

North Carolina Trends in Nursing: 1987 - 2006

RN and LPN Supply Trends

April, 2007

The North Carolina Center for Nursing

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This report takes a long-range view of changes in the nursing workforce in North Carolina. Graphs and data tables show how the supply of RNs and LPNs has changed over time and relative to changes in the size of the general population in the state. These supply counts are provided in three different ways – the total number of nurses holding an active license to practice, the total number of nurses who report being employed in a nursing position in the state, and the estimated number of full time equivalent nurses in the workforce. Trends in employment status are reported for both RNs and LPNs, along with trends in employment status by age in the 2006 workforce.

The results of a new long-range forecast of both the supply of RNs and the expected demand for RNs are also reported here. This new forecast has been conducted during the past year using North Carolina data to inform the Nurse Supply Model and Nurse Demand Model developed by the federal Bureau of Health Professions. Also new this year is a chart and data table showing the number of RNs who are newly licensed in North Carolina each year and where they received their entry-into-nursing education. This information is useful for workforce planners and educators in the state as they try to understand how much our nursing education system needs to expand in order to meet our growing demand for RNs.

Counts of the number of nurses licensed and/or in the workforce are based on data made available by the NC Board of Nursing. From 1987 – 2004 we used the data files after they had passed through the NC Health Professions Data System at the Cecil G. Sheps Center for Health Services Research. Beginning with the 2005 files we starting receiving the data directly from the NC Board of Nursing. This allows us to publish this trend report series about 6 months earlier than in previous years.

Estimates of the RN and LPN workforce in North Carolina are based on the number of licensed nurses that reported being employed either full or part time in nursing positions within the state of North Carolina as of their most recent license renewal. Case files for newly licensed nurses do not contain this employment status information until they file renewal forms approximately 24 months after

receiving their initial license to practice. We have incorporated newly licensed nurses into the NC workforce and full-time equivalent (FTE) estimates by assuming that all newly licensed nurses (new graduates and experienced nurses new to North Carolina, except those with a home address outside of NC) are employed in nursing positions within the state, and by imputing values for hours worked per week based on the average for their age and highest degree status for RNs, or age, and home county location for LPNs. When counting LPNs, either in the total number licensed, the number employed in the workforce, or FTE estimates, we have excluded any LPN that also holds an active RN license in that specific analysis year. This prevents double counting when combining counts of RNs and LPNs and gives a more accurate picture of the nursing workforce in the state.

The data tables and line graphs on pages 5 and 6 compare the growth of the general population in North Carolina (adjusted in the graphs) to the growth in the number of RNs and LPNs licensed to practice in the state from 1987 through 2006. Among RNs there has been a strong growth trend over the past 2 decades, although that growth is slowing. Among LPNs the growth trend has been more erratic, with a net loss of licensed LPNs in 4 of the past 5 years. These pages also report the size of the actual nursing workforce (those that are licensed and practicing in a nursing position within North Carolina), the size of that workforce in terms of FTEs (based on a 40 hour work week), and how the ratio of FTE nurses to general population has changed over time. In the case of RNs, that ratio has increased in all but 2 years during the past two decades, indicating both a persistent increase in demand for RNs over the past two decades and in our ability to maintain an increasing supply. The LPN licensed population and workforce has not grown much, if at all, during the past decade, except for a slight upturn in the past 2 years (2005 and 2006).

The proportion of all licensed RNs that are actively employed in nursing positions has been consistently above 80% for the past two decades. In 2006, 85.4% of all the RNs with an active license to practice in North Carolina were employed in either a full time or part time nursing position within the state. This compares favorably with national statistics that show 83.3% of all RNs licensed in 2004 were employed in the nursing workforce.¹ Approximately 4% of licensed RNs reported holding a job outside of the nursing profession (although some of these jobs may be in a healthcare setting), and 8.3% were unemployed or retired. These proportions have been remarkably steady over the past 2 decades, as shown in the graph on Page 7. The information on Page 8 shows how employment patterns vary by age within the population of licensed RNs in 2006. Among licensed LPNs the employment status trends have been very similar to that of RNs (see Page 9). In 2006, 83.6% of all

LPNs were employed in a nursing position, about 5% worked outside of nursing, and 9.9% were unemployed or retired. The percentage of nurses that reported being employed outside of nursing remained relatively stable from 1987 to 2006, accounting for approximately 3% to 5% of all licensed RNs and between 5% to 8% of LPNs.

Although the absolute number of RNs with an active license who are not employed in any field has grown steadily over the past 20 years, as a proportion of the total population of licensed RNs they have been shrinking. In some quarters these licensed and unemployed RNs are seen as a potential addition to the workforce, if they can just be enticed back into practice. In the past few years it has become possible to identify which of these nurses consider themselves to be retired and/or disabled (see the data and graphs on page 8 and 10) – thus refining this information. In 2006, approximately one-third of the RNs who were not employed were actually retired and/or disabled. The same was true for LPNs. In addition, the data and charts on pages 8 and 10 which report employment status by age show that most of the potential re-entrants are aged 50 and older, a finding that is consistent with national reports. Although data are not available about the length of time these nurses have been out of practice or their ability to return, it may be that some of them could re-enter patient care after receiving formal orientation, retraining, or completing refresher courses.

