourth highest in non-emergency outpatient hospital visits. They also rank 8th highest for nursing facility residents per capita, and are above the statewide average for estimated home health visits.

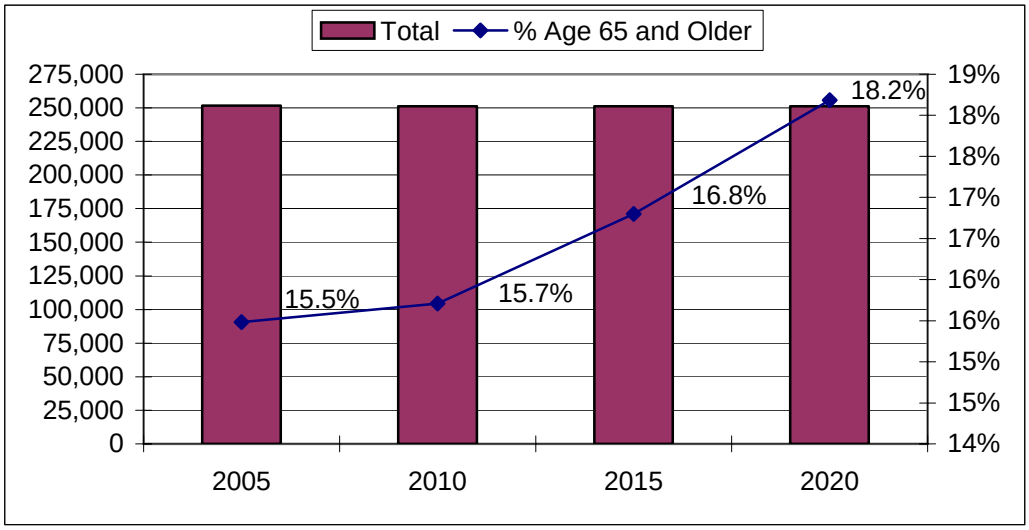
Broome/Tioga hospitals are well-staffed with RNs compared to the statewide baseline, with these counties ranking among the highest ten county groups for both inpatient and emergency department staffing, but in the lowest ten for RNs per non-hospital ambulatory care visit. Broome/Tioga counties also have many fewer RNs per estimated home health visit.

Table 259. Demand for Services per 1,000 Population and RNs per Unit of Service, Broome/Tioga Counties and New York

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Broome/ Tioga Counties	New York	Ranking	Broome/ Tioga Counties	New York	Ranking
Hospital Inpatient Days	588 inpatient days	946 inpatient days	31/39	6.14	4.78	7/39
Hospital Emergency Department Visits	362 ED visits	397 ED visits	25/39	2.37	1.55	8/39
Hospital Outpatient Days	5,050 visits	2,215 visits	4/39	0.13	0.15	13/39
Nursing Facilities	7.5 residents	5.9 residents	8/39	0.11	0.14	22/39
Home Health	357 visits	320 visits	13/39	0.41	1.07	29/39
Non-Hospital Ambulatory Care	3,368 visits	3,233 visits	12/39	0.08	0.28	35/39
Public Health	1,000 people	1,000 people	--	6.54	2.53	8/39
School Health	164 children	168 children	22/39	9.27	14.01	27/39
Other	1,000 people	1,000 people	--	1.85	2.32	19/39

Demand for RNs in Broome/Tioga counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Broome/Tioga counties is projected to decline very slightly in the coming years, but the population age 65 and older (already nearly 16%) will become a progressively larger proportion of the population (18% in 2020). Still, Broome/Tioga's ranking for percent of the population age 65 and older will fall from 12th out of 39 to 16th out of 39.

Figure 41. Projected Population of Broome/Tioga Counties and Percent Age 65 and older



Demand for some services (hospital inpatient, hospital outpatient, nursing facilities, non-hospital ambulatory care, and nursing education) will increase, driven in large part by the aging of the population. Even so, Broome/Tioga counties rank in the bottom ten for projected growth in hospital inpatient days and nursing facility residents. Demand for other services, such as hospital emergency department visits, home health visits, public health, and school health will decrease somewhat as the population declines slightly.

Table 260. Projected Demand for Services and Annual Growth Rate by Setting, Broome/Tioga Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	157,865	0.42%	0.69%	30/39
Hospital Emergency Department Visits	91,008	-0.01%	2.70%	23/39
Hospital Outpatient Days	1,304,935	0.17%	0.43%	26/39
Nursing Facilities	1,957	0.25%	0.92%	33/39
Home Health	88,487	-0.11%	0.49%	30/39
Non-Hospital Ambulatory Care	869,551	0.16%	0.47%	27/39
Nursing Education	139	0.10%	-0.29%	7/39
Public Health	251,538	-0.01%	0.22%	23/39
School Health	41,298	-0.37%	-0.22%	18/39
Other	251,538	-0.01%	0.22%	23/39

These two counties only need to increase their supply a little in order to maintain their current ratios of RNs to units of service or to make their ratios consistent with statewide ratios. However, they have been losing RNs during the 1990-2005 period. Their RN supply will need to increase by nearly 25% in order to make the counties consistent with national ratios.

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
2,010	2.55%	1,975	0.78%	2,440	24.49%	2,861	45.97%	2,003	2.19%

A projected supply of 2,451 RNs in 2020 means that Broome/Tioga counties, despite some of the challenges they face, may be able to avoid an RN shortage through 2020.

Chemung/Schuyler County

Supply. Chemung/Schuyler's estimated base year RN population was 1,117 RNs in 2005. RNs in Chemung/Schuyler counties are much older than RNs statewide (with a median age of 50 versus 46), and are much more likely to be older than age 55 (22% versus 17%). Chemung/Schuyler counties rank second in the percentage of RNs that are diploma/ADN nurses (75% compared to 39% statewide), and second to last in the percentage of RNs with master's degrees.

Table 262. Selected Characteristics of RNs, Chemung/Schuyler Counties and New York

	Chemung/ Schuyler Counties	New York	Rankings
Employed RNs	1,117	165,124	24/39
Median Age	51	46	--
% 55+	32.6%	16.9%	9/39
% Diploma/ADN	75.5%	39.4%	2/39
% BSN	20.8%	43.0%	34/39
% MSN	3.7%	17.6%	38/39
% in Hospitals	56.3%	64.1%	20/39

Only 56% of RNs in Chemung/Schuyler counties are employed in hospitals (versus 64% statewide). An estimated 20% percent work in non-hospital ambulatory care (compared to 11% statewide), while an estimated 7% work in public health (much higher than the 3% statewide average), and an estimated 9% work in school health (versus 3% statewide).

Sixty-three percent of the RNs working in Chemung/Schuyler live in these counties, while 22% come from Steuben/Yates counties and 15% come from Pennsylvania. An estimated 27 RNs per year move into the areas that supply Chemung/Schuyler counties with RNs, and an estimated 7 of these RNs will work in Chemung/Schuyler counties. At the same time, an estimated 14 RNs who work in Chemung/Schuyler counties will relocate out of Chemung/Schuyler supply areas (1.3% of Chemung/Schuyler counties' RNs).

Table 263. Location of Residence of RNs Employed in Chemung/Schuyler Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Chemung/Schuyler RN Supply

Chemung/Schuyler Counties Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Chemung/ Schuyler	In-migrants to Chemung/ Schuyler workforce	Out-migrants from Chemung/ Schuyler workforce
Chemung/Schuyler	62.6%	0	0	76.9%	0	0
Steuben/Yates	22.1%	27	14	21.5%	6	3
Bradford/Sullivan/Tioga Counties, PA	15.3%	0	89	15.7%	0	14
		27	103		6	17

Between 2005 and 2006, an estimated 78 new RNs graduates entered the Chemung/Schuyler counties workforce. The number of new graduates entering the workforce is expected to decline as the population of working-age women declines. Attrition of existing RNs due to death, disability, or retirement was estimated at 25 RNs in 2005-06 (2.2% of the workforce), but this is projected to grow to as much as 2.6% as the workforce ages. The RN workforce in Chemung/Schuyler counties is expected to continue to grow through 2020. This is a projected gain of 1.7% annually, compared to an estimated loss of 3.4% annually between 2000 and 2005.

Table 264. Projected Components of RN Supply Change, Chemung/Schuyler Counties, 2005-2020

Chemung/ Schuyler	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	1117	1159	1198	1233	1266	1294	1319	1341	1360	1378	1394	1408	1419	1429	1439	29%
In-migration	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	0%
Out-migration	17	18	18	19	19	20	20	20	21	21	21	21	21	22	22	29%
Net migration	-11	-12	-12	-13	-13	-14	-14	-14	-15	-15	-15	-15	-15	-16	-16	45%
Graduates	78	77	75	73	72	71	70	69	68	67	66	66	65	64	63	-19%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Attrition	25	26	27	29	30	33	35	36	36	36	38	39	39	38	38	52%
Total	1159	1198	1233	1266	1294	1319	1341	1360	1378	1394	1408	1419	1429	1439	1449	25%

Table 265. Relative Rankings of Key Components of Supply Projections, Chemung/Schuyler Counties

	Chemung/Schuyler Ranking
% of resident RNs working in county	15/39
% of RN workforce that lives in county	33/39
In-migration	33/39
Out-migration	26/39
Net migration	29/39
Projected attrition, 2020	34/39
Projected supply growth, 2005-2020	14/39

Demand. Chemung/Schuyler counties rank first among the county groups for inpatient days per 1,000 population, and rank fifth for emergency department visits per 1,000 population. There are

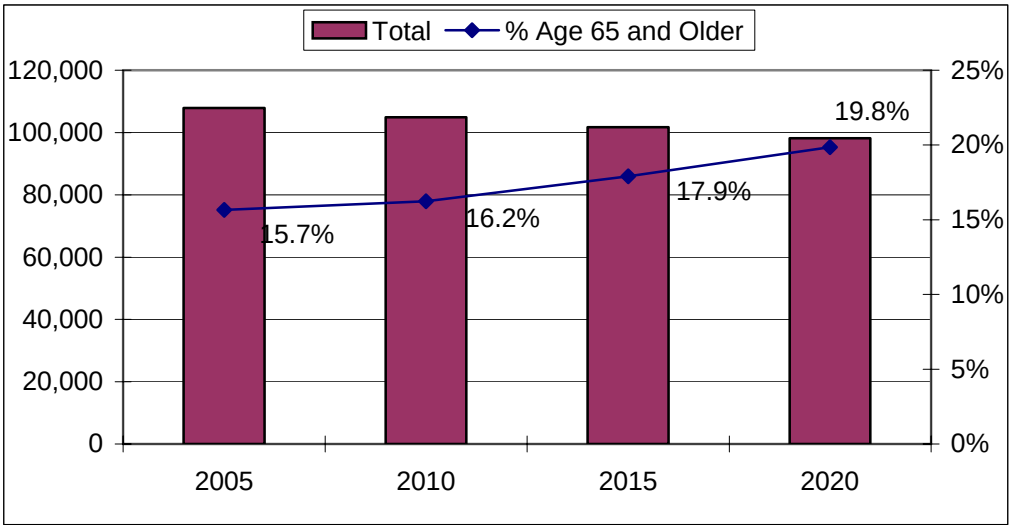
also more nursing facility residents than statewide, and more home health visits per capita, although there are fewer children per capita. RN staffing is low in hospital settings, but higher than average in non-hospital ambulatory settings (ranking third in the state).

Table 266. Projected Demand for Services and Annual Growth Rate by Setting, Chemung/Schuyler Counties

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Chemung/ Schuyler Counties	New York	Rankings	Chemung/ Schuyler Counties	New York	Rankings
Hospital Inpatient Days	1,761 inpatient	946 inpatient	1/39	2.81	4.78	33/39
Hospital Emergency Department	602 ED visits	397 ED visits	5/39	1.06	1.55	34/39
Hospital Outpatient Days	4,207 visits	2,215 visits	7/39	0.06	0.15	34/39
Nursing Facilities	7.5 residents	5.9 residents	9/39	0.10	0.14	24/39
Home Health	368 visits	320 visits	8/39	0	1.07	33/39
Non-Hospital Ambulatory Care	3,373 visits	3,233 visits	10/39	0.62	0.28	3/39
Public Health	1,000 people	1,000 people	--	7.64	2.53	6/39
School Health	141 children	168 children	25/39	55.08	14.01	3/39
Other	1,000 people	1,000 people	--	0	2.32	39/39

Demand for RNs in Chemung/Schuyler counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Chemung/Schuyler counties is projected to decline in the coming years, but the population age 65 and older will become a progressively larger proportion of the population (from almost 16% to almost 20%). Chemung/Schuyler counties are expected to maintain their ranking as the eighth oldest county group in the state.

Figure 42. Projected Population of Chemung/Schuyler Counties and Percent Age 65 and Older



The decrease in population in Chemung/Schuyler counties will produce a decline in demand for most services. These counties fall into the bottom five statewide for projected growth in demand for all types of services studied. However, the population that will remain will be older and will require increasing hospital inpatient and nursing facility services.

Table 267. Projected Demand for Services and Annual Growth Rate by Setting, Chemung/Schuyler County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	193,384	0.12%	0.69%	38/39
Hospital Emergency Department Visits	58,856	-0.66%	2.70%	39/39
Hospital Outpatient Days	431,053	-0.35%	0.43%	39/39
Nursing Facilities	836	0.24%	0.92%	35/39
Home Health	37,739	-0.34%	0.49%	37/39
Non-Hospital Ambulatory Care	345,566	-0.34%	0.47%	39/39
Nursing Education	63	-1.42%	-0.29%	39/39
Public Health	98,147	-0.63%	0.22%	39/39
School Health	15,245	-1.11%	-0.22%	38/39
Other	98,147	-0.63%	0.22%	39/39

Due to population loss, Chemung/Schuyler counties will not have to increase their RN supply very much in order to maintain current ratios. Furthermore, because Chemung/Schuyler counties are already short of RNs, maintaining current ratios will not be sufficient to produce an adequate RN workforce. These counties should plan to increase their RN supply by 15% to 53% in order to increase the quality of care.

Table 268. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Chemung/Schuyler Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
1,127	0.90%	1,444	29.27%	1,709	53.00%	2,271	103.31%	1,286	15.13%

The growth in supply is projected to increase 25% over the 2005-2020 period. Such an increase will enable Chemung/Schuyler counties to approach the ratios of RNs to units of service observed statewide, but these counties will still be disadvantaged compared to national benchmarks.

Delaware/Otsego/Schoharie Counties

Supply. Delaware/Otsego/Schoharie's estimated base year RN population was 1,257 RNs in 2005. RNs in Delaware/Otsego/Schoharie counties are slightly younger than RNs statewide (with a median age of 45 versus 46). An estimated 68% of RNs working in Delaware/Otsego/Schoharie Counties are diploma/ADN nurses (compared to 39% statewide), while 25% are BSNs (compared to 27% statewide), and 7% have a MSN or doctorate (versus 18% statewide).

