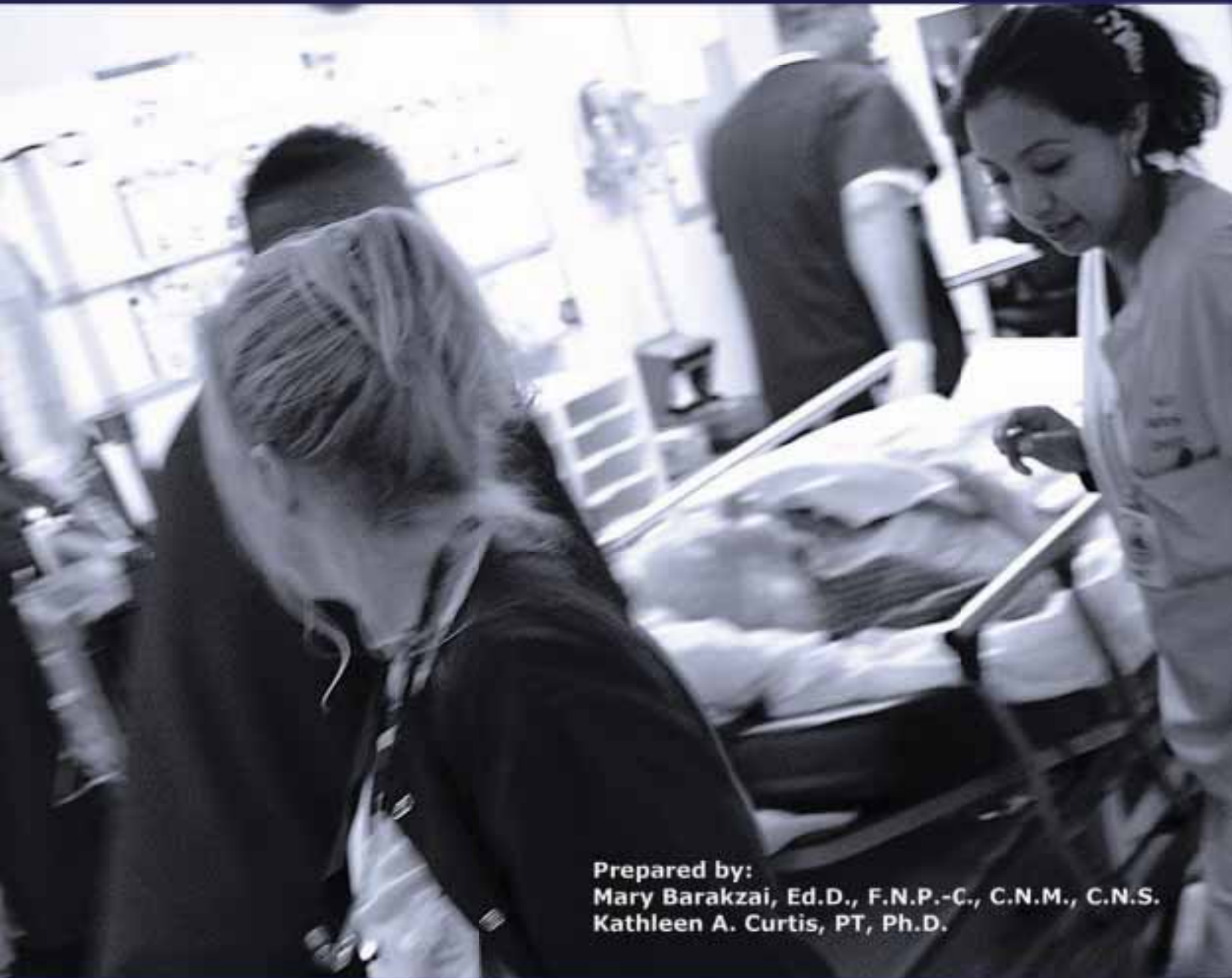


# ***Crisis in Care***

## **The Nursing Shortage in the San Joaquin Valley**



Prepared by:  
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# Crisis in Care:

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Mary Barakzai, Ed.D., F.N.P.-C., C.N.M., C.N.S.  
Kathleen A. Curtis, PT, Ph.D.

Published by:

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California State University, Fresno

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The Central California Center for Excellence in Nursing was established in 2006 at California State University, Fresno to address issues of nursing supply and demand, nursing education, practice improvement, and other critical concerns of nurses in the San Joaquin Valley. Its goals are to enhance nursing education, to promote research, and to support collaboration among nursing educators, healthcare organizations, and other stakeholders to create a healthier San Joaquin Valley.

Additional information about the Central California Center for Excellence in Nursing may be found at [www.centralcalifornianursing.org](http://www.centralcalifornianursing.org)

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## Executive Summary

Although healthcare has weathered nursing shortages in the past, the current lack of nurses in the San Joaquin Valley is rapidly reaching crisis proportions. As the baby boomers age, the demand for health care is increasing at the same time that the size of the nursing workforce is shrinking due to retirement and attrition. Although nursing education programs in the Valley have expanded enrollment in response to the shortage, these nine schools would need to graduate 132% more nurses annually to achieve even 90% of the current national average of nurses per 100,000 population by 2020.

At the same time, nursing programs face several constraints to the admission of more students. The currently recommended level of preparation for entry to practice is the baccalaureate degree. The increasingly complex care demanded by the rapid advances in technology, equipment, and treatment regimens for the current high acuity patient population requires nurses prepared for critical clinical decision-making in the changing healthcare environment. Education at the baccalaureate degree level requires doctorally-prepared faculty.

Schools in the San Joaquin Valley are grappling with a severe faculty shortage, especially of doctorally-prepared faculty. Adequate faculty with doctoral degrees are required to educate the baccalaureate-prepared nursing workforce. Nursing students need to be introduced to career pathways in academia. In addition, infrastructure and clinical site availability limit admission slots. The development of new doctoral programs and reduction of the significant disparity in pay between faculty and practicing nurses are necessary first steps.

In addition, a mechanism must be developed to utilize current clinical sites efficiently and to identify new sites. Finally, continued investment and funding need to be provided both to support increased nursing enrollment and to update and expand much needed dedicated classrooms, learning laboratories, technology, and equipment.

Recommendations include actions that address the capacity of educational programs, the barriers to student and nurse retention and the issues that influence attrition. Recommendations to address the nursing shortage in the San Joaquin Valley include increasing educational capacity by expanding admission slots in current programs and establishing new programs and options. However, successful strategies must start even earlier in the educational process with appropriate counseling and educational preparation in the primary and secondary grades. In addition, access to prerequisites must be assured so that students are ready to enter nursing programs in a timely manner. Admission criteria to nursing programs must be based on factors identified by research as predicting successful completion in order to improve retention and passage of the licensure examination. At the center of the nursing shortage is the even more severe shortage of nursing faculty. Without adequate and qualified faculty, program expansion is impossible. Strategies to encourage nurses to assume faculty roles include educational stipends, providing salaries comparable to those in the clinical sector, and making educational opportunities more accessible through the development of new doctoral nursing programs and the utilization of distance education techniques. In addition to preparing new nurses, attention must be paid to retaining currently practicing nurses. Mentoring of new graduates,

residency programs, the incorporation of technology in ways that assist nurses in providing patient care, adequate support staff, and a positive supportive culture in the workplace are all practices that increase job satisfaction and retention. Older nurses in particular provide a wealth of knowledge and experience that is difficult to replace. Recommendations to increase retention of older nurses include flexible scheduling and benefits packages as well as the incorporation of various ergonomic approaches to decrease the incidence of injury. Finally, in order to assure that nurses are able to meet the demands of caring for high-acuity patients with multiple co-morbidities and complex therapeutic regimens, it is recommended that strategies be employed to increase the number of baccalaureate-prepared nurses in the workforce.

Strategies to address this crisis must include all stakeholders and be collaborative and sustainable. Short-term solutions and stop-gap measures, such as the recruitment of foreign nursing graduates, have been tried in the past and have failed. It is especially important that academic programs, hospitals, and other healthcare entities come together to address the regional nursing workforce crisis by developing comprehensive strategies on several fronts. Both how nurses are educated and their role in 21st century healthcare must be examined. In addition, workplace issues leading to dissatisfaction or inability to continue working need to be assessed and resolved in order to retain the current nursing workforce. Advanced practice nurses play a critical role in providing clinical leadership and in mentoring and retaining new graduate nurses. Although addressing the nursing shortage will require difficult decisions and hard work, it also provides the impetus to assess and retool our educational programs and workplaces and to re-invent the nursing profession as a stronger and more effective partner in healthcare.

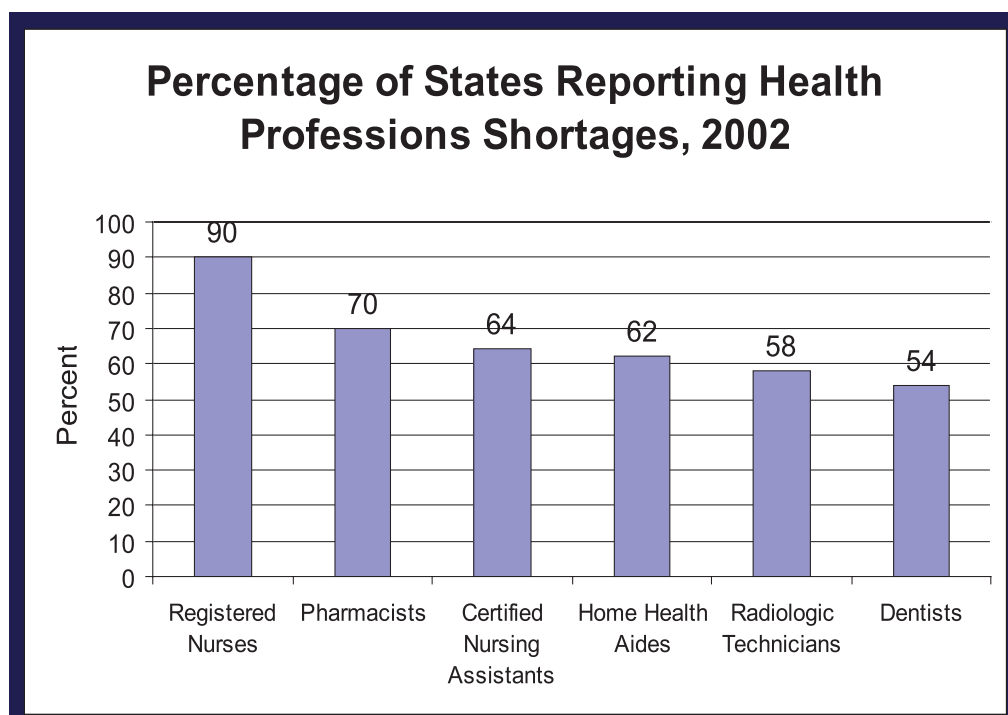


## Introduction

Registered Nurses (RNs) are central to safe, quality health care (American Association of Colleges of Nursing, AACN 2006c) and are the largest component of the healthcare workforce (AACN, 2006; Cox, Anderson, Teasley, Sexton, & Carroll, 2005; Hassmiller & Cozine, 2006). Registered nurses work in a variety of settings, including hospitals, schools, clinics, health departments, home health care and skilled nursing facilities. Nurses play a unique role in these settings, providing round-the-clock surveillance to identify problems and intervene promptly to safeguard the health of their patients. As the largest health care occupation, registered nurses held 2.4 million jobs across the nation in 2004, with 3 in 4 holding full-time positions (U.S. Department of Labor, Bureau of Labor Statistics, 2004). The demand is so great for RNs that nursing is projected to be the second largest growth industry in the nation over the next decade (Hecker, 2005).

However, the United States is currently facing a severe shortage of registered nurses. Although the exact extent of the shortage has not been determined, there is general agreement that the present lack of nurses is critical and the outlook for the future may be even more devastating. Moore and Payne (2002) found that 90% of states reported that nursing shortages were a major concern, while the Health Resources and Services Administration [HRSA] estimated that 30 states had a shortage of nurses, and it was projected that 44 states and the District of Columbia would be affected by 2020 (HRSA, 2002). Meanwhile, Rothberg (2005) estimates that there are approximately 126,000 unfilled nursing positions nationwide.

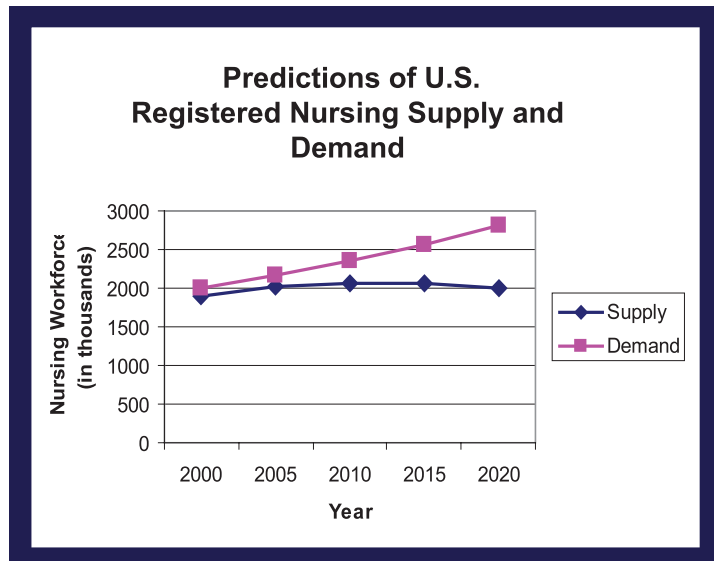
**Figure 1**



*Source:* Moore & Payne. (2002). *State Responses to Health Worker Shortages: Results of 2002 Survey of States*. Rensselaer, NY: Center for Health Workforce Studies, School of Public Health, SUNY Albany.

Despite predictions by the Health Resources & Services Administration that nursing will experience more growth than any other health related occupation, the number of vacancies nationally is expected to increase yearly. Although this increase will initially be relatively slow until about 2010, it is predicted that the national shortage will increase to over 350,000 full-time equivalent (FTE) nurses by 2012 (Hecker & Frank, 2004). Despite efforts to educate more nurses, the gap between supply and demand will widen, resulting in a national shortage of 29% resulting in more than 800,000 unfilled FTE nursing positions by 2020 (HRSA, 2002).

**Figure 2**



Source: National Center for Health Workforce Analysis, (2002). *Projected Supply, Demand, and Shortages of Registered Nurses*. Washington, DC: U.S. Department of Health and Human Services.

This shortage will have immediate and far-reaching effects, including decreasing quality of nursing care, delays in medication administration and procedures, diversion of patients from emergency departments, delayed elective surgery, and closed beds. It has been estimated that inadequate nursing staff is responsible for 25% of all unexpected events resulting in patient death, injury or permanent disability (Joint Commission on Accreditation of Healthcare Organizations [JCAHO], 2002). Without adequate nurses, patients have longer hospital stays, more hospital acquired infections, increased incidence of cardiac arrest, and a higher chance of dying. Studies have shown that if nursing workloads double to 8 patients instead of 4, the number of avoidable deaths would increase by 20,000 per year, and even the addition of one patient to a nurse's workload can result in a 7% greater chance of patient death after surgery (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002).





In addition to providing direct patient care services, nursing and healthcare also contribute significantly to the economic well-being of the nation and the region (Collaborative Economics, 2003). The healthcare workforce, of which nursing is the largest component, includes approximately 12% of all workers nationwide and has a major impact on the Gross Domestic Product (Dionne, Moore, Armstrong, & Martiniano, 2006). Therefore, a shortage of nurses can have an adverse impact on the economy of a community or a country. Since the implementation of legislation mandating minimum nurse to patient ratios took effect in California in 2004, acute care hospitals must either close beds or contract with temporary agency or traveling nurses, if the number of local nurses is not adequate to meet the staffing requirements. Both agency nurses and “travelers” are much more costly than staff nurses. In addition, inadequate permanent staff results in increased expenses for continuous recruitment, sign-on-bonuses, and orientation, adversely impacting health care costs (First Consulting Group, 2001).



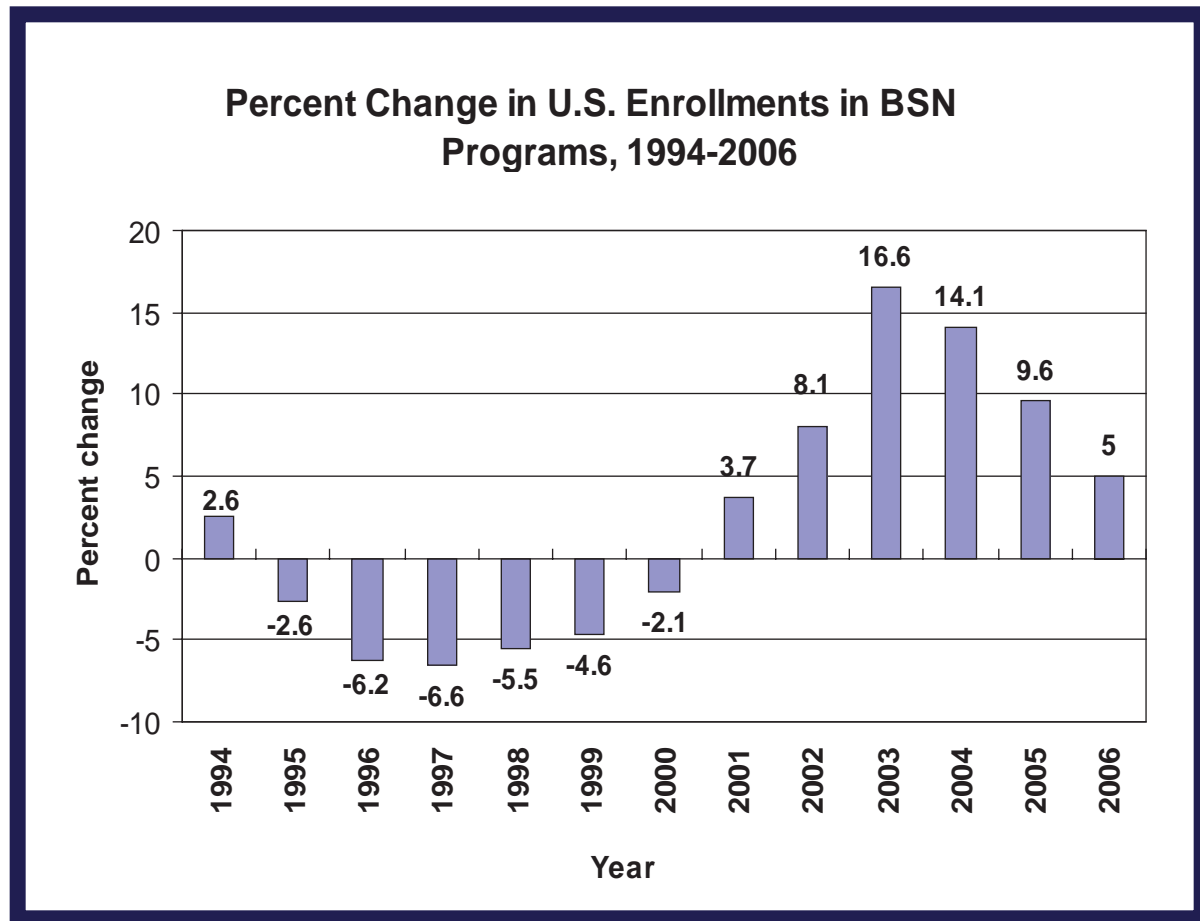
Conversely, growth in health services results in new career opportunities and prosperity for the region (Collaborative Economics, 2003). More nurses means not only better healthcare for the people of the San Joaquin Valley, but also stimulates the economy, provides more public revenue, spurs job growth in other areas of healthcare as well as in support services such as diagnostic laboratories, and medical supplies.

Nursing shortages are not new. The United States has experienced a significant shortfall of nurses every decade or so for the last 50 years (Cleary & Rice, 2005). However, the present

shortfall is more severe than previous ones, and the stakes grow higher as the population ages and the prevalence of chronic conditions increases (Hassmiller & Cozine, 2006). While the overall population of the United States is expected to grow by about 18% between 2000 and 2020, it is predicted that the size of the population that is 65 years and older will increase by 54% during the same interval. Thirty-two percent of this older age group has heart disease; 36% are hypertensive; and 50% suffer from arthritis. Most have multiple conditions, resulting in a much higher utilization of health services and nursing care (National Center for Health Workforce Analysis, 2002).

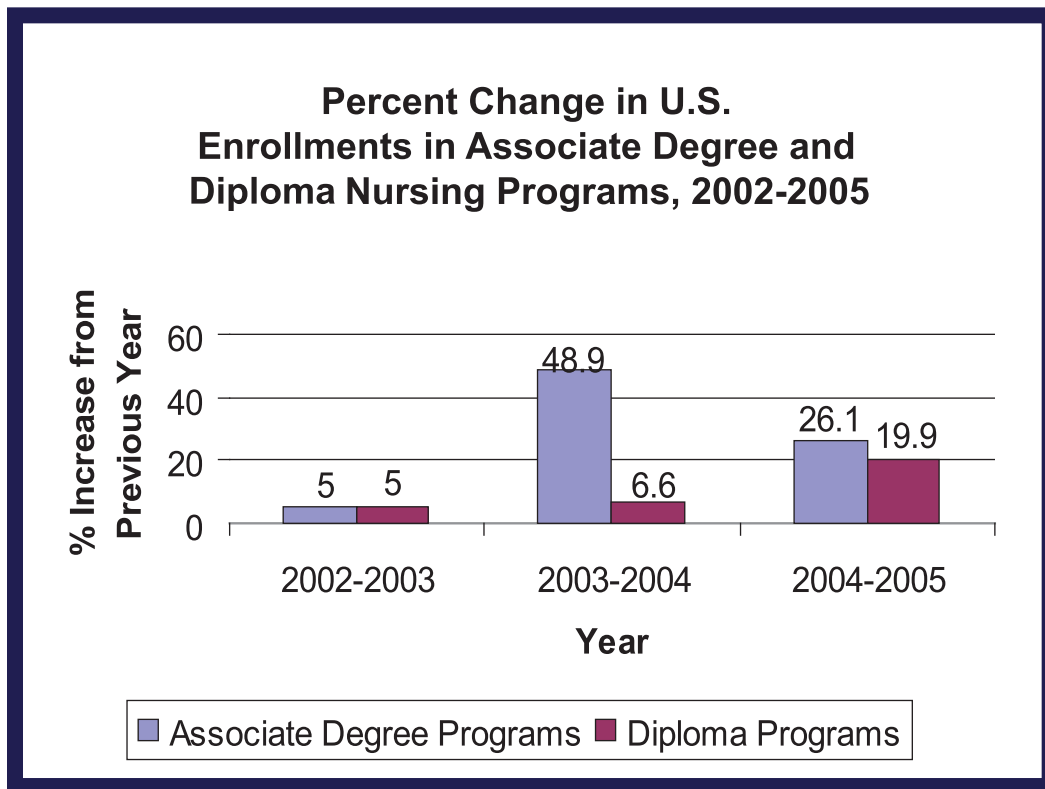
In the mid 1990's the widespread adoption of managed care in conjunction with a recession resulted in a downsizing of the nursing workforce (Keating & Sechrist, 2001). This, in turn, triggered declining enrollments in nursing programs from 1995-2000 (AANC, 2006a; Hospital Association of Southern California [HASC], 2006). In order to meet the current demand, nursing programs have attempted to increase enrollment (Figure 3). Enrollments have increased in both associate degree and diploma nursing programs as well (Figure 4).

**Figure 3**



Source: American Association of Colleges of Nursing Research and Data Center (2006). Percentage Change in Enrollments in Entry-Level Baccalaureate Nursing Programs: 1994-2006. Available December 13, 2006 from <http://www.aacn.nche.edu/Media/ppt/94-06EnrChgs.ppt>

**Figure 4**

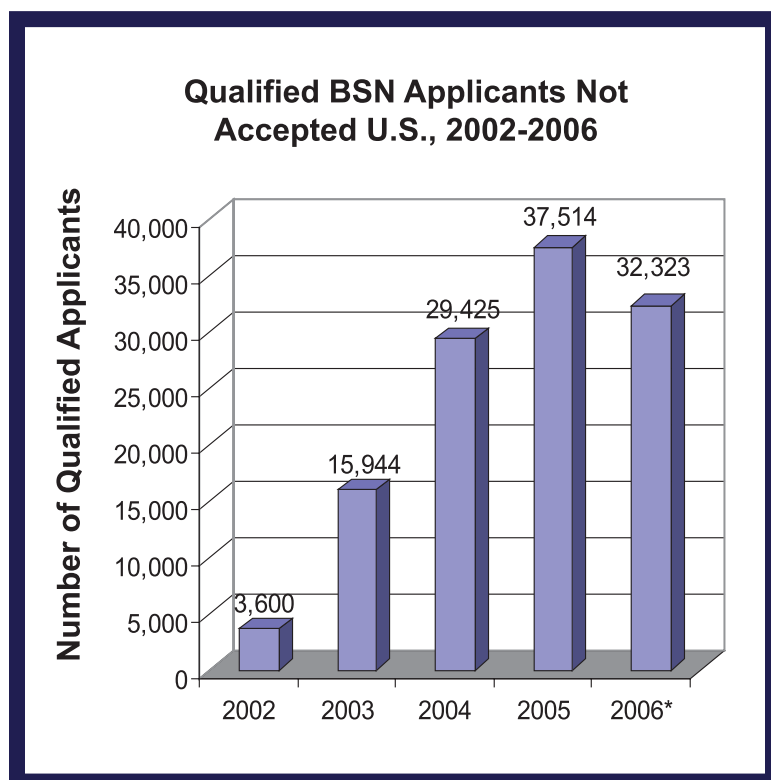


Source: NLN (2005). Despite Encouraging Trends Suggested by the NLN's Comprehensive Survey of all Nursing Programs, Large Number of Qualified Applications Continue to be Turned Down. Press Release.

