

Introduction

Paralleling national trends, communities throughout Colorado face current or imminent shortages of various types of health professionals. If unchecked, this trend, coupled with the aging of the population, may have a significant impact on the ability of Coloradans to gain timely access to needed health care services. These health profession shortages are especially acute in the nursing profession where the average age of registered nurses (RN) is increasing rapidly and fewer new entrants are choosing to enter the profession.

Informed policymaking to address health care workforce issues has been stymied by a lack of reliable, trended health professions data. Recognizing this lack of information on workforce characteristics and as part of its Health Professions Initiative, The Colorado Trust, as part of its Health Professions Initiative, provided funding to the Colorado Health Institute (CHI) to build and maintain a series of health professions databases and accompanying indicators that can be used to track the supply of health professionals in Colorado over time. The databases will contain information gleaned from survey questionnaires mailed to 11 health professions.

CHI is pleased to release this report which updates the initial findings of the 2005 Colorado Registered Nurse (RN) Workforce Survey. The original findings appeared in the September 2006 technical paper. This current report includes 12,559 respondents, an increase from the 10,821 respondents originally reported on. With the additional 1,700 records added to the dataset, the findings remain consistent with the first report.

CHI previously released the public use data file for the RN Workforce Survey as part of its Colorado Health Workforce Database. The updated public use file, with the additional 1,700 respondents, can be found at: www.coloradohealthinstitute.org/hot_issues/healthprofessionsdatabase.htm¹

This paper is intended to familiarize readers and database users with key findings from the survey questionnaire as well as discuss the generalizability of the survey data. Specifically, the paper summarizes the:

- Survey response rate relative to the entire licensed registered nurse population in Colorado;
- Limitations of the survey data with regard to generalizing the findings to Colorado's entire licensed RN population;
- The length of time survey respondents intend to remain in the field of nursing;
- Differences in the demographic profile and working conditions of respondents who work in urban versus rural areas; and
- Factors associated with respondents' perceptions of their workplace environment.

¹ The Colorado Health Institute wishes to thank members representing the nursing profession serving on the Health Professions Database Advisory Council for their assistance in the development of the questionnaire and the data cleaning process.

With such a large database, 12,559 respondents and 105 variables, the possibilities for analysis are many. CHI staff has selected a number of key variables to analyze for this technical paper. The resulting findings are neither comprehensive nor definitive. To better understand the analytical capacity of the database, it is hoped that interested individuals and organizations using the database for policy research purposes will share their analysis and findings with CHI.

RESPONSE RATE

In the summer of 2005, around 52,000 individuals held an RN license to practice in Colorado. Because a Colorado RN license must be renewed every two years, and the population of licensees is substantial, in any given year only half of current licensees are subject to licensure renewal.

In August 2005, questionnaires were included with the licensing renewal forms mailed to RNs whose licenses were due for renewal. CHI received survey responses from more than 12,000 RNs or 52 percent of the 24,000 RNs who renewed in fall 2005. For this brief, we assume there are no significant differences in the characteristics of individuals renewing their licenses in 2005 versus those renewing in 2006. Therefore, we presume that the data from 2005 respondents represents 52 percent of RNs with licenses expiring in the 2005-06 period.²

It is known that a significant number of Colorado licensees hold an RN license in another state and likewise live elsewhere while also holding a valid Colorado license. The focus of this paper, however, is the more than 8,000 RNs who listed a Colorado address and responded that they were currently working in a nursing position at the time of their RN license renewal in 2005. The survey data for all respondents, regardless of their working status or home state, is included in the public use data file referred to above.

DATA LIMITATIONS

The representativeness of the survey sample to the Colorado licensed RN population is not known due to the following:

- The survey sample was not randomly drawn from the RN population—rather, it was the half of RNs who were slated to renew their license in 2005;
- The response rate was 52 percent;
- It was not possible to follow up with nurses who did not respond to the survey; and
- It was not possible to adjust the data based on known characteristics of those who did not respond to the survey.

Because of these limitations, it is not possible to generalize the survey findings to Colorado's RN population. Yet, in spite of the potential biases introduced by those who chose to return a completed survey versus those who did not, it is still the case that 12,559 RNs licensed in Colorado chose to participate in the 2005 survey.

² New graduates were not sent the survey since they do not undergo the renewal process until two years after the receipt of their first license.

To minimize potential biases in the future, the 2007 RN survey will be mailed to a smaller, stratified random sample of the RN population. By limiting the number surveyed, we anticipate that the response rate will be greater due to more aggressive follow up and better tracking of the population characteristics we seek such as nurses practicing in the rural areas of the state. This new strategy will minimize bias and maximize the representativeness of the sample to the entire licensed RN population in Colorado.

