The 2004 Colorado Nursing Faculty Supply and Demand Study

The 2004 Colorado Nursing Faculty Supply and Demand Study

Presented to:

Colorado State Workforce Council

By: **The Colorado Center for Nursing Excellence**

Under contract with:

The Colorado Health Institute

A NOTE TO THE READER

This study reviews the nurse education and nurse supply and demand literature. In addition, it reports on primary data collected in the State of Colorado in 2004 regarding the nurse educator shortage. The report contains many acronyms, and terms of art in nursing education that have been defined for the reader in the Glossary at the end of the document. We encourage the reader to refer to this glossary when needed.

CHI and the Center for Nursing Excellence would like to thank the following individuals for their guidance and participation in crafting the report.

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FOREWORD

The Colorado Nursing Faculty Supply and Demand Study| [Study] was designed to identify and analyze key factors and issues affecting the supply of and demand for nursing faculty and the relationship between nurse education programs and the market for professional nurses in Colorado. The Study focuses on four primary areas: 1) economic factors that affect the supply of nursing faculty, including the economic rewards of teaching; 2) non-economic factors affecting supply such as faculty workload, work environment, opportunities for professional development and faculty educational requirements; 3) the infrastructure of nurse education programs in Colorado; and 4) the role played by the private sector in its capacity of serving as the clinical training component of nurse education and supporting nurse faculty in both recruitment and retention efforts. The Study examined issues related to nursing faculty supply for both licensed practical nursing (LPN) and registered nursing (RN) educational programs.

The research effort took full advantage of information available in the current nursing workforce literature, and also collected primary data from Colorado nursing programs and clinical training sites related to supply and demand issues that are known to affect the recruitment and retention of nursing faculty. Specifically, the Study undertook the following tasks and activities:

1. Conducted a systematic review of available literature and existing data;

2. Utilized an expert project advisory panel to review the study design, research questions, and data collection methods, including the identification of key informants to be interviewed;

3. Administered a Web-based survey that was sent to all Colorado post-secondary education institutions that maintain a professional nurse education program;

4. Administered a Web-based survey that was sent to all hospitals serving as clinical training sites and a subset of skilled nursing facilities in Colorado that also serve as clinical training sites;

5. Conducted key informant interviews with leaders in academic training programs and clinical training sites; and,

6. Analyzed primary data collected to provide a baseline of Colorado-specific information regarding faculty supply, demand and shortage issues in the state.

This Study is a first step in compiling the data necessary to understand and address the issues related to achieving an adequate supply of qualified nursing faculty. It is a snapshot in time and highlights the need for more robust, well-defined and reliable data monitoring efforts by which to understand the full picture of nursing workforce supply and demand over time and the factors associated with affecting noted trends. However, the findings make it clear that Colorado educators, clinical training sites and policy makers face substantial challenges related to the current supply of nursing faculty and the methods available to increase the overall capacity of the state's nursing education system.

- Colorado's current nurse faculty shortage is significantly greater than the national average.

- Colorado struggles to compete with other states to attract faculty due to economic and non-economic factors including compensation levels, workload demands and the budget constraints that disproportionately affect state-supported higher education.

- Nursing education deployed significant and rapid program expansions over the past three years in response to the workforce shortage. In a number of ways, these expansions have exacerbated the faculty shortage and increased job dissatisfaction.

- Faculty attrition is projected to increase significantly due to anticipated nurse faculty retirements, especially within the state's four year colleges and universities.

- The majority of the state's nursing programs are publicly funded and are therefore caught up in the current fiscal crisis facing all of higher education in Colorado.

- The private sector, particularly clinical facilities employing newly graduated nurses (hospitals and long term care facilities), is already spending millions of dollars per year to support nursing education. This support takes the form of subsidizing clinical faculty, providing clinical instruction, offering scholarships and tuition reimbursement and expanding clinical rotations to meet the increased demand for clinical training sites.

- Clinical facilities report that newly graduated nurses are often unprepared to assume the responsibilities of independent practice. Concerns over the quality of patient care require them to provide orientation programs to new graduates ranging from four weeks to more than three months and costing in excess of $2 million annually.

- Nursing education is beginning to take advantage of advances in technology to enhance teaching methods, and of collaborative relationships with clinical facilities to strengthen the level of preparedness of new graduates and improve faculty job satisfaction.

- Nursing programs have begun to utilize technology to enhance existing teaching methods and the overall educational experience. Together with clinical training sites, educational programs are building sustainable collaborative approaches to strengthen the competencies of new nurse graduates. Among these innovative educational methods, the challenge is how to successfully achieve technology transfer and diffusion of innovation so as to ensure widespread adoption of those practices that yield the best results.

The findings from this study point to the need for coordinated action to address Colorado's overall nursing workforce needs and, in particular, the need for an adequate supply of qualified faculty. A solid foundation of public and private sector collaboration already exists upon which to build a sustainable action plan. Colorado's nursing programs and health care facilities are pursuing many of the most promising strategies identified nationally and by other states, particularly related to cultivating an adequate supply of clinical faculty. Colorado-specific initiatives designed to support and strengthen faculty roles and resources are emerging. There are additional opportunities to further the use of non-traditional and multidisciplinary approaches to faculty development such as streamlining graduate program requirements, use of interdisciplinary faculty teams, and expansion of regional institutional collaborations. Regulatory and institutional policies warrant further examination related to the continuum of educational opportunities for practicing nurses, including opportunities to better utilize Colorado's pool of retired nurse educators.

As key informants note, nurse faculty issues are inexorably linked to the complex range of factors that contribute to the overall nursing workforce shortage. Other states offer approaches for recruiting and training nurse educators that Colorado should consider. The experiences of leading states like North Carolina and California suggest that key questions must be answered such as: What are the numbers and qualifications of nurse educators that are needed? What array of nursing education programs is needed to yield the right mix of practicing nurses? What data is needed to inform these decisions? We suggest that this study is a starting point for understanding both the contributing factors and potential solutions for Colorado's nurse faculty shortages.

I. INTRODUCTION

Professional nurses account for a major segment of the health care workforce. In 2000, professional nurses represented 21 percent of the health care workforce nationally.[1] In Colorado, nurses represent 25 percent of the health care workforce and will account for 15 percent of all job growth over the next ten years.[2]

Over the past ten years, the nursing workforce shortage has become commonly recognized by the public. As a result of concerted recruitment efforts ranging from nationwide media campaigns to local community and employer-based initiatives, there has been a surge of interest in the nursing profession as a viable and potentially attractive career option. Despite the promise of these recent recruitment efforts, the current nursing shortage is projected to worsen significantly through 2020. Converging conditions in the U.S. population and health care system have contributed to the projected shortage, principally the increased demand brought about by population demographics and medical technology -- a demand that is unmatched by the projected supply of nurses entering the profession.[3]

It has been estimated that there is currently an 11 percent shortage of nurses in Colorado, which is two times greater than the national average. Without a significant increase in the production of new nurses, this shortage is projected to triple to 30 percent by 2020.[4] During this same period, the population of Colorado is expected to grow 16 percent, while the population aged 65 and older is projected to grow 113 percent.

In order to meet projected nursing workforce needs, health care industry and nurse leaders throughout Colorado have suggested a core strategy be expanding programs to graduate at least twice as many registered nurses annually, as well as re-engineering curriculum to better prepare graduates for the realities of current and future nursing practice.[5] Nurse leaders have argued that addressing Colorado's nursing shortage must include increasing both the absolute number of graduates as well as improving the competencies of new registered nurses entering practice.[6]

Colorado's registered nurse shortage is the result of a complex interplay of factors that includes health care financing and delivery, the structure of Colorado's post-secondary nurse education system and the evolution of nurse education programs in Colorado. Resolution of the current nurse shortage will require a comprehensive and systematic effort that recognizes the interconnectedness of the educational and health care delivery systems including advances in medical technology, the work environment, reimbursement policy and legislative and regulatory action.[7]

Barriers to Workforce Expansion

Nationally, the University Health System Consortium and the American Association of Colleges of Nursing (AACN) Joint Task Force identified six factors that influence the production of nurses: a) adequate numbers of nursing faculty with the appropriate clinical preparation; b) adequate access to quality placements for clinical learning experiences; c) adequate classroom and laboratory space; d) adequate faculty salaries; e) adequate state financing; and f) adequate numbers of science and general education courses available in the university to accommodate increased enrollments in nursing programs.[8]

Access to an adequate supply of qualified nursing faculty is a cornerstone for successful expansion of the nursing workforce in Colorado and across the U.S.[9,10,11] Sixteen thousand (16,000) qualified nursing school applicants nationwide were denied admission in 2003 as a result of inadequate numbers of qualified nursing faculty.[12,13] As discussed in the summary of findings from this current Study, more than 2600 applicants were turned away in Colorado during this same period as a result of capacity constraints within the state's nursing programs.

II. THE CURRENT STUDY

The Study identifies key factors and issues affecting the supply of and demand for nursing faculty in Colorado. The Study evolved from a 2003 report issued by the Colorado Center for Nursing Excellence (Center), which examined nursing workforce challenges confronting Colorado.[14] In collaboration with the Colorado Workforce Development Council, the Center engaged nurse educators, major clinical training sites through the Colorado Health & Hospital Association (CHA), the Colorado Nurses Association, the Colorado Council of Nurse Educators, and the Colorado Organization of Nurse Leaders to frame the current study. The Center then contracted with the Colorado Health Institute to design and execute the study in collaboration with this partnership.

The Study was designed to identify and analyze key factors and issues affecting the supply of and demand for nursing faculty and the relationship between nursing programs and the market for professional nurses in Colorado. The study focused on four primary areas: 1) economic factors that affect the supply of nursing faculty, including the economic rewards of teaching; 2) non-economic factors affecting supply such as faculty workload, work environment, opportunities for professional development, and faculty educational requirements; 3) the infrastructure of nurse education programs in Colorado; and 4) the role played by the private sector in its capacity of serving as the clinical training component of nurse education and supporting nurse faculty in both recruitment and retention efforts. The Study examined issues related to nursing faculty supply for both LPN and RN educational programs.

Methods

The research effort took advantage of available information in the current nursing workforce literature and also collected primary data from Colorado nursing programs and clinical training sites related to supply and demand issues that are known to affect the recruitment and retention of nursing faculty. Specifically, the study undertook the following tasks and activities:

1. Conducted a systematic review of available literature and existing data;

2. Utilized an expert project advisory panel to review the study design, research questions and data collection methods, including the identification of key informants to be interviewed;

3. Administered a Web-based survey that was sent to all Colorado post-secondary education institutions that maintain a professional nurse education program;

4. Administered a Web-based survey that was sent to all hospitals serving as clinical training sites and a subset of skilled nursing facilities in Colorado that also serve as clinical training sites;

5. Conducted key informant interviews with leaders in academic training programs and clinical training sites; and,

6. Analyzed primary data collected to provide a baseline of Colorado-specific information regarding faculty supply, demand and shortage issues in the state.

(1) Literature Review

A systematic review and synthesis of Colorado-specific literature and relevant national data was undertaken. The review was intended to make maximum use of existing data and information that describes the current status of nurse education as well as the market for nursing faculty in Colorado. Existing data and completed studies were identified from a number of state and local resources as well as from the National Library of Medicine's Medline system.

These studies were evaluated for their methodological rigor and subsequently synthesized into a review of existing knowledge of the nursing faculty market.

Descriptive information about Colorado's nurse education programs was gathered from individual college catalogues, curricula descriptions and college Web pages. Information includes number of faculty, faculty academic degrees and professional licensure. Individual school admission offices were contacted to complete data and fill information gaps in the information (see Appendix A).

(2) Expert Advisory Panel

An expert advisory panel composed of key stakeholders was formed to review project processes and findings. The panel included representatives of Colorado's nurse education programs, health care facilities providing clinical training sites, the Colorado Nurses Association, Colorado Association of Nurse Leaders, Colorado Center for Nursing Excellence and the Colorado Health and Hospital Association. The panel was convened on July 28, 2004 to review the study design and methodology and to make suggestions for questionnaire content and format of surveys of nursing programs and clinical training sites. The panel was also asked to help identify key informants from the nurse educational system and thought leaders in the clinical training sites around the state. The panel also reviewed initial study results and made recommendations on the final presentation of findings.

(3) Online Survey: Nursing Programs

An online Web-based questionnaire was developed to collect data from Colorado's nurse education programs. The instrument was designed to collect data on the current status and future planning for both academic and clinical nurse faculty. The questionnaire included queries about faculty size, vacancy rates, faculty compensation, sources of program revenue, recruitment and retention strategies and innovations used by schools to increase the supply of nursing faculty (see Appendix B). The Nursing Program Questionnaire was accessed through the CHA Website.

All 28 of Colorado's nurse education programs were directed to the online questionnaire; 21 programs (78.5 percent) responded. Responders represented the following program categories (many of which offer more than one type of program): 13 LPN programs, eight ADN programs, eight BSN programs, and four post-baccalaureate programs.

(4) Online Survey: Clinical Training Sites

Under the auspices of CHA, clinical training sites were contacted to participate in the study. Clinical training sites were identified with the help of the Colorado Health and Hospital Association, the Colorado Center for Nursing Excellence and the Colorado Health Care Association. The Colorado Health and Hospital Association and Colorado Health Care Association identified facilities that provide clinical experience.

As with the nurse educational programs, a survey of clinical training sites was carried out to gather information about clinical training capacity issues. The survey was designed to gather information about both the structure and capacity of the clinical training sites that cooperate with the

educational programs in Colorado. The survey questionnaire (see Appendix C) was available on the CHA Website.

In total, 81 facilities were directed to the survey; 51 responded for a 62.9 percent response rate. Of the respondents that identified their training site, 36 were hospital facilities and four were long-term care facilities; the remainder were not identified.

(5) Key Informant Interviews

Under the auspices of the Colorado Center for Nursing Excellence and CHA, a list of key informants was identified and interviewed. Structured interviews were conducted by telephone with nursing school deans or their designees for a representative sample of Colorado nursing educators. Nursing directors, CEOs from clinical training sites and a representative from the Colorado Board of Nursing were interviewed. The interviews were completed over a four-week period (see Appendix D).

Questions for nurse educators included perceptions of factors contributing to faculty shortages; salary issues; age of faculty and practicing nurses; workforce and role expectations; innovations in faculty recruitment and retention; issues related to job satisfaction; perceptions of their ability to impact policy and nursing practices; and innovations in addressing faculty shortages.

Questions for clinical training sites included identification of barriers to expansion of clinical training opportunities; financing of clinical training and supervision; scheduling and supervisor burden; opportunities for acceleration of training; training needs related to quality assurance in the provision of direct care; and faculty participation in new clinical and teaching technologies.

Key informant interviews were designed to collect information not available from the online survey and to clarify data collected through the surveys. Qualitative information is an important component of any survey effort as it is integral to providing a more holistic picture of the phenomenon being studied. The sampling strategy for the interviews included identifying a representative group of leaders from the various types of nursing programs and clinical training sites while being attentive to the geographic variability found in the state between rural and urban training sites and educational programs.

(6) Analytical Approach

Key informant interviews were analyzed based on common themes noted by educators and clinical training sites separately; where appropriate, these themes were cross-referenced by informant type.

Survey analysis included examining overall frequencies by respondent type (schools and clinical training sites); two- and four-year institutions and rural/urban differences were reported separately for comparative purposes. For the purposes of this analysis "urban" includes the Denver Metro Area, Northeast/Central region (Greeley), and South Central region (Colorado Springs and Pueblo). While in certain respects, these areas other than Denver Metro have rural components, they do represent a cluster of educational programs and facilities that are distinct from the truly rural areas of the state. The Western Slope, especially Mesa County, was considered rural despite being a metropolitan statistical area (MSA) because of the uniquely rural circumstances that characterize the geography of the region and distribution of resources.