NLN. (2004). Startling data from the NLN's comprehensive survey of all nursing programs evokes wake-up call: Program- inclusive number raise nursing and nursing faculty shortages to crises level. Press Release.

Although nursing programs are struggling to educate more students, they are unable to enroll an adequate number to meet current and projected needs. During the mid-1990's when nursing enrollments dropped, fewer faculty were hired or replaced. Fewer available positions in academic settings discouraged nurses from seeking advanced degrees to assume faculty roles. Inadequate numbers of nursing faculty currently limits the ability of many educational programs to enroll more nursing students. In 2005-2006, bachelor's degree programs nationwide were unable to accept 32,323 qualified students primarily due to lack of faculty (Figure 5).

**Figure 5**

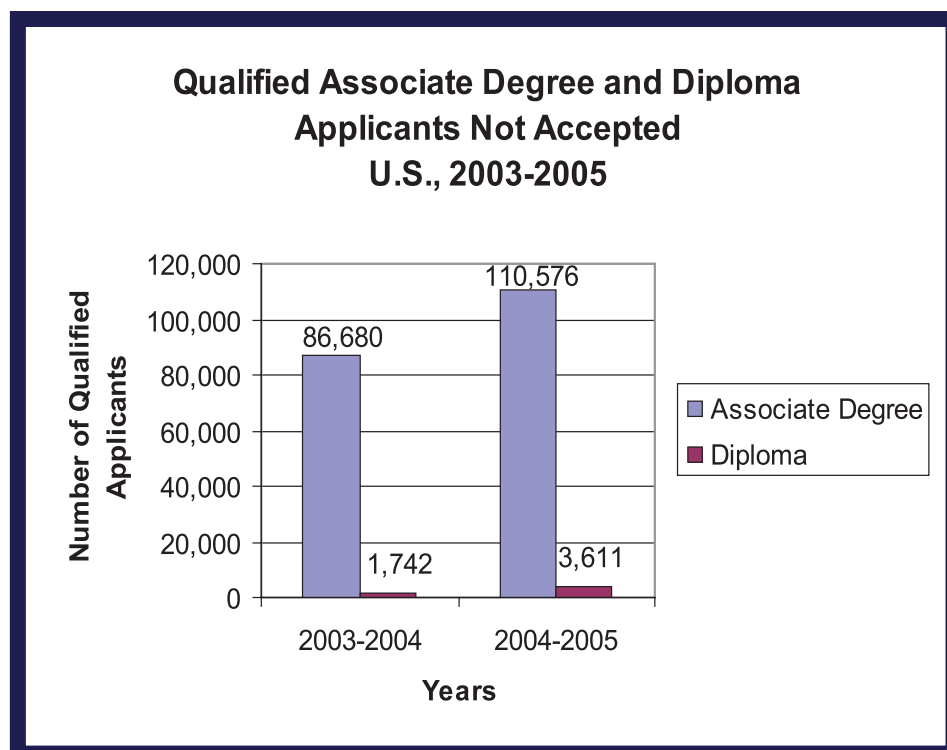


Source: American Association of Colleges of Nursing Research and Data Center (2006). Qualified Applications Turned Away from Entry-Level Baccalaureate Nursing Programs: 2002-2006. Available December 12, 2006 from <http://www.aacn.nche.edu/Media/ppt/02-06TurnedAway.ppt>

\*2006 result based on preliminary data 12/06

This phenomenon is not just confined to BSN programs. Despite monumental increases in student enrollment in associate degree and diploma programs (Figure 4), there were still over 100,000 too few slots for all qualified applicants in 2004. (Figure 6)

**Figure 6**



Source: NLN (2005). Despite Encouraging Trends Suggested by the NLN's Comprehensive Survey of all Nursing Programs, Large Number of Qualified Applications Continue to be Turned Down. Press Release.

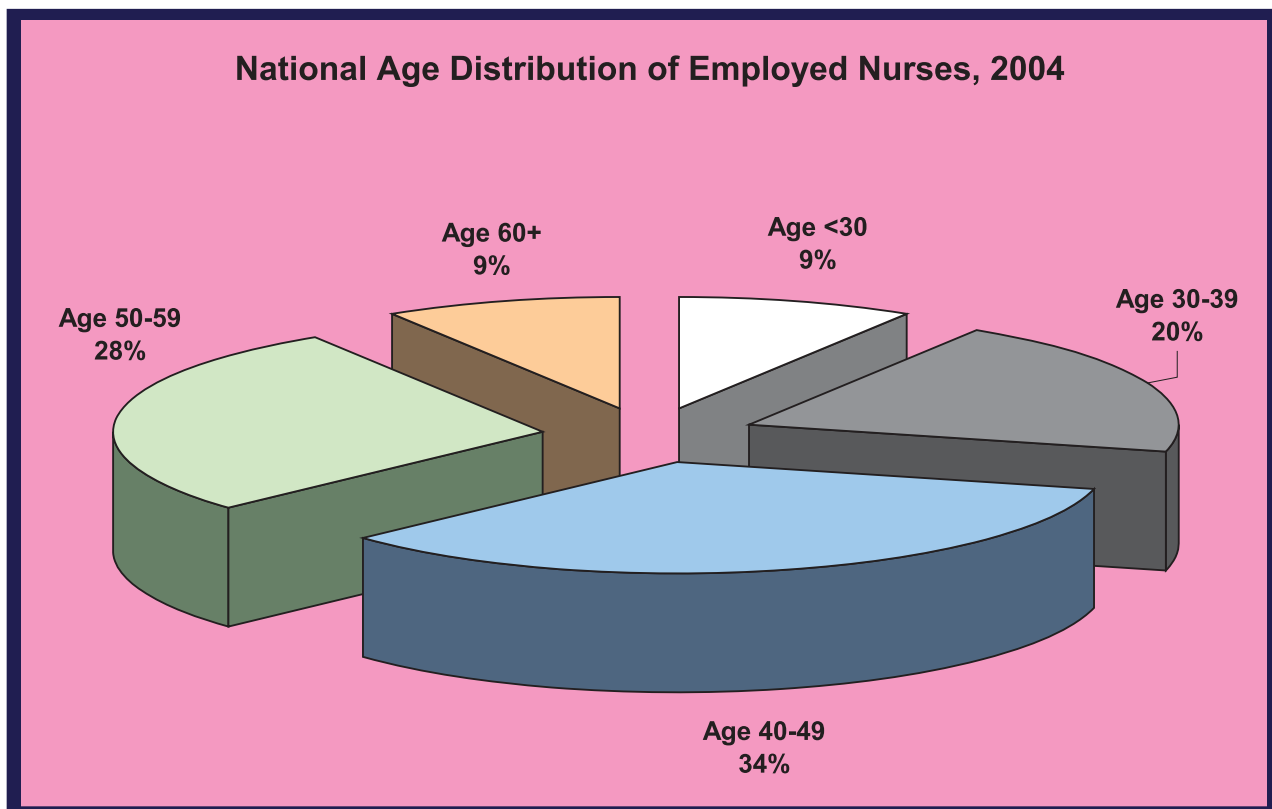
NLN. (2004). Startling data from the NLN's comprehensive survey of all nursing programs evokes wake-up call: Program-inclusive number raise nursing and nursing faculty shortages to crises level. Press Release.



In fact, nursing programs of all types have been unable to meet the demand resulting in fewer than 38% of applicants being accepted in 2005. Acceptance to a nursing program is so competitive that for the past 3 years more than 90% of accepted students went on to enroll (NLN, 2006). Despite these heroic efforts to meet the need for more nurses, the gap between supply and demand continues to increase.

Contributing to the current shortage is attrition from the nursing workforce. At the same time that fewer new nurses are being prepared, the nursing workforce is aging, and many are nearing retirement age. Nationally, the average age of nurses in 2005 was 46.8 years (HRSA, 2004). Nurses in California were about a year older, with an average age of 47.7 years (California Board of Registered Nursing [BRN], 2004).

**Figure 7**



Source: The New York Center for Health Workforce Studies. (2006). *The United States Health Workforce Profile*. p. 46. Available October 31, 2006 from <http://chws.albany.edu>



Because of the physical demands of bedside nursing, many nurses are unable to continue in the profession much past their mid-50's (Kimball & O'Neil, 2002). Therefore, many nurses will be considering retirement in the next few years.

In addition, 50% of nurses report dissatisfaction with their jobs and 22% plan to leave the profession of nursing in the next year (Hart Research Associates, 2001). The need to replace nurses who retire or leave the profession may essentially negate attempts by nursing programs to address the workforce shortage through increases in enrollment. Job vacancies due to retirement and attrition may well exceed job openings due to employment growth.

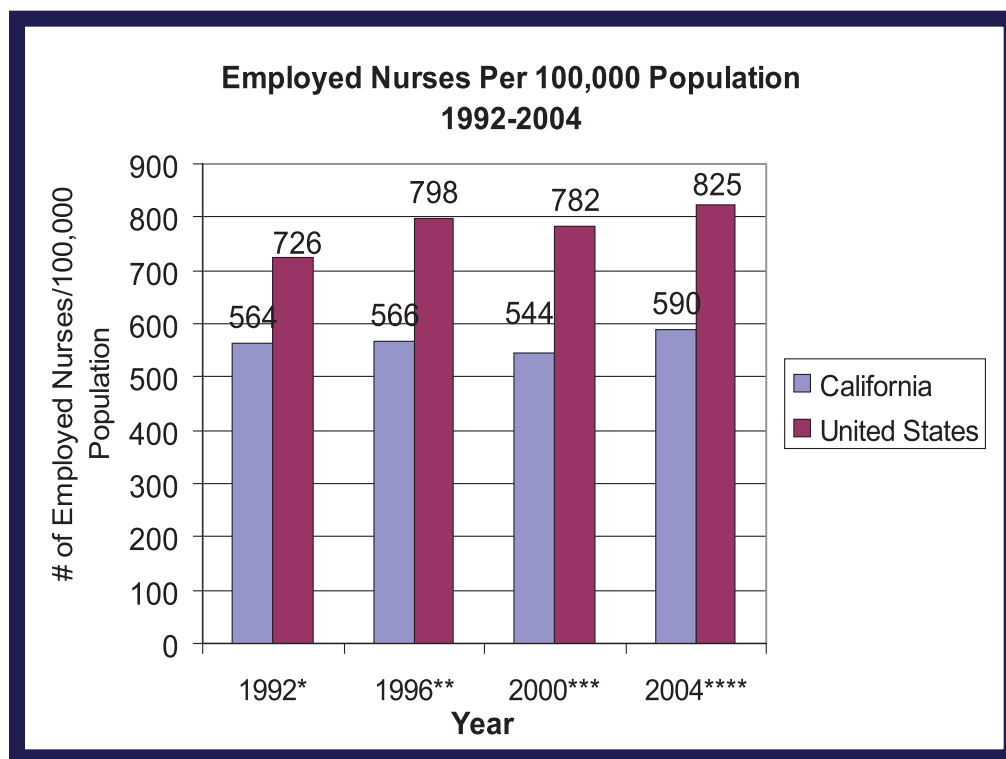
In the past, nursing and teaching were two of the few career options open to women. However, in the mid 1990's, the increasing number of attractive career paths for women resulted in a decreased applicant pool for the nursing profession. In response, several national campaigns to stimulate interest in the profession were launched. One of the most notable efforts in this arena is Johnson & Johnson's nationwide *Discover Nursing* campaign which provides information on nursing programs, salaries, and scholarships.

## **The Nursing Shortage in the San Joaquin Valley**

Although the shortage of nurses is being felt throughout the United States, not all geographic areas have been affected equally. One measure of how well the nursing workforce is meeting the demand is to determine the nurse-to-population ratio, or the number of employed nurses per 100,000 population. Although on average there are 825 working RNs per 100,000 people for the nation as a whole, there is a wide range between various states and regions. In 2004, the District of Columbia had 2,093 employed nurses per 100,000 people, while New Hampshire had 1,283. California was ranked 50th in the nation with only 590 employed registered nurses per 100,000 population (HRSA, 2004).



**Figure 8**



\*Source: HRSA. (1992). *The Registered Nurse Population: National Sample Survey of Registered Nurses 1992*. Available December 3, 2006 from <ftp.hrsa.gov/bhpr/nursing/Samplesurveyis/1992sampsur.pdf>.

\*\*Source: HRSA. (1996). *The Registered Nurse Population: National Sample Survey of Registered Nurses 1996*. Available December 3, 2006 from <ftp.hrsa.gov/bhpr/nursing/Samplesurveyis/1996sampsur.pdf>

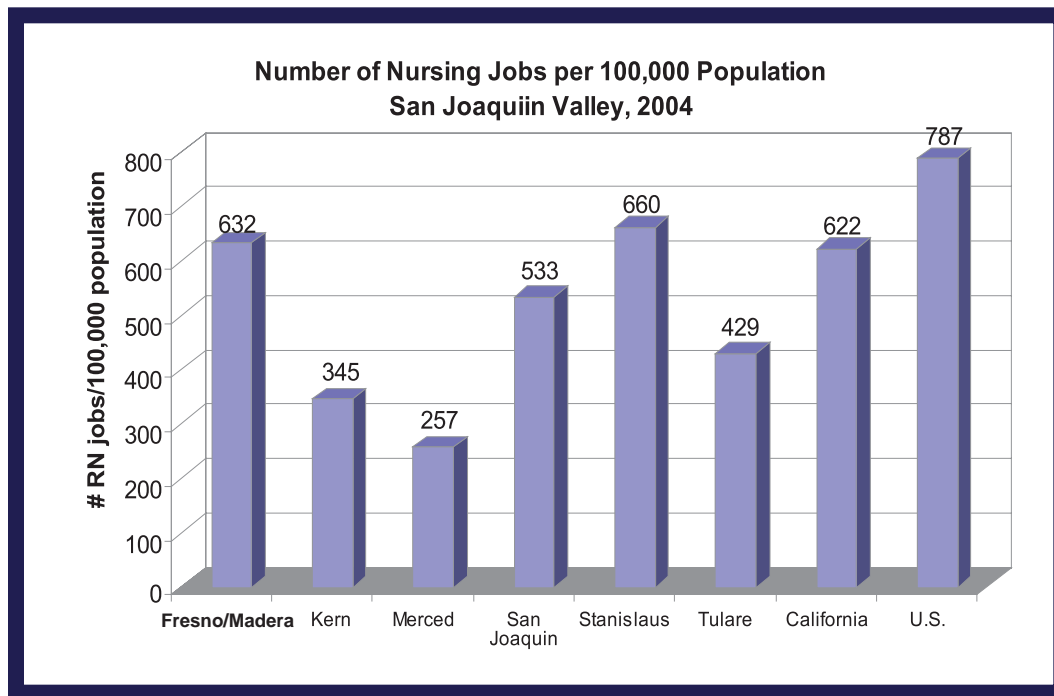
\*\*\*Source: Spratley, E., Johnson, A., Sochalski, J., Fritz, M., & Spencer, W. (2002). *The Registered Nurse Population: Findings from the National Sample Survey of Registered Nurses March 2000*. Washington, DC: U.S. Department of Health and Human Services

\*\*\*\*Source: HRSA. (2004). *The Registered Nurse Population: National Sample Survey of Registered Nurses March 2004. Preliminary Findings*. Available September 30, 2006 from <http://bhpr.hrsa.gov/healthworkforce/reports/rnpopulation/preliminaryfindings.htm>

Although California made substantial gains in its nurse-to-patient ratio in 2004, it is still well behind the rest of the nation. The San Joaquin Valley has been even more severely affected. In 2006, the California Institute for Nursing and Health Care (CINHC) issued a regional workforce report card comparing the RN job density of various regions to the state and national averages (Figure 9). Although basing calculations on the number of nursing jobs on which taxes are paid is a different method than that used by HRSA, CINHC believes that it is more accurate since it accounts for those nurses who hold more than one position.

The Fresno MSA including Madera, received a grade of C-, San Joaquin County was awarded a grade of D; while Kern, Merced, and Tulare counties all received F grades. (Lin, Lee, Juraschek, Jones, & Hsiao, 2006). Unfortunately, these dismal numbers do not tell the whole story, since the need for healthcare in the Valley is higher than many other areas due to both the poverty and poor health of its citizens. In addition, the capacity of educational institutions in the area to respond to this crisis is hampered by lack of faculty, funding, and inadequate infrastructure.

**Figure 9**



Source: Bureau of Labor Statistics, United States Department of Labor. (2004). *2004 State Cross-Industry Estimates, 2004 Occupational Employment and Wage Estimates*. Available November 12, 2006 from <http://www.bls.gov/>

Source: State of California, Department of Finance. (2006). *California County Population Estimates and Components of Change by Year, July 1, 2000-2006*. Available January 1, 2007 from [http://www.dof.ca.gov/HTML/DEMOGRAP/ReportsPapers/Estimates/E2/E-2\\_2000-06.asp](http://www.dof.ca.gov/HTML/DEMOGRAP/ReportsPapers/Estimates/E2/E-2_2000-06.asp)

Source: HRSA. (2004). *The Registered Nurse Population: National Sample Survey of Registered Nurses March 2004. Preliminary Findings*. Available September 30, 2006 from <http://bhpr.hrsa.gov/healthworkforce/reports/rnpopulation/preliminaryfindings.htm>

*Data for Kings County not available.*

Positive action requires accurate information. In order to accurately assess the impact of the current nursing shortage as well as to predict the future need for nurses, a number of variables must be considered. The demand for nurses is based, among other things, upon regional characteristics such as population growth and demographics including age, ethnicity, socioeconomic status, insurance status, and burden of disease. In addition, the supply of the nursing workforce must be considered. The supply of nurses includes students currently enrolled in nursing programs in addition to the current nursing workforce. (HRSA, 2005). It is important to consider the capacity of the educational programs, as well as the attributes of the nurses currently in the workforce, especially characteristics such as the number working part-time or in occupations other than nursing, age, retirement plans, and job satisfaction.

## The Demand for Nurses

The San Joaquin Valley, located in the heart of California, is composed of eight counties: Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare. It is home to about 3.9 million people, more than 10% of California's total population (State of California, Department of Finance, 2006). It is also an area of rich cultural diversity, with an estimated 70 ethnic groups speaking 105 different languages (Bengiamin, Capitman, Paul, Riordan, & Curtis, 2005).

Although the Valley is known worldwide for the abundance and variety of its agricultural products, the region faces serious economic and environmental challenges. The average per capita income in the eight counties is 32.2% lower, and the average poverty rate is 30.9% higher than state-wide



rates. College attendance is 50% lower, and access to healthcare services is 31% lower than California state-wide rates. Poor health access is partially due to severe shortages of physicians, especially in low-income and rural areas (California Partnership for the San Joaquin Valley, 2006). The air and water quality are among the worst in the nation (California Partnership for the San Joaquin Valley, 2006).

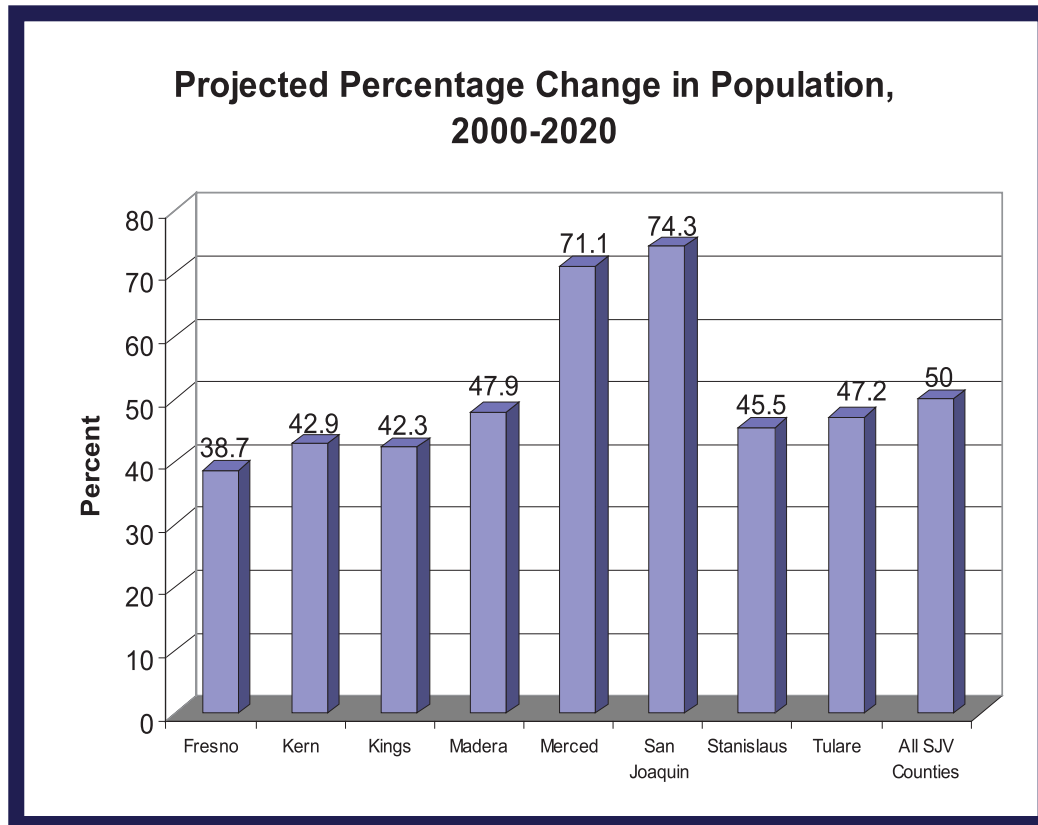
Demographics have a tremendous impact on the demand for health care in the present and the need for healthcare workers in the future. There are several demographic trends which are of particular importance when trying to predict the need for nurses: 1) the rate and volume of increase in the number of people, especially those in older age

groups, 2) the ethnic make-up of the area to be served, and 3) the health status of the population. It is also necessary to estimate the level of healthcare services that society will be able and willing to purchase at a given point in time (HRSA, 2003). All of these factors will determine not only the number of nurses needed, but where they will be needed, and the type of care they will need to provide.

### Demographics: Population Growth

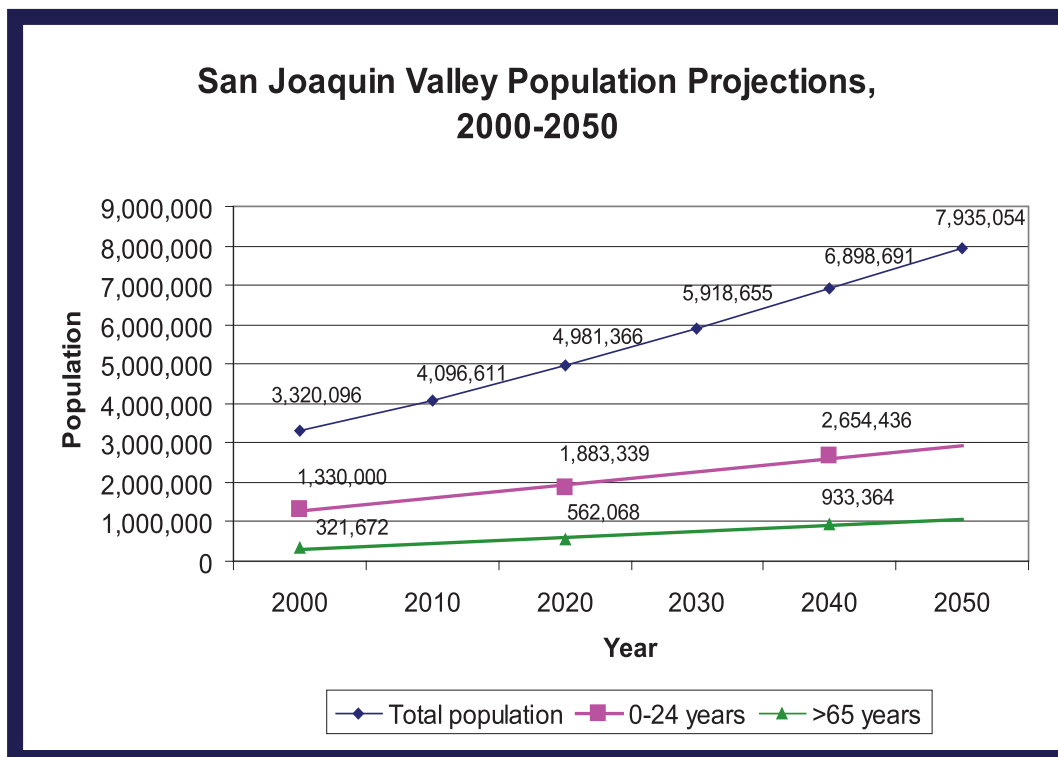
Despite its economic and environmental problems, the San Joaquin Valley is one of the fastest growing regions in the state and the country. It is estimated that the region's population will grow by one and a half million new residents by 2020, an increase of 50%, almost twice the state average of 28.8% (California Department of Finance, Demographic Research Unit, 2004). It is projected that by 2020 the San Joaquin Valley will have almost 4.9 million residents (Figure 11). The sheer numbers of this population explosion will demand a significantly larger nursing workforce. In addition, by 2020, the two groups of the population which consume the most health care, those under age 24 and those over age 65, are expected to almost double (Collaborative Economics, 2003). (Figure 11) And the population will continue to grow.