THE SCOPE OF THE NURSING SHORTAGE

According to the U.S. Bureau of Labor Statistics, the aging of the U.S. population between 2006 and 2014 and its expected increased demand for medical services will result in the RN profession experiencing the second largest increase in *new jobs* relative to all other occupations in the United States.³ Between 2002 and 2012, the increase in new RN jobs nationally is anticipated to be 27 percent.⁴

In addition to this projected increased demand, thousands of openings for existing jobs are available within the nursing profession as RNs leave the nursing workforce for other careers, opt to stay at home or retire. According to the National Sample Survey of Registered Nurses, the *average* age for RNs in the United States increased from 42 years to 47 years between 1996 and 2004.⁵ By comparison, in 2004, the *median* age of the U.S. labor force was 40 years old.⁶ Colorado-specific data reveal a troubling trend. While Colorado's population increased by 23 percent between 1991-1992 and 1999-2000, the number of RN degrees awarded decreased by nine percent. This translates to 26 percent fewer degrees awarded per 100,000 Coloradans during this time period.⁷

The Colorado Department of Labor estimates that the employment opportunities for RNs in Colorado will increase by 46 percent (1,470 new positions per year) between 2004 and 2014, a significantly higher demand factor than national projections.⁸ Due to projected and actual turnover, an additional 680 replacements annually will be required to maintain Colorado's RN workforce. In sum, a total of 2,150 RN positions will need to be filled annually to meet the projected demand. In percentage terms, Colorado's increased demand for RNs is anticipated to be the fifth highest of all states in the country.⁹

Professional nurses leave the profession for a variety of reasons. Moreover, because of nursing faculty shortages, the capacity of training programs to recruit and train new RNs is insufficient to meet the demand created by individuals seeking a career in nursing. In fact, Colorado's nurse faculty shortage is

³ U.S. Department of Labor, Bureau of Labor Statistics, *Occupational Outlook Handbook, 2006-07 Edition*, Registered Nurses available at <http://stats.bls.gov/oco/ocos083.htm> (accessed August 4, 2006).

⁴ U.S. Department of Labor, Bureau of Labor Statistics. February 2004. *Monthly Labor Review*, p. 87.

⁵ Health Resources and Services Administration, 2004. *National Sample Survey of Registered Nurses: Preliminary Findings*, p.5.

⁶ U.S. Department of Labor, Bureau of Labor Statistics. Available at <http://www.bls.gov/emp/emplab08.pdf> (accessed September 14, 2006).

⁷ Health Resources and Services Administration, 2000. *HRSA State Health Workforce Profiles: Colorado*, p.36.

⁸ Colorado Department of Labor. Colorado Occupational Projections. Available at <http://www.coworkforce.com/lmi/oeo/0414CoSWOcc.xls> (accessed August 4, 2006).

⁹ The data reflect the anticipated change in demand between 2002 and 2012. States exceeding Colorado's demand estimate include: Arizona, Nevada, Idaho, and Utah. Data are submitted by each state's labor department to State Occupational Projects. Available at <http://www.projectionscentral.com/projhome.asp> (accessed August 4, 2006).

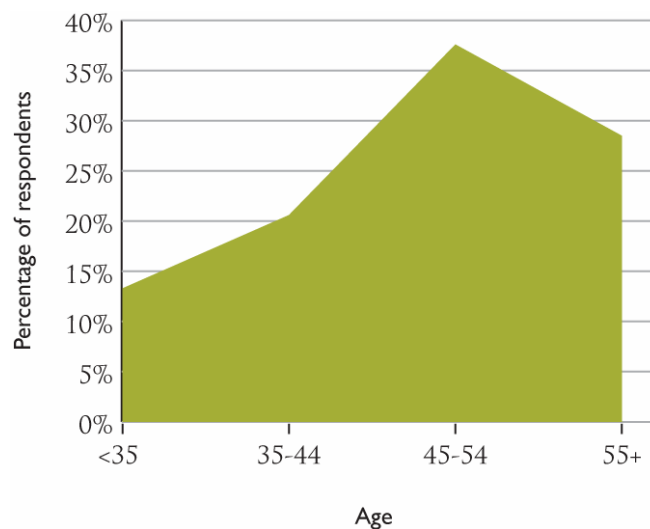
considerably greater than the national average.¹⁰ Consequently, there are a large number of potential nursing candidates on community college waiting lists in Colorado.

Survey findings

RETENTION

One of the major factors influencing retention is the increasing age of Colorado's nursing workforce. Graph I summarizes the age distribution of respondents to the 2005 RN Survey. Two-thirds were 45 years and older. As noted earlier, one cannot assume that this age distribution is representative of the entire RN workforce in Colorado.

