



Analysis of Nurse Licensure Data in Florida: Methods and Statewide Results

January 2007

[This document serves as technical documentation
in complement to region and county-level data tables.]

Executive Summary

The Florida Center for Nursing (Center) analyzed Florida Board of Nursing (FBON) licensure data, current as of January 2007, on all registered nurses (RNs), licensed practical nurses (LPNs), and advanced registered nurse practitioners (ARNPs) in the state. The Center, a state agency charged with generating and disseminating information related to the nursing shortage in Florida, focused on what the data can tell us about our current and future nursing workforce. Because these FBON data are collected for regulatory purposes, not for workforce planning, our knowledge of the state's nursing workforce remains limited. The data do not indicate whether nurses are working, how much they work, or in what settings. Still, information about the geographic distribution and demographic characteristics of the licensed nurse population proved useful for understanding issues related to workforce diversity, an aging nurse workforce, and regional differences in the nurse population. This report details the methods used to clean and analyze the data and presents statewide results.

Methods:

- Data quality within the licensure database has improved in recent years. Losses to obviously incorrect or suspicious dates of birth and initial licensure were minimal – less than 1% of records. About 8% of cases were missing data on gender and 10% were missing data on race/ethnicity.
- Date of initial licensure was used to construct a measure of tenure as a nurse in Florida. This date may be “reset” if nurses allow their licenses to expire but later become licensed again in the state, so average tenure as a nurse in Florida may be underestimated by these data.
- Only 40% of nurses provided practice location addresses that were different from the mailing address they provided to FBON. In the remaining 60% of cases, nurses may have given either residence or work addresses. The data do not allow a clean analysis of where nurses live and work, although they do allow identification of nurses who report working or receiving mail outside the state of Florida.
- A subset of the total file containing nurses who may be working in nursing in Florida was constructed by dropping cases where: 1) nurses have inactive licenses, 2) nurses have status codes rendering them ineligible to practice, 3) nurses did not give a Florida address as either a mailing or practice address, and 4) nurses gave practice addresses outside the state of Florida. A total of 63,289 nurses were excluded from the subset used in analysis.
- The remaining 237,644 nurses analyzed in this report are potential members of the nursing workforce in Florida. The Center's method of selecting nurses for further analysis is more stringent than is the method used by FBON in its most recent report on nursing licensure in Florida.
- For region and county-level analysis, nurses were placed into counties, regional workforce boards, and larger regions of the state. When nurses gave unique practice location information, they were placed in the counties and regions in which they are employed. Others were placed according to their mailing address, which may be home or work.
- Since many nurses are likely to commute from one county to another in order to work, county placement is probably the least accurate for describing the distribution of the nursing workforce. More accuracy is probable in larger geographic areas since the areas are more likely to encompass both work and residence location.

Results:

- The average age of nurses in Florida, as of January 2007, was 46.6 for LPNs, 47.5 for RNs, and 48.2 for ARNPs.
- About 40% of the state's licensed nurse population is over the age of 51, and about 14% of nurses are over the age of 61.
- The state of Florida's nurse population is more diverse in terms of race/ethnicity and gender than is the nurse population of the nation as a whole. Over 9% of Florida's RNs are male, and more than 25% reported non-white race or Hispanic ethnicity. LPNs are the most diverse nurse type in terms of race and ethnicity, and ARNPs have the highest percentage of males.
- Female nurses were older, on average, than their male counterparts. As well, White nurses were generally older than were members of racial/ethnic minority groups.
- Hispanic, Native American, and Asian nurse populations contain proportionately more males than do White or Black nurse populations. Men are particularly underrepresented among Blacks.
- Tenure as a nurse in Florida tracks closely with age. Nurses age 20 or younger have on average been licensed less than a year, while nurses age 61 or older have on average been licensed for more than 20 years.
- The composition of the state's nurse population differs dramatically across regions of the state. Nurses in the South tended to be younger and were much less likely to report White race: two-thirds of RNs, half of ARNPs, and 85% of LPNs in this regions were members of racial/ethnic minority groups. In contrast, over three-quarters of nurses in the Northwest (Panhandle) region reported White race.

Discussion and Conclusions:

- If most nurses retire by age 60, Florida can expect to lose more than 40% of its currently licensed RN population over the next decade. It is unlikely, given the smaller cohorts of nurses in generations following the baby boomers, that newly licensed nurse cohorts will be able to compensate for these losses.
- Policy solutions must target issues specific to an aging nurse workforce in order to retain older nurses in the state, including re-design of nurse work environments to match the physical limitations associated with aging and the effective preparation and use of seasoned nurses as educators.
- More encouraging findings include the younger average age of male and racial/ethnic minority nurses in the state. This suggests that nursing is seen as a viable career option among young men and minorities and that the state's future nursing workforce may be more diverse. The particularly young age of Hispanic nurses forecasts a larger workforce in the future capable of communicating with Spanish-speaking patients.
- Investigation of regional differences in the state's nurse population underscores the need to consider nursing supply and demand at sub-state levels. The extent of a nursing shortage, as well as effective solutions to the shortage, will need to be assessed and implemented at regional levels. These considerations mean that accurate sub-state nurse workforce supply and demand estimates are critical for strategic planning.

Much is still unknown about the state's nursing workforce. The Center's current and future research projects, including a workforce survey of nurses and assessment of nurse demand through employer surveys, will hopefully bring us closer to understanding the nature of our nursing shortage and best approaches to resolving it.