**Figure 10**



Sources: State of California Department of Finance, *Population Projections by Race/Ethnicity, Gender and Age for California and Its Counties, 2000-2050*, Sacramento, CA, May 2004.

**Figure 11**



Sources: State of California Department of Finance, *Population Projections by Race/Ethnicity, Gender and Age for California and Its Counties, 2000-2050*, Sacramento, CA, May 2004.



## Demographics: Age

In addition to a rapidly increasing population, the proportion of the population over age 65 is also rising. The increasing size of the elderly population is one of the most important factors influencing future need for nurses. Statewide, the number of residents 65 and older is projected to increase by 172% from 2000 to 2040, with most of the growth taking place prior to 2020. The elderly population in the San Joaquin Valley is expected to increase by 189% in the same time period (Lee & Villa, 2000). Not only will the total number of the elderly increase, but the segment with the most rapid growth will be the very old, those 80 and older (HRSA, 2003).

The greatest challenge for the nursing profession in the San Joaquin Valley over the next two decades may well be caring for the aging baby boomer generation. While the number of residents over age 65 will grow by 57% in the 20 years between 2000 and 2020 (State of California Department of Finance, 2006), it is projected that the number of nurses in the region will increase by only 13.5% by 2020 (Spetz, 2006). Those residents over age 65 have a much higher per capita use of healthcare services than the rest of the population. As scientific and medical innovations continue to increase longevity, it is predicted that healthcare utilization will continue to increase among the older and very old segments of the population. (Table 1)

**Table 1**

### Current National Utilization of Healthcare Services per 1,000 Population

Age Category	Inpatient Days Acute Care Hospital		Emergency Department Visits		Home Health Visits		Nursing Home Residents	
	Female	Male	Female	Male	Female	Male	Female	Male
0-4 yrs.	610	644	790	451	424	403	0.2	0.2
5-17 yrs.	68	63	396	208				
18-24 yrs.	278	112	577	311	318	180		
25-44 yrs.	273	188	398	272				
45-64 yrs.	389	475	341	201	1,339	1,035	2.6	1.0
65-74 yrs.	1053	1,345	470	243	6,682	4,400	14.5	6.9
75-84 yrs.	1928	2,303	706	321	17,409	11,406	52.4	32.0
≥85 yrs.	2893	3,564	1,126	507	25,521	21,273	194.4	187.0

Source: HRSA. (2003). *Changing Demographics: Implications for Physicians, Nurses, and Other Health Workers*. Available December 12, 2006 from <ftp://ftp.hrsa.gov/bhpr/nationalcenter/changedemo.pdf>

The elderly not only have greater medical needs, they also have different ones. Therefore, those specialties or institutions which care for this segment of the population will experience a particularly high need for nurses. It is estimated that the increase in the population in general as well as the aging of the population between 2000 and 2020 will result in a 30% increase in inpatient days at acute care hospitals, a 17% increase in emergency department visits, a 36% rise in home health visits, and a 40% increase in the number of nursing home residents (HRSA, 2003). Nationally, some experts predict that the demand for nursing home admissions will be even higher, perhaps even double the current rate (Alexih, 2001). This forecast is based on the fact that although currently many elderly are cared for at home by family members, in the future this may not be possible. This is due to a trend toward smaller family size and the increasing percentage of women, who often assume caregiver roles, in the workforce.



Increased numbers of hospitalizations, outpatient visits and nursing home admissions translates into the need for more nurses. Nationally, it is predicted that acute care hospitals will need 36% more staff nurses in 2020 than they had in 2000; outpatient clinics, 70% more; home health 109% more; and nursing homes, 66% more nurses (Dall & Hogan, 2002, cited in HRSA, 2003).

Studies have shown that elderly patients with higher levels of education and socioeconomic status are less likely to report disabilities and have fewer complications since they are more apt to follow provider instructions. In the San Joaquin Valley, with its high poverty rate and low average educational achievement, high levels of disability and complications in the elderly can be anticipated (Freedman & Martin, 1998).

As the population of the Valley and nation are aging, so are the nurses. A large number of baby boomer nurses will be retiring just as the rest of their generation starts to need more nursing care. By 2010 it is estimated that nationally approximately 40% of nurses will be 50 years old or older (United States General Accounting Office [GAO], 2001). Additionally, the baby boomers are followed by the baby bust generation, resulting in a major decline in the number of people in the workforce. So, at the same time that more people need more care, there will be fewer people to care for them. As the proportion of the elderly in the population increases, the traditional proportion of the population from which nurses are drawn will be much smaller. The ratio of women 18-44 years old to the oldest elderly (85 years old and older) will decline from 40 to 1 in 2000 to 15 to 1 by 2040 (GAO, 2001).

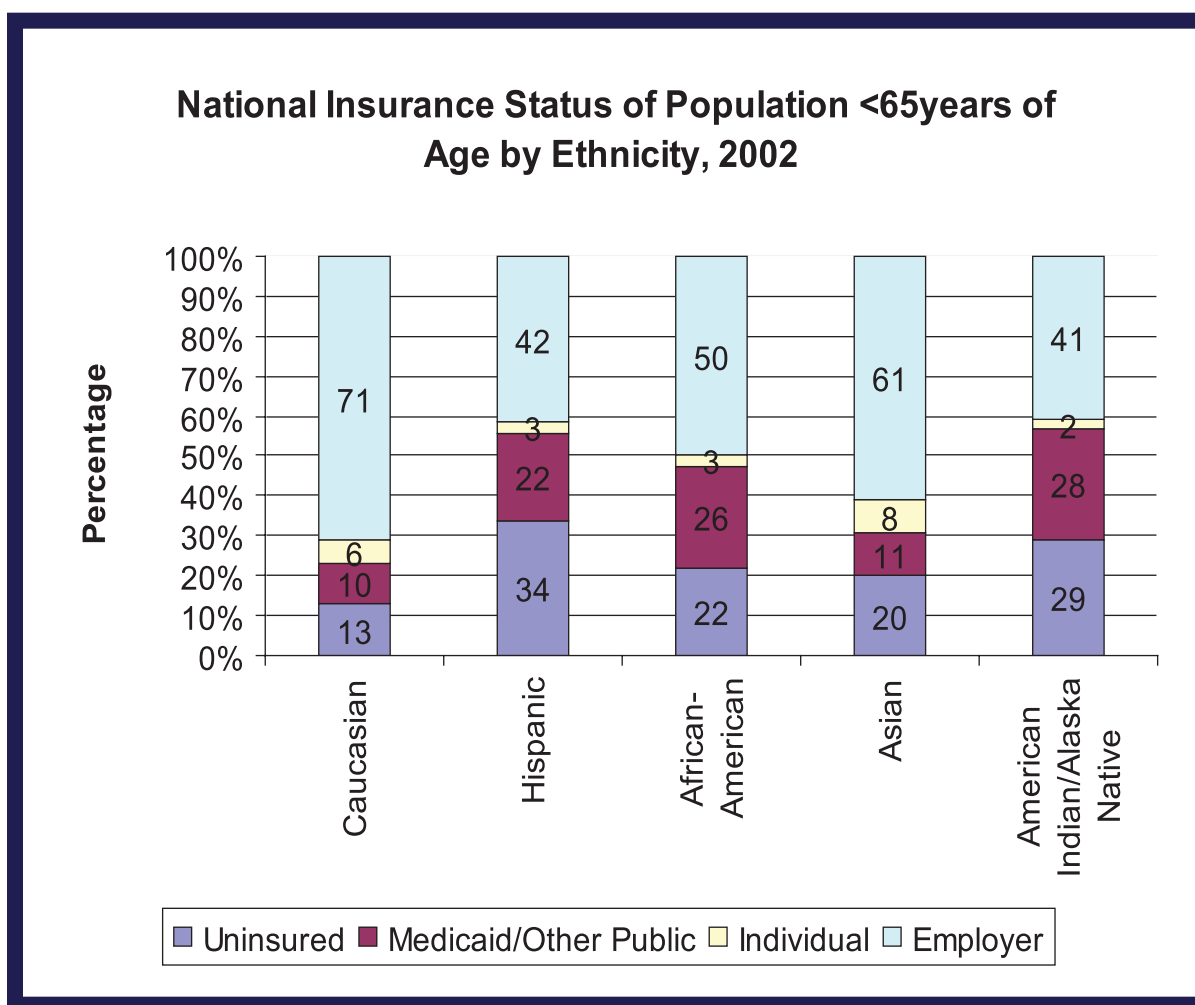
In addition, the aging of the population will have a significant effect on the United States economy due to the rapid escalation in healthcare spending. At the same time, the proportion of workers to retirees will shift from the current level of 3.3 workers for each retiree to 2.1 workers per retiree during the next 25 years (U.S. Census Bureau Public Information Office, 2006). This demographic shift will put a severe strain on Medicare and Medicaid which pay for a preponderance of healthcare for the elderly. Lack of funding may result in drastic changes in the system, such as the reduction of benefit levels, increased co-pays, or payment only for certain essential services (HRSA, 2003). All of these options would have an effect on the demand for nurses.

## Demographics: Ethnicity

The San Joaquin Valley is recognized for the diversity of its population, which is so great that in several counties there is no ethnic majority (Table 2). In addition, the San Joaquin Valley has the largest concentration of Laotian and Hmong refugees in the United States (The California Endowment, 2002).

Culture has an important effect on the utilization of healthcare services, and access is often directly related to ethnicity. Ethnically diverse populations have twice the likelihood of being uninsured compared to White Americans (HRSA, 2003). The uninsured are less likely to receive preventive care and, therefore, more likely to be hospitalized for problems which could have been prevented by timely medical care (Figure 12).

Figure 12



Source: Kaiser Commission on Medicaid and the Uninsured, (2004) Health Insurance Coverage in America: 2003 Data Update. Available March 6, 2007 from <http://www.kff.org/uninsured/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=49550>

Poor communication can hinder care and compliance for diverse patients speaking languages other than English. Studies have found that non-native English-speakers are less apt to have recommended medical studies performed, negatively impacting their care (Kravitz, Helms, Azari, Antonius, & Melnikow, 2000. as cited in HRSA, 2003). In addition, the prevalence of a number of health conditions varies by ethnicity. Finally, the type of healthcare services utilized also differs among patients from different ethnic groups. For example, African Americans have a disproportionately higher number of emergency department visits than do Caucasians. Ethnic groups with high birth rates, such as Hispanics and Southeast Asians, access obstetrical and pediatric services more frequently than do Caucasians (HRSA, 2003). Therefore, as the population becomes even more ethnically diverse in the San Joaquin Valley, more nursing services may be needed to provide different types of care.

As a measure to improve the healthcare system, the Pew Health Professions Commission recommended that diversity among healthcare workers be increased to reflect that of the population served (O'Neill & the Pew Health Professions Commission, 1998 as cited in HRSA, 2003). It is believed that patients trust and feel more comfortable with healthcare professionals with similar backgrounds. Currently, in California about 64% of nurses are Caucasian and only 8% are male (Fletcher, Guzley, Barnhill, & Philhour, 2004). Although the nursing workforce is overwhelmingly white and female, efforts are being made to recruit students from under-represented ethnic groups in the profession. Therefore, not only will more nurses be needed, but also more nurses from diverse backgrounds.

**Table 2**

**Estimated San Joaquin Valley Population Characteristics by Race/Ethnicity, 2005**

Area	Population	Race/Ethnicity					
		White	African American	Hispanic	Asian	Native American	Pacific Islander
Fresno	877,584	37.9%	5.7%	46.1%	8.9%	1.9%	0.2%
Kern	756,825	45.8%	6.3%	42.5%	3.9%	1.7%	0.3%
Kings	143,420	40.4%	8.6%	46.1%	3.3%	2.0%	0.3%
Madera	142,788	44.7%	4.3%	47.5%	1.6%	3.0%	0.4%
Merced	241,706	37.6%	4.1%	50.2%	6.7%	1.6%	0.2%
San Joaquin	664,116	42.4%	7.7%	33.9%	13.5%	1.3%	0.5%
Stanislaus	505,505	53.0%	3.0%	36.4%	5.0%	1.4%	0.5%
Tulare	410,874	39.1%	1.9%	54.2%	3.5%	1.9%	0.3%
<b>San Joaquin Valley</b>	<b>3,742,818</b>	<b>42.6%</b>	<b>5.2%</b>	<b>44.6%</b>	<b>5.8%</b>	<b>1.9%</b>	<b>0.3%</b>
<b>California</b>	<b>36,132,147</b>	<b>44.5%</b>	<b>6.8%</b>	<b>34.7%</b>	<b>12.1%</b>	<b>1.2%</b>	<b>0.4%</b>

Source: U.S. Census Bureau (2005), *State and County QuickFacts*, available from <http://quickfacts.census.gov/qfd/states/06000.html>

### Demographics: Socioeconomic Factors

Despite mild winters which provide agricultural jobs almost year round, the San Joaquin Valley is one of the most economically depressed regions in the United States. The per capita income is 32.2% lower than the California average of \$35,219, and the percentage of persons at or below the federal poverty level is 30.9% higher (California Partnership for the San Joaquin Valley, 2006). Although progress has been made in recent years, in 2005 the annual unemployment rate in the Valley was 60.9% higher than the state average (California Employment Development Department, 2004).

**Table 3**

### Economic Characteristics of the San Joaquin Valley

Area	Per Capita Income*	Percentage at or below the Federal Poverty Level**	Percentage of Unemployment***
Fresno	\$25,573	20.6%	9.0%
Kern	\$24,335	18.2%	8.3%
Kings	\$21,253	18.2%	9.4%
Madera	\$21,949	18.9%	7.7%
Merced	\$23,379	18.2%	9.8%
San Joaquin	\$25,527	14.7%	7.6%
Stanislaus	\$25,885	14.2%	8.3%
Tulare	\$23,153	21.5%	9.4%
<b>San Joaquin Valley</b>	<b>\$23,882</b>	<b>18.1%</b>	<b>8.7%</b>
<b>California</b>	<b>\$35,219</b>	<b>13.8%</b>	<b>5.4%</b>

\* Source: California Employment Development Department, Labor Market Information Division, *Local Area Profile*, 2004, available from <http://www.labormarketinfo.edd.ca.gov/>

\*\* Percentage at or below the federal poverty level (\$18,000 for a family of 4) is accurate for 2003.

Source: U.S. Census Bureau (2005), *State and County QuickFacts*, available from <http://quickfacts.census.gov/qfd/states/06000.html>

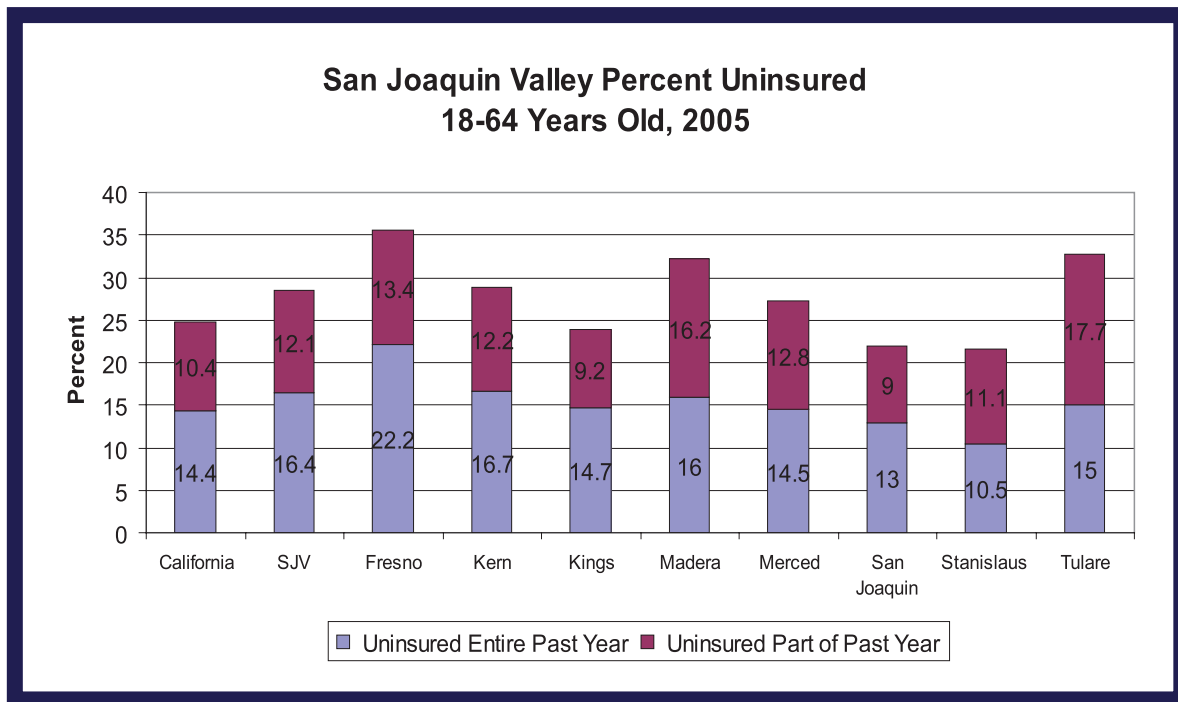
\*\*\* California Employment Development Department, Labor Market Information Division, *Monthly Labor Force Data for Counties: Annual Average 2005*, Sacramento, CA, April 2006, available from <http://www.labormarketinfo.edd.ca.gov>

### Demographics: Insurance Status & Access Issues

The percentage of people without health insurance for at least part of the year is higher in all eight counties of the San Joaquin Valley than the California average of 24.8% (UCLA Center for Health Policy Research, 2005). Many of the uninsured work in low paying jobs which do not offer employees health coverage (Porter, Fox, Beard, & Chapman, 2003). Fewer patients in the San Joaquin Valley have private insurance than patients in other parts of the state as well, with a much higher proportion depending on state administered programs. This mirrors the trend nationally (Figure 13)



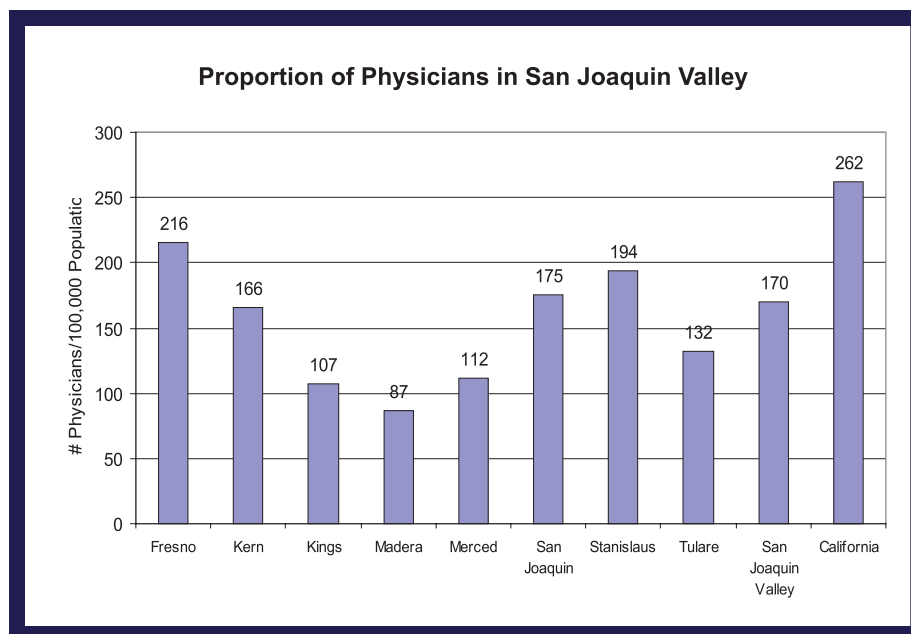
**Figure 13**



Source: UCLA Center for Health Policy Research, California Health Interview Survey, 2005

Other challenges include disparities in the availability of health care professionals. Although there were 94,546 physicians in California in 2005 (Medical Board of California, 2006), the number of doctors engaged in patient care per 100,000 people in the San Joaquin Valley was only 170 compared to 262 in California as a whole (RAND, 2005).

**Figure 14**

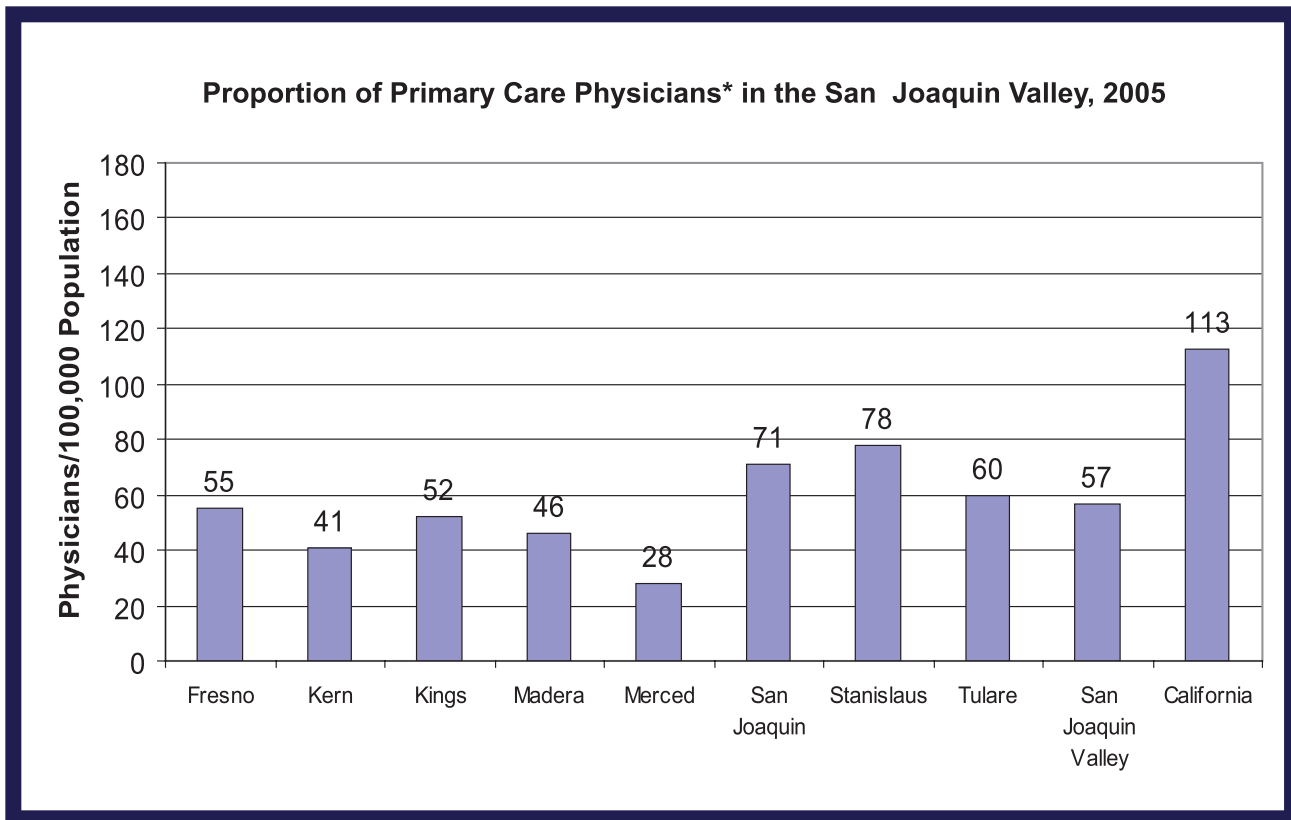


Sources: American Medical Association. (2006). *Physician Related Data Resources Available February 24, 2006 from [www.ama-assn.org/cgi-bin/sserver/datallist.cgi](http://www.ama-assn.org/cgi-bin/sserver/datallist.cgi)*

U.S. Census Bureau (2005), *State and County QuickFacts*, available from <http://quickfacts.census.gov/qfd/states/06000.html>

However, when the numbers are broken down, it becomes evident that although the Valley lacks specialists, (Figure 16), it is particularly in need of primary care physicians (Figure 15).