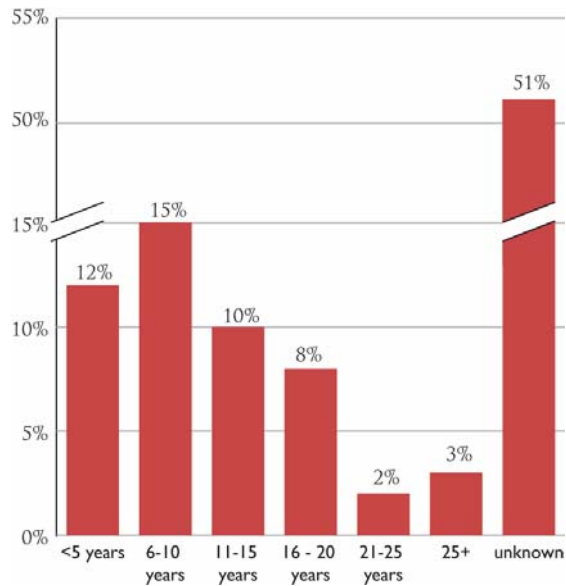
Graph I. Age distribution of respondents to the 2005 Colorado RN survey



Respondents were asked how many additional years they plan to work in a nursing position. Of the 49 percent of respondents who provided an estimate, the average time was 12 years. It is interesting to note, however, that 51 percent indicated that they did not know how much longer they would work in the field. Graph 2 summarizes the number of additional years respondents expected to work in a nursing position. Approximately 27 percent indicated that they plan to leave the profession in the next 10 years.

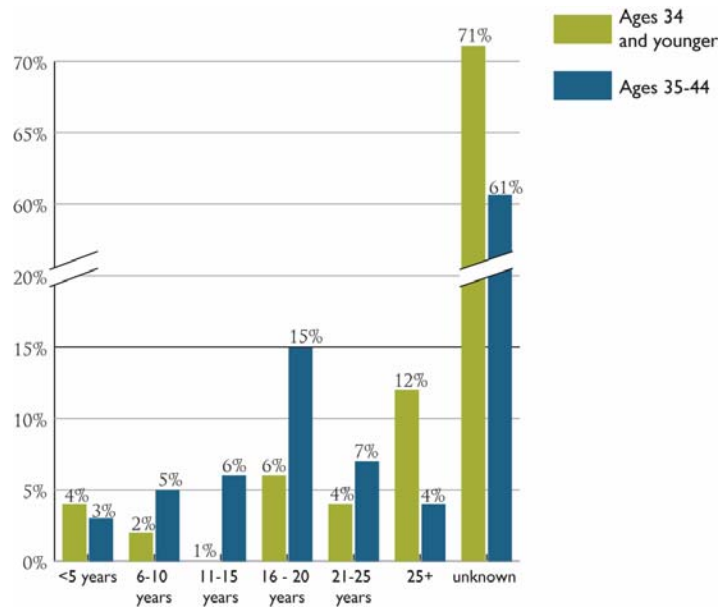
¹⁰ The Colorado Center for Nursing Excellence and the Colorado Health Institute, February 2005. [The 2004 Colorado Nursing Faculty Supply and Demand Study](#), p. 4.

Graph 2. Colorado 2005 RN Survey: Numbers of years remaining in a nursing position



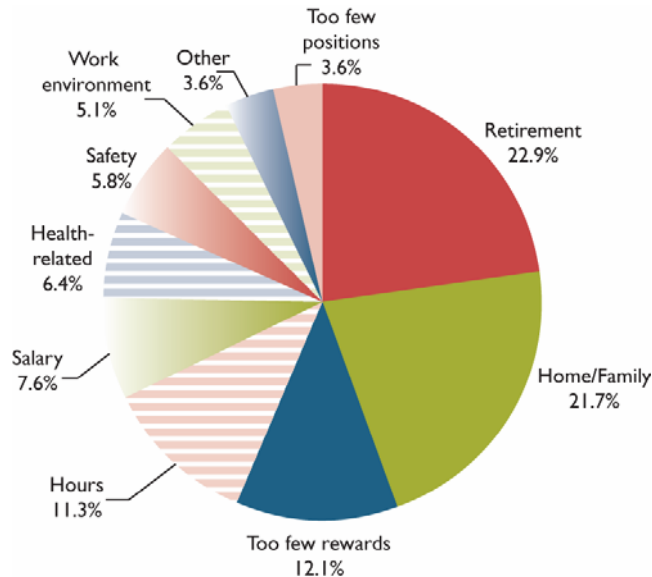
Graph 3 displays this anticipated professional longevity for younger nurses, those 34 years and under and those ages 35 to 44 years. Nearly seven percent of respondents age 34 and younger plan to leave the field within the next 10 years, while eight percent between the ages of 35 and 44 plan to leave during the same time period. Seventy-one percent of RNs 34 years or younger and 61 percent between the ages of 35-44 did not know how much longer they would continue to work in the nursing field.

Graph 3. Number of additional years respondents plan to work in nursing, registered nurses <35 years old and 35-44 years old



To better understand why RNs are not working in a nursing position, respondents holding a current RN license but not working in a nursing position were asked why not. Chart 1 summarizes the distribution of the reasons noted.^{11,12}

Chart 1. Reasons not working in a nursing position: 2005 RN survey respondents



Of all the reasons noted, approximately 22 percent were related to retirement, while another 22 percent were taking care of home and family. Only 12 percent of the reasons had to do with more convenient hours in another position and seven percent with better salaries in another field. Interpreting these results should be tempered by the fact that only currently licensed RNs received the survey and that former licensees who chose not to maintain their license were not surveyed.