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Background

The Florida Center for Nursing was established in 2001 by the State of Florida to address issues related to nurse supply, demand, and shortage. The Center's mission includes generation and dissemination of information related to the nursing shortage, and its vision is that the Center be nationally recognized as the definitive source for information about nurse supply and demand in the state of Florida. Critical to these efforts is recurring analysis of data on the state's nursing workforce to identify trends in demographic composition, geographic distribution, and workforce participation patterns. Coupled with recurring assessment of employer demand for nurses, such information may be used to measure the extent of nurse labor shortages and to forecast future nurse supply and demand.

Nurse licensure data, collected and maintained by the Florida Board of Nursing (FBON), is one important source of data on nurse supply. The licensure database contains the most complete information available in the state specific to the regulation of nurses. Included is information on the number of nurses, their eligibility to practice, their demographic characteristics, and (with important limitations discussed below) their distribution across the state of Florida. The data, when trended over a number of years, will allow assessment of key questions about the nursing workforce including:

- How is the average age of nurses changing over time? How many nurses can be expected to retire in the next five to ten years, given prevalent age-driven retirement patterns?
- Is the nursing workforce becoming more demographically diverse over time, and is it keeping step with changes in population diversity?
- How do the number and characteristics of nurses vary in different regions of the state?

Until now, analysis of licensure data collected by FBON has been limited by deficits in the database, including large amounts of missing or implausible data in many fields (Gregg and Brunell, 2003). As well, there existed no standard agreement between the Center and the FBON regarding access to the data for workforce analysis. In the fall of 2006, the Center and FBON reached an agreement whereby licensure data will be provided to the Center regularly as a data extract (a static file) drawn from the dynamically changing licensure database. Analyses indicate that the data quality has improved in recent years, making the prospect of future trending more realistic. This report is based on the Center's first production extract of the licensure data. The analysis provides a baseline profile of the state's nurse population and the first data point necessary for trend analysis in the future.

Licensure data collected by FBON do not include information about the work behavior of nurses, and this limits their usefulness for strategic labor force planning. The data do not indicate whether nurses are working, whether they work in or outside of nursing, how much they work, or in what setting. Beginning in January 2007, the Center launched a nurse survey to collect workforce data from nurses during their biennial license renewal or their initial licensure in the state of Florida. The FBON is working with the Center to ensure seamless transition to the online survey after online license renewal, and notice of the survey effort has been placed on the license renewal forms and letters of initial licensure mailed by FBON. The Center's hope is that the

workforce survey data can be usefully combined with licensure data to produce a more accurate understanding of the state's nursing workforce.

Data and Methods

After significant testing of the extraction process by Center and FBON/Medical Quality Assurance staff, the first extract of production licensure data – current as of the extraction – was received by the Center on December 20, 2006. Given the probability of more limited licensure activity during the last few weeks in December, owing both to the holidays and the absence of a renewal period during this time, the data may be reasonably interpreted as beginning-of-year data for 2007.

The extract includes RN, ARNP, and LPN licensees with a variety of license statuses, such as Clear, Delinquent, Obligations, and Suspended. Many of the statuses carry full or limited privileges to work as nurses in the state (e.g., Clear or Obligations), while others render licensees ineligible to practice nursing in Florida (e.g., Delinquent or Suspended). Combined with information on the licensee's activity status – whether the license is Active or Inactive – these data allow assessment of the number of nurses who may, by law, practice nursing in the state.

Other data elements extracted from the licensure database include rank (RN, ARNP, or LPN), license number, date of birth, gender, race/ethnicity, year of initial licensure in Florida, mailing address, and current practice location. The data quality for most of these elements appears good, but as will be discussed in more detail below, questions remain about the validity of mailing and practice location addresses as measures of nurses' geographic distribution.

A separate extraction from FBON includes data on the education history of some licensees. Unfortunately, these data are not currently available for the vast majority of RNs and thus are of limited utility for the present analysis. In the future, as FBON works to collect data required by NURSUS (National Council of State Boards of Nursing data collection system), more education data may become available.

Data Cleaning and Manipulation

The first step in cleaning the licensure data was to identify outliers or implausible dates of birth and initial licensure. Among RNs and LPNs both, nurses whose year of birth was recorded as 1916 or earlier were coded as missing. This procedure sets the age ceiling at 89 for both RNs and LPNs. Birth years prior to 1917 contained very small numbers of nurses (less than 10 nurses, or less than 0.01% of the nurse population). Although it is possible that some licensed nurses are older than 89, a reasonable cut-off had to be selected because some birthdates went back into the 19th century and even earlier. The impact of this recoding was very small. Less than 0.5% of the RN records and about 1% of the LPN records were given missing age values as a result of the procedure. Likewise, nurses whose year of birth was recorded as being later than 1986 (RNs) or 1987 (LPNs) were also coded as missing. These dates were chosen based on both logic and a sharp drop in the number of records having birthdates after these two dates. RNs reported to be younger than 20 and LPNs younger than 19 – the youngest possible ages, if initial licensure

occurred in 2006 – were coded as missing. At this end of the age spectrum, less than 0.1% of RNs and LPNs were recoded to missing. **Losses to obviously incorrect or suspicious dates of birth were minimal – less than 1% of records.**

Very few RNs or LPNs reported being initially licensed in Florida prior to 1951, a date indicating the nurse has been continuously licensed in Florida for 55 years. The code 1801 was apparently given to some nurses for whom data were missing on this element, and these nurses were recoded as missing for the present analysis. Among RNs, seven nurses recorded as having been initially licensed in Florida in 1920 were recoded to missing. Among LPNs, one nurse recorded as having been initially licensed in 1939 was recoded to missing. Losses to incorrect dates here were also quite minimal. An important note regarding this variable is that it may be “reset” if nurses allow their licenses to expire but later become licensed again in the state. Since it is not possible to tell whether this has happened to nurses in the licensure extract we received, the measure must be interpreted with caution. **Average tenure as a nurse in Florida may be underestimated by these data.**

The second step in data cleaning was to identify a subset of licensees who are eligible to practice nursing and, based on their address information, likely to be living or working in the state of Florida. This process was an attempt to cull the complete file down to those nurses who could be reasonably suspected of practicing nursing in Florida. Short of information about their work behavior, these are the only items that can be used as a proxy for membership in the Florida nursing workforce.