Data Limitations

This primary data collection effort represents a point in time estimate (2003) and therefore is intended to serve as baseline information for future planning and monitoring purposes. It should

be noted that the survey responses and key informant interviews represent small numbers from an analytical perspective and therefore limit our ability to cut the data too finely. The most significant data limitation is the rate of non-response to a large number of questions on both surveys. Many important questions had to be dropped from our report because of low response rates. Some were included for illustrative purposes only; they do not represent stable estimates of the underlying information that was requested. In these cases, a footnote is included.

Where appropriate, we have provided analyses by type of program, including two-year versus four-year institutions and urban/rural comparisons of nursing school statistics.

Finally, this primary data collection is of a qualitative nature; that is, for many questions on the survey and all questions on the key informant interview protocol, respondents were queried about issues that reflect their individual attitudes and perceptions of the issue being discussed.

III. BACKGROUND

National Nursing Faculty Shortages

Nationwide, the number of vacant faculty positions is increasing. In a recent congressional briefing, Dr. Janet Allen, Dean of the School of Nursing at the University of Maryland characterized the current faculty shortage as "a growing crisis exacerbated by state budget cuts."[15] The AACN Special Survey on Vacant Faculty Positions reported a nurse faculty vacancy rate of 8.6 percent in 2003, up from the 7.4 percent in 2000.[16] Nurse faculty positions requiring doctoral degrees account for the majority of vacancies[17] and are due, in part, to "the relatively recent doctoral preparation required for tenured and tenure track individuals."[18] The Southern Regional Board of Education (SREB) projected a 12 percent deficit of nursing faculty for the 16 SREB states and the District of Columbia.[19] A 2002 report, the Faculty Census Survey of RN and Graduate Programs conducted by the National League of Nursing, found that 1,106 full-time faculty positions nationwide remained unfilled.[20]

Nurse faculty shortages result from a combination of conditions: 1) faculty retirements, 2) departure from academic life by younger faculty, 3) non-competitive salaries, 4) tuition and loan burden of graduate study, 5) diminishing pipeline of master's and doctoral-prepared graduates, 6) age of doctoral students and time to graduation, and 7) faculty workload and role expectations.[21,22] Although the mix of conditions may vary depending on a state's specific RN educational system, its fiscal health and policy environment and geography (rural versus urban states), the underlying causes of faculty shortages remain the same. Salary differentials between faculty and clinical positions are substantial, placing nursing schools at a significant disadvantage for attracting qualified applicants.[23,24,25] Retirement of academic nurse faculty is projected to intensify throughout the next decade given the current median age of doctoral-prepared faculty of 53.5 years.[26]

Commencing in 2003, an estimated 200-300 doctoral-level faculty are eligible for retirement on an annual basis with similar numbers of master's-prepared faculty beginning to retire in 2012.[27] Compounding the nursing faculty shortage is a decline in the number of students graduating from masters' and doctoral nursing programs. The AACN report on 2003-2004 Enrollment and Graduations in Baccalaureate and Graduate Programs in Nursing noted an increase in graduate nursing school enrollment of 10.2 percent for master's and 5.6 percent for doctoral students, but a decrease in graduation rates of 2.5 percent and 9.9 percent in master's and doctoral programs, respectively.[28]

Nationwide Strategies to Address Faculty Shortages

Efforts to resolve the nurse faculty shortage are in progress at both the national and state levels. The AACN White Paper on Faculty Shortages in Baccalaureate and Graduate Nursing Programs offers a comprehensive list of strategies being employed to address nurse faculty shortages. Findings from the current Study indicate that Colorado nursing programs and health facilities are currently implementing many of these strategies.

(1) Use of nontraditional and multidisciplinary approaches – Faculty capacity can be expanded in nontraditional ways with existing resources. Traditionally, nursing has objected to utilizing non-nurse faculty, yet multidisciplinary and trans-disciplinary faculty, common curriculum and cross-listing of courses can provide an important source of increased instructional capacity and help to alleviate the growing nurse faculty shortage while enhancing the student education experience (see Appendix E for specific strategies).

(2) Utilization of retiree faculty pool – Retirement often has been viewed as an all-or-none decision in the academic nursing community, relegating an experienced faculty pool to retirement and rendering them unavailable for continued contributions to nurse education. Increasingly, these retirement policies are being reconsidered to allow retired faculty to return to teaching responsibilities (see Appendix E).

(3) Innovative approaches to clinical education – Clinical education is resource-intensive for colleges and universities, but is critically important to the education of competent professional nurses. Nurse educators are becoming increasingly creative in offering quality clinical experiences to students in the face of decreasing clinical faculty resources. Many schools have developed formal partnerships with clinical training sites to use in-house expert nurse clinicians to teach students and thereby increase faculty capacity and competence (see Appendix E).

(4) Investing in educational research – There is currently insufficient evidence regarding best and even promising practices on how to fully utilize faculty and enhance the teaching experience for nursing school faculty; in short, more educational research is needed and being funded in the area of faculty recruitment and retention (see Appendix E).

State Studies Examine Nurse Faculty Shortages

State strategies for resolving the nurse faculty shortage differ depending on the state's projected nursing shortage, post-secondary education system, and legal, regulatory, and political environment. Knowledge concerning states' nursing workforce issues continues to grow as numerous states have begun examining the relationships between RN education programs, graduate readiness for practice and the health care marketplace.[29,30,31,32,33,34,35,36,37,38,39,40,41,42,43]

Common themes emerging from these state studies can inform Colorado's public dialogue concerning the supply of and demand for nursing faculty. These themes include:

(1) Annual data are needed to accurately assess the degree and extent of the nursing shortage. Projecting the need for additional nursing workforce and nursing school faculty has been described as a "moving target." Factors affecting need that should be tracked include: in-migration of nurses from other states; retention levels for the existing nurse workforce; and changes in demand for nurses as hospitals and other health care facilities expand and specialize.[44]

(2) Faculty shortages differ depending on type of nursing program. Recruitment and retention issues related to doctoral faculty in four year schools include "brain drain" from state schools due to failure to pay competitive academic salaries, elimination of faculty positions because of state budget cuts, competition from the private sector for PhD nurses and decreased interest in educator and research roles.[45,46,47,48,49,50] Recruitment and retention issues related to community college faculty include low salary levels (significantly below what are offered to new graduates in entry-level hospital positions), the requirement that faculty must have an MSN degree and the high costs associated with the clinical education component of nurse preparation.[51,52,53]

(3) Today's complex health care environment requires a realignment of nurse education to meet the complex health care needs of patients.[54] Educational preparation issues being addressed in many states relate to new graduates' readiness to exercise the critical thinking skills needed in the clinical setting[55,56,57,58,59] and the continued availability of appropriate clinical training sites to prepare professional nurses for practicing in the 21st century health care system.[60,61,62,63,64]

It has been argued that the complexity of today's health care environment demands that professional nurses possess high levels of critical thinking and problem solving skills. Consequently, the National Advisory Council on Nurse Education and Practice recommends that at least two-thirds of the nurse workforce hold a baccalaureate or higher degree in nursing by 2010, a 20 percent increase from 2003 numbers.[65]

The North Carolina Nursing Workforce Task Force posed five questions when they began the process of examining the quality of the state's 64 RN educational programs; these questions framed the problem identification as well as the strategies proposed by the task force. The five questions were:

1) Are there too many nurse education programs in North Carolina and do existing programs operate at an acceptable level of efficiency and quality?

2) Do we have the right mix of nurse education programs that are likely to yield the right mix of graduates and practicing nurses?

3) Is there a defensible rationale for maintaining the present number of nurse educational programs and/or allowing new programs to develop?

4) Are there cost-effective ways to reorganize North Carolina's existing array of nurse education programs so that the overall quality and productivity of these programs could be enhanced?

5) What are the principal factors affecting the quality and production capacity of existing nurse educational programs and how might these be improved upon?[66]

In California, the California Health Care Foundation and University of California at San Francisco held a daylong strategic conversation with representatives from nurse education programs, health care organizations, organized labor and professional nurse associations to discuss the state's nurse workforce shortage. Three primary questions guided their discussion:

1) Is it possible to collect a consistent and reliable set of nursing workforce measures to provide the necessary data to track supply, demand, shortages and adequacy of nurses in California?

2) What incentives and resources are necessary to identify, activate, and facilitate positive change in the work environments of nurses? What models of care delivery, nursing leadership and nurse education will facilitate this change?

3) How can we reinvent the image and practice of nursing to target the populations that are essential to the future of the nursing profession in California?[67]

In these two state examples, particularly the questions that framed their respective approaches to addressing nurse faculty shortages, are kernels of insight that can help guide Colorado nurse educators and public and private policy makers as they set out to address nurse educator shortage in Colorado. The challenge to all states is to develop viable methods to train new nurse educators and do so in such a way as to be ever mindful of the relationship between quality and capacity, as they are inextricably linked.

IV. SETTING THE CONTEXT: NURSE EDUCATION IN COLORADO

Professional nursing in Colorado consists of two levels of practice, the Licensed Practical Nurse (LPN) and the Registered Nurse (RN). Both levels of practice require completion of an approved educational program that includes both academic and clinical components, licensure through the successful completion of a standardized national examination and demonstrated competency through requirements set by the Colorado Board of Nursing.

LPN training involves completion of an academic and clinical training program, typically one year or less, offered through a variety of educational institutions including technical schools, community colleges and other independent private schools and programs. Four-year colleges and universities also offer limited LPN programs.

RN training can take several routes, the most common of which are the two-year associate degree program (ADN) and the four-year baccalaureate degree program (BSN). In Colorado, RN programs are largely offered through publicly funded community colleges (ADN) and 4-year colleges and universities (BSN and Nursing Doctorate degrees). The majority of new nurses in Colorado graduate from a community college with an ADN degree. However, many ADN nurses first obtain their LPN degree in one year and then take an additional year to complete ADN requirements, often while employed in clinical setting. This "One plus One" approach is made possible under a cooperative agreement instituted between nurse education programs and the Colorado Board of Nursing and is referred to as the Nursing Articulation Model (NAM).

The NAM provides the opportunity for many practicing LPN and ADN nurses to continue their education and obtain a higher degree – LPN to RN and subsequently ADN to BSN. The NAM enables a seamless transition for nurses to progress to higher levels of education through streamlined requirements and coursework content that has been accepted by all nursing programs in the state.

In response to the demand for more nurses in Colorado, there has been a rapid expansion of new RN preparation programs that are designed to accommodate those entering nursing from a non-nursing Bachelor of Science or Bachelor of Arts educational background. The accelerated BSN programs require 13 months to 15 months of study after completion of specified prerequisites. A four-year Doctorate in Nursing (ND) program enables RN licensure during the second year of study while also providing a graduate-level nursing degree.

Basic Educational Requirements

The goal of nurse education programs is to enable graduates to obtain licensure and enter into professional practice with demonstrated clinical competency in the application of nursing theory and knowledge in a clinical practice setting. Nurse education at both the LPN and RN level includes didactic coursework in a classroom setting, clinical simulation in a controlled laboratory environment and supervised clinical practice where the application of knowledge and skills is employed in direct patient care.

Academic content - The knowledge base for professional nursing practice includes social science (e.g., psychology), basic science (e.g., biology, chemistry) and health science (e.g., physiology, pharmacology). Nursing theory and practice are also major components of the classroom learning experience.

Clinical content - Core competency in nursing practice is the ability to exercise critical thinking, which applies textbook knowledge and skills in a clinical setting with actual patients. An essential component of the nurse education process is the clinical rotation, experiential learning in a range of clinical sites where students provide direct patient care under the supervision of clinical faculty. These clinical rotations largely occur within acute care institutions, the primary employment sector for registered nurses, but increasingly are occurring in community-based and institutional long-term care settings. Clinical training sites agree to provide learning experiences for students and often provide clinical faculty and/or preceptors from among their employed nursing staff.

Colorado Licensure, Scope of Practice and Nursing Program Requirements

Health professional licensure is intended to ensure that those individuals with direct patient care responsibilities have the requisite education and clinical competencies to meet a minimum standard of safe practice.

The Colorado State Board of Nursing, with a primary mission of public protection, is housed in the Colorado Department of Regulatory Agencies. The Board approves nursing programs in Colorado and otherwise regulates the practice of nursing. The Board sets practice requirements and issues nursing licenses. Every state, including Colorado, requires passage of a standardized licensing examination that is administered by the National Council of State Boards of Nursing. Colorado does not have continuing education requirements as a condition of re-licensure.

Policy oversight of nursing education and practice comes from a variety of sources, statutes, rules and regulations. The Colorado Nurse Practice Act (CRS 12-38-101) defines the scope of nursing practice. All licensed RNs, regardless of their educational preparation, can perform the basic duties and responsibilities within the scope of the RN license in the state. All health care institutions in Colorado require evidence of nurse licensure of their employees; however, they are also free to establish additional educational preparation and experience requirements (for example the BSN degree as opposed to the ADN degree.)

Nursing education is guided both by the Colorado Nurse Practice Act and its associated Rules and Regulations, and the Colorado Commission on Higher Education. In addition, education institutional policies are also applicable. The authority for approval and periodic review of nursing education programs in the State rests with the Colorado Board of Nursing, in collaboration with the Commission on Higher Education.

According to information provided by the Colorado Board of Nursing, Colorado is acknowledged for its flexible interpretation of its Nurse Practice Act including reduced and minimally restrictive program, clinical education and regulatory requirements. The Board is pursuing a variety of strategies to support innovations in nursing education including: 1) technical assistance and consulting to programs to facilitate problem solving and to streamline processing of new program applications; 2) approval for pilot projects that evaluate technology-driven teaching methods; 3) convening a task force to identify combined education options for licensed psychiatric technicians and licensed practical nurses to help augment the long-term care workforce; and 4) technical assistance to programs in response to new national nurse licensing examination standards and methods.

Accreditation

Accreditation is the method by which individual institutions and teaching programs demonstrate that they have met educational standards. External accrediting entities establish review crite-

ria and conduct an examination of the processes and structures, and increasingly the outcomes, maintained within an educational program. These criteria include course design and curriculum, student-faculty ratios, qualifications of faculty and types of faculty. The National League of Nursing Accrediting Commission (NLNAC) accredits nursing programs, including community college and ADN programs, and the Commission on Collegiate Nursing Education (CCNE) accredits BSN programs and four-year institutions. Historically, the requirements set by external accrediting agencies have exceeded the minimum program thresholds set by the Colorado State Board of Nursing. However, changes in the Board rules enacted in 2001 require that by 2008, all nursing programs in Colorado must be accredited by an external entity.

Currently, two community colleges in Colorado, Otero and Pueblo, are accredited and efforts are underway by the Colorado Community College and Occupational Education System (CCCOES) to obtain NLNAC accreditation as a system. The majority of community colleges across the country are already NLNAC approved. All Colorado four-year nursing schools are currently accredited by CCNE or NLNAC.

NCLEX Examination

The National Council of State Boards of Nursing has developed two tests for each level of professional nursing (NCLEX-PN and NCLEX-RN) that are used by state boards to facilitate licensure decisions. To be eligible to take the NCLEX, candidates must apply for licensure in the state or U.S. territory in which they intend to practice. The five-hour examination assesses knowledge, skills and clinical competencies for nursing practice. The NCLEX pass standards are reviewed every three years and candidates must score above the minimum threshold to pass. In 2003, nationally there were 76,688 RN candidates with an 87.02 percent pass rate and 44,075 PN candidates with an 88.21percent pass rate.

All states currently rely on the NCLEX examination to ensure baseline knowledge for entry into professional nursing. As a result, one of the specific objectives for most nursing programs is to prepare students for passage of the NCLEX examination.   The passing standard for the RN examination was raised effective April 2004 to reflect the recognition that a greater level of knowledge, skills and clinical competencies are needed to practice professional nursing. This action was taken in response to a national job analysis of new nursing graduates. The results mirrored concerns being raised by health care employers, particularly hospitals, about the competencies needed for nurses entering practice within health care institutions with more complex, sicker patients.

