

Registered Nurse Workforce Survey 2014

Table of Contents

1. About the Data	Page 2
2. Demographics	Page 3
3. Human Capital	Page 8
4. Geography	Page 13
5. Earnings	Page 18
6. Appendix A	Page 20

About the Data

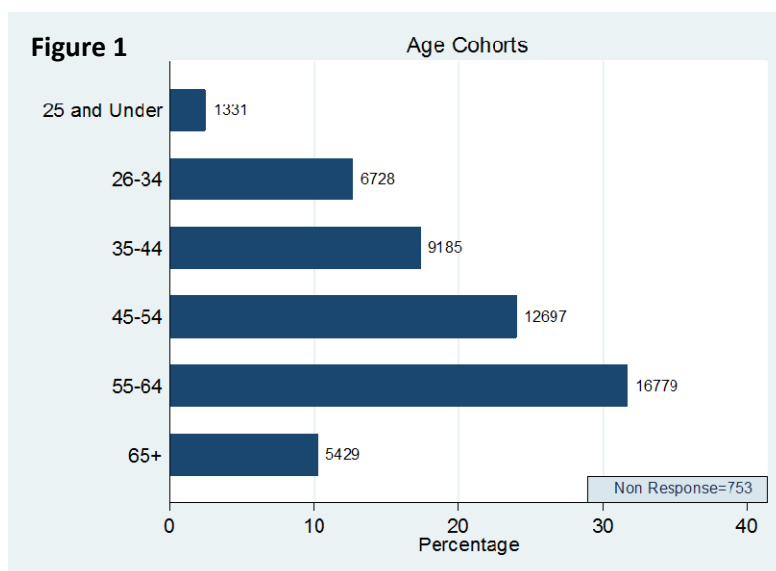
The primary source of data for this report is a survey offered to individual Registered Nurses completing on-line licensure renewal. The renewal period ran from (3/6/14) to (5/31/14) and the voluntary survey yielded 52,902 participants. There were 171,739 Registered Nurses (including Advanced Practice Nurses) in Illinois as of August 2014.

The survey includes 28 questions consistent with the national minimum dataset requirements of the Forum of State Nursing Workforce Centers. A comprehensive record of questions and responses is provided in Appendix A. Information obtained from the survey can be categorized into four areas. Demographic information includes age, diversity (ethnicity, gender), and retirement horizon. Human capital elements are education and area of employment specialty. Job characteristics include work setting, earnings, and other details. Geographic information is derived from employer zip codes reported by participants.

Demographics

Figure 1 presents the distribution of RN survey participants by selected age categories. Age is derived from unfiltered participant responses to date of birth. The horizontal bar for each category represents both the number of responses (listed to the right) and the share of total (indicated on the axis below). The substantial share of Illinois RNs in advanced age categories represents a significant context for many other observations in this report. The

value of these age categories as a cross-reference for other information is enhanced by the relatively small number of non-responses (listed in the lower right corner).



The selected age categories should facilitate comparison to data from other sources. In particular, age distribution is a common focus of other reports on the nursing workforce. Care should be taken with regard to timing of cohorts reported in other studies. For example, a recent report by the Health Resources and Services Administration (*The U.S. Nursing Workforce: Trends in Supply and Education*, April 2013) presents age distribution from data that was collected four to five years earlier than that of this study.

Diversity of the Illinois RN workforce is explored in Figure 2. White females with initial licensure in the U.S. constitute a substantial majority; however, there are indications of changing demographics observable across age categories. The 35-44 age category exhibits the greatest diversity with relative maximum percentages for African-American, Asian, Non-U.S., and male populations. The Latina share (reading from right to left in that row of the table) increases across age cohorts to a maximum of 7% for the 26-34 age category. Another notable observation from Figure 2 is the minimal ethnic diversity of the youngest age category.

Figure 2

Diversity by Age Cohorts

	25 and Under	26-34	35-44	45-54	55-64	65 and Over
Age Frequency	1,331	6,728	9,185	12,697	16,779	5,429
White Female	77%	69%	62%	74%	80%	82%
Not White	23%	31%	38%	26%	20%	18%
Asian	7%	8%	9%	6%	4%	3%
African American	3%	7%	10%	8%	7%	7%
Latina	5%	7%	5%	3%	2%	1%
Other	2%	3%	3%	2%	2%	2%
Non U.S. Intial License	2%	3%	9%	5%	5%	4%
Male	7%	8%	9%	6%	4%	3%

The survey asks participants a pair of questions on retirement plans. The distribution across selected categories of years to retirement is presented in Figure 3. The largest category is composed of RNs within five years of exit. More than one-third of survey participants report anticipated retirement over the next decade. On this question there are a substantial number (4,106) of non-responses and an even larger number (7,054) indicating uncertainty with regard to retirement plans.

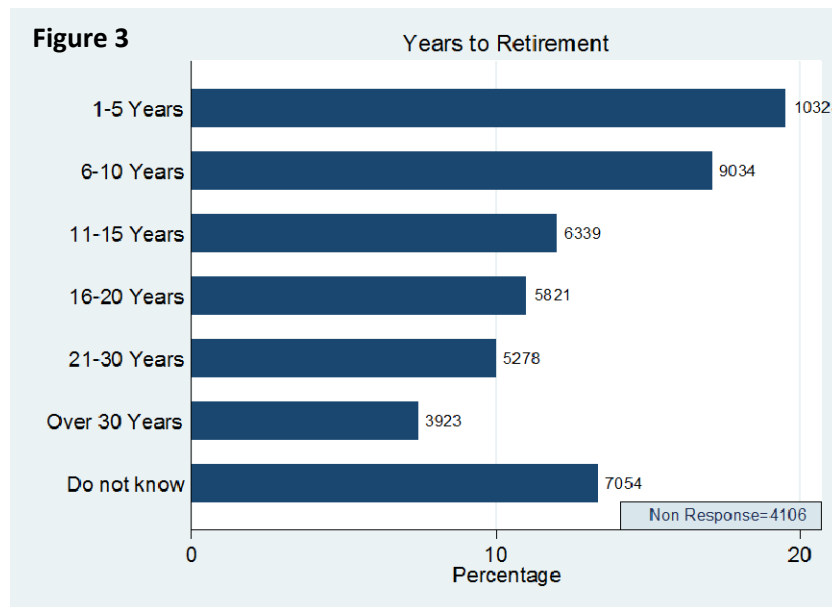


Figure 4

Years to Retirement by Age Cohort

	25 and Under	26-34	35-44	45-54	55-64	65+
1-5 Years	173	628	456	805	5615	2507
	14%	10%	5%	7%	37%	63%
6-10 Years	52	219	407	2034	5833	358
	4%	4%	5%	17%	38%	9%
11-15 Years	16	129	672	3638	1773	31
	1%	2%	8%	31%	12%	1%
16-20 Years	26	366	1939	3074	330	11
	2%	6%	23%	26%	2%	0%
21-30 Years	101	1246	2835	947	90	16
	8%	20%	33%	8%	1%	0%
Over 30 Years	604	2245	834	110	81	22
	48%	36%	10%	1%	1%	1%
Do Not Know	280	1418	1460	1227	1518	1054
	22%	23%	17%	10%	10%	26%
Total	1252	6251	8603	11835	15240	3999