Table 269.Selected Characteristics of RNs, Delaware/Otsego/Schoharie Counties and New York

	Delaware/Otsego/ Schoharie Counties	New York	Rankings
Employed RNs	1,257	165,124	23/39
Median Age	45	46	--
% 55+	13.3%	16.9%	31/39
% Diploma/ADN	68.4%	39.4%	8/39
% BSN	24.8%	43.0%	33/39
% MSN	6.8%	17.6%	31/39
% in Hospitals	55.8%	64.1%	22/39

About 56% of RNs in Delaware/Otsego/Schoharie counties are employed in hospitals (versus 64% statewide), and an estimated 18% work in non-hospital ambulatory care (compared to 11% statewide), 12% percent work in nursing facilities (versus 10% statewide), and 5% work in home health (compared to 4% statewide). Less than 1% of these counties' RNs are believed to work in public health.

The vast majority of the RNs working in Delaware/Otsego/Schoharie (92%) live in these three counties, while 6% percent come from Chenango/Cortland counties, and the remainder comes from Broome/Tioga and Herkimer/Oneida county groups. An estimated 246 RNs per year move into the areas that supply Delaware/Otsego/Schoharie counties with RNs, and an estimated 41 of these RNs will work in Delaware/Otsego/Schoharie. At the same time, an estimated 178 RNs who work in Delaware/Otsego/Schoharie counties will relocate out of Delaware/Otsego/Schoharie supply areas (14.1% of the RN workforce).

Table 270. Location of Residence of RNs Employed in Delaware/Otsego/Schoharie Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Delaware/Otsego/Schoharie RN Supply

Delaware/Otsego/ Schoharie Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Delaware/ Otsego/Schoharie	In-migrants to Delaware/ Otsego/Schoharie workforce	Out-migrants from Delaware/ Otsego/Schoharie workforce
Broome/Tioga	0.8%	37	85	0.05%	0.2	0.4
Chenango/Cortland	6.4%	115	0	7.0%	8	0
Delaware/Otsego/Schoharie	92.1%	43	232	76.3%	32	177
Herkimer/Oneida	0.8%	52	105	0.3%	0.2	0.3
		246	421		41	178

Between 2005 and 2006, an estimated 88 new RNs graduates entered the Delaware/Otsego/Schoharie counties' workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women wanes. Attrition of existing RNs due to death, disability, or retirement was estimated at 27 RNs in 2005-06 (2.2% of the workforce), but this is projected to grow to 4.1% as the workforce ages. The greatest challenge for this group of counties is the steady projected out-migration (the highest in the state), which is already causing declines in the RN workforce that are expected to continue through 2020. Between 2005 and 2020, the RN supply in Delaware/Otsego/Schoharie counties could decline by 42%. This translates to an average annual growth rate of –3.7%. This estimate is surprisingly grim given that annual growth in supply was estimated at a robust 3.1% between 2000 and 2005.

Table 271. Projected Components of RN Supply Change, Delaware/Otsego/Schoharie Counties, 2005-2020

D/O/S Counties	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	1257	1180	1112	1053	1001	956	915	878	846	819	797	777	760	745	734	-42%
In-migration	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	0%
Out-migration	177	167	157	149	141	135	129	124	119	116	112	110	107	105	104	-42%
Net migration	-137	-127	-117	-109	-101	-95	-89	-84	-79	-76	-72	-70	-67	-65	-64	-54%
Graduates	88	87	87	86	86	85	85	85	85	85	85	85	85	85	85	-3%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	27	28	29	29	30	32	33	33	32	32	33	33	33	31	30	9%
Total	1180	1112	1053	1001	956	915	878	846	819	797	777	760	745	734	726	-38%

Table 272. Relative Rankings of Key Components of Supply Projections, Delaware/Otsego/Schoharie Counties

	Delaware/Otsego/Schoharie Ranking
% of resident RNs working in county	16/39
% of RN workforce that lives in county	6/39
In-migration	23/39
Out-migration	1/39
Net migration	39/39
Projected attrition, 2020	12/39
Projected supply growth, 2005-2020	37/39

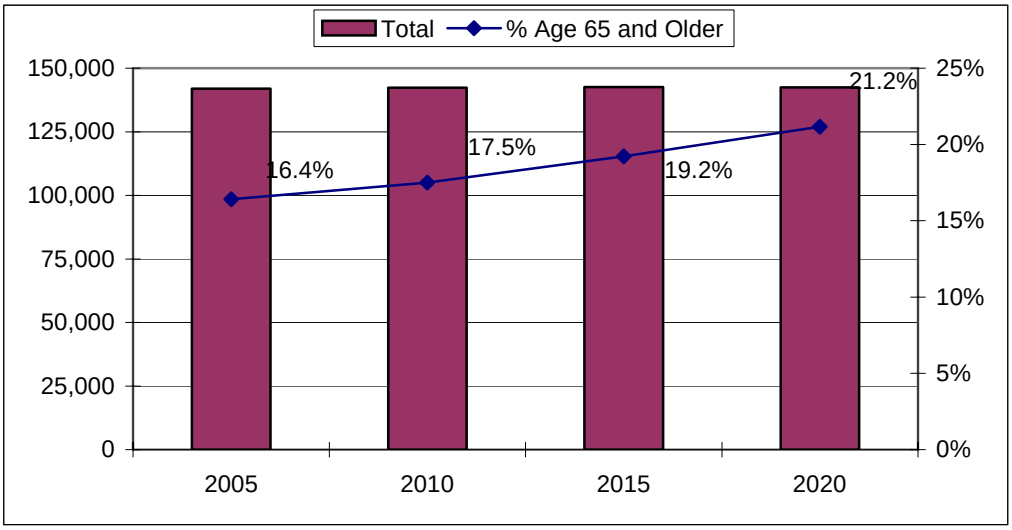
Demand. While the use of hospital inpatient services per capita in Delaware/Otsego/Schoharie counties is comparable to that statewide, the use of emergency and non-emergency outpatient services is much higher. RN staffing is comparable to statewide ratios in most settings except for hospital inpatient settings, public health and school health. In particular, the ratio of public health RNs to the population appears to be one of the lowest in the state.

Table 273. Demand for Services per 1,000 Population and RNs per Unit of Service, Delaware/Otsego/Schoharie Counties

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Delaware/Otsego/ Schoharie Counties	New York	Rankings	Delaware/ Otsego/ Schoharie Counties	New York	Rankings
Hospital Inpatient Days	916 inpatient days	946 inpatient	16/39	2.99	4.78	31/39
Hospital Emergency Department Visits	766 ED visits	397 ED visits	1/39	1.99	1.55	13/39
Hospital Outpatient Days	6,128 visits	2,215 visits	2/39	0.11	0.15	17/39
Nursing Facilities	6.3 residents	5.9 residents	23/39	0.17	0.14	16/39
Home Health	372 visits	320 visits	5/39	1.25	1.07	11/39
Non-Hospital Ambulatory Care	3,424 visits	3,233 visits	3/39	0.47	0.28	7/39
Public Health	1,000 people	1,000 people	--	0.67	2.53	36/39
School Health	157 children	168 children	32/39	8.53	14.01	27/39
Other	1,000 people	1,000 people	--	2.59	2.32	15/39

Demand for RNs in Delaware/Otsego/Schoharie counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Delaware/Otsego/Schoharie counties is projected to increase slightly in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 16% to over 21%). This county group ranks fourth in the state in their percentage of older adults, and is expected to maintain this ranking through 2020.

Figure 43. Projected Population of Delaware/Otsego/Schoharie Counties and Percent Age 65 and Older



Demand for most health care services is projected to increase in Delaware/Otsego/Schoharie counties as the population continues to grow and age. Demand for school health services may decrease as children become a smaller proportion of the population, and demand for nursing education may decline as women in the age groups that typically attend nursing school also become a smaller proportion of the population.

Table 274. Projected Demand for Services and Annual Growth Rate by Setting, Delaware/Otsego/Schoharie Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	143,777	0.67%	0.69%	20/39
Hospital Emergency Department Visits	109,789	0.07%	2.70%	18/39
Hospital Outpatient Days	869,897	0.25%	0.43%	23/39
Nursing Facilities	1,022	0.88%	0.92%	19/39
Home Health	53,533	0.08%	0.49%	25/39
Non-Hospital Ambulatory Care	508,394	0.29%	0.47%	21/39
Nursing Education	85	-0.23%	-0.29%	15/39
Public Health	142,502	0.03%	0.22%	19/39
School Health	22,259	-0.01%	-0.22%	9/39
Other	142,502	0.03%	0.22%	19/39

While the RN supply in Delaware/Otsego/Schoharie counties grew 9% between 1990 and 2005, it was not nearly adequate to match either national or state benchmarks. The RN supply in these counties will need to continue to grow by at least 7% in order to maintain current ratios.

Table 275. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Delaware/Otsego/Schoharie Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
1,345	7.00%	1,493	18.77%	1,710	36.04%	2,213	76.05	1,360	8.19%

In fact, the supply of RNs in Delaware/Otsego/Schoharie counties is expected to decline substantially, based on the observed out-migration of RNs from these counties and from the counties that supply them with RNs. If this occurs, serious shortages of RNs will result in Delaware/Otsego/Schoharie counties.

Seneca/Tompkins Counties

Supply. Seneca/Tompkins' estimated base year RN population was 688 RNs in 2005, making it the fifth smallest RN workforce in New York. RNs in Seneca/Tompkins counties are the same median age as RNs statewide (46), but are somewhat more likely to be older than age 55 (19% versus 17%). Interestingly, this county group ranks third in the state for RNs with a master's degree. An estimated 49% of RNs working in Seneca/Tompkins counties are diploma/ADN nurses (compared to 39% statewide), while 26% are BSNs (compared to 43% statewide), and 25% have a MSN or doctorate (versus 18% statewide).

Table 276. Selected Characteristics of RNs, Seneca/Tompkins Counties and New York

	Seneca/Tompkins Counties	New York	Rankings
Employed RNs	688	165,124	35/39
Median Age	46	46	--
% 55+	18.9%	16.9%	13/39
% Diploma/ADN	48.9%	39.4%	22/39
% BSN	26.4%	43.0%	27/39
% MSN	24.7%	17.6%	3/39
% in Hospitals	28.1%	64.1%	39/39

Only about 28% of RNs in Seneca/Tompkins counties are employed in hospitals (versus 64% statewide), giving RNs in this county group the lowest rate of hospital employment in the state. An estimated 14% work in non-hospital ambulatory care (compared to 11% statewide), and an estimated 20% percent work in nursing facilities (versus 10% statewide).

Most of the RNs working in Seneca/Tompkins counties (77%) live in these counties, while 14% come from Chenango/Cortland counties, and 4% from Broome/Tioga counties. The remainder comes from Onondaga/Madison/Cayuga counties (3%). An estimated 242 RNs per year move into the areas that supply Seneca/Tompkins counties with RNs, and an estimated 11 of these RNs will work in Seneca/Tompkins counties. At the same time, an estimated 64 RNs who work in Seneca/Tompkins counties will relocate out of the Seneca/Tompkins supply areas (9.3% of the RN workforce).

Table 277. Location of Residence of RNs Employed in Seneca/Tompkins Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Seneca/Tompkins RN Supply

Seneca/Tompkins Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Seneca/Tompkins	In-migrants to Seneca/Tompkins workforce	Out-migrants from Seneca/Tompkins workforce
Broome/Tioga	4.0%	37	85	1.6%	1	1
Chenango/Cortland	14.2%	115	0	8.9%	10	0
Onondaga/Madison/Cayuga	3.0%	90	30	0.3%	0	0
Seneca/Tompkins	77.0%	0	79	79.7%	0	63
		242	193		11	64

Between 2005 and 2006, an estimated 48 new RNs graduates entered the Seneca/Tompkins counties' workforce. Attrition of existing RNs due to death, disability, or retirement was estimated at 15 RNs in 2005-06 (2.2% of the workforce), but this is projected to grow to 2.9% as the workforce ages. Seneca/Tompkins counties face a serious decrease in their RN supply between 2005 and 2020, possibly approaching a decline of 23%.

Table 278. Projected Components of RN Supply Change, Seneca/Tompkins Counties, 2005-2020

Seneca/ Tompkins	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	688	668	650	633	617	603	589	576	565	555	546	538	530	523	518	-25%
In-migration	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	0%
Out-migration	64	62	60	59	57	56	55	54	53	52	51	50	49	49	48	-25%
Net migration	-53	-51	-49	-48	-46	-45	-44	-43	-42	-41	-40	-39	-38	-38	-37	-30%
Graduates	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	0%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	15	15	16	16	16	17	17	17	17	16	17	17	17	15	15	-1%
Total	668	650	633	617	603	589	576	565	555	546	538	530	523	518	514	-23%

The fact that this county group has one of the lowest rates of net RN migration in the state perhaps accounts for the low projected rate of supply growth, which is an estimated annual average decline of 1.9%. This is an improvement, however, over the 2.7% average annual decline estimated for the period of 2000 to 2005.

Table 279. Relative Rankings of Key Components of Supply Projections, Seneca/Tompkins Counties

	Seneca/Tompkins Ranking
% of resident RNs working in county	13/39
% of RN workforce that lives in county	18/39
In-migration	27/39
Out-migration	3/39
Net migration	38/39
Projected attrition, 2020	30/39
Projected supply growth, 2005-2020	36/39

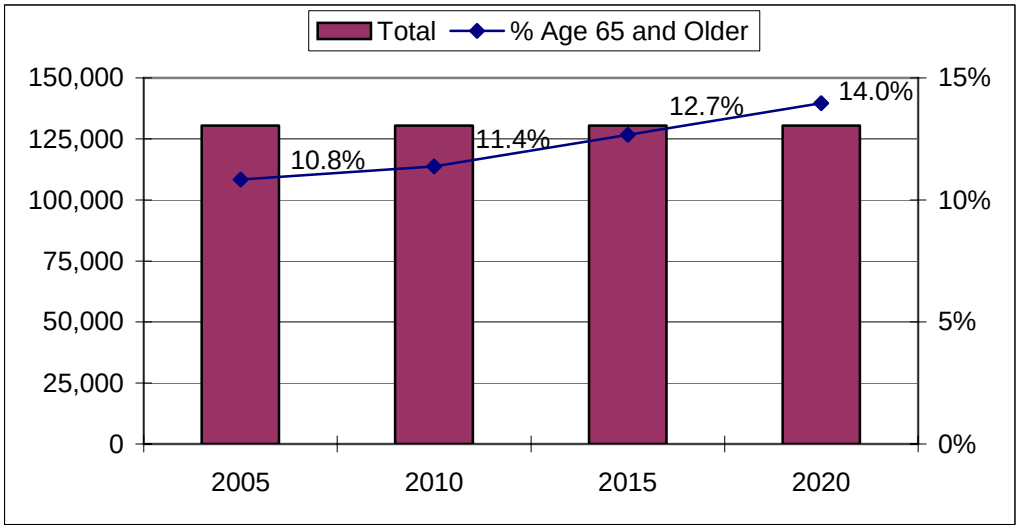
Demand. The use of all hospital-based services per capita in Seneca/Tompkins counties is much lower than that statewide, and the numbers of nursing facility residents and home health visits are also lower. Furthermore, Seneca/Tompkins counties have many fewer children per capita than the statewide average. RN staffing in hospital inpatient settings is lower than statewide, while emergency department staffing and nursing facility staffing is higher.