In 2004, 1235 graduates from Colorado's 21 nursing programs sat as first time candidates for the NCLEX-RN examination.[68] For the year, NCLEX-RN pass rates for Colorado were 82.93 percent (ADN) and 82.87 percent (BSN) for a total RN pass rate of 82.91 percent. NCLEX-RN pass rates for all states combined for the same period were 85.33 percent and 84.84 percent, respectively.[69]

Current Efforts Underway in Colorado's Community College System

The Colorado Community College and Occupational Education System is seeking to obtain NLN accreditation for the system as a whole as opposed to each of the system's 24 programs and 11 colleges seeking individual accreditation. This action is in response to Board of Nursing rules that require all nursing programs to be accredited by 2008. CCCOES anticipates this uniform accreditation will strengthen all of its nursing programs and address policy and capacity concerns identified by a 2004 legislative task force charged with examining the structure of the community

college system. Those concerns included: admission policies that allowed inadequately prepared students to begin nursing programs, leading to high rates of attrition; uncoordinated admissions procedures; uneven implementation of curriculum; low NCLEX pass rates among graduates of some schools; and tuition and fees that were inadequate to support quality nursing education. CCCOES is addressing these concerns, including the phasing in of uniform admissions criteria and centralized admissions to all nursing programs in the system. Standardization of curriculum across all ADN and LPN programs has begun and will continue through the 2005 academic year. Final revisions to the set of uniform nursing program policies and preparation for accreditation will take place during 2006.

Faculty Preparation and Requirements

Nursing school faculty are employed on either a full-time or part-time basis in both academic and clinical positions, or they can be hired to fill both roles simultaneously. Nursing programs typically employ full-time faculty for academic positions that include coursework in nursing theory and all science-based coursework. Part-time adjunct faculty are often employed to provide specialty content and fill vacancies when full-time faculty are not available. Clinical instructors, who are responsible for teaching in clinical settings, are often employed part-time, work on a contract basis and may or may not have an adjunct faculty appointment.

In Colorado, the Colorado Board of Nursing sets faculty requirements; these standards serve as minimum thresholds and may be less than national accreditation standards. Nurse faculty are generally required to possess an advanced degree that is one level higher than the program level in which the individual is teaching.[70] Faculty qualifications for two-year programs vary by teaching responsibility. For example, full-time faculty (classroom and clinical) must posses a Master of Nursing (MSN) or have an accepted written plan for obtaining a master's degree; adjunct part-time clinical faculty must possess a BSN at a minimum, with a master's the preferred level of preparation.[71] CCCOES requires that all full-time faculty obtain a vocational teaching certificate. In LPN programs, a program director is required to have a graduate degree in nursing; however, instructors may have as a minimum a BSN or a plan for obtaining a BSN degree.

Four-year colleges and universities require a Master of Nursing degree at a minimum for any teaching position in a BSN program or serving as clinical faculty. Full-time tenure track academic faculty are required to have a doctorate degree in nursing.[72]

V. STUDY FINDINGS

For the purposes of this analysis, the findings have been analyzed by two-year and four-year institutional status and also include select urban/rural differences. Two-year schools include Colorado's community colleges, although some programs are housed in alternative settings such as health care facilities and technical colleges. Two-year schools graduate LPN and ADN-prepared registered nurses. Four-year institutions include the state's colleges and universities and primarily graduate BSN and graduate level (MSN, DN and PhD) nurses. Given the differing resource requirements between two- and four-year institutions, we have analyzed the survey data accordingly to identify differences that may exist in faculty supply and demand across the two types of educational preparation. We have also provided descriptive statistics that highlight differences between rural and urban programs.

## NURSING PROGRAM SURVEY: SUMMARY STATISTICS

Twenty-one academic nurse education programs responded to the online survey; 12 were two-year schools and nine were four-year institutions. The distribution of students enrolled in degree/diploma programs in 2003 by type of institution is displayed in Figure 1.

- As illustrated in Figure 2, the majority of students graduating from two-year schools in 2003 were licensed practical nurses (LPNs) followed by associate degree RNs. Conversely, the majority of four-year institutions were graduating nurses with a Bachelor of Science degree (BSN), with a much smaller percentage graduating a post-baccalaureate program (MSN, PhD and doctorate in nursing).

Figure 1. 2003 Nursing Student Enrollment by Type of Program
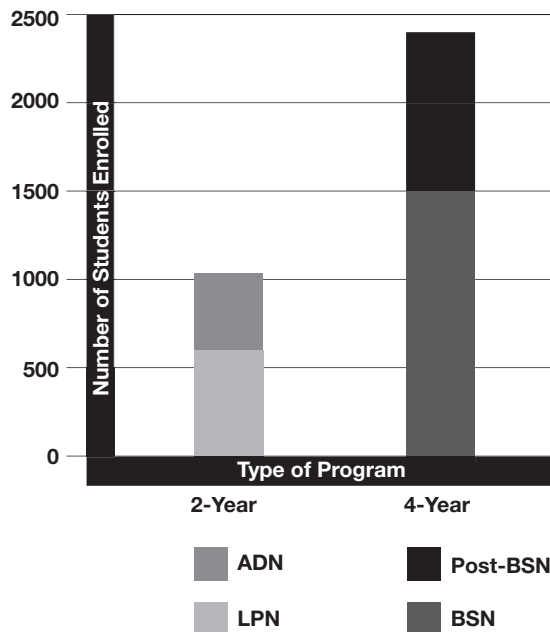
Figure 2. 2003 Nurse Graduates by Type of Degree/Diploma
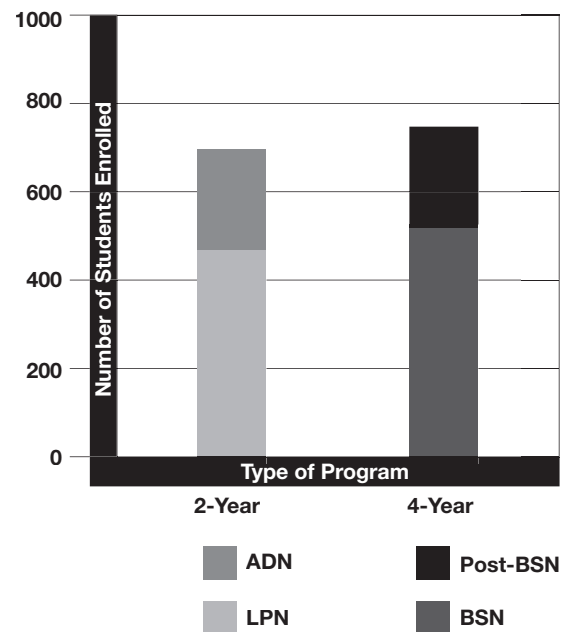
Academic Faculty

- In general, four-year nursing schools have larger faculties than those found in two-year institutions. In 2003, the average two-year school employed slightly more than five FTE faculty members as opposed to the four-year schools that employed, on average, close to 17 FTE faculty positions (the FTE figure includes both full-time and part-time faculty).

- Faculty vacancies in absolute and average numbers were one-third higher among the four-year schools (22 versus 16 and 3.7 versus 2.00 respectively) as compared to the two-year schools at the close of the 2003 academic year. However, as a percentage of the total faculty, the four-year schools experienced a 15 percent vacancy rate at the end of the 2003 academic year while the two-year schools experienced a 25 percent vacancy rate.

- Projected need for new faculty for the 2005 academic year was slightly higher among the 4-year schools where a 17 percent increase was reported versus a 15 percent increase among the two-year schools.

The three primary reasons given for faculty vacancies were retirement, resignations, and program expansions.

- Although highest-ranked reasons were similar across two- and four-year institutions, four-year schools were more likely to rank retirement highest, while two-year schools ranked resignations highest. Both two- and four-year institutions ranked program expansion as a major cause of faculty vacancies (92 percent of both two- and four-year schools ranked expansion as among their top two reasons for faculty vacancies).

- Of those listing resignation as the primary reason for a faculty vacancy, the reasons given were: accepted another teaching position (n=4), accepted another non-teaching position (n=4), limited career opportunity (n=3) and workload or the work environment (n=3).

Further probing about the nature of program expansions revealed the following examples:

- Added a part time program

- Increased the size of the program by 75 percent

- Increased enrollment and added a new accelerated BS Program

- Added the first year to the second year RN program, now have LPN level

- Numbers of students increased in all pre-licensure student and post-licensure (graduate training) options; tremendous growth in the RN to BSN and MS on-line options

- Enrollments increased 34 percent, added a Masters Program

- Added a new site

Among the strategies listed by all nursing schools for filling current vacancies, the following three were most frequently cited: professional networking, advertising and recruitment from the ranks of part-time faculty.

Primary barriers to faculty recruitment during the 2003 academic year included the following:

- 82 percent reported salary levels as a primary barrier to recruitment of new faculty;

- 76 percent reported that a limited qualified applicant pool was a major barrier to recruitment; and

- 68 percent reported a decreased interest in the educator role.

The ***average starting salary*** during the 2003 academic year across all nursing programs reporting was $39,272; for two-year schools the average was $35,992, while four-year institutions' salaries started at $45,833. [It should be noted that only six of the nine four-year schools reported data for this question.] When viewed by rural/urban differences, the ***average starting salary*** for nursing school faculty in 2003 was significantly lower in rural areas ($33,878) than in urban areas ($44,667).

The ***average salary*** for academic faculty during the 2003 academic year was $44,664; when viewed by institutional status, the two-year school salaries averaged $39,891, while four-year program salaries averaged $54,210. [Again, only six of the nine four-year institutions reported.] The ***average salary*** for academic faculty in nursing schools located in rural communities was $37,405, while faculty in urban locations earned, on average, $51,924.[73]

Clinical Instructors

The average number of FTE clinical instructors for all programs was 5.5 during the 2003 academic year; there was little difference in the average number of clinical faculty between two-year (6) and four-year (5) schools; although the number of clinical instructor FTEs allocated to two-year schools was higher (n=52) than those allocated to four-year institutions (n=35) as shown in Figure 3.

Figure 3. Clinical Instructor Supply by Type of Institution:
2003 FTE Allocations, 2005 Projected Need
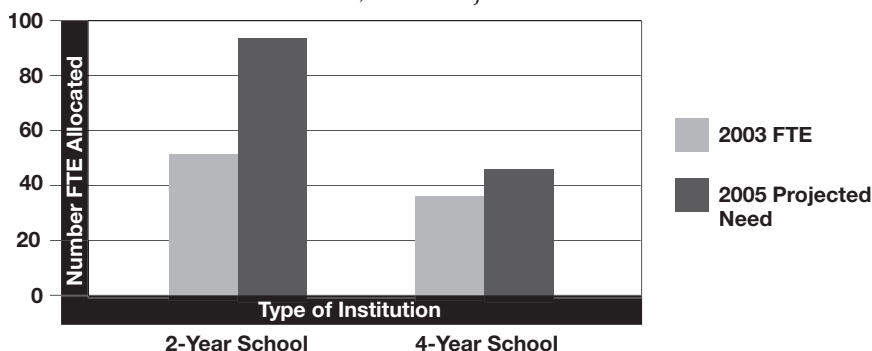
When clinical instructor supply is analyzed by 2003 allocation level and 2005 projected need, the differences between two-year and four-year institutions becomes more pronounced as illustrated in Table 1.

Table 1 – Clinical Instructors by 2-Year and 4-Year Institution: *2003 Allocation versus 2005 Projected Need*

| Year	2-Year Institution	4-Year Institution
2003 FTE Allocation of Clinical Instructors	52 *(9 of 12 reporting)*	35 *(7 of 9 reporting)*
2005 Projected Need for Clinical Instructors	94 *(10 of 12 reporting)*	45 *(6 of 9 reporting)*
Percent Increase above 2003 FTE Level	81%	29%

Similarly, the projected need for clinical instructors is more acute in rural nursing programs compared to urban programs as shown in Table 2.

Table 2 – Clinical Instructors by Urban and Rural Nursing Programs:
2003 Allocation versus 2005 Projected Need

Year	Urban Programs	Rural Programs
2003 FTE Allocation of Clinical Instructors	68 *(9 of 11 reporting)*	19 *(7 of 10 reporting)*
2005 Projected Need for Clinical Instructors	103 *(10 of 11 reporting)*	36 *(6 of 9 reporting)*
Percent Increase above 2003 FTE Level	51%	89%

- The single highest-ranked reason for clinical instructor shortages listed was program expansions (72 percent ranked this as primary), followed by resignations (33 percent). Other reasons cited included addition of new programs and increased enrollments.

- As with academic faculty, reasons cited for resignations of clinical instructors during the 2003 academic year included: accepted other teaching positions, accepted a non-teaching position, workload and/or work environment issues, limited career advancement opportunities and personal reasons.

- Advertising, professional networking and joint appointments were all cited as the most effective methods for recruiting clinical instructor vacancies during the 2003 academic year.

- Barriers to clinical faculty recruitment during the 2003 academic year included: salary levels (88 percent), work scheduling (76 percent) and limited pool of qualified applicants (44 percent).

- When asked about the number of FTE clinical instructors supported through a strategic partnership with a health care facility, such as a Clinical Scholar Program, four-year schools were twice as likely to have such an arrangement in place (21 versus 14 in the two-year schools)

- Difficulties in finding clinical instructors for specific clinical areas were reported and are displayed in Figure 4. Percentages represent only those specialty areas ranked as most difficult to recruit (ranked 1 or 2 on the survey).

Figure 4. Clinical Instructor Specialty:
*Difficulty of Recruitment*

22
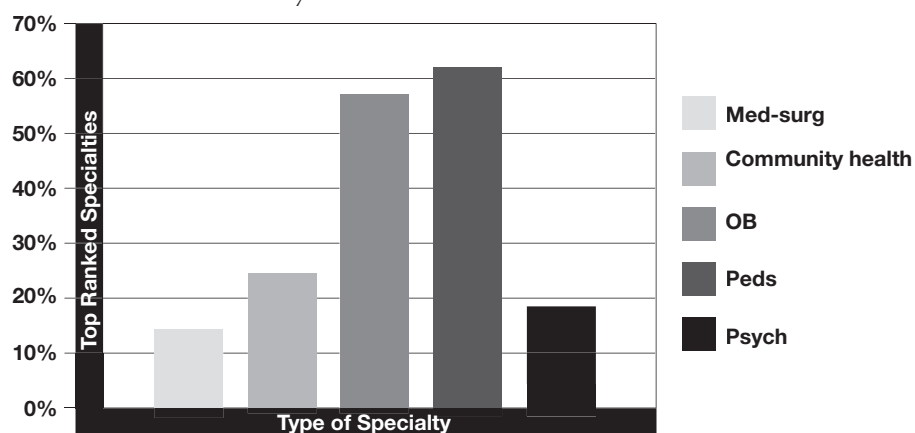
- When asked about level of difficulty in hiring qualified clinical instructors in a timely manner during the 2003 academic year, 62 percent of respondents ranked level of difficulty at 4 or 5 (most difficult=5).

- The average rate of pay for clinical instructors for the 2003 academic year for all nursing programs reporting (n=19) was $24.20/hour. Differences between two-year and four-year institutions were negligible ($24.60 versus $23.42, respectively) whereas the difference between urban and rural hourly rates was more noteworthy ($26.58 versus $21.83, respectively).

Student Enrollment

- As shown in Figure 5, student enrollment in LPN programs was projected to remain relatively flat from the 2003 to the 2004 academic year while projected student enrollment in the ADN, BSN and post-baccalaureate programs was expected to grow more substantively in 2004.