Figure 4 breaks down this information across the familiar age cohorts. It would not be unreasonable to expect a strong negative correlation between age and years to exit. The survey results generally fit with this expectation with observed responses clustering in cells along the northeast (1-5 years, 65+) to southwest (over 30 years, 25 and under) diagonal of the table. Exceptions to the anticipated pattern (in other words, values off the diagonal) include a number of individuals with time to exit that exceeds most others in their cohorts. These include a few hundred 65+ individuals with more than 1-5 years to exit, over two thousand in the 55-64 age category with anticipated retirement 11-15 years away, and almost one thousand in the 45-54 age category with anticipated retirement 21-30 years away.

Figure 5 presents primary reasons for delaying retirement. Note first the large number of non-responses (17,535) and the additional large number (19,390) indicating no eminent retirement as a reason for skipping other options. The remaining responses are ordered by frequency of response with economic conditions as the leading concern. Other popular responses highlight the desirability of flexible work hours, reduced physical demands, and increased compensation.

Years of experience as an RN is another individual element of interest that can be derived from survey responses. Figure 6 presents experience in categories of 0-7 years, 8-14 years, 15-23 years, 24-33 years and 34+ years. The distribution across these five experience categories is presented for each of our familiar age cohorts.

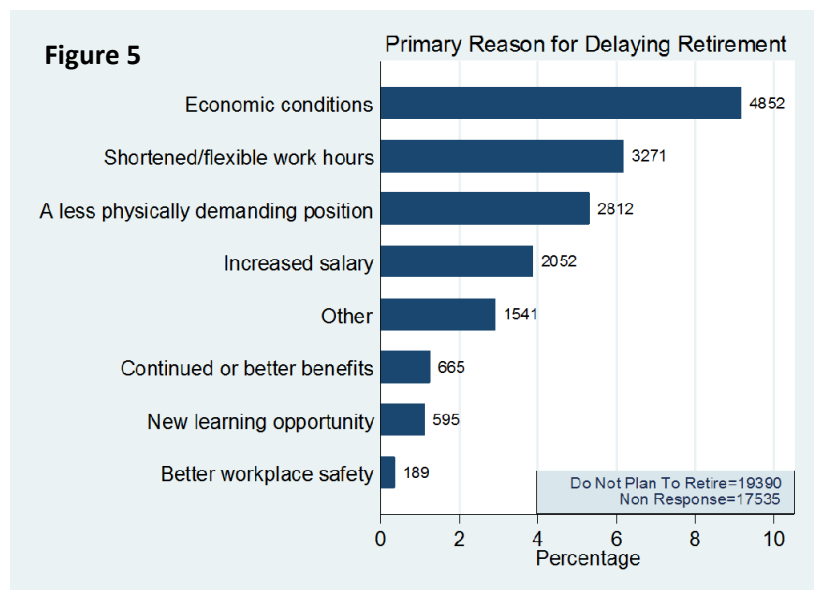


Figure 6 is a six panel diagram appearing on the next page below. The upper left panel confirms that RNs in the youngest cohort are concentrated in the least experienced group (0-6 years). At the other extreme (lower right) we also see that the vast majority of RNs aged 65+ belong to the most experienced group (34+ years). However, a more complex picture emerges for age cohorts 25-34, 35-44, 45-54 and 55-64. In each of these age categories we observe individuals with diverse levels of experience. This observation is consistent with heterogeneity in the timing of RN career choices. That is, individuals enter the field at different points in the life cycle, up to their late 40's and even beyond. In the age cohort of 35-44, one cannot equate age with years of experience, which is different from the 25 and under age cohort where the young age is equated with experience. Hospital administrators would have to look at different onboarding.

The lower three panels of Figure 6 on the next page below indicate that a sum of nearly 23,000 individuals with 24+ years of experience are found in the 45+ age cohorts. That is a wealth of professional experience by any measure. However, when we consider the intersection between age, experience, and anticipated retirement we begin to appreciate how demographics cast a long shadow over the nursing workforce challenges ahead. Older nurses constitute a substantial share of the Illinois nursing workforce.