**Figure 15**



\*"Primary care physicians" are defined as family practitioners, general internists, general pediatricians, and general practitioners

Sources: *American Medical Association. (2006). Physician Related Data Resources Available February 24, 2006 from*

*[www.ama-assn.org/cgi-bin/sserver/datallist.cgi](http://www.ama-assn.org/cgi-bin/sserver/datallist.cgi)*

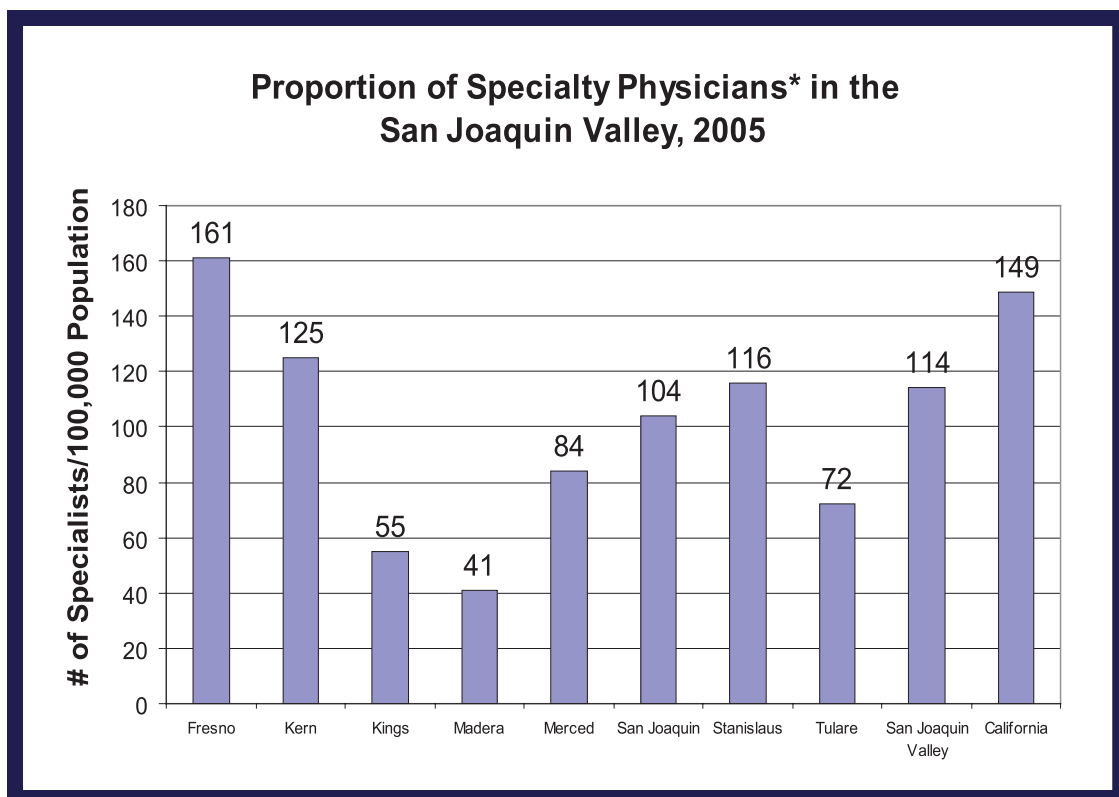
*2005-2006 Annual Report Medical Board of California, Available from [www.mbc.ca.gov/Pubs\\_Annualrept\\_2005-2006.pdf](http://www.mbc.ca.gov/Pubs_Annualrept_2005-2006.pdf)*

*United States Census Bureau, State and County QuickFacts, available from [www.quickfacts.census.gov/qfd/states/06000.html](http://www.quickfacts.census.gov/qfd/states/06000.html)*





**Figure 16**



\*"Specialty physicians" is defined as those board certified in a specialty other than general/family practice, internal medicine, or pediatrics

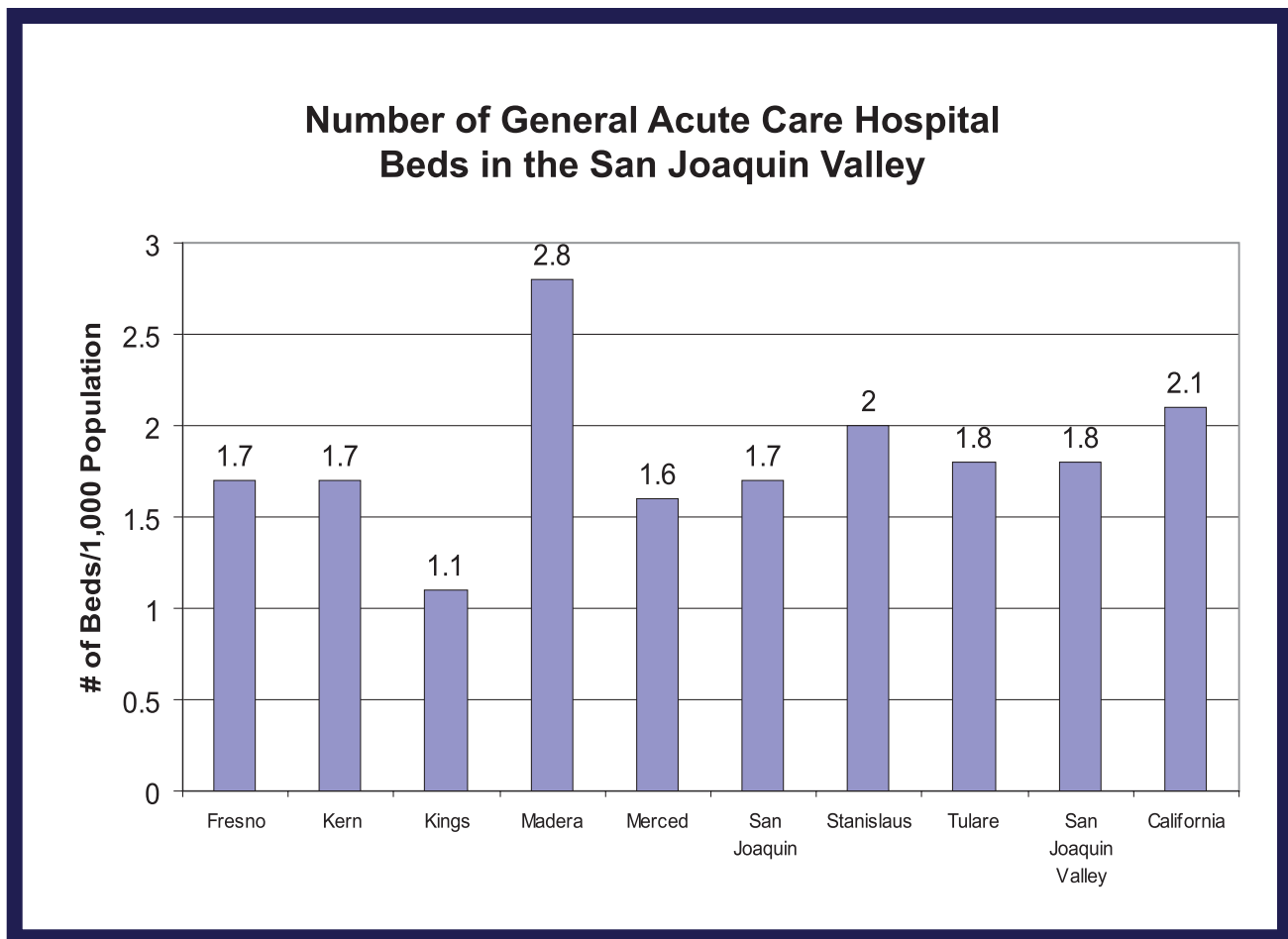
Source: American Medical Association. (2006). *Physician Related Data Resources Available February 24, 2006 from [www.ama-assn.org/cgi-bin/sserver/datallist.cgi](http://www.ama-assn.org/cgi-bin/sserver/datallist.cgi)*

2005-2006 Annual Report Medical Board of California, Available from [www.mbc.ca.gov/Pubs\\_Annualrept\\_2005-2006.pdf](http://www.mbc.ca.gov/Pubs_Annualrept_2005-2006.pdf)

United States Census Bureau, State and County QuickFacts, available from [www.quickfacts.census.gov/qfd/states/06000.html](http://www.quickfacts.census.gov/qfd/states/06000.html)

In addition, there is also a shortage of acute care hospital beds in the San Joaquin Valley. Although Madera County has a greater number of beds than the state average, that number is greatly inflated by the presence of Children's Hospital Central California, the thirteenth largest pediatric hospital in the nation. It is a regional medical center with 255 pediatric beds and serves not only the San Joaquin Valley, but also the Sacramento area and the Central Coast (Children's Hospital Central California, 2006). For adults and those in other counties, the lack of beds often leads to long waits for admission for elective procedures, early discharge or inability to admit. (Figure 17).

**Figure 17**



Source: \*DHS & DOF data; OSHPD data (CRB2005 #22) as reported in Umbach, K. (2005). *San Joaquin Valley: Land, People, and Economy*. Sacramento, CA: California Research Bureau

The lack of primary care physicians, specialists, and hospital beds all can play a part in making timely and effective healthcare difficult to obtain. When access to care is limited by lack of providers, segments of the population, including those without health insurance, are much less likely to receive preventive care designed to limit the development of serious health problems in the future. Lack of basic health care services can result in an undue burden of disease, higher utilization of emergency and in-patient services, higher acuity and increased comorbidities, and overall greater long term consumption of health resources (HRSA, 2003; Buerhaus, Konelan, Ulrich, Norman, & Dittus, 2006; JCAHO, 2002).

## Demographics: Burden of Disease

In addition to limited access to health care and substandard air quality, poor nutrition and inactivity have resulted in a number of chronic conditions and serious health problems for Valley residents. The prevalence of asthma, obesity, diabetes mellitus, hypertension, coronary artery disease, and osteoarthritis is greater in the region than for the state as a whole (Lund, 2005; Lund, 2005a; Lund, 2005b; Lund, 2003; Lund & Pheatt, 2004; Lund, Sugerman, & Foerster, 2004; Mendez-Luck, Yu, Meng, Jhavar, & Wallace, 2004). As the population in the Valley ages, the prevalence of these conditions will increase, placing still greater demands on the healthcare system and the nursing profession. In an area like the San Joaquin Valley which has a high prevalence of serious chronic conditions, a significant percent of the population living in poverty, and a rapidly growing population, it is readily apparent that a shortage of health care providers will have a serious impact.

## The Supply of Nurses

The supply of nurses is based on the number of nurses in the nursing pipeline, that is, the number of students currently enrolled in nursing programs in the Valley and the current nursing workforce (HRSA, 2005). The capacity of the educational programs in the Valley and attributes of the nurses currently in the workforce both influence projections of future supply.

### Nursing Pipeline: Students in Nursing Programs

Prior to acceptance in any type of nursing program, an applicant must graduate from high school and successfully complete a number of college-level prerequisites. Although these prerequisites lean heavily toward the sciences, other courses, such as English, speech, mathematics, psychology, and sociology are also commonly required. Pre-professional nursing students are often delayed in completing these prerequisite courses as these classes are over-enrolled. In addition, slight variations in prerequisite requirements between nursing educational programs may also delay student progression through this phase of the process. Students must then apply and be accepted to an accredited program approved by the California Board of Registered Nursing (BRN).

All nurses must complete an approved educational program and pass a national licensing examination. There are several types of nursing programs. Although there are currently no diploma programs in the region, about 14% of Valley nurses are diploma graduates (California Board of Registered Nursing, 2004).

Diploma programs are usually 3 years in length and located in a hospital. Associate degree programs often take 2 years of full-time study and are usually offered through a community college. Graduates from these programs receive an Associate Degree in Nursing (ADN) or an Associate of Science degree. There are currently six associate degree programs in the San Joaquin Valley: Bakersfield College, College of the Sequoias, Fresno City College, Merced Junior College, Modesto Junior College, and San Joaquin Delta College. About 57% of nurses in the region hold an associate degree in nursing (California BRN, 2004). Baccalaureate programs are usually four to five years in length and culminate in a Bachelor of Science in Nursing (BSN) degree.





There are three baccalaureate programs in the Valley: California State University, Fresno; California State University, Bakersfield; and California State University, Stanislaus. Twenty-nine percent of nurses in the Valley graduated from a BSN program (California BRN, 2004).

A number of diploma and associate degree nurses return to school to earn a bachelor's degree. Each of the three California State Universities in the Valley have RN-to-BSN program which allows these nurses to build on their previous educational and work experiences. This pathway has increased the number of nurses holding baccalaureate degrees in the Valley to about 36.6% of the nursing workforce (California BRN, 2004).

In addition, 9.4% of nurses in the Valley go on to earn a master's degree (California BRN, 2004). There are currently Master of Science in Nursing (MSN) programs at two institutions in the San Joaquin Valley region. At present, there are no nursing doctoral programs in the region, which is a serious barrier to nurses hoping to pursue doctoral education. In addition, since it is difficult to attract advanced degree nurses from outside the region, the absence of doctoral programs in nursing in the Valley has resulted in a severe shortage of doctorally-prepared faculty and researchers in the San Joaquin Valley.

The educational pipeline includes students throughout the entire educational process from application to licensure. Since it involves a series of steps, each of which can be considered as a target for policies to increase the size of the nursing workforce, each stage will be discussed separately.

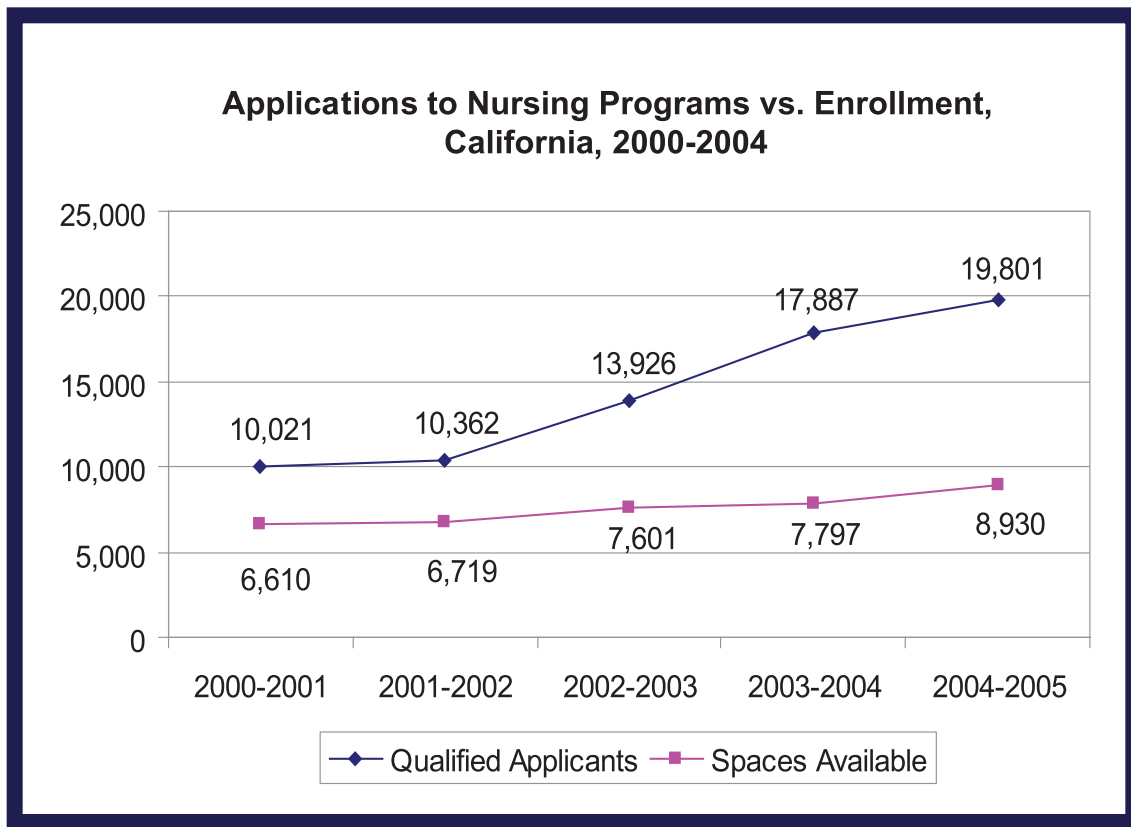
### **Application and Enrollment**

Preparation for a career in nursing starts well before the application process. Prospective students must receive both appropriate counseling and academic preparation in high school, including a strong background in English, reading, writing, mathematics, and science. Inadequate counseling and poor high school preparation often result in disappointment and low levels of success, especially among diverse populations. This in turn limits diversity in the nursing workforce.

Nursing programs lack sufficient faculty and clinical training opportunities to accommodate additional students. Currently, the number of applications to nursing programs far exceeds the number of available program slots for admissions, nationally, statewide, and in the Valley. Although nursing programs across the country have increased class size in order to address the national nursing shortage, national estimates indicate that more than 32,000 qualified applicants are not admitted each year (AACN, 2006b). Statewide, the gap between the number of qualified applicants and the number enrolled also continues to increase as well (Figure 18).



**Figure 18**



Source: Waneka & Spetz. (2006). *California Board of Registered Nursing Annual School Report: Trends in Nursing Education*.

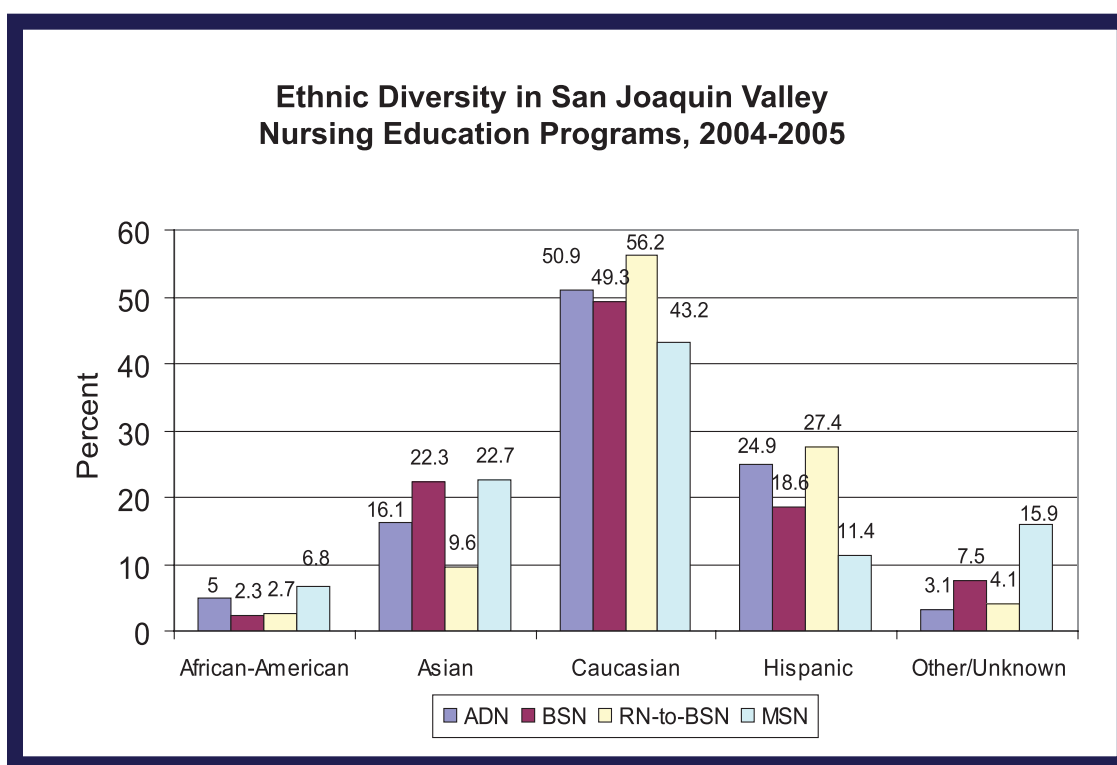
This same inability to admit the qualified applicants needed to relieve the nursing shortage is even more severe in the Valley's nine programs due to the shortage of nursing faculty. Although this number is probably artificially elevated because students frequently apply to several programs, each year the educational programs in the eight counties receive many more qualified applicants than they can accept. In 2004-2005, 1,334 or 47% of the qualified applicants were not accepted due to lack of faculty, funding, and infrastructure (California BRN, 2005).

Nursing programs use different methods to select their students. In most programs, either the total grade point average (GPA) or the GPA of selected prerequisites are among the selection criteria. However, some programs have resorted to a lottery system or first-come, first-served criteria to deal with the flood of applicants. Since less well-prepared students may be accepted using random selection methods, the number of students who are unsuccessful academically or unable to pass the licensing examination is often unacceptably high.

In addition to trying to admit the strongest students, programs in the Valley have made a conscious effort to increase diversity in their student body and recruit new populations into nursing. Although the passage of Proposition 209 in 1996 eliminated affirmative action in California, in 2004-2005 almost 50% of the San Joaquin Valley prelicensure students were from ethnic minority groups, twice

the national average for the discipline (Figure 19). In addition, there are a number of foreign nursing graduates in California who add to the diversity of the workforce (Martin-Holland, Bello-Jones, Shuman, Rutledge, & Sechrist, 2003).

**Figure 19**



Source: 2004-2005 California Board of Registered Nursing's *Nursing Education Program Survey*.

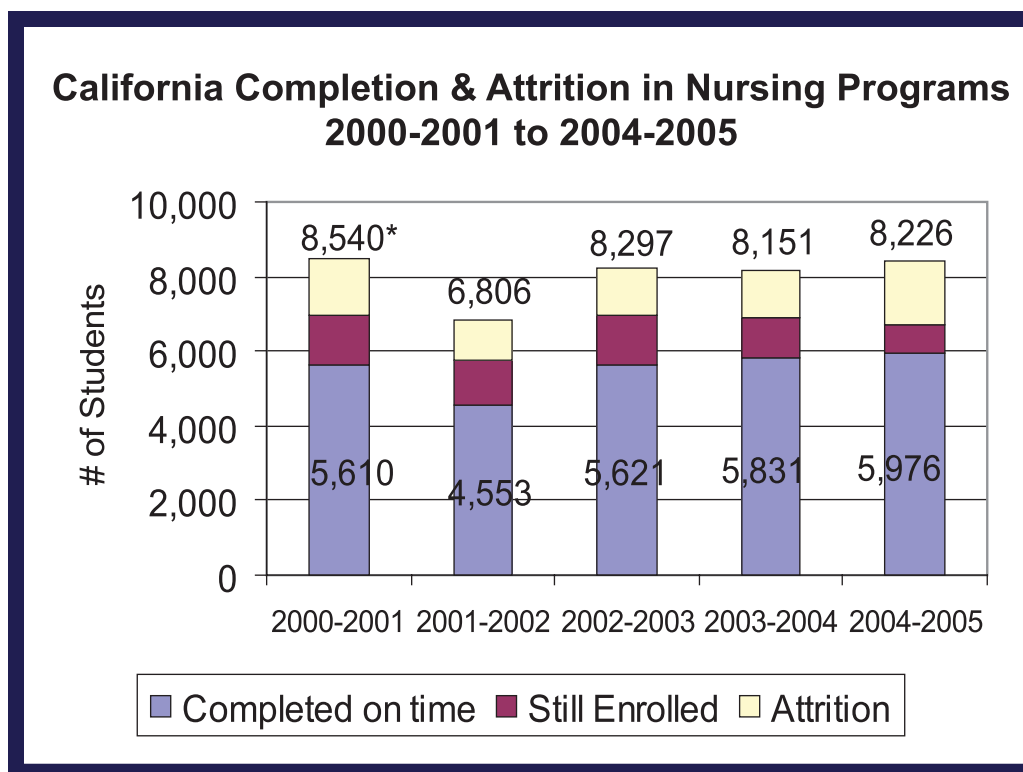
Programs also actively try to recruit male students. Men continue to be underrepresented in nursing in the San Joaquin Valley comprising only 14.8% of students in ADN and 14.9% in BSN programs. In post-licensure programs, 15.1% of RN-to-BSN program students and 18.2% of master's degree program students are men (California BRN, 2004).

With these goals in mind, in 2004 the pre-licensure nursing programs in the San Joaquin Valley reported a total of 949 new generic students enrolled in their first nursing course, 77.3% in ADN and 22.7% in BSN programs. (Generic nursing students are those with no previous experience in nursing. This term is used to differentiate them from RN-to-BSN students, who are already practicing diploma or ADN nurses returning to obtain a bachelor's degree.) With the admission of this class of generic students, the 9 nursing programs in the Valley have reached 99.8% of their capacity based on faculty requirements, space availability, and clinical site placements. In addition, there were 73 RN-to-BSN students in Valley programs (California BRN, 2004). Strategies targeting admissions must focus on expanding capacity through increasing numbers of faculty, enhancing infrastructure, developing clinical sites, and leveraging funding and resources.