URBAN VERSUS RURAL PRACTICE¹³

Health professions research has found that the nursing shortage is more acutely felt in rural areas where fewer RNs are working relative to the population. Thus, to develop effective strategies for increasing the supply of rural practicing RNs, it is helpful to understand the characteristics of nurses who are currently working in a rural community. For example, health professions research suggests that health professionals who grow up in a rural area are more likely than their urban counterparts to practice in a rural community. Therefore, encouraging young people who grow up in rural areas with scholarships, loan repayment and other financial incentives has been shown to be effective at increasing the number of health professionals who choose a rural practice setting.

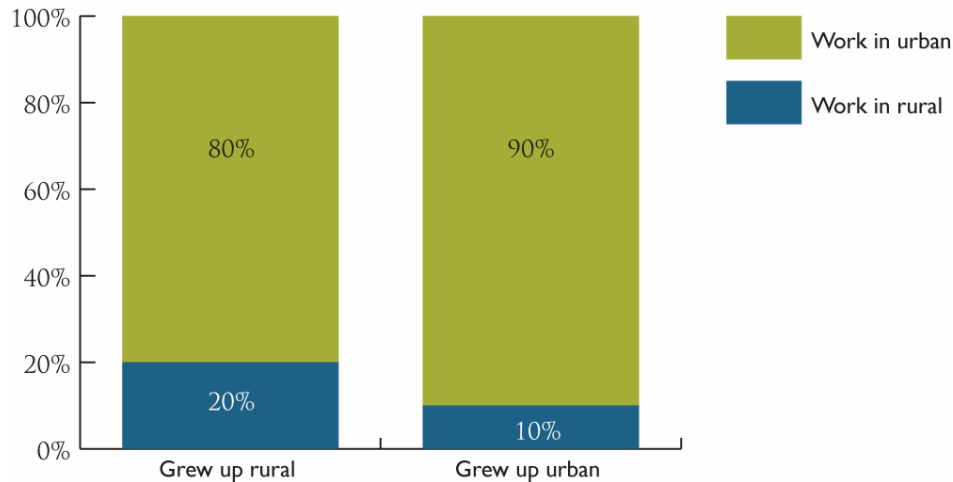
¹¹ Respondents were allowed to note more than one reason for leaving nursing. Thus, Chart 1 summarizes the distribution of reasons given by those 2,090 respondents who are currently not working in nursing (regardless of primary address location) and not the number of unduplicated respondents.

¹² Includes all nurses, regardless of state associated with primary address, who are not currently working in nursing and who responded to the question.

¹³Rural-Urban Commuting Area (RUCA) codes were used to classify rural and urban areas. RUCAs are sub-county measures of urban/rural status based on 2000 Census data and 2004 ZIP code areas. They are more specific than larger county-based definitions in order to more accurately classify intra-county areas as rural or urban.

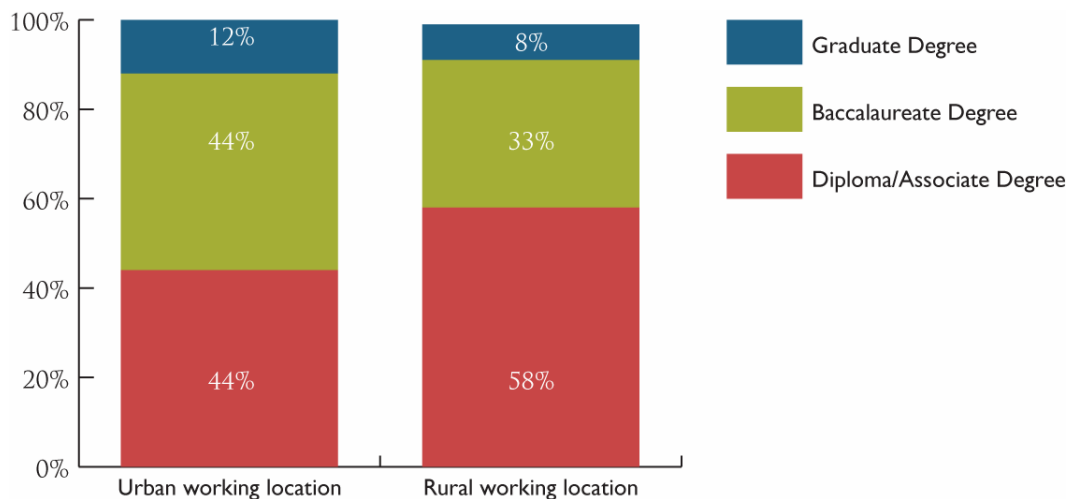
Among the RN survey respondents, there was a clear association between where a respondent grew up and the primary practice location s/he chose. Of those respondents who grew up in a rural area, 20 percent reported working in a rural area. In the alternative, only ten percent of respondents who grew up in an urban area reported practicing in a rural area.

