The (New) Economics of Staffing Registered Nurses

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DRAFT

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Abstract. This paper uses public, proprietary, and survey data to examine recent demographic and market trends for registered nurses in the United States. Surveys conducted in 2008 and 2010 show how hospital nursing officers are adapting recruitment, retention, training, and supplementation strategies to the relaxing nurse labor market. Since beginning of the recession, nursing unemployment remained about one-fourth the national average, rising above 2% in 2009. In the same period, the mean vacancy rate for surveyed hospital administrators dropped from 7.2% to 4.2%. Expanding non-overtime employment from domestic entrants and re-entrants exceeds the contraction in foreign labor and overtime labor, resulting in a 1.4% growth in total RN hours in 2009, down from about 5% in previous years. Surveyed hospital administrators report reductions in bonuses for new recruits, overtime, turnover, budgeted vacancies, tuition support, and overall perception of a shortage. Findings suggest how nurse recruitment, retention, training, and utilization adapt to economic conditions.

1 PhD Candidate, Institute for Work & Employment Research, MIT Sloan School of Management. Replication materials will be posted on the author’s website. The author is indebted to David Autor, Sally Klingel, Thomas Kochan, Paul Osterman Joanne Spetz, Louise White, and interviewees at hospitals, nursing schools, and the MNA for helpful comments. The usual disclaimer applies. Correspondence: alanmb@mit.edu.
Introduction

Since at least the mid-1990s, researchers, policy-makers, and administrators have portended a public health crisis due to a shortage of registered nurses (Buerhaus, Auerbach, and Staiger 2000, 2007; Blendon et al. 2002). In 2006, an average of 8.5% of budgeted positions for hospital nurses were unfilled while nursing unemployment stood at 1.2%,\(^2\) prompting many hospitals to experiment with a wide variety of aggressive staffing strategies, including powerful incentives for new recruits; regularly supplementing staffing through overtime, foreign nationals, and agency nurses; and forging partnerships with educational institutions to widen the pipeline of new nurses.

However, the recent anecdotal reports interrupt the familiar refrain of a nursing shortage. Administrators are reporting that experienced nurses are re-entering the labor market and requesting longer hours (perhaps as spouses are laid-off), while hospitals are experiencing declining census counts and demand for elective procedures. These reports imply a simultaneous increase in supply and decrease in demand for nurses, prompting an unusual relaxation of the nursing labor market and reversal of a two-decade-long trend.

This study addresses two complementary questions. First, how has the recession affected the demographics and key labor market indicators for registered nurses? Second, how have hospitals’ staffing practices adapted to the new economic climate? It does so using data from the Bureau of Labor Statistics, the NCLEX-RN licensure examination, and surveys of hospital administrators conducted in Summer 2008 and Summer 2010 matched with data from the American Hospital Association.

This study supports the conclusion that the recent recession has indeed spurred both a relaxation in the nursing labor market and broad shifts in hospitals’ employment practices, and gives more precise estimates as to their magnitude. Budgeted vacancies declined from 7% in 2008 to 4% in 2010, while unemployment rose from about 1.5% to over 2%. Nursing employment growth slowed as employers substituted away from “supplementary” staffing (such as overtime and foreign nurses) and toward part-time and regular-time staffing. Hospitals also reduced signing bonuses, relocation bonuses, and tuition reimbursement for LPN-to-RN and BSN candidates. While fewer hospital administrators reported a perceived shortage, outstanding vacancies, recruitment bonuses, and support for MSN candidates (particularly among specialty-care hospitals) suggests that job prospects remain stronger among geographically-flexible nursing managers and specialists. Results suggest that, while experienced nurses may be benefiting from reduced mandatory overtime and overwork, new nurses may find it more difficult to find entry-level positions, particularly those offering opportunities for training and advancement.

Findings have both immediate implications regarding the current state of nursing, and provide a compass for forecasting how the quality of nursing jobs and hospitals’ employment practices may respond to demographic trends and economic cycles affecting the nursing labor market.