In 2005, the federal Bureau of Health Professions in the Health Resources and Services Administration (HRSA) released new versions of their state-level forecasting models for the nursing workforce. These models allow workforce planners to use the data packaged with the models or substitute data generated in their own states to predict the future supply of RNs and the FTE demand for RNs, LPNs, and nurse aides. We used both the HRSA Nurse Supply Model and the Nurse Demand Model to forecast the supply and demand for RNs from 2000 through 2020 in North Carolina. The results, shown on Page 12, suggest that North Carolina is at the beginning of a nursing shortage that will rapidly grow more severe over the next 13 years, due primarily to the aging and retirement of the current nursing workforce. In 2006, 31% of all licensed RNs were over the age of 50. According to the model estimates, the state currently needs about 7,000 more RNs than the number available. By 2015 that shortage is expected to be almost 20,000; by 2020 the shortage could exceed 32,000. It should be noted that long range estimates of this type are not as precise as the numbers might suggest. But the factors driving this shortage – the aging and retirement of a large segment of the nursing workforce, the aging of the general population and their increased demand for nursing services, and a demographically smaller workforce over the next 10-15 years to fill those gaps – are indisputable.

There is no doubt that North Carolina and every other state with a growing population will experience a nursing shortage in the next 10 – 15 years. The unknown factor is how severe it will be, and that will be determined by the actions and policies adopted now to increase new graduates, entice inactive nurses back to the workforce, and retain the current workforce for as long as possible.

One important factor in the solution of any labor shortage is wages. Average annual wage and salary data reported by the Bureau of Labor Statistics for RNs and LPNs² show that both groups of nurses saw wages increase between 2000 and 2005. However, when these wages are adjusted for buying power (standardized to year 2000 constant dollars) wages actually decreased between 2004 and 2005. In the short term, stagnant or declining wage levels influence the current workforce to leave the work place altogether, or decrease the amount of hours worked per week.³ In the long term, shrinking wages deter new entrants into the nursing profession. Since both of these reactions will increase the severity of a nursing shortage caused primarily by demographic factors, the role of wages in deepening or alleviating the nursing shortage cannot be ignored.

The last page (Page 13) shows the number of RNs obtaining their initial license to practice in the state each year. About half of all newly licensed RNs each year are new graduates just entering the profession, 85% of whom receive their nursing education in our state. The other half are experienced RNs migrating into NC from other states or other countries. The data show that North Carolina has benefited from this strong pattern of in-migration, since fewer than 50% of our new RNs each year are products of our education system. However, educators and policy makers need to be aware of this reliance on in-migration to produce new RNs, since such migration may slow or stop in the future. In that event, our nursing education system will need to expand in order to meet the needs of our state.

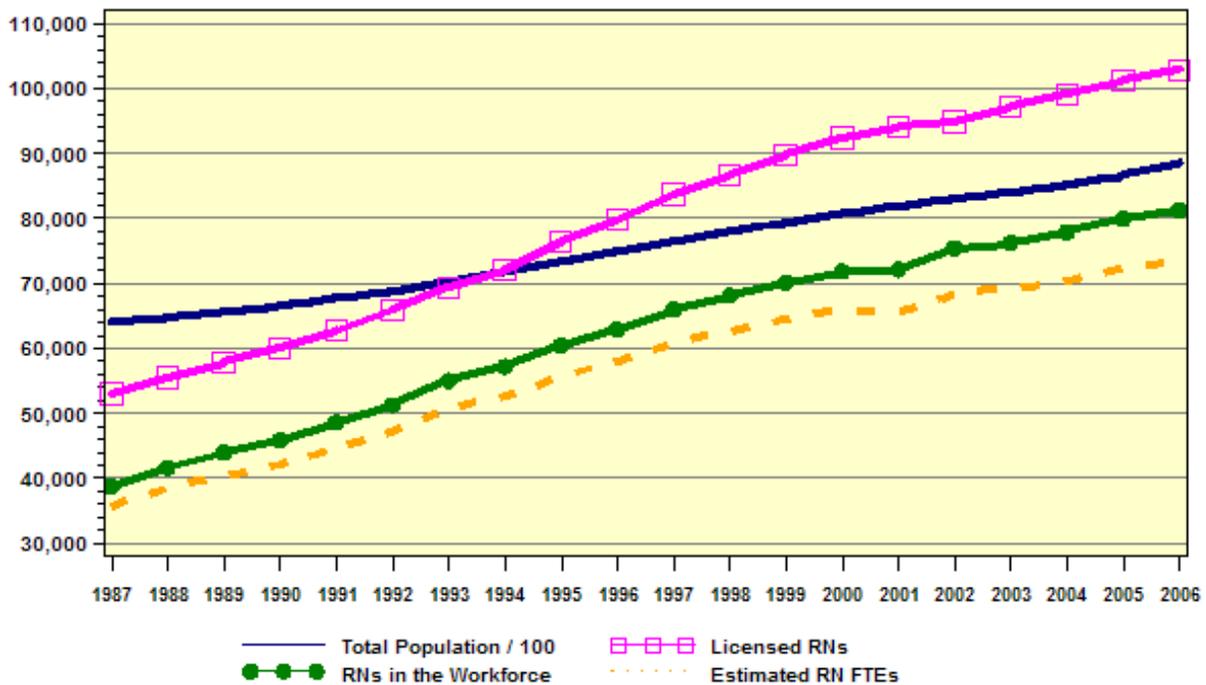
End Notes

¹ The Registered Nurse Population: Findings from the March 2004 National Sample Survey of Registered Nurses. June, 2006. U.S. Department of Health and Human Services, health Resources and Services Administration, bureau of Health Professions.

² Bureau of Labor Statistics, Occupational Employment Statistics, North Carolina. Downloaded February 18, 2007 from http://www.bls.gov/oes/current/oes_nc.htm

³ See the article by Buerhaus, Auerback and Staiger. "Recent Trends in the Registered Nurse Labor Market in the U.S.: Short-Run Swings on Top of Long-term Trends" Nursing Economic\$, March-April, 2007. Vol. 25, No. 2. for an explanation of how wages influence the work activity decisions of nurses.