Graph 4. Respondents' practice location by where they grew up



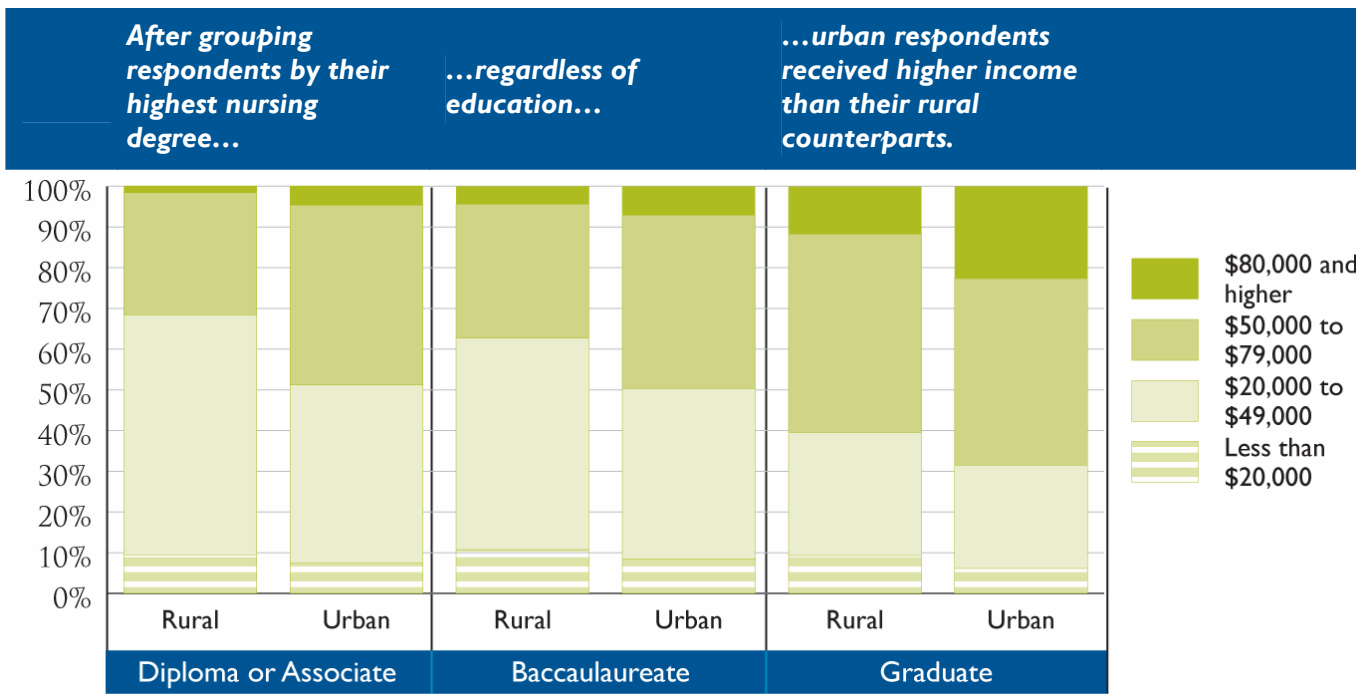
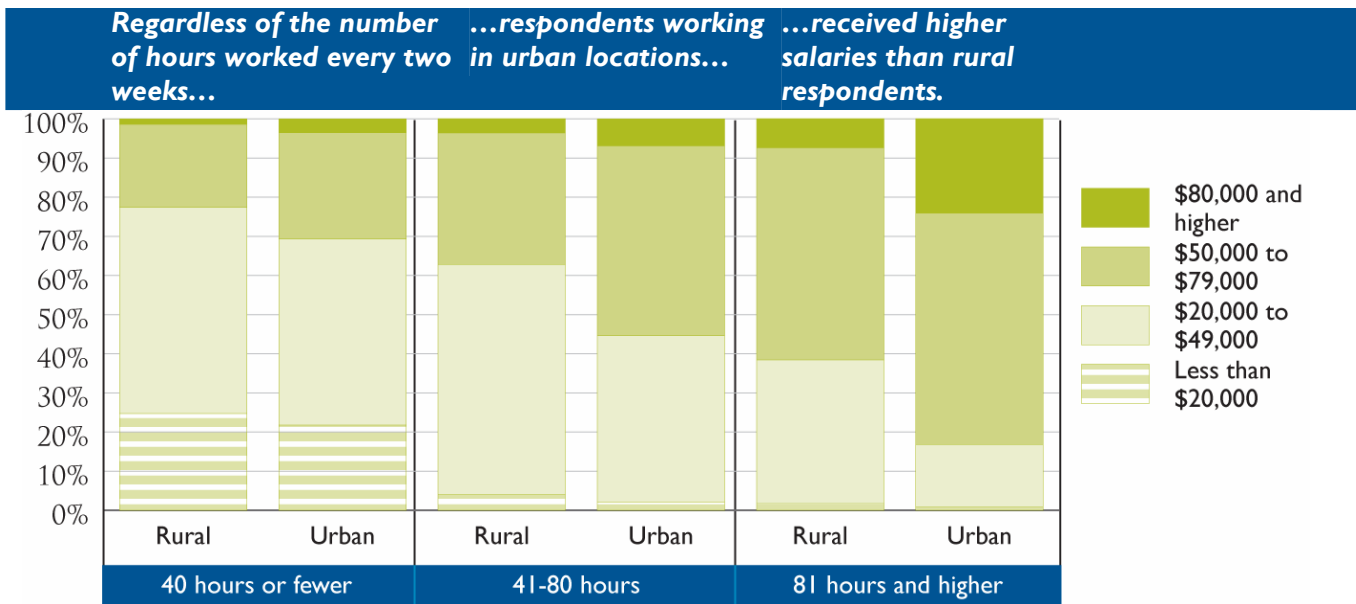
Analysis of the survey data indicates that the highest nursing degree of RNs practicing in a rural area was more likely to be a diploma or associate degree as compared to RNs working in urban areas that were more likely to have a bachelor's degree. Fifty-eight percent of rural practicing respondents' highest nursing degree was a diploma or associate degree, compared to 44 percent of urban practicing nurses. In order to close this education gap, one policy option would be to expand the reach and capacity of baccalaureate nursing programs in rural areas.