I. The State of the RN Labor Market

\(^2\) Vacancy statistics provided by the AHA (2007), and unemployment is taken from the author’s calculations using the CPS.
Data. Trends in the market for RNs are tracked using the Current Population Survey (CPS) except where otherwise noted. The CPS is a nationally-representative monthly survey of households conducted by the Census Bureau for the Bureau of Labor Statistics, and is a workhorse for employment and demographic data. A mean of 1,440 RNs, 14,235 healthcare workers, and 198,510 workers in all occupations were sampled by the CPS in each year from 1995 to 2009. All reported differences in labor market indicators are statistically different with a p-value of less than 10% except where otherwise noted.

Unemployment and Underemployment. From 1995 to 2008, the unemployment rate among registered nurses was generally between 1% and 1.5% before increasing to over 2% in 2009 (Figure 1). Unemployment among RNs remained about one-fourth the national average, while unemployment among all healthcare occupations has remained about one-half of the national average. The historically low unemployment rate among RNs has been viewed as a hallmark of the nursing shortage.

Unemployment among RNs in their twenties remains low. From 2008 to 2009, estimated unemployment among young RNs increased from 1.2% to 1.9%, a difference within the sampling error of 0.8%. In contrast, unemployment among all workers in their twenties increased from 8.8% to 13.5% from 2008 to 2009.

Unfortunately, the CPS does not have a large enough sample of RNs in any given year to make specific claims regarding the labor market experiences of new graduates. However, both media reports and hospital administrators interviewed for this study suggested that full-time students applying for entry-level positions are having considerable difficulty. One dilemma is that hospitals may prefer giving longer hours to incumbent staff or hiring re-entrants to nursing, and hospital administrators surveyed in 2008 reported the mean cost of orienting a new hire to be $16,500. In addition, the recession may have caused RNs to desire longer hours to compensate for laid-off spouses; comparing the period 2000-2007 to 2008-2009, the mean married RN worked half an hour more per week, while the mean never-married RN worked half an hour less.

While more RNs surveyed by the CPS are reporting being laid-off, the share of RNs on layoff remains lower than the national average before and during the recession. In 2009, an estimated three RNs per thousand were unemployed and on layoff, up from two RNs per thousand throughout the decade. In contrast, in 2009, twelve workers in all occupations were on layoff, up from the decade-average of seven.

Demographics. The demographic composition of the RN labor force is a focal point of debates regarding the future of nursing. In an often-cited series of articles, Buerhaus, Auerbach, and Staiger (2000, 2003, 2007) predict that the retirement of the baby-boomers would simultaneously reduce the supply of RNs while increasing demand for health care, thereby exacerbating the shortage.

Figure 2 highlights the aging population of RNs and the “baby-boom” cohort’s movement to retirement age. Put another way, in 2000, 25% of the RN workforce was at least fifty years old; by 2009, that

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3 Healthcare occupations are composed of the CPS major occupational categories “Healthcare Practitioners and Technical Occupations” (56.4%) and “Healthcare Support Occupations,” (43.6%). Registered nurses compose 20.9% of workers in healthcare occupations.
The proportion increased to 37%. Indeed, the median age among RNs is substantively greater than those for other workers. Median ages among RNs increased from 43 in 2000 to 46 in 2009, while the median ages among all workers increased from 40 to 42. The retirement dilemma is particularly problematic among managerial and specialty RNs. The median age for RNs with graduate degrees is 47, and the median age for those without graduate degree is 43.

Also citing the CPS, Buerhaus, Auerbach, and Staiger (2009) argued that entry by younger workers, foreign-born workers, and men has resulted in “strong employment growth,” although “the current nurse shortage has not been eliminated.” Following the CPS through 2009, trends among younger workers and men are less encouraging, with absolute increases in each share largely attributable to steady overall growth in nursing rather than accelerating entry by young nurses or men. As shown in Figure 3, workers under the age of 35 constituted about 24% of the nursing workforce throughout the decade, and differences between 2000 and 2009 are not statistically significant at conventional benchmarks. However, there was a statistically significant increase of about 4% in the shares of both nonwhite and foreign-born workers. The share of non-citizens generally increased until 2007 before declining in 2009. Results are consistent with reports that hospitals are scaling back reliance on nurses on skilled-worker visas.