Growth in the RN Labor Force and the General Population in North Carolina

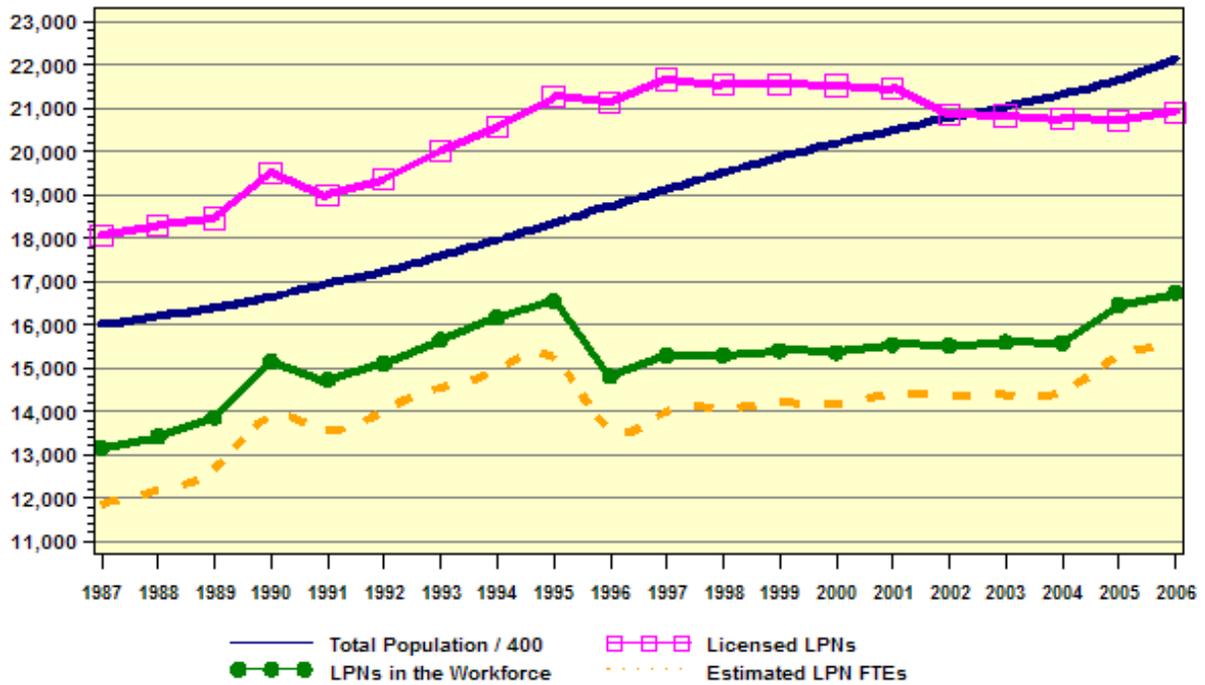


Year	Licensed RNs in NC	Estimated RN Workforce	Estimated RN FTEs	Total NC Population	Estimated RN FTEs per 100,000
1987	53,068	38,838	35,722.90	6,405,868	557.66
1988	55,562	41,714	38,449.62	6,483,344	593.05
1989	57,855	44,019	40,430.70	6,568,810	615.50
1990	60,143	45,908	42,118.25	6,662,523	632.17
1991	62,803	48,642	44,722.85	6,782,824	659.35
1992	65,993	51,360	47,238.04	6,895,428	685.06
1993	69,457	55,098	50,691.05	7,041,021	719.94
1994	72,240	57,281	52,670.44	7,186,013	732.96
1995	76,470	60,502	55,648.26	7,343,181	757.82
1996	79,840	62,984	57,974.72	7,499,276	773.07
1997	83,770	66,034	60,711.12	7,655,524	793.04
1998	86,799	68,166	62,692.92	7,809,051	802.82
1999	89,798	70,218	64,457.65	7,951,151	810.67
2000	92,485	71,902	65,872.82	8,078,909	815.37
2001	94,157	72,184	65,678.82	8,199,541	801.01
2002	95,003	75,500	68,362.28	8,313,494	822.31
2003	97,284	76,302	69,221.16	8,415,710	822.52
2004	99,157	78,006	70,474.12	8,531,040	826.09
2005	101,312	79,974	72,217.88	8,672,459	832.73
2006	102,922	81,308	73,326.75	8,856,505	827.94

Note: The actual general population figure has been divided by 100 in the graph to fit the scale of the axis. See the Technical Notes document for an explanation of how the estimated workforce and FTEs are derived.

Data source: RN counts are based on analysis of the annual RN licensure files. Population counts are from the NC State Data Center.

