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HEALTHCARE INDUSTRY & OCCUPATIONS

In the Inland Empire

MAY 2012

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Quick Facts

The healthcare workforce accounts for about 8% of the total workforce in the Inland Empire, employing more than 115,000 people.

Over the next five years, it is projected that the Inland Empire's healthcare sector will grow by nearly 14%, resulting in an increase of 16,600 jobs.

Registered nurses make up 28% of employment in Hospitals and are expected to grow by 16% over the next five years.

The ratio of healthcare workers to residents in the Inland Empire is 1:34, much lower than Orange County (1:22), Los Angeles County (1:23) and San Diego County (1:24).

In 2011, the average earnings per worker in the Inland Empire's healthcare sector was $59,203, almost $15,000 more per worker than regional earnings across all other sectors.

By the year 2015, the population of the Inland Empire is projected to number 4.7 million and will increase to 5.2 million by the year 2020, resulting in a higher demand for healthcare services.

The Inland Empire's current healthcare workforce does not reflect the region's racial/ethnic diversity, specifically in higher level careers. While Hispanics comprise 45% of the Inland Empire's population and are projected to make up 49% by 2020, only 12% of registered nurses (RNs), the largest healthcare occupation in the region, are of Hispanic origin.

Compared to the national average of 860 RNs per 100,000 in population, the Inland Empire has 515 RNs per 100,000, earning a "D" rating on the 2010 Report Card from the California Institute for Nursing and Health Care.

In the Inland Empire, the ratio of primary care physicians to the population was 40:100,000 in 2008; far below the nation's standard of 65 to 80 per 100,000.

By 2014, the number of insured will increase by more than 500,000 in the Inland Empire as a result of the healthcare reform bill.

The Inland Empire region has some of the lowest education attainment rates in the state, with only 28% of its population holding some type of a college degree or award.

Approximately 16% of Riverside County and 18% of San Bernardino County residents live below the poverty level.

Introduction

The healthcare sector plays a critical role in maintaining the health and well-being of a population as well as contributing to the economic development of communities. With rapid growth of population in California in general and the Inland Empire (San Bernardino and Riverside counties) specifically, the need for high-quality healthcare services is expanding, which will require a sufficient pool of qualified workers to provide these services. The skill and knowledge of the healthcare workforce are crucial for the advancement of the healthcare sector in the region.

An examination of the healthcare workforce and its role becomes even more important in the context of unemployment and job creation. As of December 2011, the Inland Empire's unemployment rate stands at 12.2%, well above the U.S. rate of 8.3%.[1] Riverside and San Bernardino counties were among the hardest hit regions during the Great Recession, with nearly 160,000 jobs lost from 2007 to 2010. During that time regional healthcare firms added 5,200 jobs. As a recession-resistant field for job seekers to enter and retain employment, the healthcare sector offers jobs in a wide range of occupations and skill levels. Providing solutions to the many challenges faced by the healthcare industry is crucial to the region's economic recovery.

In order to fully understand the healthcare sector, a group of regional public and private stakeholders (the Advisory Committee) led by the Economic Development Agencies and Workforce Investment Boards in Riverside and San Bernardino Counties initiated a comprehensive study of the healthcare labor market in the Inland Empire. The funding for this research was provided in-part through the Regional Industry Clusters of Opportunity Grant (RICOG). The Inland Empire/San Diego-Imperial Center of Excellence of the California Community Colleges conducted the research and developed this study.

The purpose of this study is to provide a snapshot of the Inland Empire's current healthcare labor market, growth projections, existing and projected workforce gaps, and to recommend strategies for a sustainable healthcare workforce in the region. Specifically, this study attempts to address the following research questions:

- What factors are impacting and transforming the healthcare industry and workforce in the Inland Empire?
- What is the employment size and industry make-up of the healthcare sector in the region?
- What are the critical healthcare occupations in terms of current employment, wages, and projected growth?
- What training and education programs prepare for healthcare careers?
- What workforce mis-matches and training gaps exist?

The Center of Excellence collected quantitative and qualitative data from a variety of public and private sources to inform the analysis. We obtained industry and occupational data from Economic Modeling Specialists, Inc. (EMSI), a proprietary source of secondary labor market information. The research Advisory Committee validated a list of occupations selected for the study with a panel of regional industry professionals. We then compiled an inventory of healthcare education and training programs in the region as well as student completion information utilizing the Integrated Postsecondary Education Data System (IPEDS) and the California Community College Chancellor's Office (CCCCO) Data Mart. We used the quantitative data collected on employment and program completions to identify and estimate potential workforce gaps. In addition, we reviewed numerous regional and statewide healthcare studies, newspaper articles, and findings from regional focus group discussions, and incorporated key information into this study.

[1] U.S. Bureau of Labor Statistics

Factors Influencing Healthcare Industry

The healthcare industry is continually changing to meet the needs of the target populations, adapt to public policy, and incorporate new technologies. Currently, several factors are transforming the healthcare industry and workforce. At the national level, the Affordable Care Act (ACA) contains provisions which will, if fully implemented, create more demand for healthcare services and change the way services are delivered. Technological advances in health informatics and mobile health are requiring the existing workforce to obtain new skills and knowledge. On a regional level, demographic factors such as an expanding population and increased diversity of communities are creating an impetus for growth of key healthcare occupations and necessitate a more representative healthcare workforce. This section explores these and other factors affecting the healthcare industry in San Bernardino and Riverside counties.[2]

Healthcare Reform

The Patient Protection and Affordable Care Act enacted in 2010 is a multi-faceted bill designed to restructure the national healthcare system. The bill consists of reforms that will expand healthcare insurance to be inclusive of all American citizens and focus on prevention and health promotion.[3] The mandate that all citizens have health coverage will increase the demand for healthcare services and result in growth of the healthcare workforce.

Specifically, the ACA funding provisions expand training opportunities for positions such as nurse practitioners. According to the 2011 Alliance for Health Reform's report, the law allocates $50 million for training of nurses allowing them to advance their skills and transition to nurse practitioner roles. The report also emphasizes that nurse practitioners play a critical role in operating primary care clinics in rural areas.[4] As a region with vast rural territories, the Inland Empire needs to have a sufficient supply of qualified nurse practitioners to provide services to remote populations. The region is likely to benefit from additional funding appropriated for these purposes.

Another provision of the ACA, entitled Public Health Workforce Training, is designed to support training and education in a variety of public health disciplines.[5] The legislation allocates funding to augment the cost of education and training for public health workers and provides financial support for additional Public Health Training Center locations. This will allow the Inland Empire to expand public health services for underserved rural and impoverished communities.

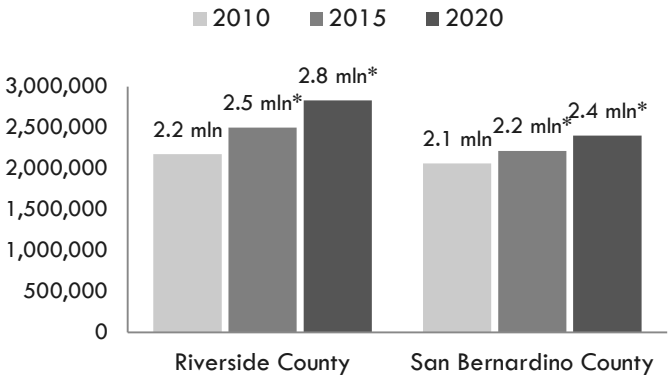
Demographic Trends

Growing Population

The size of the population, as previously mentioned, drives the demand for healthcare services. This is true for the nation and state as well as the Inland Empire. According to Census data, the 2010 population of the two-county region was 4.2 million (2.2 million in Riverside County and 2 million in San Bernardino County).[6] In the next 10 years, Riverside County is projected to experience an average growth rate of 14% while San Bernardino County will expand its population by 8% (see Figure 1). With two of the largest populations in the state, there is clearly a need for a sufficiently large healthcare workforce to provide services to the region's residents.

[2] These factors were selected based on their recurrence in existing studies on healthcare and for their importance in shaping the future healthcare workforce in the Inland Empire.
[3] American Public Health Association. The Affordable Care Act's Public Health Workforce Provisions: Opportunities and Challenges. June 2011.
[4] Alliance for Health Reform. Health Care Workforce: Future Supply vs. Demand. April 2011.
[5] American Public Health Association. The Affordable Care Act's Public Health Workforce Provisions: Opportunities and Challenges. June 2011.
[6] U.S. Census Data 2010

Figure 1 –Population in the Inland Empire



*projected
Source: State of California, Department of Finance, July 2010

Expanding population coupled with the aforementioned provisions of the ACA bill are expected to further impact reported shortages in the healthcare workforce.[7] A recent statewide survey of hospitals conducted by California Hospital Association (CHA) found that population growth was one of the top 5 concerns related to the supply of the healthcare workforce.[8] This is especially significant for the Inland Empire, a region with a rather low relative concentration of healthcare workers. According to Employment Development Department (EDD) data, the ratio of healthcare workers to residents in the combined San Bernardino-Riverside region is 1:34, which is much lower than those of Orange County (1:22), Los Angeles County (1:23) and San Diego County (1:24).[9] Some parts of the region are facing even greater shortages; for example, a study on the healthcare workforce in the Coachella Valley suggests that continued emphasis will be needed to assure there is a supply of well-trained and experienced nurses and other outpatient serving occupations to keep up with projected need.[10]

Economic Indicators

During the recent economic downturn, the Inland Empire was one of the hardest hit areas financially. Current unemployment in the region is estimated at 12.5% in Riverside County and 11.9% in San Bernardino County; both counties have higher unemployment rates than the state's estimated10.9%.[11] Sizable and sustained unemployment has a direct effect on the incomes of area households. In 2011, the median household income in the Inland Empire was approximately $54,000, significantly less than the state's median household income of $60,000.[12] According to Census data, 16% of Riverside County and 18% of San Bernardino County residents live below the poverty level; when compared to the state poverty level (16%), Riverside County is comparable and San Bernardino County is relatively worse off.

The healthcare industry provides a viable option to help alleviate poverty in the region by offering jobs that pay livable wages for all levels of skills and education. Occupations at every skill and education level are key for the Inland Empire where only 27-28% of the population has earned some level of college degree and the majority of residents hold only a high school diploma.[13] While there are numerous occupations that do not require postsecondary education, the area would benefit greatly from a larger supply of qualified workers for higher level/professional healthcare occupations (i.e. physicians, registered nurses).

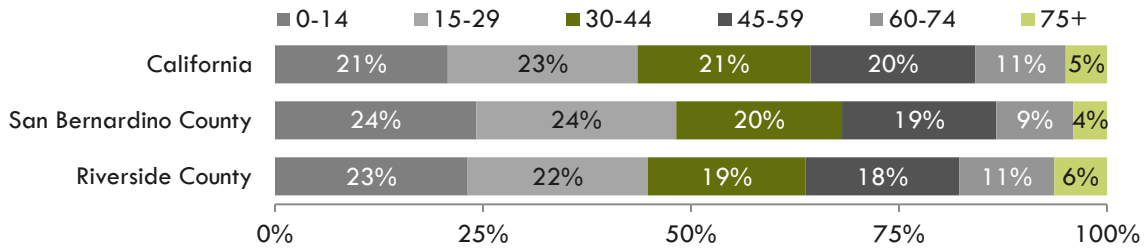
The lack of primary care health professionals has created a significant number of Medically Underserved Areas (MUAs) in the Inland Empire. To date, there are 22 areas in the two counties that have been designated as having too few primary care physicians, high infant mortality rates, high poverty and/or high elderly populations.[14]

[7] Alliance for Health Reform. Health Care Workforce: Future Supply vs. Demand. April 2011.
[8] California Hospital Association. California's Allied Health Workforce. February 2011.
[9] EDD; U.S. Census 2010.
[10] Desert Healthcare District. Charting the Course: A Coachella Valley Healthcare Workforce Needs Assessment. 2009.
[11] State of California Employment Development Department.
[12] InfoUSA through ESRI
[13] American Community Survey
[14] Health Resources and Services Administration

Aging

Another important demographic factor influencing the healthcare industry in the region is the aging of the population. In 2010, approximately 16% of the Inland Empire's population was 60 and older (see Figure 2). By 2020, this age group is projected to increase slightly to 17% of total population.[15] Since the elderly use more healthcare services than younger adults, any increases in numbers will significantly impact healthcare demand.

Figure 2 – Population by Age Group, 2010



Source: U.S. Census through ESRI, 2010

The issue of age is two-pronged for the healthcare workforce: (1) the aging of the population in general requires specialized services for the elderly and (2) the aging of the healthcare workforce creates a need for replacement workers.