In 2009, 7.8% of RNs were men, which is not a statistically significant increase from 7.2% in 2000. Earlier Decennial Censuses find that men accounted for 5.9% of RNs in 1990, and 4.6% in 1980. In contrast, non-citizens’ share of nurses has declined since 2006.

**RN Job Growth.** An ongoing concern in the health policy community is that the domestic production of RNs is insufficient to counter the acceleration of RN retirees and increases in the demand for nurses prompted by the aging population and a general expansion of demand for health care.

In 2005, an estimated 2.45 million RNs worked a total of 4.30 billion hours. Total RN hours grew by 3.4% in 2006, 4.9% in 2007, and 5.4% in 2008, when an estimated 2.65 million RNs worked a total of 4.94 billion hours. Much of the growth since 2000 came from foreign nationals. From 2000 to 2007, hours provided by foreign nationals increased from 4.3% to 6.0% of the total, or about 140,000 FTE jobs.

In 2008, the Bureau of Labor Statistics estimated that registered nursing will grow by 22% and create 581,500 new jobs from 2008 to 2018, the largest absolute projected increase of any occupation. The BLS estimated particularly strong growth outside of hospitals, which currently employ 60% of RNs. Despite growth forecasts, the recession sharply stalled the growth of the RN workforce. If nursing experienced average growth over this time, or 4.6%, RNs would have worked 5.15 billion hours in 2009. In actuality, RNs experienced growth of 1.4%, to 5.00 billion hours in 2009. Hospital administrators reported that budgetary constraints following the recession have led to a reduction of hours and new hiring. Cited reasons include reduced demand for medical services (particularly elective procedures) and frozen credit markets.

Annual hours may also be decomposed by demographic and labor market characteristics of interest. In 2007, full-time work provided 4.0 billion hours, while part-time work provided 0.7 billion hours. From 2007 to 2008, aggregate full-time hours increased 6.7% (a gain of 280 million hours) while aggregate
part-time hours decreased 3.0% (a loss of 20 million hours). In contrast, from 2008 to 2009, aggregate full-time hours increased 0.7% (a gain of 30 million hours) while aggregate part-time hours increased 5.9% (a gain of 40 million hours). The shift from full-time to part-time hours is largely attributable to substitution of overtime work with part-time work. Potential explanations for this trend may include avoidance of overtime premia, avoidance of benefits, scheduling purposes, or attempt to create a buffer of experienced nurses in advance of the economic recovery or retirements.

In addition, work performed by foreign nationals contracted 18% between 2007 and 2009, accounting for about 1% of the decline in total hours.

**Labor Force Entry.** Nursing schools’ capacity constraints, particularly due to a difficulty recruiting and retaining nursing faculty (implicitly at typical wages), is often-cited as an exacerbating factor to the nursing shortage (see, for example, Hinshaw 2001, AACN 2005, Raymond 2005, Yordy 2006). The number of candidates passing the NCLEX-RN licensure exam is tracked to analyze entry into registered nursing. The NCLEX tests for entry-level competence and is required by all US state and territorial nursing boards.

Figure 4 traces NCLEX passers among US and internationally-educated candidates. The number of US-educated passers nearly doubled from a trough in 2002 to 2009, to about 134,000. While the number of foreign-educated passers increased more than five-fold from a trough in 2000 to 2007, it has since declined about 15% to 19,300.

**II. Adaptation of Hospital Recruitment, Retention, and Training Practices**

To examine how Chief Nursing Officers (CNO’s) at American hospitals have adapted staffing strategies to address new market conditions, this section presents results from surveys conducted in the summers of 2008 and 2010.

**Data.** The data set includes institutional, metropolitan, and local labor market characteristics of U.S. hospitals and their staffing practices. Hospitals’ nurse staffing practices come from mail surveys of chief nursing officers at U.S. hospitals located in metropolitan statistical areas. This data was then matched with data from the American Hospital Association’s Annual Survey of Hospitals.