Graph 5. Highest nursing degree, urban and rural RN respondents



Employers in rural areas often cite the challenge of offering salaries that are competitive with those in urban areas. Analysis of the 2005 RN Survey data suggest that respondents practicing in an urban area earn more than those practicing in a rural area even when controlling for the number of hours worked or education level.

Graph 6. Comparison of salaries of RN respondents practicing in urban and rural areas based on number of hours worked every two weeks and educational level attained



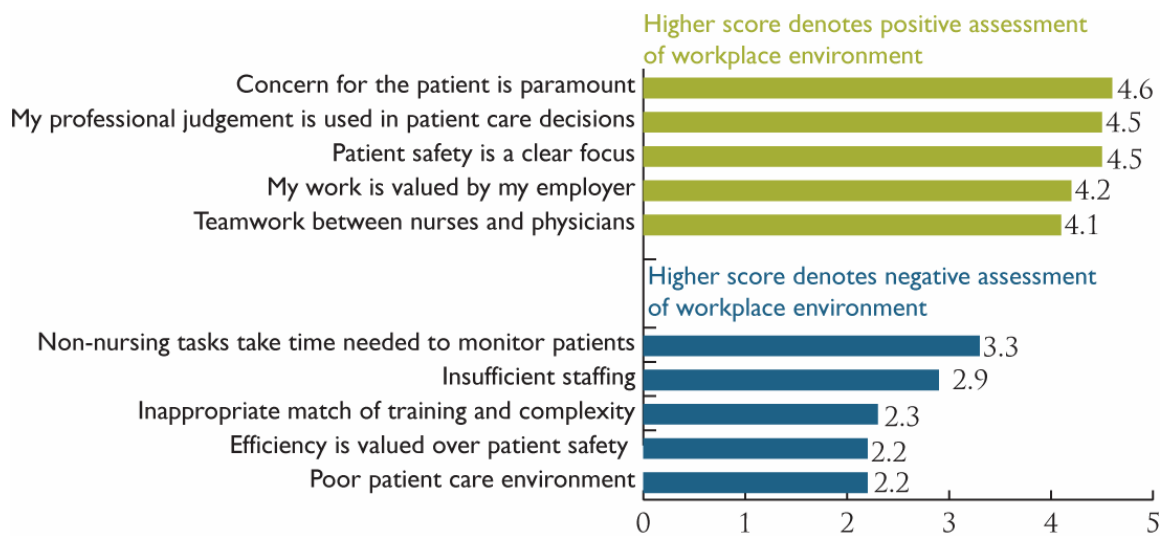
Despite conventional wisdom with regard to differences between RNs practicing in urban and rural areas, no significant association was found between rural and urban respondents' age, plans to remain in

nursing or number of hours worked.¹⁴ There were few differences in the workplace environment responses, except that urban respondents were more likely to agree that their workplace was not staffed sufficiently and that efficiency was valued over patient safety.¹⁵

WORKPLACE ENVIRONMENT

Respondents were asked to evaluate a variety of workplace environment factors on a scale of one to five as they applied to their principal nursing position. A score of five indicates that the respondent has the highest level of agreement with the statement. Graph 7 summarizes the average scores of the 10 workplace environmental factors.

Graph 7. Workplace environment results (averages on scale of 1-5)



As shown on Graph 8, it was illuminating to analyze respondents’ perceptions of their workplace environment by specific work settings.