Figure 5. 2003/2004 Student Enrollment by Type of Program
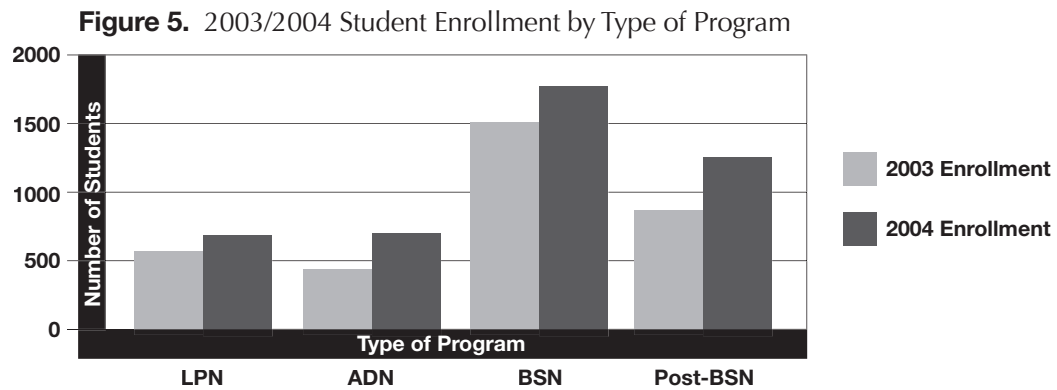
- Of programs reporting,* the largest number of qualified applicants not admitted to nursing programs in 2003 and 2004 was found among BSN candidates (n=1300/1460 respectively). Conversely, LPN and ADN applicants not admitted actually declined during the same time periods. It should be noted that these numbers are very unstable due to the high non-response rate to these questions (see Figure 6).

Figure 6. Qualified Applicants Not Admitted by Type of Program: *2003/2004 Academic Years*
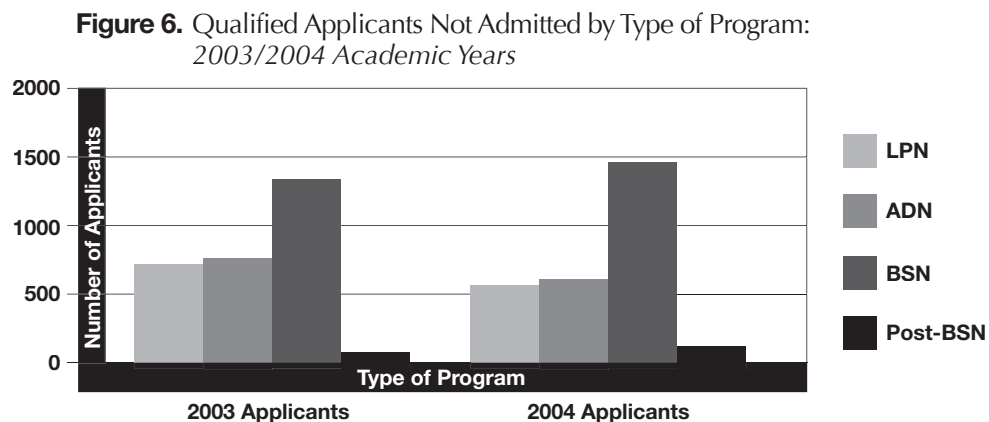
* Only one-third of LPN and ADN programs reported for 2003, while two-thirds reported for 2004. The response rate on this question was higher for the BSN programs: two-thirds for both time periods.

- As illustrated in Figure 7, the largest number of nurse graduates in 2003 was from BSN programs (n=526) followed by LPNs (n=470)
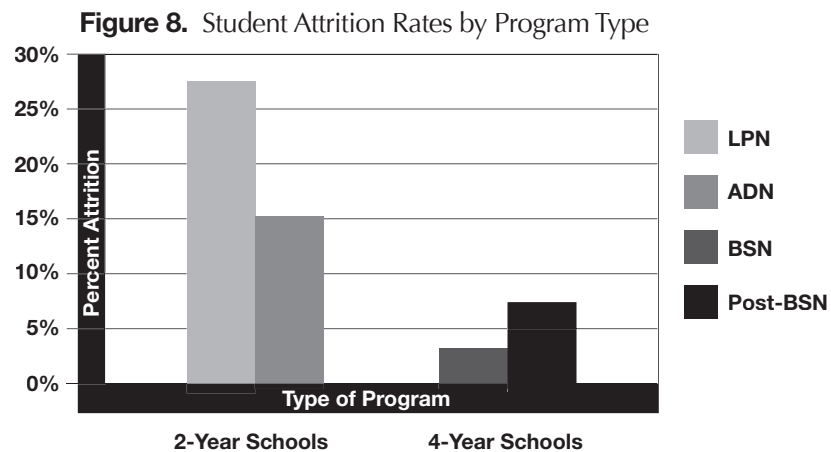
Figure 7. Nurse Graduates: 2003 Academic Year
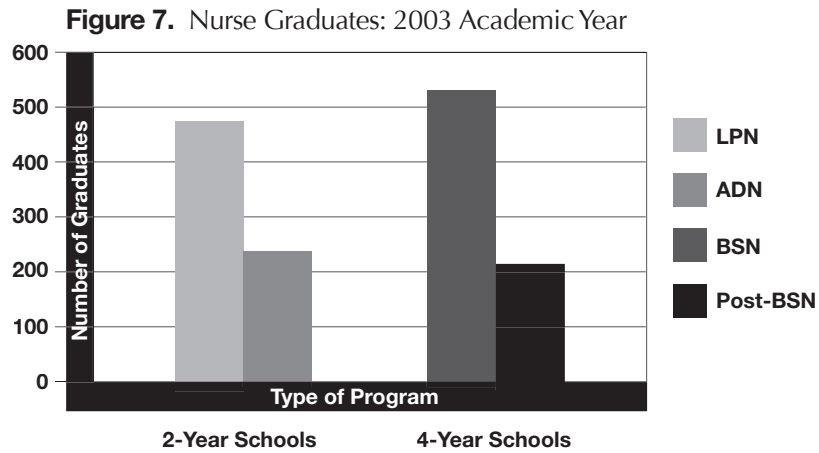
- When asked about 2003 student attrition rates for each type of nursing program, the highest attrition rate reported was among LPN students (27 percent);* while the lowest rate was among BSN students (3 percent).**

Figure 8. Student Attrition Rates by Program Type

As noted in Figure 9, clinical rotations utilized by student nurses tended to differ depending on the program:

- Two-year schools were more likely to utilize facility-based placements (hospitals and nursing homes) and outpatient clinics (90 percent).

- Four-year schools utilized a wider range of non-facility-based placements, including hospice and home health care, and were less likely to utilize institutional long-term care settings (nursing homes) than the two-year schools.

Student attrition was defined as the percentage of students starting but not completing the 2003 academic year.

**Again, non-response on this question was significant: nine of 12 LPN programs responded; six of 12 ADN programs; and five of nine BSN programs.*

Figure 9. Available Clinical Rotations by Type of Program
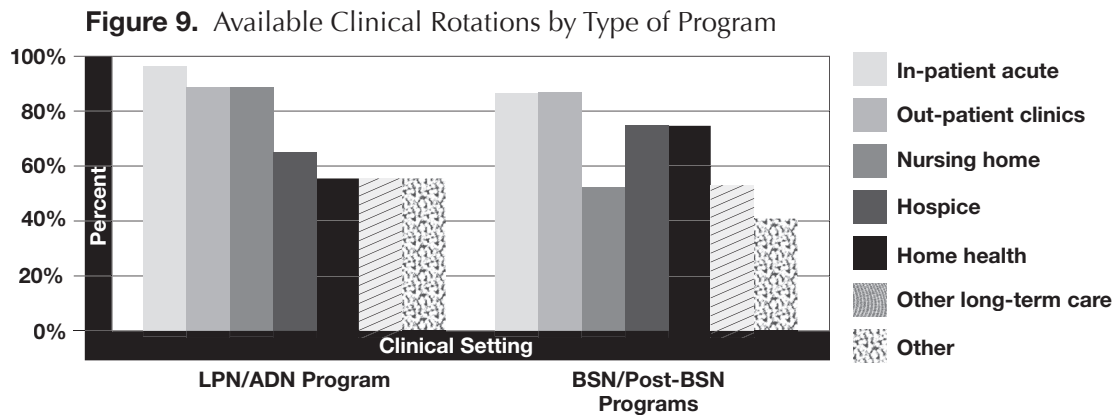
Reported barriers to securing clinical sites included:

- Competition between nursing programs for hospital sites at desired times
- Difficulty finding faculty for evening and weekends
- Overload on patients with students on days and then evenings
- Limits to total number of students an agency/institution will take
- Limited acute care sites that must be shared between nursing programs throughout the state
- Low patient census
- Pediatric, community health and psych rotations very difficult to secure
- Pediatrics, psychiatric and obstetrics were reported to be the most difficult clinical rotations to secure in rural areas.

Finally, as a summation question, nursing school respondents were asked to describe any innovative or new approaches to increasing the number of nursing students and graduates at their institution. A range of strategies were described:

- Using PICTEL LIVE interactive TV to add a campus 40 miles away and increase students by eighteen beginning in 2003
- On-campus clinical scenarios taught in the lab
- Strategic partnership with clinical facilities; expansion of Clinical Scholar model; use of grant funds to expand and upgrade skills lab
- Increased program enrollment in 2003 academic year; working with regional medical center to develop contract for clinical instruction
- Use of evening, nights and weekend clinical rotations; use of sites in smaller communities
- Hospital funded student positions for an accelerated/second degree program
- Offering rotations at low peak periods during the year, e.g. winter and summer intersession
- Industry partner donated $60,000/yr for 3 years to fund a faculty position
- Using mill levy funds to support new nursing program
- Instituted part-time program for those who work full-time
- Clinical simulation lab

- Strong community support financially and as training sites; use of Advisory Board has developed clinical sites and revamped curriculum to be able to increase clinical sites and provide funding for faculty
- Introducing sessions, web pages, advisory, mentoring programs and networking

CLINICAL TRAINING SITE SURVEY: SUMMARY STATISTICS

Online surveys were distributed to 81 acute, rehabilitation, and long-term care facilities in Colorado; 51 were returned for a response rate of 63 percent.

- When asked whether their facility offered a clinical training site for nursing student rotations (defined as LPN, ADN, BSN, and post-baccalaureate) during the 2003 academic year, 88 percent (n=45) responded in the affirmative

Table 3 displays the types of clinical rotations facilities reported offering to nursing students during the 2003 academic year.

Table 3 – Types of Clinical Rotations Offered

Rotation Type	Percent (n)
4-hour	21.6% (n=11)
8-hour	76.5% (n=39)
12-hour	62.7% (n=32)
Day Shift	72.5% (n=37)
Evening Shift	56.9% (n=29)
Night Shift	41.2% (n=21)
Weekends	54.9% (n=28)
Other	7.8% (n=4)

The types of clinical settings available for nursing student clinical rotations as reported by clinical training sites for the 2003 academic year are listed in Table 4.

Table 4 – Training Sites Within Facilities

Settings	Percent (n)
OB/Labor & Delivery	54.9% (n=28)
Medical-Surgical I	72.5% (n=37)
Medical-Surgical II	52.9% (n=27)
Psychiatry	21.6% (n=11)
Pediatrics	35.3% (n=18)
Operating Room (excl. OB)	49% (n=25)
Emergency Department (excl. OB)	60.8% (n=31)
Hospice	9.8% (n=5)
Other*	51% (n=26)

*The "Other" category included: long-term care (e.g., skilled nursing facility, home health care, assisted living, Alzheimer's Unit), rehabilitation facility, critical care, ICU and geriatric care.

The types of nursing programs affiliated with respondent facilities offering clinical rotations during the 2003 academic year are displayed in Figure 10.

Figure 10. Affiliated Nursing Programs for Clinical Rotations
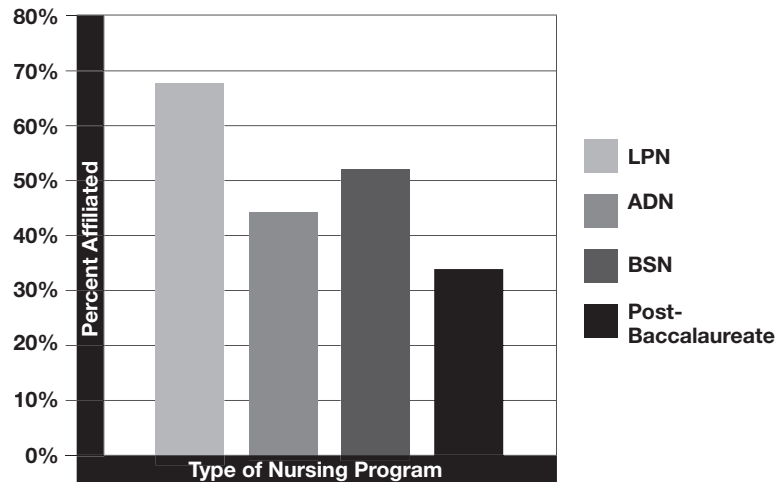
- Reporting facilities noted that they provided clinical rotations, on average, to 4.5 programs during the 2003 academic year. The range was from a low of one program to a high of 17 programs per facility.

- The average number of nursing students (all categories) that utilized responding facilities for clinical rotations during the 2003 academic year was 168 students per facility; the range was a low of one student to a high of 852 students.

- Of the responding facilities, 55 percent (n=28) reported that they had the capacity to accept additional nursing students during the 2004 academic year. A variety of comments regarding student expansions were offered including: some facilities did not previously have students but were interested in offering clinical training with the caveat that student shifts would need to fit into clinical staff availability; would like to serve as a clinical placement but no students are interested; offering non-traditional shift opportunities.

The types of support for nurse education provided by responding facilities during the 2003 academic year is displayed in Figure 11.

Figure 11. Clinical Training Site Support
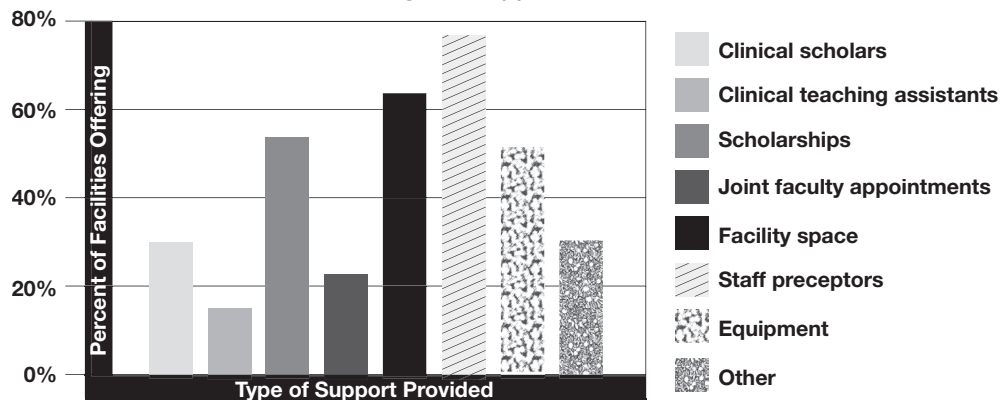
- The "Other" category included: nurse preceptor for students; tuition reimbursement; observational experiences in other departments; clinical nurse educators provide additional learning experiences (lectures, hands-on classes, etc.); nursing clinical rotations and preceptorships; orienting students to our computer systems; Clinical Scholar Program in development based on grant received; and staff guest lecturers and Lamplighters Mentor Program

- The average cost to facilities of providing all sources of support during the 2003 academic year was $140,693. When viewed in the aggregate, responding facilities reported spending $4.362 million dollars to support the clinical education of nurses. The range was a low of $1,000 to a high of $773,000 per facility for nurse training-related expenses.

The types of training offered to facility staff to serve as clinical preceptors are displayed in Figure 12.

Figure 12. Types of Preceptor Training
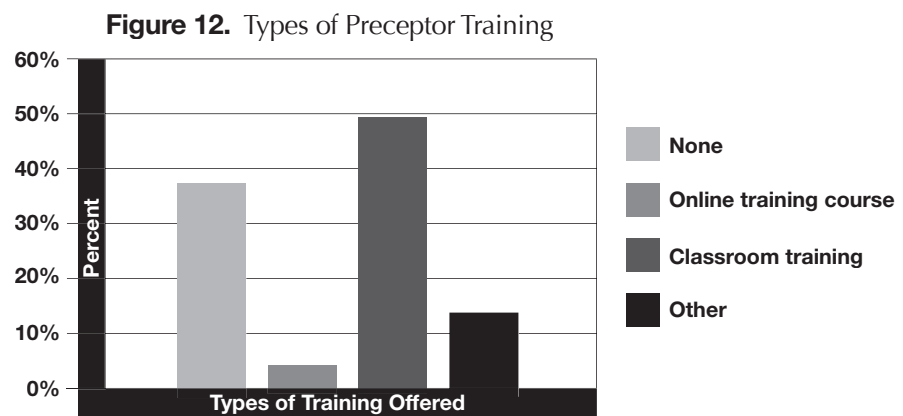
- Training modalities reported in the "Other" category included: one-on-one mentoring; a Preceptor Training Class; outsourcing training to one of current school partners; reading material related to precepting students; eight hours of classroom instruction to become eligible for wage differential, then eight hours continuing education annually; and an 8-hour course in Preceptor Skill Building.