Although most licensees have address information for both “mailing” and “practice” locations, inspection of the data revealed that in about 60% of cases the two addresses had identical zip codes. Discussion with FBON staff uncovered a couple of important points regarding interpretation of the addresses: 1) “mailing” address may be a home residence *or* a work location – wherever the nurse wishes to receive mail from FBON, and 2) “mailing” address may be substituted for “practice” address if the latter is left blank; if practice address is different from mailing address, it is probably safe to assume that the nurse works at the practice address. **The data do not allow a clean analysis of where nurses live and work, although they do allow identification of nurses who report working or receiving mail outside the state of Florida.**

A four-step process was used to generate a subset from the total file (N = 300,933) for analysis. In the first step, nurses with an inactive license were dropped (around 9,500 records). In the second, nurses with status codes rendering them ineligible to practice were dropped (around 20,200 records). In the third step, nurses who did not give a Florida address as either a mailing or practice address were dropped (around 26,300). In the final step, the remaining nurses who gave a *practice* address outside the state of Florida were dropped (about 6,800 records). Reasons for exclusion from the analysis subset were roughly evenly split between ineligibility and geography. **A total of 63,289 nurses were excluded from the analysis subset.**

Table 1 below compares members of the analysis group subset – those who may be practicing nursing in Florida – with those who were dropped from the analysis group. Analysis group members were similar to others in distribution across license types and gender categories. The

group is on average two years younger than those excluded from analysis, and a lower proportion of analysis group members are aged 61 or older. This reflects the fact that retirees have been excluded from analysis. Those retained were slightly more diverse in terms of racial/ethnic background than those who were excluded from analysis. As expected, those who were excluded were less likely to have active statuses and much less likely to have Clear licenses.

Table 1. Comparison of Analysis Group with Others and All Licensees

	All Florida Licensees	Analysis Group	Others
Number of Nurses	300,933	237,644	63,289
License Type (N / %)			
RN	217,972 (72.43%)	169,555 (71.35%)	48,417 (76.50%)
LPN	69,769 (23.18%)	57,561 (24.22%)	12,208 (19.29%)
ARNP	13,192 (4.38%)	10,528 (4.43%)	2,664 (4.21%)
License Status (%)			
Clear	91.14	99.51	59.67
Delinquent	7.35	0.00	34.95
Retired	0.45	0.00	2.13
Temporary Permit	0.39	0.15	1.28
Military Active	0.31	0.06	1.23
Obligations	0.13	0.15	0.05
Suspended	0.11	0.00	0.51
Probation	0.06	0.07	0.03
Conditional	0.04	0.05	0.03
Emergency Suspension	0.03	0.00	0.12
Voluntarily Withdrawn	0.00	0.00	0.00
Activity Status (%)			
Active	96.78	99.99	84.73
Inactive	2.75	0.00	13.08
Missing/NA	0.46	0.00	2.19
Average Age	47.63	47.25	49.05

Table 1. (continued)

	All Florida Licensees	Analysis Group	Others
Age in Categories (% of non-missing cases)			
20 or younger	0.06	0.07	0.02
21-30	9.00	9.30	7.86
31-40	20.56	20.72	19.95
41-50	27.96	28.62	25.46
51-60	27.74	27.85	27.31
61 or older	14.69	13.44	19.39
<i>% missing</i>	<i>0.73</i>	<i>0.66</i>	<i>0.98</i>
Average Years Licensed in FL			
	12.54	12.85	11.36
<i># missing</i>	<i>1,509</i>	<i>605</i>	<i>904</i>
Gender (% of non-missing cases)			
Female	90.45	90.64	89.73
Male	9.55	9.36	10.27
<i>% missing</i>	<i>8.47</i>	<i>8.32</i>	<i>9.06</i>
Race/Ethnicity (% of non-missing cases)			
White	73.37	72.16	78.02
Black	13.36	14.19	10.22
Hispanic	6.17	6.49	4.96
Asian	5.45	5.49	5.31
Native American	0.21	0.20	0.26
Others	1.41	1.46	1.23
<i>% missing</i>	<i>9.95</i>	<i>9.78</i>	<i>10.55</i>

Table 1 also indicates the extent of missing data for each item. Those items used for regulatory purposes (e.g., license statuses) had no or very little missing data. Some demographic items, on the other hand, were not as consistently recorded. While less than 1% of licensees were missing age data, about 8% of licensees in the analysis group were missing data on gender and almost 10% were missing data on race/ethnicity.