Table 280. Demand for Services per 1,000 Population and RNs per Unit of Service, Seneca/Tompkins County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Seneca/Tompkins Counties	New York	Rankings	Seneca/ Tompkins Counties	New York	Rankings
Hospital Inpatient Days	264 inpatient days	946 inpatient days	39/39	3.50	4.78	28/39
Hospital Emergency Dept. Visits	200 ED visits	397 ED visits	37/39	2.07	1.55	12/39
Hospital Outpatient Days	1,225 visits	2,215 visits	35/39	0.11	0.15	19/39
Nursing Facilities	4.9 residents	5.9 residents	35/39	0.22	0.14	5/39
Home Health	287 visits	320 visits	36/39	0	1.07	39/39
Non-Hospital Ambulatory Care	3,074 visits	3,233 visits	38/39	0.24	0.28	25/39
Public Health	1,000 people	1,000 people	--	6.96	2.53	7/39
School Health	136 children	168 children	38/39	34.13	14.01	7/39
Other	1,000 people	1,000 people	--	4.14	2.32	8/39

Demand for RNs in Seneca/Tompkins counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Seneca/Tompkins counties is projected to remain relatively constant in size in the coming years, but the population age 65 and older will become a progressively larger proportion of the population (from about 11% to 14%). Still, Seneca/Tompkins counties rank third lowest in their percentage of the population age 65 and older, and are expected to remain in the lowest five through 2020.

Figure 44. Projected Population of Seneca/Tompkins Counties and Percent Age 65 and Older



Demand for most health care services is projected to increase in Seneca/Tompkins counties as the population ages. The exception is the demand for RNs working in home health, which reflects the relatively young population of this county group.

Table 281. Projected Demand for Services and Annual Growth Rate by Setting, Seneca/Tompkins Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	36,907	0.45%	0.69%	28/39
Hospital Emergency Department Visits	26,218	0.03%	2.70%	20/39
Hospital Outpatient Days	162,789	0.11%	0.43%	27/39
Nursing Facilities	711	0.77%	0.92%	25/39
Home Health	36,696	-0.15%	0.49%	31/39
Non-Hospital Ambulatory Care	412,221	0.17%	0.47%	26/39
Nursing Education	48	0%	-0.29%	10/39
Public Health	130,743	0%	0.22%	21/39
School Health	18,437	0.26%	-0.22%	8/39
Other	130,743	0%	0.22%	21/39

Despite low population growth and minimal aging of the population, the substantial projected decrease in the RN supply will cause serious challenges for Seneca/Tompkins counties. The counties may be unable to maintain its current supply of RNs, and may fall below state and national benchmarks (which they currently exceed).

Table 282. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Seneca/Tompkins Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
695	1.0%	616	-10.5%	650	-5.5%	849	23.4%	693	0.7%

Steuben/Yates Counties

Supply. Steuben/Yates' estimated base year RN population was 758 RNs in 2005. RNs in Steuben/Yates counties are considerably older than RNs statewide (with a median age of 51 versus 46). An estimated 48% of RNs working in Steuben/Yates are diploma/ADN nurses (compared to 39% statewide), while 25% are BSNs (compared to 43% statewide), and 27% have a MSN or doctorate (versus 18% statewide). The estimated percentage of RNs with master's degrees or higher is the highest in the state.

Table 283. Selected Characteristics of RNs, Steuben/Yates Counties and New York

	Steuben/Yates Counties	New York	Rankings
Employed RNs	758	165,124	32/39
Median Age	51	46	--
% 55+	18.0%	16.9%	17/39
% Diploma/ADN	47.8%	39.4%	25/39
% BSN	24.9%	43.0%	32/39
% MSN	27.2%	17.6%	1/39
% in Hospitals	62.7%	64.1%	12/39

About 63% of RNs in Steuben/Yates counties are employed in hospitals (similar to 64% statewide). An estimated 3% of the counties' RNs work in non-hospital ambulatory care (compared to 11% statewide), 2% percent work in nursing facilities (versus 10% statewide), and 14% work in home health (compared to 4% statewide).

Most of the RNs working in Steuben/Yates counties (65%) live in these counties, while 25% come from Chemung/Schuyler counties, and 7% from Allegany/Cattaraugus counties. An estimated 142 RNs per year move into the areas that supply Steuben/Yates counties with RNs, and an estimated 37 of these RNs will work in Steuben/Yates counties. At the same time, an estimated 8 RNs who work in Steuben/Yates counties will relocate out of Steuben/Yates supply areas (1.1% of the RN workforce).

Table 284. Location of Residence of RNs Employed in Steuben/Yates Counties, Residential Migration Patterns, and Estimated Effects of Residential Migration on Steuben/Yates RN Supply

Steuben/Yates Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Steuben/Yates	In-migrants to Steuben/Yates workforce	Out-migrants from Steuben/Yates workforce
Allegany/Cattaraugus	6.7%	0	0	8.1%	0	0
Chemung/Schuyler	24.8%	115	0	21.8%	25	0
Steuben/Yates	65.3%	27	14	45.3%	12	6
Bradford/Sullivan/Tioga, PA	3.1%	0	89	2.3%	0	2
		142	103		37	8

Between 2005 and 2006, an estimated 53 new RNs graduates entered the Steuben/Yates workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women wanes. Attrition of existing RNs due to death, disability, or retirement was estimated at 17 RNs in 2005-06 (2.2% of the workforce). Steuben/Yates counties are benefited by strong in-migration into their supply areas, and the supply of RNs is projected to steadily grow between 2005 and 2020. Overall supply growth during this period could reach 80%.

Table 285. Projected Components of RN Supply Change, Steuben/Yates Counties, 2005-2020

Steuben/ Yates	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	758	823	885	945	1,002	1,056	1,107	1,156	1,202	1,247	1,291	1,332	1,370	1,408	1,445	91%
In-migration	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	0%
Out-migration	8	9	10	10	11	11	12	12	13	13	14	14	15	15	16	91%
Net migration	29	28	27	27	26	26	25	25	24	24	23	23	22	22	21	-26%
Graduates	53	53	51	51	50	49	49	49	48	48	48	47	47	47	47	-12%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	17	18	19	20	22	24	26	27	27	28	30	31	32	31	32	86%
Total	823	885	945	1,002	1056	1,107	1,156	1,202	1,247	1,291	1,332	1,370	1,408	1,445	1,481	80%

Steuben/Yates' average annual growth rate of 4.5% is the third highest in the state, but follows an estimated average annual decline of 1.6% between 2000 and 2005. The relatively small sample size for this country group may be producing an extreme estimate of past growth, future growth, or both.

Table 286. Relative Rankings of Key Components of Supply Projections, Steuben/Yates Counties

	Steuben/Yates Ranking
% of resident RNs working in county	33/39
% of RN workforce that lives in county	29/39
In-migration	13/39
Out-migration	28/39
Net migration	6/39
Projected attrition, 2020	38/39
Projected supply growth, 2005-2020	3/39

Demand. The use of all hospital-based services per capita in Steuben/Yates counties is much higher than that statewide, and the use of other services is somewhat higher as well. Inpatient utilization ranks fourth in the state, while non-hospital ambulatory care utilization ranks fifth.

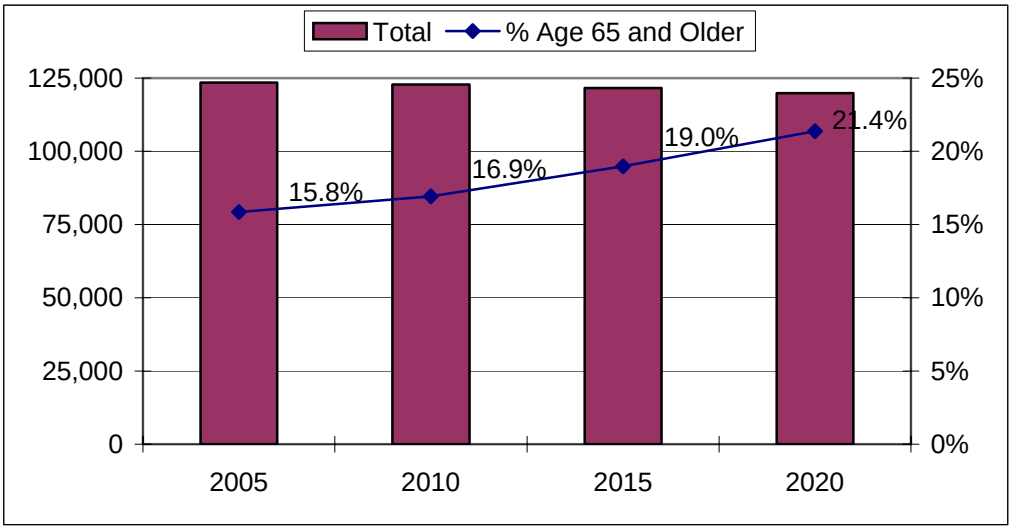
RN staffing in hospital-based settings is, however, much lower than statewide. This is also the case in nursing facilities and non-hospital ambulatory care, although it appears that home health agencies are better staffed per visit than the national average (ranking third for estimated RN staffing).

Table 287. Demand for Services per 1,000 Population and RNs per Unit of Service, Steuben/Yates Counties

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Steuben/Yates Counties	New York	Ranking	Steuben/ Yates Counties	New York	Ranking
Hospital Inpatient Days	1,582 inpatient days	946 inpatient days	4/39	2.20	4.78	36/39
Hospital Emergency Dept. Visits	457 ED visits	397 ED visits	14/39	0.56	1.55	39/39
Hospital Outpatient Days	3,576 visits	2,215 visits	9/39	0.03	0.15	39/39
Nursing Facilities	6.8 residents	5.9 residents	20/39	0.02	0.14	37/39
Home Health	366 visits	320 visits	9/39	2.39	1.07	3/39
Non-Hospital Ambulatory Care	3,402 visits	3,233 visits	5/39	0.06	0.28	38/39
Public Health	1,000 people	1,000 people	--	5.78	2.53	12/39
School Health	182 children	168 children	8/39	24.64	14.01	12/39
Other	1,000 people	1,000 people	--	0	2.32	36/39

Demand for RNs in Steuben/Yates counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Steuben/Yates counties is projected to decline in the coming years, but the population age 65 and older will become a progressively larger proportion of the population (from about 16% to 21%). This county group is already one of the oldest in New York, ranking sixth for the percentage of the population age 65 and older, and is expected to rise to third by the year 2020.

Figure 45. Projected Population of Steuben/Yates Counties and Percent Age 65 and Older



Demand for many health care services is projected to increase in Steuben/Yates counties as the population ages. However, demand for RNs in hospital emergency departments, nursing education, public health, and school health is expected to decline with the projected decrease in the population.

Table 288. Projected Demand for Services and Annual Growth Rate by Setting, Steuben/Yates Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	215,874	0.66%	0.69%	21/39
Hospital Emergency Department Visits	54,869	-0.19%	2.70%	28/39
Hospital Outpatient Days	455,932	0.21%	0.43%	25/39
Nursing Facilities	993	1.08%	0.92%	15/39
Home Health	47,489	0.32%	0.49%	19/39
Non-Hospital Ambulatory Care	435,021	0.23%	0.47%	24/39
Nursing Education	46	-0.93%	-0.29%	36/39
Public Health	120,005	-0.20%	0.22%	30/39
School Health	20,349	-0.68%	-0.22%	29/39
Other	120,005	-0.20%	0.22%	30/39

Projected robust growth in the RN supply in Steuben/Yates counties should allow these counties to maintain their current ratios of RNs to units of service. These counties are already much shorter on RNs than either state or national benchmarks, however, and even the strong projected growth will not be sufficient to bring them up to these measures of adequate staffing.

Table 289. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Steuben/Yates Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
825	8.8%	1,614	113.0%	1,914	152.5%	2,537	234.7%	870	14.8%

Western New York Region

Nearly 13,000 RNs are employed in Western New York, which is composed of Allegany/Cattaraugus, Chautauqua, Erie, and Niagara counties. RNs in this region are older on average than RNs statewide, and more likely to have a diploma or ADN and less likely to have a BSN as their highest degree. They are also less likely to be employed in hospitals.

Table 290. Selected Characteristics of Western New York RNs

	Western New York	New York
Employed RNs	12,584	165,124
Median Age	47	46
% 55+	15.1%	16.9%
% Diploma/ADN	54.0%	39.4%
% BSN	35.0%	43.0%
% MSN	11.1%	17.6%
% in Hospitals	53.5%	64.1%

Most RNs who work in Western New York live in Western New York, and this region is gaining more resident RNs through migration than it is losing. Since most RNs who reside in Western New York will also work there, this means most of these in-migrant RNs will join the Western New York workforce.

Table 291. Location of Residence of RNs Employed in Western New York, Residential Migration Patterns, and Estimated Effects of Residential Migration on Western New York RN Supply

Western New York Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Western New York	In-migrants to Western New York workforce	Out-migrants from Western New York workforce
Western New York	96.0%	169	0	94.9%	160	0
Finger Lakes	2.6%	105	18	1.3%	1	0
Southern Tier	0.3%	87	525	0.3%	0	2
Out of State	1.0%	7	0	1.2%	0	0
					161	2

Between 2005 and 2006, the RN supply in Western New York grew by an estimated 550 RNs, or about 4.4%.

Table 292. Projected Components of RN Supply Change, Western New York, 2005-2006

Western New York Region	2005-2006
Base	12,584
In-migration	161
Out-migration	2
Net migration	159
Graduates	611
Foreign	0
Attrition	220
	+550 (4.4%)

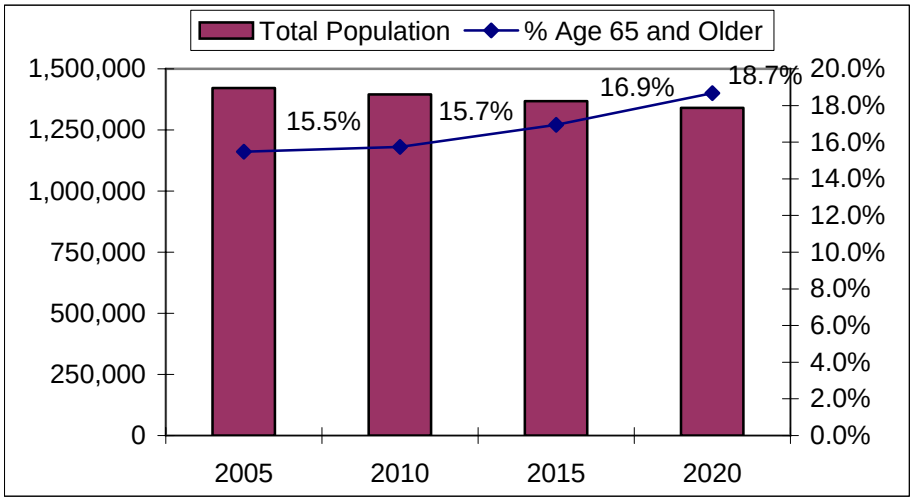
Western New York residents used more inpatient days per capita than residents of the state overall, as well as more home health visits and slightly more ambulatory care visits. There were also more nursing facility residents per capita in Western New York than statewide. At the same time, there were fewer hospital RNs and fewer home health RNs per units of service, although there were somewhat more RNs working in non-hospital ambulatory care and school health.