## Retention & Attrition

About a quarter of nursing students in both BSN and ADN programs fail to complete their nursing studies within the expected schedule of the program. Many will drop back a semester or two due to illness, family responsibilities, financial concerns, or academic load. Many of these students will go on to graduate at a later date. However, in 2004-2005, 120 ADN and 30 BSN students either dropped out or were disqualified. The five most common reasons students gave for failure to continue their nursing studies were academic failure, personal reasons, clinical failure, financial need, and change of major or career interest. In an effort to decrease this high level of attrition, prelicensure programs have employed a number of strategies, including mentoring, remediation, tutoring, personal counseling, and increased financial aid (California BRN, 2005).

**Figure 20**

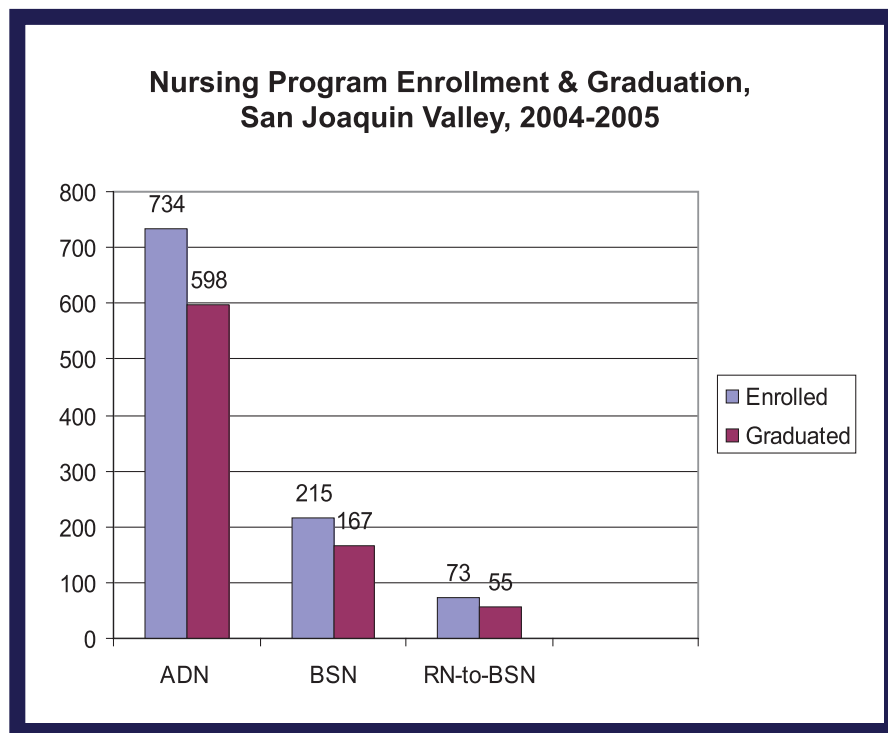


\*Total enrollment is cumulative and may include those students enrolled in previous years.

Source: Waneka, R. & Spetz, J. (2006). California Board of Registered Nursing annual school report: Trends in nursing education, 2000-2001 to 2004-2005. Available September 21, 2006 from <http://www.rn.ca.gov/forms/pdf/trends.pdf>

Despite these efforts, the attrition rate continues to climb, reaching over 1,700 statewide in 2004-2005 (California BRN, 2005). This high rate of attrition, if not addressed effectively, will add significantly to the growing nursing shortage. Over the next ten years if attrition remains at the current rate, 17,000 slots in nursing programs will fail to result in program graduates.

**Figure 21**

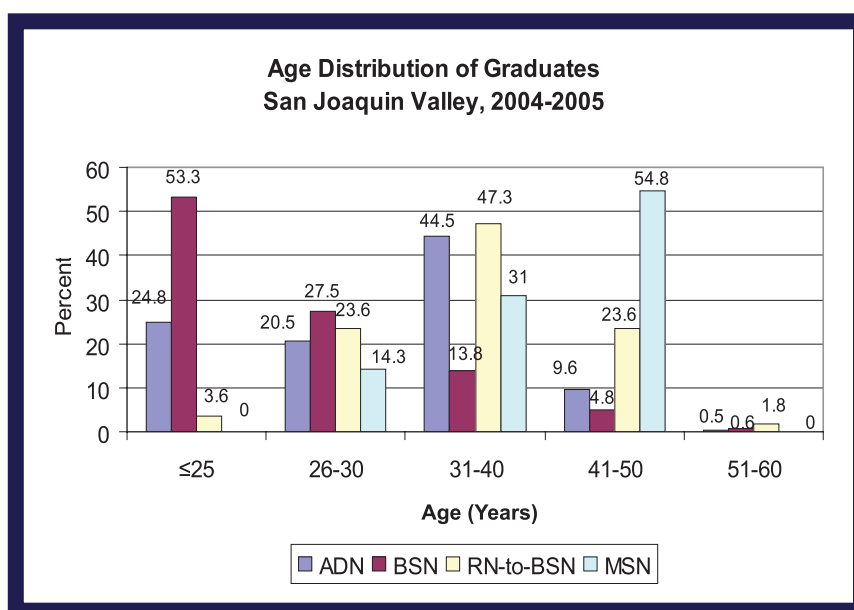


Source: 2004-2005 California Board of Registered Nursing's Nursing Education Program Survey.

### Graduation

The number of new nurses graduating in the San Joaquin Valley in 2004-2005 was 765, with 598 ADN graduates and 167 from BSN programs (Figure 21). Graduates in the San Joaquin Valley tend to be older than new nurses in the past, with almost half of the prelicensure graduates older than 30 years (California BRN, 2005) (Figure 22).

**Figure 22**

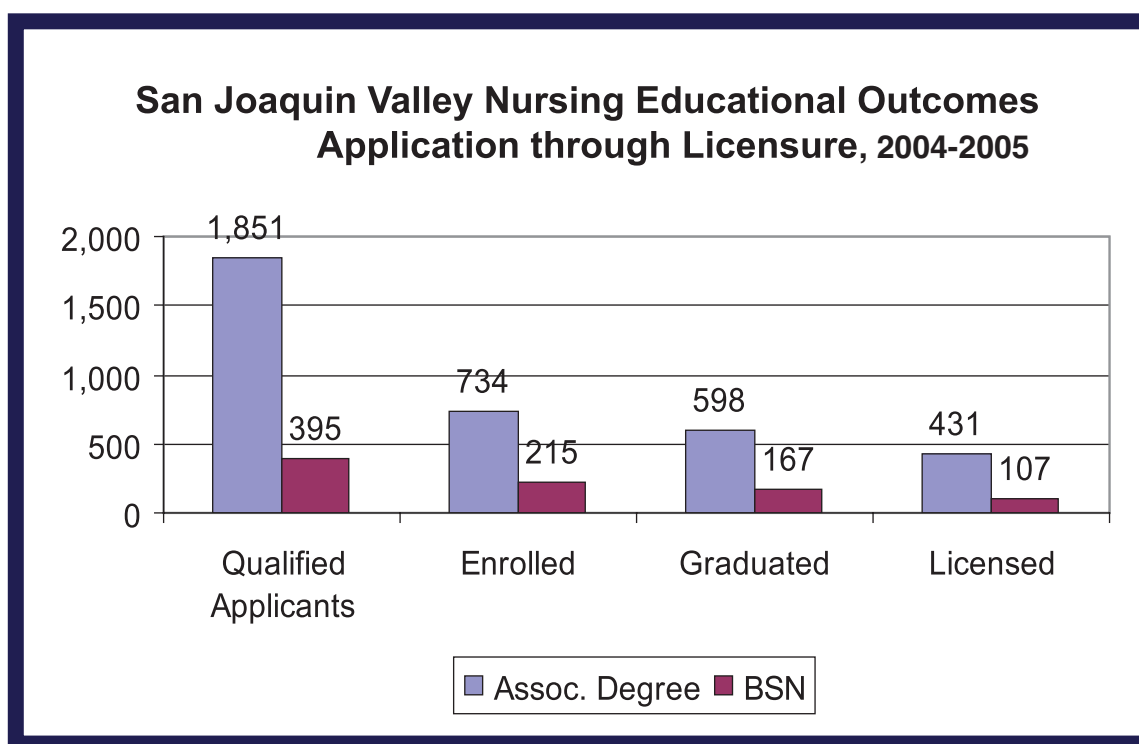


Source: 2004-2005 California Board of Registered Nursing's Nursing Education Program Survey.

## Licensure

To ensure public protection and safety, graduates are required to take and pass a national licensing examination that measures competence to perform safely and effectively as an entry-level registered nurse. The National Council Licensure Examination for Registered Nurses (NCLEX-RN®), developed by the National Council of State Boards of Nursing (NCSBN), is administered by the California Board of Registered Nursing. It is expected that new graduates will have a success rate of 80% to 90% (California Board of Registered Nursing, 2000; NCSBN, 2004). A review of the NCLEX-RN pass rates revealed from 2002 to 2006, the average NCLEX-RN pass rate for all nine programs in the San Joaquin Valley ranged from 69% to 96% for graduates who took the exam for the first time. In 2004-2005, 19% or 127 of the 665 new RNs who graduated from Valley nursing programs were unable to obtain their RN licensure due to NCLEX-RN failure (California BRN, 2005). In fact, only 538 newly licensed RNs joined the workforce that year, less than 60% of what was needed to fill the 905 vacant positions. The situation improved slightly in 2005-2006, when 854 RNs took the RN licensure examination for the first time. Although 141 or 16.5% of them failed, the remaining 713 were licensed and able to join the nursing workforce (California BRN, 2006).

Figure 23



Source: 2004-2005 California Board of Registered Nursing's Nursing Education Program Survey

Strategies are desperately needed to improve the percentage of students who pass the examination and enter the workforce. This is of such concern that the California Board of Registered Nursing established a task force in 2000 to identify factors that contribute to NCLEX-RN failure and to determine strategies to improve success rates. Several student characteristics were identified as putting the student at risk of NCLEX-RN failure. Lack of English fluency has been shown to have a significant effect on NCLEX-RN performance (California BRN, 2000). Deficits in pronunciation, vocabulary, fluency, and grammar make it difficult for students to both communicate and comprehend. In addition, poor academic preparation especially related to reading competency and math skills was found to be a significant barrier to NCLEX-RN passage. Since nursing textbooks generally are written at a 14th grade reading level, reading competency at least at the 12th grade level has been identified as necessary for NCLEX-RN success (Arathuzik & Aber, 1998). Students reading at a lower level may have difficulty mastering theoretical content. In addition, many students have numerous other responsibilities besides school which can adversely affect passing the licensure examination. Students who work more than 20 hours a week or have excessive family responsibilities have also been identified as being at increased risk of NCLEX-RN failure. Finally, students who wait more than 5 months after graduation to take the examination are more apt to fail (California BRN, 2000).

To improve outcomes, many nursing programs are examining their admission and academic policies in order to identify and implement strategies to facilitate student success. Policies that permit students to retake prerequisite science courses as well as random or first-come/first-served admission policies have been implicated as factors resulting in a lower NCLEX® pass rate (California Board of Registered Nursing, 2000). A substandard pass rate for first-time NCLEX® examinees may adversely impact a nursing program in a number of ways, including decreasing the applicant pool and increasing scrutiny by stakeholders and regulatory agencies, such as the BRN and Commission on Collegiate Nursing Education (Norton, et al, 2006). In addition, providing admission slots to students who complete the program but do not pass the licensing examination deprives another student of the opportunity to become a nurse.

### **Nursing Pipeline: The Current Nursing Workforce**

At present, the nurse-to-population ratios in all eight counties of the San Joaquin Valley are well below the national average and most are below the state mean. This is the case even though the Valley has the highest rate of nurses actually employed in nursing in the state, with 91.8% of the nurses with an active nursing license currently working in healthcare full or part-time. The majority of the approximately 21,000 nurses in the Valley are white (67%) and almost all are female (93%). They also tend to be middle-aged or older. Only 22% are under 40, while almost 20% are 55 or older. Almost 14% of nurses currently working in the Valley plan to retire or to leave nursing within the next 5 years, while another 20% plan to decrease the number of hours they work. This attrition from the current workforce will further exacerbate the severe nursing shortage in the Valley (California BRN, 2004).

Although part-time workers represent additional capacity that is already in the workforce, only 26% or approximately 5,500 nurses in the Valley currently work less than 33 hours a week (California BRN, 2004). In addition, since the majority of the nursing workforce is older and female, many are considering decreasing their hours even more due to health concerns or in order to care for children or elderly parents (HRSA, 2005). Of the approximately 1,722 nurses with active licenses who are not currently working as nurses, only about 23% or about 400 nurses are planning on returning to the profession. Twenty-six percent state that they will definitely never return to nursing. This leaves a little more than half of this group undecided (California BRN, 2004).



In addition, there is a substantial mismatch between the educational preparation of the current workforce and what employers want. Currently, 29% of nurses in the San Joaquin Valley are baccalaureate prepared, while 71% have an associate degree or are diploma nurses (California BRN, 2004). However, the demand for nurses with baccalaureate and master's degrees continues to rise, while the demand for associate nurses is decreasing (National League for Nursing, 2003). This increased demand is due in part to the complexity of healthcare today and for the need for nurses with specialty training to work in intensive care units, emergency rooms, and other specialized areas (Keating & Sechrist, 2001). Therefore, there is a strong national movement to increase the number of baccalaureate prepared nurses. Research has shown that patients in hospitals with a higher proportion of baccalaureate prepared nurses have fewer complications and have lower rates of death than those in hospitals with fewer nurses with BSN degrees (Aiken, Clarke, Cheung, Sloane, & Silber, 2003). These findings, among others, prompted the National Advisory Council on Nurse Education and Practice (NACNEP) to recommend to Congress and the U.S. Secretary of Health that at least two-thirds of the nursing workforce have at least a baccalaureate degree by 2010. NACNEP based this recommendation on the belief that BSN education with its much broader, more scientific base is necessary to address current complex health needs (NACNEP, 2001).

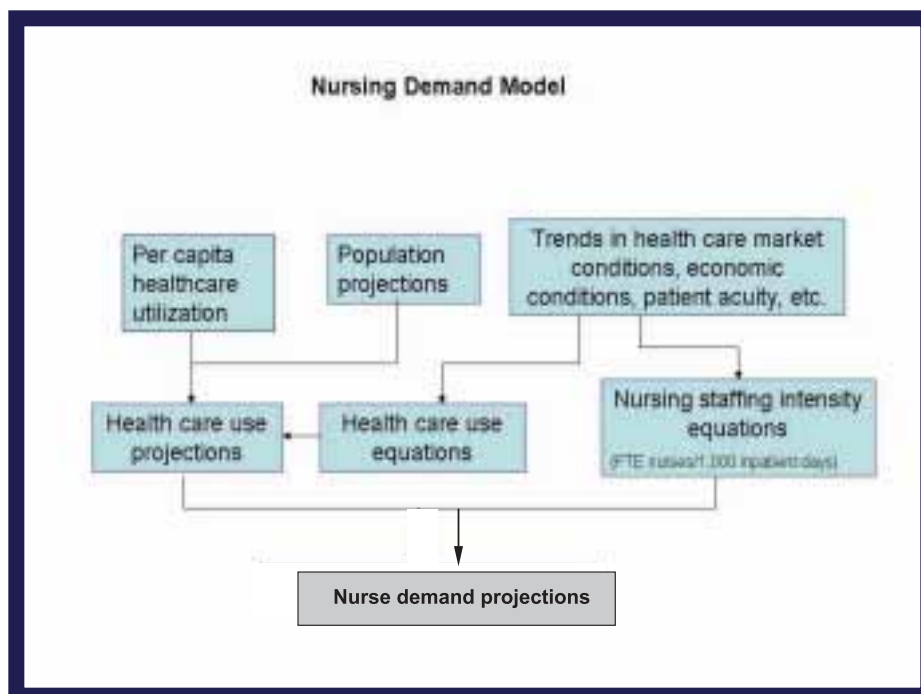
The nursing shortage has become so severe in the Valley that in 2005 when the Hospital Association of Southern California (HASC) and CINHC surveyed hospitals in the area, 11 were actively recruiting foreign-educated nurses and another three were considering overseas recruitment. Overseas recruitment has been a common short-term strategy which is costly, time consuming, and often unsatisfactory. The average cost of recruiting a foreign-educated nurse is about \$20,000 and can be as much as \$80,000, not including orientation expenses. In addition, orientation is often prolonged, taking up to 3 years (HASC, 2006). However, with an average vacancy rate in the San Joaquin Valley for nursing jobs of 15% (California BRN, 2004) compared with a 12% statewide rate, the cost and the ethical consideration of hiring nurses away from areas with even more severe nursing shortages are often overlooked (HASC, 2006). However the effect of these losses on a developing country can be devastating. In 1999, the number of nurses from Ghana who were lost to overseas recruitment was the same as the number of new graduates. The next year, twice as many emigrated as graduated, resulting in a vacancy rate in nursing positions of over 50% (Changutura & Vallabhaneni, 2005).

## **The Need for Nurses: Present & Future**

Although it is fairly easy to determine the extent of the nursing shortage currently, it is much more difficult to predict future need, since there are a number of interacting variables that have to be considered. These factors include the nursing education system, legislative and regulatory factors, the healthcare environment, technology, economic indicators, and population demographics as well as the number and attributes of the current and future nurses themselves (HRSA, 2003). The capacity of the educational programs in the region must be considered, including the ability of the programs to accept students, the percentage of those students who graduate, and the number who pass the licensure examination. New opportunities for nurses both within traditional healthcare settings and in other areas as well must be factored in. In addition to changes in the healthcare delivery system, population growth and demographics such as age and insurance status must be taken into account.

One method that has been widely used to determine the future need for nurses is the Nursing Demand Model developed by HRSA (Biviano, Tise, Fritz, & Spencer, 2004; Dall & Hogan, 2002).

Figure 24



Source: Dall, T.M. & Hogan, P.F. (2002). *The Nursing Demand Model: Development and Baseline Forecasts*. Report prepared for Workforce Analysis and Research Branch, Office of Research and Planning, BHPr, HRSA.

Biviano, M.B., Tise, T., Fritz, M., & Spencer, W. (2004). *What is Behind HRSA's Projected Supply, Demand, and Shortage of Registered Nurses?* Available December 14, 2006 from <ftp://ftp.hrsa.gov/bhpr/workforce/behindshortage.pdf>

The possibility of technological advances must also be considered, since a significant innovation could have far-reaching effects on how and where care is provided, as evidenced by the role the laparoscope has played in the growth of out-patient surgery. However, although outpatient surgery has caused a decline in acute care hospital days, at the same time it has increased the acuity and complexity of hospitalized patients.

It is estimated that there were 17,070 nursing jobs in the San Joaquin Valley in 2002, with a shortfall of 2,410 registered nurses resulting in a gap of 14 to 15% (California BRN, 2004). Using the Nursing Demand Model, by 2012 it is projected that the number of RN jobs in the region will increase by 32.1% to 22,550. Stanislaus County is expected to experience the greatest percentage of growth (42.9%), and Kings County the least (11.6%). The California Employment Development Department has projected in the next six years there will be an average of 905 RN job openings every year in the eight-county region (Table 4).

**Table 4****RN Occupational Projections of Employment, 2002 to 2012**

Area	RN Employment*		Change		Annual Average # of New Jobs
	Estimated 2002	Projected 2012	#	%	
Fresno/Madera**	5,550	7,730	2,180	39.3%	334
Kern	3,210	3,990	780	24.3%	145
Kings	430	480	50	11.6%	14
Merced	650	730	80	12.3%	22
San Joaquin	3,160	4,200	1,040	32.9%	170
Stanislaus	2,470	3,530	1,060	42.9%	158
Tulare	1,600	1,890	290	18.1%	62
<b>San Joaquin Valley</b>	<b>17,070</b>	<b>22,550</b>	<b>5,480</b>	<b>32.1%</b>	<b>905</b>
<b>California***</b>	<b>201,600</b>	<b>258,400</b>	<b>56,800</b>	<b>28.2%</b>	<b>9,900</b>

\* Data for RN projections of employment are from the California Employment Development Department, Labor Market Information Division, (2006). Occupation Explorer, accessed October 17, 2006 from <http://www.labormarketinfo.edd.ca.gov>

\*\* Data for Fresno County is not available. Data for Fresno MSA has been displayed for Occupational Projections of Employment (also called “Outlook” or “Demand”).

\*\*\* Data estimates for California are from the California Employment Development Department, Labor Market Information Division, Health Care Careers, Sacramento, CA, July 2005, p. 89.

However, predictions vary about the future need for nurses in California and the Central Valley. The California Endowment has predicted that the state as a whole will need between 30% and 60 % more registered nurses by 2020 to meet the needs of our growing and aging population (The California Endowment, 2002). Another estimate is that 571 new nurses will be needed every year for the next 6 years just to maintain the status quo in the Valley (California Employment Development Department, 2006). Although there are a number of variables that cause expert predictions to vary, all sources agree that the San Joaquin Valley is in the midst of a serious nursing shortage that is rapidly escalating.

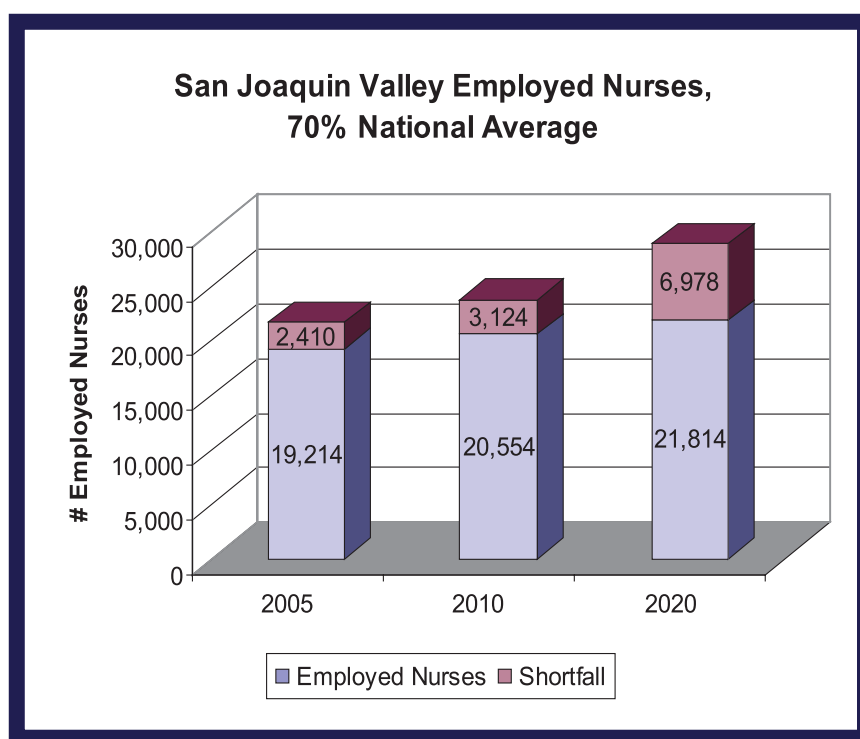
## Setting Workforce Targets

Much of the current discussion related to nursing workforce issues is based on an ideal number of nurses per capita. Therefore, it is important to determine the regional targets based on population growth and the characteristics of the population, including the number of undocumented residents and the number of uninsured residents, and the age of the nurses in the region. The capacity of the educational programs in the region must also be considered (Jones, 2006).

It has been suggested that goals at three different levels be established: the first goal is to maintain the status quo by achieving 70% of the national average or 578 nurses per 100,000 population, the second target is 743 or 90% of the national average, and the third to achieve the national average of 825 nurses per capita. Assuming that the utilization of health care remains the same, that the rate of immigration and migration does not change, and that the capacity of educational programs remains the same, the Central Valley will need an additional 3,124 nurses in 2010 and 6,978 more by 2020 (Jones, 2006) to achieve 70% of the national average.

In order to maintain the status quo of 70% of the national average, the nursing programs in the Valley would need to produce 465 more graduates each year from now until 2020. This would mean an increase of 62% in successful completions with all students passing the licensing exam and remaining in the area.

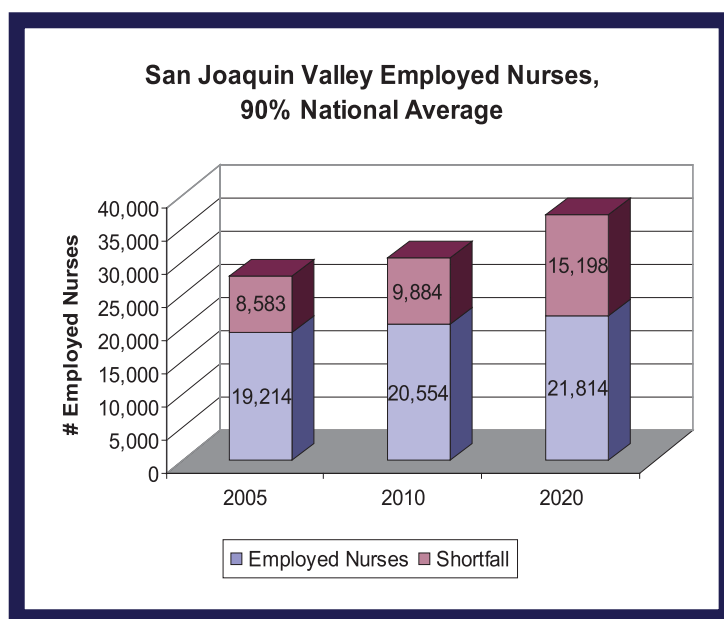
**Figure 25**



Source: Jones D, (2006). *Setting Educational Targets: San Joaquin Valley, A Report Update on the Projected Shortage and Educational Capacity Targets*.