It is important to note that the Center’s method of selecting nurses for further analysis is more stringent than is the method used by FBON in its most recent report on nursing licensure in Florida (FBON, 2005). The Center excludes nurses who do not appear to live or work in Florida in addition to those who are ineligible to practice nursing in the state. FBON

reports counts of nurses including all who hold an active license. As a result, the FBON counts reported at the end of fiscal year 2004-2005 are larger than the size of the Center's analysis group in January, 2007 – nearly a year and half later¹. From a workforce planning perspective, the differences in estimates are quite important. **Florida may not have access to the nursing resources implied by FBON estimates, since many of the nurses report working and/or living outside the state of Florida.**

Nurse Placement

For the purpose of analyzing the state's nurse supply at regional levels, the analysis group members were placed into counties, regional workforce boards, and larger regions of the state consisting of multiple workforce boards. As noted previously, precision is difficult to obtain here since many nurses do not have unique practice location information and it is unknown whether their mailing address represents a residence or work location. **Since many nurses are likely to commute from one county to another in order to work, county placement is probably the least accurate for describing the distribution of the nursing workforce. More accuracy is probable in larger geographic areas since the areas are more likely to encompass both work and residence location.**

When nurses gave unique practice location information, they were placed according to the county in which they are employed. In other cases, nurses were placed according to the county in which their mailing address – which may be home or work – is located. This procedure maximizes the accuracy of placement for describing workforce distribution as much as can be expected given the data limitations.

To investigate data quality and salvage missing data on county placement, each licensee's recorded zip code was compared against a SAS statistical software lookup table of zip codes current as of second quarter, 2006². In the vast majority of cases, nurses gave valid zip codes within the state of Florida. In some cases, however, nurses had a valid county placement pre-assigned by FBON when the zip codes they gave were invalid. The decision was made to use the pre-assigned county placement from FBON in all cases where it was given. The zip code lookup table was used to assign county and regional placement in cases where zip codes were available but pre-assigned county placement was not. About 500 missing counties were salvaged for mailing address, and about 800 were salvaged for work address. Of the 237,644 nurses in the analysis group, only 140 cases did not contain enough information for county placement. These cases are included in statewide figures but absent from regional analysis.

¹ A comparison of actively licensed nurse counts from January, 2007 with the counts reported by FBON (2005) demonstrates growth in the nurse supply consistent with the percent growth reported by FBON for change during fiscal year 2004-2005.

² Zip codes change over time but are reasonably steady in the short term. SAS makes new zip code lookup tables available periodically. The zip code table was downloaded from <http://support.sas.com/rnd/datavisualization/maponline/html/misc.html>

Statewide Profile of Nurses in Florida

Table 2 below shows the distribution of the analysis group across rank categories and allows comparison of the different ranks in size, demographic composition, tenure as a nurse in Florida, and extent of missing data.

Table 2. Statewide Comparison of Nurses by Rank

	RN	LPN	ARNP
Number of Nurses	169,555	57,561	10,528
Average Age	47.48	46.39	48.17
Age in Categories (% of non-missing cases)			
20 or younger	0.01	0.27	0.00
21-30	9.04	11.00	4.25
31-40	20.09	22.74	19.92
41-50	28.99	26.94	31.75
51-60	28.14	25.94	33.55
61 or older	13.73	13.11	10.54
<i>% missing</i>	<i>0.55</i>	<i>1.05</i>	<i>0.28</i>
Average Years Licensed in FL			
	13.03	11.69	16.21
<i># missing</i>	<i>450</i>	<i>151</i>	<i>4</i>
Gender (% of non-missing cases)			
Female	90.74	91.33	85.88
Male	9.26	8.67	14.12
<i>% missing</i>	<i>7.22</i>	<i>12.83</i>	<i>1.38</i>
Race/Ethnicity (% of non-missing cases)			
White	74.13	64.11	82.09
Black	10.98	25.38	7.81
Hispanic	6.57	6.48	5.37
Asian	6.71	2.17	3.25
Native American	0.18	0.28	0.22
Others	1.43	1.58	1.26
<i>% missing</i>	<i>8.97</i>	<i>13.03</i>	<i>5.08</i>

The average age of nurses in Florida, as of January 2007, was 46.4 for LPNs, 47.5 for RNs, and 48.2 for ARNPs. The figures for RNs and ARNPs are slightly higher than the average age of 46.8 estimated for all RNs in the country, as of March 2004, by the National Sample Survey of Registered Nurses (sample survey) (BHPr, 2004). They are also consistent with projections of an aging nurse workforce through 2010 (Buerhaus et al., 2000).

When examined by age categories, the data show that Florida can expect to lose a significant number of nurses to retirement within the next decade. Almost 14% of actively licensed RNs living or working in the state are aged 61 or older, and retirement is likely eminent for many of these RNs. More alarmingly, nearly 30% of RNs are aged 51-60, and these nurses can be expected to retire within 10 years. Thus, **Florida can expect to lose more than 40% of its currently licensed RN population over the next decade.** A similar pattern is in place for ARNPs and LPNs. **It is unlikely, given the smaller cohorts of nurses in generations following the baby boomers, that newly licensed nurse cohorts will be able to compensate for these losses.**

ARNPs tended to have the longest tenure as nurses in Florida, with an average of 16.21 years licensed as nurses in the state. LPNs had the shortest tenure at 11.69 years. As noted above, these figures must be interpreted in terms of continuous licensure and may not reflect the overall tenure of nurses who were unlicensed in the state for a period of time before again obtaining a nursing license.

The state of Florida's nurse population is more diverse in terms of race and gender than is the nurse population of the nation as a whole, according to results from the 2004 sample survey. Whereas only 5.7% of the nation's RNs were male as of 2004, over 9% of Florida's RNs are male. The proportion of male ARNPs is even higher at 14.1%. Similarly, sample survey results estimate that 88.4% of the nation's RNs were White in 2004, while only 74.1% of Florida's RNs reported White race. Nearly 11% of RNs in Florida are Black, 7% Hispanic, and 7% Asian. Florida's nurse population varies in racial/ethnic distribution according to the rank of the nurse. LPNs are the most diverse nurse type, with over 25% reporting Black race and only 64.1% reporting White race. ARNPs are the least diverse nurse type with only 8% of nurses reporting Black race and 5% reporting Hispanic ethnicity.