Table 293. Demand for Services per 1,000 Population and RNs per Unit of Service, Western New York

Total Units of Service	Units of Service per 1,000 pop		RNs per Unit of Service	
	Western New York	New York	Western New York	New York
Hospital Inpatient Days	1,255 inpatient days	946 inpatient days	3.23	4.78
Hospital Emergency Department Visits	381 ED visits	397 ED visits	1.40	1.55
Hospital Outpatient Days	2,158 outpatient visits	2,215 outpatient visits	0.08	0.15
Nursing Facility Residents	7.1 residents	5.9 residents	0.16	0.14
Home Health Visits	362 visits	320 visits	0.63	1.07
Non-Hospital Ambulatory Care	3,377 visits	3,233 visits	0.41	0.28
School Health	170 children	168 children	3.14	2.75
Public Health	1,000 persons	1,000 persons	0.33	0.51
Other	1,000 persons	1,000 persons	0.53	1.01

The population of Western New York is projected to decline between 2005 and 2020, although the proportion of the population age 65 and older is expected to grow during this period, as shown in Figure 46.

Figure 46. Projected Population of Western New York and Percent Age 65 and Older



Due to the projected decline in the population, projected demand for many types of health services will also decline between 2005 and 2020. Demand for other types of health services, such as hospital inpatient care and nursing facilities, will grow, but will do so much more slowly than projected statewide averages.

Table 294. Projected Demand for Services and Annual and Historical Growth Rate by Setting, Western New York

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, Western New York, 2005-2020	Projected Annual Growth Rate, New York
Hospital Inpatient Days	1,552,944	0.05%	0.69%
Hospital Emergency Department Visits	510,358	-0.42%	2.70%
Hospital Outpatient Days	2,995,288	-0.18%	0.43%
Nursing Facilities	10,292	0.17%	0.92%
Home Health	490,450	-0.33%	0.49%
Non-Hospital Ambulatory Care	4,675,784	-0.17%	0.47%
Nursing Education	538	-0.85%	-0.26%
Public Health	1,340,784	-0.39%	0.22%
School Health	215,019	-0.78%	-0.22%
Other	1,340,784	-0.39%	0.22%

Table 295. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Western New York

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
12,364	-1.8%	13,241	5.2%	15,167	20.5%	20,157	60.2%	13,604	8.1%

Allegany/Cattaraugus County

Supply. Allegany/Cattaraugus' estimated base year RN population was 548 RNs in 2005. These counties will likely face challenges related to their older RN supply (average age of 48 compared to 46 statewide). Allegany/Cattaraugus counties rank sixth for the percentage of RNs who are diploma/ADN nurses (70%, compared to less than 40% statewide). Just over one-quarter of RNs who work in these counties are BSNs (compared to 43% statewide), and fewer than 5% have a MSN or doctorate (versus 18% statewide).

Table 30. Selected Characteristics of Allegany/Cattaraugus County RNs

	Allegany/Cattaraugus Counties	New York	Ranking
Employed RNs	548	165,124	36/39
Median Age	48	46	--
% 55+	14.4%	16.9%	25/39
% Diploma/ADN	69.8%	39.4%	6/39
% BSN	26.0%	43.0%	29/39
% MSN	4.2%	17.6%	36/39
% in Hospitals	55.8%	64.1%	21/39

Fifty-six percent of the RNs employed in Allegany/Cattaraugus counties work in hospitals (versus 64% statewide), while less than 6% work in physician offices or outpatient care centers (versus 11% statewide). Almost one in five RNs in Allegany/Cattaraugus counties works in a nursing facility (20% versus 10% statewide).

More than 75% of RNs working in Allegany/Cattaraugus counties live in these counties. Seven percent commute from Erie County, and small numbers commute from Genesee/Orleans, Chautauqua, and Steuben/Yates counties, or from across the Pennsylvania border. An estimated 532 RNs per year move into the areas that supply Allegany/Cattaraugus with RNs, and an estimated 21 of these RNs will work in Allegany/Cattaraugus counties. At the same time, an estimated 28 RNs who work in Allegany/Cattaraugus counties will relocate out of Allegany/Cattaraugus supply areas (5.3% of Allegany/Cattaraugus County RNs).

Table 31. Location of Residence of RNs Employed in Allegany/Cattaraugus, Residential Migration Patterns, and Estimated Effects of Residential Migration on Allegany/Cattaraugus County RN Supply

Allegany/Cattaraugus Counties Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Allegany/ Cattaraugus	In-migrants to Allegany/ Cattaraugus workforce	Out-migrants from Allegany/ Cattaraugus workforce
Allegany/Cattaraugus	75.7%	0	0	63.1%	0	0
Chautauqua	3.4%	0	0	2.4%	0	0
Erie	6.7%	499	694	0.4%	20	28
Genesee/Orleans	4.8%	0	0	3.2%	0	0
Steuben/Yates	3.7%	27	14	1.8%	0.5	0.2
Cameron/Elk/McKean/Potter Counties, PA	5.6%	7	0	3.9%	0.3	0
		532	708		21	28

An estimated 26 new RNs graduates entered the Allegany/Cattaraugus workforce between 2005 and 2006. The number of new graduates entering the workforce is expected to remain relatively constant. Attrition of existing RNs due to death, disability, or retirement was estimated at 10 RNs in 2005-06 (1.8% of the workforce), but this is projected to grow dramatically (to 20.6% of the workforce) as the workforce ages.

The RN workforce in Allegany/Cattaraugus counties is expected to continue growing until approximately 2010, at which time rising attrition will cause the RN workforce to begin to decline. By 2020, the RN workforce in Allegany/Cattaraugus is expected to have shrunk by 10% to 44%.

Table 32. Projected Components of RN Supply Change, Allegany/Cattaraugus Counties, 2005-2020

Allegany/ Cattaraugus Counties	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	548	557	564	568	568	566	561	552	538	518	493	462	430	394	354	-35%
In-migration	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	0%
Out-migration	28	28	29	29	29	29	29	28	27	26	25	24	22	20	18	-35%
Net migration	-7	-7	-8	-8	-8	-8	-8	-7	-6	-5	-4	-3	-1	1	3	-142%
Graduates	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	0%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	10	12	14	18	20	23	27	33	39	45	52	56	61	67	73	638%
	557	564	568	568	566	561	552	538	518	493	462	430	394	354	309	-44%

Allegany/Cattaraugus counties rank ninth in out-migration (but 20th in in-migration), and rank second for projected attrition. The RN supply of Allegany/Cattaraugus counties is projected to decline by 3.9% per year (the second largest decline in the state), which appears very likely given the estimated decrease of 7.8% per year observed between 2000 and 2005-06.

Table 33. Relative Rankings of Key Components of Supply Projections, Allegany/Cattaraugus Counties

	Allegany/Cattaraugus Ranking
% of resident RNs working in county	23/39
% of RN workforce that lives in county	19/39
In-migration	20/39
Out-migration	9/39
Net migration	30/39
Projected attrition, 2020	2/39
Projected supply growth, 2005-2020	38/39

Demand. There are many fewer inpatient days per capita in Allegany/Cattaraugus counties than the state overall average, and both emergency and non-emergency hospital ambulatory visits are also lower than the state average. There are, however, more nursing facility residents per capita and more estimated home health visits and non-hospital ambulatory visits per capita, reflecting a population that is older than the statewide population.

These counties also rank in the bottom ten for many ratios of RNs to units of service, including hospital outpatient days, home health, non-hospital ambulatory care, public health, and school health (although some of these are based on numbers too small to be reliable).

Table 34. Demand for Services per 1,000 Population and RNs per Unit of Service, Allegany/Cattaraugus Counties and New York

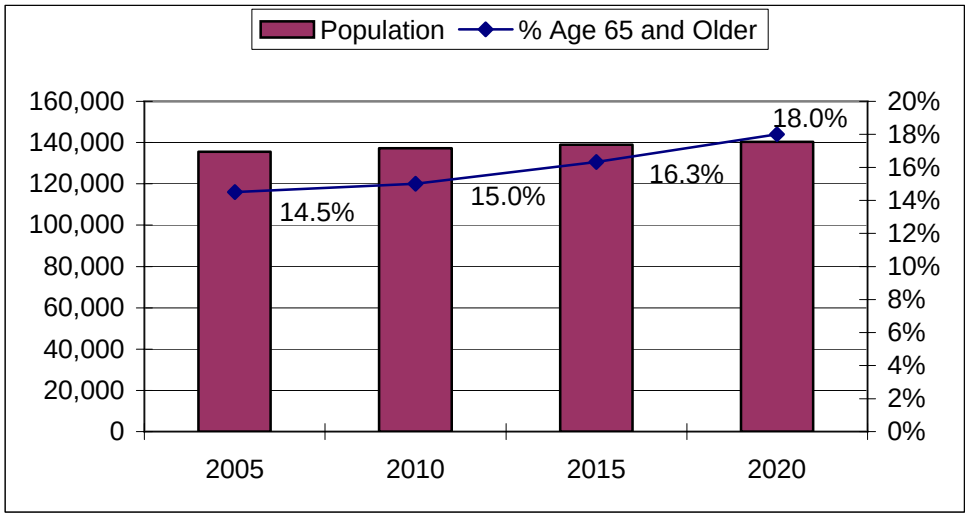
	Units of Service per 1,000 Population			RNs per Unit of Service		
	Allegany/Cattaraugus Counties	New York	Ranking	Allegany/ Cattaraugus Counties	New York	Ranking
Hospital Inpatient Days	415 inpatient days	946 inpatient days	36/39	4.10	4.78	23/39
Hospital Emergency Department Visits	325 ED visits	397 ED visits	31/39	1.34	1.55	26/39
Hospital Outpatient Days	1,878 visits	2,215 visits	26/39	0.07	0.15	33/39
Nursing Facilities	6.5 residents	5.9 residents	22/39	0.13	0.14	19/39
Home Health	337 visits	320 visits	20/39	0	1.07	39/39*
Non-Hospital Ambulatory Care	3,303 visits	3,233 visits	17/39	0.07	0.28	36/39
Public Health	1,000 people	1,000 people	--	0.81	2.53	35/39
School Health	180 children	168 children	13/39	0	14.01	39/39**
Other	1,000 people	1,000 people	--	3.47	2.32	11/39

*Tied with Schenectady, Chemung/Schuyler, Chenango/Cortland, Genesee/Orleans, Rockland, Oswego, and Seneca/Tompkins counties (all had no home health RNs in their samples).
**Tied with Schenectady, Fulton/Montgomery, Saratoga, Livingston/Wyoming, and Columbia/Greene counties (all had no school RNs in their samples).

Demand for RNs in Allegany/Cattaraugus counties may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of

Allegany/Cattaraugus counties is projected to rise only moderately in the coming years, but the population age 65 and older will become a progressively larger proportion of the population (from almost 15% to almost 18%).

Figure 47. Projected Population of Allegany/Cattaraugus Counties and Percent Age 65 and Older



Between 2005 and 2020, demand for all types of health care is expected to increase in Allegany/Cattaraugus counties. The greatest percentage increase is projected in nursing facilities. Allegany/Cattaraugus counties rank in the top ten for projected demand growth in hospital emergency department visits, nursing education, public health, school health, and other settings.

Table 35. Projected Demand for Services and Annual Growth Rate by Setting, Allegany/Cattaraugus Counties

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	62,399	0.69%	0.69%	18/39
Hospital Emergency Department Visits	45,831	0.27%	2.70%	9/39
Hospital Outpatient Days	268,654	0.36%	0.43%	17/39
Nursing Facilities	1,003	0.89%	0.92%	20/39
Home Health	46,404	0.11%	0.49%	23/39
Non-Hospital Ambulatory Care	475,916	0.41%	0.47%	15/39
Nursing Education	26	0	-0.26%	9/39
Public Health	140,361	0.23	0.22%	9/39
School Health	25,654	0.35	-0.22%	5/39
Other	140,361	0.23	0.22%	9/39

Allegany/Cattaraugus counties have steadily lost RNs between 1990 and 2005, but the RN supply will need to grow by at least 5% in order to continue to maintain current ratios of RNs to services. In order to offer RN-to-services ratios consistent with those found nationwide, Allegany/Cattaraugus counties will need to increase their RN workforce by 67% by 2020.

Table 35. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Allegany/Cattaraugus Counties

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
575	4.93%	855	5.60%	915	66.97	1,197	118.43	640	16.79

It seems likely – with a projected supply of 309 RNs by 2020 – that these counties will not be able to achieve even the benchmark based on maintaining current ratios, and may, in fact, have only about half of the RNs required to do so.

Chautauqua County

Supply. Chautauqua County's estimated base year RN population was 928 RNs in 2005. RNs in Chautauqua County are much older than RNs statewide (with a median age of 51 versus 46), and are more likely to be older than age 55 (33% versus 17%). In fact, Chautauqua ranks second in the state for RNs age 55 and older. An estimated 64% of RNs working in Chautauqua County are diploma/ADN nurses (compared to 39% statewide), while 32% are BSNs (compared to 43% statewide), and 4% have a MSN or doctorate (versus 18% statewide).

Table 51. Selected Characteristics of Chautauqua County RNs

	Chautauqua Counties	New York	Rankings
Employed RNs	928	165,124	31/39
Median Age	51	46	--
% 55+	32.6%	16.9%	2/39
% Diploma/ADN	64.1%	39.4%	12/39
% BSN	31.5%	43.0%	22/39
% MSN	4.4%	17.6%	35/39
% in Hospitals	48.7%	64.1%	33/39

Chautauqua County is unusual in that only 49% of RNs are employed in hospitals (versus 64% statewide). An estimated 25% work in school health, although this estimate was likely influenced by sampling error. Nine percent work in nursing facilities (compared to 10% statewide), while an estimated 10% work in public health (much higher than 3% statewide). Only a few Chautauqua County RNs work in non-hospital ambulatory care (4% versus 11% statewide), and few work in home health (2% versus 4% statewide).

Most of the RNs working in Chautauqua County live in the county (75%). Fifteen percent come from Erie County, and 7% come from Allegany/Cattaraugus counties. Nearly 3% come from Pennsylvania. An estimated 525 RNs per year move into the areas that supply Chautauqua County with RNs, and an estimated 8 of these RNs will work in Chautauqua County. At the same time, an estimated 10 RNs who work in Chautauqua County will relocate out of Chautauqua supply areas (1.2% of Chautauqua County RNs).