- ***An aging population*** requires providers of specialized elderly care, Geriatricians. However, there is a reported shortage of these professionals. A study by Today's Research on Aging raises two issues central to elderly care physicians: the declining interest in primary care by medical students, and the decline in the number of primary care physicians who are receiving certification in geriatrics.[16] It is estimated that there are currently one geriatrician for every 1,900 seniors age 75 or older, while by the year 2030 the U.S. will need a total of 36,000 geriatricians.[17]
- ***The aging of the healthcare workforce*** is expected to create staffing shortages as workers in key healthcare occupations become eligible for retirement. The California Hospital Association estimates that by the year 2015 over 2,600 employees in select allied health occupations, statewide, will be eligible for retirement. According to the Board of Registered Nursing, 16% of the region's nursing workforce is projected to retire by 2015. In the Inland Empire, clinical lab scientists, respiratory therapists, and pharmacists are expected to have the most retirees by 2015.[18] Representatives at regional healthcare focus groups reported that many registered nurses delayed retirement during the Great Recession, adding that it is the calm before the storm. In the near future, they predict that Baby Boomer nurses will retire, creating severe shortages.[19]

Racial/Ethnic Diversity

The diverse racial and ethnic population of the region offers important considerations and challenges when planning for a qualified and representative healthcare workforce. The U.S. Department of Health and Human Services' Office of Minority Health defines the service of a diverse population as cultural competence.[20] In Riverside and San Bernardino counties, cultural competence is a crucial element in the quality of care as nearly half of the population is Hispanic or Latino (see Figure 3). In addition, according to Department of Finance projections, Hispanics will be the majority (52%) in the Inland Empire by 2030.

[15] California Department of Finance.
[16] Today's Research on Aging. Aging and the Health Care Workforce. 2010.
[17] Health Care Workforce. Future Supply Vs. Demand. 2011
[18] California Hospital Association. Critical Roles: California's Allied Health Workforce. February 2011. This figure does not include nursing occupations.
[19] Regional Healthcare Employer Focus Group Meetings – October 2010 and February 2011.
[20] Cultural competence is defined as "the way patients and doctors can come together and talk about health concerns without cultural differences hindering the conversation, but enhancing it". Source: http://minorityhealth.hhs.gov/templates/browse.aspx?lvl=2&lvlid=11

Figure 3 –Population by Race and Ethnicity

Source: U.S. Department of Finance

The diverse ethnic populations of the region, however, are not equally represented in the Inland Empire's healthcare workforce. According to the California Board of Registered Nursing's 2010 Survey of Registered Nurses, half of all registered nurses in the region are white, about 22% Filipino, and 12% Hispanic.[21] Other studies also suggest that racial and ethnic diversity is especially lacking in higher level occupations. A University of California, San Francisco study on health professions concludes that racial and ethnic diversity has an inverse relationship with required education level and accompanying wages. When looking at the diversity in physician occupations, UCSF found that "while Latinos represent one-third of the state's adult population, only 5% of California Physicians are Latino".[22]

Technological Advances in Healthcare

One of the latest trends affecting the healthcare sector is the introduction of Health Information Technology (Health IT).[23] Health IT primarily changes the support services of healthcare by utilizing Electronic Health Records (EHR) to record patient health information and move away from a paper based record system. This technology is expected to make patient care safer and more effective, reduce costs, and change the way many healthcare jobs are performed.

Mobile Health and Wireless Health Technology are technological advances that are changing the way healthcare is being provided. Mobile health is the adoption of new communication patterns in healthcare using mobile devices and software that introduces the concept of "participatory health".[24] Wireless healthcare applies the remote monitoring and collection of patient health data for a quick and accurate flow of information from patient to physician. These mobile and wireless technologies will impact healthcare by moving some services out of hospitals and medical clinics and broadening the skills/knowledge required for some direct care occupations. The remote servicing of patients, via these technologies, will create the demand for nurses, health information technicians and other allied health occupations that can deliver services and information in non-traditional settings.

[21] California Board of Registered Nursing's 2010 Survey of Registered Nurses, 2010.
[22] UCSF Center for the Health Professions. *Allied Health Workforce in California Analysis: Los Angeles Region*. October 2007
[23] Health IT or health information technology is the "application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of health care information, data, and knowledge for communication and decision making" (Brailer, D., & Thompson, T. (2004). Health IT Strategic Framework. Washington, DC: Department of Health and Human Services
[24] mHealth Initiative, Inc.

Community Healthcare

The shift toward more public health and community health services is another factor impacting the healthcare industry and workforce in the region. Building the public health workforce and emphasizing the utilization of community health services are key components of the ACA. According to the American Public Health Association (APHA), community health programs will support the promotion of health in communities by educating residents on prevention, health and nutrition, and healthy behaviors. As a result, the industry will likely need more allied health workers in addition to community based workers (nutritionists, public/community health educators, community health workers/*promotores*), and nurse practitioners. [25] Other occupations with potential growth are those that work in the fields of primary care and elderly care. In the Inland Empire, local community health centers will play a critical role in delivering these services and growing a competent community health workforce. [26]

Industry Overview

This section defines the healthcare industry, provides the composition of the industry subsectors, analyzes and maps employment growth, and provides industry wage data.

Healthcare Industry Definition

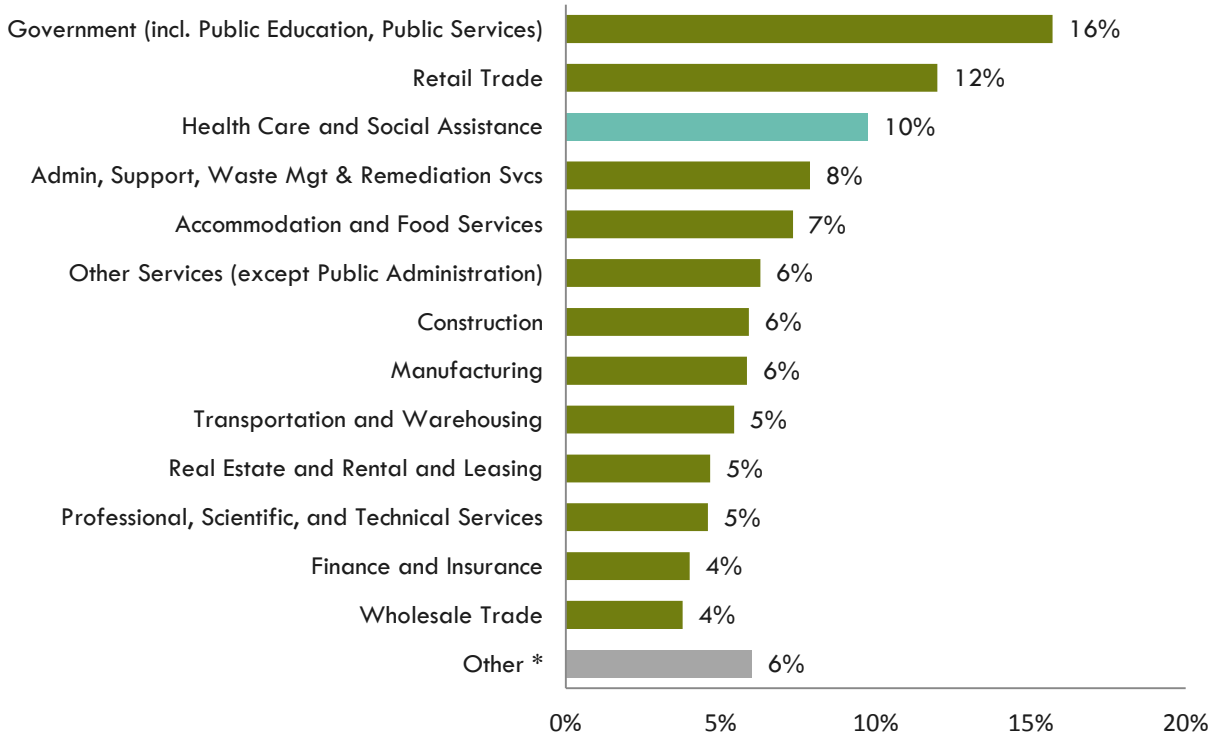
According to the Bureau of Labor Statistics, the healthcare sector combines medical technology and the human touch to diagnose, treat, and administer care to the general population.[27] The healthcare sector is typically comprised of the following three subsectors: [28]

- *Ambulatory Health Care Services* [NAICS Code 621: Industries in this subsector provide direct and indirect health care services to ambulatory patients. This sector typically does not provide inpatient services. Health practitioners in this subsector provide outpatient services. Includes physician offices, dental offices, other health practitioners such as optometrists and podiatrists, outpatient care centers, medical and diagnostic laboratories, home health care services and ambulance services.] [29]
- *Hospitals* [NAICS Code 622: Industries in this subsector provide medical, diagnostic, and treatment services that include physician, nursing, and other health services to inpatients and outpatient services as a secondary activity. Includes general medical and surgical hospitals, psychiatric and substance abuse hospitals and specialty hospitals.]
- *Nursing and Residential Care Facilities* [NAICS Code 623: Industries in this subsector provide residential care combined with either nursing, supervisory, or other types of care as required by the residents. In this sector, the facilities are a significant part of the care process and the care provided is a mix of health and social services with the health services being largely some level of nursing services. Includes nursing care facilities, residential mental health facilities, and community care facilities for the elderly.]

In the Inland Empire, the healthcare industries sector represents the third largest employer, accounting for approximately 10% of employment among all industries. Figure 4 displays the proportion of employment in the Inland Empire by industry cluster.

[25] Allied health occupations are understood to be (clinically based) occupations that serve as the initial, and sometimes, only contact for the underserved population. Allied Health Workforce in California Analysis: Los Angeles Region, 2008.
[26] There are 22 community health centers in Riverside county and 6 in San Bernardino county. Source: U.S. Department of Health and Human Services, Health Resources and Services Administration. HRSA Data Warehouse.
[27] Bureau of Labor Statistics located at http://www.bls.gov/oco/cg/cgs035.htm
[28] The fourth sub-sector within the NAICS category 624, Social Assistance, was not considered for analysis.
[29] NAICS is the North American Industry Classification System. Source http://www.census.gov/eos/www/naics/index.html

Figure 4 – 2011 Employment by Industry Sector*



Source: EMSI Complete Employment – 2011.4
*Other category includes industry sectors with less than 4% of total employment in the region.

Industry Employment

The healthcare industry in California is one of the largest sources of economic revenue and an important provider of jobs. Over the period from 2010-2011, combined employment in the three healthcare subsectors grew by 23,000 in California (1.6% growth) totaling nearly 1.5 million in 2011. On a regional level, the healthcare sector in the Inland Empire accounted for over 120,000 jobs in 2011. In comparison, there were approximately 429,000 workers in healthcare industries in Los Angeles County and 140,000 employees in Orange County in the same year (see Table 1).

Table 1 –Industry Employment by Region

Region	2011 jobs	2016 jobs	Growth	% Growth	EPW*
Inland Empire	***120,640***	***137,298***	***16,658***	***14%***	***$59,203***
Los Angeles County	428,790	484,057	55,267	13%	$63,616
Orange County	139,659	158,918	19,259	14%	$64,616
California	1,488,043	1,686,700	198,657	13%	$67,031

Source: EMSI Complete Employment - 2011.3
*EPW=Earnings per worker

Over the period from 2011 to 2016, the healthcare sector in the Inland Empire is expected to increase employment by 14% resulting in 16,600 new jobs. This growth rate is comparable to that of Orange County and slightly exceeds the relative employment increase in Los Angeles County and the state as a whole.

Employment by Subsector

Among the three industry subsectors, the ambulatory health care services subsector is the largest employer in the region, accounting for over half of all jobs in healthcare sector (see Table 2). It is also expected to be the fastest growing subsector, with 16% projected growth over the next five years and over 10,000 additional jobs. Hospitals and Nursing and Residential Care Facilities will also experience robust employment growth of 13% and 9%, respectively, and collectively add over 6,000 new jobs.