While there are few regional differences in the extent of missing data across the different items, some differences by nurse rank are notable. ARNPs had the least amount of missing data for all items. Only 0.3% of ARNPs were missing data on age, 1.4% were missing data on gender, and 5% were missing data on race/ethnicity. LPNs had the highest proportions of missing data. Nearly 13% were missing data on gender, about 1% were missing data on age, and over 13% were missing data on race.

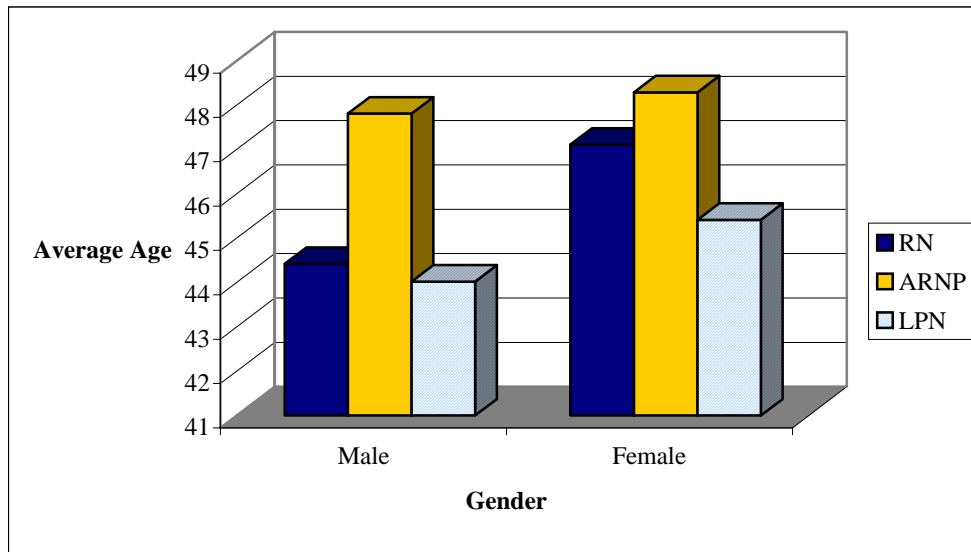


Figure 1. Average Age by Gender and Nurse Rank

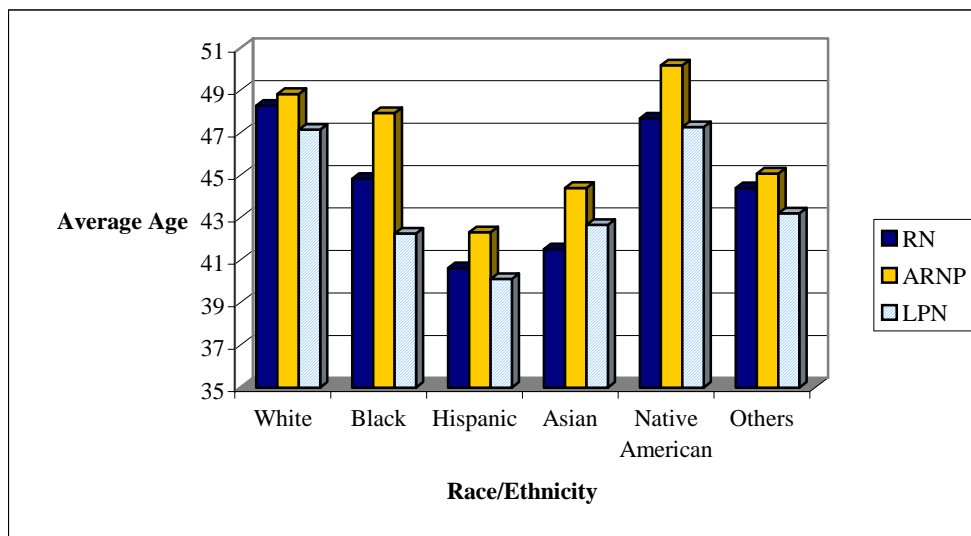


Figure 2. Average Age by Race and Nurse Rank

Figures 1 and 2 show the relationship of age to gender and race by the rank of nurses. Female nurses of all types were older than their male counterparts, a pattern that may result from the relatively recent increased interest in nursing as a career for young men. The difference in average age is most striking among RNs: female RNs are, on average, nearly three years older than male RNs. The difference in age is least notable among ARNPs, a nurse type in which males have been better represented for some time.

Figure 2 illustrates substantial differences in age across the different categories of race and ethnicity. The youngest nurses in the state are Hispanic, a pattern holding across all nurse types.

The oldest nurses are White and, for ARNPs, Native American³. The much younger average age of Hispanic, Asian, and (for RNs and LPNs) Black nurses in the state suggests that nursing is being seen as an attractive career option for younger members of minority racial and ethnic groups. This is encouraging news for the state, as it means our nurse population in the future may look more like the state’s general population in terms of racial/ethnic background. The particularly young age of Hispanic nurses is especially encouraging, as it portends a larger nurse workforce in the future capable of communicating with Spanish-speaking patients.