- When asked what percentage of nurses at the facility were engaged in clinical teaching (e.g., Clinical Scholars) during the 2003 academic year, of the 11 facilities that responded an average of three percent noted that their nursing workforce was so engaged.

When asked how clinical teaching assistants (CTAs) were reimbursed during the time they functioned as CTAs in the 2003 academic year, the following numbers were reported.

Figure 13. Reimbursement Strategies for Clinical Instructors
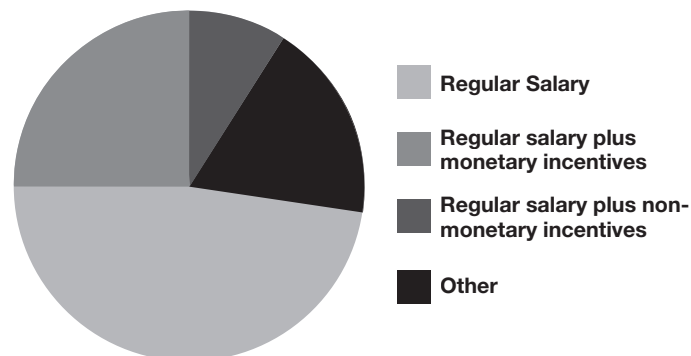
- Strategies mentioned in the "Other" category included: a free workshop for the CTAs provided by the school; college pays some staff for time instructing students; the facility pays the difference between the school and their hospital wage; and RN donated time.

The following factors were ranked in terms of their importance to facilities in allocating clinical rotation sites among competing nursing programs (1 = most important).

Settings	Average Rank	Rank Based on Average
Historical relationship with nursing program	1.38	1
Type of nursing program	1.55	2
Other	2.20	3
Cost	2.76	4

The following reasons were provided for the "Other" category:

- The quality of students and their academic preparation
- Instructor support
- Potential for hiring of students after graduation
- Quality of nursing instructors provided by school
- Schools with whom we provide Clinical Scholars

Sixty-one percent of facilities reported being currently engaged in collaborative efforts with nursing programs to increase nursing program enrollments. Of these collaborative activities, the following were noted:

- Scholarships to support students
- Funding support for instructor positions
- CNO serves on school committees for program development; hospital staff participate as guest speakers at schools
- Collaborations with nursing programs and other facilities in the area to provide the best education for our students
- Paying clinical lab instructors who are then reimbursed by the junior college
- HCA and Department of Labor grant program
- Worksite option program with the university
- Accelerated RN program
- The hospital provides money for a 2nd degree program with nursing school
- Providing stipends to clinical faculty
- Worksite options for employees on campus; some are partially or fully funded with grant dollars, programs for CNA, LPN and LPN IV certification
- Collaborative relationship with school to increase class size; monetary donation in 2001 that provided purchase of additional training equipment and re-model of space for clinical lab

- Providing tuition assistance and scholarships to employees so they can attend nursing degree programs
- Partnership with school to provide clinical rotations and extern program
- RN refresher program funded through Arapahoe-Douglas Works
- Colorado AHEC online RN refresher course
- Serve as a research site
- Clinical Scholars Program built through partnership
- On-going partnership to offer on-site education, the Alliance for Clinical Education
- Nurse Extern Program; Nurse Scholar Program and scholarships; staff teaching content at local schools of nursing; faculty orientation program; staff satisfaction survey
- Currently working under a Health Care Consortium grant to provide career assessment, skills enhancement, CNA training, and LPT training to incumbent workers
- Mentoring program with the Community College
- Providing a rotation in administrative nursing for senior BSN candidates
- Increased yearly enrollment through accelerated RN program, financially supported by institution
- Salary of five faculty paid by institution which allows for increased enrollment by about 60 students per year

When asked to rate the level of effectiveness of these collaborative efforts, the average reported was 4.1 on a scale where 5 = very effective.

Facilities were asked to describe barriers they experienced in developing effective collaborative relationships with nursing programs.

- Belief that many nursing students are not prepared to begin work when they have completed their ADN program; due, in part, to their clinical instructors, and in part to the limited amount of time students spend in clinical rotations
- Availability of enough patients for the number of students as it is a small rural facility
- Logistics such as classroom space and equipment
- The school of nursing has experienced a faculty turnover and has had difficulty recruiting qualified faculty for clinical rotations
- Invoicing issues – since some of these programs were funded with grant money (workforce development), the instructors were not always compliant in providing the information needed to meet funding requirements
- As a facility licensed for 30 beds, when our census drops, it is very difficult to provide the students with a good experience
- Distance to training programs
- Time and scheduling are barriers to bringing groups together
- Nursing programs sometimes don't seem to want any help with faculty development
- Overt competition between nursing programs
- Identifying clinical faculty in a timely manner as they are hired at last minute based on numbers of enrolled students; scheduling for nine schools is a logistical nightmare
- We don't always agree with teaching philosophies and methodologies

Forty-seven percent of facilities reported adopting some innovative practices to increase their capacity to place nursing students for clinical rotations. Innovations included:

- Evening and weekend rotations

- Utilizing ALL clinical areas in the facility

- Use of simulation in the laboratory setting

- Use of the Clinical Scholar model for all student placements

- Variable shifts, special locations for special experiences, partnering 1-2 students with one preceptor when appropriate

- Alternate rotations, preceptor/faculty model

- 12-hour shifts to increase frequency of rotations (shorter, but more concentrated)

- Increased numbers by having all six students on one unit, thereby opening another unit for six more students

- Staff nurses with advanced degrees utilized as Clinical Scholars with release time paid

- Applied for grant to implement computerized critical thinking tools; a collaborative effort to prepare students and new graduates to maximize the learning environment

When asked how many new nursing graduates the facility hired during the 2003 academic year, the average number of new hires across facilities was 17 nurses, with a low of one graduate to a high of 98 new graduate hires in 2003.

The average length of time for orientation of new nursing graduate hires during the 2003 academic year varied, although the majority of respondents noted 9-12 weeks (40.9 percent); followed by 4-8 weeks (31.8 percent) and greater than 12 weeks (20.5 percent); only seven percent of facilities reported three weeks or less.

OBSERVATIONS FROM KEY INFORMANTS

A total of 24 interviews were held with nursing leaders from various regions in the state representing both nurse education programs of different types and clinical facilities that contribute to nurse education and hire new graduates.

Nurse educators corroborated survey findings regarding current and projected faculty and clinical instructor vacancies and offered a range of insights regarding the factors affecting faculty supply and demand. Clinical training site informants offered insights regarding the impact of faculty shortages, especially related to the clinical competency of new nurses and how it may affect the quality of health care provided. They further commented on the extent to which clinical training sites are called upon to support the nurse education process. All informants noted that there is growing collaboration between nursing education and clinical practice sites and a growing number of promising practices underway.

In the face of what is perceived to be a growing shortage of nurses, training site informants stressed the need for adequate and well-managed resources; sustainability; strategic alignment of nurse education and clinical training site interests; the involvement of policy makers and the business community; and the need for ongoing monitoring and assessment of the adequacy of Colorado's nursing workforce over time.

Factors Influencing Faculty Supply and Demand

In their comments, nurse educators discussed how the nature of the shortage depended on the characteristics of specific nursing programs and the nature of the relationships that existed between clinical training sites and educational institutions. Distinguishing features included whether the nursing program primarily prepares students for clinical practice (ADN, BSN and Accelerated BSN) or a faculty position and/or a research role (MSN and PhD); the age of the educational program; the geographic location of the school; and the availability of funding, particularly state versus private funds.

Program expansions

Nursing program informants reported experiencing significant pressure to expand student enrollments and graduation levels in response to the increased demand for nurses. Rapid expansions in program size and types have occurred within the last few years including the addition of accelerated BSN and LPN programs, and increased class size within existing ADN and BSN programs. Informants report program enrollment expansions ranging from 30 to 100 percent. As the survey findings indicate, informants report that rapid program expansions have exacerbated faculty and clinical instructor shortages by creating additional demands on faculty and thereby contributing to faculty attrition. According to informants:

- Faculty and clinical instructor workload have increased without a concomitant increase in pay or benefits.

- Philosophical differences about faculty teaching methods and expectations were exacerbated by the demands of teaching concentrated curricula to highly qualified but non-traditional students within accelerated BSN programs.

- Especially in rural areas of Colorado, the pool of qualified faculty and clinical instructors (at recommended qualification levels) is small-to-nonexistent, further compromising the ability to fill additional faculty and clinical instructor positions.

- Four-year BSN programs and graduate degree programs have significant concern about impending faculty attrition due to retirements at the same time that programs are being expanded.

- Within the community college system, and in rural and non-Denver metro areas, many informants report challenges in finding adequate numbers of qualified clinical faculty, especially in specialty areas of practice such as obstetrics and pediatrics. Schools have been forced to compromise the level of education required for clinical faculty (e.g., using non-masters-prepared clinical faculty for teaching of ADN and BSN students).

Effects of the nationwide nursing faculty shortage

Program informants identified the national nurse faculty shortage as a compounding factor that affects recruitment and retention of qualified nursing faculty within Colorado.

- Four-year BSN and graduate level programs report being especially vulnerable to recruitment efforts by out-of-state schools offering more attractive incentives.

- Informants report that recruitment is generally more time- and labor- intensive due to the nature of the applicant pool (smaller number of well-qualified applicants) and the continued need to recruit faculty due to the current and projected shortage. Some informants report timeframes ranging from six weeks to seven months to fill a faculty position.

Resource constraints and non-competitive work environment

Nursing program informants offered numerous examples of how current state budget constraints and funding for higher education are affecting the ability of schools to fund and recruit adequate numbers of faculty and clinical instructor positions. Issues identified include working conditions, wages, benefits and lack of higher education infrastructure (e.g., classroom space, facilities).

- In state-supported schools, new faculty positions cannot be added to accommodate increased student enrollments.

- State-funded nursing programs offering graduate degrees and preparing new faculty have had positions eliminated by budget cuts.

- Well-funded and respected nurse faculty researchers have been recruited away to other faculties with better salaries, benefits and working conditions.

- Colorado ranks at the "rock bottom" in the amount of money spent per student for higher education.

- The prevailing faculty shortage and increased enrollments mean that many faculty work long hours including nights and weekends. Academic faculty in four-year institutions tends to have somewhat less intensive work schedules.

- Some informants report that while they have been able to expand programs with adequate faculty, classroom space and clinical sites are inadequate.

Informants emphasized that significant wage gaps exist between nurse faculty and nurses in clinical practice, creating a major barrier to faculty and clinical instructor recruitment and retention. Specifically, faculty compensation ranges from one-third to two times lower than what nurses earn in clinical practice.

- Salary and benefits are even more non-competitive considering the high cost of living.

- "I've brought people in, I've done national searches, and people just won't work for the salaries we are paying. People interested in a position think that they can negotiate their salary, but this is not possible because of the state (budget)."

- Clinical instructors are paid an hourly rate that does not include benefits or time spent completing administrative responsibilities. They can earn much more in clinical settings.

- "A full-time faculty salary range can be between $30 -$37,000 for 9 months… a part-time clinical instructor is paid $25/hour, whereas a hospital pays $35-45/hour for an ICU nurse. "

- "In the past three years, three of our faculty left to go to institutions that more than doubled their salary and offered unique benefit packages that included substantial funding for research and other types of assistance, we cannot begin to offer that."

- There is high turnover mostly driven by salary and the cumbersome payment process for part-time people. The turnover cycle for FT faculty is every two years, and for PT faculty it is every year.

Barriers to obtaining post-baccalaureate degrees

Informants reported that nurses who may be interested in teaching encounter barriers to obtaining their graduate nursing degree. These barriers include:

- Obtaining a graduate degree requires finding the time and resources to pay for the degree while continuing to work full-time.

- "Hospitals differentiate on years of experience but not on education level, e.g. an ADN nurse with 10 years of experience makes the same as a MSN level nurse with 10 years experience."

- Schools are not aggressive enough in the recruitment of PhD candidates.

- Nurse training funds primarily support Master level nurse preparation as opposed to PhD education.

Infrastructure and resources for clinical education

Informants offered diverse perspectives regarding the adequacy of clinical training and availability of clinical rotation slots. Some schools reported minimal problems finding clinical placements due to historic relationships with facilities. Other informants noted significant challenges in attracting and keeping qualified clinical instructors and challenges in coordinating a sufficient number of clinical rotations for students. Specific issues include:

- There are not enough placements for student demand.

- Collaborative relationships exist, but not in enough places. Many schools are competing for clinical slots in the same facilities, which leads to burnout of the clinical facility that precept students. A coordinated system for clinical placement is needed.

- The opening of new hospitals decreased census in existing facilities in the Denver Metro area. This has affected the number and quality of student placements, i.e., fewer patients, less experience.

- Some facilities cancel placements after rotations are scheduled.

- Rural training sites are difficult to secure, particularly in specialty areas such as obstetrics, pediatrics, mental health, and community health.

- There are waiting lists for people wanting to go into nursing. Some programs must admit students provisionally until there is clinical space.

- Programs are continuously "scrambling" to find clinical rotations: "It is one of the most stressful parts of our job each semester;" "It's getting worse because everyone is trying to increase capacity."

Impacts of Faculty Shortages Identified

According to informants, faculty shortages preclude the state from taking full advantage of the current resurgence of interest in nursing careers. Reported impacts of faculty shortages fall into several categories.

Inhibits nursing program expansions and increased numbers of new graduates

While most informants report recent program expansions, perspectives vary as to whether further program expansion is possible.

- As reported among survey respondents, significant numbers of qualified applicants are being turned away from nursing programs.

- A sense of urgency was reported about whether nursing programs will continue to be able to respond to the growing interest in nursing.

- Program expansions create pressure on the physical learning environment, including lack of adequate classroom space.

Compromised quality of educational outcomes

Informants emphasized the importance of focusing on the quality – not just the quantity – of the expanding nurse workforce and the need to make sufficient investments in nurse education. This includes the need to better screen nursing school candidates to reduce student attrition and thus ensure a more competent workforce. Other comments include:

- The recent and rapid expansion of nursing programs has resulted in increased faculty-to-student ratios. Quality clinical education requires relatively low student-to-instructor ratios; problems occur with too large or too small a ratio, which unnecessarily increases program costs.

- It was noted that there is inadequate clinical experience in nursing school curriculum due to previously enacted regulations that reduced the number of clinical hours required for graduation. The Colorado State Board now requires only 740 hours of direct clinical practice, one of the lowest in the nation.

- Programs have both waiting lists and high attrition rates, pointing to the need for re-visiting nursing school entrance requirements.

- Lack of qualified faculty leads to uneven curriculum standards within and between programs as schools attempt to spread faculty reach over a larger number of students.

- A Colorado response to the nursing shortage has resulted in reducing the number of hours required to graduate. Many respondents felt that this has compromised the overall quality of nurse education programs.

- Strengthening the preparedness of students applying to nursing programs, including ensuring the completion of pre-requisites before an applicant is placed on the wait list for a program.

Reliance on external resources

Nursing program informants relate that they are relying on external sources of funding to extend their ability to recruit and retain faculty, provide sufficient clinical education placements for students, and purchase teaching tools like simulation technology.

- Clinical facilities are making significant contributions to nurse education in ways that vary based on location and the cooperative relationships with schools that have developed over time.