The sample frames for each survey were randomly chosen from metropolitan hospitals included in the AHA hospital survey. For the 2008 survey, 1,286 first-round surveys were addressed and deliverable to Chief Nursing Officers at hospitals with at least twenty-five beds, 140 were returned. A follow up survey was sent to non-respondents, of which 133 were returned, for a cumulative response rate of 21.2%. The response rate was higher in 2010. Of 1,402 deliverable surveys, 315 were returned. Interviewees suggested the survey would more likely be filled by an administrative assistant rather than the CNO personally.

Each survey was developed through an iterative process of referring to nursing management literature and consultation with chief nursing officers, labor representatives, and deans at geographically and institutionally diverse hospitals and nursing schools. Each survey described itself as “a survey of hospital registered nurse recruitment strategies,” and asked CNO’s to identify whether they used a broad variety of
nurse management practices. A cover letter offered summary statistics to respondents who left contact information.

A chi-squared test concludes that response status is dependent on governance, but there is otherwise there is insufficient evidence to conclude (at a 10% significance level for either survey) that other variables predict response. About 75% of each sample represents general medical and surgical hospitals. To produce national-level descriptive statistics, responses are weighted according to each hospital’s estimated probability of response using hospital characteristics from the AHA data set.  

Exhibit 5 compares turnover, vacancies, staffing practices, and training in 2008 and 2010, and formally tests for changes. Exhibit 6 further breaks down summary statistics by hospitals’ size and governance.

**Turnover, Vacancies, and Perception of Shortage.** Historically high numbers of budgeted but vacant positions for registered nurses is often-cited by nursing manpower analysts as a defining feature of the nursing shortage (Irvine and Evans 1995; Buerhaus, Auerbach, and Staiger 2000, 2007, 2009; American Hospital Association 2007; American Health Care Association 2007). Several studies have linked understaffing to a wide range of adverse quality indicators (see Lin et al. 2006, for review).

Surveyed hospital administrators report large and statistically-significant declines in turnover, budgeted but unfilled vacancies, and perceptions of a nursing shortage. Turnover declined most sharply in large and government-controlled hospitals.

Overall, respondents’ mean vacancy rates in 2008 were 7.4% with a sampling error of 0.9%, slightly lower than the AHA’s estimate of 8.5% in 2007. Vacancy numbers greatly exceed the nursing unemployment rate for this period, estimated to be 1.2% by the CPS. By 2010, this gap narrowed, with the mean hospital reporting 4.4% of budgeted RN positions are vacant, while unemployment rose above 2%. While RNs continue to enjoy a large vacancy-to-unemployment ratio, interviewees and respondents suggested that vacancies were predominantly in managerial and specialty positions, rather than entry-level positions.

**Recruitment, Retention, and Supplementation.** The historically-tight market for registered nurses prompted nursing officers to experiment with a wide range of RN recruitment, retention, and supplementation strategies. Perhaps the most comprehensive study is the Community Tracking Study, results of which are summarized by May, Bazzoli, and Gerland (2006). The CTS provides a rich account of the experiences of health care in the sixty individual communities it tracks, and is a useful complement to the nationally-representative survey conducted here.

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4 Specifically, a logistic regression estimates the likelihood a hospital responds to the survey as a function of governance (government, for-profit, or non-profit), log-bed size, and dummy variables indicating membership in a hospital system, a hospital network, or status as a general medical and surgical hospital. Responses are then weighted by the inverse probability of response, with a minimum of 3.27 (associated with an estimated 31% probability of response) and a maximum of 8.73 (associated with an estimated 11.5% probability of response). Reweighting provides unbiased national estimates under the condition that response is random within groups included in the logistic regression.
Interviewed hospital administrators describe a rich set of practices to attract and retain staff nurses, and to supplement vacant positions through a combination of overtime, temporary agency (“travelling”) nurses, and foreign recruitment.

In 2008, hospital administrators reported the aggressive use of recruit and poach nurses through generous signing and relocation bonuses. Forty-one percent of hospitals (particularly for-profit hospitals) offered signing bonuses, with 10th percentile, median, and 90th percentile amounts of $1,000, $5,000, and $10,000 respectively. Twenty-five percent of hospitals offered signing bonuses instantly or over the first six months, with another quarter offering bonuses over one year, and half deferring bonuses over more than one year. Half of hospitals offering relocation bonuses offered $3,000 or less, and 10% of hospitals offered relocation bonuses of $10,000 or more. Signing bonuses are particularly common among private hospitals. Further analysis shows that relocation bonuses are particularly common among hospitals with greater beds and employing greater share of local registered nurses. By 2010, the share of hospitals offering signing bonuses dropped from about 43% to 21%, and the share offering relocation bonuses dropped from about 39% to 15%.