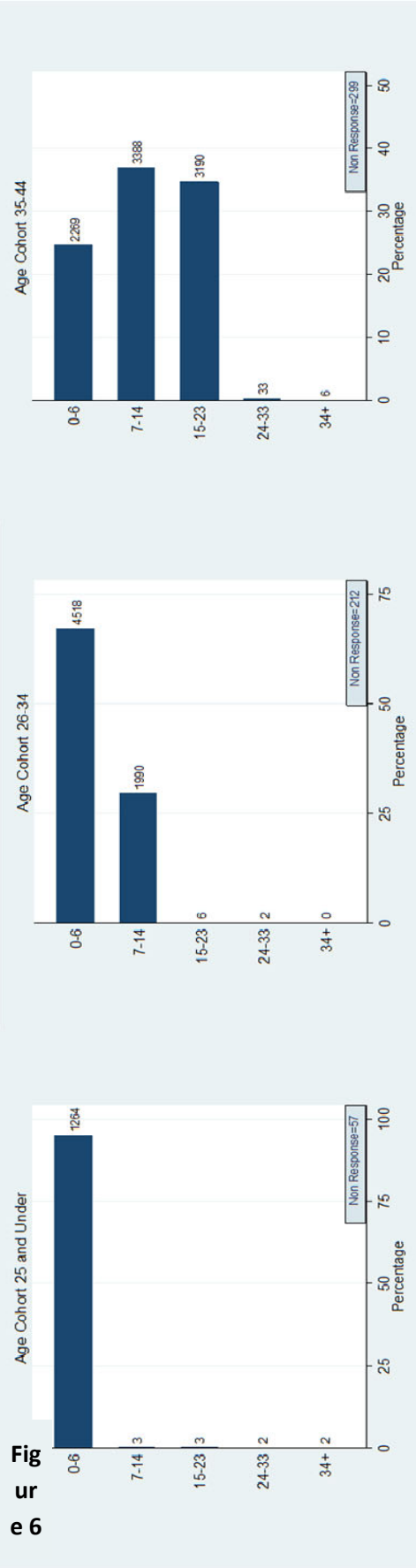
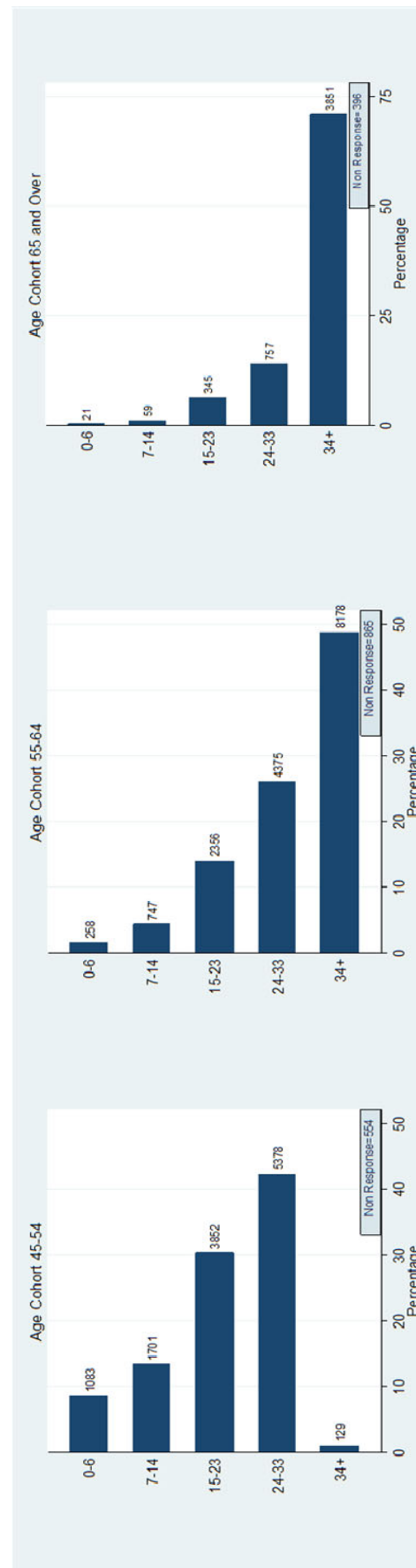


Figure 6



Human Capital

The concept of human capital encourages us to think of the workforce in terms of the productive capacity of each individual. Skills and knowledge can be general (productive in a variety of contexts) or specific (most valuable in a particular context, such as a unique industry setting or specialized occupational role). A human capital perspective is essential to our full appreciation of the role of health care, education, and workforce development in promoting economic growth and societal well-being. In this section we look at education and area of medical specialty in the RN survey responses.

Figure 7 presents the response frequencies (to the right of each horizontal bar) and shares (on the axis below) for educational attainment. The categories are ordered by overall frequency with baccalaureate degree in nursing logging almost 40% of all responses. Associate degree in nursing accounts for more than 25% of the total. The remaining 35% are distributed across a broad spectrum of educational categories. Advanced degrees beyond baccalaureate (nursing and other) constitute almost half of this remainder. This is a current snapshot of Illinois RN educational attainment.

Figure 8, on the next page, offers a pipeline perspective with educational information decomposed by age cohorts. Educational categories are ordered by overall frequency to highlight differences in educational shares across age cohorts.

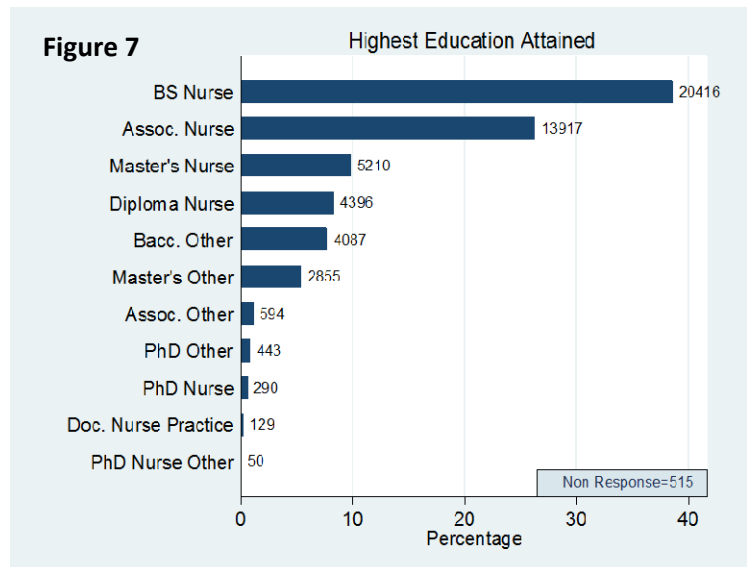
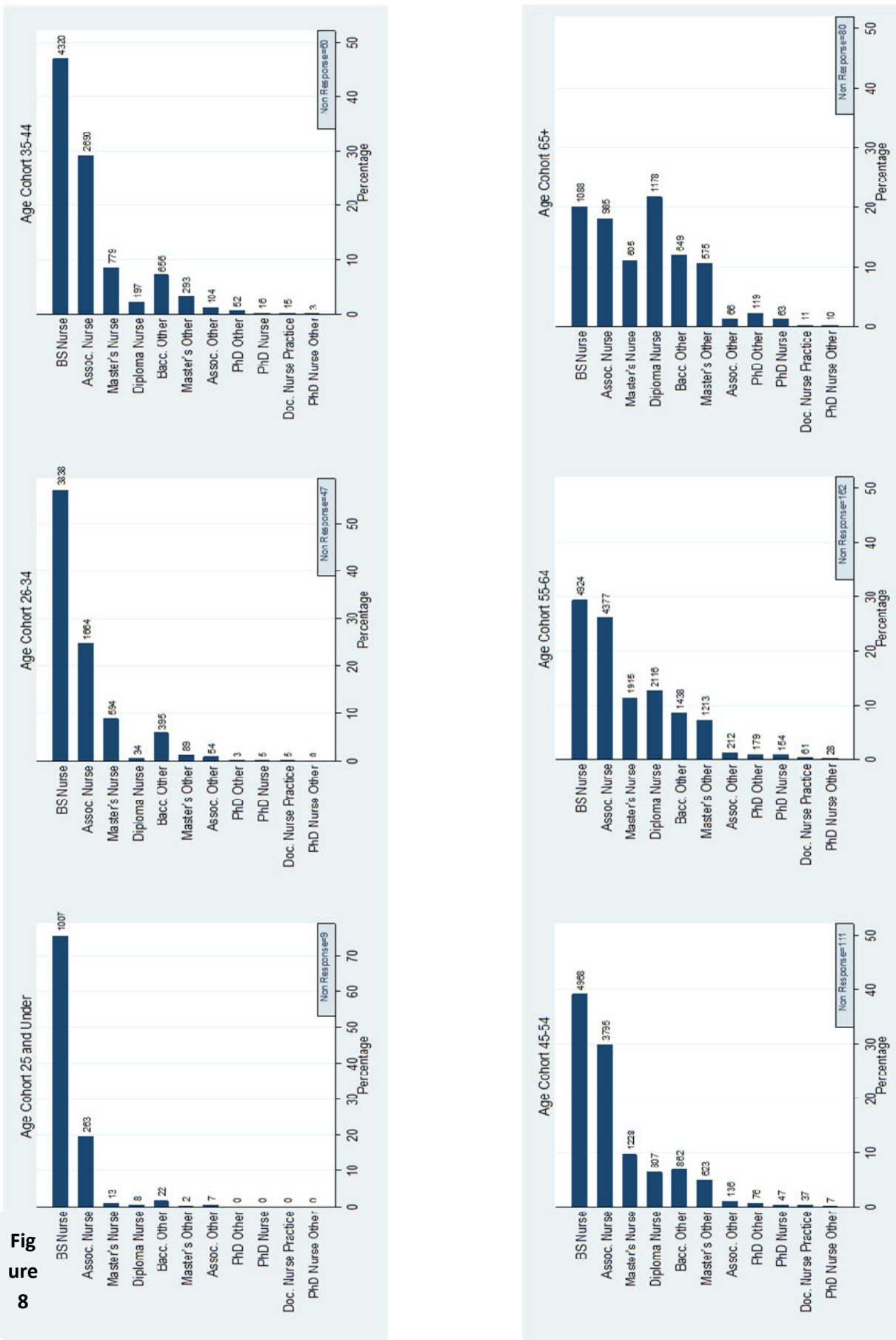