Table 2 –Employment by Subsector in the Inland Empire

NAICS Code	Description	2011 Jobs	% of jobs	2016 Jobs	Growth	% Growth
621	Ambulatory Health Care Services	65,099	54%	75,445	10,346	16%
622	Hospitals	33,094	27%	37,305	4,211	13%
623	Nursing and Residential Care Facilities	22,447	19%	24,548	2,101	9%
	Total	**120,640**	**100%**	**137,298**	**16,658**	**13%**

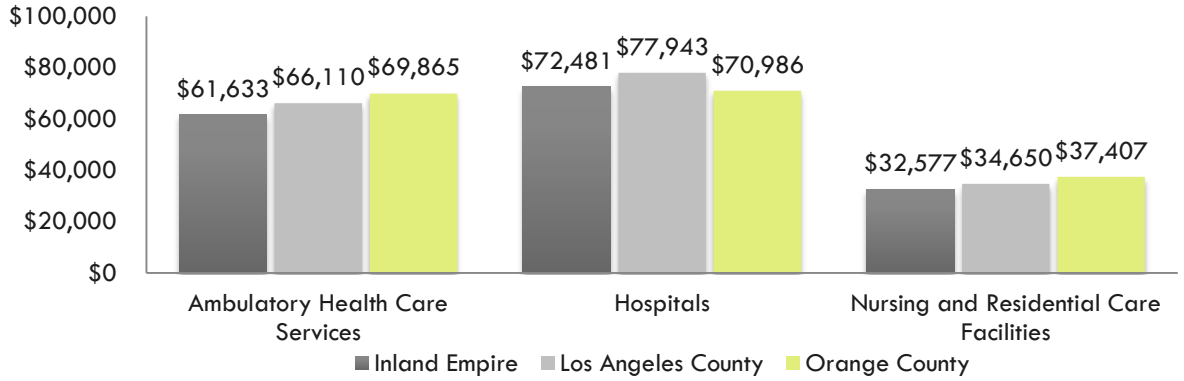
Source: EMSI Complete Employment – 2011.3

Industry Wages

The healthcare sector in the Inland Empire does not only present opportunities for employment, but also offers good wages, thus enhancing the economic well-being of the region's residents. According to EMSI data, healthcare employers in the two-county region pay higher average wages compared to all other sectors in the same area. In 2011, average earnings per worker (EPW) in the healthcare sector were $59,203, almost $15,000 (32%) more per worker than regional earnings across all other sectors.

Among the three subsectors, hospitals represent the highest paying employers in the region largely due to the fact that they normally employ more top earners compared to other subsectors. The average annual salary per worker (in the Inland Empire) is $72,481 in Hospitals, compared to $61,633 in Ambulatory Health Care Services and $32,577 in Nursing and Residential Care Facilities. Across all subsectors, Inland Empire wages are less than those paid in neighboring counties (see Figure 4). Among healthcare professionals, there is a perception that the region is losing graduates of healthcare programs to neighboring counties; earnings comparisons may support this opinion.

Figure 4 - Earnings Comparison



Source: EMSI Complete Employment - 2011.3

Industry Staffing Patterns

Tables 3 – 5 demonstrate the occupational make-up (also known as "staffing patterns") of the three healthcare subsectors. The information provided is for the top 10 occupations with the largest number of jobs in each subsector.

Ambulatory Health Care Services

Ambulatory health care services establishments which typically include dentist offices, physician offices, and medical and diagnostic laboratories, mostly employ medical assistants, medical secretaries, physicians and surgeons, nurses, home health aides, and others. Medical assistants account for nearly 6,000 positions or 9% of current subsector jobs, followed by medical secretaries and physicians/surgeons. Personal and home care aides and home health aides are expected to experience the fastest growth (26% each) in the next five years. Registered nurses are projected to grow by 21% over the next five years in Ambulatory Health Care Services industries. This growth is the largest for RNs among all three subsectors; 16% RN job growth for Hospitals and 12% for Nursing and Residential Care Facilities. Table 3 provides current and projected job data for the top 10 largest occupations, which collectively represent 54% of employment in this subsector.

Table 3 – Top 10 Occupations in Ambulatory Health Care Services in the Inland Empire
(sorted by 2011 jobs)

SOC Code	Description	2011 Jobs	2016 Jobs	Growth	% Growth	% of Industry
31-9092	Medical assistants	5,805	6,707	902	16%	9%
43-6013	Medical secretaries	4,542	5,217	675	15%	7%
29-1069	Physicians and surgeons	4,459	4,967	508	11%	7%
29-1141	Registered nurses	4,185	5,048	863	21%	6%
31-9091	Dental assistants	3,999	4,703	704	18%	6%
39-9021	Personal and home care aides	3,268	4,127	859	26%	5%
31-1011	Home health aides	2,742	3,463	721	26%	4%
43-4171	Receptionists and information clerks	2,389	2,558	169	7%	4%
19-3031	Clinical, counseling, and school psychologists	1,882	2,098	216	11%	3%
31-1012	Nursing aides, orderlies, and attendants	1,844	2,155	311	17%	3%
	Total	**35,115**	**41,043**	**5,928**	**17%**	**54%**

Source: EMSI Complete Employment – 2011.3

Hospitals

Hospitals that provide both inpatient and outpatient services largely employ allied health and direct care occupations (see Table 4). Overwhelmingly, registered nurses represent the largest occupation in this subsector, accounting for about 9,200 jobs in 2011 and 28% of total hospital employment. Other top occupations include nursing aides, licensed vocational nurses, and medical secretaries. Respiratory therapists are projected to have the largest percentage increase (17%) in jobs over the next five years while registered nurses are estimated to have the largest number of new jobs (1,494) over the five year period. Hospitals also employ clerical and other support occupations such as office clerks, maids and housekeeping cleaners, and interviewers.

Table 4 – Top 10 Occupations in Hospitals in the Inland Empire
(sorted by 2011 jobs)

SOC Code	Description	2011 Jobs	2016 Jobs	Growth	% Growth	% of Industry
29-1141	Registered nurses	9,202	10,696	1,494	16%	28%
31-1012	Nursing aides, orderlies, and attendants	2,035	2,272	237	12%	6%
29-2061	Licensed vocational nurses	1,059	1,179	120	11%	3%
43-6013	Medical secretaries	1,058	1,190	132	12%	3%
29-1126	Respiratory therapists	880	1,029	149	17%	3%
29-2053	Psychiatric technicians	786	844	58	7%	2%
43-4111	Interviewers, except eligibility and loan	772	898	126	16%	2%
43-9061	Office clerks, general	728	809	81	11%	2%

SOC Code	Description	2011 Jobs	2016 Jobs	Growth	% Growth	% of Industry
37-2012	Maids and housekeeping cleaners	720	718	(2)	0%	2%
29-2034	Radiologic technologists and technicians	631	703	72	11%	2%
	Total	**17,871**	**20,338**	**2,467**	**11%**	**53%**

Source: EMSI Complete Employment - 2011.3

Nursing and Residential Care Facilities

Health and social services, as well as a large and growing offering of nursing home services industries comprise the nursing and residential care facilities subsector. Nursing aides, orderlies, and attendants account for over 4,500 jobs and 20% of the total employment in these industries (see Table 5). Other nursing occupations, such as licensed vocational nurses and registered nurses, together make up 13% of employment in nursing and residential care facilities. Nurses and nursing aides occupations are projected to add 12-13% more jobs over the period from 2011-2016.

Table 5 – Top 10 Occupations in Nursing and Residential Care Facilities in the Inland Empire *(sorted by 2011 jobs)*

SOC Code	Description	2011 Jobs	2016 Jobs	Growth	% Growth	% of Industry
31-1012	Nursing aides, orderlies, and attendants	4,586	5,191	605	13%	20%
29-2061	Licensed vocational nurses	1,832	2,077	245	13%	8%
31-1011	Home health aides	1,506	1,656	150	10%	7%
29-1141	Registered nurses	1,187	1,335	148	12%	5%
39-9011	Child care workers	1,011	962	(49)	(5%)	5%
37-2012	Maids and housekeeping cleaners	886	900	14	2%	4%
39-9021	Personal and home care aides	735	768	33	4%	3%
35-2012	Cooks, institution and cafeteria	518	591	73	14%	2%
35-2021	Food preparation workers	510	551	41	8%	2%
21-1093	Social and human service assistants	499	491	(8)	(2%)	2%
	Total	**13,270**	**14,522**	**1,252**	**7%**	**58%**

Source: EMSI Complete Employment - 2011.3

Occupational Overview

This section provides an overview of the occupations that comprise the healthcare sector and analyzes employment, growth, and educational requirements data. Specifically, we identified and collected data for 47 critical occupations in the healthcare field. The occupations selected and validated by the research Advisory Committee range from low to high skill and represent several fields of practice in healthcare.

According to EMSI data, all 47 healthcare occupations account for 115,579 jobs in the Inland Empire. This number is expected to increase to 131,333 by 2016, a growth of nearly 14%, which is consistent with the projected growth rate for the same occupations in the state and slightly larger than that in the nation (13%). EMSI estimates that there will be about 26,000 regional job openings, including 16,000 new and 10,000replacement jobs, for combined healthcare occupations over the next five years.[30]

Largest Healthcare Occupations

Table 6 provides detailed labor market data for the top 10 largest healthcare occupations in the Inland Empire by current employment.

[30] See Appendix B for job statistics.

Table 6 - Largest Healthcare Occupations in the Inland Empire (by 2011 Jobs)

Description	2011 Jobs	2016 Jobs	Growth	% Growth	Annual Openings	Average Hourly Wages
Registered nurses	**21,353**	24,281	2,928	14%	959	$36.22
Personal and home care aides	**11,283**	13,543	2,260	20%	593	$9.58
Nursing aides, orderlies, and attendants	**10,456**	11,702	1,250	12%	354	$12.02
Medical assistants	**7,137**	8,251	1,114	16%	302	$13.10
Medical secretaries	**6,419**	7,273	854	13%	257	$15.05
Licensed vocational nurses	**6,154**	6,891	737	12%	340	$21.15
Physicians and surgeons	**5,675**	6,281	606	11%	221	$81.58
Home health aides	**5,133**	6,167	1,031	20%	257	$10.48
Dental assistants	**4,177**	4,894	717	17%	222	$14.72
Clinical, counseling, and school psychologists	**3,375**	3,676	301	9%	156	$28.99

Source: EMSI Complete Employment - 2011.3

Among the largest occupations are three nursing positions: *registered nurses*, *nursing aides*, and *licensed vocational nurses*. Together, these occupations presently account for over 37,900 jobs and constitute nearly one-third of healthcare employment in the Inland Empire. In 2016, nursing occupations are projected to increase employment to about 42,800 jobs; a growth of just under 5,000 jobs. *Registered nurses (RNs)* currently account for the largest number of healthcare jobs in the region and are expected to add almost 3,000 jobs over the next five years not considering potential impact of ACA bill and other trends in healthcare delivery.

In addition to jobs created because of industry growth, there will be employment opportunities available due to retirements and other attrition factors (replacement jobs). It is anticipated that there will be approximately 960 annual job openings, both new and replacement positions, for RNs from 2011to 2016.

Fastest Growing Healthcare Occupations

Table 7 lists the top 10 occupations with the highest relative employment growth in the next five years.

Table 7 – Inland Empire Fastest Growing Healthcare Occupations (by % Growth)

Description	2011 Jobs	2016 Jobs	Growth	% Growth	Annual Openings	Average Hourly Wages
Home health aides	5,133	6,164	1,031	**20%**	260	$10.48
Personal and home care aides	11,283	13,543	2,260	**20%**	593	$9.58
Emergency medical technicians and paramedics	1,919	2,296	377	**20%**	115	$17.74
Medical scientists, except epidemiologists	877	1,040	163	**19%**	50	$42.06
Physician assistants	831	984	153	**18%**	46	$39.79
Dental assistants	4,177	4,897	717	**17%**	222	$14.72
Dental hygienists	1,305	1,530	225	**17%**	72	$39.31
Medical assistants	7,137	8,251	1,114	**16%**	302	$13.10
Surgical technologists	618	708	90	**15%**	34	$20.17
Cardiovascular technologists and technicians	328	378	50	**15%**	15	$25.07

Source: EMSI Complete Employment - 2011.3

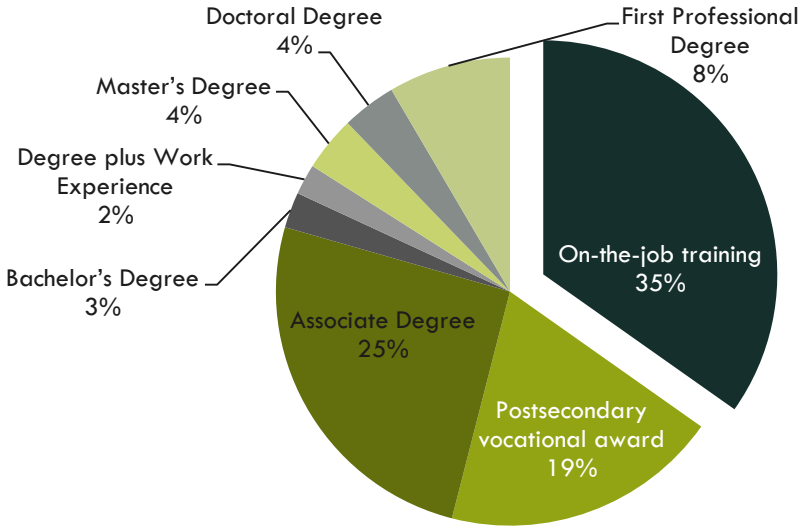
As shown in Table 7, *personal and home care aides* and *home health aides* are the fastest growing occupations in the Inland Empire; projected to increase 20% each by 2016. However, these occupations are the lowest wage earners and require little training or education. Entry level occupations such as these can often position employees for advancement opportunities and movement along a career ladder. *Physician assistants* and *medical scientists* are both high wage earners and fast growing occupations. In addition, *medical assistants* represent the fourth largest occupational group in the Inland Empire, accounting for over 7,000 current jobs in the region and 300 annual job openings. Nurse practitioners are an emerging occupation in the healthcare field and as such there is no available labor market data to estimate current or future jobs. However, this occupation is expected to be in high demand in the near future, generating significant growth in the labor market; this according to the experts at the California Institute for Nursing & Health Care.