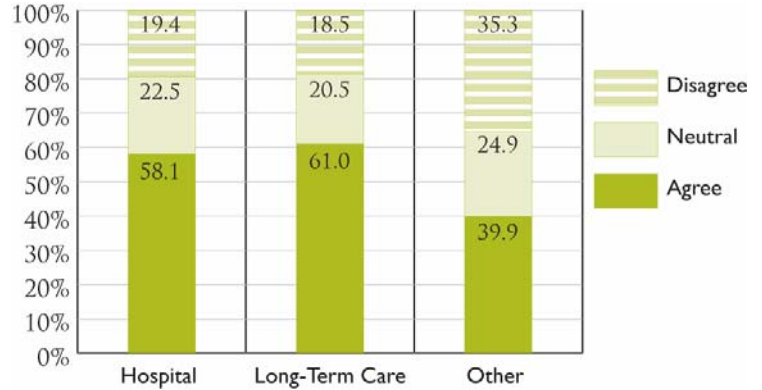
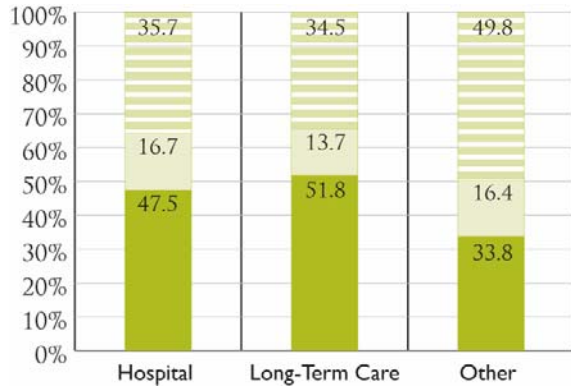
¹⁴ Statistical significance for age was analyzed by four age cohorts: under 35, 35-44; 45-54 and 55 and over. Plan to stay in the nursing profession was analyzed by: five years or fewer; 6-10 years; 11-15 years; 16-20 years; 21-25 years; more than 25 years; and unknown. Number of hours worked every two weeks was analyzed by: 40 or fewer; 41-80 hours; and over 80 hours.

¹⁵ Workplace environment was analyzed by a 1-5 rating scale for 10 statements.

Graph 8. Respondents' assessment of workplace environment by work setting¹⁶

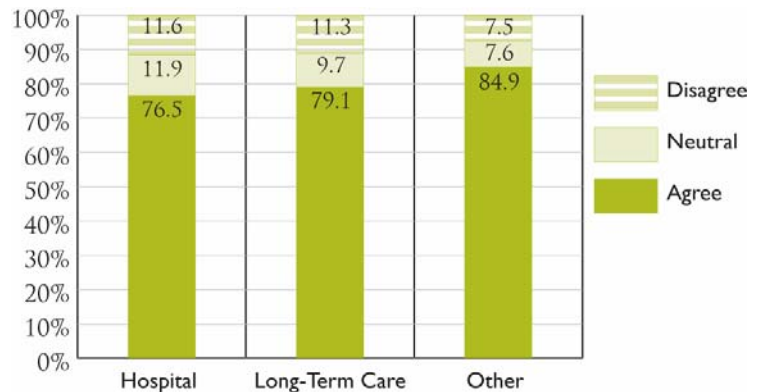
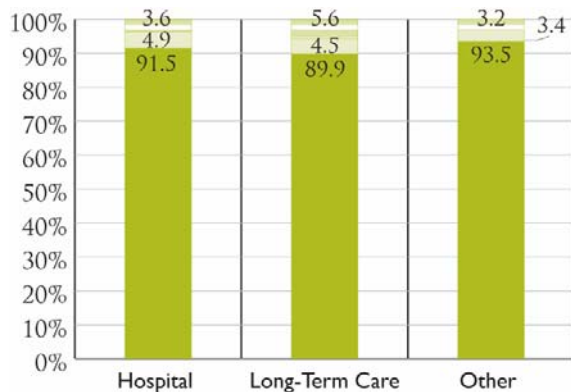
Respondents in hospital and long-term care settings were more likely to agree that there is insufficient staffing in the workplace...

...and non-nursing tasks take time that is needed to monitor patients.



However, regardless of work setting, the overwhelming majority of respondents believe that in their workplace concern for the patient is paramount...

...and that their work is valued by their employer.



¹⁶ For the purposes of this analysis, the “agree” category consists of those respondents who indicated that they agreed or somewhat agreed with a statement. The “disagree” category consists of those respondents who indicated that they disagreed or somewhat disagreed. The “neutral” category consists of those respondents who neither agreed nor disagreed. The work setting category “other” includes nursing education/academic, public/community health, ambulatory care and other (e.g. managed care/insurance and telemedicine.)

Because RN roles and responsibilities vary considerably by position, CHI analyzed respondents' perceptions of their primary workplace based on the number of hours respondents work in direct patient care.¹⁷ Our analysis indicates that the more hours a respondent worked in direct patient care the more likely he or she was to agree that in the workplace:

- Staffing levels were insufficient (30 percent of respondents not working in direct patient care agreed compared to 52 percent of respondents working more than 80 hours in direct patient care every two weeks);
- Non-direct care nursing tasks took needed time away from patients (36 percent of respondents not working in direct patient care agreed compared to 50 percent of respondents working more than 80 hours every two weeks in direct patient care);
- The patient care environment was compromised (13 percent of respondents not working in direct patient care agreed compared to 24 percent of respondents working more than 80 hours every two weeks in direct patient care);
- RN professional judgment was utilized in making decisions about patient care (83 percent of respondents not working in direct patient care agreed compared to 90 percent of respondents working more than 80 hours every two weeks in direct patient care); and
- Teamwork existed between nurses and physicians (67 percent of respondents not working in direct patient care agreed compared to 84 percent of respondents working more than 80 hours every two weeks in direct patient care).