- Informants from public educational institutions, especially community colleges, emphasize that due to budget constraints they can only augment programs and faculty through resources provided by clinical facilities and non-state grants.

- Positions being funded by outside sources tend to be Master's rather than PhD level.

- One school has added a PhD and second degree program with shared funding from two institutions, student cost-sharing, and a two-year post-graduation work commitment.

Promising Practices in Faculty Recruitment and Retention

Informants cited several strategies that appear to be producing positive results in faculty recruitment and retention.

Use of non-traditional faculty

- Use of BSN graduates in clinical settings
- "Grow your own" MSN faculty
- Use of one-year term appointments of MSN-prepared nurses

Collaborative investments to offset salaries and strengthen clinical education

- Use of Clinical Scholars and Clinical Teaching Assistants
- Joint appointments between a school and a health care facility
- Tuition support programs
- Creating more supportive work environments
- Mentoring programs for new clinical faculty
- Exposure to the nurse educator role beginning during senior rotations

Promising Innovations in Clinical Education

Some informants cautioned that expansion programs are new and it is too early to predict outcomes. However, a range of promising practices were noted:

- Computer simulation to augment but not replace direct clinical practice experience
- Greater flexibility in clinical rotations
- Use of Clinical Scholars

Effectiveness of Collaboration

Nursing program informants generally felt positive about the extent to which education and clinical training sites collaborate to address nursing shortage issues, but acknowledged that this collaboration could be further strengthened. They emphasize that building and maintaining relationships between hospitals and schools must be ongoing and based on achieving mutual interests, i.e. "what can we do for each other?" Examples of collaborative efforts between schools and clinical training sites included:

- Responding to practice realities by changing class and clinical time schedules to accommodate hospital schedules
- Improving the coordination of clinical rotations between schools and facilities through organized efforts such as the Colorado Council of Nurse education and ACE
- Involving clinical sites and workforce centers in advisory roles to schools of nursing
- Making funding investments between one or more facilities and a school to add faculty positions such as a Clinical Scholar position

Nursing Program Expansions

Informant perspectives were mixed regarding their interest and ability to further expand nurse education programs and numbers of graduates. Some reported continuing efforts to expand capacity; others noted that they have expanded as far as possible for the foreseeable future, having exhausted available resources. Barriers created by Colorado's higher education system were reported, particularly in trying to recruit out-of-state faculty.

Clinical Training Site Perspectives

Clinical site informants noted playing a critical role in supporting nurse education as well as making substantial contributions to the quality and supply of nurse graduates. Facilities emphasized that the lack of clinical readiness among new graduates is one of their major concerns. This results in a high rate of turnover among nurses and requires considerable investments by facilities to provide needed clinical training to newly graduated nurses.

Clinical site informants reported many positive aspects of providing clinical rotations and the fact that they work with multiple schools to provide clinical training opportunities.

Quality concerns about clinical instructor preparation

Concerns about the quality of clinical instruction were noted, including that support for clinical faculty is minimal, clinical faculty lack familiarity with clinical sites' policies and procedures and the high turnover of clinical faculty.

- Perception that clinical faculty lack clinical knowledge and expertise, that skills have "lapsed"
- Students often teach students
- Students entering clinical rotations lack basic assessment skills
- Clinical faculty facilitate rather than teach
- Student-to-instructor ratios are too high
- Not enough clinical hours for students

Gaps in the clinical competence in new graduates

Clinical site informants emphasized that the current health care system relies much more heavily on medical technology, documentation and care planning. Clinical competence among nurses includes technical skills, critical thinking and strong interpersonal skills. A nurse must be able to manage a caseload in a fast-paced environment and function effectively as part of an interdisciplinary team. Facilities raise several concerns about the deficits they experience in new graduates that must be addressed before an individual can assume an independent role within the clinical setting: Nurses must be able to problem-solve, delegate and prioritize; lacking these abilities leads to "failure to rescue." There is a gap in professionalism where new nurses focus on tasks as opposed to managing the "whole" patient.

Barriers to expanding clinical training opportunities

Many clinical site informants reported that they are at or near capacity in terms of clinical training slots. Several factors contribute to further expansion:

- A significant number of staff already serve as preceptors
- Schools need to provide more instructors – one facility could add 25 percent more students if it had qualified clinical instructors
- Facilities are already bearing the costs of re-educating new graduates because of what they see as the education/practice gap
- Attempts to implement programs such as the Clinical Scholar are difficult in certain locations when there are insufficient nurses with teaching experience and MSN degrees
- Census variations affect the quality of clinical experiences and demands on facility staff

Strategies for improving the clinical training of nurses

Informants acknowledged that educational programs are striving to work more closely with them and that collaborative strategies hold promise for streamlining the process of clinical education. Many facilities are interested in expanding their capacity to provide clinical rotations. They offer suggestions for improvements within both facilities and educational institutions that can enhance clinical education and mitigate the gap between education and practice. Promising methods to augment clinical training within facilities include:

- Use of simulation technology
- Clinical instructor bridge program where a clinical instructor acts as a preceptor for the first 1-2 months of orientation, post licensure exam
- Flexible scheduling of rotations, including night and alternative shifts
- Formal tracking systems to monitor rotations

Informants also offered suggestions for educational improvements that would strengthen a graduate's readiness for clinical practice. These include:

- Increasing the number of clinical hours required as part of nurse education
- Offer more coursework on "how to teach" during nurse education programs
- Encouraging associate degree RNs to obtain BSN and MSN degrees
- Beginning specialty training earlier in the education process
- Customizing learning experiences to align with individual student's needs.

Managing competing demands for clinical education

Clinical site informants report that they are increasing called upon to provide resources for multiple educational institutions. In order to accommodate numerous students and schools, students are often required to be very flexible in hours and locations of rotations. Like educators, they see the formalizing of collaborative processes to coordinate rotations (through efforts like Alliance for Clinical Educators) to have produced positive results. Facilities emphasized that their choices about affiliations with particular schools relate to: synergistic opportunities for the facility; the potential for recruitment of new graduate nurses for their workforce; and service to the local community.

Promising strategies for funding clinical education

Facilities acknowledge that they are, many believe unfairly, shouldering the financial responsibility for clinical education. This includes student education, as well as orientation costs for new graduates who are considered to be largely unprepared to assume independent roles immediately post-graduation. Promising practices reported by facilities include: paying for faculty positions; providing students' tuition; providing for on-site BSN completion; and offering loan forgiveness programs.

Other investments targeted at the work environment included:

- Promoting the socialization process through Clinical Scholar programs
- Residency programs
- Promoting safe culture and environment
- Using simulation technology

VI. SUMMARY AND CONCLUSIONS

On its face, the Study points to the need for additional resources to support the nursing education infrastructure. However, the Study's findings affirm that contributing factors and promising strategies to address the current faculty shortage are complex and multifaceted, including both economic and non-economic factors. Achieving the needed outputs of the education system – an adequate supply of clinically competent nurse graduates capable of critical thinking and applying knowledge and technical skills in a fast-paced environment – will require a purposeful redesign of the educational system and prudent use of existing and new resources.

Optimizing the cost-effectiveness of Colorado's nurse education system demands that new approaches, beyond those traditionally used, be tested within nursing education programs and the clinical training sites with which they form strategic and educational partnerships. When compared to other states, Colorado has already actively pursued many promising strategies to strengthen faculty recruitment and retention and therefore has laid a firm foundation of collaborative relationships between nursing education and clinical institutions.

Key Themes

Five themes emerged from the data assembled for the Study that merit mention. We provide these themes to set the context and substance for moving policy and practice forward.

(1) The Relationship Between Quality and Capacity

Given the current nursing shortage, an understandable focus of nurse educators, program administrators, policy makers and the health care industry has been to produce more nurse graduates. The Study findings illustrate some of the unintended effects of recent and rapid program expansions in Colorado, revealing the dynamic tension between quality and capacity.

After a period of rapid expansion in the numbers and types of programs and student enrollments within nursing programs, concern is growing over the quality of nursing education across the continuum of programs. The areas of concern include a lack of or incomplete pre-nursing science and math foundation courses completed by students at entry into community college nursing programs, including core academic prerequisites of new students; the curriculum content of the undergraduate and graduate nursing programs; the quality of learning at all levels of nurse education; and the clinical competencies of new graduates, including their ability to engage in independent clinical practice. Informants argued for the need to rebalance educational priorities on the overall quality of the educational experience, as opposed to simply focusing on the increased production of nurses, while acknowledging the delicate balance between quantity and quality in the context of nurse supply shortages.

This report of findings discusses the relationship between quality and capacity with reference to nursing education. The primary data collected from surveys and key informants suggests that further efforts can and are being taken to better target student recruitment so as to ensure readiness for professional nursing practice, and that improvements are being made to strengthen nursing school curricula, both in clinical and didactic educational requirements. In combination, these improvements will serve to support students and enrich the teaching experience of existing faculty and new faculty recruits. Several examples illustrate this point.

- Until quite recently, program admission policies within the community college system were admitting students unprepared in the health sciences; this contributed to high rates of program attrition and low rates of graduation. Unevenly prepared students affect both the classroom and clinical experiences of all students and make it all the more difficult for faculty to teach.

- Nursing programs that have been unable to recruit and retain graduate prepared faculty often must hire faculty who are "provisionally" prepared, that is, faculty who are engaged in graduate study while involved in teaching activities.

- Clinical training sites have argued for the need for better prepared clinical instructors, noting high turnover and inconsistent clinical competencies of clinical instructors. Conversely, nursing programs report their inability to recruit clinical nurse faculty because of current work conditions and low compensation levels.

- Nursing programs vary in the scope and quality of educational curriculum offered. One measurement of this variability is the NCLEX pass rates among graduates of the state's various nursing programs.

(2) Key Barriers to Recruiting and Retaining Faculty

Priority areas identified to address both economic and non-economic barriers to faculty recruitment and retention include identifying ways to make it financially feasible and professionally attractive to serve in a faculty role, and implementing new models to cultivate and support nurses in the faculty role.

The inability to be competitive with clinical nurse salaries and the salaries offered by nursing schools in other states were the most frequently cited barriers to nurse faculty recruitment and retention. The stressful work environment created by the rapid diffusion of new programs and increased numbers of students compounds the problem. The Study identified a particularly promising approach to strengthening the supply of clinical faculty where the greatest immediate shortages are being felt, the Clinical Scholar, which is currently being implemented in certain areas of Colorado. This collaborative cost-sharing model between schools and training sites provides increased compensation and elevates the clinical faculty role. Diffusion of this model is a high priority in the state among its nursing programs especially in rural areas.

A range of new clinical simulation technologies is also available and gradually being implemented in nursing programs and clinical training sites. In Colorado, a growing number of programs are purchasing technology-based teaching tools; however, at the current time, these tools are not well-integrated into existing curricula, and faculty need to be supported in their use. The traditional culture of nursing education is being continually challenged as nurse educators pursue these innovative efforts to revitalize the faculty role.

Graduate-level nurse education programs preparing master's- and doctorate-level nurse faculty must be supported. Currently, Colorado has five universities that prepare graduate level nurses. At issue is how best to expand access to graduate degrees for nurses throughout the state. Distance learning and cooperative agreements between levels and types of nursing programs are options currently being tested. Streamlining graduate-level nursing curriculum and program entrance and graduation requirements are strategies successfully being used in other states and are worthy of further investigation by Colorado's nurse education programs.

Encouraging existing master's-prepared faculty to continue their education through various incentive programs is also a strategy to be explored; however, financial barriers to PhD study must be part of the equation. Unlike other states, Colorado has limited graduate tuition support programs within its public education institutions. Financial aid through federal grants and public and private scholarships is often tied to full-time study, making it difficult for practicing nurses to compete for these funds. Full-time graduate study also removes a nurse from the practice setting, compounding the workforce shortage.

(3) System Redesign

Colorado's nursing education infrastructure is largely publicly-funded and relies heavily on the community college system. Recent pressures to respond to the workforce shortage have generated rapid program growth among nursing schools, resulting in a proliferation of innovative approaches, many untested, to increase enrollments. These efforts include creatively filling faculty positions; adding new types of programs, e.g. accelerated programs; adding career and education ladders such as a new LPN program where an ADN program already existed or an ADN program where a BSN program existed. These efforts are designed to put professional nurses in the workplace as soon as possible, while also enabling them to continue an educational path to a higher degree. The study shows that these expansions have strained existing resources, both human and physical, and contributed to the faculty shortage.

Informants convey a strong message of needing to "catch their breath" and stabilize the system. Yet faculty needs, concerns about quality, continued pressures to expand the workforce and state fiscal constraints are ongoing. The opportunity and challenge now appears to center on balancing these local efforts with a more systematic effort to stabilize and enhance nursing education with a state-wide system-level focus. Balancing healthy competition between programs with uniform standards is now at issue. The community college system offers a case in point. Within the system, schools vary widely in their resource capacity, curriculum and overall performance as measured by the NCLEX pass rate of new graduates. Efforts to obtain NLN accreditation as a system will require a new level of standardization across the schools in the system. While challenging the boundaries of program autonomy, it offers the opportunity to build on the strengths of high-performing schools and set the quality bar at an optimum level for all schools in the system to achieve.

There are other opportunities to achieve greater efficiency within clinical training sites that have the potential to expand and strengthen clinical education. Despite the considerable resources already committed by private industry, there are additional non-traditional opportunities to expand the range of clinical rotations that have been reported by key informants and are worthy of replication.

(4) Aligning State Policy in Support of the Quality-Capacity Equation

The professional standards of nursing education and practice, similar to other health professions, are codified in state statute, regulation and licensure. Policy decisions regarding education requirements and budget resources for certain aspects of nursing education are under the auspices of the Colorado Commission on Higher Education, while others lie with the Department of Regulatory Agencies. In addition, the profession itself maintains accountability standards for the practice of nursing and provides leadership in maintaining these standards through mechanisms such as accreditation. Colorado's State Board of Nursing enacts rules that reflect state statutes and policies, while also incorporating national standards for professional nurse practice, patient safety and nurse education standards. The current rules are the result of an historic approach to policy

and regulatory oversight that encourages flexibility and responsiveness to market conditions while ensuring consumer protections.

Informants cite the challenges associated with producing more nurses to mitigate workforce shortages while also ensuring that nurses are adequately prepared to meet the demands of current clinical practice environments. They point to the role of a strong and balanced policy and regulatory framework that can align competing interests and support system improvements. As nursing workforce shortages have worsened, state regulatory requirements related to nurse education standards, including the number of clinical hours spent in direct patient care, faculty preparation requirements, oversight of program performance and curriculum content are critically important. The effective interplay of authorities with responsibility for nursing education and practice is essential to strengthen nursing education and its outputs.

The current state budget crisis is an important backdrop framing all efforts to address the nurse faculty shortage. Questions regarding what should be a baseline level of public investment in nursing education abound. The findings from this study suggest that considerable health industry resources and public and private grant funds have been deployed to fill current resource gaps. These funding sources are short-term with limited sustainability, and this cost-shifting approach may be adding to the overall costs of delivering health care in Colorado.

(5) Investing in Data, Monitoring and Educational Research

This Study has identified the need for reliable, longitudinal data to monitor efforts at improving the faculty supply equation. Routine collection of uniform nurse workforce data would enable nurse educators, the health care industry and policy makers to understand the nature and degree of the nurse workforce shortage, to make strategic policy and resource decisions, to avoid unintended consequences of untested approaches and to wisely shepherd finite resources.

At the present time this data collection capacity does not exist. This study was the first step in such an effort. The data limitations of the survey have been discussed elsewhere, but a first step is a necessary step and further refinement and agreement of the core data elements to be tracked will lead to more informed decision-making. The Colorado Nursing Faculty Supply and Demand Study provides a solid stepping-off point in this journey.

GLOSSARY OF TERMS

Faculty – Individuals meeting the requirements established by the governing body of an educational institution and designated as having on-going responsibility for curriculum development, planning, teaching, guiding, monitoring and evaluating learning in the classroom and practice settings. For nursing programs, faculty requirements are established by the Colorado Commission on Higher Education and the Colorado State Board of Nursing. Additionally, individual schools, colleges and universities may set their own additional requirements for faculty.