Growth in the LPN Labor Force and the General Population in North Carolina

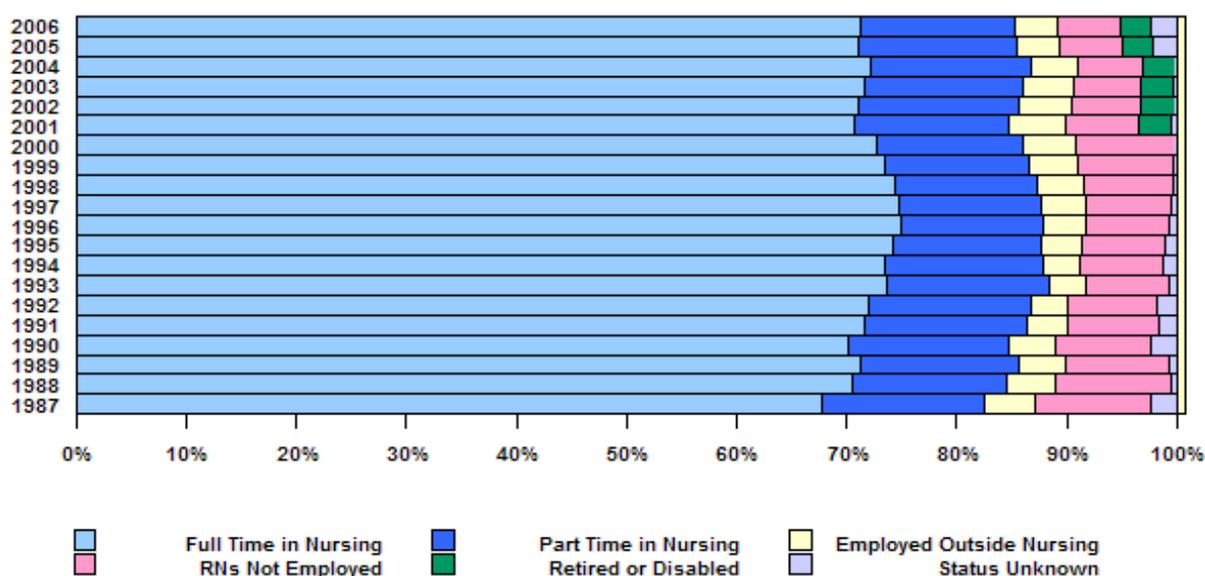


Year	Licensed LPNs in NC	Estimated LPN Workforce	Estimated LPN FTEs	Total NC Population	Estimated LPN FTEs per 100,000
1987	18,076	13,172	11,858.50	6,405,868	185.12
1988	18,304	13,427	12,166.28	6,483,344	187.65
1989	18,474	13,877	12,685.26	6,568,810	193.11
1990	19,517	15,162	13,886.23	6,662,523	208.42
1991	18,995	14,735	13,569.09	6,782,824	200.05
1992	19,361	15,111	14,019.28	6,895,428	203.31
1993	20,036	15,656	14,542.77	7,041,021	206.54
1994	20,575	16,175	14,960.02	7,186,013	208.18
1995	21,271	16,561	15,229.55	7,343,181	207.40
1996	21,138	14,818	13,563.41	7,499,276	180.86
1997	21,665	15,303	14,002.31	7,655,524	182.90
1998	21,559	15,312	14,070.28	7,809,051	180.18
1999	21,568	15,413	14,205.28	7,951,151	178.66
2000	21,544	15,368	14,168.90	8,078,909	175.38
2001	21,474	15,554	14,400.94	8,199,541	175.63
2002	20,870	15,529	14,359.99	8,313,494	172.73
2003	20,831	15,610	14,382.74	8,415,710	170.90
2004	20,769	15,594	14,442.03	8,531,040	169.29
2005	20,730	16,475	15,283.90	8,672,459	176.23
2006	20,920	16,750	15,487.99	8,856,505	174.88

Note: The reported hours worked per week, used in calculating FTEs, do not appear to be reliable for LPNs in 1987. The chart and data table use employment status to calculate an FTE count for that year. See the Technical Notes document for an explanation of how the LPN workforce and FTEs were derived.

Data source: LPN counts are based on analysis of the annual LPN licensure files. LPNs also holding an active RN license have been removed and are counted in the RN supply data. Population counts are from the NC State Data Center.

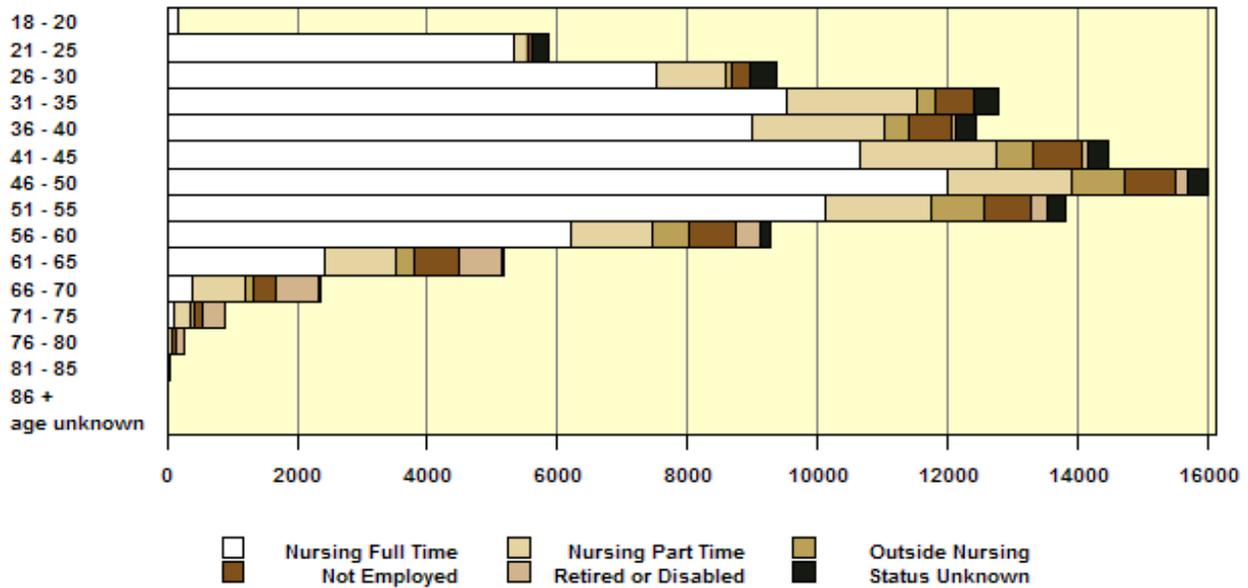
Trends in the Employment Status of RNs Licensed to Practice in North Carolina