Figure 8



In Figure 8 attainment of nursing baccalaureates spikes with a peak share at the youngest cohort. The nursing associates share climbs above 30% for the 35-44 and 45-54 cohorts. Advanced degrees beyond baccalaureate are concentrated among older cohorts. RNs aged 55+ hold more than 55% of all advanced degrees while RNs aged 45+ hold almost 80% of all advanced degrees. The majority of PhD's are nurses between the age of 55-64.

Figure 9

	Currently Enrolled in a Nursing Education Program						Total
	25 and Under	26-34	35-44	45-54	55-64	65+	
Associates Degree	1	4	10	17	18	5	55
	2%	7%	18%	31%	33%	9%	100%
Baccalaureate Degree	131	606	768	739	319	29	2592
	5%	23%	30%	29%	12%	1%	100%
Masters Degree	86	799	731	614	253	19	2502
	3%	32%	29%	25%	10%	1%	100%
Post Masters Certificate	3	32	50	68	50	6	209
	1%	15%	24%	33%	24%	3%	100%
Doctoral Program	12	124	89	119	112	12	468
	3%	26%	19%	25%	24%	3%	100%
Post-Doctoral Program	0	1	4	6	5	0	16
	0%	6%	25%	38%	31%	0%	100%
Other	4	44	61	103	158	27	397
	1%	11%	15%	26%	40%	7%	100%
Total	237	1610	1713	1666	915	98	6239
	4%	26%	27%	27%	15%	2%	100%

Current enrollment patterns by age are presented in Figure 9 with degree programs ordered by educational level. Note the reduced number of categories as the survey question on enrollment does not distinguish between nursing and other education programs. In many occupations we might expect to see more of a positive correlation between age and educational level enrollment. The Illinois RN data suggest a more complex pattern with nursing as a late blooming or second career for many and students of diverse ages sharing classrooms at all levels of education.

Instructional capacity at community colleges, universities and other academic settings is a requisite element of the education pipeline. Information on educational attainment by age for RNs who self-identify as working in academic settings is presented in Figure 10. Master's and PhDs in academic settings are concentrated in the 45+ aged cohorts consistent with our more general observation above.

Figure: 10

Age Cohorts by Highest Education for Academic Settings

	26-34	35-44	45-54	55-64	65+	Total
BS Nurse	24	26	51	71	17	189
Assoc. Nurse	7	11	10	18	6	52
Master's Nurse	33	78	173	271	87	642
Diploma Nurse	0	1	4	15	9	29
Bacc. Other	0	4	4	21	9	38
Master's Other	0	5	16	37	25	83
Assoc. Other	0	1	0	2	0	3
PhD Other	0	3	9	41	37	90
PhD Nurse	2	2	21	92	31	148
Doc. Nurse Practice	0	5	10	22	4	41
PhD Nurse Other	0	0	2	10	4	16
Total	66	136	300	600	229	1331

Specialized training and experience can enhance skills that are most valuable in a particular context. Information on individual employment in specialty areas is provided through the survey. In Figure 11 we hope to see the distribution of RNs across primary specialties. “Other” is the most popular response and there are as many non-responses as some of the most frequent responses. The top five named specialties are acute/critical, medical/surgical, geriatric, pediatrics, and home health.