Joint appointment – A nurse faculty member who is employed by a school of nursing and a health care facility. Teaching responsibilities include clinical teaching assignments and academic committee work, student advising and other responsibilities as designated. Joint appointment faculty must meet the same criteria for rank as regular full-time faculty.

Classroom instructor/lecturer - A clinical nurse who teaches on a course-specific, part-time basis.

Clinical instructor – A licensed nurse who supervises nursing students during their clinical rotation and is responsible for the overall coordination of the clinical experience and evaluation of students. Typically, the student/instructor ratio is one clinical instructor for every 6-8 students. Students practice under the license of the clinical instructor. Clinical instructors are usually part-time, hourly employees with no additional duties at the training site.

Clinical preceptor - A licensed nurse employed by a clinical training site who assumes joint teaching responsibility with an academic faculty member when a clinical instructor is not available on site. Preceptors are designated by the clinical training site and may also provide instructional support for other nurses assuming this role within the facility.

Clinical scholar – A professional nurse employed by a health care facility who is interested in teaching and enters into a contract with an educational program to oversee the clinical rotations of nursing students. Responsibilities include matching students with preceptors, providing instructional support to preceptors and helping to improve the overall quality of clinical education in the practice setting. Clinical scholars interact with, and receive financial and non-financial support from, both the clinical training site and the nursing program. Clinical scholars are available to both ADN and BSN training programs.

COLORADO SCHOOLS and PROGRAMS (June 2004)*

School Contact Information	Nursing Program	Academic Advisement	Financial Aid	LPN	ADN	BSN	LPN to ADN	LPN to BSN	ADN to BSN	BA/BS to BSN
Aims Community College Greeley Campus Health Sciences Building 2040 Clubhouse Dr. P.O. Box 69 Greeley, CO 80632 http://www.aims.edu	970-330-8008	970-330-8008 X 6251 or 6923	970-330-8008 X 6355	X	X		X			
Arapahoe Community College 5900 S. Santa Fe Dr. P.O. Box 9002 Littleton, CO 80160-9002 303-797-5900 http://www.arapahoe.edu	303-797-5939 nursing@arapahoe.edu	303-797-5651; advising@arapahoe.edu	303-797-5661	X	X					
Colorado Mountain College 831 Grand Avenue Glenwood Springs, CO 81602 800-621-8559 http://www.joinus@coloradomtn.edu	970-947-8232	970-947-8275	970-947- 8277	X	X		X			
Colorado Northwestern Community College Craig Campus 50 College Drive Craig, CO 81625 http://www.cncc.edu/nursing.htm	970-824-1119	970-824-1119	970-675-3204	X	X		X			
Colorado State University - Pueblo 2200 Bonforte Boulevard Pueblo, CO 81001 877-872-9653 http://www.uscolo.edu	719-549-2401	719-549-2401, 877-872-9653	877-872-9653			X			X	X
Community College of Denver 1111 W. Colfax Avenue P.O. Box 173363 Denver, CO 80217-3363 303-556-2600 http://www.ccd.rightchoice.org	303-365-8300	303-556-2481	303-556-2420	X	X		X			
Concorde Career Institute 111 Havana Street Aurora CO 80010 303-861-1151 http://concordecareercolleges.com/denver/	303-861-1151	303-861-1151	303-861-1151	X						

* *Information on this chart is updated biannually. Please contact individual schools for further updates on their programs. Additionally, further information on programs listed here, including tuition and class structures available (campus, part-time, online, distance, evenings, weekends), can be found by contacting the school or visiting their Web site.*

Colorado Nursing Programs – continued

School Contact Information	Nursing Program	Academic Advisement	Financial Aid	LPN	ADN	BSN	LPN to ADN	LPN to BSN	ADN to BSN	BA/BS to BSN
Delta-Montrose Area Vo-Tech Center 1765 U.S. Highway 50 Delta, CO 81416 970-874-7671 http://www.dmavtc.edu	970-874-6515	970-874-6515	970-874-6503	X						
Denver School of Nursing 1401 19th Street Denver, CO 80202 303-292-0015 / 888-479-5550 http://www.denverschoolofnursing.org	303-292-0015 X 215	303-292-0015 X 215		X		X				
Emily Griffith Opportunity School 1250 Welton Street Denver, CO 80204 303-575-4700 http://egos-school.com	303-575-4737	303-575-4712	303-575-4744	X						
Front Range Community College Longmont Campus 2121 Miller Drive Longmont, CO 80501 303-678-3722 http://www.frontrange.edu	303-678-3834	303-678-3646	303-678-3695	X						
Front Range Community College Larimer Campus 4616 South Shields Fort Collins, CO 80526 970-226-2500 http://www.frcc.cc.co.us	970-204-8200	970-204-8815	970-204-8376	X	X		X			
Front Range Community College Westminster Campus 3645 West 112th Avenue Westminster, CO 80031 303-466-8811 http://www.frcc.cc.co.us	303-404-5522	303-404-5235; 303-404-5208	303-404-5250	X	X		X			
Lamar Community College 2401 South Main Street Lamar, CO 81052 719-336-2248 http://www.lamarcc.com	800-968-6920	719-336-1598; 719-336-1595; 719-336-1597	800-968-6920	X	X		X			

Colorado Nursing Programs – continued

School Contact Information	Nursing Program	Academic Advisement	Financial Aid	LPN	ADN	BSN	LPN to ADN	LPN to BSN	ADN to BSN	BA/BS to BSN
Mesa State College 1100 North Avenue Grand Junction, CO 81501 970-248-1020 http://www.mesastate.edu	970-248-1398	970-248-1926	970-248-1396			X	X		X	
Metropolitan State College of Denver 1006 11th Street Campus Box 33 PO Box 173362 Denver, CO 80217 303-556-2400 http://www.mscd.edu	303-556-4391	303-556-3680	303-575-5880						X	X
Morgan Community College 17800 Road 20 Fort Morgan, CO 80701 970-542-3100 or 800-622-0216 http://www.mcc.cccoes.edu	800-622-0216 X 3240	800-622-0216 X 3160	800-622-0216 X 3150	X			X			
Northeastern Junior College 100 College Drive Sterling, CO 80701 800-626-4637 http://www.njc.edu	970-521-6701	970-521-6701	970-521-6800	X						
Otero Junior College 1802 Colorado Avenue LaJunta, CO 81050 719-384-6831 http://www.ojc.cccoes.edu/	719-384-6898	719-384-6869	719-384-6834	X	X		X			
Pikes Peak Community College 5675 South Academy Boulevard Colorado Springs, CO 80906 719-576-7711; 800-456-6847 http://www.ppcc.edu	800-456-6847 X 5400	800-456-6847 X 7216	800-456-6847 X 7089	X	X		X			
Pueblo Community College 900 West Orman Avenue Pueblo, CO 81004-1499 719-549-3200 http://www.pcc.cccoes.edu	719-549-3409	719-549-3358	719-549-3020	X	X		X			

Colorado Nursing Programs – continued

School Contact Information	Nursing Program	Academic Advisement	Financial Aid	LPN	ADN	BSN	LPN to ADN	LPN to BSN	ADN to BSN	BA/BS to BSN
Regis University Loretto Heights Department of Nursing 3333 Regis Blvd., Mail Code G-8 Denver, CO 80221 303-458-4232 http://www.regis.edu	303-458-4344	303-458-4344	303-458-4126			X				X
San Juan Basin Technical School P.O. Box 970, Cortez, CO 81321 970-565-8457 www.sanjuanbasintechschool.org	970-565-8457 X 129, 970-385-4267	970-565-8457 X 129	970-565-8457	X						
TH Pickens Tech 500 Airport Boulevard Aurora, CO 80011 303-344-4910 http://www.pickenstech.org	303-326-2048	303-344-4910	303-344-4910	X						
Trinidad State Junior College 600 Prospect Street Trinidad, CO 81082 800-621-8752 http://www.tsjc.cccoes.edu (Trinidad and Alamosa Campus)	800-937-6884 X 5668	800-937-6884 X 5557	800-621-8752	X	X		X			
University of Colorado at Colorado Springs Beth-El College of Nursing & Health Sciences 1420 Austin Bluffs Parkway Colorado Springs, CO 80933 719-262-4422 http://web.uccs.edu/bethel/	719-262-3473	719-262-3473	719-262-3460			X			X	X*
University of Colorado Health Sciences Center 4200 East 9th Avenue Box C288 Denver, CO 80262 303-315-5592 http://www.uchsc.edu/nursing	303-315-5592	303-315-0347; 303-315-3958; 303-315-4300 (RN-BSN)	303-315-8364 financial aid @uchsc.edu			X			X	X

*Accelerated Program

Colorado Nursing Programs – continued

School Contact Information	Nursing Program	Academic Advisement	Financial Aid	LPN	ADN	BSN	LPN to ADN	LPN to BSN	ADN to BSN	BA/BS to BSN
University of Northern Colorado School of Nursing Gunter 3080 Greeley, CO 80639 http://www.unco.edu/HHS/son/son.htm	970-351-2293	970-351-2293	970-351-2502, Web site			X			X	X
University of Phoenix 10004 Park Meadows Dr. Lone Tree, CO 80124 303-755-9090 http://www.phoenix.edu	303-755-9090	303-755-9090	303-755-9090					X	X	
University of Phoenix 2864 S. Circle Dr. #900 Colorado Springs, CO 80906 719-599-5282 http://www.phoenix.edu	719-599-5282	719-599-5282	719-599-5282					X	X	

School Contact Information	Nursing Program	Academic Advisement	Financial Aid	BSN to MSN	BSN to PhD	MS/MA or MSN to PhD	BS/BA/BSN or MS/MA/MSN to DNP	MSN to PhD	Post Master's Cert.
Regis University Loretto Heights Department of Nursing 3333 Regis Blvd., Mail Code G-8 Denver, CO 80221 303-458-4232 http://www.regis.edu	303-458-4232	303-458-4344	303-458-4126	X					X
University of Colorado at Colorado Springs Beth-El College of Nursing & Health Sciences 1420 Austin Bluffs Parkway Colorado Springs, CO 80933 719-262-4422 http://web.uccs.edu/bethel/	719-262-4424	719-262-3473	719-262-3460	X		X			X
University of Colorado Health Science Center 4200 East 9th Avenue Box C288 Denver, CO 80262 303-315-5592 http://www.uchsc.edu/nursing	303-315-5592	303-315-3958; 303-315-4300	303-315-8364 financial.aid@uchsc.edu	X	X	X	X	X	X
University of Northern Colorado School of Nursing Gunter 3080, Box 125 Greeley, CO 80639 http://www.unco.edu/HHS/son/son.htm	970-351-2293	970-351-2293	970-351-2502, Web site	X	X	X		X	X
University of Phoenix 10004 Park Meadows Dr. Lone Tree, CO 80124 303-755-9090 http://www.phoenix.edu	303-755-9090	303-755-9090	303-755-9090	X					X
University of Phoenix 2864 S. Circle Dr. #900 Colorado Springs, CO 80906 719-599-5282 http://www.phoenix.edu	719-599-5282	719-599-5282	719-599-5282	X					X

Appendix B
NURSING PROGRAM QUESTIONNAIRE*

1. Please indicate the types of programs offered by your institution (indicate all that apply).

LPN **(n=13)**

ADN **(n=9)**

BSN **(n=9)**

Post-Baccalaureate **(n=4)**

Faculty (Full Time/Part Time)

2. Please provide the number of Faculty full time equivalents (FTE) allocated to your institution for the 2003 academic year. **(n=19)**

3. Please indicate the number of Faculty vacancies at close of the 2003 academic year. **(n=14)**

4. Please indicate your institution's projected need for Faculty for the 2005 academic year. **(n=18)**

5. Please rank the following reasons, if applicable, for Faculty vacancies during the 2003 academic year (1 = primary reason, etc.).

Retired **(n=13)**

Resigned (other than retired) **(n=17)**

Program Expansion **(n=13)**

Other **(n=13)**

6. If 'Program Expansion' and/or 'Other' were selected in Q. 5, please describe.

7. Please rank the following reasons, if applicable, for Faculty resignations during the 2003 academic year (1 = primary reason, etc.).

Accepted other teaching position **(n=5)**

Accepted other non-teaching position **(n=8)**

Workload/work environment **(n=6)**

Limited career development opportunities (professional and/or financial) **(n=5)**

Personal **(n=4)**

Other **(n=1)**

8. If 'Other' was selected in Q.7, please describe.

* The number of schools that responded to each part of each question is noted as (n=).

9. Please rank the following strategies, if applicable, your institution utilized in the 2003 academic year to fill Faculty vacancies (1 = most effective, etc.).

Recruitment from part time staff **(n=12)**

Advertising **(n=17)**

Professional networking **(n=17)**

Joint appointments (e.g., strategic partnership with industry) **(n=8)**

Other **(n=8)**

10. If 'Other' was selected in Q. 9, please describe.

11. Please rank the following barriers to recruitment of Faculty, if applicable, your institution experienced during the 2003 academic year (1 = primary barrier, etc.).

Salary level **(n=17)**

Limited qualified applicant pool **(n=16)**

Decreased interest in educator role **(n=9)**

Other **(n=3)**

12. If 'Other' was selected in Q. 11, please describe.

13. Please indicate the starting salary for Faculty for the 2003 academic year. **(n=19)**

14. Please indicate the average salary for Faculty for the 2003 academic year. **(n=19)**

Clinical Instructors (Affiliate/Adjunct Faculty)

15. Please provide the number of Clinical Instructor full time equivalents (FTE) allocated to your institution for the 2003 academic year. **(n=16)**

16. Please indicate the number of Clinical Instructor FTEs employed through strategic partnerships with the industry (e.g., Clinical Scholar program). **(n=8)**

17. Please indicate the number of Clinical Instructor vacancies at the close of the 2003 academic year. **(n=9)**

18. Please indicate your institution's projected need for Clinical Instructors for the 2005 academic year. **(n=16)**

19. Please rank the following reasons, if applicable, for Clinical Instructor vacancies during the 2003 academic year (1 = primary reason, etc.).

Retired **(n=3)**

Resigned (other than retired) **(n=12)**

Program Expansion **(n=11)**

Other **(n=5)**

20. If 'Program Expansion' and/or 'Other' were selected in Q. 19, please describe.

21. Please rank the following reasons, if applicable, for resignations of Clinical Instructors during the 2003 academic year (1 = primary reason, etc.).
Accepted other teaching position **(n=3)**
Accepted other non-teaching position **(n=10)**
Workload/work **(n=8)**
Limited career advancement opportunities (professional and/or financial) **(n=9)**
Personal **(n=6)**
Other **(n=3)**

22. If 'Other' was selected in Q. 22, please describe.

23. Please rank the following strategies, if applicable, your institution utilized in the 2003 academic year to fill Clinical Instructor vacancies (1 = most effective, etc.).
Advertising **(n=15)**
Professional networking **(n=16)**
Joint appointments (e.g., strategic partnership with industry) **(n=11)**
Other **(n=2)**

24. If 'Other' was selected in Q. 23, please describe.

25. Please rank the following barriers to recruitment of Clinical Instructors, if applicable, your institution experienced during the 2003 academic year (1 = primary barrier, etc.).
Salary level **(n=17)**
Work schedule **(n=13)**
Limited qualified applicant pool **(n=18)**
Decreased interest in educator role **(n=10)**
Other **(n=0)**

26. If 'Other' was selected in Q. 25, please describe.

27. Please rank the difficulty of finding Clinical Instructors for the following specialty areas (1 = most difficult, etc.).
Community Health **(n=10)**
Medical-Surgical **(n=15)**
Obstetrics **(n=17)**
Pediatrics **(n=14)**
Psychiatric **(n=14)**
Geriatrics **(n=9)**
Other **(n=2)**

28. If 'Other' was selected in Q. 27, please describe.

29. Please indicate the level of difficulty in hiring qualified Clinical Instructors in a timely manner your institution experienced during the 2003 academic year (1 = least difficult, 5 = most difficult). **(n=19)**

Level of Difficulty in Hiring Clinical Instructors:

Least Difficult – Most Difficult:
⚪ 1   ⚪ 2   ⚪ 3   ⚪ 4   ⚪ 5

30. Please rank the following barriers to retention of Clinical Instructors, if applicable, your institution experienced during the 2003 academic year (1 = primary barrier, etc.).
Accepted other teaching position **(n=7)**
Accepted other non-teaching position **(n=10)**
Workload/work environment **(n=12)**
Limited career advancement opportunities (professional and/or financial) **(n=14)**
Personal **(n=9)**
Other **(n=3)**

31. If 'Other' was selected in Q. 30, please describe.

32. Please indicate the rate of pay for Clinical Instructors for the 2003 academic year. **(n=18)**

Student Enrollment

33. Please indicate student enrollment for the 2003 academic year.
LPN **(n=11)**
ADN **(n=7)**
BSN **(n=8)**
Post-Baccalaureate **(n=5)**

34. Please indicate the projected student enrollment for the 2004 academic year.
LPN **(n=12)**
ADN **(n=9)**
BSN **(n=8)**
Post-Baccalaureate **(n=5)**

35. Please indicate the number of qualified applicants NOT admitted to your institution's program for the 2003 academic year.
LPN **(n=5)**
ADN **(n=3)**
BSN **(n=6)**
Post-Baccalaureate **(n=1)**

36. Please indicate the projected number of qualified applicants NOT admitted to your institution's program for the 2004 academic year.