With a target of 90% of the national average, the Valley would need almost 10,000 additional nurses by 2010 and over 15,000 by 2020 (Jones, 2006). Annually, nursing education programs in the area would need to graduate 1,013 more students. Since only 731 students graduated in 2005, this would mean a 132% increase in the number of graduates, again assuming that all of these graduates passed the NCLEX and remained in the Valley.

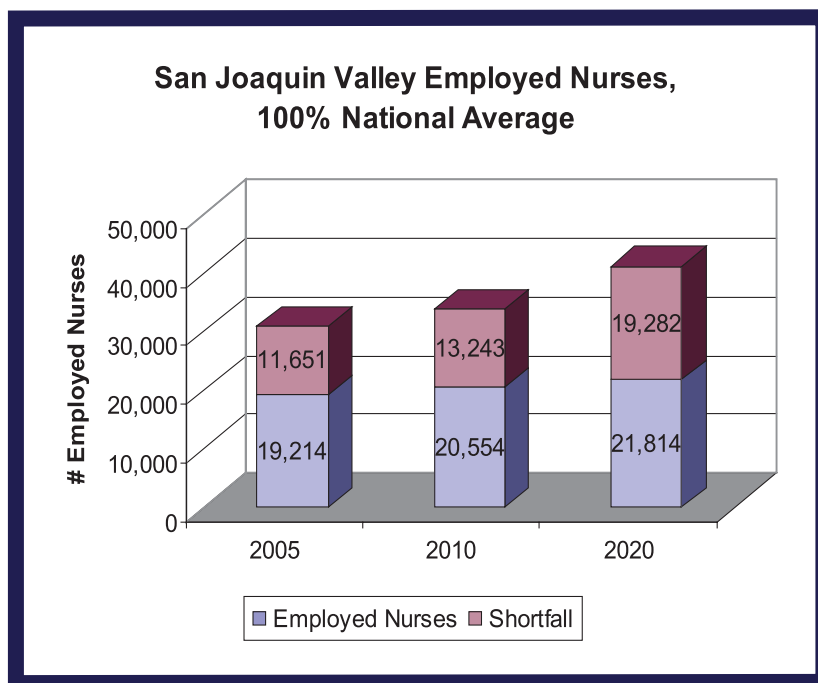
**Figure 26**



Source: Jones D, (2006). *Setting Educational Targets: San Joaquin Valley, A Report Update on the Projected Shortage and Educational Capacity Targets.*

Finally, in order to achieve the current national average, almost 20,000 new San Joaquin Valley nurses would be needed by 2020 (Jones, 2006).

**Figure 27**



Source: Jones D, (2006). *Setting Educational Targets: San Joaquin Valley, A Report Update on the Projected Shortage and Educational Capacity Targets.*

## The Problems

In the past, many strategies addressing workforce shortage issues have focused on immediate solutions, such as recruiting nurses from other states or from overseas (The California Endowment, 2002). However, these solutions have proven repeatedly to be ineffective. Perspectives on nursing education and the public perception of nurses and their role need to be examined. Resolving the nursing shortage in the Central San Joaquin Valley will require the collective effort of all stakeholders: nursing programs, centers for nursing, businesses, hospital associations, foundations, state education agencies, the public workforce system, and other health care entities. Simplistically, there are two ways to increase the number of nurses: educate more new nurses and encourage already licensed nurses to continue in or return to the field. The following are some of the issues that need to be addressed in order to effectively increase the number of nurses.

### Lack of Educational Capacity

Increasing the number of new nurses in the San Joaquin Valley depends on an adequate number of programs with an adequate number of admission spaces. If graduation rates remain as they are, by 2020 the number of nurses will increase by only 13% in the face of population growth in the Valley which is predicted to reach 50% (Jones, 2005; Jones, 2005a; Jones & Leach, 2005).

All nine nursing education programs have already started taking steps to address the current and future nursing shortage. Although each has increased the number of students admitted, such expansion puts a tremendous strain on resources, primarily related to faculty, classroom space, and clinical sites. Deloras Jones, Executive Director of the California Institute for Nursing and Health Care (CINHC) has identified five components which must be considered when assessing educational capacity. These are 1) funding to support student enrollments; 2) the availability of qualified faculty; 3) clinical training capacity, which includes both the availability of clinical sites and clinical faculty; 4) infrastructure, consisting of classrooms and laboratory facilities; and 5) availability of prerequisite courses (Jones, 2005).

#### *Funding to support student enrollments*

All of the nursing programs in the San Joaquin Valley are publicly funded. Although students pay fees, this amount only offsets a very small part of the actual cost of their education. Whereas students pay fees totaling between \$1,000 and \$3,200 annually, the actual cost to the institution of educating a nursing student for one year is closer to \$10,059 of which only \$2,548 is allocated as indirect cost (Jones, 2005a). Since every nursing student enrolled actually costs the educational institution almost \$7,500 per year, this is a serious barrier to expanding enrollment.

#### *Availability of qualified faculty*

Without faculty, it is impossible to expand nursing programs. Therefore, any successful effort to increase educational capacity must first address the faculty shortage. Programs must meet requirements of both the California Board of Registered Nursing and the national accrediting bodies related to faculty preparation and faculty-student ratios. In 2006 there were an estimated 1,390 unfilled, budgeted, full-time nursing program education positions nationwide, with a vacancy rate of 7.9% in baccalaureate and higher-degree programs and a 5.6% vacancy rate in associate degree programs (National League of Nursing, 2006a). San Joaquin Valley nursing programs continue to struggle to fill faculty positions. In the 9 schools in the Valley, 12 (6.3%) of the 191 FTE faculty positions are vacant, slightly higher than the 6.1 % vacancy rate for the state as a whole (California BRN, 2005). This faculty shortage has forced nursing programs in



the Valley, state, and nation to turn away qualified applicants. As programs seek to expand enrollment in order to address the nursing shortage, still more faculty will be needed resulting in an even higher percentage of unfilled faculty positions.

In addition, the number of faculty vacancies is projected to increase as current nursing faculty age and retire. The average age of nursing education program faculty in the Central Valley is 48.7 years. At least three San Joaquin Valley nursing faculty are expected to retire in 2006, and it is estimated that another 60 faculty will retire statewide. (California BRN, 2005). Because of the aging of faculty, retirements are expected to accelerate at the same time that the number of younger replacement faculty is decreasing.

Recruitment of faculty is challenging, in part due to the greater number of opportunities afforded highly educated nurses. All of the programs in the San Joaquin Valley reported that non-competitive salaries are a major barrier to recruiting faculty. There is a significant disparity in pay for academic faculty and clinical salaries, making it difficult for academic programs to compete with clinical settings (California BRN, 2005; HASC, 2006). Low faculty compensation is part of the larger funding issue facing public higher education institutions. Several programs in other states have developed faculty fellowship programs which provide funds to nursing programs to augment academic faculty salaries. (AACN, 2006a).

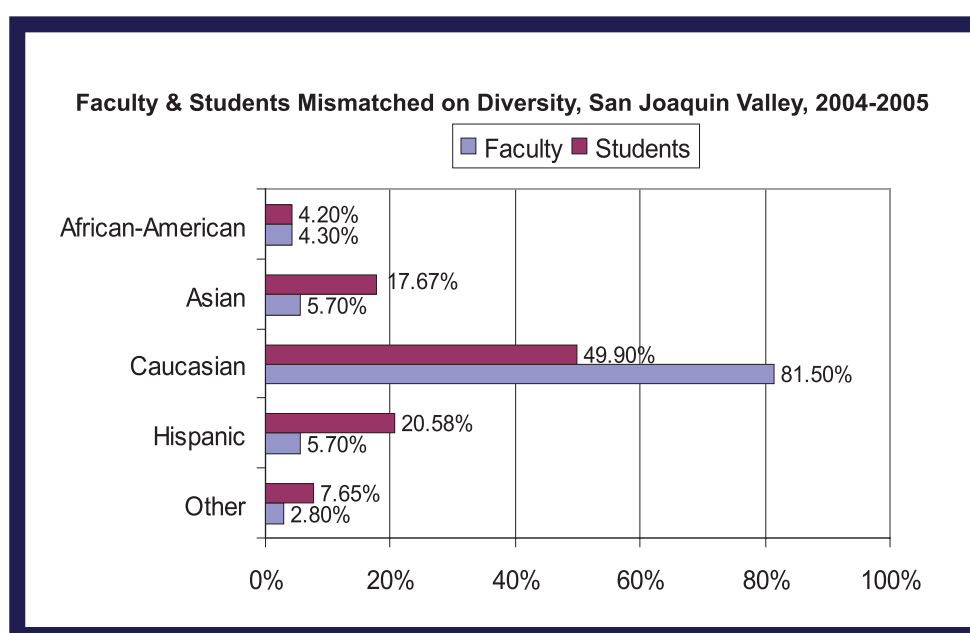
Another factor that severely restricts faculty hiring is the shortage of adequately prepared applicants for faculty positions. There are no doctoral programs in nursing in the San Joaquin Valley and only five in the state, three in private and two in public institutions. In 2004-2005, only 29 students received doctoral degrees in nursing from these programs (California BRN, 2005). A national survey of doctoral graduates indicated that the number of nurses pursuing an academic career is steadily decreasing. In 1984 15.5% of doctorally prepared nurses were employed in areas other than academia. By 1999, that number had increased to almost 27% (AACN, 2005).

Currently in California, the minimum qualifications for full-time teaching faculty are a master's degree in nursing and at least one year of experience as a registered nurse. Baccalaureate and graduate programs require nursing faculty to have doctoral preparation. Not only are faculty with doctoral degrees necessary for the preparation of BSN students, they are also pivotal in the education of the master's degree students who can become faculty in associate degree programs. Of the 292 full and part-time nursing faculty in the Valley, only 29 (9.9%) are doctorally-prepared. Fifty-three per cent have a master's degree and approximately 27% are baccalaureate-prepared, while almost 10% have only an associate degree (California BRN, 2005). An attempt to alleviate the shortage of clinical faculty has been instituted through a continuing education course offered on weekends to encourage staff nurses to consider sharing their expertise by teaching clinically.

In order to meet the faculty student ratios mandated by the California Board of Registered Nursing and the national accrediting bodies, many programs have increased the number of part-time faculty. Currently in the San Joaquin Valley, over 47% of nursing faculty are hired on a part-time basis (California BRN, 2005). However, part-time employees are often not as actively involved in the academic institution and do not carry the full college service load. In addition, they are not as available to students and may have time conflicts with other commitments. Finally, the use of master's degree-prepared nurses raises some quality issues. The expectation is that instructors hold a higher degree than their students have changed. Although these instructors may have a good grasp of clinical material, they often lack the ability to help students with utilizing research findings or other higher order skills.

Over the next three years, all programs in the Valley expect enrollments to increase. Without a comprehensive strategy, these rapid program expansions can exacerbate faculty and clinical instructor shortages and contribute to faculty attrition.

In addition to more faculty overall, the programs in the Valley are also striving to recruit more faculty from ethnic minority groups. Although students in the nursing programs are increasingly diverse, nursing faculty remains overwhelmingly Caucasian (81.5%) and female. This has resulted in a serious mismatch in ethnic distribution between nursing faculty and students in nursing programs. In addition, as programs attempt to recruit more male students, they are also striving to recruit more male faculty. Currently 10.3% of faculty in Valley nursing education programs are males, while 11.3% of prelicensure students are men (California BRN, 2005).



**Figure 28**

Source: 2004-2005 California Board of Registered Nursing's Nursing Education Program Survey

### *Clinical training capacity*

Since nursing is a practice discipline, adequate and appropriate clinical “hands-on” experiences are critical to the preparation of competent, capable, and confident healthcare providers. The importance of an authentic environment and real patients, while receiving expert feedback from faculty, is seen as an integral part of nursing education. Studies have shown that confidence, the ability to work as part of an interdisciplinary team, and the development of critical thinking skills are enhanced by direct patient care supervised by qualified faculty (National Council of State Boards of Nursing, 2005). Therefore, an inadequate number of clinical sites or clinical faculty is a major barrier to the expansion of nursing program enrollment. Clinical sites can only handle a certain number of students before patient care suffers. Additional students add to the work of the staff nurses, congestion on the floor, and confusion.

Stimulated by the difficulty in obtaining appropriate clinical placements, there is currently much national scrutiny of clinical experiences to determine the duration and focus of these educational components necessary to prepare a safe and knowledgeable entry level nurse. Programs in the Valley have already started to address the shortage of clinical sites through creative scheduling of experiences, the utilization of nontraditional sites, and use of laboratory simulation experiences.

### *Infrastructure*

The experiential nature of nursing results in high costs for educational institutions. The required low faculty to student ratios and necessary equipment also add to the expense. As nursing programs expand, there is a need for more and larger classrooms and more laboratory facilities. Rapid advances in technology, equipment, and treatment modalities mean that nursing clinical laboratories must be frequently updated. In addition, due to inadequate clinical placement sites, many programs have to rely on simulations using high fidelity mannequins and computer-based simulators, both of which require substantial expenditures. Public funding formulae for higher education often do not take into account differences between academic programs. This makes expanding costly programs like nursing even more difficult for state-funded institutions.

### *Availability of prerequisite courses*

Nursing education programs commonly require a number of prerequisites. Efforts have been made to standardize these courses in order to facilitate articulation between colleges and universities. Common prerequisites include anatomy, physiology, chemistry, microbiology, English composition, oral communication, math, and critical thinking. Many students in both associate and baccalaureate programs have difficulty registering for nursing prerequisite courses, particularly the required science courses. Sometimes students are unable to access these courses for several semesters, during which time they may decide to change their career goals. Although work has been done to encourage consistency in prerequisite coursework requirements among programs, additional sources for these prerequisites must be developed to allow students to progress in a timely manner.

### *Nursing workforce issues*

There are three approaches to increasing the size of the nursing workforce: 1) to increase the number of nursing students, 2) retain new nurses in the profession, and 3) convince nurses who have left the workforce to return. However, preparing new nurses takes time, at least two to four years for each cohort. In view of the current lack of capacity of the educational programs in the San Joaquin Valley to significantly increase enrollment, it is imperative that the nurses currently employed in healthcare continue in the workforce and those not working as nurses be encouraged to return to nursing. However, in the Valley 90% of the nurses who have an active license are already currently working and approximately three-fourths of them are employed full-time. Therefore, even if these nurses all began working full-time, the impact on the nursing shortage would not be significant. In addition, almost 14% of nurses currently working in the Valley plan to retire or to leave nursing within the next five years, while another 20% plan to decrease the number of hours they work (California BRN, 2004). It is believed that nurses with active licenses who are not currently working in the profession and nurses with inactive licenses will likely represent only a

very small percentage of new nurses in the future (Fletcher, Guzley, Barnhill, & Pilhour, 2004).

#### *Job dissatisfaction*

The rate of job dissatisfaction, particularly among hospital based nurses, is high. In one study, 41% of nurses reported being unhappy with their present job and 22% were planning to leave within the year (Aiken, Clarke, Sloan, Sochalski, Busse, et al, 2001), resulting in an annual turnover rate of about 20% (Kosel & Olivo, 2002 as cited in JCAHO, 2002). Not only are nurses dissatisfied with their particular jobs, they are also unhappy with nursing itself. A majority would not recommend the profession to others (GAO, 2001).

Nurses cite a variety of issues leading to this disillusionment including long and irregular hours, lack of respect and appreciation, stress, heavy physical demands, understaffing, a desire for more salary, and limited pathways for advancement (Hart Research Associates, 2001). Unfortunately, Press Ganey, Associates, a national vendor of healthcare satisfaction surveys, found that when nurses are dissatisfied so are patients. In addition, their surveys showed that the more severe the nursing shortage, the more dissatisfied patients were with their care (Kaldenberg & Regrut, 1999). Currently, the average national turnover rate for nurses is 13.9% (AACN, 2006c). However, this rate can run much higher. In some areas it is reported that 40-50% of new graduates leave their jobs within their first year (Webb, 2006). High turnover rates also affect hospital finances, since recruitment and orientation are often extremely costly.

#### *Aging nursing workforce*

In addition to being disillusioned by nursing, many nurses are approaching retirement. By 2020, the average age of working nurses will be 50 (Buerhaus, Staiger, & Auerbach, 2000). As nurses grow older, they often have concerns about their ability to meet the physical demands of work in the busy, chaotic hospital setting which often involves many hours of standing and walking as well as lifting and transferring patients. In addition, 10 or 12 hour shifts are the norm, and about 25% of nurses in the state report having to work mandatory overtime to maintain mandatory patient-staff ratios (Fletcher, Guzley, Barnhill, & Philhour, 2004).



Hospitals have turned to a number of strategies to meet mandatory staffing ratios in the face of the nursing shortage. The most commonly used techniques are mandatory overtime, sign-on bonuses, and travelers and agency nurses. All of these are expensive and short-term solutions. The use of mandatory overtime requires compensation at 150% of base salary and also can result in a substantial risk of nurse burn-out. The gains in staff recruitment achieved by sign-on bonuses are frequently off-set by the cost of orientation of recent graduates and high turnover rates. The use of contract labor, whether travelers or agency nurses, costs hospitals about twice what a salaried RN would cost, due to orientation expenses and agency fees. Finally, overseas recruitment is extremely costly and also a lengthy process. In addition,

these nurses often need extensive orientation and may experience cultural communication problems. Another consideration is the ethical dilemma of recruiting these nurses from countries facing their own nursing shortages (Hospital Association of Southern California, 2006).

## Recommendations

The purpose of this study is to analyze the complexity of the nursing shortage and to identify long-term, effective, coordinated strategies that will allow California and the San Joaquin Valley to address the current shortage and avoid future ones. It is especially important that academic programs and hospitals come together to address this regional nursing workforce crisis by developing comprehensive strategies on several fronts. However, the shortage is so complex and severe that state and national input is needed as well.

### Progress to Date

#### *State level*

Although preparation and retention of the nursing workforce is primarily the responsibility of the educational and healthcare sectors, they have been unsuccessful in their attempt to address a shortage of this magnitude. State government has a pivotal role in ensuring an adequate nursing workforce as well as financing and regulating both healthcare and education. The State provides significant funding at all the public colleges and universities. The government also uses financial incentives such as student loan repayment to encourage nurses and other healthcare professionals to work in certain locations or to go into particular specialty areas (HRSA, 2002). Finally, the State impacts nursing workforce issues through its reimbursement policies for Medi-Cal and its regulation of private insurance companies (Dionne, Moore, Armstrong, & Martiniano, 2006).

In January 2002, California established the Nursing Workforce Initiative to address nursing shortage issues. This three year \$60 million Workforce Investment Act provided monetary support to nursing students, funds for job redesign to increase retention, money for career development pilot projects, and assistance in marketing nursing as a career. In addition, California has attempted to increase retention and improve the quality of nursing care by passing legislation in 1999 to establish minimum nurse-to-patient ratios in acute care hospitals. In addition, legislation was recently passed to restrict mandatory overtime for nurses. This regulation prohibits nurses scheduled to work a 12-hour shift from working more than 12-hours in a 24 hour period except in an emergency.

The California Board of Registered Nursing, which is a state governmental agency, is responsible for licensing nurses, approving educational programs, and defining the scope of nursing practice. In addition, the BRN has actively worked with both the California State University system and the community college system to ensure that prerequisites are standardized to enhance articulation between the two systems. The Board also collects nursing workforce data and disseminates it, as well as studies issues of general importance to nursing, such as strategies to improve NCLEX-RN passage.

Other state agencies and departments have also implemented strategies to relieve the nursing shortage. The Office of Statewide Health Planning and Development (OSHPD) has expanded its Health Careers Training Program that focuses on training Registered Nurses, as well as other health workers.

#### *On the regional level*

Despite the challenges, nursing schools are finding creative ways to expand student capacity. Some schools are forming partnerships with clinical agencies to support mutual needs in training additional nurses and bridging the faculty gap (Jones, 2004). For example, College of the Sequoias in Visalia partnered with Central Valley General Hospital, Hanford Community Hospital, Corcoran District Hospital, Kaweah Delta Health Care District, and the Tulare District Hospital to train an additional 150 nurses over a three-year period, from March 2003 to April 2006.



Fresno City College partnered with Community Regional Medical Center, Madera Community Hospital, Saint Agnes Medical Center, and Kaiser Permanente-Fresno to develop the Paradigm Program to train hospital employees over a continuous 18-month period with staff from the hospitals serving as clinical instructors. In addition, one hospital also provided an endowed faculty position. These new A.D.N. nurses then committed themselves to working for their sponsoring hospital for a minimum of two years after graduation. A nursing grant from former Governor Davis added 65 more nurses to the program over a three-year period.

California State University, Fresno also partnered with Community Regional Medical Center, Saint Agnes Medical Center, Kaiser Permanente-Fresno, and Children's Hospital Central California to expand undergraduate enrollment. Since the inception of the Nursing Students Today and Tomorrow (Nursing Stat) collaborative effort, the baccalaureate nursing program increased enrollment 10% annually, adding 30 new students over the three-year period from 2003 to 2006.

To further address the nursing shortage, several nursing schools in the San Joaquin Valley have developed new prelicensure programs. Both California State University, Fresno and California State University, Bakersfield have instituted entry-level-masters programs. These accelerated programs enable students who have a baccalaureate degree in another field to complete the required nursing courses and become registered nurses. The master's degree component of the program can result in preparation as a nurse practitioner or clinical nurse specialist. Several community colleges have added accelerated tracks as well. Many of these new options are utilizing distance education techniques and weekend and evening courses to leverage resources such as classroom space and faculty.

To address the faculty shortage, California State University, Fresno has developed a new Clinical Nurse Specialist/Nurse Educator Program to prepare nursing faculty at the master's degree level. In addition, San Joaquin Valley College partnered with Fresno City College, West Hills College, and California State University, Fresno to train forty clinical nursing faculty a year. This faculty development course is taught in the classroom and online and is supported by the grant from the California HealthCare Foundation.

### **Role of State Government**

Although the State has the ability to change nursing scope of practice and licensure requirements, these issues are complex and contentious and change would be difficult to effect. Instead, there are a number of actions that the government could initiate that would bolster the efforts of academia and healthcare.

- Leverage funding at the state level to support the development of an adequate pool of young, qualified, adequately prepared nursing faculty. This has already proven to be an effective strategy in several other states. For example, Connecticut established a targeted investment grant program to support faculty development, while other states have instituted forgivable loan programs for faculty who agree to teach in the state for a predetermined length of time. Maryland levied a 0.1% increase on the hospital rate structure which is expected to generate almost \$9 million annually for faculty and undergraduate student support (AACN, 2006a).
- Implement legislation that prohibits cuts of nursing education funding.
- Develop new state funding mechanisms, such as categorical funding.



- Provide incentives, such as matching funds, for partnerships working to increase educational capacity.
- Institute a system of Medicare funding subsidization of RN programs such as the current method for medical education (Jones, 2005). For example, to meet the costs of Graduate Medical Education (GME), Medicare, and in some states, Medicaid, make payments to residency programs to offset training expenses. Such a model would be effective for nursing programs as well.

## **Increasing Educational Capacity**

### *Increase availability of nursing programs*

Educational opportunities in nursing are limited in the San Joaquin Valley. There are currently 9 generic RN programs with only 1,863 enrollment slots (California BRN, 2005). Although programs in the region are attempting to expand enrollment, other options need to be considered as well.

- Increase admission slots through program expansion and aggressive faculty recruitment
- Establish new programs, such as accelerated programs for non-nursing college graduates with a baccalaureate degree in another discipline. This type of fast-track year-round program would take anywhere from 12 to 18 months of full-time study
- Maximally leverage opportunities for distance learning to make nursing education available to remote San Joaquin Valley areas, e.g. explore the use of videoconferencing to access students in remote sites and nontraditional locations such as hospitals.
- Identify additional resources to fund new programs and expansion of current programs

### *Increase access to prerequisites*

- Explore the use of distance education techniques to provide expanded access to prerequisite coursework.
- Develop consistency in prerequisite requirements between nursing educational programs.
- Develop dual enrollment options to allow students to take prerequisites at colleges and universities which do not have nursing programs.
- Offer nursing students priority enrollment in prerequisite courses.

### *Increase funding to support student enrollments*

Funding sources from private organizations and on the national, state and regional levels must be explored and actively solicited. In addition, the full range of financial aid must be explained to both students and their parents, as both feasible and desirable.

- Waive rules which prohibit second-degree students from accessing state financial aid.
- Increase loan forgiveness programs, especially in underserved areas.