Supplementary practices were typically viewed as more costly and less desirable than recruiting a new full-time nurse, as overtime and agency nurses use has been linked to errors, poor morale, and burnout (Bpharm et al. 2002, Rogers et al. 2004, Hayes et al. 2006, Hall, Propper, and Reenen 2008). Interviewed nursing officers reported agency nurses were typically less-experienced and unfamiliar with hospital protocols and procedures, and whose greater pay (even after adjusting for benefits) could harm morale among staff. Nursing officers surveyed in 2008 reported that agency nurses were most-commonly used to fill budgeted-but-vacant positions (72%), followed by filling-in for leaves of absence and sick days (60%), unusual or season work (52%), and to fill critical or specialty care positions (40%). Interviewed nursing officers also suggested that staff nurses would receive preferential scheduling and positions. Interestingly, 46% of hospitals report using agency nurses in 2010, within the sampling error of the share in 2008. One interpretation of this finding is that temporary nurses are more-easily let-go, and so are being used to weather economic uncertainty.

As shown in the previous section, recruitment of foreign-born and internationally-educated nurses grew rapidly in the past decade, owing largely to a special exemption (Schedule A) in the H1-B visa program that allows hospitals to forego demonstrating an inability to recruit nurses at existing wage rates and allows registered nurses to bypass visa caps. Since 2007, the decade-long increase in internationally-educated NCLEX-RN passers reversed, consistent with declining filings for H1-B nurses.

The tendency for overtime and workers’ hours to decline in economic recessions is well-known (Okun 1962, Cho and Cooley 1993), and appears to also be the case in nursing. The proportion of hospitals reporting that more than 10% of staffing is composed of overtime work dropped from 34% to 15%, with large and non-profit hospitals experiencing the greatest declines. Both intensive overtime and agency

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5 Formally, a binomial logistic regression is run with relocation as the dependent variable and log-beds, log-metropolitan employment share, and controls for governance as independent variables. Both beds and employment share are found to be positive and statistically significant predictors of likelihood of paying relocation costs, with p<0.05 and p<0.01, respectively. This finding suggests that the threat of poaching deters regionally-weak hospitals from paying relocation costs.
nurse use is also found to be strongly and statistically-significantly correlated (p<0.01) with a perceived shortage in both 2008 and 2010.

Training and Educational Partnerships. Nursing offers one of the most sophisticated and robust vocational training tracks, owing in large part the necessary and natural collaboration between hospitals and nursing schools. Larger hospitals typically offer career tracks beginning with assistance with basic college skills training to tuition reimbursement for graduate training, and may be intimately involved with local nursing education by providing schools and students with financial and experiential resources.

Hospital administrators interviewed in 2008 reported a wide range of activities for promoting local nursing education. Common practices include serving as a clinical rotations site for nursing students (88%), serving as an externship site (58%), and providing free lecture space for nursing classes (36%). About one-third of hospitals in both 2008 and 2010 reported providing financial support to nursing schools or nursing faculty directly. The range of these programs defies statistical overview, but includes gifts to nursing schools to establish new programs, fellowships and salary supplementation for nursing faculty, and paid leave for staff nurses to teach in the “off” season.

Tuition reimbursement for current employees who pursue higher degrees are more common. In 2008, 86% of hospitals offered tuition support for nurses pursuing LPN-to-RN, BSN, or advanced degrees. These programs typically permit eligibility instantly or upon one year at the hospital (often accruing at the rate of one year of tuition support per year of work) and require student nurses to work at least half-time. Quartile tuition awards are $2,000, $3,000, and $5,000.