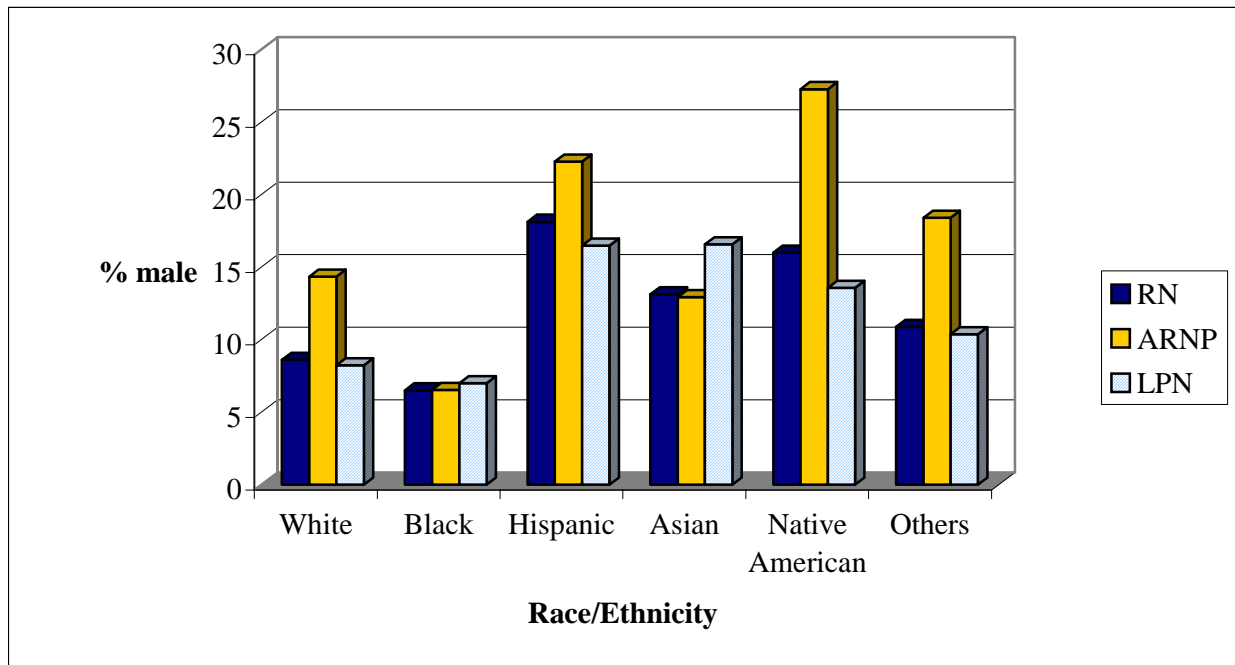


Figure 3. Percent Male by Race/Ethnicity and Nurse Type

The different racial/ethnic groups also differ in the proportion that are male, as Figure 3 shows. While men are underrepresented in all groups, they are particularly underrepresented among Blacks, even in the comparatively balanced ARNP category. More surprisingly, men are better represented among Hispanics, Asians, and Native Americans than they are among Whites. This latter finding is good news for the state because it indicates the presence of male role models in minority racial/ethnic groups that can serve an important recruitment function for nursing among young male minorities.

³ Native Americans in the ARNP category stand out in these charts for being older and proportionately more male. However, since less than .25 percent of ARNPs are Native American (a total of 23 ARNPs), the proportions are greatly affected by the presence of small numbers of older and male Native American ARNPs.

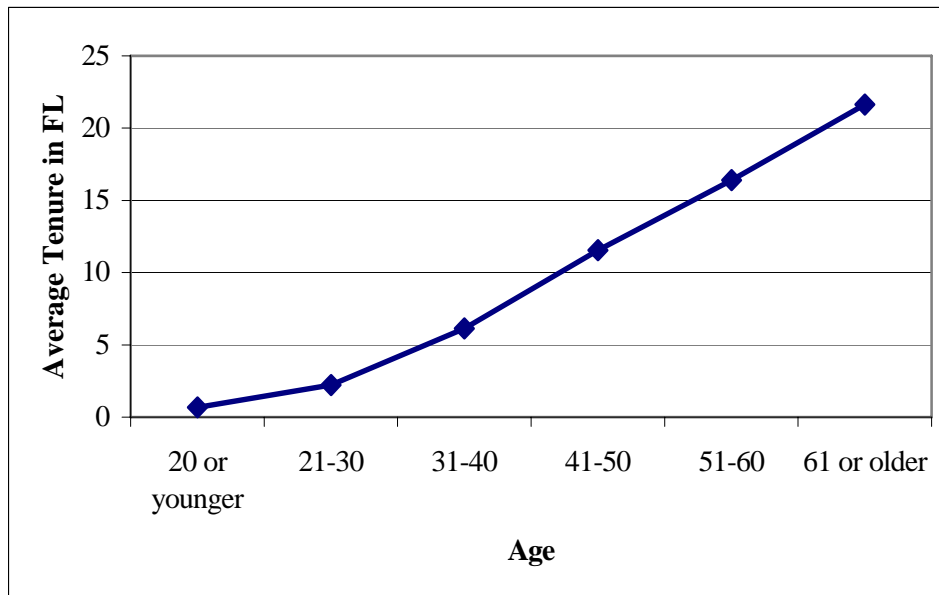


Figure 4. Average Tenure as a FL Nurse by Age

As noted previously, our measure of tenure as a nurse in Florida may be “reset” if a nurse’s license lapses and is then reinstated. Still, Figure 4 shows a predictable and nearly linear relationship of tenure to age: older nurses have been licensed longer. Nurses in the youngest age category, 20 or younger, have on average been licensed less than a year. In contrast, nurses aged 61 or older have on average been licensed for more than 20 years. Because of the relationship of age to tenure, gender and racial/ethnic differences in tenure largely follow the same relationship of these variables to age.