### *Increase quality of applicant pool*

California's K-12 educational system is not adequately preparing students for nursing programs, especially in the areas of math and sciences (The California Endowment, 2002).

- Improve academic preparation and increase achievement expectations.
- Align academic content so that students are well prepared for baccalaureate education.
- Develop partnerships between schools, communities, and business to provide students with learning opportunities for academic enrichment in sciences.
- Increase collaboration between nursing education programs and K-12 education.
- Provide and support bridge programs to enable community college graduates to succeed in baccalaureate nursing programs.
- Provide K-12 students, parents, teachers, counselors, and librarians with information about nursing as a profession. Recruitment efforts must start early in the educational system.
- Encourage the establishment of healthcare magnet schools which incorporate nursing activities into the academic programming.
- Develop a "High School Health Corps" which will allow students to earn a Medical Assistant Certificate to facilitate better part-time jobs and to provide entry into healthcare professions (California Health Care Foundation, 2002).
- Assist schools in developing interdisciplinary curricula to increase student preparedness for higher education in nursing and other health fields.
- Institute Health Academies and other group information sessions in high schools, middle schools, and elementary schools to discuss career options in healthcare.
- Offer and encourage students to enroll in summer enrichment programs in science and math.
- Increase the quality of the applicant pool by helping talented students see nursing as an attractive career option. Some ethnic groups do not currently consider nursing to be an appealing career direction (The California Endowment, 2002). In addition, other young adults may not consider entering nursing because nurses are often depicted as playing a passive role in health care decision-making (Chaguturu & Vallabhaneni, 2005). Nurses must be presented as educated and responsible professionals, not as subservient "handmaidens" to physicians. In addition, the rewarding aspects of nursing should be emphasized. An integrated marketing strategy should be developed by a coalition of healthcare systems, government, and nursing organizations. In addition, individual practicing nurses must act as "ambassadors" for nursing stressing the positive aspects of the profession.
- Update the image of nursing. The current image of nursing does not accurately reflect what nurses really do and are and may conflict the career aspirations of many college students (California Health Care Foundation, 2002).

### *Increase diversity of the applicant pool*

Increasing diversity in the healthcare workforce is seen as necessary to address the continuing racial and ethnic disparities in the United States and to improve the overall health of the nation (Dower, McRee, Briggance, & O'Neil, 2001; HRSA, 2006; The California Endowment, 2002; The Sullivan Commission, 2004).

- Encourage hospital support staff such as radiology technicians, respiratory therapists, aides, and assistants to become nurses. These are groups that are often ethnically and racially diverse.
- Develop systems of mentors and role models in nursing reflecting the ethnic diversity of the Valley.
- Develop career pathways from other health professions into nursing through mechanisms such as work-study programs.
- Coordinate the curricula of all health professions academic programs to eliminate the repetition of coursework when one seeks a career transition or advancement.
- Develop standardized articulation mechanisms between all health professions education programs. For example, allied and auxiliary workers, which include over 200 professions and occupations (Ruzek, Bloor, Anderson, & Ngo, 1999), often find moving up the career ladder to be difficult because much of their coursework does not transfer into nursing programs. This is often a very experienced group as well as a diverse one. Standardized articulation mechanisms would allow them easier access to nursing education and increase the diversity of the profession as well.
- Prepare recruiting material that reflects diverse students and males in photographs.
- Use males and ethnically diverse students and nurses as speakers at information seminars, health fairs and schools.
- Encourage pre-professional and professional recruitment activities by diverse students and graduates.

#### *Develop meaningful admission criteria*

In 1990 the admission requirements for California community colleges were dramatically changed by the implementation of the Title 5 Regulations. These regulations eliminated selection criteria for admission to nursing programs in order to provide equal access to all students. In order to comply with these regulations, community colleges either adopted a lottery system or admitted students on a first-come/first-served basis. This practice has resulted not only in attrition as high as 40% in some A.D.N. programs, but also in increased NCLEX® failures (California BRN, 2000). However, the California Community College Chancellor's Office has allowed programs to apply supplemental criteria such as GPA, if they present research to support its inclusion as an admission requirement.

- Develop and implement meaningful evidence-based admission criteria incorporating factors identified by research as predicting success in nursing programs. Items that have been identified as factors predicting success are high GPA, reading at a 12th grade level or higher, and strong math and reading comprehension skills.
- Institute academic policies which prohibit retaking courses repeatedly. A prominent red flag is withdrawing from prerequisite courses and retaking them repeatedly to obtain a higher grade.
- Require volunteer work or experience. Students who complete 100 hours or more volunteer experience have more realistic expectations of the role and requirements of nursing practice. Exposure to several practice environments may further increase awareness of the multiple dimensions of the nursing role.



### *Improve student retention*

The problem of student attrition must also be aggressively addressed. When asked to rank factors that resulted in their attrition from a nursing program, the most common cause was transfer to another school, closely followed by a change of major or career interest (California BRN, 2005). The development and implementation of effective selection criteria is a first step in stemming the flood of attrition. Admission of students with strong academic skills, a clear perception of the nursing profession, and a strong desire to become a nurse will decrease attrition from academic failure and changes of major. However, students drop out of programs for other reasons as well. Financial need plays a large role in both attrition and academic and NCLEX-RN failure. Students who are unable to focus adequately on their studies due to competing financial needs often inadvertently compromise their success.

The policy of admitting minimally qualified students via lottery or first-come/first-served methods has led to an increase in attrition in the community college system. The average state-wide attrition rate in A.D.N. programs is estimated at almost 25%, accounting for the loss of 1,400 students yearly, with the highest rates among underrepresented minority students. (Seago & Spetz, 2003). In 2004-2005, the Valley lost 120 potential nurses to attrition (California BRN, 2005). The San Joaquin Valley cannot afford to lose students who hold seats in an already insufficient number of admission slots (Jones, 2004).

- Explore sources of student financial assistance. Provide counseling and information about these resources to all nursing students.
- Provide early and aggressive evaluation of learning disabilities and appropriate tutoring and remediation.
- Develop a system of big brother/big sister mentoring by an RN or more advanced nursing student from a similar ethnic background.
- Assist with the organization of study groups to provide academic and emotional support to students.
- Provide early assessment and academic assistance with reading comprehension, language proficiency, composition, or study habits, and essential computer skills.
- Institute a system of faculty follow-up with at-risk students and the development of individualized remediation plans with faculty supervision.
- Provide instruction on test-taking strategies.
- Provide support services such as psychological counseling.
- Utilize funding such as Flo's Cookie Jar to provide one-time emergency funds to students.
- Provide opportunities for tutoring, review sessions, and independent learning resources to students.
- Engage pre-program orientation to develop realistic expectations, encourage utilization of available resources, and facilitate student success.

### *Improve NCLEX® passage rates*

One way to meet the demand is by raising the NCLEX® pass rates. A 5% increase in NCLEX® pass rate by first time examinees would increase the RN workforce capacity by 63-90 RNs per year for the region. To improve this critical outcome, a variety of strategies can be considered, including competency testing, curriculum revisions, NCLEX® review courses, and faculty development.

California State University, Fresno is piloting its NCLEX® Success program and plans to offer a regional NCLEX® preparation program both for students identified as at risk for NCLEX® failure and for graduates from nursing programs in the area who have been unsuccessful on their first attempt.

- Identify at-risk students early in the program and institute timely and individualized remediation.
- Utilize computer testing programs to familiarize students with this examination format
- Encourage students to take the NCLEX® within three months of graduation.
- Provide preparedness assessment examinations and practice tests.
- Utilize recognized national standardized testing systems to evaluate student preparedness and identify areas of weakness.
- Review NCLEX® results to determine areas of curricular weakness and address these content areas.
- Provide NCLEX® review courses on campus.
- Develop a comprehensive synthesis course to be offered in the final semester.
- Promote educational research to identify best practices resulting in NCLEX® success.

#### *Increase availability of qualified faculty*

All nine nursing programs in the San Joaquin Valley identified the lack of qualified faculty in both the classroom and clinical arena as being the primary reason limiting program expansion. There is a documented shortage of faculty nationwide. Industry and practice sites are vying for doctorally-prepared nurses and paying much larger salaries. There is no consistent or system-wide mechanism in public colleges and universities through which nursing faculty can currently expect meaningful compensation. Until this basic disparity is addressed and institutions are willing to pay competitive salaries, academia will have a difficult time recruiting or attracting the best and the brightest students to become nursing faculty.

- Provide incentives to practicing nurses to return to school and become faculty.  
Various initiatives have been suggested to address the faculty shortage. Grant programs can provide funds to graduate nursing programs for scholarships for students in nurse educator programs. Other initiatives can encourage practicing nurses to return to school to earn graduate degrees and become faculty. Providing stipends to clinical faculty can allow them to pursue full time graduate study. Loan repayment forgiveness or repayment programs for nurse educators, can provide a stable faculty workforce. Lastly, programs to educate faculty mentors can promote retention of new nursing faculty in the academic role (AACN, 2006a).
- Encourage nursing students to continue their education in a timely manner. In the past, the traditional model was to earn a degree then work several years in order to get experience and then return to school, repeating this cycle several times until obtaining a terminal degree. This practice has resulted in nursing faculty with a mean age of 46 at the time of completion of doctoral studies (Berlin & Sechrist, 2002), leaving only a few years of productive employment prior to retirement. If students continue their education and graduate in their late 20's or 30's, they will enter the faculty role much earlier and have a longer and more effective academic career.
- Develop a faculty mentoring program to prepare new faculty to teach and to assist with retention of faculty. The state of Kansas has developed The Clinical Faculty Academies which assists new faculty to develop new educational materials, and provides them with a standardized curriculum. The program also offers education to mentors and preceptors on strategies to support and retain new faculty (AACN, 2006a).



- Increase faculty salaries to keep pace with those offered in clinical practice. Several states have developed faculty fellowship programs which provide funds to nursing programs to attract faculty by augmenting salaries to match those received in practice. The state of Pennsylvania has instituted the Nurse Faculty Lines Program to provide funds to non-profit, tax-exempt schools of nursing to underwrite faculty salaries (AACN, 2006a). In order to compete with hospitals and other health care organizations, some academic institutions have taken the salaries of nursing faculty off the faculty salary matrix and begun to pay market value.
- Develop a regional online faculty resource center to assist in matching available nursing faculty with programs program vacancies.
- Develop educational tracks which prepare nurses with non-nursing master's degrees to become eligible to work as nursing faculty. Currently, in order to serve in a faculty position at the baccalaureate level a nurse must have a master's degree in nursing, even though he/she may have a doctoral degree.
- Explore sharing of faculty and content experts among nursing programs via videoconferencing and other technology-driven methods. Creative solutions for sharing of salaries and benefits must be explored as well. This solution would be facilitated through the use of distance education such as videoconferencing, which would allow faculty to interact with students from various programs and locations at the same time.
- Increase access to doctoral nursing education. Access to doctoral programs is severely limited in the San Joaquin Valley. There are only five programs in the state offering a doctoral degree in nursing. Four are located in Southern California and one in San Francisco. In 2004-2005, there were 251 enrolled doctoral students in the five programs and 29 graduates (California BRN, 2005). For many San Joaquin Valley nurses aspiring to earn an advanced degree, the location of these programs and the scheduling of coursework make attendance impossible. Steps need to be taken to enhance access to doctoral nursing education in the Valley, whether through distance modalities, the establishment of satellites, the development of joint doctoral programs, or the initiation of new doctoral programs.
- Designate nursing faculty positions as a "business necessity" to increase compensation. This would allow the institution to compete with higher clinical salaries to hire faculty in order to achieve the college's objectives and to insure the safe and efficient operation of the nursing program.
- Provide 12-month contracts to faculty who so desire to improve nursing faculty salaries.
- Develop special focused programs to prepare clinical faculty. In order to function as a nursing instructor, a master's prepared nurse must either have at least a year of teaching experience or complete a course which includes practice in teaching nursing. The California Board of Registered Nursing does not currently specify the length of such a course. At present, several schools in the San Joaquin Valley have collaborated to develop a BRN-approved class to prepare clinical faculty which is available online.
- Establish retirement policies which facilitate the utilization of retired faculty.
- Develop a system by which employers share in the salary of clinical instructors through joint appointments.
- Ensure statewide access to graduate education for nursing faculty via distance education modalities to facilitate obtaining advanced degrees.
- Commence succession planning in anticipation of massive nursing faculty retirement during 2015-2020.



- Use multidisciplinary and trans-disciplinary faculty to teach coursework which is not nursing specific, such as research methods.

#### *Increase clinical training capacity*

Adequate clinical education is critical to patient safety (California Health Care Foundation, 2001). As the number of nursing programs and nursing students increase, pressure is placed on hospitals and other clinical sites to accommodate more and more clinical groups. The sheer number of nursing students contributes to the level of confusion and congestion on a floor, until a critical level is reached where patient care suffers. Creative measures are needed to provide the very important and necessary hands-on patient care experiences which are central to the preparation of qualified, competent, and confident new nurses.

- Schedule clinical rotations at off times, such as evenings, nights, and weekends. For example in areas like labor and delivery and the emergency department, learning experiences are available around the clock.
- Incorporate the use of simulation in which high-tech computerized mannequins, standardized patients, or actors are used instead of actual patients. Simulation has long been used in occupations such as aviation to provide a safe environment for trainees to practice and refine their skills. Simulation provides a standardized and reproducible environment, removes dependence on chance opportunities for learning new skills, exposes students to a wider range of situations, and increases opportunities for formative feedback.
- Recruit and train a group of standardized patients to depict realistic encounters and presentations of disease.
- Educate nursing faculty in the use of simulation, computerized mannequins and standardized patients in instruction and assessment.
- Develop a series of clinical cases utilizing computerized mannequins or actors to share among regional nursing programs, including grading rubrics.
- Utilize clinical teaching assistants to provide closer student supervision.
- Conduct research to determine the appropriate use and timing of simulation experiences which can substitute for traditional practice through research.
- Ensure that clinical preceptors and faculty are well-prepared to support clinical learning.

#### *Address infrastructure constraints*

Infrastructure also influences the time and place of instructional delivery. Nursing programs are often unable to expand because they lack classroom space, faculty office space, desks, and computers. Many have nursing skills labs which are inadequate or obsolete.

- Utilize distance education techniques to expand access.
- Provide weekend and evening courses to maximize flexibility.
- Offer part-time student enrollment and faculty employment options to leverage classroom space and faculty.

- Partner with other schools and hospitals to address funding, space, or faculty limitations.
- Seek funding resources to further develop infrastructure.
- Develop centralized regional clinical simulation laboratories, learning resource centers, and skills assessment labs.

## **Workplace Issues**

### *Increase collaboration between service, education, and healthcare consumers*

The nursing shortage in the San Joaquin Valley is too large and complex for any one entity to address entirely on its own. Nursing programs cannot educate students without clinical partners, and healthcare organizations are dependent on well-educated nurses.

- Collaboration between labor, service and education is imperative to accomplish the major changes needed to modernize nursing practice, restructure nursing education and meet the workforce demands.
- Collaboration between educational programs has already resulted in the development of articulation agreements to encourage continuing education of LVNs and ADN's.
- In addition, collaboration between health care facilities and educational programs has also been instrumental in the development of the contract education model, in which an employee is identified and sponsored by the healthcare organization during the nursing program. In return, the new nurse agrees to work for that organization after graduation.
- It is also important to collaborate with organizations and groups that represent people from diverse backgrounds in order to facilitate the development of healthcare services and delivery methods to best meet the needs of underrepresented groups. This will assist in preparing nurses to address the needs of these stakeholders.
- Health care organizations and academic institutions must work together to develop shared clinical faculty positions.
- Dialogue must take place with practice partners, academic institutions, nursing organizations, and centers for nursing to advocate at the state level on nursing issues.

### *Increase retention of nurses in clinical sites*

New graduate nurses tend to change jobs frequently, staying an average of only 28 months in their first position. The annual turnover rate in 2000 was 21.3% nationally, and it is estimated that to replace a nurse costs more than twice the annual salary for that position (HMS Group, Ltd., 2002). A pleasant, safe, and healthy work environment is a crucial component of job satisfaction in nursing staff and was cited as being more important than wages and benefits in retention (Spetz & Adams, 2006). Tang identified four factors which determine job satisfaction: organizational and nurse manager characteristics, the work environment, and the characteristics of the nurse (Tang, 2003).

- Establish a solid mentoring program, one-on-one buddy system, or formal nursing residency program to ease new nurses into the workplace and effectively bridge the transition from the educational to the work environment.
- Job sharing would allow for flexibility which would appeal to both older nurses as well as younger nurses with family obligations.

- Incorporate technology in ways which save time and increase job satisfaction, such as medical record systems which link diagnoses with care plans. Most nurses enjoy patient care, but resent finding themselves doing more and more documentation due to reimbursement and risk management requirements. Use of computerized record keeping systems at point of service by PDA tablet or notebook computers can help facilitate nursing documentation.
- Have computers at the nurses' station and on mobile carts to save time and increase access for documentation requirements.
- Abolish sign-on bonuses. Make bonuses contingent upon performance and longevity, not recruitment. Sign-on bonuses do nothing to increase the stability or growth of the nursing workforce. Such strategies only lure nurses from one healthcare organization to another. The increased turnover rate from job-hopping results in higher costs for hospitals due to the need for repeated recruitment and orientation of new employees and the need to use more expensive temporary agency and traveling nurses. A well-educated, clinically competent local nursing workforce needs to be developed to meet current and future workforce needs.
- Institute policies to enhance morale, such as increasing autonomy, shared governance, and recognition.
- Provide flexibility in selection of non-wage benefits.
- Develop career ladders and work/study pathways to graduate education. Financial incentives should be provided to complete further education.
- Develop a culture of support from management. The Joint Commission on Accreditation of Healthcare Organizations (2002) suggests that a culture of support by practices that empower, value, and reward nursing staff. This culture is further reinforced by setting staffing levels based on experience and skills which meet patient needs; by instituting changes which streamline essential job tasks and allow them more time for direct patient care; and by adopting a zero-tolerance policy for abusive behavior toward staff.
- Provide adequate support staff to assist with clerical and clinical tasks.
- Establish formal nursing residency programs to move new graduates to become competent providers. Most new graduate nurses have some difficulty moving from the familiar educational setting into the workforce and transitioning from a student to a clinical role (Casey, Fink, Krugman & Propst, 2004). At the same time, employers perceive that new graduates are not completely prepared to function in a basic practice setting (National Council of State Boards of Nursing, 2002). Often preceptors don't have the time or inclination to thoroughly mentor a new nurse, and orientation programs are often hurried and disorganized. The feeling of not being adequately mentored and supported has been implicated in the high nursing turnover rates which plague many healthcare organizations. Formal nurse residency programs, with an organized curriculum and trained preceptors, have been developed at a number of hospitals using the medical residency model. Although such programs are relatively new, their popularity is increasing especially in specialty areas.
- Utilize advanced practice nurses in key clinical leadership roles. These nurses can serve not only as resources for quality improvement but can provide critical role modeling for new graduates.

### *Increase retention of older nurses*

Eighty-two percent of nurses 40 and older plan to retire in the next 40 years (Hatcher, Bleich, Connolly, Davis, Hewlett, & Hill, 2006). Nationwide, this group of aging baby boomers is becoming the largest source of potential labor (Penner, Perun, & Steueerle, 2003). In recognition of this situation, the White House Conference on Aging encouraged the removal of all barriers to the retention of older workers in 2005 (Hatcher et al., 2006). Although nursing is physically demanding, it is the knowledge, and intuition that experienced nurses develop over time, that are of the greatest value and the most difficult to replace. Especially critical is the loss of knowledge of how to get the job done better and faster (DeLong, 2004 cited in Hatcher et al., 2006). Therefore, the loss of older experienced nurses may actually result in a decrease in quality of care, patient safety, and productivity (Hatcher et al., 2006). The need to retain these nurses provides the opportunity for hospitals and other organizations to assess and provide ergonomic adaptations to prevent injury and fatigue and make changes that will benefit nurses of all ages (The Robert Wood Johnson Foundation, 2004).

- Flexible, creative scheduling would encourage older nurses to remain in the workforce longer.
- Develop benefits packages tailored to older workers, such as health benefits for older part-time employees.
- Develop a mentoring program for new nurses utilizing retired or nearly retired older nurses through the use of financial incentives and decreased patient loads.
- Provide options for phased retirement.
- Institute injury prevention programs to retain all nurses, with special attention toward the needs and risk factors common among older nurses.
- Allow older nurses to work part-time without adversely affecting their retirement benefits.
- Provide elder-care subsidies that will enable older workers to relieve themselves of caretaker responsibilities.
- Provide adequate support staff to carry out clerical and routine clinical tasks.
- Adopt ergonomic approaches to decrease incidence of cumulative trauma and to compensate for the normal effects of aging.
  - Incorporate decentralized nursing stations.
  - Install over-bed lifts.
  - Provide adjustable lighting.
  - Incorporate adequate storage of supplies outside patient rooms.
  - Standardize patient rooms to make them more flexible to minimize patient transfer.
  - Provide ergonomic computer stations.
- Create positions which utilize the skills of experienced nurses, such as conducting patient safety assessments, educating patients and families and helping them negotiate the health-care system.
- Offer wellness programs that encourage and financially support fitness and conditioning for older workers.

## Support Baccalaureate and Master's Degree Preparation

In the current shortage as well in previous ones, much discussion has revolved around ways to increase the number of nurses without regard to educational pathway. However, the complex healthcare environment, increasing acuity and complexity of patient load, rapid advances in technology and therapeutic regimens, all clearly indicate the need for registered nurses with the broad, more scientific base provided by baccalaureate education (NACNEP, 2001; Aiken, et al., 2003; ANCC, 2006c). The goal is not just to produce more nurses, but to educate nurses able to provide the clinically challenging care needed by the current more complicated, high-acuity patient population.

- Increase funding and support to BSN and entry-level-master's degree programs.
- Increase the number and capacity of RN to BSN programs.
- Improve articulation between community college ADN curricula and baccalaureate nursing programs.
- Increase the number of advanced practice nurses with master's degrees such as clinical specialists and nurse educators who can serve as key mentors, clinical leaders and role models.

## Summary

Due to the complex interaction of multiple factors, the current nursing shortage may very well precipitate a public health crisis within the next few years. One of the major causes of this situation is a long history of ineffective, uncoordinated, short-term, short-sighted responses to similar shortages in the past. These stop-gap measures have done nothing to address the major systemic flaws allowing shortages to reoccur with cyclic regularity. The current response must address the basic systemic causes in order to avoid future shortages. We can no longer continue to “tinker” around the edges, doing more of the “same old” things. Without well-thought out, innovative redesign, we will find ourselves facing another nursing crisis in another decade with perhaps even more disastrous results (Jones, 2005).

The goal of this report is to present reliable and accurate data about nursing workforce issues in the Central San Joaquin Valley to illustrate trends and to provide support for decisions related to nursing in the future in order to insure that all the people of the Central San Joaquin Valley receive quality nursing care from an adequate and well-educated nursing work force. Although much work has been done on the national and state levels, it is important to refine current forecasting models for use regionally. This information is designed to enable regional governmental agencies, health care organizations, private industry, and educational institutions in the region to track supply and demand of registered nurses, to maximize existing resources, to develop comprehensive and effective long-term strategies to address the current critical shortage and to avoid future crises. The San Joaquin Valley as a whole must actively work to identify and develop creative strategies for addressing the numerous bottlenecks which are restricting our current nursing workforce development efforts. This severe and complex situation requires collaboration, immediate and major restructuring, difficult decisions, hard work, and new levels of accountability and commitment.