Year	Full Time in Nursing	Part Time in Nursing	Employed Outside of Nursing	Not Employed or Retired	Status Unknown	Total RNs Licensed
1987	35,978	7,827	2,395	5,621	1,247	53,068
1988	39,226	7,772	2,457	5,798	309	55,562
1989	41,203	8,337	2,486	5,385	444	57,855
1990	42,151	8,866	2,490	5,192	1,444	60,143
1991	44,959	9,261	2,322	5,296	965	62,803
1992	47,509	9,793	2,212	5,273	1,206	65,993
1993	51,218	10,210	2,322	5,230	477	69,457
1994	53,062	10,425	2,420	5,492	841	72,240
1995	56,755	10,342	2,731	5,854	788	76,470
1996	59,846	10,333	3,013	6,103	545	79,840
1997	62,688	10,832	3,272	6,613	365	83,770
1998	64,626	11,203	3,591	7,072	307	86,799
1999	65,930	11,857	3,995	7,718	298	89,798
2000	67,248	12,364	4,415	8,271	187	92,485
2001	66,545	13,261	4,767	9,156	428	94,157
2002	67,494	13,815	4,576	8,936	182	95,003
2003	69,625	13,980	4,522	8,871	286	97,284
2004	71,617	14,386	4,225	8,772	157	99,157
2005	72,106	14,400	4,074	8,535	2,197	101,312
2006	73,420	14,457	3,978	8,592	2,475	102,922

Data source: Annual RN licensure files. The 'retired or disabled' category in the graph was first introduced mid-2001.

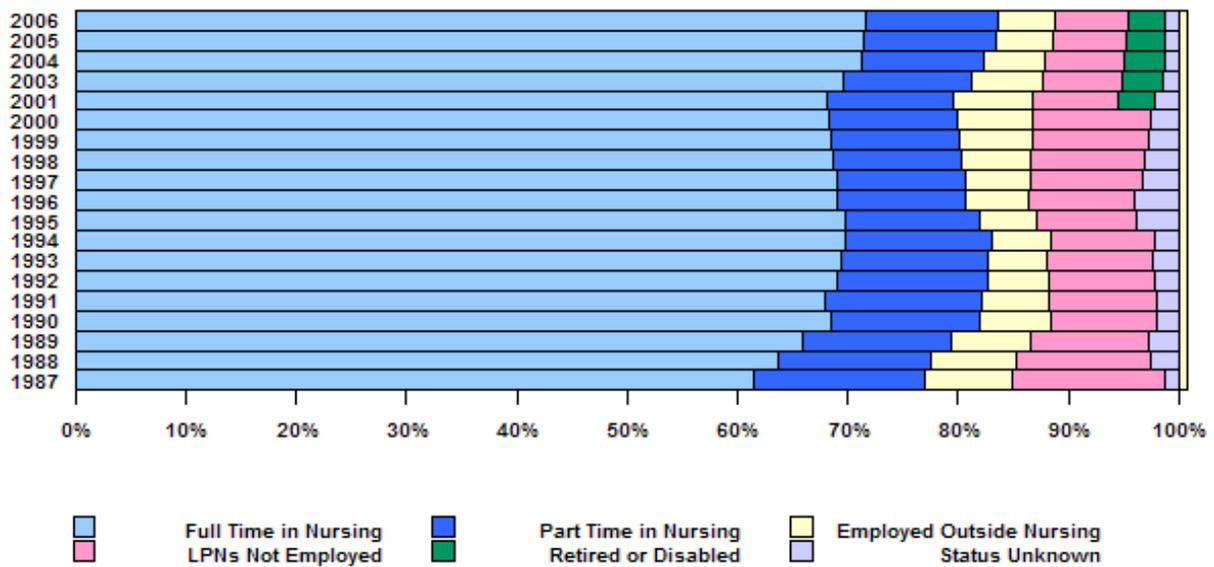
Employment Status by Age Group for All RNs Licensed in North Carolina in 2006



Age Groups	Full Time in Nursing	Part Time in Nursing	Employed Outside Nursing	Not Employed in Any Field	Retired or Disabled	Status Unknown	Total # Licensed by Age Group
18 - 20	174	1	0	0	0	0	175
21 - 25	5,340	191	14	61	3	247	5,856
26 - 30	7,525	1,057	109	267	10	392	9,360
31 - 35	9,511	1,998	299	589	14	374	12,785
36 - 40	8,996	2,025	374	666	48	314	12,423
41 - 45	10,631	2,095	573	759	99	300	14,457
46 - 50	11,981	1,925	804	796	169	322	15,997
51 - 55	10,104	1,641	797	729	237	299	13,807
56 - 60	6,196	1,264	556	729	374	164	9,283
61 - 65	2,431	1,089	283	688	647	49	5,187
66 - 70	402	810	106	359	659	8	2,344
71 - 75	95	276	43	141	337	4	896
76 - 80	12	64	15	44	130	2	267
81 - 85	7	16	1	6	24	0	54
86 +	1	0	1	0	4	0	6
age unknown	14	5	3	2	1	0	25

Data source: 2006 RN license files collected by the NC Board of Nursing as of 10/31/2006.