Occupational Education Requirements

The level of education required for the occupations of study ranges from on-the-job training to a first professional degree. It is important to note that education requirements provided here are only minimum requirements for the occupations and not necessarily the education level that employers are looking for. For example, registered nurses have a minimum education requirement of Associate degree but according to the Bureau of Labor Statistics, "registered nurses with at least a bachelor's degree in nursing (BSN) will have better job prospects than those without one.[31]

Nearly 65% of the jobs require some level of educational award for employment while the remaining 35% need only need on-the-job training. Figure 5 shows the proportion of jobs requiring each level of degree/experience.

Figure 5 - Occupational Employment by Required Level of Education



Source: EMSI Complete Employment – 2011.3

Table 8 further displays the various levels of education/training along with the number of occupations and jobs, projected growth, and average hourly wage for each group of occupations. See Appendix B for detailed data on each group.

[31] Bureau of Labor Statistics, located at http://www.bls.gov/ooh/Healthcare/Registered-nurses.htm#tab-6.

Table 8 – Healthcare Occupational Employment and Growth by Education Level

Education Level	# of Occupations	2011 Jobs	2016 Jobs	Growth	% Growth	Openings	Average Hourly Wages
Short-term on-the-job training	4	16,970	20,334	3,364	16%	4,364	$12.51
Moderate-term on-the-job training	6	23,228	26,472	3,244	12%	5,108	$16.37
Postsecondary vocational award	7	22,208	24,830	2,622	11%	4,656	$18.93
Associate Degree	**11**	**29,407**	**33,390**	**3,983**	**13%**	**6,556**	**$28.70**
Bachelor's Degree	4	2,849	3,114	265	9%	608	$28.05
Degree plus Work Experience	1	2,438	2,717	279	11%	512	$40.30
Master's Degree	6	4,376	4,945	569	12%	927	$33.01
Doctoral Degree	3	4,334	4,804	470	12%	1,050	$36.16
First Professional Degree	5	9,769	10,727	958	9%	1,947	$53.96
TOTAL/AVERAGE	**47**	**115,579**	**131,333**	**15,754**	**14%**	**25,728**	**$29.78**

Source: EMSI Complete Employment – 2011.3

Data in Table 8 shows that there will be employer demand for qualified healthcare workers across all educational and training levels. Specifically, notable findings include the following:

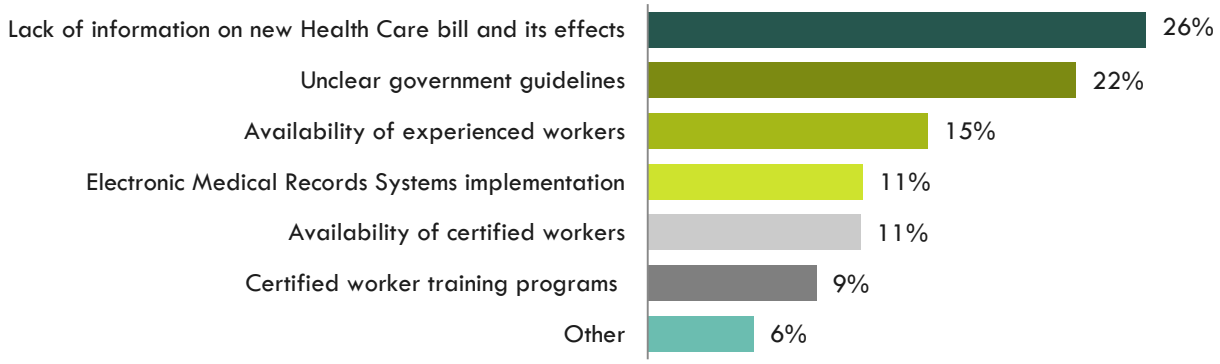
- Over the next five years, healthcare occupations requiring short-term on-the-job training are expected to experience the fastest growth (16%), followed by those requiring Associate degrees (13%). The average hourly wages paid for jobs requiring short-term on-the-job training are lowest among this group, while wages paid for jobs requiring an Associate degree are more than double those for short-term on-the-job training thus validating the importance of obtaining a 2-year college credential for healthcare jobs.
- Positions that necessitate an Associate degree are projected to have the most job openings over the next five years (6,556 jobs) and provide good livable wages for residents in the region.
- The increase in wages from an Associate degree to a Bachelor's degree is less significant but should not be considered a deterrent for pursuing a Bachelor's degree as this degree is often a stepping stone toward graduate and postgraduate education.
- Jobs requiring a First professional degree and a Bachelor's degree are expected to experience slightly lower (but still significant) growth rates in the next five years (9% each).

Employer Needs and Challenges

A thorough review of studies and healthcare employer focus group discussions outline the challenges facing healthcare employers in the Inland Empire. Issues surrounding the Healthcare reform bill, the shortage of a qualified healthcare workforce, diversity of the population, and poverty in the region are some of the primary concerns reported by regional healthcare organizations.

According to a 2010 survey of 736 healthcare establishments in the Inland Empire, 26% (192) of regional healthcare employers reported the lack of information on the new healthcare bill and its effects as the top concern, while another 15% of them cited the availability of experienced workers as a challenge (see Figure 6). [32]

Figure 6 – Inland Empire Healthcare Employer Concerns



Effects of the Healthcare Reform Bill

The recently passed Healthcare reform bill has created some concern for regional healthcare employers. First, the bill will add to the number of patients seeking medical services. According to the Inland Empire Health Plan, there will be 500,000 more insured individuals in the Inland Empire by the year 2014.[33] Researchers at the University of California, San Francisco found that rural and underserved areas such as the Inland Empire will be significantly strained with the increased numbers of people gaining coverage through ACA.[34] Shortages of physicians and other allied health workers already being felt in the Inland Empire will be amplified in the next few years as the region struggles to keep up with demand for health related services. New models of healthcare delivery, expected to meet the increased demand for services, are likely to further impact these shortages. The patient-centered Medical Home Model and Accountable Care Organizations (ACOs) are thought to both improve access to quality care and require more primary care providers – physicians, physician assistants practicing under physicians and nurse practitioners.[35] These new modes of healthcare treatment are delivered by groups or teams of healthcare providers and support facilities and staff.[36] Additionally, these challenges will also create indirect impacts related to providing services to the newly insured while receiving low reimbursement rates, attracting and retaining healthcare workers, and ensuring an adequate infrastructure to support the treatment of the population.

Healthcare Workforce Shortages

As mentioned above, regional healthcare establishments are also concerned about the lack of qualified workers to provide medical attention to the region's large and growing population. Compounding this issue is the length of time and cost associated with replacing workers who leave the labor force due to retirement or other reasons. This report's analysis of job openings and educational program completions lends credibility

[32] Centers of Excellence. Healthcare Industries Employment and Workforce in San Bernardino and Riverside counties. May 2011.
[33] Bradley P Gilbert, CEO, Inland Empire Health Plan. Healthcare Reform and Its Impact on the Inland Empire.
[34] Center for Health Professions, University of California, San Francisco. California's Health Care Workforce: Readiness for the ACA Era. December 2011
[35] Recently, the California Department of Healthcare Services has changed the vernacular from Physicians to Primary Care providers in order to effectively implement changes brought about by the ACA.
[36] Ibid.

to this concern and supports the need to focus on retention. Findings do support the need for more physicians, nurses, and other allied health workers in the Inland Empire. A nurse recruiter from a local hospital recently asserted:

> *"Retention of nurses is a real problem. There is a high cost to registered nurse turnover; it's one and a half times the annual salary to replace a nurse. Plus, when you hire a nurse, there's a four-year return on investment to get them fully trained".*[37]

Statistics on the number of primary care physicians in the Inland Empire and surrounding areas show that both San Bernardino and Riverside counties are lagging far behind surrounding counties in the number of active primary care physicians serving the area population (see Table 9). For every 100,000 people in San Bernardino County, there are 44 primary care physicians and 36 physicians for every 100,000 people in Riverside County, with even greater disparity in the rural areas of the Inland Empire.

Table 9 - Primary Care Physicians in the Inland Empire

Area	Active primary care physicians	Per 100K people
California	22,528	59
Riverside County	**773**	**36**
San Bernardino County	**923**	**44**
Los Angeles County	6,072	58
Orange County	2,004	64

Source: California Healthcare Foundation, 2009

Participants at Inland Empire healthcare employer focus groups suggested ways to attract and retain physicians. Proposed measures included a dual focus on internal and external recruitment and retention of physicians, developing relationships with key medical centers to collectively market for physicians, and seeking loan repayment options for physicians who choose to work in the region.[38]

Importance of Diversity in Healthcare Professions

The region has a reported need for a more racially and ethnically diverse healthcare workforce. As previously discussed, the Inland Empire is a largely diverse region, but this diversity is not well represented in the healthcare workforce, especially in higher level occupations. The region's workforce focus group suggested that this affects both the perception of care and actual health outcomes for the region. According to The California Wellness Foundation, the health of minority patients can be improved with services rendered by healthcare providers who speak the same language and/or have an understanding of the cultural beliefs and methods of these underrepresented groups.[39]

Impact of Poverty on Healthcare Services

Along with racial and ethnic diversity, the Inland Empire has troubling income indicators that impact health care. Impoverished communities typically lack the education and resources to maintain a healthy lifestyle thereby requiring services to treat conditions that could have been prevented. Additionally, significant poverty levels and low median household earnings translate to healthcare patients utilizing some form of government assistance for healthcare services resulting in low reimbursement rates for healthcare providers. Data shows that both counties in the region have some of the largest populations in the state but some of the lowest reimbursement rates for health care services. Riverside County, the state's fourth most populous county, has the fifth fastest growing population of people living below the poverty level and receives healthcare reimbursement rates of only $45.24 per person. In comparison, San Francisco County receives the state's highest reimbursement allocation of $199.82 per person.[40] Changing the formula by which county reimbursement rates are decided was another critical issue that surfaced at the region's healthcare employer focus groups.[41]

[37] Regional Healthcare Employer Focus Group Meetings – February 2011.
[38] Regional Healthcare Employer Focus Group Meetings – October 2010 and February 2011.
[39] The California Wellness Foundation. *TWCF Public Education Campaign: Increasing Diversity in the Health Professions* located at http://www.calwellness.org/how_to_apply/diversity_in_health_fact_sheet.htm
[40] California Healthline. *Riverside Lobbying for Raise in State Health Care Funding*. August 5, 2010.
[41] Regional Healthcare Employer Focus Group Meetings – October 2010 and February 2011.

Workforce Training and Education

In order to assess how regional educational institutions are addressing employer demand for a trained healthcare workforce, the COE identified and inventoried all relevant programs offered by public and private educational entities in the Inland Empire. In addition, COE collected student completion information where such data was available.

According to the inventory of regional programs compiled, 11 community colleges, six universities, four regional occupational centers, and a myriad of proprietary technical schools currently offer various healthcare programs. Together, these institutions account for a total of 54 different healthcare education and training offerings across the two counties. Notably, Loma Linda University (LLU), a health-sciences educational institution offers more than 38 programs in healthcare fields related to the occupations of study. Additionally, the University of California, Riverside's School of Medicine is planning to enroll its first incoming class in the fall of 2013 (pending accreditation), thus becoming the first public medical school in the Inland Empire. Appendix C provides a detailed look at the number of certificate and degree programs offered by various regional educators.