Analysis of Regional Differences

The composition of Florida’s nurse population differs, sometimes dramatically, across regions of the state. The map in Appendix A illustrates which counties and regional workforce boards belong to the larger regions of the state discussed in this section of the report. Readers can access this information for smaller geographic units, including regional workforce boards and counties, on our website at <http://www.FLCenterForNursing.org>.

It is important to reiterate the limitations of data on the work location of nurses. Where possible, nurses have been placed in counties of their work location. However, this information is not unique from “mailing” address in 60 percent of cases, and it is unknown what proportion of that 60 percent provided a work address as the address to which they wished to receive mail from FBON. **At the largest units of geographic analysis, the six regions of the state detailed in Appendix A and in Tables 3-5 below, accuracy is maximized since the areas are likely to encompass both the home and work locations of most nurses.**

Table 3. Regional Differences in the RN Population

	Statewide	South	Southwest	Southeast	Central	North	Northwest
Number of Nurses	169,555	17,100	50,409	35,012	34,492	19,959	12,479
Average Age	47.48	45.45	48.81	47.65	47.80	45.76	46.30
Age in Categories (%)							
20 or younger	0.01	0.01	0.01	0.00	0.01	0.01	0.01
21-30	9.04	11.89	7.19	7.71	8.81	12.63	11.23
31-40	20.09	25.85	17.73	20.27	19.38	21.68	20.69
41-50	28.99	27.20	28.40	30.83	28.92	28.10	30.27
51-60	28.14	23.39	30.76	27.82	28.45	26.91	26.06
61 or older	13.73	11.66	15.90	13.37	14.44	10.66	11.74
Average Years Licensed in FL	13.03	12.46	13.07	13.50	12.78	13.13	12.87
Gender (%)							
Female	90.74	85.79	91.26	91.70	91.78	90.27	90.59
Male	9.26	14.21	8.74	8.30	8.22	9.73	9.41
Race/Ethnicity (%)							
White	74.13	33.38	85.53	64.57	78.48	79.95	88.06
Black	10.98	21.86	5.26	19.26	8.61	8.76	6.75
Hispanic	6.57	29.59	3.57	5.44	5.01	2.49	1.50
Asian	6.71	12.31	4.57	8.45	6.37	7.57	2.54
Native American	0.18	0.14	0.14	0.11	0.18	0.23	0.47
Others	1.43	2.72	0.92	2.17	1.35	0.99	0.68

Notes: 104 nurses without a county placement are included in the statewide figures but omitted from regional analysis. See page 7 of this document for more information on methods of nurse placement. See page 8 for information on missing data. The percentages reported here are computed based on non-missing cases for each variable.

About 60 percent of the state’s RNs live and/or work in the populous Southwest, Southeast, and Southern regions. The South region, containing only Miami-Dade and Monroe counties, contains over 10 percent of the states nurses alone. RNs in the Southwest region have the highest average age (nearly 49 years), and almost 16 percent are aged 61 or older. RNs in the South have the youngest average age (about 45 years). The South is also unique in being the only region where non-white RNs outnumber White RNs. Almost 30 percent of RNs in the South are Hispanic, and another 22 percent are Black. Only one-third of RNs in this region are White. The Southeast region also contains proportionately more racial/ethnic minority RNs. Nearly 20 percent of RNs in this region are Black, and nearly 10 percent are Asian. In stark contrast, the RN population in Northwest Panhandle region of the state is 88 percent White, 7 percent Black, and less than 2 percent Hispanic. The South contains proportionately more male RNs (14%) than other regions, a finding consistent with its higher proportion of Hispanic nurses and the relationship of gender to race/ethnicity.

Table 4. Regional Differences in the ARNP Population

	Statewide	South	Southwest	Southeast	Central	Northwest	North
Number of Nurses	10,528	1,204	3,352	1,931	1,712	960	1,363
Average Age	48.17	47.40	49.04	47.72	47.82	48.46	47.59
Age in Categories (%)							
20 or younger	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21-30	4.25	3.91	3.17	3.53	5.22	4.19	7.07
31-40	19.92	23.46	18.55	21.08	20.29	17.40	19.82
41-50	31.75	32.95	31.09	34.11	30.97	33.02	28.96
51-60	33.55	30.70	34.62	32.76	32.61	35.22	34.56
61 or older	10.54	8.99	12.57	8.52	10.91	10.17	9.58
Average Years Licensed in FL	16.21	18.03	15.74	15.83	15.58	16.62	16.83
Gender (%)							
Female	85.88	86.92	85.67	87.82	83.92	82.82	87.29
Male	14.12	13.08	14.33	12.18	16.08	17.18	12.71
Race/Ethnicity (%)							
White	82.09	48.76	89.89	75.40	86.83	91.29	90.11
Black	7.81	19.85	3.47	13.92	5.37	4.35	4.44
Hispanic	5.37	20.96	3.12	4.60	4.09	1.45	2.26
Asian	3.25	7.70	2.21	4.11	2.68	1.90	2.26
Native American	0.22	0.26	0.25	0.27	0.18	0.22	0.08
Others	1.26	2.48	1.07	1.70	0.85	0.78	0.86

Notes: Six nurses without a county placement are included in the statewide figures but omitted from regional analysis. See page 7 of this document for more information on methods of nurse placement. See page 8 for information on missing data. The percentages reported here are computed based on non-missing cases for each variable.