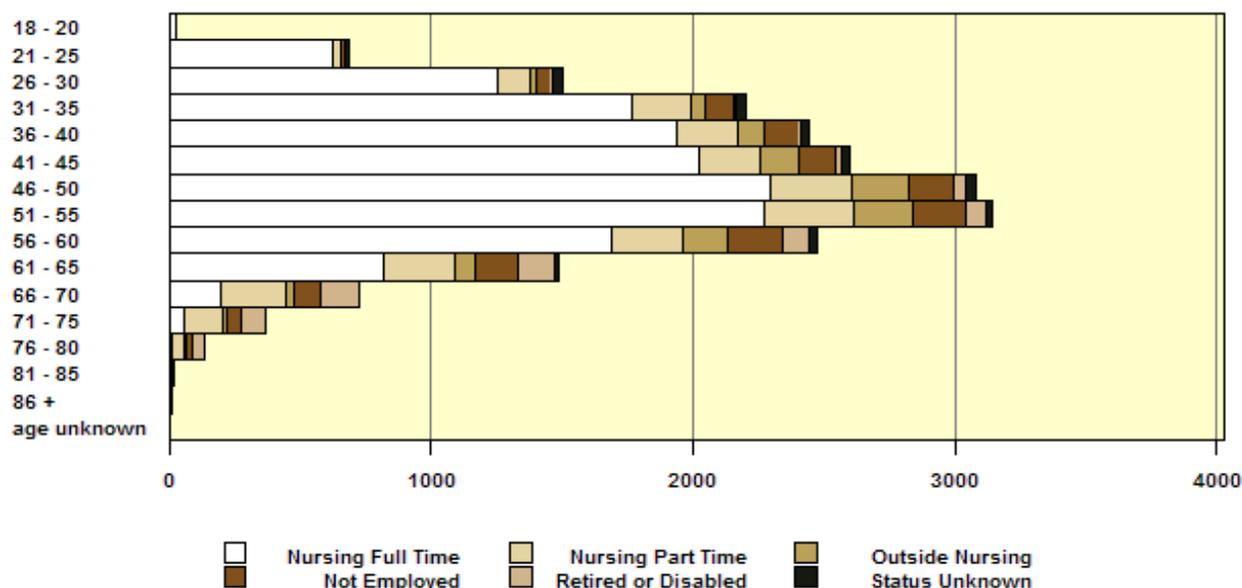
Trends in the Employment Status of LPNs Licensed to Practice in North Carolina



Year	Full Time in Nursing	Part Time in Nursing	Employed Outside of Nursing	Not Employed or Retired	Status Unknown	Total LPNs Licensed
1987	11,107	2,817	1,428	2,498	226	18,076
1988	11,658	2,545	1,411	2,211	479	18,304
1989	12,192	2,472	1,340	1,979	491	18,474
1990	13,383	2,620	1,262	1,853	399	19,517
1991	12,919	2,670	1,174	1,870	362	18,995
1992	13,376	2,628	1,065	1,888	404	19,361
1993	13,897	2,674	1,076	1,924	465	20,036
1994	14,356	2,720	1,102	1,936	461	20,575
1995	14,843	2,575	1,101	1,921	831	21,271
1996	14,588	2,473	1,185	2,040	852	21,138
1997	14,954	2,533	1,280	2,209	689	21,665
1998	14,803	2,531	1,344	2,230	651	21,559
1999	14,776	2,519	1,417	2,273	583	21,568
2000	14,737	2,484	1,471	2,309	543	21,544
2001	14,619	2,468	1,545	2,384	458	21,474
2002	14,369	2,417	1,409	2,294	381	20,870
2003	14,515	2,395	1,347	2,262	312	20,831
2004	14,790	2,304	1,175	2,232	268	20,769
2005	14,796	2,504	1,086	2,072	272	20,730
2006	14,982	2,516	1,075	2,070	277	20,920

Data source: Annual LPN licensure files. The 'Retired or Disabled' category in the graph was first introduced mid-2001. Any LPN who also holds a valid RN license has been removed from this analysis.

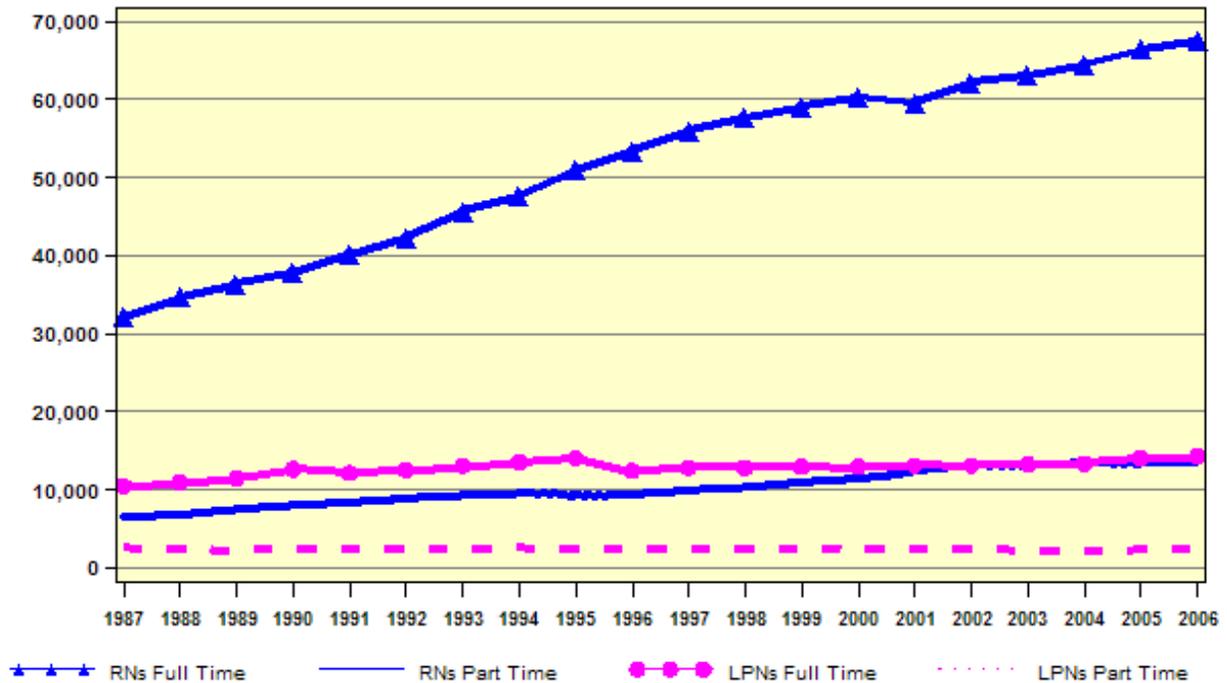
Employment Status by Age Group for All LPNs Licensed in North Carolina in 2006