The following groups of educational institutions offer healthcare education and training in the region:

Regional occupational centers and programs (ROCP or ROP) in California offer tuition-free career preparation and technical education courses to high school students and adults. Strong partnerships with business and industry allow ROCPs to provide students with the opportunity to combine hands-on training and traditional classroom instruction in preparation for careers. Industry and business partnerships have the added value of informing programs that ROCPs offer, making them relevant by incorporating new and emerging industry trends into curricula.[42] There are four ROCPs in the Inland Empire: Riverside County ROP, Baldy View ROP, Colton-Redlands-Yucaipa ROP, and San Bernardino County ROP. Collectively, they offer 31 programs that train individuals for entry-level occupations across various professions as well as introductory/career exploration of healthcare. Appendix D provides an inventory of all regional ROP offerings in healthcare.

Community colleges (CC) are two-year institutions that provide basic skills and general education, and workforce training programs preparing students for many licensed healthcare occupations that require an Associate degree or less, or for a transfer to four-year universities.[43] CCs offer degree and certificate programs, have minimum entry requirements, and charge relatively low fees making educational attainment a realizable option for the general population of the region. Awards conferred through community colleges include vocational, technical, and pre-professional certificates and Associate degrees (A.A. or A.S). Students of community colleges include traditional students, working adults, the under/unemployed, and older adults.

Community colleges in the region offer 19 total certificate and degree programs in healthcare-related fields. Programs that prepare students for direct care occupations are the most common offerings at the regional CCs. Appendix E provides a listing of healthcare programs available at local community colleges.

Four-year colleges and universities offer undergraduate (Bachelor's) and graduate (Master's and/or Doctorate) degrees in the arts and sciences for traditional and transfer students. Students pursuing an undergraduate or graduate degree specialize in a field of study and are prepared to enter the workforce in mid-level occupations. The cost to attend four-year colleges and universities is considerably greater than the cost to attend community colleges. The four-year institutions in the Inland Empire offer awards in 44 healthcare-related areas. Appendix F displays specific Bachelor's and advanced degrees available in Riverside and San Bernardino counties through the universities.

Proprietary technical schools are for-profit educational institutions. Similar to community colleges, proprietary schools generally offer certificates and Associate degrees in vocational education. Unlike community colleges, proprietary schools offer accelerated programs designed to meet market needs in a timely fashion

[42] California Association of Regional Occupational Centers and Programs: located at http://www.carocp.org/welcome.html
[43] California Community College Chancellor's Office; located at http://www.cccco.edu/CommunityColleges/tabid/830/Default.aspx

and are not held accountable to state accreditation standards. Proprietary schools in the Inland Empire offer 18 different healthcare programs. Appendix G provides a list of Technical/Proprietary programs offered in the region.

Healthcare academies and health career pathways programs at the elementary, middle and high school levels offer K-12 students core academics paired with health career exploration and technical skills. Some area high schools have partnered with their local Regional Occupational Program (ROP) for the delivery of health career related training and education. Most of the region's high school Health Academies are part of grant-funded offerings through the California Partnership Academies (CPAs) program but additional training is offered through health career pathways programs and academies. These offerings are aimed at increasing students' awareness of health careers through contextualized learning. The program requires recruitment of a minimum of 50% underperforming or at-risk students. In the Inland Empire, there are at least 16 different Healthcare pathways programs and academies that focus on the Health Science and Medical Technology Industry (see Figure 7). Many of these schools have affiliated Health Occupations Students of America (HOSA) and Junior Upcoming Medical Professionals (JUMP) clubs, providing health career exploration and leadership opportunities. These programs play a critical role in creating sustainable pipelines of students interested in health careers. Table 10 displays regional health CPAs and their locations.

Figure 7 – Health Career Programs/ Academies in Inland Empire

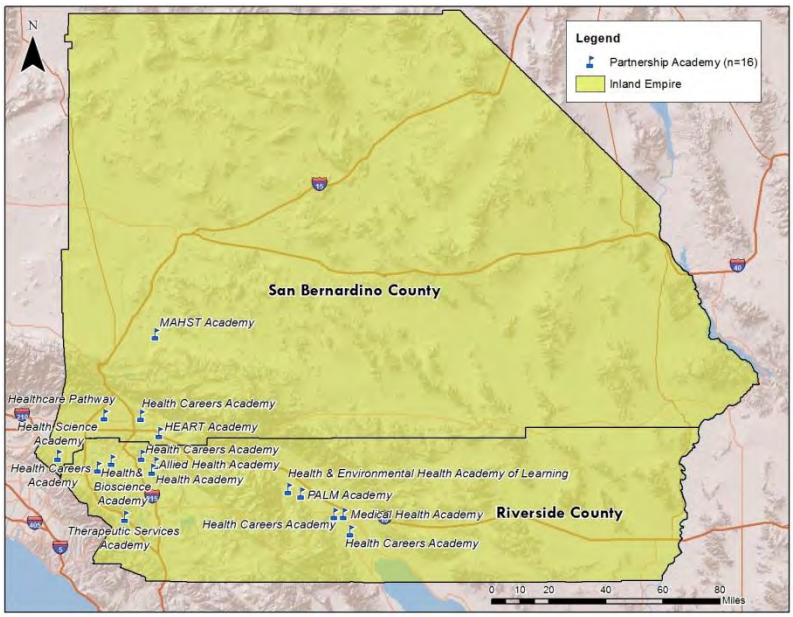


Table 10 – Healthcare Partnership Academies in the Inland Empire

Partnership Academy	School	City & County
Allied Health Academy	Valley View High	Moreno Valley, Riverside
Health Academy	Vista Del Lago High	Moreno Valley, Riverside
Health and Bioscience Academy	Ramona High	Riverside, Riverside
Health and Environmental Health Academy of Learning	Cathedral City High	Cathedral City, Riverside
Health Careers Academy	Canyon Springs High	Moreno Valley, Riverside
Health Careers Academy	Coachella Valley High	Thermal, Riverside
Health Careers Academy	La Sierra High	Riverside, Riverside
Health Careers Academy	Indio High	Indio, Riverside
Health Science Academy	La Quinta High	La Quinta, Riverside
Palm Springs Academy of Learning Medicine (PALM)	Palm Springs High	Palm Springs, Riverside
Therapeutic Services Academy	Temescal Canyon High	Lake Elsinore, Riverside
Health Careers Academy	Pacific High	San Bernardino, San Bernardino
Health Sciences Academy	Chino Hills High	Chino Hills, San Bernardino
Therapeutic Services Academy	Fontana A.B. Miller High	Fontana, San Bernardino
HEART Academy	Redland Senior High	Redlands, San Bernardino
Medical and Health Science Technology Academy	Apple Valley High	Apple Valley, San Bernardino

Source: California Department of Education; Inland Coalition

Although education pathways exist in several fields of healthcare, projected regional shortages in the healthcare workforce necessitate an examination of educational outcomes in the region. Overall, the Inland Empire faces significant challenges in student completion. According to an investigative report published by The Press- Enterprise, one in five students dropped out of high school in San Bernardino County in 2010, while every sixth student did not complete high school in Riverside County.[44] Health Career Pathways, including CPAs, are well positioned to increase student completion by enrolling at-risk students into health academies and improving their prospects for college and career exploration. However, these efforts are not numerous and there exists a perception among healthcare professionals that the number and capacity of programs should be increased to meet the needs of the region.

Workforce Gap Analysis by Occupational Clusters

In order to analyze workforce supply against expected demand, the 47 selected healthcare occupations were grouped into clusters using UCSF's existing career mapping project methodology and other studies as the basis for grouping.[45] As a result, six main occupational clusters were identified:

- Dental
- Direct Care
- Technical
- Clerical/Administrative
- Primary Care Providers and Physician-related
- Public Health and Human Services

The occupations included in each cluster are listed below:

Cluster	Occupations (SOC Code)	
Dental	Dentists (29-1021) Dental hygienists (29-2021)	Dental assistants (31-9091) Dental laboratory technicians (51-9081)
Direct Care	Registered nurses (29-1141) Licensed vocational nurses (29-2061) Home health aides (31-1011) Nursing assistants (31-1014) Occupational therapists (29-1122) Personal care aides (39-9021) Physical therapists (29-1123) Psychiatric technicians (29-2053)	Respiratory therapists (29-1126) Occupational therapist aides (31-2012) Occupational therapist assistants (31-2011) Physical therapist aides (31-2022) Physical therapist assistants (31-2021) Respiratory therapy technicians (29-2054) Surgical technologists (29-2055)
Technical	Pharmacists (29-1051) Pharmacy technician (29-2052) Emergency medical technicians & paramedics (29-2041) Diagnostic medical sonographer (29-2032) Radiologic technologists and technicians (29-2034) Cardiovascular technologists (29-2031) Audiologists (29-1181)	Nuclear medicine technologists (29-2033) Medical scientists (19-1042) Microbiologists (19-1022) Medical and clinical lab technologists (29-2011) Medical and clinical lab technicians (29-2012)

[44] The Press-Enterprise. Education: Battle on to increase graduation, college-going rates. 30 October 2011.

[45] The University of California San Francisco published a career ladders project that mapped the career path for several healthcare fields. The report included four fields of healthcare and provided career movement, required education, and related occupations. See Appendix B for the Career Ladder Pathways produced by UCSF. Sources: University of California San Francisco. *The Career Ladder Mapping Project*. December 2002, The State of Missouri, *Allied Healthcare Workforce in Missouri: An Overview of Allied Health Careers*. October 2007, located at www.missourieconomy.org/pds/health_allied.pdf., Bureau of Labor Statistics.

Cluster	Occupations (SOC Code)	
Clerical-Administrative	Medical records and health information technicians (29-2071) Medical secretaries (43-6013) Medical and health services managers (11-9111)	Medical transcriptionists (31-9094) *Medical scribes (emerging)*
Primary Care Providers and Physician-related	Chiropractors (29-1011) Physicians and surgeons (29-1069) Nurse practitioners (29-1171)	Physician assistants (29-1071) Medical assistants (31-9092)
Public Health and Human Services	Clinical, counseling, and school psychologists (19-3031) Social and human service assistants (21-1093) Medical and public health social workers (21-1022) Health educators (21-1091) Speech language pathologists (29-1127)	Dietitians and Nutritionists (29-1031) Epidemiologists (19-1041) *Community health navigator (21-1094-emerging)* *Medical interpreter (emerging)*

Note: Occupations in italics are not presented in the following gap analysis as they are emerging and do not yet have labor market data to report.

The analysis of occupational projections (workforce demand) and annual healthcare program completion data (workforce supply) for each cluster yielded the following overall observations:

- Completion data shows that proprietary technical schools are awarding the largest number of vocational certificates in the region. Although it is important to include these programs into the supply-demand analysis and consider some of the best practices implemented by these institutions, further research is needed to establish the quality criteria and determine the value of these programs to the healthcare employers in the region. It is necessary to note that if we were to exclude the completion numbers of proprietary schools, some of the perceived oversupply of trained students for certain healthcare occupations may in fact be shortages.
- In the region, proprietary schools conferred the majority of awards in four of the six occupation clusters. Data shows large numbers of student completions in vocational programs such as medical/clinical assistant, dental assistant, respiratory therapist, pharmacy technician, medical insurance coding specialist, and health and medical administrative services. Medical/clinical assistant programs at proprietary schools awarded over 2,000 certificates in 2011, the largest number of awards among all programs. However, looking only at community college awards for this program, it appears there is an undersupply of workers.
- Dental hygienists and respiratory therapists, occupations requiring an Associate degree, demonstrate a shortage of trained professionals when considering only community college program completers. Thus far, only Moreno Valley College in Riverside County offers an Associate degree in dental hygiene. However, the completion numbers are rather low; in 2011, it awarded eight degrees. Crafton Hills and Victor Valley Colleges in San Bernardino County are the two institutions offering certificate and degree awards for Respiratory Care Therapy, with a limited number of completers as well.
- Community colleges offer more programs in registered nursing, licensed vocational nursing, and certified nursing assistant compared to other programs. There are at least six community colleges that offer each of these three fields of specialization. In 2011, community colleges and proprietary schools together awarded 1,211 credentials to program completers resulting in a potential oversupply of over 200 students. Certified Nursing Assistant (CNA) programs at community colleges reported approximately 165 student completions in 2011 and labor market data shows 354 annual openings for CNA occupations, pointing to a potential under-supply on the market of 135 students. In 2011, area education institutions counted 1,211 student completions in registered nursing programs.