Since 2008, the share of hospitals sponsoring non-employee students (including for work commitment) declined from 31% to 20%. For-profit and small hospitals are less likely to provide financial support for nursing schools and faculty. The share of hospitals providing tuition reimbursement for LPNs pursuing training to become a registered nurse dropped from 85% to 75%. Each decline is statistically significant with p<0.01.

III. Conclusions

By tracking trends from the Current Population Survey, the NCLEX exam data, and two nationally-representative surveys of nursing officers, a portrait of the “new” economics of registered nurse staffing emerges. Nursing’s growth has slowed from a rate of about 5% in the previous three years to 1.5% from 2008 to 2009. This decline is attributable largely to reductions in foreign recruitment and overtime and attrition, with growth attributable to an increase in non-overtime work from domestically-educated new-entrants and re-entrants.

The previous two years has seen a sharp decline in the share of Chief Nursing Officers perceiving their hospital is experiencing a nursing shortage. This belief is reflected in the contraction in the vacancy-to-unemployment ratio, which dropped from about 8-to-1 in 2007 to about 2-to-1 in 2010.

These new conditions are also reflected in hospitals’ recruitment, retention, supplementation, and training practices. Surveyed hospital administrators report a decline in recruitment bonuses, a decline in overtime,
and a decline in foreign recruitment from 2008 to 2010. These effects are also often mediated by hospital size and governance.

Interviews and survey data suggest hospitals are better-able to fill entry-level positions, and are instead focusing resources to fill managerial or specialty care positions through training or recruitment. Given that highly-educated specialty and managerial nurses are also generally closer to retirement and less-mobile than entry-level nurses, job opportunities may be best among the young and geographically-flexible nurses with specialized or managerial skills.

For nurses, the economic downturn has likely benefited certain experienced nurses while generally making new nurses worse-off. While reductions in mandatory overtime and other supplementary staffing practices generally bodes well for older nurses who are believed to most at-risk of burnout, reduced recruitment and training is likely to disadvantage young and entry-level nurses, and potentially discourage others from pursuing a career in nursing.

For nursing departments, the economic downturn presents great challenges and opportunities. On one hand, hospitals experiencing declining census counts often face pressure to reduce staffing, improve efficiency, and control costs. On the other hand reduced demand, accelerating domestic production, and re-entry among experienced nurses has relaxed competition (particularly for entry-level positions) and allowed hospital administrators to rely less upon aggressive poaching practices, foreign recruits, and overtime labor. It has also prompted nursing administrators to focus scarce recruitment and training resources on the hospital’s specific needs.
**Bibliography**


Exhibit 1
RN Unemployment Rates in Perspective


Standard errors of estimated unemployment are 0.13% for healthcare workers and 0.18% for registered nurses. All estimated differences in 2009 are statistically significant with p<0.01.
Exhibit 2
The Aging RN Workforce

Running mean lowess-smoothed estimates from 2000 Decennial Census and 2009 CPS MORGs.
Exhibit 3

Minorities in Nursing

[Graph showing trends in percentages for Age<35, Non-Whites, Foreign-Born, Males, and Non-Citizens from 2000 to 2009]
Exhibit 4

NCLEX (RN Licensing) Examination Trends

Data from National Council of State Boards of Nursing. Available online at www.ncsbn.org/1237.htm
### Exhibit 5

Changes vacancy, turnover, recruitment, staffing, and training from 2008 to 2010

<table>
<thead>
<tr>
<th>Hospital Characteristics</th>
<th>2008</th>
<th>2010</th>
<th>Change</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurses unionized</td>
<td>24.6%</td>
<td>24.6%</td>
<td>0.0%</td>
<td>0.999</td>
</tr>
<tr>
<td>Mean Turnover Rate</td>
<td>10.9%</td>
<td>8.8%</td>
<td>-2.1%</td>
<td>0.018</td>
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<tr>
<td>Mean Vacancy Rate</td>
<td>7.4%</td>
<td>4.4%</td>
<td>-3.0%</td>
<td>&lt;0.001</td>
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<tr>
<td>CNOs perceive shortage</td>
<td>79.9%</td>
<td>19.6%</td>
<td>-60.4%</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