Figure: 11

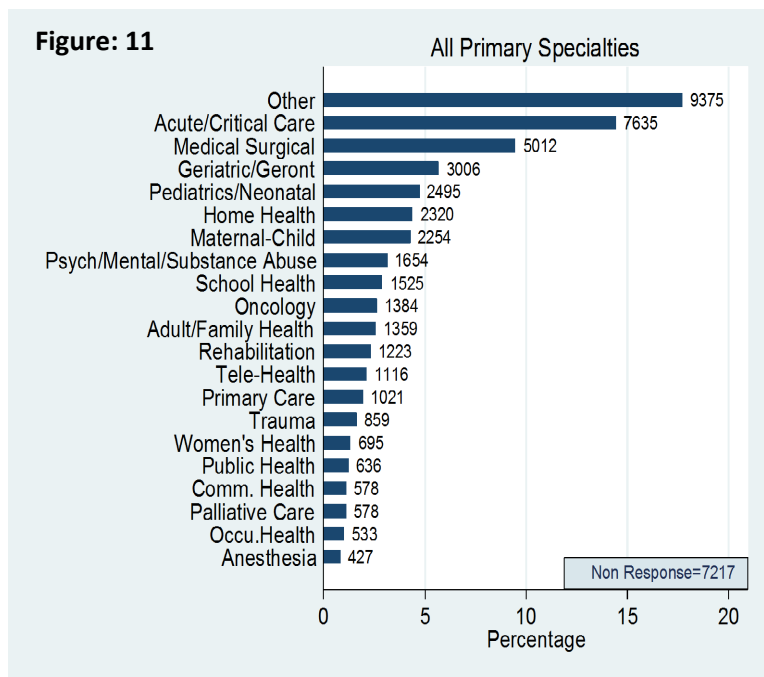


Figure 12

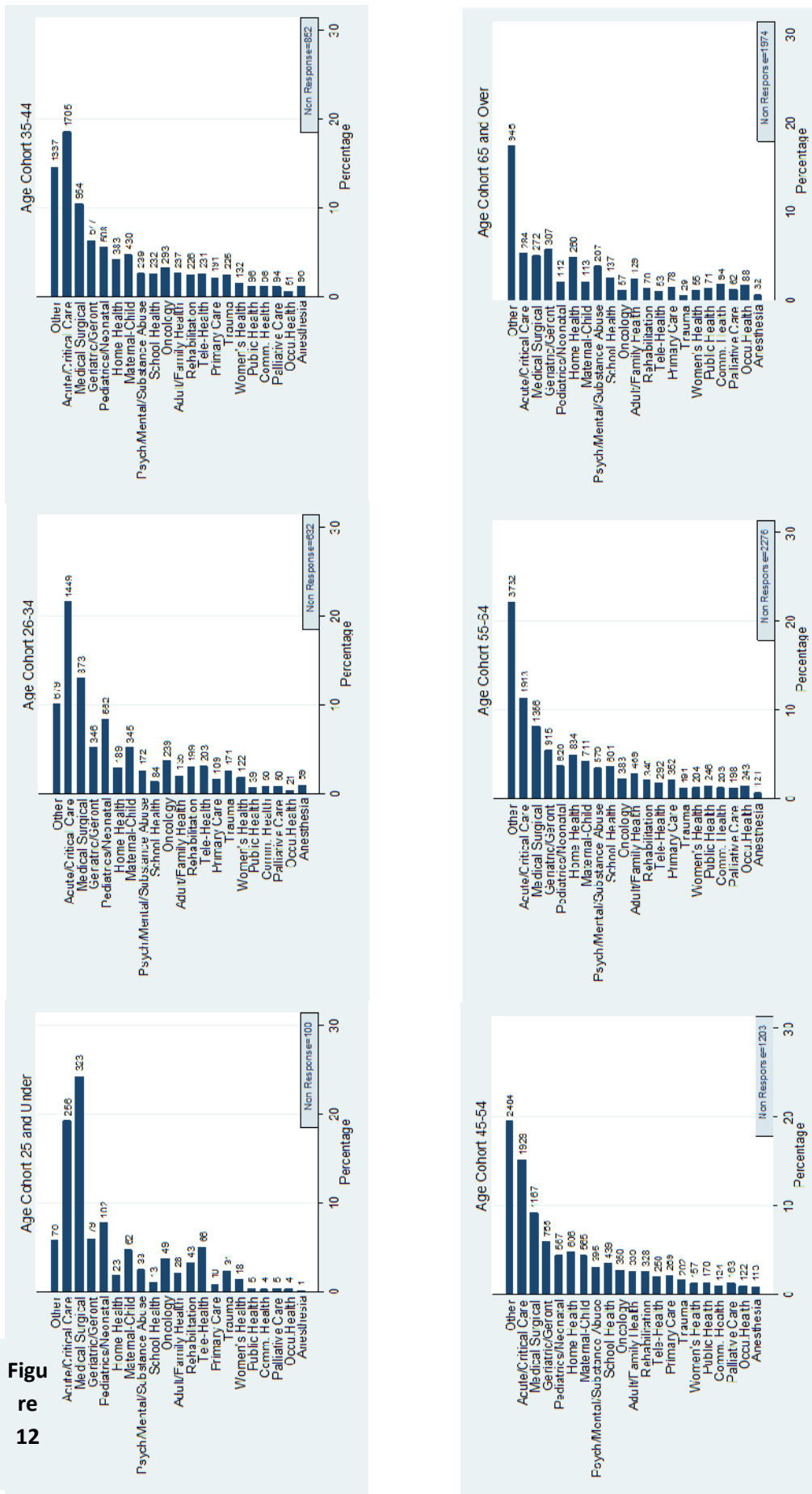


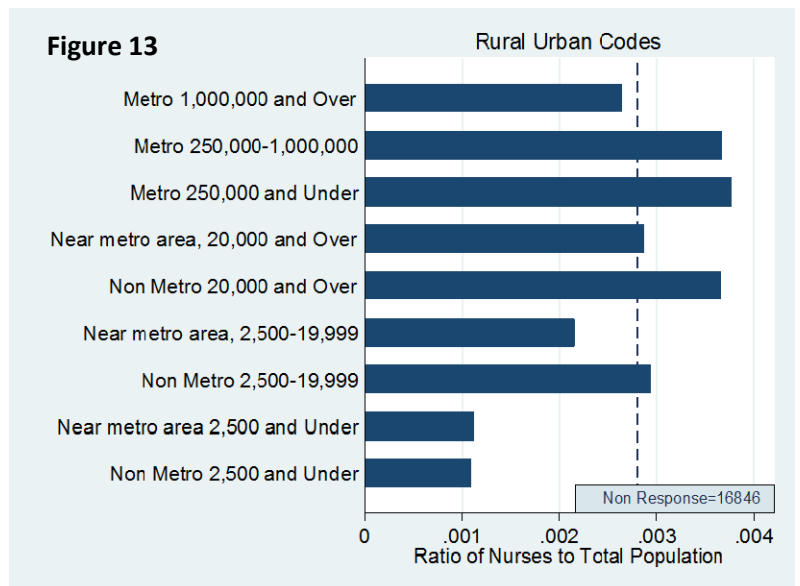
Figure 12 decomposes the information on specialty area by age cohorts. There are subtle but notable differences with acute/critical, medical/surgical, oncology and telehealth commanding greater shares within young cohorts. Specialty areas with larger shares in older cohorts include other, psychiatric, school nursing and community health.

Geography

Location-oriented data are collected through four questions on the survey. Question #5 gathers information on country of initial licensure, questions #11 and #12 have respondents identify all states of current licensure and practice, and question #19 asks respondents for the state and zip code of their primary employer. We use employer zip code to provide location-oriented views of the Illinois RN workforce. The employer zip code field has a significant number of non-responses (11,923) plus a number of responses indicating out-of-state employers. We are still able to consistently identify employer locations within Illinois for more than 75% of the full participant sample.