Table 52. Location of Residence of RNs Employed in Chautauqua County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Chautauqua County RN Supply

Chautauqua County Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Chautauqua	In-migrants to Chautauqua workforce	Out-migrants from Chautauqua workforce
Allegany/Cattaraugus	7.4%	0	0	10.5%	0	0
Chautauqua	75.1%	0	0	87.3%	0	0
Erie	14.9%	499	694	1.4%	7	10
Crawford/Warren Counties, PA	2.6%	26	55	2.1%	1	1
		425	749		8	11

Between 2005 and 2006, an estimated 44 new RNs graduates entered the Chautauqua County workforce. The number of new graduates entering the workforce is expected to remain fairly constant. Attrition of existing RNs due to death, disability, or retirement was estimated at 16 RNs in 2005-06 (1.7% of the workforce), but this is projected to grow dramatically (to as much as 25.8% of the workforce) as the workforce ages. Chautauqua County is already losing RNs, and the problem is only expected to worsen as their workforce grows older.

Table 53. Projected Components of RN Supply Change, Chautauqua County, 2005-2020

Chautauqua	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	928	854	786	723	664	610	560	511	464	418	375	333	294	256	221	-76%
In-migration	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	0%
Out-migration	110	101	93	85	79	72	66	60	55	49	44	39	35	30	26	0%
Net migration	-102	-93	-85	-78	-71	-65	-59	-53	-47	-42	-37	-32	-27	-23	-19	-82%
Graduates	44	44	44	43	43	43	43	42	42	42	42	42	42	42	42	-5%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	16	19	21	24	26	29	32	37	41	44	47	49	52	55	57	247%
Total	854	786	723	664	610	560	511	464	418	375	333	294	256	221	187	-78%

Chautauqua County is first in the state for projected attrition of RNs, and last in the state for projected supply growth. A projected loss of 10.7% of the RN workforce per year is a steep decline even from the loss of 0.9% observed between 2000 and 2005.

Table 54. Relative Rankings of Key Components of Supply Projections, Chautauqua County

	Chautauqua Ranking
% of resident RNs working in county	10/39
% of RN workforce that lives in county	20/39
In-migration	31/39
Out-migration	28/39
Net migration	26/39
Projected attrition, 2020	1/39
Projected supply growth, 2005-2020	39/39

Demand. Services used per capita in Chautauqua County are higher than statewide in every setting. In particular, Chautauqua County ranks fourth in the state for its large number of nursing facility residents.

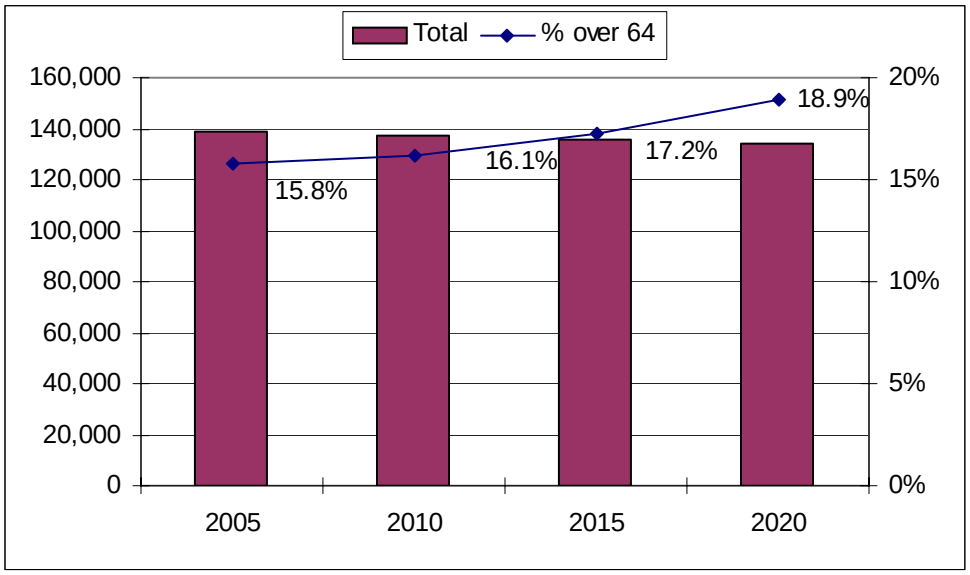
At the same time, Chautauqua County has fewer RNs per units of service in nearly every setting (although sampling error may be responsible for a disproportionate estimate of RNs in public health and school health and a corresponding underestimate of RNs in some other settings). The county ranks particularly low in RNs per hospital inpatient days.

Table 55. Demand for Services per 1,000 Population and RNs per Unit of Service, Chautauqua County and New York

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Chautauqua County	New York	Rankings	Chautauqua County	New York	Rankings
Hospital Inpatient Days	970 inpatient	946 inpatient	11/39	2.58	4.78	35/39
Hospital Emergency Department Visits	476 ED visits	397 ED visits	11/39	1.25	1.55	27/39
Hospital Outpatient Days	2,712 visits	2,215 visits	17/39	0.07	0.15	30/39
Nursing Facilities	8.5 residents	5.9 residents	4/39	0.07	0.14	32/39
Home Health	369 visits	320 visits	7/39	0.43	1.07	28/39
Non-Hospital Ambulatory Care	3,383 visits	3,233 visits	8/39	0.09	0.28	34/39
Public Health	1,000 people	1,000 people	--	6.52	2.53	9/39
School Health	181 children	168 children	10/39	94.92	14.01	1/39
Other	1,000 people	1,000 people	--	0	2.32	37/39

Demand for RNs in Chautauqua County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Chautauqua County is projected to decline in the coming years, but the population age 65 and older will become a progressively larger proportion of the population (from about 16% to almost 19%). Despite this growth, however, Chautauqua County is projected to fall from the seventh most elderly population in the state to the 12th most elderly between 2005 and 2020.

Figure 48. Projected Population of Chautauqua County and Percent Age 65 and Older



Demand for inpatient hospital and nursing facility services is projected to increase as the population of Chautauqua County ages, but demand for other services is projected to decline as the population decreases. Although growth is expected, Chautauqua County ranks in the lowest

five counties for projected growth in inpatient days, nursing facility residents, and home health visits.

Table 56. Projected Demand for Services and Annual Growth Rate by Setting, Chautauqua County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	139,559	0.25%	0.69%	36/39
Hospital Emergency Department Visits	63,937	-0.21%	2.70%	31/39
Hospital Outpatient Days	372,562	-0.06%	0.43%	34/39
Nursing Facilities	1,225	0.23%	0.92%	35/39
Home Health	48,828	-0.30%	0.49%	36/39
Non-Hospital Ambulatory Care	466,350	-0.04%	0.47%	33/39
Nursing Education	42	-0.31%	-0.29%	26/39
Public Health	134,345	-0.21%	0.22%	31/39
School Health	23,789	-0.34%	-0.22%	17/39
Other	134,345	-0.21%	0.22%	31/39

The dramatic projected decline in RN supply in Chautauqua County is a serious concern, even given the decreases in projected demand for many types of services. Hospital inpatient services are the most RN-intensive, and the projected increase in demand in this setting means that the RN supply in Chautauqua County would have to increase almost 3% between 2005 and 2020 in order to simply maintain current ratios. This is extremely unlikely if current rates of out-migration continue, and Chautauqua County is already below state and national benchmarks for ratios of RNs to units of service.

Table 57. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Chautauqua County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
953	2.69%	1,302	4.03%	1,466	57.97%	1,939	108.94%	1,021	7.14%

Erie County

Supply. Erie County's estimated base year RN population was 9,999 RNs in 2005. RNs in Erie County are comparable in age to those statewide. An estimated 52% of RNs working in Erie County are diploma/ADN nurses (compared to 39% statewide), while 36% are BSNs (compared to 27% statewide), and 12% have a MSN or doctorate (versus 18% statewide).

Table 103. Selected Characteristics of RNs, Erie County and New York

	Erie County	New York	Rankings
Employed RNs	9,999	165,124	6/39
Median Age	47	46	--
% 55+	14.0%	16.9%	28/39
% Diploma/ADN	52.2%	39.4%	21/39
% BSN	35.8%	43.0%	18/39
% MSN	12.0%	17.6%	24/39
% in Hospitals	54.1%	64.1%	26/39

About 54% of RNs in Erie County are employed in hospitals (versus 64% statewide). An estimated 18% work in non-hospital ambulatory care (compared to 11% statewide), and an estimated 13% percent work in nursing facilities (versus 10% statewide).

The vast majority of the RNs working in Erie County (93%) live in the county, while 5% percent come from Niagara County, and the remainder comes from Genesee/Orleans, Allegany/Cattaraugus, Livingston/Wyoming, or Chautauqua counties. An estimated 499 RNs per year move into the areas that supply Erie County with RNs, and an estimated 468 of these RNs will work in Erie County. At the same time, an estimated 652 RNs who work in Erie County will relocate out of Erie County supply areas (6.5% of the RN workforce).

Table 104. Location of Residence of RNs Employed in Erie County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Erie County RN Supply

Erie Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Erie	In-migrants to Erie workforce	Out-migrants from Erie workforce
Allegany/Cattaraugus	0.6%	0	0	9.2%	0	0
Chautauqua	0.1%	0	0	16.0%	0	0
Erie	93.0%	499	694	93.8%	468	651
Genesee/Orleans	0.7%	0	0	8.4%	0	0
Livingston/Wyoming	0.4%	0	21	5.4%	0	1
Niagara	5.2%	0	0	31.1%	0	0
		499	715		468	652

Between 2005 and 2006, an estimated 477 new RNs graduates entered the Erie County workforce. The number of new graduates entering the workforce is expected to decline, however, as the population of working-age women declines. Attrition of existing RNs due to death, disability, or retirement was estimated at 174 RNs in 2005-06 (1.7% of the workforce), but this is projected to grow to 3.6% as the workforce ages. The Erie County RN workforce is expected to experience growth until 2010, and slow, steady declines thereafter. Between 2005 and 2020, the RN supply in Erie County may be reduced by 4%.

Table 105. Projected Components of RN Supply Change, Erie County, 2005-2020

Erie Co.	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	9999	10126	10224	10297	10338	10357	10348	10324	10272	10204	10132	10050	9971	9883	9791	-2%
In-migration	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	0%
Out-migration	652	660	667	671	674	675	675	673	670	665	661	655	650	644	638	-2%
Net migration	-185	-193	-200	-204	-207	-208	-208	-206	-203	-198	-194	-188	-183	-177	-171	-7%
Graduates	477	472	467	462	453	448	448	443	439	439	434	434	429	429	424	-11%
Foreign	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	0%
Attrition	174	190	203	226	236	258	273	299	312	321	331	333	344	352	355	104%
Total	10126	10224	10297	10338	10357	10348	10324	10272	10204	10132	10050	9971	9883	9791	9698	-4%

This supply projection (equating to an average annual growth rate of –0.3%) may be overly optimistic given that declines of 1.7% per year were estimated for the RN supply of Erie County between 2000 and 2005-06.

Table 106. Relative Rankings of Key Components of Supply Projections, Erie County

	Erie Ranking
% of resident RNs working in county	5/39
% of RN workforce that lives in county	5/39
In-migration	14/39
Out-migration	5/39
Net migration	32/39
Projected attrition, 2020	23/39
Projected supply growth, 2005-2020	32/39

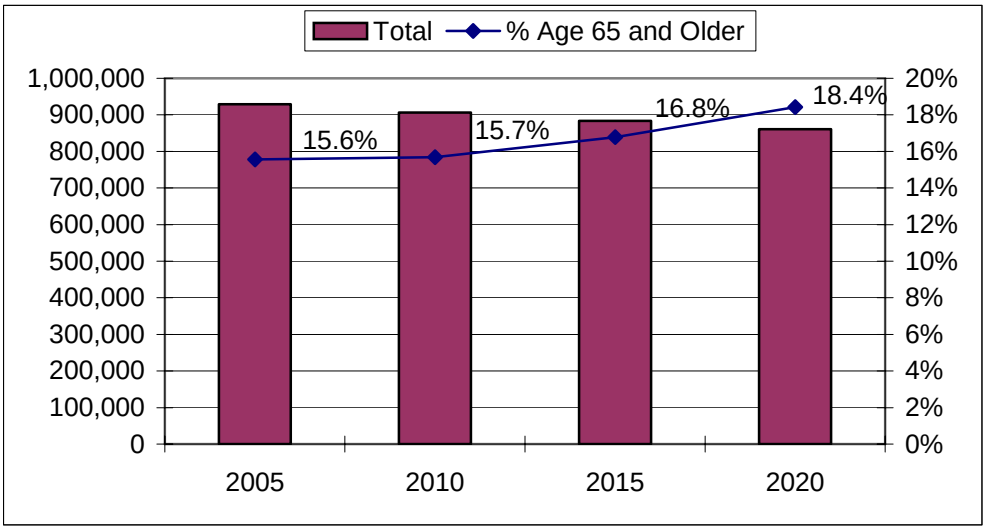
Demand. The use of hospital inpatient services per capita in Erie County is high, probably because of an influx of patients to Buffalo hospitals from surrounding counties. RN staffing per unit of service tends to be lower in Erie County than state averages, however, especially in hospital inpatient and home health settings.

Table 107. Demand for Services per 1,000 Population and RNs per Unit of Service, Erie County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Erie County	New York	Rankings	Erie County	New York	Rankings
Hospital Inpatient Days	1,298 inpatient	946 inpatient days	6/39	3.98	4.78	25/39
Hospital Emergency Department Visits	334 ED visits	397 ED visits	24/39	1.41	1.55	24/39
Hospital Outpatient Days	2,202 visits	2,215 visits	21/39	0.08	0.15	27/39
Nursing Facilities	6.8 residents	5.9 residents	18/39	0.20	0.14	8/39
Home Health	363 visits	320 visits	11/39	0.66	1.07	26/39
Non-Hospital Ambulatory Care	3,372 visits	3,233 visits	11/39	0.57	0.28	6/39
Public Health	1,000 people	1,000 people	--	2.86	2.53	24/39
School Health	168 children	168 children	24/39	24.54	14.01	13/39
Other	1,000 people	1,000 people	--	3.33	2.32	12/39

Demand for RNs in Erie County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Erie County is projected to decline markedly in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 16% to over 28%). Erie County is currently 11th highest in the state for the percentage of the population age 65 and older, but is expected to fall to 14th by 2020.

Figure 49. Projected Population of Erie County and Percent Age 65 and Older



The population of Erie County is projected to decline by about one-half a percent per year between 2005 and 2020, so demand for health care services is also projected to decline. Due to the aging of the population, however, demand for hospital inpatient and nursing facility services will not decline nearly as fast as the size of the population. Still, growth in demand for hospital

inpatient services is projected to be the lowest in the state. Erie County also ranks among the bottom five county groups in low growth of demand for many other services.