### Recruitment & Staffing

| Pays signing bonus | 42.5% | 20.7% | -21.8% | <0.001 |
| Pays relocation bonus | 38.8% | 14.8% | -24.0% | <0.001 |
| High overtime use | 33.8% | 15.4% | -18.4% | <0.001 |
| Contracts agency nurses | 48.2% | 45.9% | -2.3%  | 0.645   |

### Training

| Sponsors schools | 39.2% | 30.8% | -8.4% | 0.039 |
| Sponsors students | 30.9% | 19.8% | -11.1% | 0.002 |
| Sponsors faculty | 34.1% | 30.6% | -3.6% | 0.363 |
| Has extern program | 59.1% | 51.3% | -7.8% | 0.058 |
| Tuit. for college-readiness | 86.1% | 68.7% | -17.4% | --   |
| Tuit. for LPNs-to-RN | 86.1% | 74.2% | -11.9% | <0.001 |
| Tuit. for BSN-to-MSN | 81.0% | 78.9% | -2.1% | 0.522 |

p-values are for a two-tailed test that rates did not change.
## Exhibit 6

Employment practices by hospital size and governance, 2000 and 2010

<table>
<thead>
<tr>
<th>Hospital Size</th>
<th>Governance</th>
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<tbody>
<tr>
<td></td>
<td>&lt; 200 Beds</td>
<td>Large: 200+ Beds</td>
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<tr>
<td>Nurses unionized</td>
<td>23.3%</td>
<td>17.8%</td>
<td>26.2%</td>
<td>31.9%</td>
<td>42.4%</td>
<td>49.2%</td>
<td>17.9%</td>
<td>10.5%</td>
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<td>Mean Turnover Rate</td>
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<td>13.3%</td>
<td>8.3%</td>
<td>10.0%</td>
<td>11.8%</td>
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<tr>
<td>Mean Vacancy Rate</td>
<td>6.75%</td>
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<td>7.83%</td>
<td>4.3%</td>
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<td>5.8%</td>
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<td>CNOs perceive shortage</td>
<td>70.7%</td>
<td>22.3%</td>
<td>84.8%</td>
<td>14.8%</td>
<td>73.3%</td>
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<td>Pays signing bonus</td>
<td>42.0%</td>
<td>20.7%</td>
<td>39.6%</td>
<td>20.0%</td>
<td>29.1%</td>
<td>26.2%</td>
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<td>Pays relocation bonus</td>
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<td>47.2%</td>
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<td>25.5%</td>
<td>13.3%</td>
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<td>High overtime use</td>
<td>30.6%</td>
<td>17.4%</td>
<td>39.8%</td>
<td>8.3%</td>
<td>37.7%</td>
<td>18.3%</td>
<td>37.7%</td>
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<td>Contracts agency nurses</td>
<td>37.5%</td>
<td>42.5%</td>
<td>59.4%</td>
<td>49.6%</td>
<td>42.3%</td>
<td>43.3%</td>
<td>37.5%</td>
<td>50.8%</td>
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<tr>
<td>Sponsors schools</td>
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<td>21.6%</td>
<td>46.1%</td>
<td>45.5%</td>
<td>24.6%</td>
<td>28.1%</td>
<td>39.2%</td>
<td>17.9%</td>
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<tr>
<td>Sponsors non-ee students</td>
<td>27.6%</td>
<td>17.3%</td>
<td>35.8%</td>
<td>23.9%</td>
<td>25.0%</td>
<td>18.0%</td>
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<td>17.5%</td>
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<td>Sponsors faculty</td>
<td>25.8%</td>
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<td>50.4%</td>
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<td>Has extern program</td>
<td>57.2%</td>
<td>42.5%</td>
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<tr>
<td>Tuit. for coll.-readiness</td>
<td>66.3%</td>
<td>--</td>
<td>72.0%</td>
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<td>59.0%</td>
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<tr>
<td>Tuit. for LPNs-to-RN</td>
<td>85.0%</td>
<td>73.3%</td>
<td>85.2%</td>
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<tr>
<td>Tuit. for BSN-to-MSN</td>
<td>80.8%</td>
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<td>Greatest Standard Error</td>
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<td>107</td>
<td>135</td>
<td>57</td>
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