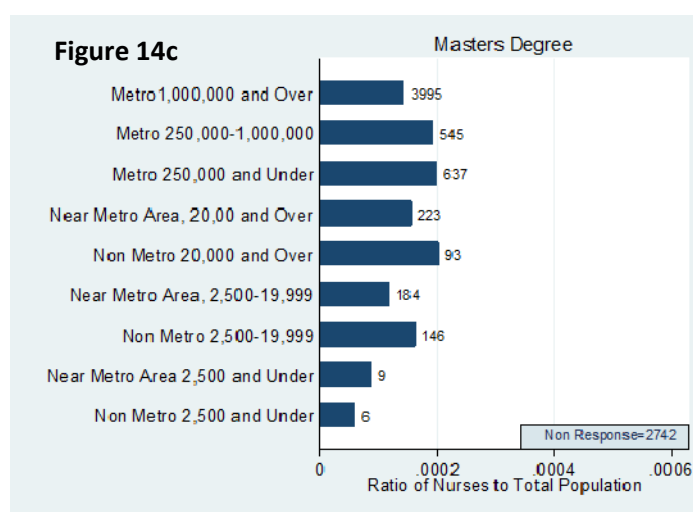
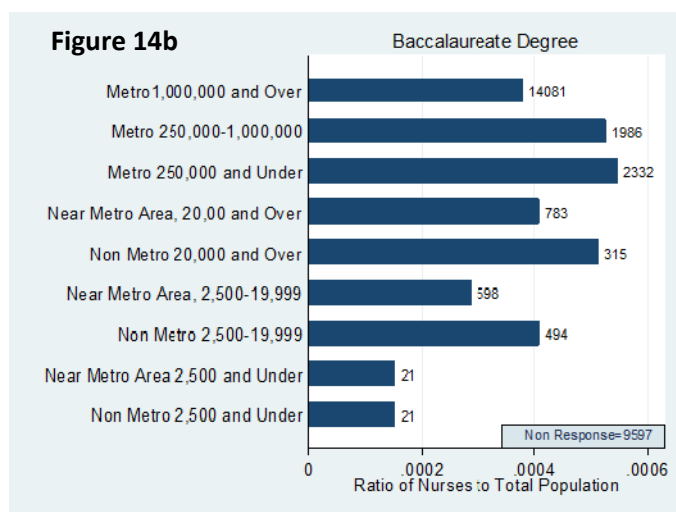
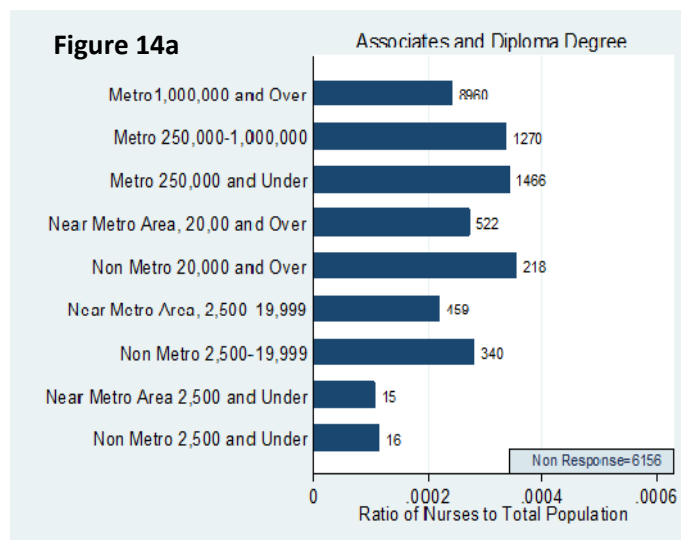
Illinois counties are the common denominator for geographic information presented. There are 102 counties in the state and each of the 3,000+ zip codes in survey responses has been assigned to the corresponding county. The distribution of respondents across counties is reported in Appendix A with question #19 information. Given the geography of population density in Illinois it is neither surprising nor particularly informative to know that RNs are generally clustered where people are generally clustered. Viewing a ratio of RN workforce density relative to population provides a more informative measure for comparison across geographic areas. Note that these are RNs responding to the survey as opposed to all RNs and also note that location is based on reported employer location not residence.

Counties can be grouped in terms of their rural-vs-urban nature, a function of population density within the county and nature of contiguous counties. Figure 13 provides a view of Illinois RN workforce coverage across counties grouped and ordered from most urban to most rural. The RN workforce coverage appears to be most densely clustered in suburban areas and smaller metropolitan areas. The ratio measuring RN workforce coverage is lowest in sparsely populated rural



counties whether those counties are next to metropolitan areas or in more remote locations.

This approach can be replicated for considering more specific geographic concerns. For example, disaggregation by educational attainment yields Figures 14a, 14b and 14c. While the frequency and relative density ratio shift in scale across the three diagrams it is the shape of the distribution across rural-vs-urban categories that really matters. Consistency of shape would imply that RN workforce density across geographic areas does not differ substantially for different levels of educational attainment.



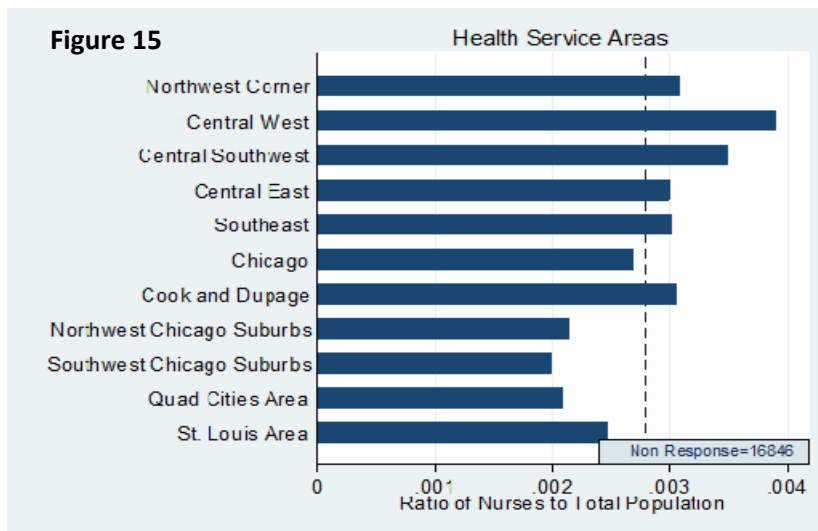
An alternative grouping of Illinois counties is based on location. Health Service Areas (HSA) serve as a common reference for various health care related reports including *The 2007 Illinois Nursing Workforce Survey Report* (National Research Council, October 2007). Of the eleven HSA defined for Illinois a typical HSA is composed of multiple full counties with at least one housing a metropolitan area. For example, HSA #3 in the Illinois county map below combines Springfield's

Sangamon County with neighboring Logan County and Adams County to the east. Particular Health Service Areas (such as HSA #11) refer to counties associated with metropolitan areas in bordering states. Our largest metropolitan area is divided into several HSA with one reserved for the City of Chicago alone (#6), a second for non-Chicago portions of Cook and DuPage counties (#7), and others including the remaining suburban “collar” counties (#8 & #9).