LPN **(n=8)**

ADN **(n=6)**

BSN **(n=7)**

Post-Baccalaureate **(n=3)**

37. Please indicate student attrition (percentage of each program's students starting but not completing the 2003 academic year).

LPN **(n=9)**

ADN **(n=6)**

BSN **(n=5)**

Post-Baccalaureate **(n=4)**

38. Please indicate the number of students who graduated during the 2003 academic year.

LPN **(n=11)**

ADN **(n=6)**

BSN **(n=7)**

Post-Baccalaureate **(n=4)**

39. Please indicate the number of enrolled students for each Faculty member for the 2003 academic year.

LPN **(n=6)**

ADN **(n=5)**

BSN **(n=5)**

Post-Baccalaureate **(n=2)**

40. Please estimate the per graduated student cost to your institution for the 2003 academic year.

LPN **(n=5)**

ADN **(n=5)**

BSN **(n=3)**

Post-Baccalaureate **(n=4)**

Program Costs

41. Please estimate total program costs for the 2003 academic year.

LPN **(n=8)**

ADN **(n=3)**

BSN **(n=5)**

Post-Baccalaureate **(n=1)**

42. Please estimate the percentage of your institution's program revenue derived from the following sources for the 2003 academic year (inclusive of all programs).

% Student Fees **(n=10)**

% Hospitals **(n=7)**

% Foundations **(n=3)**

% Federal Grants **(n=3)**

% State Grants **(n=5)**

% Scholarships **(n=4)**

% In-Kind Donations **(n=2)**

% Other **(n=5)**

43. If 'Other' was selected in Q. 42, please describe.

44. Please estimate the percentage of your institution's program revenue derived from the following sources for the 2005 academic year (inclusive of all programs).

% Student Fees **(n=13)**

% Hospitals **(n=5)**

% Foundations **(n=2)**

% Federal Grants **(n=4)**

% State Grants **(n=6)**

% Scholarships **(n=4)**

% In-Kind Donations **(n=3)**

% Other **(n=5)**

Clinical Rotations

45. Please indicate the types of settings utilized by your institution for clinical rotations (indicate all that apply).

Hospital in-patient **(n=20)**

Out-patient clinic **(n=19)**

Skilled nursing facility **(n=16)**

Hospice **(n=15)**

Home health agency **(n=14)**

Other Long term care (asst living, etc.) **(n=12)**

Other **(n=11)**

46. If 'Other' was selected in Q. 45, please describe.

47. Please indicate times of clinical rotations offered by facilities that provide your institution with clinical sites (indicate all that apply).

Day shift **(n=20)**
Evening shift **(n=18)**
Night shift **(n=7)**
4 hour **(n=8)**
8 hour **(n=20)**
12 hour **(n=16)**
Weekends **(n=0)**
Other **(n=1)**

48. If 'Other' was selected in Q. 47, please describe.

49. Please describe any barriers your institution encountered in finding sufficient clinical sites for student rotations during the 2003 academic year. **(n=17)**

50. Please rank the level of difficulty your institution experienced in securing specialty settings for student clinical rotations during the 2003 academic year (1 = most difficult, etc.).

Community Health **(n=9)**
Medical-Surgical **(n=17)**
Obstetrics **(n=19)**
Pediatrics **(n=20)**
Psychiatric **(n=15)**
Geriatrics **(n=0)**
Other **(n=0)**

51. If 'Other' was selected in Q. 50, please describe.

52. Please describe innovative approaches implemented by your institution to increase the number of nursing students and graduates (e.g., simulation technology). **(n=16)**

Appendix C
CLINICAL TRAINING SITE QUESTIONNAIRE[*]

1. Did your facility offer clinical sites for nursing student rotations during the 2003 academic year? Nursing students are defined as LPN, and, BSN, and Post-Baccalaureate. **(n=51)**
   If no, skip to Q. 9.

2. Please indicate nursing clinical rotation times offered by your facility during the 2003 academic year (indicate all that apply).
   4-hour **(n=11)**
   8 hour **(n=39)**
   12 hour **(n=32)**
   Day shift **(n=37)**
   Evening shift **(n=29)**
   Night shift **(n=21)**
   Weekends **(n=28)**
   Other **(n=4)**

3. If OTHER was selected in Q. 2, please describe. **(n=4)**

4. Please indicate the types of settings offered by your facility for nursing student clinical rotations during the 2003 academic year (indicate all that apply).
   OB/Labor & delivery **(n=28)**
   Med-Surgical I **(n=37)**
   Med-Surgical II **(n=27)**
   Psychiatry **(n=11)**
   Pediatrics **(n=18)**
   Operating Room **(n=25)**
   Emergency department **(n=31)**
   Hospice **(n=5)**
   Other **(n=26)**

5. If OTHER was selected in Q. 4, please describe.

6. Please indicate the types of nursing programs that utilized your facility for clinical rotations during the 2003 academic year (indicate all that apply).
   LPN **(n=34)**
   ADN **(n=22)**
   BSN **(n=27)**
   Post-BSN **(n=17)**

* The number of training sites that responded to each part of each question is noted as (n=).

7. Please indicate the total number of nursing programs (all categories) that utilized your facility for clinical rotations during the 2003 academic year. **(n=44)**

8. Please indicate the total number of nursing students (all categories) that utilized your facility for clinical rotations during the 2003 academic year. **(n=39)**

9. Does your facility have the capacity to accept additional nursing students for clinical rotations for the 2004 academic year? **(n=51)**

10. If YES was selected in Q. 9, please describe. **(n=25)**

11. Please indicate the types of support your facility provided for nursing student education during the 2003 academic year (indicate all that apply).
Clinical Scholar **(n=15)**
Clinical teaching assistants **(n=7)**
Scholarships **(n=27)**
Faculty joint appointments **(n=12)**
Facility space **(n=32)**
Staff preceptors **(n=39)**
Equipment **(n=26)**
Other **(n=15)**

12. If OTHER was selected in Q. 11, please describe. **(n=18)**

13. Please estimate the cost to your facility of providing all sources of support identified in Q. 11 & 12 during the 2003 academic year. **(n=31)**

14. If your facility provides staff to function as preceptors for nursing students, please indicate the type of training staff receive prior to precepting (please indicate all that apply)
None **(n=19)**
Online training **(n=2)**
Classroom training **(n=25)**
Other **(n=7)**

15. If OTHER was selected in Q. 14, please describe. **(n=9)**

16. If applicable, what percentage of your nursing employees were Clinical Teaching Assistants (Clinical Scholar Program) during the 2003 academic year? **(n=11)**
If none, Skip to Q.19.

17. Please indicate how employees identified in Q. 16 were reimbursed during the time they functioned as Clinical Teaching Assistants during the 2003 academic year (indicate all that apply).
Regular salary **(n=12)**
Regular salary plus monetary incentives **(n=7)**
Regular salary plus non-monetary incentives **(n=2)**
Other **(n=4)**

18. If OTHER was selected in Q. 17, please describe. **(n=4)**

19. Please rank the following factors, if applicable, utilized by your facility to allocate clinical rotation sites among competing nursing programs (1 = most important, etc.).
Nursing program type **(n=40)**
History of relationship w/program **(n=39)**
Cost **(n=25)**
Other **(n=5)**

20. If OTHER was selected in Q. 19, please describe. **(n=5)**

21. Is your facility currently engaged in collaborative efforts with nursing programs located in Colorado to increase nursing student program enrollments? **(n=51)**

22. If YES was selected in Q. 21, please describe. **(n=31)**

23. Please indicate the level of effectiveness of collaborative efforts described in Q. 22 (1 = not effective, 5 = very effective). **(n=31)**

24. Please describe barriers, if any, your facility experienced in developing effective collaboration relationships with nursing programs. **(n=24)**

25. Has your facility adopted innovative practices to increase the facility's capacity to place nursing students for clinical rotations? **(n=47)**

26. If YES was selected in Q. 25, please describe. **(n=21)**

27. How many new nursing graduates did your facility hire during the 2003 academic year? **(n=41)**

28. What was the average length of orientation for new nursing graduate hires during the 2003 academic year? **(n=44)**
3 weeks
4-8 weeks
9-12 weeks
Greater than 12 weeks

29. What was the estimated cost of orienting a new nursing graduate from the time of hire to time of independent practice during the 2003 academic year? **(n=33)**

30. Please provide us your E-mail address in case we need to clarify your response.

Appendix D

CLINICAL TRAINING SITE
KEY INFORMANT INTERVIEW PROTOCOL

My name is Deborah Kendall-Gallagher. I am a PhD student in the School of Nursing at the University of Colorado Health Sciences Center. I am working with the Colorado Health Institute on a project that is examining the supply and demand for nursing faculty in Colorado. The project is part of a larger study that addresses Nursing Workforce challenges confronting Colorado; the larger study is spearheaded by the Colorado Center for Nursing Excellence. The Colorado Health & Hospital Association and the Colorado Center for Nursing Excellence are cooperating on the project.

You have been identified as a key informant expert in your field. Your experiences, observations, and perspectives would greatly enhance our understanding of the issues related to factors that influence the supply and demand of nursing faculty, clinical training of nursing students, and readiness for practice.

May I tape the interview? If you would like something to be off the record, please let me know and I'll stop the tape recorder. All information is confidential and will be reported in the aggregate, unless you would like to be identified.

1. Does your program provide clinical training opportunities for nursing students? Please describe your program. What are the positive aspects of providing the program? What are the challenges of providing the program (e.g., scheduling, preceptor burden, financial burden, etc.)?

2. Please describe any plans your organization has in the next five years to expand clinical training opportunities for nursing students? What types of challenges do you anticipate in implementing these plans?

3. Is there much competition among different educational institutions for clinical training opportunities with your organization? What is your organization's selection process when there are several educational institutions competing for a limited number of clinical training slots?

4. What do you think are some promising practices of financing clinical training of nursing students? Are there ways to change funding mechanisms to increase the number of nursing students training at your facility?

5. Please describe any innovative methods your organization employs to increase the number of nursing students moving through clinical training at your facility (e.g., use of new clinical and teaching technologies, accelerated and/or non-traditional training programs, etc.)?

6. Please describe the type and level of collaboration your organization experiences in working with nursing educational programs. Are your staff nurses involved as faculty for nursing program? If so, how are staff nurses encouraged to become faculty? What types of faculty arrangements does your organization have with nursing programs? What are your thoughts as to how collaboration can be improved?

7. What types of gaps between education and clinical competence does your organization experience with new graduates?

8. How do you believe the clinical training of nursing students can be improved?

9. Is there anything that I have missed or that you would like to address related to the nursing shortage, the nursing faculty shortage, readiness for practice, or other topics?

Thank you for your time. The Colorado Health Institute will be preparing the report; I do not know when the report is scheduled for release but anticipate before the end of the year.

Appendix E
NATIONAL AND STATE STRATEGIES

- Consolidate core curriculum requirements across nursing majors and/or clinical tracks to reduce duplication of faculty effort.

- Accept courses from other disciplines as appropriate to meet nursing program requirements.

- Develop joint academic activities with other disciplines (health care and non-health care) both within and between universities to capitalize on existing resources.

- Create interdisciplinary courses to meet the common needs of related disciplines.

- Utilize expert non-nurse faculty to hold administrative positions within the nursing academic unit.

- Identify any existing regulatory requirements that limit nurses with non-nursing graduate degrees from teaching in nursing programs so that efforts to remove these barriers can be planned.

- Better utilize junior faculty by partnering them with senior faculty who can serve as mentors in course development without requiring more resource intensive team teaching.

- Seek opportunities to sponsor educational sessions that inform nurses outside the academic setting about an academic career, emphasizing the positive aspects of a teaching career and offering specific strategies for gaining the necessary credentials/experience to become faculty members.

- As they exist, consider reducing or eliminating experience or other artificial prerequisites for graduate study.

- Examine current curricula and program requirements and streamline them as much as possible to facilitate timelier program completion.

- Remove impediments to graduate study for working nurses by offering more convenient course times, encouraging partnering institutions to offer students more flexible work schedules, and offering courses to partnering health care facilities, possibly at their site(s).

- Attract more second-degree students to the nursing profession and encourage these and other high-achieving students to consider the faculty role early in their education.

- Explore collaboration with schools or regional consortia that have successful distance education programs in place.

Specific retirement policy changes include:

- Examine college/university retirement policies and work to eliminate unnecessary restrictions to continued faculty service, particularly mandatory retirement ages and financial penalties for retired faculty who return to teaching.

- Design new phased retirement plans that support the inclusion of productive retired faculty.

- Redesign current faculty workloads to accommodate part-time retired faculty.

- Reward retired faculty with incentives such as reimbursement for conferences, assignment of a graduate assistant, and release time for professional activities rather than direct salary support if monetary compensation is not an option.

- Consider other ways that retired faculty might enhance current faculty resources by counseling or tutoring students, supervising in skills labs, mentoring students and/or faculty, assisting with research projects, and serving as ambassadors to the community.

- Create programs that formally include and recognize retired nursing faculty as members of the school faculty.

- Cultivate a workplace environment that is positive, productive, enriching, and satisfying so that retirees will want to continue teaching longer.

These Academic-clinical training site partnerships have varying characteristics and incentives and include the following strategies:

- Increase the use of formal partnerships between schools of nursing and clinical facilities, identifying and capitalizing on specific benefits that are attractive and useful to both partners.

- Develop clinical faculty appointments or other forms of recognition for qualified clinical staff in return for supervising and teaching students in clinical placements.

- As needed, prepare and educate clinical staff regarding best practices for clinical precepting, teaching and evaluation.

- Include clinical site staff on school of nursing committees and task forces to add their expertise and perspective to the education of student nurses.

- Import clinical education strategies from other health disciplines, both internal and external to one's own setting, that demonstrate a faculty enhancing effect.

- Explore the use of simulated clinical experiences in supervised learning resource centers.

Some of the promising activities on this front include:

- Develop and implement, with academic colleagues, research agendas that emphasize the importance of educational research to the future of the nursing profession.

- Conduct research to better understand the psychology and sociology of teaching and adult learning and translate the research into teaching strategies.

- Study and evaluate specified educational requirements, e.g., faculty-to-student ratios that do not make sense in the current educational context, assess their origin and consider their continued practice.

- Study and evaluate nontraditional and accelerated programs, assessing their success, lessons learned, and potential use as models for future curriculum development.

- Draw on the expertise and seek collaboration with other organizations that focus on educational research.

END NOTES

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