## References

- Arathuzik, D. & Aber, C. (1998). Factors associated with National Council Licensure Examination-Registered Nurse Success. *Journal of Professional Nursing, 14*, 119-125.
- Aiken, L.H., Clarke, S.P., Cheung, R.B., Sloane, D.M., & Silber, J.H. (2003). Educational levels of hospital nurses and surgical patient mortality. *Journal of the American Medical Association, 290*(12), 1617-1623.
- Aiken, L. H., Clarke, S. P., Sloane, D. M., Sochalski, J., & Silber, J. H. (2002). Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *Journal of the American Medical Association, 288*(16), 1987-1993.
- Aiken, L.A., Clarke, S.P., Sloan, D.M., Sochalski, J.A., Busse, R., Clarke, H., Giovannetti, P., Hunt, J., Rafferty, A.M., & Shamian, J. (2001). Nurses' reports on hospital care in five countries. *Health Affairs, 20*(3), 43-53.
- Alecxi, L.M. (2001). The impact of sociodemographic change on the future of long-term care. *Generations, 25*(1), 7-11.
- American Association of Colleges of Nursing. (2006). *Nursing Fact Sheet*. Available November 1, 2006 from <http://www.aacn.nche.edu/Media/FactSheets/nursfact.htm>
- American Association of Colleges of Nursing. (2006a). *State initiatives to address the nursing shortage*. Available November 1, 2006 from <http://www.aacn.nche.edu/Publications/pdf/StateInitiatives10-06.pdf>.
- American Association of Colleges of Nursing (2006b). *Student Enrollment Rises in U.S. Nursing Colleges and Universities for the 6th Consecutive Year*. Available December 1, 2006 from <http://www.aacn.nche.edu/Media/NewReleases/06Survey.htm>
- American Association of Colleges of Nursing. (2006c). *Syllabus: The Newsletter of the American Association of Colleges of Nursing, 32*(5), 5. September-October, 2006.
- American Association of Colleges of Nursing. (2005). *Faculty Shortages in Baccalaureate and Graduate Nursing Programs: Scope of the Problem and Strategies for Expanding the Supply*. Available November 1, 2007 from <http://www.aacn.nche.edu/Publications/WhitePapers/FacultyShortages.htm>



American Association of Colleges of Nursing Research and Data Center (2006). *Percentage Change in Enrollments in Entry-Level Baccalaureate Nursing Programs: 1994-2006*. Available December 13, 2006 from <http://www.aacn.nche.edu/Media/ppt/94-06EnrChgs.ppt>

American Association of Colleges of Nursing Research and Data Center (2006a). *Qualified Applications Turned Away from Entry-Level Baccalaureate Nursing Programs: 2002-2006*. Available December 12, 2006 from <http://www.aacn.nche.edu/Media/ppt/02-06TurnedAway.ppt>

American Medical Association. (2006). *Physician Related Data Resources*. Available February 24, 2006 from [www.ama-assn.org/cgi-bin/sserver/datallist.cgi](http://www.ama-assn.org/cgi-bin/sserver/datallist.cgi)

Bengiamin, M., Capitman, J.A., Paul, C.M., Riordan, D.G., & Curtis, K.A., (2005). *Healthy People 2010: A 2005 Profile of Health Status in the San Joaquin Valley*. Fresno, CA: California State University, Fresno.

Berlin, L.E. & Sechrist, K.R. (2002). The shortage of doctorally prepared nursing faculty: A dire situation. *Nursing Outlook*, 50(2), 50-56.

Biviano, M.B., Tise, T., Fritz, M., & Spencer, W. (2004). *What is Behind HRSA's Projected Supply, Demand, and Shortage of Registered Nurses?* Available December 14, 2006 from <ftp://ftp.hrsa.gov/bhpr/workforce/behindshortage.pdf>

Buerhaus, P.I., Konelan, K., Ulrich, B.T., Norman, L., & Dittus, R. (2006). State of the registered nurse workforce in the United States. *Nursing Economic\$,* 24(1), 6-12.

Buerhaus, P.I., Staiger, D., & Auerbach, D. (2000). Implications of an aging RN Workforce. *Journal of the American Medical Association*, 283(22), 2948-2954.

Bureau of Labor Statistics, United States Department of Labor. (2004). *2004 State Cross-Industry Estimates, 2004 Occupational Employment and Wage Estimates*. Available November 12, 2006 from <http://www.bls.gov/>

California Board of Registered Nursing, (2006). 2004-2005 Board of Registered Nursing, *Nursing Education Program Survey Report: San Joaquin Valley Dataset*. Sacramento, CA: Author.

California Board of Registered Nursing. (2006, August). *NCLEX Pass Rates*. Available from <http://www.rn.ca.gov/schools/passrates.htm>

- California Board of Registered Nursing. (2005). *2004-2005 Annual School Report*. Available October 13, 2006 from <http://www.rn.ca.gov/forms/pdf/schoolrpt04-05.pdf>
- California Board of Registered Nursing. (2004). *Survey of Registered Nurses in California: 2004*. Available October 13, 2006 from <http://www.rn.ca.gov/forms/pdf/2004rnsurvey.pdf>
- California Board of Registered Nursing. (2000). *NCLEX-RN Task Force Report: The Problem and the Plan*. Sacramento, CA: Author.
- California Department of Finance, Demographic Research Unit. (2004). *E-2 California County Population Estimates*.
- California Department of Finance, Demographic Research Unit. (2004a). *Population Projections by Race/Ethnicity, Gender and Age for California and Its Counties, 2000-2050*, Sacramento, CA: Author.
- California Employment Development Department, Labor Market Information Division. (2006). *County Snapshots*. Sacramento, CA: Author. Available from <http://www.labormarketinfo.edd.ca.gov/>
- California Employment Development Department, Labor Market Information Division. (2006a). *Monthly Labor Force Data for Counties: Annual Average 2005*. Sacramento, CA: Author. Available from <http://www.labormarketinfo.edd.ca.gov>
- California Employment Development Department, Labor Market Information Division. (2006b). *Occupation Explorer*. Sacramento, CA: Author. Available from <http://www.labormarketinfo.edd.ca.gov>
- California Employment Development Department, Labor Market Information Division. (2005). *Health Care Careers*. Sacramento, CA: Author.
- California Employment Development Department, Labor Market Information Division. (2004). *Local Area Profile*. Sacramento, CA: Author. Available from <http://www.labormarketinfo.edd.ca.gov/>
- California Healthcare Foundation. (2002). *Issue Brief: Stakeholder Perspectives on California's Nurse Staffing Crisis*. Available November 1, 2006 from <http://www.chcf.org/documents/hospitals/IBStakeholderNursingStaffCrisis.pdf>
- California Healthcare Foundation. (2001). *CHCF Issue Brief: Understanding California's Nursing Crisis*. Available November 1, 2006 from <http://www.chcf.org/documents/hospitals/UnderstandingCaliforniasNursingCrisis.pdf>

- California Partnership for the San Joaquin Valley. (2006). *The San Joaquin Valley: California's 21st Century Opportunity*. Available November 29th from <http://www.bth.ca.gov/capartnership/pdf/TheSanJoaquinValley.pdf>
- Casey, K., Fink, R., Krugman, M., & Propst, J. (2004). The graduate nurse experience. *Journal of Nursing Administration*, 34(6):303-311
- Changuturu, S. & Vallabhaneni, S. (2005). Aiding and abetting -- Nursing crises at home and abroad. *New England Journal of Medicine*, 353(17), 1761-1763.
- Children's Hospital of Central California. (2006). *Quick Facts*. Available February 12, 2007 from <http://www.childrenscentralcal.org/default.asp?ID=106>
- Cleary, B. & Rice, R., Eds. (2005). *Nursing workforce development: Strategic state initiatives*. New York City: Springer Publishing Company, Inc.
- Collaborative Economics. (2003). *Good medicine: Making health services an economic priority for the San Joaquin Valley*. Available September 20, 2006 from [http://www.greatvalley.org/publications/pub\\_detail.aspx?pId=101](http://www.greatvalley.org/publications/pub_detail.aspx?pId=101)
- Cox, K.S., Anderson, S.C., Teasley, S.L., Sexton, K.A., & Carroll, C.A. (2005). Nurses' work environment perceptions when employed in states with and without mandatory staffing ratios and/or mandatory staffing plans. *Policy, Politics, & Nursing Practice*, 6(3), 191-197.
- Dall, T.M. & Hogan, P.F. (2002). *The Nursing Demand Model: Development and Baseline Forecasts*. Report prepared for Workforce Analysis and Research Branch, Office of Research and Planning, BHPr, HRSA.
- DeLong, D.W. (2004). *Lost Knowledge: Confronting the Threat of an Aging Workforce*. New York: Oxford University Press.
- Dionne M, Moore J, Armstrong D, & Martiniano R. (2006). *The United States Health Workforce Profile*. Rensselaer, NY: Center for Health Workforce Studies, School of Public Health, SUNY Albany.
- Dower, C., McRee, T., Briggance, B., & O'Neil, E. (2001). *Diversifying the Nursing Workforce: A California Imperative*. San Francisco, CA: California Workforce Initiative at the UCSF Center for the Health Professions.
- First Consulting Group. (2001). *The Healthcare Workforce Shortage and Its Implications for American's Hospitals*. Available January 23, 2007 from <http://www.aha.org/aha/content/2002/pdf/FcgWorkforceReport.pdf>

- Fletcher, J.E., Guzley, R.M., Barnhill, J., & Philhour, D. (2004). *Survey of registered nurses in California*. Sacramento, CA: California Board of Registered Nursing.
- Freedman, V.A. & Martin, L.G. (1998). Understanding trends in functional limitations among older Americans. *American Journal of Public Health*, 88(10), 1457-1462.
- HSM Group, Ltd. (2002). Acute care hospital survey of RN vacancy and turnover rates in 2000. *Journal of Nursing Administration*, 32(9), 437-439.
- Hassmiller, S.B. & Cozine, M. (2006). Addressing the nurse shortage to improve the quality of patient care. *Health Affairs*, 25(1), 268-274.
- Hatcher, B, Bleich, M., Connolly, C., Davis, K., Hewlett, P., & Hill, K. (2006). *Wisdom at Work: The Importance of the Older and Experienced Nurse in the Workplace*. Available December 12, 2006 from <http://www.rwjf.org/files/publications/other/wisdomatwork.pdf>
- Hart, Peter D. Research Associates. (2001). *The Nurse Shortage: Perspectives from Current Direct Care Nurses and Former Direct Care Nurses*. Available on November 14, 2006 from [http://www.aft.org/pubs-reports/healthcare/Hart\\_Report.pdf](http://www.aft.org/pubs-reports/healthcare/Hart_Report.pdf)
- Health Resources & Services Administration. (2005). *Nursing Education in 5 States: The Importance of State Appropriations to sustain nursing school capacity in states with acute nurse shortages*. Available December 12, 2006 from <http://bhpr.hrsa.gov/healthworkforce/reports/nurseed/intro.htm>
- Health Resources & Services Administration. (2004). *The Registered Nurse Population: National Sample Survey of Registered Nurses, March 2004. Preliminary Findings*. Available September 30, 2006 from <http://bhpr.hrsa.gov/healthworkforce/reports/rnpopulation/preliminaryfindings.htm>
- Health Resources & Services Administration. (2003). *Changing Demographics: Implications for Physicians, Nurses, and Other Health Workers*. Available December 12, 2006 from <ftp://ftp.hrsa.gov/bhpr/nationalcenter/changedemo.pdf>
- Health Resources & Services Administration. (2002). *Projected Supply, Demand, and Shortages of Registered Nurses: 2000-2020*. Available November 14, 2006 from [http://www.ahca.org/research/rnsupply\\_demand.pdf](http://www.ahca.org/research/rnsupply_demand.pdf)

- Health Resources & Services Administration. (1996). *The Registered Nurse Population: National Sample Survey of Registered Nurses 1996*. Available December 3, 2006 from <ftp.hrsa.gov/bhpr/nursing/Samplesurveyis/1996sampsur.pdf>.
- Health Resources & Services Administration. (1992). *The Registered Nurse Population: National Sample Survey of Registered Nurses 1992*. Available December 3, 2006 from <ftp.hrsa.gov/bhpr/nursing/Samplesurveyis/1992sampsur.pdf>.
- Hecker, D. (November 2005). Occupational employment projections to 2014. *Monthly Labor Review*, 128(11), 70-101.
- Hecker, D.E. & Frank, D.S. (February 2004). Employment outlook: 2002-12. Occupational employment projections to 2012. *Monthly Labor Review*, 127(2), 80-105.
- Hospital Association of Southern California (2006). *The Nursing Shortage: What We're Doing about It, What You Can Do about It*. Available December 1, 2006 from <http://www.hasc.org/download.cfm?ID=14654>
- Joint Commission on Accreditation of Healthcare Organizations. (2002). *Healthcare at the Crossroads: Strategies for Addressing the Evolving Nursing Crisis*. Washington, DC: JCAHO.
- Jones, D. (2006). Setting Educational Targets: *San Joaquin Valley. A Report Update on the Projected Shortage & Educational Capacity Targets*. Presentation at the Central California Center for Excellence in Nursing, Fresno, CA. November 2006.
- Jones, D. (2005). *Increasing Capacity in California Schools of Nursing*. Available November 7, 2006 from <http://www.cinhc.org/programs/documents/Supply-DemandinCABullets042005edited.doc>
- Jones, D. (2005a). *Building Educational Capacity in California Schools of Nursing*. Available November 7, 2006 from <http://www.cinhc.org/documents/Goal1BEC033105.doc>
- Jones, D. & Leach, L.S. (2005). *Master Plan for the California Nursing Workforce. Goal I: Building Educational Capacity in California Schools of Nursing*. Available November 7, 2006 from [www.cinhc.org/programs/documents/Goal1BEC033105.doc](http://www.cinhc.org/programs/documents/Goal1BEC033105.doc)

- Jones, D. (2004) *Summary Report: Education Service Partnership Initiative (ESPI)*. Available November 12, 2006 from [http://www.cinhc.org/global/documents/ESPIFinalReport\\_websummary.doc](http://www.cinhc.org/global/documents/ESPIFinalReport_websummary.doc)
- Kaldenberg, D. O. & Regrut, B. (1999). Do satisfied patients depend on satisfied employees? Or, do satisfied employees depend on satisfied Patients? *The Satisfaction Report*. Press Ganey: (3). Available January 19, 2007 from [https://www.pressganey.com/products\\_services/readings\\_findings/satmon/article.php?article\\_id=140](https://www.pressganey.com/products_services/readings_findings/satmon/article.php?article_id=140)
- Kaiser Commission on Medicaid and the Uninsured, (2004) *Health Insurance Coverage in America: 2003 Data Update*. Available March 6, 2007 from <http://www.kff.org/uninsured/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=49550>
- Keating, S.B. & Sechrist, K. R. (2001). The nursing shortage in California: The public policy role of the California Strategic Planning Committee for Nursing. *Online Journal of Issues in Nursing*. Vol. #6, No. #1, Manuscript 2. Available September 30, 2006 from [http://www.nursingworld.org/ojin/topic14/tpc14\\_2.htm](http://www.nursingworld.org/ojin/topic14/tpc14_2.htm)
- Kimball, B & O'Neil, E. (2002). *Health Care's Human Crisis: The American Nursing Shortage*. Princeton, NJ: The Robert Wood Johnson Foundation.
- Kosel K. & Olivo, T. (2002). *The Business Case for Workforce Stability*. Volume 7: VHA Research Series. Irving, TX: Center for Research and Innovation, VHA Inc.
- Kravitz, R.L., Helms, L.H., Azari, R., Antonius, D., & Melnikow, J. (2000). Comparing the use of physician time and health care resources among patients speaking English, Spanish, and Russian. *Medical Care*, 38(7), 728-738.
- Lee, R. & Villa, V. (2000). *Population Aging in California*. Available December 12, 2006 from [www.ceda.berkeley.edu/papers/rlee/PopAging-villa2.pdf](http://www.ceda.berkeley.edu/papers/rlee/PopAging-villa2.pdf)
- Lin, V., Lee, A., Juraschek, S., Jones, D., & Hsiao, I. (2006). *California Registered Nurse Regional Workforce Report Card*. Available October 1, 2006 from [http://www.cinhc.org/news/documents/CINHCreport\\_finalWeb.pdf](http://www.cinhc.org/news/documents/CINHCreport_finalWeb.pdf)
- Lund, L.E. (2005). *Asthma in Adults in California Counties, 2003*. California Department of Health Services
- Lund, L.E. (2005a). *Asthma in Children and Adolescents in California Counties, 2003*: California Department for Health Services



- Lund, L.E. (2005b). *Prevalence of Diabetes in California Counties, 2003 Update*. State of California Department of Health Services Center for Health Statistics.
- Lund, L.E. (2003). *Prevalence of Arthritis in California Counties, 2001*. State of California Department of Health Services Center for Health Statistics.
- Lund, L.E. & Pheatt, N. (2004). *Prevalence of Heart Disease in California Counties, 2001*. State of California Department of Health Services Center for Health Statistics.
- Lund, L.E., Sugerman, S.B., & Foerster, S.B. (2004). *Prevalence of Obesity and Health Weight in California Counties, 2001*. State of California Department of Health Services Center for Health Statistics. .
- Martin-Holland, J., Bello-Jones, T., Shuman, A., Rutledge, D.N., & Sechrist, K.R. (2003). Ensuring cultural diversity among California nurses. *Journal of Nursing Education*, 42(6), 245-248.
- Medical Board of California. (2006). *2005-2006 Annual Report*. Available January 17, 2006 from [www.mbc.ca.gov/Pubs/Annualrept\\_2005-2006.pdf](http://www.mbc.ca.gov/Pubs/Annualrept_2005-2006.pdf)
- Mendez-Luck, C.A., Yu, H., Meng, Y.Y., Jhavar, M., & Wallace, S.P. (2004). *Over Four Million California Adults Age 45 and Older Have High Blood Pressure*. Los Angeles: UCLA Center for Health Policy Research.
- Moore J & Payne L. (2002). *State Responses to Health Worker Shortages: Results of 2002 Survey of States*. Rensselaer, NY: Center for Health Workforce Studies, School of Public Health, SUNY Albany.
- National Advisory Council on Nurse Education and Practice. (2001). *First Report to the Secretary of Health and Human Services and the Congress*. Available November 24, 2006 from [ftp://ftp.hrsa.gov/bhpr/nursing/firstreport.pdf](http://ftp.hrsa.gov/bhpr/nursing/firstreport.pdf)
- National Center for Health Workforce Analysis. (2002). *Projected supply, demand, and shortages of registered nurses: 2000-2020*. Available November 7, 2006 from [www.ahca.org/research/rnsupply\\_demand.pdf](http://www.ahca.org/research/rnsupply_demand.pdf)
- National Council of State Boards of Nursing (2005). *NCLEX Fact Sheet*, October 2005. Retrieved November 27, 2005 from [http://www.ncsbn.org/pdfs/NCLEX\\_fact\\_sheet.pdf](http://www.ncsbn.org/pdfs/NCLEX_fact_sheet.pdf)
- National Council of State Boards of Nursing (2004) *Paper and pencil NCLEX-RN results: Number of candidates taking NCLEX examination and percent passing by type of candidate 1983-1994*. Retrieved August 30,

- 2004 from [http://www.ncsbn.org/pdfs/Table of Pass Rates 1994.pdf](http://www.ncsbn.org/pdfs/Table_of_Pass_Rates_1994.pdf)
- National Council of State Boards of Nursing. (2002). *Post-Entry Competence Study*. Available February 27, 2007 from <https://www.ncsbn.org/986.htm>
- National League for Nursing. (2006). *NLN Data Reveal Slowdown in Nursing School Admissions Growth*. Press Release. {Online}. Available November 1, 2006 from [http://www.nln.org/newsreleases/databook\\_08\\_06.pdf](http://www.nln.org/newsreleases/databook_08_06.pdf)
- National League for Nursing (2006a). *Nurse Educators, 2006: A Report of the Faculty Census Survey of RN and Graduate Programs*. New York City: National League for Nursing.
- National League for Nursing (2005). *Despite Encouraging Trends Suggested by the NLN's Comprehensive Survey of all Nursing Programs, Large Number of Qualified Applications Continue to be Turned Down*. Press Release. [Online]. Available January 1, 2007 from <http://www.nln.org/newsreleases/nedsdec05.pdf>
- National League for Nursing. (2004). *Startling Data for the NLN's Comprehensive Survey of all Nursing Programs Evokes Wake-Up Call: Program-Inclusive Numbers Raise Nursing and Nursing Faculty Shortages to Crisis Level*. Press Release. [Online]. Available January 1, 2007 from <http://www.nln.org/newsreleases/datarelease05.pdf>
- National League for Nursing. (2003). *Nursing Data Review, Academic Year 2003: Volume 1 Contemporary RN Nursing Education*. New York, NY: NLN.
- Norton, C. K., Relf, M. V., Cox, C. W., Farley, J., Lachat, M., Tucker, M., & Murray, J. (2006). Ensuring NCLEX-RN success for first-time test-takers. *Journal of Professional Nursing*, 22(5), 322-326.
- O'Neil, EH and the Pew Health Professions Commission. (1998). *Recreating Health Professional Practice for a New Century*. San Francisco, CA: Pew Health Professions Commission.
- Penner, R.G., Perun, P. & Steuerle, E. (2003). *Letting Older Workers Work*. The Retirement Project Brief Series, No. 16. Washington: Urban Institute. Available January 14, 2007 from [http://www.urban.org/UploadedPDF/310861\\_retirement\\_no16.pdf](http://www.urban.org/UploadedPDF/310861_retirement_no16.pdf)
- Porter, P.G., Fox, P., Beard, R. L., & Chapman, R.W. (2003) *The state of the great Central Valley of California: Assessing the region via indicators—public health and access to care*. Available September 20, 2006 from [http://www.greatvalley.org/publications/pub\\_detail.aspx?pId=75](http://www.greatvalley.org/publications/pub_detail.aspx?pId=75)

- RAND California. (2005). *Physicians and Surgeons in California* [Data Files]. Retrieved December 4, 2006 from <http://ca.rand.org/stats/health/physicians.html>
- Rothberg, M.B., Abraham, I., Lindenauer, P.K., & Rose, D.N. (2005). Improving nurse-to-patient staffing ratios as a cost-effective safety intervention. *Medical Care*, 43(8), 785-791.
- Ruzek, J.Y., Bloor, L.E., Anderson, J.L., Ngo, M. & the UCSF Center for the Health Professions. (1999). *The Hidden Health Care Workforce: Recognizing, Understanding, and Improving the Allied and Auxiliary Workforce*. San Francisco, CA: UCSF Center for the Health Professions.
- Seago, J.A. & Spetz, J. (2003). *Admission Policies and Attrition Rates in California Community College Nursing Programs*. San Francisco: UCSF Center for California Health Workforce Studies, Center for Health Professions.
- Spetz J. (2006). *Regional Forecasts of the Registered Nurse Workforce in California*. San Francisco, CA: Center for California Health Workforce Studies.
- Spetz, J. & Adams, S. (2006). How can employment-based benefits help the nurse shortage? Making nursing more attractive involves more than just wage levels. *Health Affairs*, 25(1), 212-218.
- Spratley, E., Johnson, A., Sochalski, J., Fritz, M., & Spencer, W. (2002). *The Registered Nurse Population: Findings from the National Sample Survey of Registered Nurses, March 2000*. Washington, DC: U.S. Department of Health and Human Services.
- State of California, Department of Finance. (2006). *California County Population Estimates and Components of Change by Year, July 1, 2000-2006*. Available January 1, 2007 from [http://www.dof.ca.gov/HTML/DEMOGRAP/ReportsPapers/Estimates/E2/E-2\\_2000-06.asp](http://www.dof.ca.gov/HTML/DEMOGRAP/ReportsPapers/Estimates/E2/E-2_2000-06.asp)
- State of California Department of Finance, Demographic Research Unit. (2004). *Population Projections by Race/Ethnicity, Gender and Age for California and Its Counties, 2000-2050*, Sacramento, CA: Author.
- Tang, J.H.-C. (2003). Evidence-based protocol: Nurse retention. *Journal of Gerontological Nursing*, 29(3), 5-14.

- The California Endowment. (2002). *Increasing the Diversity of the Nursing WorkForce*. Press Release [Online]. Available from [http://www.calendow.org/news/press\\_releases/2002/special/press032702/issuebkgrd.stm](http://www.calendow.org/news/press_releases/2002/special/press032702/issuebkgrd.stm)
- The New York Center for Health Workforce Studies. (2006). *The United States Health Workforce Profile*. Available October 31, 2006 from <http://chws.albany.edu>
- The Robert Wood Johnson Foundation. (2004). Designing the 21st Century Hospital. Available January 15, 2007 from <http://www.rwjf.org/files/publications/other/Design21CenturyHospital.pdf>
- The Sullivan Commission. (2004). *Missing Persons: Minorities in the Health Professions: A Report of the Sullivan Commission on Diversity in the Healthcare Workforce*. Available November 14, 2006 from [www.aacn.nche.edu/Media/pdf/SullivanReport.pdf](http://www.aacn.nche.edu/Media/pdf/SullivanReport.pdf)
- Umbach, K. (2005). *San Joaquin Valley: Land, People, and Economy*. Sacramento, CA: California Research Bureau
- United States Census Bureau Public Information Office. (2006). *Facts for Features*. Available December 1, 2006 from [http://www.census.gov/Press-Release/www/releases/archives/facts\\_for\\_features\\_special\\_editions/006105.html](http://www.census.gov/Press-Release/www/releases/archives/facts_for_features_special_editions/006105.html)
- United States Census Bureau. (2005). *State and County QuickFacts*. Available from <http://quickfacts.census.gov/qfd/states/06000.html>
- United States General Accounting Office. (2001). *Nursing Workforce: Emerging Nurse Shortages due to Multiple Factors, Report to the Chairman*. Subcommittee on Health, Committee on Ways and Means, House of Representatives.
- UCLA Center for Health Policy Research. (2005). *California Health Interview Survey*. Available January 19, 2006 from <http://www.chis.ucla.edu/>
- Waneka, R. & Spetz, J. (2006). *California Board of Registered Nursing annual school report: Trends in nursing education, 2000-2001 to 2004-2005*. Available September 21, 2006 from <http://www.rn.ca.gov/forms/pdf/trends.pdf>
- Webb, O.G. (2006). Retaining older RNs. *Advance for Nurses Online Editions*. Available September 11, 2006 from <http://nursing.advanceweb.com/>





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