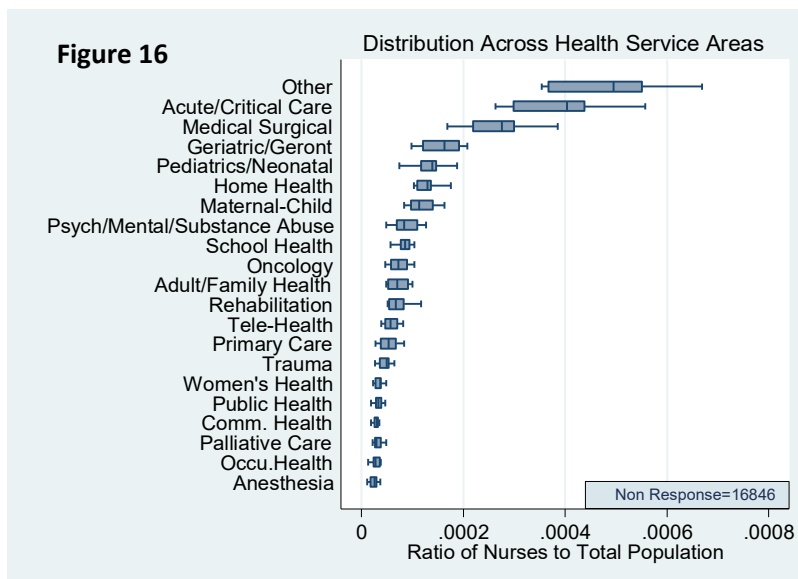
Health Service Area Map



Figure 15 presents RN workforce coverage ratios across the eleven Illinois Health Service Areas. The HSA associated with Peoria and Springfield show the highest ratios of RN employment relative to population. HSA defined with large suburban populations appear to be the least served. Compared to categories based on county type (in Figure 13), the range of values across HSA is limited. It would be instructive to see this measure mapped by county to avoid drawing conclusions that rely on pre-determined HSA boundaries.



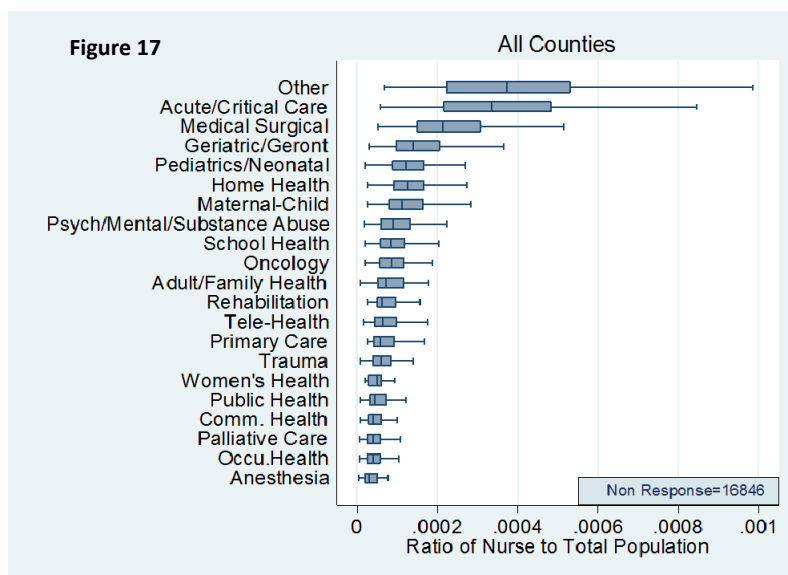
An alternative approach to specific geographic concerns involves a “box-plot” or “box-and-whiskers” diagram where one can work efficiently with a multiple-category variable and observe the range of values across geographic areas. When working with three education categories or six age cohorts we have relied on multiple bar charts. This approach becomes infeasible when exploring a variable like primary specialties with twenty-one categories. Figure 16 presents the distribution of RN density ratios across HSA for each of the primary specialty categories. The extreme left and right whiskers give the minimum and maximum observed values. A box represents the bulk of the distribution with left and right ends identifying 25th and 75th percentile values. The median value



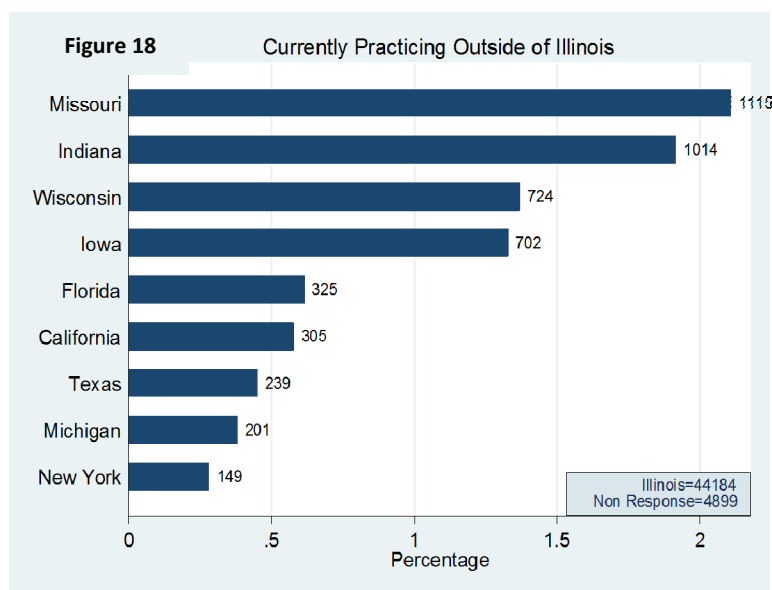
(across eleven HSA in this case) is shown within the box by a vertical hash mark.

In Figure 16 there is substantial variation across HSA for the top three specialty categories (other, acute/critical, medical/surgical); however, there is little apparent variation across HSA for all other specialties. This implies that the RN workforce in those nineteen categories is

distributed proportionately to population throughout the state. Would this implication hold up to changes in the definition of geographic areas? Figure 17 replicates the process with 102 counties as the units of observation. From this perspective there is considerable variation across geographic areas for all specialties. Aggregation to the HSA level masks these differences.