Table 108. Projected Demand for Services and Annual Growth Rate by Setting, Erie County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	1,205,721	-0.03%	0.69%	39/39
Hospital Emergency Department Visits	311,494	-0.55%	2.70%	37/39
Hospital Outpatient Days	1,964,109	-0.29%	0.43%	38/39
Nursing Facilities	6,308	-0.06%	0.92%	37/39
Home Health	315,138	-0.47%	0.49%	38/39
Non-Hospital Ambulatory Care	3,001,810	-0.31%	0.47%	38/39
Nursing Education	424	-0.78%	-0.29%	34/39
Public Health	863,588	-0.51%	0.22%	37/39
School Health	135,274	-0.98%	-0.22%	35/39
Other	863,588	-0.51%	0.22%	37/39

Despite projected declines in demand, Erie County may have difficulty even maintaining current ratios of RNs. RN supply is projected to decline slightly more quickly than the projected decline in demand (4% versus 3%). It would require a decline of 5% to bring Erie County's ratios down to those of New York overall, but would require a 7% increase to fill all hospital vacancies and a 10% increase to bring ratios up to national averages. At best, Erie County may maintain better ratios than the state overall, but may not be able to maintain its current levels of staffing.

Table 109. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Erie County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
9,699	-3.0%	9,484	-5.2%	11,044	10.05%	14,725	47.3%	10,655	6.6%

Niagara County

Supply. Niagara County's estimated base year RN population was 1,109 RNs in 2005. RNs in Niagara County are slightly younger than RNs statewide (with a median age of 45 versus 46), and are much less likely to be older than age 55 (10% versus almost 17% statewide). An estimated 54% of RNs working in Niagara County are diploma/ADN nurses (compared to 39% statewide), while 35% are BSNs (compared to 43% statewide), and 12% have a MSN or doctorate (versus 18% statewide).

Table 167. Selected Characteristics of RNs, Niagara County and New York

	Niagara County	New York	Rankings
Employed RNs	1,109	165,124	25/39
Median Age	45	46	--
% 55+	10.0%	16.9%	35/39
% Diploma/ADN	53.8%	39.4%	18/39
% BSN	34.7%	43.0%	19/39
% MSN	11.5%	17.6%	27/39
% in Hospitals	50.9%	64.1%	30/39

About 51% of RNs in Niagara County are employed in hospitals (versus 64% statewide). An estimated 10% of Niagara County RNs work in non-hospital ambulatory care (compared to 11% statewide), 11% percent work in nursing facilities (versus 10% statewide), and 7% work in home health (compared to 4% statewide).

Most of the RNs working in Niagara County (82%) live in the county, while 18% come from Erie County. An estimated 499 RNs per year move into the areas that supply Niagara County with RNs, but only an estimated 1 of these RNs will work in Niagara County. At the same time, it's estimated that about 1 RN who work in Niagara County will relocate out of Niagara County supply areas.

Table 168. Location of Residence of RNs Employed in Niagara County, Residential Migration Patterns, and Estimated Effects of Residential Migration on Niagara County RN Supply

Niagara Suppliers	% from supplier	In-migrants to supplier	Out-migrants from supplier	% of resident RNs commuting to Niagara	In-migrants to Niagara workforce	Out-migrants from Niagara workforce
Erie	17.7%	499	694	0.2%	1.0	1.4
Niagara	82.3%	0	0	54.5%	0.0	0.0
		499	694		1.0	1.4

Between 2005 and 2006, an estimated 53 new RNs graduates entered the Niagara County workforce. The number of new graduates entering the workforce is expected to decline somewhat as the population of working-age women wanes. Attrition of existing RNs due to death, disability, or retirement was estimated at 20 RNs in 2005-06 (1.8% of the workforce), but this is projected to grow to 5.1% of the workforce as the workforce ages. Attrition will be a serious challenge for the RN workforce in Niagara County. Overall supply growth between 2005 and 2020 is projected at about 6% (or an average of 0.6% growth annually). Although slow growth, this is an improvement over the 2000-2005 period, when Niagara County is estimated to have experienced a 3% annual decline in the supply of RNs.

Table 169. Projected Components of RN Supply Change, Niagara County, 2005-2020

Niagara Co.	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	
Base	1,109	1,142	1,172	1,198	1,220	1,239	1,254	1,265	1,270	1,271	1,268	1,262	1,253	1,241	1,226	11%
In-migration	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0%
Out-migration	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	0%
Net migration	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	34%
Graduates	53	52	51	51	50	49	49	49	48	48	48	47	47	47	47	-12%
Foreign	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
Attrition	20	22	25	28	31	34	37	42	47	50	53	55	58	61	63	222%
Total	1,142	1,172	1,198	1,220	1,239	1,254	1,265	1,270	1,271	1,268	1,262	1,253	1,241	1,226	1,209	6%

Table 170. Relative Rankings of Key Components of Supply Projections, Niagara County

	Niagara County Ranking
% of resident RNs working in county	30/39
% of RN workforce that lives in county	16/39
In-migration	36/39
Out-migration	36/39
Net migration	22/39
Projected attrition, 2020	6/39
Projected supply growth, 2005-2020	27/39

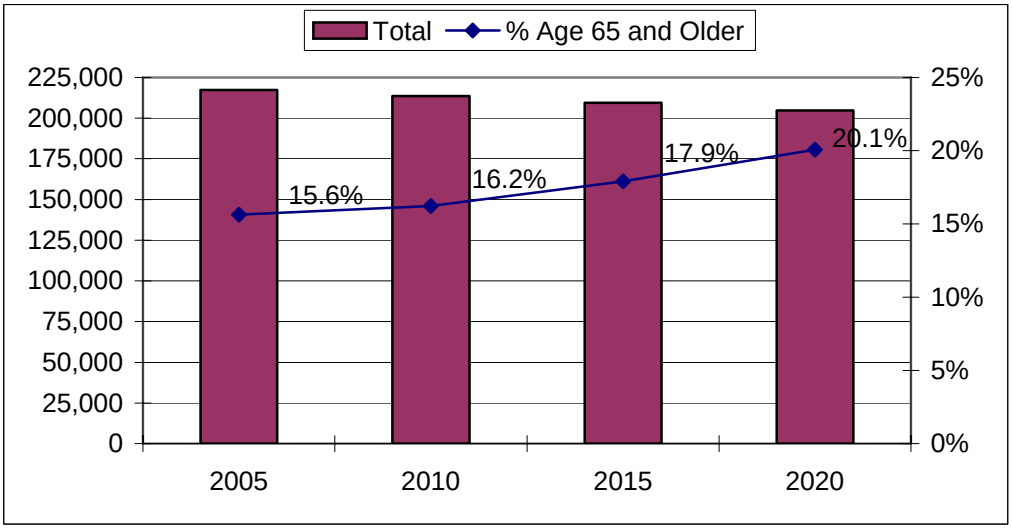
Demand. Niagara County has relatively few inpatient days or non-emergency outpatient visits compared to the statewide average, probably because of its proximity to the large medical centers in the city of Buffalo in neighboring Erie County. Emergency department visits are, however, somewhat higher than the statewide average. There are also many more nursing facility residents per capita, and somewhat more home health visits. RN staffing in Niagara County is low in most settings, particularly hospital outpatient services and nursing facilities.

Table 171. Demand for Services per 1,000 Population and RNs per Unit of Service, Niagara County

	Units of Service per 1,000 Population			RNs per Unit of Service		
	Niagara County	New York	Rankings	Niagara County	New York	Rankings
Hospital Inpatient Days	644 inpatient days	946 inpatient days	28/39	2.81	4.78	32/39
Hospital Emergency Department Visits	436 ED visits	397 ED visits	16/39	1.50	1.55	33/39
Hospital Outpatient Days	1,808 visits	2,215 visits	27/39	0.08	0.15	28/39
Nursing Facilities	7.3 residents	5.9 residents	10/39	0.08	0.14	29/39
Home Health	369 visits	320 visits	6/39	1.01	1.07	15/39
Non-Hospital Ambulatory Care	3,393 visits	3,233 visits	6/39	0.15	0.28	31/39
Public Health	1,000 people	1,000 people	--	4.37	2.53	15/39
School Health	164 children	168 children	28/39	37.99	14.01	6/39
Other	1,000 people	1,000 people	--	0	2.32	38/39

Demand for RNs in Niagara County may change as a consequence of changing demand for services (by growth of and aging in the population, for example), changing staffing patterns (higher acuity leading to more RNs per patient, for example), or both. The population of Niagara County is projected to decline in the coming years, and the population age 65 and older will become a progressively larger proportion of the population (from about 16% to 20%). The county ranked ninth highest in the percentage of older adults in 2005, and is expected to rank seventh highest by 2020.

Figure 50. Projected Population of Niagara County and Percent Age 65 and Older



Demand for most health care services is projected to decline in Niagara County as the population declines. Nursing facility residents and hospital inpatient days are projected to increase, however, with the aging of the population. Niagara County ranks among the bottom five county groups in low RN staffing for hospital inpatient and emergency departments, nursing education, public health, school health, and other settings.

Table 172. Projected Demand for Services and Annual Growth Rate by Setting, Niagara County

	Projected Demand for Services by Setting, 2020	Projected Annual Rate of Growth in Demand, 2005-2020	Projected Annual Growth Rate, New York	Ranking
Hospital Inpatient Days	145,265	0.24%	0.69%	37/39
Hospital Emergency Department Visits	89,096	-0.42%	2.70%	35/39
Hospital Outpatient Days	389,964	-0.06%	0.43%	33/39
Nursing Facilities	1,757	0.63%	0.92%	27/39
Home Health	80,080	-0.02%	0.49%	27/39
Non-Hospital Ambulatory Care	731,708	-0.06%	0.47%	34/39
Nursing Education	46	-0.93%	-0.29%	37/39
Public Health	204,939	-0.40%	0.22%	35/39
School Health	30,301	-1.09%	-0.22%	37/39
Other	304,939	-0.40%	0.22%	35/39

RN supply in Niagara County is expected to continue to grow between 2005 and 2020, and the county should be able to maintain current ratios of RNs to units of service. It is unlikely, however, that Niagara County will achieve ratios approaching statewide averages, and substantial hospital RN vacancies in the county are likely to continue.

Table 173. Projected Changes in RN Supply Necessary to Meet Selected Benchmarks of Adequate Supply, Niagara County

Current Ratio		Equal Distribution		National Ratio		Ideal Ratio		Vacancy-Based	
#	% Change	#	% Change	#	% Change	#	% Change	#	% Change
1,137	2.5%	1,600	44.3%	1,742	57.1%	2,297	107.1%	1,288	16.1%

V. Next Steps: Setting a Future Research Agenda

This report should be a point of departure for two very important lines of continuing research. The first relates to improving, refining, and validating the current model. This report is very preliminary given the known and substantial limitations of the current data sources and should be regarded as a first step. The second line of continuing research is focused on better understanding the various components of the model at the substate level.

A. Further Development of the Current Model

Use of three-year averages. The immediate next step in further developing the model is to check the data currently used against three-year averages from the American Community Survey (ACS). The 2007 ACS data should be released in October 2008. The use of this data averaged together with the 2005 and 2006 ACS should produce more accurate estimates in small areas. For example, there are four county groups (Oswego County, Rensselaer County, Columbia/Greene counties, and Fulton/Montgomery counties) that have estimates of the RN population based on fewer than 20 RNs, which is clearly not sufficient. Another six county groups have data based on at least 20, but fewer than 30 RNs. While the former group may still not have adequate numbers with the addition of another year of data, the latter group should yield reasonable estimates of RN age, education, commuting and migration, and employment setting.

Use of re-registration data. By the end of 2008, preliminary data on roughly one-third of the state's licensed RNs should be available from the Center's RN re-registration survey. This should provide the most accurate picture of the state's RNs because of the large numbers – when the survey's three-year cycle is complete at the end of 2010, every licensed RN in the state should have received a survey. A similar survey of physicians registers a response rate close to 90%, and a comparable response rate is anticipated for RNs. These data should be more reliable than the three-year average of ACS data discussed above, but comparisons of the three-year average of ACS and the re-registration data should provide important information on whether or not ACS data are a viable foundation for supply and demand forecasting in states that do not collect their own detailed data.

Confidence intervals and significance testing. Because of concerns related to the quality of the available data, the next report issued should include confidence intervals around most of the estimates. Significance testing to determine whether differences between counties and the state or changes over time are statistically meaningful could also enhance the quality of future work.

Adjustments for hospital-based versus non-hospital-based ambulatory care. The way the current model is estimated, there is a potential for doublecounting and thus overestimation of demand for ambulatory services. Hospital-based outpatient visits are calculated based on actual patterns of service utilization by county, while non-hospital based ambulatory visits are estimated based on the characteristics of the population. But these variables are not necessarily independent of one another – higher actual use of hospital-based outpatient services might mean lower use of non-hospital based outpatient services than one would predict based on the demographics of the population. Currently, this is not adjusted for. Future iterations of the model

should include some attempt to account for this, perhaps by using a ratio based on the ratio of physicians in that county practicing in hospital-based to non-hospital ambulatory settings.

Adjustments for acuity. All inpatient days in the current iteration of the model are treated equally in determining the need for RN staffing. Some of the areas that appear to be faring best as far as supply and demand, however, are home to large medical centers that would be expected to receive a disproportionately large share of critically acute cases. Future versions of the model should include an adjustment for patient acuity, even if this takes the simple form of an adjustment for the percentage of hospital beds in the county that are ICU or CCU beds.

Alternate assumptions for nursing education. Currently the model predicates future graduations and future demand for nursing faculty on the number of women age 18 to 44, and assumes that they will go into nursing school at current rates. Current nursing school entries are constrained, however, by the availability of nursing faculty and clinical sites, with many nursing schools in New York reporting that they turn away qualified candidates each year. Thus, if the number of women age 18 to 44 in a population declines this may not necessarily reduce the number of nursing students if the availability of nursing faculty, clinical sites, and other nursing school infrastructure remains the same; the schools will simply be able to increase their acceptance rate of qualified applicants. It is not clear how to adjust effectively for this, however, when the availability of nursing faculty is one of the unknowns the model seeks to predict. Serious thought needs to be given to the issue in the next version of the model.

Refined geographic migration data. The current model forecasts out-migration by carrying forward the percentage of RNs in a given area who are currently migrating out (e.g., if out-migration in the base year is 2% of the RN population, it is assumed that out-migration in subsequent years will continue to be 2%, accounting for projected changes in the age and education level of the RN workforce). In contrast, in-migration is forecast by applying the raw number of in-migrations and carrying this forward (e.g., if in-migration in the base year is 109 RNs, it is assumed that in-migration in subsequent years will continue to be 109 RNs, regardless of how the size of the RN workforce within that county changes). Because the groups from which in-migrants come are RNs who live outside the area, it does not make sense to standardize in-migration as a percentage of RNs who live inside the area.