Age Groups	Full Time in Nursing	Part Time in Nursing	Employed Outside Nursing	Not Employed in Any Field	Retired or Disabled	Status Unknown	Total # Licensed by Age Group
18 - 20	27	1	1	0	0	0	29
21 - 25	624	31	4	9	0	18	686
26 - 30	1,251	129	19	59	3	40	1,501
31 - 35	1,770	223	53	109	6	44	2,205
36 - 40	1,939	236	98	129	9	33	2,444
41 - 45	2,024	230	152	141	22	33	2,602
46 - 50	2,299	312	210	178	40	42	3,081
51 - 55	2,272	340	231	201	74	27	3,145
56 - 60	1,687	278	171	203	105	30	2,474
61 - 65	817	275	77	167	140	9	1,485
66 - 70	198	252	27	104	146	1	728
71 - 75	60	144	19	56	91	0	370
76 - 80	8	53	6	24	46	0	137
81 - 85	4	10	2	2	4	0	22
86 +	1	1	5	0	2	0	9
age unknown	1	1	0	0	0	0	2

Data source: 2006 LPN license file collected by the NC Board of Nursing as of 10/31/2006. Any LPN who also holds a valid RN license has been removed from this analysis.

Growth of Full Time Employment in the North Carolina Nursing Workforce

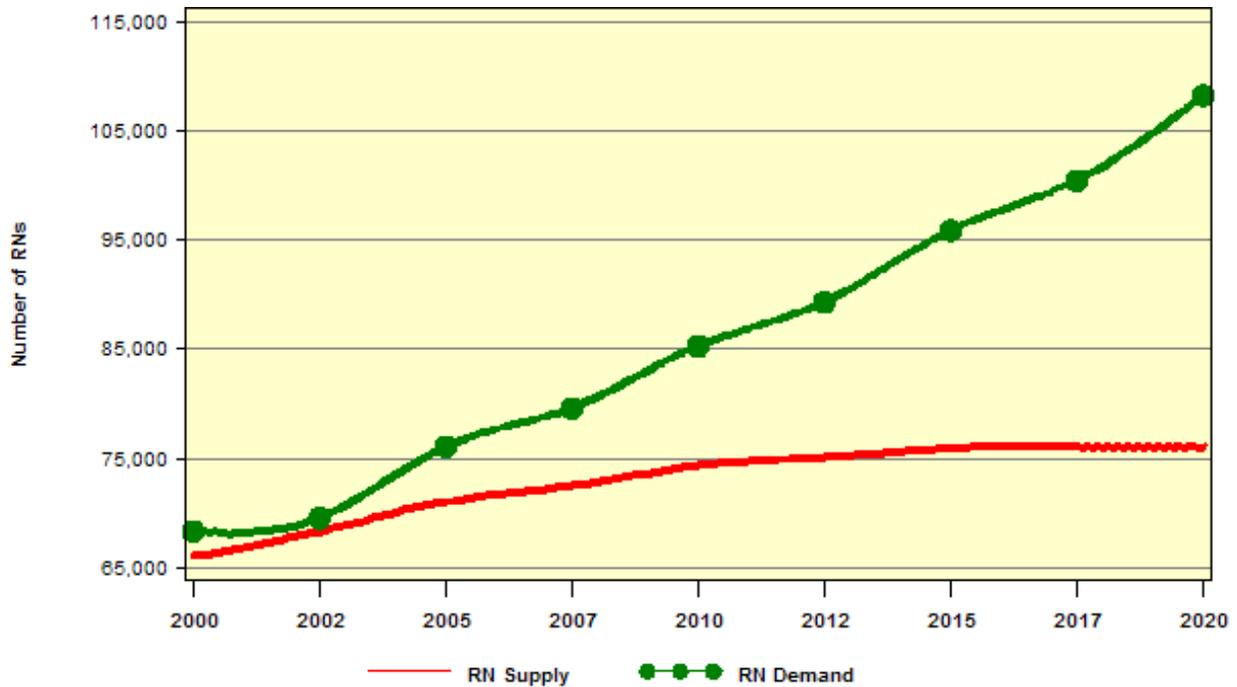


Year	RNs Full Time	RNs Part Time	LPNs Full Time	LPNs Part Time
1987	32,230	6,608	10,545	2,627
1988	34,791	6,923	11,048	2,379
1989	36,480	7,539	11,555	2,322
1990	37,835	8,073	12,705	2,457
1991	40,172	8,470	12,213	2,522
1992	42,399	8,961	12,623	2,488
1993	45,752	9,346	13,124	2,532
1994	47,721	9,560	13,599	2,576
1995	50,992	9,510	14,127	2,434
1996	53,463	9,521	12,468	2,350
1997	56,027	10,007	12,905	2,398
1998	57,791	10,375	12,920	2,392
1999	59,189	11,029	13,034	2,379
2000	60,384	11,518	13,029	2,339
2001	59,716	12,468	13,205	2,349
2002	62,244	13,256	13,192	2,337
2003	63,140	13,162	13,323	2,287
2004	64,501	13,505	13,421	2,173
2005	66,479	13,495	14,147	2,328
2006	67,712	13,596	14,391	2,359

Note: These figures reflect the number of full and part time positions held by those nurses employed in nursing positions within North Carolina in any given year. Any LPN who also held a valid RN license in any specific year has been removed from the analysis of LPNs in that year.

Data source: Annual RN and LPN licensure files.