- Four-year colleges and universities are important in the preparation of students to enter into higher level occupations in healthcare. According to the data, universities produce the largest number of completers in general psychology (720 Bachelor's degrees awarded in 2011, providing a larger labor pool in this field than will be needed over the next five years. However, four-year schools are not meeting workforce demand in Pharmacy and Medicine. As employers move toward requiring a Bachelor's degree for Registered Nurses, 4 year institutions will be critical in preparing the workforce for these occupations and for establishing the pathway toward a higher level education required for Nurse Practitioners. Loma Linda University is the only educational institution in the Inland Empire that offers first professional degrees in these areas. ***Statistics show that the region is realizing a deficit of about 70 physicians and surgeons and approximately 20 pharmacists.*** In addition to offering the only First professional degrees, LLU is the only entity that provides four-year and advanced education in medical and clinical laboratory technology, physical therapy, and specialty physician areas.

Detailed examination of workforce gaps specific to each occupational cluster is presented herein. For each occupational cluster, data includes average occupational wages, the number of annual openings, the number of 2011 related educational programs completions, and the calculated gap between annual job openings and program completions. An oversupply of program completions is represented by a positive whole number and an undersupply of program completions is shown as a negative whole number contained in parentheses. See Appendix H for a more detailed description of the data provided in Tables 11-16.

Dental Occupations

The cluster of dental occupations includes dentists and dental support occupations, such as dental lab technicians and dental assistants. The educational requirements range from some degree of on-the-job training to a first professional degree, representing a clear career pathway in this cluster. Dental assistants and dental hygienists do not vary widely on the jobs task performed in practice. However, unlike hygienists, dental assistants must be supervised by dentists when services are performed on a patient. Both occupations require licensing by the Committee on Dental Auxiliaries.

Table 11 provides labor market and student completion data for each of the dental occupations.

Table 11 - Dental Cluster Occupational Employment and Education

Occupations	Education Requirement	Avg wages	2011 Jobs	Annual Openings	2011 Completions	Gap: Oversupply (Undersupply)
Dentists, general	First professional degree	$65.16	1,627	71	105	34
Dental hygienists	Associate degree	$39.31	1,305	72	109	37
Dental assistants	Moderate-term on-the-job training	$14.72	4,177	222	567	345
Dental laboratory technician	Moderate-term on-the-job training	$25.19	117	4	8	4
Total			**7,226**	**369**	**789**	**420**

Source: EMSI Complete Employment – 2011.3

In the Inland Empire, the dental cluster as a whole will increase employment by 15% over the next five years and account for approximately 8,300 jobs in 2016. Over half of the expected jobs will be for dental assistants, which (together with dental hygienists) are projected to grow by 17%. Average hourly earnings for the dental occupations in the region range from about $15 to $65.

While the range of wages for dental workforce is fairly wide, the gender and ethnic make-up is not. According to a UCSF study, graduates of dental assistant programs in the greater Los Angeles area are

mostly female (around 85-90%) and more than half are ethnically Hispanic or Latino.[46] However, the workforce of dentists is not nearly as ethnically diverse. National data shows that 86% of dentistry positions in the U.S. are held by the White, non-Hispanic population, with Asians representing the next largest percentage (7%).[47] Although no similar statistics were readily available for the Inland Empire, various conversations with industry representatives confirmed the same trend in the region.

A range of programs in the field of Dentistry are offered at every education level in the Inland Empire. ROCPs introduce students to careers in dental assisting, while community colleges further their skills and knowledge in this entry-level dental profession. Programs offered at community colleges also prepare students for the entry level occupations of dental laboratory technician. Only one community college (Moreno Valley College) offers dental hygienist training. Four-year education institutions provide advanced education in dental hygiene and dentistry; Loma Linda University offers a Bachelor's level program in Dental Hygiene.

In 2011, the Inland Empire accounted for approximately 676 students who completed programs of study in dental assisting and dental hygiene combined; the number of projected job openings in these occupations is only about half the number of completions (294 annual openings). The largest number of awards in dental assisting (528 technical certificates) was granted by proprietary colleges. When statistics on proprietary technical institutions are excluded from the gap analysis, potential workforce shortages could be expected.

Appendix H provides detailed data on student completion of the dental programs across all educational entities and workforce supply/demand analysis.

Direct Care Occupations

The Direct Care occupations include healthcare workers from many fields of practice who provide direct treatment to patients in a variety of settings including hospitals, medical clinics, and mental health institutions. Within the nursing pathway of this cluster, a licensed vocational nurse (LVN), an entry-level nursing profession, can pursue an Associate degree to become a registered nurse (RN) and then further a career by obtaining an advanced degree and becoming a nurse practitioner.

Table 12 explores various direct care occupations, educational requirements, projected employment, and program award statistics.

Table 12 - Direct Care Occupational Employment and Education

Occupations	Education Requirement	Avg Wages	2011 jobs	Annual Openings	2011 Completions	Gap: Oversupply (Undersupply)[48]
Registered nurses	Associate degree and Bachelor's degree[49]	$36.22	21,353	959	1,211	252
Licensed vocational nurses	Postsecondary vocational award	$21.15	6,154	340	1,183	843
Home health aides	Short-term on-the-job training	$10.48	5,133	257	N/A	N/A
Nursing assistants	Postsecondary vocational award	$12.02	10,456	354	219	(135)
Personal and home care aides	Short-term on-the-job training	$9.58	11,283	593	N/A	N/A

[46] UCSF Center for the Health Professions. *Allied Health Workforce Analysis: Los Angeles Region*. May 2008.
[47] American Journal of Public Health. Addressing Health Care Disparities and Increasing Workforce Diversity: The Next Step for Dental, Medical, and Public Health Professions. 2006.
[48] This gap number does not included potential gaps for the 4 occupations that require short-term on-the-job training only, as post-secondary education is not a requirement for employment. Therefore, the "Gap" total is not a true difference between annual openings and 2011 completions.
[49] Associate degree is the minimum required education level while some employers prefer a Bachelor's degree for employment.

Occupations	Education Requirement	Avg Wages	2011 jobs	Annual Openings	2011 Completions	Gap: Oversupply (Undersupply)[48]
Occupational therapists	Master's degree	$32.10	505	22	34	12
Physical therapists	Master's degree	$34.77	1,314	52	145	93
Respiratory therapists	Associate degree	$29.21	1,505	68	252	184
Respiratory therapy technicians	Postsecondary vocational award	$26.08	75	2	47	45
Occupational therapist aides	Short-term on-the-job training	$15.97	42	2	N/A	N/A
Occupational therapist assistants	Associate degree[50]	$22.80	214	9	1	(8)
Physical therapist aides	Short-term on-the-job training	$14.02	512	21	N/A	N/A
Physical therapist assistants	Associate degree	$25.59	566	24	39	15
Psychiatric technicians	Postsecondary vocational award	$22.55	1,433	56	62	6
Surgical technologists	Postsecondary vocational award	$20.17	618	34	56	22
Total			**61,163**	**2,793**	**3,249**	**1,329**

Source: ESMI Complete Employment – 2011.3

Direct care occupations in the Inland Empire account for more than 61,000 jobs in 2011. Registered nurses and personal and home care aides collectively make up one half of total employment in this cluster. Home health aides (HHA) and personal and home care aides are expected to experience the largest percentage growth in jobs over the next five years (20% each), followed by surgical technologists (15%). Education requirements for direct care professions range from on-the-job training to a Master's degree. State licensing is required for LVNs and conferred by the California Board of Vocational Nursing and Psychiatric Technicians. Registered nurses receive licensing verification through the California Board of Registered Nursing. Average hourly wages for these occupations range from $9.58 to $36.22.

The direct care career pathways provide latitude for advancing to higher-level careers in direct care or exploring other fields of healthcare. Entry-level education and training in direct care occupations can be a stepping stone to occupations in technical and clerical-administrative occupations. For example, a physical therapist assistant can enter the workforce with minimal education/training and advance to a physical therapist by pursuing an advanced degree.

Registered nurses, the largest healthcare occupation and substantial income earners, are not representative of the diverse population of the Inland Empire. According to a BRN nursing workforce survey, half of all RNs in the region are White, non-Hispanic, 20% are Filipino, and only 12% are Hispanic. [51]

On the workforce supply side, community colleges and proprietary schools offer several programs that train for LVNs. The overwhelming majority of student completions in this cluster are in the fields of RNs and LVNs, approximately 2,300 awards in 2011. Data demonstrates that the labor market in the region is potentially oversupplied with LVNs and RNs. However, it is important to consider factors such as potential out-migration of the workforce because of lower paid wages in the region, recent economic retraction, and the trend toward a Bachelor's degree requirement for RNs as opposed to an Associate degree.

[50] Associate degree is the minimum required education while some employers prefer a Bachelor's degree for employment
[51] Bureau of Registered Nursing. Nursing Workforce Survey, 2010

Technical Occupations

Technical occupations assist in the delivery of healthcare through indirect practices like nuclear medicine, radiology, or pharmaceuticals. Technical healthcare positions generally perform diagnostic tests or dispense medications.[52] Some examples of these occupations include technologists, pharmacists, and medical scientists.

Table 13 provides labor market and educational information for these and other occupations included in the cluster.

Table 13 - Technical Occupational Employment and Education

Occupations	Education requirement	Avg Wages	2011 Jobs	Annual Openings	2011 Completions	Gap: Oversupply (Undersupply)
Audiologists	First professional degree	$37.19	80	3	63	60
Pharmacists	First professional degree	$56.53	1,932	82	61	(21)
Pharmacy technician	Moderate-term on-the-job training	$16.28	2,941	156	626	470
Emergency medical technicians and paramedics	Postsecondary vocational award	$17.74	1,919	115	270	155
Diagnostic medical sonographer	Associate degree	$32.61	387	14	31	17
Radiologic technologists and technicians	Associate degree	$28.73	1,508	55	78	23
Nuclear medicine technologists	Associate degree	$38.60	100	4	0	(4)
Medical scientists, except epidemiologists	Doctoral degree	$42.06	877	50	100	50
Microbiologists	Doctoral degree	$37.42	82	4	44	40
Medical and clinical lab technologists	Bachelor's degree	$36.11	681	26	13	(13)
Cardiovascular technologists and technicians[53]	Associate degree	$25.07	328	15	0	(15)
Medical and clinical lab technicians	Associate degree	$18.71	699	28	0	(28)
Total			**11,534**	**552**	**1286**	**734**

Source: EMSI Complete Employment – 2011.3

Education requirements for technical healthcare occupations range from on-the-job training to a doctoral degree. Almost half of the occupations in this cluster require an Associate degree for employment, while four (audiologists, microbiologists, medical scientists, except epidemiologists and pharmacists) require Doctoral credentials or a First Professional Degree. It is interesting to note that public health laboratories are required by California law to be led by directors with doctorate degrees but only 10 of 38 labs in the state are.[54] Career ladders exist in the fields of pharmacy and radiology/nuclear medicine. A pharmacist technician can upgrade skills and education to become a pharmacist, while a radiologic technologist/technician can pursue an advanced career as a Magnetic Resonance Imaging (MRI) technician upon obtaining a higher level degree.

Collectively, technical healthcare occupations in the Inland Empire account for over 11,000 jobs and are expected to add 14% more jobs over the next five years. A survey by the CHA reported medical lab technicians and clinical lab scientists (technologists) among the top 10 occupations with high vacancy rates in

[52] Desert Healthcare District. Charting the Course: A Coachella Valley Healthcare Workforce Needs Assessment. 2009.
[53] No programs offered in the Inland Empire for this occupation
[54] University of California, Berkeley; Berkeley News Center. *More public health professionals needed to avert crisis, warns new report.* 02/27/08.

California.[55] Our research confirms that the Inland Empire will also experience a shortage of qualified workers for these two occupations. Anticipated retirements were cited as the main issue driving the demand for replacement workers in this occupational category. In the region, these occupations demonstrate fairly robust job growth rates in the next five years and account for sizable numbers of jobs.

Average hourly wages for this cluster range from about $16 to $56. Pharmacy technicians are the lowest earners while pharmacists are the highest paid professionals.

Programs that prepare students for employment in technical occupations include pharmacy, radiology/nuclear medicine, and emergency medical technology, among others. ROCPs offer training in three of the fields within this grouping – emergency medical technology, pharmacy, and diagnostic medical technology.

The largest need in this cluster is for medical and clinical lab technologists which are projected to be undersupplied in the labor market by 28 jobs. The next largest demonstrated need is for Pharmacists. Loma Linda University is the only education institution in the Inland Empire that offers a professional degree program in Pharmacy, accounting for 61 completions in 2011. Overwhelmingly, the most awards reported in this cluster were granted by proprietary colleges for Pharmacy technicians (539 technical certificates) and by community colleges in Emergency Medical Technology (255 certificates in 2011) creating more graduates than needed in the labor market.