At the same time, however, potential in-migrants to an area are not evenly distributed across all areas outside the area in question. RNs are probably more likely to migrate from adjacent counties or states than from the opposite coast, for example. Projected population changes in the counties or states that supply a given county with in-migrants should ideally be the foundation for projections of RN in-migration to that given county from those counties or states (similar to the way in-commuters were handled). This will be a time-consuming process to execute exactly because unlike the commuting analysis, the areas supplying in-migrants are not necessarily limited to those areas within commuting distance of New York.

Changing the assumptions. In the methodology section, this report discussed potential adjustments than can be made based upon changes in the demographics, economics, and health care environment of a county group, but the effects of these adjustments on the supply and

demand estimates of specific counties are not explored in the results section. Future work should explore alternate scenarios based on alternate assumptions, and the policy implications thereof.

Condition-based projections and new treatments. The most ambitious refinement that can be made to the model is a change from estimates of demand based on population age and gender to estimates of demand based on the estimated health conditions of the population. On the surface this seems like a great deal of work to make a relatively minor distinction – after all, gender and age relate to demand for services in large part because they are an efficient proxy for particular conditions and the utilization associated with those conditions. Put briefly, age matters because older people are more likely to have chronic conditions such as hypertension, diabetes, cancer, heart disease, and COPD, and these conditions require more use of health care services.

Age is only an efficient proxy for utilization, however, insofar as age-specific utilization rates do not change. Historically this has not been true. We know that today people age 65 and older are using fewer hospital services than in the past – in 2004, for example, the national hospital inpatient utilization rate was 1,405 days of care per 1,000 persons age 65-74, compared to 3,147 days per 1,000 in this age group in 1980. At the same time, use of both hospital and non-hospital ambulatory services per capita rose among people in this age group.

Some of this change undoubtedly relates to changes in the way services are provided, with a greater shift towards community-based care. But this shift was partially enabled by new treatments and technologies that allowed some procedures that once required inpatient stays to be done instead on an outpatient basis. And the shift was also partially enabled by changes in the prevalence of certain conditions among people in this age group. The baby boom generation has stayed healthier for longer than any other generation in U.S. history. Yet recent trends, such as rising rates of obesity and diabetes, hint that life expectancy for certain populations are beginning to decline – and the corollary to this is that these populations may develop some chronic conditions (and need a greater intensity of services) earlier in their lives than their parents did. At the same time, however, other chronic conditions such as hypertension have become less problematic even as they become more prevalent due to the introduction of new pharmaceutical treatments.

In order to remain on top of changes in the age-specific prevalence of certain conditions and on the types of services those conditions require, it may be worthwhile to try to incorporate data on changing prevalence rates for key conditions and to develop indices that calculate how changes in the prevalence of these key conditions will affect demand for services such as hospital inpatient days or physician office visits based on the treatments currently in use for those conditions. For example, if you know that diabetes is increasing by X% in 45-64 year olds, and that diabetics in this age group are increasingly having procedure Y (associated on average with two outpatient visits and four home health visits) and less likely than in the past to have procedure Z (associated on average with a three-day inpatient stay), this could allow for refinement of demand estimates going forward.

Actually determining such adjustments to the model would be a complex, multistage process. Not only would it be necessary to perform some original analyses, but it would also be critical to complete a rigorous literature review. Health economists examine many of these issues, but

usually for a single specific condition, treatment, or type of service at a time. Pulling together various published work and deciding how to incorporate them into estimates of RN demand will require a serious commitment of time and resources. It is suggested that as a first step, the conditions and procedures that seem to require the most health care resources for each age group be identified.

B. Research on Components of the Model

Commuting patterns of RNs. It is clear from the data used in the development of the model that RN commuting is a key factor in supply for some counties. It is not clear, however, what determines RN commuting patterns. Presumably, RNs are most likely to work where they live if RN wages are high and housing costs are low. When RNs commute from one area to another, they are likely to commute from an area where RN wages and housing costs are both low to an area where RN wages and housing costs are both high. There are certainly other factors involved, however. The number of RN positions relative to the number of RNs in a county, travel time, whether the RN has children in the home, and even crime rates may effect commuting decisions. From the perspective of forecasting supply and demand these things may be irrelevant so long as there is data on actual commuting patterns. Understanding the predictors of these patterns may add little to the analysis. On the other hand, however, there are important policy implications to understanding why certain areas are more attractive to in-commuting RNs. Such knowledge can assist with local community planning.

Migration of RNs. Most of the key points about RN commuting also apply to RN migration. For some counties, in-migration or out-migration of RNs is the key driver behind increases or declines in supply. Again, better understanding of what makes areas attractive places for RNs to settle can benefit local communities in their efforts to recruit RNs from outside their immediate environs.

Distribution of services. It is also clear from the data used in the models that some counties have a health care system strongly based upon hospital services, while others have a more community-based health care system. Certainly factors such as rural versus urban locale are related, but there may also be relationships between the characteristics of a given county and the characteristics of its neighbors. For example, a rural county that borders another rural county that hosts a large community hospital may offer fewer hospital services than a county with the same characteristics surrounded by other counties with limited hospital services. The distance from a large city with a major medical center may also be a factor. Understanding the contributors to the hospital/community mix of services can assist policymakers and health planners in determining the most efficient and cost-effective mix of services in their community. It may also assist local RN education programs in preparing their students for nursing in the types of settings that employ RNs in their community.

Patient commuting. Patient commuting patterns relate directly to the mix of services needed in a community, and therefore the number of RNs needed. Cases like Albany County and New York County that have extremely high ratios of services to population illustrate the importance of patient commuting. The characteristics of the population living in a community are much less

important to local health planning than the characteristics of the population seeking care in that community, and the two populations may not be the same.

It is not easy to identify causal relationships between patient commuting and availability of services. Some counties may have more out-commuting of their residents to seek health care services because the services in that county are limited. Other counties may offer limited services because they are adjacent to a county with an extremely well developed health care system and most of their residents go there for care.

Much state-level health workforce planning relates to trying to even out the distribution of health care providers through various state and federal programs. It is important to these programs to understand where patients go for care and why.

Workforce aging. There appears to be dramatic variation in the age of the RN workforce. Counties with an older workforce will generally be at higher risk of shortage than those with a younger workforce. Some factors related to the age of the RN workforce are the same as those related to the age of the population as a whole – for example, urban areas tend to be younger and rural areas tend to be older. Others, however, may be specific to RNs. The presence or absence of RN education programs may be one factor. In-migration may be another factor – younger RNs are more likely to migrate, so an area with much RN in-migration may have a younger RN workforce. An area with few young RNs relative to the rest of the state may be in this position because they are not producing young RNs, they are not attracting young RNs, or they are losing their young RNs to more attractive areas. Understanding these trends may assist with developing policies to counteract the aging of the RN workforce at a local level.

Appendix A

Validation. There are a couple of ways to assess how well the base numbers reflect the actual distribution of RNs in the state. One is to examine licensure statistics from the New York State Department of Education (NYSED). Professional licensure statistics notoriously overcount active practitioners because many people who have worked hard to attain professional credentials tend to hold onto them even when they are no longer practicing. But there is little reason to believe that the overcount will be substantially greater in some areas of the state than others, meaning that the distribution of licensed RNs should reasonably reflect the distribution of active RNs (e.g., if roughly 5% of licensed RNs in the state live in Westchester County, it is likely that roughly 5% of active RNs live in Westchester County, even if the actual counts are much different).

It should also be noted that these projections focus on the work locations of RNs, while licensure statistics are based on the mailing address provided by RNs, which will in most cases be a home address. Still, because the ACS provides data on both the home and work locations of respondents, if the distribution of home locations in the ACS realistically mirrors the distribution of addresses given to NYSED by licensed RNs, it should indicate that the ACS is a reasonable data source for RN information, including work location.

As observed in Table A-1, below, the similarity between the mailing addresses of licensed RNs as reported to NYSED and the county of residence reported by individuals who self-identified as RNs (both active and non-active) in the ACS is notably strong, and the two estimates might be even closer to one another if an average of 2005 and 2006 NYSED data was used. These results support that the ACS is a viable source of data on where RNs live. If there is no evidence of systematic geographic bias in where RNs in the ACS live, there is no reason to suspect such bias exists in where RNs work in the ACS. This supports the possibility of using ACS data as the foundation of supply projections in other states and in the future.

Table A-1. Comparison of the Geographic Distribution of RN Residence in the ACS and of RN Mailing Address in NYSED Licensure Statistics

	ACS Distribution, 2005-2006	NYSED Distribution, 2007
Albany	2.1%	2.1%
Allegany/Cattaraugus	0.5%	0.6%
Bronx	4.8%	3.8%
Broome/Tioga	1.0%	1.3%
Chautauqua	0.5%	0.6%
Chemung/Schuyler	0.5%	0.7%
Chenango/Cortland	0.6%	0.5%
Clinton/Essex/Franklin/Hamilton	1.2%	1.1%
Columbia/Greene	0.8%	0.8%
Delaware/Otsego/Schoharie	0.9%	0.8%
Dutchess	1.7%	2.1%
Erie	6.1%	6.3%
Fulton/Montgomery	0.7%	0.6%
Genesee/Orleans	0.5%	0.6%
Herkimer/Oneida	1.9%	2.0%
Jefferson/Lewis	0.6%	0.7%
Kings	10.1%	7.4%
Livingston/Wyoming	0.5%	0.5%
Monroe/Wayne	4.6%	4.9%
Nassau	8.6%	9.9%
New York	4.2%	4.6%
Niagara	1.1%	1.4%
Onondaga/Madison/Cayuga	3.8%	4.3%
Ontario	1.0%	0.8%
Orange	1.9%	2.5%
Oswego	0.5%	0.6%
Queens	10.2%	8.5%
Rensselaer	1.0%	1.1%
Richmond	3.1%	3.0%
Rockland	2.5%	2.7%
Saratoga	1.3%	1.6%
Schenectady	0.7%	1.1%
Seneca/Tompkins	0.5%	0.5%
St. Lawrence	0.8%	0.7%
Steuben/Yates	0.7%	0.7%
Suffolk	9.7%	9.2%
Sullivan/Ulster	1.8%	1.5%
Warren/Washington	0.8%	0.8%
Westchester/Putnam	6.2%	6.5%

Another source of RN data to which ACS data can be compared is data collected by the Bureau of Labor Statistics (BLS). There are a couple of reasons why BLS data are of limited use as a direct source of base data. First, BLS data count positions rather than individuals, and the two

may not be the same (i.e., one nurse who works two jobs). Secondly, BLS data on employment by occupation are not available at the county level. They are, however, available at the metropolitan area level, and metropolitan areas are aggregations of counties, so comparable geographical areas can be constructed in some cases for comparison purposes[10].

As shown in Table A-2, below, the distribution of RNs jobs is similar to the distribution of RNs by county of work in many cases. The biggest exception in terms of percentages is the Long Island counties of Nassau and Suffolk, which contain 13.9% of the RN jobs in the state, but are the place of work for an estimated 15.8% of RNs. There is also a substantial difference between the estimated number of RNs jobs in the counties that constitute the New York-White Plains-Wayne, NY-NJ Metropolitan Division and the weighted number of RNs in the ACS who report working in those counties. (These raw numbers cannot be presented as a percentage of the total for New York because the area includes three New Jersey counties.)

Table A-2. Comparison of the Geographic Distribution of RN Jobs from BLS and Work Location of RNs from ACS

Area name	Employment	Counties	RNs Employed, 2005-06 Average
Binghamton, NY	2,110 (1.3%)	**Broome/Tioga**	1,972 (1.2%)
Buffalo-Niagara Falls, NY	12,230 (7.4%)	**Erie/Niagara**	11,219 (6.7%)
Glens Falls, NY	840 (0.5%)	**Warren/Washington**	1,078 (0.6%)
Nassau-Suffolk, NY Metropolitan Division	22,940 (13.9%)	**Nassau/Suffolk**	26,415 (15.8%)
New York-White Plains-Wayne, NY-NJ Metropolitan Division	96,720 (N/A)	**Bergen, NJ; Hudson, NJ; Passaic, NJ; Bronx, Kings, New York, Putnam, Richmond, Rockland, Westchester**	88,791 (N/A)
Poughkeepsie-Newburgh-Middletown, NY	5,270 (3.2%)	**Dutchess/Orange**	5,273 (3.2%)
Utica-Rome, NY	2,600 (1.6%)	**Herkimer/Oneida**	3,163 (1.9%)
New York	164,970	**New York**	167,581

Finally, a check on the total number of RNs in the state is available from the 2004 RNSS, which represents an adequate source of state-level (although not substate) data. According to the RNSS, there were an estimated 172,239 RNs working in New York in 2004 (compared to 167,581 from the ACS), and an estimated 210,569 RNs (including those not active) living in New York (compared to 192,201 from the ACS). Clearly, the ACS is an underestimate relative to the RNSS, but which one is closer to reality? It is worth noting that the 210,569 licensed RNs estimated to be living in New York in 2004 by the RNSS substantially exceeds the 192,987 RNs who were licensed in New York and using a New York mailing address in 2004 according to NYSED. It is possible that the remainder includes some RNs who are living in New York and commuting across state lines, and are not licensed in New York, but by the estimates in the 2004 RNSS itself, only 2,122 RNs who live in New York are not licensed in New York.

[10] The exception is when county groups are constructed from PUMAs that combine counties from two different metropolitan areas or from a metropolitan and non-metropolitan county.

In sum, Table A-3 shows that the ACS is a closer reflection of licensed resident supply (192,201 compared to 192,987) than the RNSS (210,569 compared to 192,987). Furthermore, the ACS is also a closer reflection of RN employment (167,581 compared to 164,970) than the RNSS (172,239 versus 164,970).

Table A-3. Comparison of Estimates of Total Number of RNs Residing or Employed in New York

	RN Residents	RN Employment
ACS, 2005-2006 Average	192,201	167,581
RNSS, 2004	210,569	172,239
BLS Occupational Employment Statistics, 2006	--	164,970
BLS Occupational Employment Statistics, 2005	--	164,370
BLS Occupational Employment Statistics, 2004	--	165,800
NYSED Licensure Statistics, 2005	193,079	--
NYSED Licensure Statistics, 2004	192,987	--

Appendix B

Validation. There are a couple of ways to determine whether ACS estimates of RN migration and commuting patterns are reasonable. First, migration and commuting patterns for RNs can be compared to migration and commuting patterns for the general population. These patterns will not always coincide, but generally areas that are attractive to in-migrants and in-commuters overall should tend to be attractive to migrating and commuting RNs. If the data show a mass exodus of RNs from a county with a population boom, or a rush of RNs into a county that is steadily losing population, there is reason to suspect substantial levels of random error in the ACS RN data. Due to small sample sizes, commuting and migration patterns are based on averages of the 2005 and 2006 ACS data. When 2007 ACS data become available, a three-year average should be used to further minimize the issue of random error.