Opinions regarding workplace environment did vary by the age of the respondent.¹⁸ For example, younger respondents were more likely than their older counterparts to agree that in their workplace:

- Staffing levels were insufficient (50 percent of respondents under the age of 35 agreed compared to 39 percent of respondents 55 years and older);
- Non-nursing tasks took time away from monitoring patients (57 percent of respondents under the age of 35 agreed compared to 46 percent of respondents 55 years and older); and
- There was an inappropriate match between their training and the complexity of patients' needs (23 percent of respondents under the age of 35 agreed compared to 20 percent of respondents 55 years and older).

¹⁷ Direct patient care was analyzed according to the number of direct patient care hours worked every two weeks—none, 20 hours or fewer, 21-40 hours, 41-60 hours, 61-80 hours, 81 hours or more. For workplace environment, the “agree” category consists of those respondents who indicated that they agreed or somewhat agreed with a workplace environment statement. The “disagree” category consists of those respondents who indicated that they disagreed or somewhat disagreed. The “neutral” category consists of those respondents who neither agreed nor disagreed.

¹⁸ Statistical significance for age was analyzed by four age cohorts: under 35, 35-44; 45-54 and 55 and over. For workplace environment, the “agree” category consists of those respondents who indicated that they agreed or somewhat agreed with a statement. The “disagree” category consists of those respondents who indicated that they disagreed or somewhat disagreed. The “neutral” category consists of those respondents who neither agreed nor disagreed.

Implications of initial findings

Findings from the 2005 RN Workforce survey tend to mirror national trends with regard to the aging of the workforce and current and projected nursing shortages. Specific findings from the Colorado sample suggest that the reasons nurses are not currently employed in a nursing position have much more to do with personal issues (health-related), family responsibilities and retirement than disillusionment with the profession per se. About half of the reasons respondents gave for not working in nursing had to do with issues unrelated to the work environment. Saying this, it is still worrisome that 12 percent of the reasons related to *too few rewards*, 11 percent to *hours worked* and eight percent to *salary* -- all issues that are amenable to private and public interventions.

Several issues related to the nursing workforce in rural areas are amenable to targeted interventions. Recruitment strategies, such as “grow-your-own” efforts, that include incentives for young people growing up in rural communities to enter the health professions have been shown to be quite successful in other states.¹⁹ Here in Colorado, The Colorado Trust has a multi-year Health Professions Initiative under way to test various recruitment strategies in rural areas of the state.

The educational background of nurses practicing in rural areas has already been noted in this paper. Many strategies exist to increase the absolute number of nurses practicing in rural areas as well as the education opportunities afforded to them. Expanding the availability of associate degree and diploma nursing programs throughout the state is one option, as is bringing baccalaureate programs to rural areas through distance learning programs and online courses. Faculty shortages were previously documented in a study completed by the Colorado Health Institute in 2005.²⁰ These faculty shortages have an overall dampening effect of the nursing workforce and may require special state-level attention if shortages are to be overcome.

It has been established that for some respondents inactive in nursing, workplace characteristics influenced their decision to leave active employment in the field. Six percent of the reasons given for not working as a nurse concerned safety, and another 5 percent had to do with the work environment. Nonetheless, the vast majority of respondents currently working in nursing gave their workplace environment high marks (see Graph 7). For those issues that leave room for improvement, such as insufficient staffing and non-nursing tasks that take time away from patient care, targeted interventions are available and worth pursuing by the institutions and agencies that employ professional nurses.

The feedback from the Colorado RNs working in nursing who responded to the CHI survey is largely positive, but some findings point to pockets of opportunity for improvement in the work environment that are amenable to public and private solutions. As RN workforce data are collected over time, this database will provide policymakers with an increasingly accurate glimpse of the changing nature of supply and retention factors.

¹⁹ For example, South Dakota’s Health Occupations for Today and Tomorrow program is a national model that provides information to students at all grade levels about careers in the health professions. The program supplies lesson plans to teachers regarding health professional training and encourages health professionals to work with current students interested in pursuing health professional careers.

²⁰ The Colorado Center for Nursing Excellence and the Colorado Health Institute, February 2005. *The 2004 Colorado Nursing Faculty Supply and Demand Study*.

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The Colorado Health Institute (CHI) is an independent, nonprofit health policy and research organization based in Denver. It was established in 2002 by Caring for Colorado Foundation, The Colorado Trust and Rose Community Foundation. CHI's mission is to advance the overall health of the people of Colorado by serving as an independent and impartial source of reliable and relevant data for informed decisionmaking.