As noted earlier the survey collects data on states in which respondents currently practice, not restricted to Illinois. Figure 18 presents the other states appearing with the greatest frequency. The two states in which IL RNs are most likely to have additional licenses are Missouri and Indiana along with most of the other states bordering Illinois. Distant states with large populations are also well-represented. This state-of-practice question generated multiple-state responses from almost 4% of respondents (including RNs specializing in tele-health) and had a non-response rate of 9%.

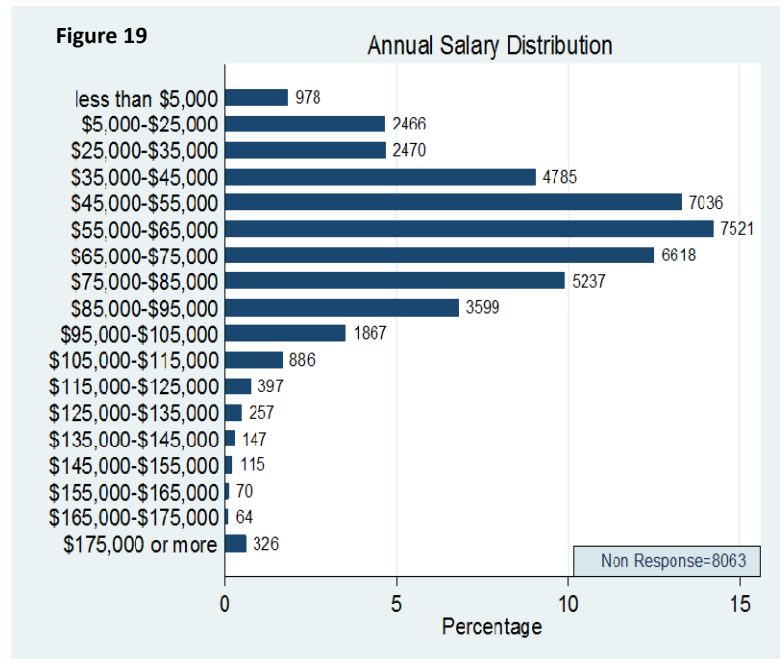


Earnings

The final question (#28) of the RN survey asks “what is your current annual salary for your primary nursing position?” with eighteen intervals provided. About 85% of survey participants selected a salary range in response and the frequency distribution is presented in Figure 19. The median response was the \$55,000 to \$65,000 interval with reported values throughout the full range of possibilities.

In this section we report on a preliminary analysis of earnings determinants making use of survey data on a variety of individual characteristics. Earnings intervals are converted to midpoint values. Potential explanatory factors (mostly in 0,1 form) are developed from data on education, primary specialty, experience, age, weekly hours, job setting, job position, and employer location. A standard cross-sectional regression of earnings (natural log transformation) on proposed factors was implemented. The set of factors included in the empirical model explained 38.3% of the variation in individual earnings.

The estimated effects reported should be understood as “conditional”. That is, conditional on all else (the other factors in the model) remaining unchanged the estimated effect is the predicted percentage impact on earnings. For example, the effects of different specialty fields reported below represent earnings premiums and penalties given equal levels of education, experience, work hours, etc. assumed across individuals in different specialties. With different education requirements across specialties it may turn out that the highest paying specialty is not the specialty exhibiting the greatest



premium.

Education matters. Compared to RNs with associate degrees those with baccalaureates enjoy an annual salary premium of more than 7%. Attainment of a master's degree adds more than 12% to the annual premium with a doctorate contributing an extra 11%.

Experience provides an initial earnings boost with an 8% to 10% total premium over the first seven years. Preliminary analysis does not confirm statistically significant earnings gains attributable to additional experience beyond the first seven years. Age conveys a small additional premium up into an individual's mid-fifties. Preliminary analysis suggests significant declines with age for those in their late-fifties and beyond.

RNs in executive positions and advanced practice positions enjoy substantial earnings premiums relative to their peers. Other positions with significant premiums include research, manager and consultant. Work settings with the most positive premiums are correctional, hospital and claims. Other settings with apparent earnings premiums include occupational, ambulatory and nursing home / assisted living care.

Specialty matters. The estimated annual earnings premiums are substantial for anesthesia and palliative. Positive effects are also confirmed for oncology, home health and tele-health. Substantial earnings penalties are evident for RNs specializing in school or community nursing. RNs with specialties in adult, public, women, and geriatric experience earnings deficits relative to peers that are less pronounced.

Geography does not appear to matter. There were no statistically significant effects from rural-vs-urban location. There were no statistically significant effects from location across Illinois Health Service Areas.

Appendix A

Survey Questions

Question 1: What is Your Gender?

Question 2: What is your race/ ethnicity? (Mark all that apply):

Question 3: What year were you born? (Place a number in a box)

Question 4: What type of nursing degree/ credential qualified you for your first U. S. nursing license?

Question 5: In what country were you initially licensed as RN or LPN?

Question 6: What is your highest level of education?

Question 7: Are you currently enrolled in a nursing education program leading to a degree/ certificate?

Question 8: What is the greatest barrier to continuing your education? (Select only one)

Question 9: What year did you obtain your initial U.S. Licensure?

Question 10: What is the status of the Illinois license currently held?

Question 11: Please list all states in which you hold an active license to practice as an RN:

Question 12: Please list all states in which you are currently practicing as an RN:

Question 13: Are you currently licensed/ certified in Illinois as a...

Question 14: What is your employment status? (Mark ALL that apply)

Question 15: If you are unemployed, not currently working as a nurse, are you:

Question 16: If unemployed, please indicate the reasons:

Question 17: In how many positions are you currently enrolled as a nurse:

Question 18: In how many hours per week do you work during a typical week in ALL your nursing positions?

Question 19: Please indicate state and zip code of your primary employer:

Question 20: Please identify the type of setting that most closely corresponds to your primary nursing position:

Question 21: Please identify the position title that most closely corresponds to your primary nursing position:

Question 22: Please identify the employment specialty that most closely corresponds to your primary nursing position:

Question 23: Please identify the type of setting that most closely corresponds to your secondary nursing position:

Question 24: Please identify the position title that most closely corresponds to your secondary nursing position:

Question 25: Please identify the employment specialty that most closely corresponds to your secondary nursing position:

Question 26: how much longer do you plan to practice as an RN in Illinois?

Question 27: If you plan to retire within the next 5 years, is there a primary factor that would persuade you to continue working as a nurse, extend your date of retirement? (Select only ONE):

Question 28: What is your current annual salary for your primary nursing position?