As shown below in Table A-4, commuting patterns of RNs do not seem dramatically different from commuting patterns of workers overall. The numbers are not identical, but they would not be expected to be. There are a few counties where there seem to be real discrepancies between RNs patterns and the patterns of other workers. Rensselaer County is a good example of this.

Residential migration patterns are also relatively similar, but again, there are some significant discrepancies for some areas. RNs living in Albany County, for example, were about twice as likely as Albany County residents overall to report that they had moved to the county in the past year.

Table A-4. Comparison Between Commuting and Migration Patterns of RNs and All Employed Persons

	% RNs in-commute	% all employed in-commute	% RNs out-commute	% all employed out-commute	% RNs move in	% all employed move in	% RNs move out	% all employed move out
Albany	45.7%	45.6%	15.0%	20.5%	16.0%	8.3%	4.0%	9.2%
Allegany/Cattaraugus	24.3%	14.9%	36.9%	27.9%	5.2%	5.3%	0.0%	4.4%
Bronx	51.8%	37.0%	43.9%	55.3%	4.1%	3.5%	7.5%	5.7%
Broome/Tioga	14.9%	12.3%	5.5%	10.6%	1.8%	4.5%	6.0%	3.9%
Chautauqua	24.9%	10.7%	12.7%	10.5%	0.0%	4.0%	0.0%	2.8%
Chemung/Schuyler	37.4%	20.7%	23.1%	20.9%	0.0%	5.5%	4.8%	3.1%
Chenango/Cortland	18.1%	22.4%	47.2%	29.2%	9.5%	3.7%	0.0%	4.4%
Clinton/Essex/Franklin/ Hamilton	2.2%	7.2%	8.8%	6.6%	0.6%	4.8%	2.5%	5.0%
Columbia/Greene	8.4%	20.2%	20.6%	35.4%	8.4%	5.3%	0.0%	4.6%
Delaware/Otsego/ Schoharie	7.9%	17.5%	23.7%	18.7%	3.3%	5.2%	13.4%	7.1%
Dutchess	34.1%	22.2%	42.3%	30.1%	2.6%	6.2%	2.3%	4.3%
Erie	7.0%	11.8%	6.2%	6.1%	6.3%	13.1%	6.9%	0.0%
Fulton/Montgomery	8.4%	12.1%	42.8%	25.9%	0.0%	3.3%	0.0%	4.6%
Genesee/Orleans	35.0%	25.0%	42.9%	39.7%	3.5%	3.9%	0.0%	5.2%
Herkimer/Oneida	8.6%	11.1%	9.6%	10.0%	2.3%	5.0%	4.3%	2.4%
Jefferson/Lewis	6.5%	8.2%	10.9%	8.7%	3.0%	3.6%	2.9%	7.2%
Kings	32.2%	29.0%	29.6%	48.2%	0.5%	3.4%	7.1%	6.4%
Livingston/Wyoming	55.4%	28.7%	70.6%	43.0%	0.0%	7.5%	2.2%	5.4%
Monroe/Wayne	14.0%	11.8%	2.5%	6.2%	0.6%	3.3%	2.8%	3.9%
Nassau	35.7%	35.6%	40.6%	41.7%	5.1%	3.2%	4.4%	4.6%
New York	77.1%	69.1%	10.6%	15.5%	7.9%	7.8%	6.2%	7.2%
Niagara	17.7%	21.0%	45.5%	36.7%	0.0%	2.4%	0.0%	4.0%
Onondaga/Madison/ Cayuga	14.4%	14.0%	4.1%	8.7%	2.6%	3.7%	0.4%	41.0%
Ontario	25.2%	37.3%	19.1%	37.7%	7.0%	7.5%	0.9%	6.1%
Orange	32.7%	19.8%	46.9%	32.1%	6.5%	6.0%	0.0%	5.0%
Oswego	25.5%	16.3%	64.3%	43.9%	5.7%	5.1%	0.0%	4.7%
Queens	36.8%	34.8%	58.0%	57.4%	4.0%	4.4%	2.8%	5.0%
Rensselaer	66.9%	35.2%	75.3%	54.6%	1.6%	6.4%	11.4%	3.1%
Richmond	13.8%	18.4%	35.4%	53.2%	9.4%	3.1%	1.7%	4.2%
Rockland	29.6%	28.1%	55.4%	38.4%	4.3%	2.7%	1.5%	5.2%
Saratoga	31.7%	28.2%	67.5%	46.4%	4.0%	7.3%	6.4%	8.3%
Schenectady	49.0%	44.6%	33.2%	45.0%	4.9%	10.3%	5.7%	4.6%
Seneca/Tompkins	23.0%	25.8%	21.0%	15.8%	0.0%	7.1%	12.4%	11.9%
St. Lawrence	1.3%	5.8%	5.3%	11.3%	0.0%	2.3%	0.0%	6.6%
Steuben/Yates	34.7%	20.8%	54.7%	25.1%	2.1%	3.0%	1.0%	5.2%
Suffolk	4.3%	12.6%	20.4%	24.4%	5.9%	3.3%	1.8%	3.1%
Sullivan/Ulster	13.3%	14.0%	44.3%	28.2%	6.1%	6.0%	1.7%	4.2%
Warren/Washington	16.5%	20.8%	30.2%	27.7%	0.0%	5.7%	0.0%	6.0%
Westchester/Putnam	31.3%	30.8%	36.3%	35.2%	3.7%	11.5%	1.9%	0.0%

Some of the most striking discrepancies are likely due to random error based on small sample size, and will be reduced when a third year of data is introduced (enabling a three-year rather than a two-year average). Other discrepancies, however, may be due to the fact that the drivers of RN commuting and migration are not necessarily the same as the drivers of commuting and migration overall. For example, a hospital closure may lead to large out-migrations of RNs from the county, while residents who work in other industries may remain unlikely to migrate out.

Or an economically depressed county in which a hospital is the only large industry may draw a large number of in-commuting RNs, but few other in-commuters. One way to examine this possibility is to compare the patterns of RNs in the ACS data to the patterns of all those employed in the hospital industry. Because this is a larger group than RNs only, the estimates for hospital employees will be less affected by random error and should be a reliable baseline for comparison.

As shown in Table A-5, the discrepancies between the patterns of RNs and others are minimized in some counties when hospital workers rather than the workforce overall are used as the comparison group. Revisiting previous examples of suspect estimates, we see that in Rensselaer County hospital workers overall are highly likely to in-commute, lending credence to the very high estimate for RN in-commuting. Similarly, we see that in Albany County, hospital workers as a group are highly likely to have moved into supply areas in the past year, supporting the high estimate for RN in-migration.

Table A-5. Comparison Between Commuting and Migration Patterns of RNs and Hospital Employees

	% RNs in-commute	% hospital workers in-commute	% RNs out-commute	% hospital workers out-commute	% RNs move in	% hospital workers move in	% RNs move out	% hospital workers move out
Albany	45.7%	38.8%	15.0%	10.8%	16.0%	21.6%	4.0%	11.3%
Allegany/Cattaraugus	24.3%	22.2%	36.9%	38.9%	5.2%	0.0%	0.0%	0.0%
Bronx	51.8%	48.0%	43.9%	53.1%	4.1%	2.7%	7.5%	5.4%
Broome/Tioga	14.9%	18.9%	5.5%	4.6%	1.8%	3.5%	6.0%	2.6%
Chautauqua	24.9%	24.3%	12.7%	9.5%	0.0%	4.8%	0.0%	0.0%
Chemung/Schuyler	37.4%	14.1%	23.1%	21.2%	0.0%	0.0%	4.8%	6.5%
Chenango/Cortland	18.1%	12.3%	47.2%	52.2%	9.5%	2.7%	0.0%	5.1%
Clinton/Essex/Franklin/ Hamilton	2.2%	5.7%	8.8%	2.0%	0.6%	0.8%	2.5%	4.9%
Columbia/Greene	8.4%	25.8%	20.6%	51.0%	8.4%	7.3%	0.0%	20.8%
Delaware/Otsego/Schoharie	7.9%	8.6%	23.7%	17.6%	3.3%	3.7%	13.4%	13.9%
Dutchess	34.1%	13.3%	42.3%	37.4%	2.6%	11.8%	2.3%	3.3%
Erie	7.0%	9.2%	6.2%	4.9%	6.3%	11.6%	0.0%	0.0%
Fulton/Montgomery	8.4%	3.6%	42.8%	15.9%	0.0%	6.2%	0.0%	0.0%
Genesee/Orleans	35.0%	24.6%	42.9%	46.0%	3.5%	3.9%	0.0%	0.0%
Herkimer/Oneida	8.6%	16.1%	9.6%	10.5%	2.3%	11.2%	4.3%	0.5%
Jefferson/Lewis	6.5%	13.3%	10.9%	18.1%	3.0%	12.5%	2.9%	3.1%
Kings	32.2%	29.6%	29.6%	35.4%	0.5%	1.7%	7.1%	6.0%
Livingston/Wyoming	55.4%	33.5%	70.6%	54.9%	0.0%	7.5%	2.2%	8.1%
Monroe/Wayne	14.0%	8.8%	2.5%	6.1%	0.6%	3.6%	2.8%	5.3%
Nassau	35.7%	38.8%	40.6%	44.4%	5.1%	3.8%	4.4%	5.4%
New York	77.1%	70.9%	10.6%	19.2%	7.9%	7.0%	6.2%	7.0%
Niagara	17.7%	26.2%	45.5%	49.6%	0.0%	0.0%	48.1%	0.0%
Onondaga/Madison/Cayuga	14.4%	13.4%	4.1%	5.3%	2.6%	2.5%	0.4%	49.4%
Ontario	25.2%	40.0%	19.1%	18.6%	7.0%	11.6%	0.9%	0.6%
Orange	32.7%	37.5%	46.9%	49.6%	6.5%	12.0%	0.0%	5.4%
Oswego	25.5%	3.8%	64.3%	51.4%	5.7%	10.9%	0.0%	8.0%
Queens	36.8%	34.5%	58.0%	59.0%	4.0%	4.4%	2.8%	4.6%
Rensselaer	66.9%	59.8%	75.3%	82.0%	1.6%	10.9%	11.4%	14.3%
Richmond	13.8%	16.3%	35.4%	43.2%	9.4%	2.7%	1.7%	2.8%
Rockland	29.6%	26.9%	55.4%	49.1%	4.3%	5.1%	1.5%	9.8%
Saratoga	31.7%	15.0%	67.5%	70.7%	4.0%	4.2%	6.4%	8.3%
Schenectady	49.0%	55.8%	33.2%	40.0%	4.9%	6.4%	5.7%	4.2%
Seneca/Tompkins	23.0%	37.2%	21.0%	45.3%	0.0%	15.2%	12.4%	11.5%
St. Lawrence	1.3%	2.6%	5.3%	15.0%	0.0%	1.1%	0.0%	9.6%
Steuben/Yates	34.7%	27.7%	54.7%	26.9%	2.1%	5.9%	1.0%	1.4%
Suffolk	4.3%	7.0%	20.4%	21.4%	5.9%	3.6%	1.8%	2.8%
Sullivan/Ulster	13.3%	30.1%	44.3%	32.1%	6.1%	6.7%	1.7%	3.0%
Warren/Washington	16.5%	47.4%	30.2%	28.1%	0.0%	0.0%	0.0%	2.7%
Westchester/Putnam	31.3%	41.7%	36.3%	47.0%	3.7%	9.4%	1.9%	0.0%

The second potential data source for validating RN commuting patterns is an RN survey done for NYSED in 2002. This survey asked both home county and work county, and is only three years previous to the 2005 ACS data. While some changes in commuting patterns undoubtedly

occurred between 2002 and 2005-2006, patterns should generally be similar between the two surveys[11].

Table A-6. Comparison Between Commuting Patterns of RNs in ACS and NYSED Survey

	% RNs in-commute, ACS 2005-2006	% RNs in-commute, NYSED Survey, 2002	% RNs out-commute, ACS 2005-2006	% RNs out-commute, NYSED Survey, 2002
Albany	45.7%	55.7%	15.0%	16.2%
Allegany/Cattaraugus	24.3%	9.1%	36.9%	29.3%
Bronx	51.8%	55.9%	43.9%	38.4%
Broome/Tioga	14.9%	15.6%	5.5%	10.2%
Chautauqua	24.9%	10.0%	12.7%	12.7%
Chemung/Schuyler	37.4%	23.1%	23.1%	24.7%
Chenango/Cortland	18.1%	19.7%	47.2%	31.6%
Clinton/Essex/Franklin/Hamilton	2.2%	5.3%	8.8%	10.3%
Columbia/Greene	8.4%	5.2%	20.6%	44.7%
Delaware/Otsego/Schoharie	7.9%	26.9%	23.7%	23.2%
Dutchess	34.1%	32.3%	42.3%	35.6%
Erie	7.0%	12.2%	6.2%	6.1%
Fulton/Montgomery	8.4%	6.8%	42.8%	19.7%
Genesee/Orleans	35.0%	29.4%	42.9%	51.0%
Herkimer/Oneida	8.6%	16.4%	9.6%	11.5%
Jefferson/Lewis	6.5%	7.8%	10.9%	11.2%
Kings	32.2%	35.5%	29.6%	29.2%
Livingston/Wyoming	55.4%	52.8%	70.6%	60.9%
Monroe/Wayne	14.0%	19.5%	2.5%	5.1%
Nassau	35.7%	26.0%	40.6%	36.3%
New York	77.1%	62.5%	10.6%	10.0%
Niagara	17.7%	20.3%	45.5%	33.7%
Onondaga/Madison/Cayuga	14.4%	23.4%	4.1%	6.5%
Ontario	25.2%	35.3%	19.1%	41.9%
Orange	32.7%	17.4%	46.9%	40.3%
Oswego	25.5%	4.6%	64.3%	39.5%
Queens	36.8%	43.5%	58.0%	48.4%
Rensselaer	66.9%	47.0%	75.3%	56.6%
Richmond	13.8%	17.1%	35.4%	31.2%
Rockland	29.6%	26.3%	55.4%	57.8%
Saratoga	31.7%	28.6%	67.5%	61.1%
Schenectady	49.0%	57.7%	33.2%	42.7%
Seneca/Tompkins	23.0%	13.6%	21.0%	20.8%
St. Lawrence	1.3%	3.3%	5.3%	7.8%
Steuben/Yates	34.7%	22.6%	54.7%	32.7%
Suffolk	4.3%	5.2%	20.4%	22.9%
Sullivan/Ulster	13.3%	23.6%	44.3%	31.9%
Warren/Washington	16.5%	21.5%	30.2%	26.3%
Westchester/Putnam	31.3%	36.2%	36.3%	35.4%

[11] The exception is that RNs who live in New York but are not licensed in New York because they commute over state lines to work will not be represented in the NYSED survey.

For the most part, these figures are close to one another (with a handful of notable exceptions). In cases where the numbers are substantially different, the NYSED survey is probably more trustworthy due to a larger sample size.