Most of the regional differences found for RNs also hold for ARNPs. Those located in the Southwest are on average a year older than is true statewide, and nearly 13 percent are aged 61 or older. The South’s ARNP population is much more diverse in terms of race/ethnicity, with over half reporting non-white race or Hispanic ethnicity. About 20 percent reported Hispanic ethnicity, and another 20 percent reported Black race. The Northwest was least diverse with over 90 percent reporting White race. In contrast to findings for RNs, the Northwest contains proportionately more male ARNPs (17%) than is true statewide, as does the Central region (16%). There were also notable regional differences in the tenure of ARNPs as nurses in Florida. Those in the South have practiced nursing in the state for over 18 years, on average, compared with less than 16 years in the Southwest, Southeast, and Central regions.

Table 5. Regional Differences in the LPN Population

	Statewide	South	Southwest	Southeast	Central	North	Northwest
Number of Nurses	57,561	4,813	19,933	10,694	11,175	5,470	5,439
Average Age	46.39	44.23	46.77	46.57	47.68	45.87	44.37
Age in Categories (%)							
20 or younger	0.27	0.76	0.17	0.34	0.20	0.17	0.26
21-30	11.00	14.30	10.57	9.80	8.57	12.58	15.50
31-40	22.74	26.22	22.42	22.05	21.12	23.38	24.94
41-50	26.94	27.40	26.54	29.32	26.46	25.63	25.59
51-60	25.94	20.97	26.14	25.80	29.06	25.65	23.74
61 or older	13.11	10.36	14.16	12.69	14.59	12.59	9.96
Average Years Licensed in FL	11.69	10.50	11.62	11.72	11.86	12.19	12.04
Gender (%)							
Female	91.33	87.11	90.85	91.84	92.52	92.54	92.25
Male	8.67	12.89	9.15	8.16	7.48	7.46	7.75
Race/Ethnicity (%)							
White	64.11	15.36	76.94	46.16	71.56	66.82	77.83
Black	25.38	49.96	14.88	44.25	18.88	25.93	17.76
Hispanic	6.48	29.06	4.86	4.60	5.81	2.53	1.22
Asian	2.17	2.83	1.84	2.31	1.99	3.27	1.78
Native American	0.28	0.19	0.22	0.24	0.26	0.42	0.54
Others	1.58	2.59	1.27	2.44	1.50	1.03	0.88

Notes: 37 nurses without a county placement are included in the statewide figures but omitted from regional analysis. See page 7 of this document for more information on methods of nurse placement. See page 8 for information on missing data. The percentages reported here are computed based on non-missing cases for each variable.

Results for LPNs show that the South again stands out for having the state’s youngest and most diverse nurse population. Although over half of the state’s LPNs are White, only 15 percent of the South’s LPNs reported White race. About half of the nearly 5,000 LPNs in this region are Black, and another 30 percent are Hispanic. LPNs in the South are nearly two years younger, on average, than is true statewide. The South also contains proportionately more male LPNs (nearly 13%) than other regions.

Discussion and Conclusions

Analysis of nurse licensure data from January, 2007 revealed that **data quality within the licensure database has improved in recent years**. Very little of the data contained implausible or missing information, and acquisition of unique practice location information for at least 40 percent of nurses in the state has improved the Center’s ability to investigate regional differences in the state’s nurse population. Still, use of the term “workforce” is inappropriate when discussing licensure data because FBON does not collect data on workforce participation; the

licensure data are collected for regulatory purposes, not for workforce planning. As a result, **we do not know how many of the nurses described in this report – particularly in the populous older age categories – are working in nursing.** As well, the inability to distinguish address information as “home” or “work” in a majority of cases hampers efforts to count the nurse population at the smallest units of geographic analysis.

Analysis of the demographic characteristics and regional distribution of the state’s nurses revealed some important facts. **The most alarming and policy-relevant fact is that the average age of nurses in Florida is rapidly nearing 50 years.** If prevalent age-driven retirement patterns hold true in the future, the state can expect to see a large proportion of its current nurse workforce retire within the next 10 years. The smaller cohorts of young nurses following the large baby boom generation of nurses will not be able to make up for these losses. In addition, the mass retirement of a large proportion of experienced nurses may result in a “brain drain” whereby the remaining nurse workforce is not only smaller but also substantially lacking in experienced mentors for new nurses. **Policy solutions that might fruitfully target the problem of an aging nurse workforce include the re-design of nurse work environments to match the physical limitations of older nurses and the effective preparation and use of seasoned nurses as educators.**

More encouraging findings include the younger average age of male and racial/ethnic minority nurses in the state. These findings suggest that nursing is seen as a viable career option among young men and minorities, and also that the state’s nursing workforce may be more diverse in the future. Particularly advantageous is the younger average age of Hispanic nurses, as this forecasts a larger workforce in the future capable of communicating with Spanish-speaking patients.

Investigation of regional differences in the state’s nurse population underscores the need to consider nursing supply and demand at sub-state levels. The regions differ dramatically in the racial/ethnic composition of the nurse population as well as nurse age, tenure, and gender. They likely also differ in patient population, demand for health care per capita, and extent of seasonal fluctuation in both nurse supply and demand for health care. **The extent of a nursing shortage, as well as effective solutions to the shortage, will need to be assessed and implemented at regional levels. These considerations mean that accurate sub-state nurse workforce supply and demand estimates are critical for strategic planning.**

Much is still unknown about the state’s nursing workforce. The Center’s current and future research projects, including a workforce survey of nurses and assessment of nurse demand through employer surveys, will hopefully bring us closer to understanding the nature of our nursing shortage and best approaches to resolving it.

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Appendix A: Map of FCN Regions, Workforce Board Regions, and Counties in Florida