Supply and Demand Forecast for RNs in North Carolina: 2000 - 2020

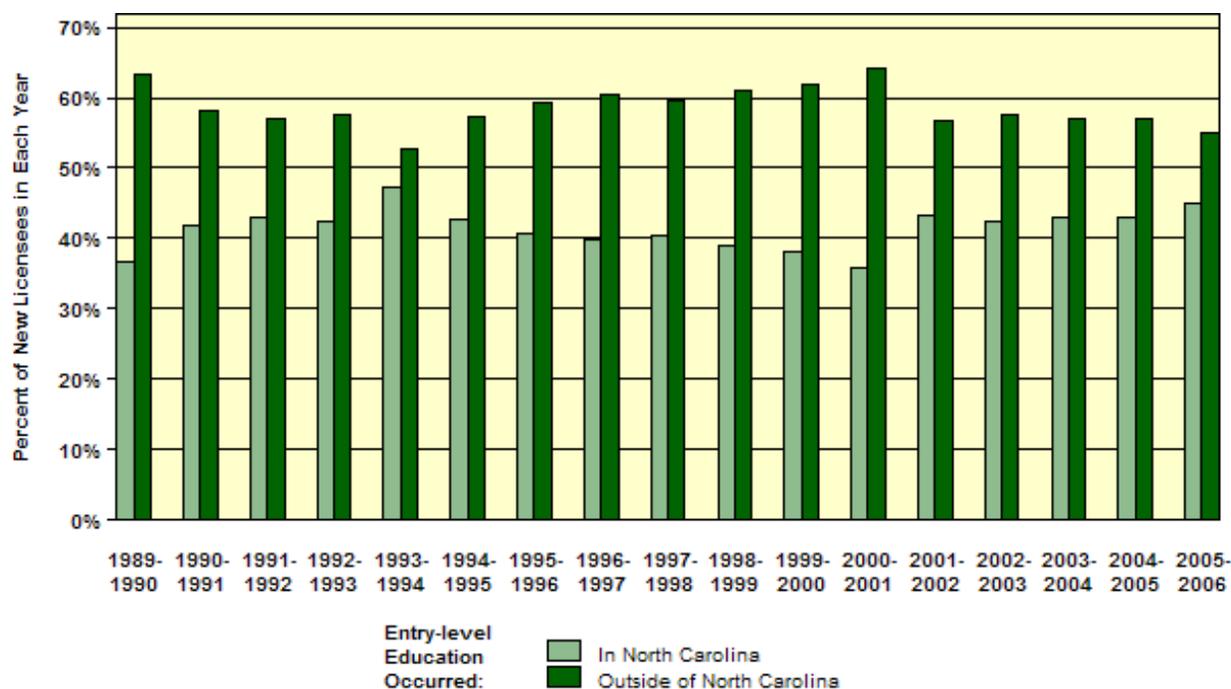


Year	RN Supply	RN Demand	Excess or Shortage	Percent Shortage
2000	66,097	68,372	-2,275	-3.3%
2002	68,272	69,557	-1,285	-1.8%
2005	71,058	76,096	-5,038	-6.6%
2007	72,541	79,625	-7,084	-8.9%
2010	74,387	85,299	-10,912	-12.8%
2012	75,136	89,320	-14,184	-15.9%
2015	75,971	95,885	-19,914	-20.8%
2017	76,189	100,449	-24,260	-24.2%
2020	76,165	108,237	-32,072	-29.6%

Note: Excess or shortage is determined by Supply minus Demand figures. A negative sign indicates a shortage of RNs in a given year.

Data source: The future supply of RNs was calculated using the Nurse Supply Model. Demand for RNs was calculated using the Nurse Demand Model. Both forecasting models were developed by the Bureau of Health Professions National Center for Health Workforce Analysis in the Health Resources and Services Administration, U.S. Department of Health and Human Services. However, default values in the model were replaced with historical data for North Carolina whenever possible. See the Quick Facts report "RN Supply and Demand Forecast for North Carolina: 2000 – 2020" Sept. 2006 at www.nccenterfornursing.org/research for more detailed information on these models and forecast estimations.

New RN Licensees Each Year by Location of their Entry-Level Education



Year	Total Number of New RN Licensees Each Year	Number Educated in North Carolina	Percent Educated in North Carolina	Number Educated Outside North Carolina	Percent Educated Outside North Carolina
1989 - 1990	5,486	2,019	36.8%	3,467	63.2%
1990 - 1991	5,320	2,231	41.9%	3,089	58.1%
1991 - 1992	6,185	2,652	42.9%	3,533	57.1%
1992 - 1993	6,396	2,710	42.4%	3,686	57.6%
1993 - 1994	6,391	3,024	47.3%	3,367	52.7%
1994 - 1995	7,244	3,086	42.6%	4,158	57.4%
1995 - 1996	7,128	2,904	40.7%	4,224	59.3%
1996 - 1997	7,481	2,970	39.7%	4,511	60.3%
1997 - 1998	7,128	2,879	40.4%	4,249	59.6%
1998 - 1999	6,949	2,720	39.1%	4,229	60.9%
1999 - 2000	6,542	2,501	38.2%	4,041	61.8%
2000 - 2001	7,486	2,684	35.9%	4,802	64.1%
2001 - 2002	6,174	2,666	43.2%	3,508	56.8%
2002 - 2003	7,118	3,021	42.4%	4,097	57.6%
2003 - 2004	7,437	3,199	43.0%	4,178	57.0%
2004 - 2005	8,400	3,617	43.1%	4,783	56.9%
2005 - 2006	8,401	3,782	45.0%	4,619	55.0%

Note: This table reports only on those RNs who were granted a new license to practice in North Carolina in a given year. These RNs did not hold an active license to practice in North Carolina as of October 31st in the first year in the range, but were issued a license at some point prior to October 31st in the second year of the range. After a review of school name and city, RNs with missing data on the state or county location of their entry-level education have been assigned to the 'outside of North Carolina' category.