Clerical-Administrative Occupations

Clerical-Administrative occupations in healthcare include front office/non-treatment occupations. These occupations are responsible for maintaining office operations and patient medical records. Although this cluster contains the fewest number of occupations, it is one of the largest in terms of number of jobs (see Table 14 for employment statistics and completion data).

Table 14 – Clerical-Administrative Occupational Employment and Education

Occupations	Education requirement	Avg wages	2011 Jobs	Annual Openings	2011 Completions	Gap: Oversupply (Undersupply)
Medical records and health information technicians	Associate degree	$18.83	1,442	64	250	186
Medical and health services managers	Degree plus work experience	$40.30	2,438	102	77	(25)
Medical secretaries	Moderate-term on-the-job training	$15.05	6,419	257	446	189
Medical transcriptionist	Postsecondary vocational award	$12.80	1,553	31	0	(31)
Total			**11,852**	**454**	**773**	**319**

Source: EMSI Complete Employment – 2011.3

Overall, occupations in this group require little educational attainment for employment. Growth in this cluster is estimated at 12% over the next five years. Average hourly earnings for these occupations range from about $13 to $40. The largest anticipated job growth is for medical secretaries (13%), followed by medical records and health information technicians with 12% expected growth.

The demand for medical records and health information technicians will likely increase as the adoption of health information technology continues to change the way medical records are maintained. Health information technicians are tasked with transitioning patient paper files to electronic files and using computer systems to help doctors analyze, diagnose and treat patients based on provided information. Another emerging occupation in this field, medical scribes, provides administrative support to physicians by entering

[55] California Hospital Association. *Critical Roles: California's Allied Health Workforce*. February 2011.

medical information from physician exams into computers and maintaining electronic medical records.[56] Medical scribes should realize significant growth in the coming years as more hospitals and physician offices transition to electronic records.

Programs that prepare for clerical-administrative occupations offer education in administration and office assistance. Regional ROCPs provide foundational awareness and education to students in a variety of applications, such as medical insurance billing, health information technology, and administrative medical assisting. Community colleges and proprietary/technical colleges offer the most workforce education and training programs in this cluster. Four-year universities/colleges only provide programs that prepare for medical and health services managers.

According to the student completion data, the largest numbers of program completers in this cluster are in medical insurance coding specialist and medical administrative programs. Combined, these programs conferred nearly 500 technical certificates in 2011. Data demonstrates that there is a potential undersupply of medical and health services managers and medical transcriptionists. Conversely, medical records and health information technicians are projected to be in surplus, with approximately 180 more graduates than jobs available. Focus group discussions revealed that trends affecting health information technicians (HIT) are not necessarily creating new jobs but instead requiring employers to upgrade the skills of their existing employees.

Primary Care Providers and Physician-Related Occupations

Occupations included in this cluster are general physicians and surgeons, specialty doctors, and support occupations. Occupations that assist physicians, such as medical assistant and physician assistant, can serve as an introduction to the more advanced physician/doctor careers. Primary care providers and specialty physicians require at least a Master's degree and, in most cases, a First professional degree. In addition to a formal education, physicians must complete a residency requirement and pass the United States Medical Licensing Examination prior to entering into practice.[57] Table 15 provides workforce data for this cluster.

Table 15 – Primary Care Providers and Physician-related Occupational Employment and Education

Occupations	Education requirement	Avg wages[58]	2011 Jobs	Annual Openings	2011 Completions	Gap: Oversupply (Undersupply)
Physicians and Surgeons[59]	First professional degree	$81.58	5,675	221	148	(73)
Chiropractors	First professional degree	$29.34	455	12	0	(12)
Physician assistants[60]	Master's degree	$39.79	831	46	24	(22)
Nurse practitioner*	Master's degree	N/A	587	24	22	(2)
Medical assistants	Moderate-term on-the-job training	$13.10	7,137	302	3,006	2,704
Total			**14,685**	**605**	**3,200**	**2,595**

Source: EMSI Complete Employment – 2011.3

*Labor market data was not available for Nurse practitioner; data for Health diagnosing and treating practitioners, all other was used in this table instead (this was the occupation code that Nurse Practitioner occupation was previously included in).

[56] Source: Los Angeles Times. *Scribe's are doctors' tech support*. September 6, 2010 located at http://articles.latimes.com/2010/sep/06/health/la-he-medical-scribes-20100906.

[57] Source: Bureau of Labor Statistics. http://www.bls.gov/oco/ocos074.htm

[58] Nurse Practitioner is a new occupation in the Standard Occupational Classification (SOC) system. Therefore, wage data is not yet available.

[59] Labor market data included in this occupation include general practitioners and surgeons but not specialty physicians. Occupational data is reflective of an all-encompassing grouping of physicians and surgeons not "all other" physicians and surgeons.

[60] Only Loma Linda University (LLU) offers a Master's degree for this occupation. Moreno Valley College offers certificate and Associate degree preparation for advancement to a higher level degree. In this gap analysis, only the 24 Masters degree completions from LLU are considered.

Table 15 demonstrates that there are about 14,000 jobs for primary care providers and physician support occupations in the Inland Empire. The anticipated employment growth for this cluster is about 12% over the next five years. The fastest growing occupations in this cluster are physician assistants and medical assistants, with 18% and 16% growth rates respectively. Among all occupations, medical assistants have the most job opportunities (1,512 new jobs in the next five years), but the least earning potential ($13.10 average hourly wage). Nurse practitioners, discussed in the Direct Care cluster analysis, are emerging as an alternative to physicians in providing primary care services. NPs are expected to realize significant growth in the coming years.

Primary care providers are reportedly realizing a workforce shortage in the Inland Empire. According to a 2009 study on the healthcare workforce in the Inland Empire, the two-county region has a "significant shortage of primary care and specialist physicians"; the study attributes a lack of physicians to social and economic conditions of the area. [61]The 2008 ratio of primary care providers to the population in the Inland Empire was 40:100,000; [62] deficient of the U.S. Department of Health and Human Services' Council recommendation of 60 to 80 primary care physicians per 100,000 people.[63] Figures from another report published by the Alliance for Health Reform estimate that by the year 2025 the existing physician shortage in the nation could grow by as much as 25 percent.[64]

A variety of educational options are available in the region along the career pathway. ROCPs offer courses that provide foundational knowledge on such topics as medical terminology, medical math, and health careers preparation and fundamentals. Baldy View and Colton-Redlands-Yucaipa ROCPs also offer courses in clinical medical assisting. Technical/proprietary colleges provide more education and training for medical assistants, compared to other programs offered. In 2011, technical colleges awarded 339 certificates in allied health and medical assisting services and over 2,000 certificates in medical/clinical assistant programs. Data reflects a significant oversupply of program graduates for the medical assisting positions, a surplus of over 2,000.

Nurse practitioners (NPs) are advanced practice nurses who typically work independent of a physician and are increasingly filling the role of primary provider in medically underserved areas. NPs will become more important as the number of insured grows in coming years. Nurse practitioner certification is regulated by the California Board of Registered Nursing as a post-license credential.

The largest workforce gap in this cluster of programs is for physicians and surgeons. In 2011, there were only 148 degrees awarded by Loma Linda University's Medicine program, while the region is estimated to need 221 physicians annually over the next five years.

Public Health and Human Services Cluster

The public health and human services cluster captures a wide variety of professionals that provide ancillary healthcare services to the population and are generally employed in non-clinical settings. For example, health educators and medical and public health social workers provide services in the public/community health arena. Table 16 summarizes workforce data for these occupations.

Table 16 – Public Health and Human Services Occupational Employment and Education

Occupations	Education requirement	Avg wages	2011 jobs	Openings	2011 Completions	Gap: Oversupply (Undersupply)
Clinical, counseling, and school psychologists	Doctoral degree	$28.99	3,375	156	903	747

[61] California HealthCare Foundation. *California Health Care Almanac;Riverside/San Bernardino: Sprawling Area, Economic Woes Create Access Challenges*. 2009.
[62] California Healthcare Foundation. California Health Care Almanac: California Physician Facts and Figures. July 2010.
[63] Lin, Joanna. California Watch. Dire shortage of doctors as senior population rises. July 10, 2010.
[64] Alliance for Health Reform. *Health Care Workforce: Future Supply vs. Demand*. 2011.

Occupations	Education requirement	Avg wages	2011 jobs	Openings	2011 Completions	Gap: Oversupply (Undersupply)
Epidemiologists	Master's degree	$30.75	34	1	23	22
Social and human service assistants	Moderate-term on-the-job training	$13.86	2,437	80	105	25
Medical and public health social workers	Bachelor's degree	$26.09	832	40	110	70
Health educators	Bachelor's degree	$23.47	791	29	163	134
Speech language pathologists	Master's degree	$30.66	1,105	41	25	(16)
Dietitians and nutritionists	Bachelor's degree	$26.53	545	27	68	41
Total			**9,119**	**374**	**1,397**	**1,023**

Source: EMSI Complete Employment – 2011.3

In the Inland Empire, this cluster of occupations is expected to grow by 7% over the next five years. Medical and public health social workers is the fastest growing occupation in this cluster (estimated 12% growth over the next five years). Average hourly wages range from about $14 to $31 for different occupations, with epidemiologists earning the top wages in the cluster. Education requirements also vary, ranging from on-the-job training to doctoral degrees; nearly all occupations (six of seven) require some level of degree attainment for employment.

The variation of occupations in this cluster is mirrored by the program offerings at regional education providers. Programs with a focus on public health topics or general health wellness and services prepare for careers in health educator occupations. Nutrition and dietetics programs provide necessary training for dietitians; awards for these programs range from Associate to Doctoral degrees. In 2011, regional educators reported 903 awards in general, clinical, and counseling psychology, representing the largest projected surplus of program completers compared to jobs available in the regional labor market. The only occupation currently showing a need for more qualified graduates is speech language pathologists (16 unmet jobs). However, a study on the public health workforce in California estimates that 50% of government health workers will be eligible to retire in 2012.[65]

Although a fairly new occupation, community health workers are also expected to be in demand in the Inland Empire. The California Health Workforce Alliance describes community health workers (also known as *promotores)* as "advocates for communities and resources to build more culturally competent systems of care, as bridges between the delivery of health services and community health improvement".[66] Although no labor market data is currently available for this occupation, anecdotal evidence from various discussions with industry representatives in the region suggests that the need for these workers will be steadily increasing. In addition, analysis of job postings from the period August 2010-July 2011 revealed that employers in San Bernardino County accounted for a significant number of job openings for this occupation, the 5th largest among other counties in the state.[67]

[65] University of California, Berkeley. Berkeley News. More public health professionals needed to avert crisis, warns new report. 02/27/2008.
[66] California Health Workforce Alliance. Community Health Workers/Promotores in the Context of Health Reform: Issues and Options. January 4, 2011.
[67] Centers of Excellence. Research Brief: Community Health Workers. September 2011.

Conclusions and Recommendations

The healthcare industry is in a state of transition. Changes taking place at the national level are creating a new environment for the delivery of health services and directly impacting the healthcare workforce. Unique regional factors such as high poverty levels, the readiness of secondary students for post-secondary education, and geographic diversity also have a direct effect on health services and the healthcare workforce. Analysis of qualitative and quantitative data depicts the healthcare industry and workforce as dynamic and evolutionary. Trends related to healthcare are providing the impetus for change in the skills and practices of healthcare labor while healthcare reform is growing the demand for medical services by increasing the number of insured.

Regionally, employment in healthcare occupations accounts for about 115,000 jobs or roughly 8% of the total workforce in the area. Some key concerns regarding the healthcare workforce are the lack of representation by ethnic minority groups, a shortage of high-earning professional healthcare workers, partly due to the inability of the region to retain qualified physicians, and the likely threat of a growing deficit of key allied health occupations in the coming years due to worker retirements and increased demand for services. Additionally, low reimbursement rates in the region are contributing to the shortage of primary care physicians in the region.[68]

The central conclusions and salient points derived from our research are provided below.

- In the region, there is a variety of healthcare programs available for almost all of the occupations of study.[69] There are areas where programs appear to be oversupplying the labor market and some where there is the need for more graduates. As the analysis was done for the two-county region, it does not take into consideration possible workforce shortages that might exist on a sub-regional level.[70]
- Looking at wage data for healthcare occupations, there is a significant wage increase from occupations that require only some level of on-the-job training or vocational award to those requiring an Associate degree, which emphasizes the value of a post-secondary award for employers in healthcare sector.
- Current make-up of the Inland Empire healthcare workforce is not reflective of the highly diverse general population. Research shows that a representative workforce is critical for improving the overall health of the populace.
- In some fields where there is an apparent over-supply of student completions, the majority of awards are coming from proprietary/trade schools. Area community colleges and 4 year institutions are falling short of meeting the need for certain key allied health occupations.
- Gap analysis suggests an **oversupply** of the following occupations (see Appendix I for full listing of occupations in oversupply)
    - Medical assistants
    - Licensed vocational nurses
    - Clinical, counseling, and school psychologists
    - Pharmacy technician
    - Dental assistants

[68] Mc Sherry, Lauren. California Healthline. Riverside Lobbying for Raise in State Health Care Funding. August 5, 2010.
[69] Recent state budget cuts have required the discontinuance of programs at local community colleges. Pending future cuts will likely have further impact on the programs being offered, resulting in a shift in the over and under supplies noted in this report.
[70] Note that gap analysis was conducted at the county level for all education programs. A more detailed evaluation at the sub-region level would need to be done in order to determine if program completions are aligning with industry needs for occupations that appear to be in oversupply.

- Gap analysis suggests an **undersupply** of the following occupations (see Appendix J for full listing of occupations in oversupply)
    - Nursing assistants
    - Physicians and surgeons
    - Medical transcriptionist
    - Medical and clinical lab technicians
    - Medical and health services managers
- Health information technology is quickly permeating the healthcare industry and creating the need for training of incumbent workers in clerical-administrative occupations but is not necessarily creating more jobs. Studies and focus groups have concluded that health IT is a skill rather than an occupation, so care should be taken to closely watch demand for this occupation.
- The Inland Empire healthcare industry does not offer competitive wages compared to neighboring counties. As a result, the apparent deficit of highly-trained healthcare practitioners in the region could be partially attributed to the fact that healthcare graduates are pursuing employment in other counties. However, more research is needed to confirm or refute this supposition.
- The move toward patient treatment in a non-hospital setting (i.e. community health) is expected to create a large demand for direct care occupations. In particular, nursing occupations will likely experience a higher demand in the coming years. Additionally, the need for community health workers, an emerging occupation, will most probably transition from a volunteer position (as it currently exists) to a formalized occupation with accompanying education and training programs.
- There is currently only one four-year institution providing graduate level coursework preparing students for higher level occupations. More program offerings at the Masters and Doctoral degree level, through the opening of a new education institution, may attract more students to these programs and populate the healthcare workforce with more highly trained workers.

Recommendations:

The findings of this report suggest a need for evaluation of healthcare programs offered in the Inland Empire and efforts toward addressing issues related to the overall system of healthcare delivery. To this end, the following recommendations are offered to the broader community of regional stakeholders, including government, educational institutions and healthcare employers:

- ***Explore new models that can support pathways from K-12 to graduate level education for the training and preparation of the future healthcare workforce.*** This would allow students to pursue a clear path toward a career in healthcare while preparing for the anticipated increase in demand for healthcare providers brought on by provisions of the Affordable Care Act.
- ***Expand existing program offerings to include courses and/or certificates in new areas such as community health workers.*** Technology trends and changes in the way healthcare services are being delivered only require additional skills or low levels of education. If educational institutions can update their related programs by adding new individual courses or certificate programs, students could quickly and easily enhance their skill set and enter or transition into community health careers.
- ***Build strong partnerships between industry and education to offer internships/apprenticeships or other assistance with transitioning graduates into jobs.*** Establishing support for graduates of healthcare programs in securing employment can help ensure that the region does not lose members of the workforce to other areas.
- ***Increase offerings of not-for-credit training for incumbent workers in order to upgrade skill sets of the existing healthcare workforce.*** In some cases, updating the skills of incumbent workers could meet the needs of employers who are integrating changes to the delivery of healthcare services. For example, the emerging occupation of health information technician requires only skills upgrade and not necessarily the addition of a new program.
- ***Increase advertisement of programs in areas that demonstrate a potential under-supply.*** Attracting students to programs that prepare for occupations that are in under-supply will build a larger pool of qualified employees for healthcare establishments. Special attention should be given to occupations that are likely to experience increasing demand in the coming years.
- ***Increase education awareness in the identified Medically Underserved Areas.*** Further research should be done to understand the availability of training and education programs in the Inland Empire MUAs. Such research would help understand if there is a need for funding and resources toward program development in these areas.
- ***Develop and/or strengthen industry advisory boards to gain insight into specific employer needs and work to address them through curriculum changes at all education levels.*** Meeting the needs of industry is critical for supplying the region's workforce. With input from an industry advisory board, education institutions would have the guidance in training and educating qualified regional workforce.
- ***Conduct a survey of healthcare establishments in the region to determine what proportion of the workforce is being lost to neighboring counties.*** The perception that graduates of regional healthcare programs are leaving for work in the nearby counties needs to be verified. A survey of healthcare establishments in the Inland Empire and possibly in the surrounding counties could yield such information.
- ***Conduct a study to understand employers' perception of the quality of training provided by various types of educational institutions.*** Such research would help the region understand better what role each type of educational institution plays in preparing work-ready healthcare workforce. The information can be used for program improvement and better alignment of the offerings with employer needs.

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Appendix A – How to Utilize this Report

This report is designed to provide current labor market information to:

- Understand the factors impacting the healthcare industry and their effect on the workforce in the Inland Empire;
- Provide information on healthcare education and training programs in the region; and,
- Promote strategic planning for employers and colleges in the area to meet healthcare needs of the population

The information in this report has been validated by industry professionals and community colleges and includes a listing of programs being offered by colleges to address workforce needs. In some instances, the labor market information and industry validation will suggest that colleges might not want to begin or add programs, thereby avoiding needless replication and low enrollments.

The funding for this research was provided through the Regional Industry Clusters of Opportunity Grant (RICOG).

The Centers of Excellence (COE), in partnership with business and industry, deliver regional workforce research customized for community college decision making and resource development. This information has proven valuable to colleges in beginning, revising, or updating economic development and Career Technical Education (CTE) programs, strengthening grant applications, assisting in the accreditation process, and in supporting strategic planning efforts.

More information about the Centers of Excellence is available at **www.coeccc.net**.

Important Disclaimer

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. Efforts have been made to qualify and validate the accuracy of the data and the reported findings; however, neither the Centers of Excellence, COE host District, nor California Community Colleges Chancellor's Office are responsible for applications or decisions made by recipient community colleges or their representatives based upon components or recommendations contained in this study.

Explanation of Data Sources

Industry Data

In order to capture a complete picture of industry employment, EMSI basically combines covered employment data from Quarterly Census of Employment and Wages (QCEW) produced by the Department of Labor with total employment data in Regional Economic Information System (REIS) published by the Bureau of Economic Analysis (BEA), augmented with County Business Patterns (CBP) and Nonemployer Statistics (NES) published by the U.S. Census Bureau. Projections are based on the latest available EMSI industry data, 15-year past local trends in each industry, growth rates in statewide and (where available) sub-state area industry projections published by individual state agencies, and (in part) growth rates in national projections from the Bureau of Labor Statistics.

Occupation Data

Organizing regional employment information by occupation provides a workforce-oriented view of the regional economy. EMSI's occupation data are based on EMSI's industry data and regional staffing patterns taken from the Occupational Employment Statistics program (U.S. Bureau of Labor Statistics). Wage information is partially derived from the American Community Survey.

Education Program Data

Community college education programs were extracted from the California Community Colleges Chancellor's Office Inventory of Approved Programs. This inventory lists credit degrees and certificates offered by California community colleges which are approved by the Chancellors office. California Community Colleges approved programs are identified by the Taxonomy of Programs (TOP), a system of nomenclature for designating programs in the California Community Colleges system. The complete TOP manual can be viewed on the Chancellor's office website at http://www.cccco.edu/Portals/4/TopTax6_rev0909.pdf

Data on Community College degree and certificate completions was accessed using the California Community Colleges Chancellor's Office Data Mart, located at http://www.cccco.edu/ChancellorsOffice/Divisions/TechResearchInfo/MIS/DataMartandReports/tabid/282/Default.aspx.

Program and completion data for 4 year education institutions and technical/proprietary institutions was compiled using the Integrated Postsecondary Education Data System (IPEDS). IPEDS gathers information from every college, university, and technical and vocational institution that participates in the federal student financial aid programs. The Higher Education Act of 1965, as amended, requires that institutions that participate in federal student aid programs report data on enrollments, program completions, graduation rates, faculty and staff, finances, institutional prices, and student financial aid.

Appendix B – Employment and Growth of Healthcare Occupations by Education Level

Occupation/SOC Code	2011 jobs	2016 jobs	Growth	% Growth	Openings	Average hourly wage
Short-term on-the-job training						
Home health aides (31-1011)	5,133	6,164	1,031	20%	1,287	$10.48
Occupational therapist aides (31-2012)	42	47	5	12%	8	$15.97
Personal and home care aides (39-9021)	11,283	13,543	2,260	20%	2,964	$9.58
Physical therapist aides (31-2022)	512	580	68	13%	105	$14.02
Moderate-term on-the-job training						
Dental assistants (31-9091)	4,177	4,894	717	17%	1,110	$14.72
Dental laboratory technician (51-9081)	117	125	8	7%	21	$25.19
Medical assistants (31-9092)	7,137	8,251	1,114	16%	1,512	$13.10
Medical secretaries (43-6013)	6,419	7,273	854	13%	1287	$15.05
Pharmacy technicians (29-2052)	2,941	3,351	410	14%	780	$16.28
Social and human service assistants (21-1093)	2,437	2,578	141	6%	398	$13.86
Postsecondary vocational award						
Emergency medical technicians and paramedics (29-2041)	1,919	2,296	377	20%	573	$17.74
Licensed vocational nurses (29-2061)	6,154	6,891	737	12%	1,700	$21.15
Medical transcriptionists (31-9094)	1,553	1,619	66	4%	153	$12.80
Nursing Assistants (31-1014)*	10,456	11,706	1,250	12%	1,771	$12.02
Psychiatric technicians (29-2053)	1,433	1,532	99	7%	279	$22.55
Respiratory therapy technicians (29-2054)	75	78	3	4%	12	$26.08
Surgical technologists (29-2055)	618	708	90	15%	168	$20.17
Associate degree						
Cardiovascular technologists and technicians (29-2031)	328	378	50	15%	74	$25.07
Dental hygienists (29-2021)	1,305	1,530	225	17%	358	$39.31
Diagnostic medical sonographers (29-2032)	387	431	44	11%	72	$32.61
Medical and clinical laboratory technicians (29-2012)	699	775	76	11%	142	$18.71
Medical records and health information technicians (29-2071)	1,442	1,613	171	12%	318	$18.83
Nuclear medicine technologists (29-2033)	100	111	11	11%	18	$38.60
Occupational therapist assistants (31-2011)	214	243	29	14%	45	$22.80
Physical therapist assistants (31-2021)	566	643	77	14%	118	$25.59
Radiologic technologists and technicians (29-2034)	1,508	1,676	168	11%	277	$28.73

Occupation/SOC Code	2011 jobs	2016 jobs	Growth	% Growth	Openings	Average hourly wage
Registered nurses (29-1141)	21,353	24,281	2,928	14%	4,793	$36.22
Respiratory therapists (29-1126)	1,505	1,709	204	14%	341	$29.21
Bachelor's degree						
Dietitians and nutritionists (29-1031)	545	588	43	8%	133	$26.53
Health educators (21-1091)	791	852	61	8%	145	$23.47
Medical and clinical laboratory technologists (29-2011)	681	744	63	9%	128	$36.11
Medical and public health social workers (21-1022)	832	930	98	12%	202	$26.09
Degree plus work experience						
Medical and health services managers (11-9111)	2,438	2,717	279	11%	512	$40.30
Master's degree						
Epidemiologists (19-1041)	34	37	3	9%	7	$30.75
Nurse Practitioner (29-1171)**	587	652	65	11%	118	N/A
Occupational therapists (29-1122)	505	568	63	12%	109	$32.10
Physical therapists (29-1123)	1,314	1,497	183	14%	262	$34.77
Physician assistants (29-1071)	831	984	153	18%	228	$39.79
Speech-language pathologists (29-1127)	1,105	1,207	102	9%	203	$30.66
Doctoral degree						
Clinical, counseling, and school psychologists (19-3031)	3,375	3,676	301	9%	779	$28.99
Medical scientists, except epidemiologists (19-1042)	877	1,040	163	19%	252	$42.06
Microbiologists (19-1022)	82	88	6	7%	19	$37.42
First professional degree						
Audiologists (29-1181)	80	88	8	10%	16	$37.19
Chiropractors (29-1011)	455	475	20	4%	60	$29.34
Dentists, general (29-1021)	1,627	1,755	128	8%	355	$65.16
Pharmacists (29-1051)	1,932	2,128	196	10%	411	$56.53
Physicians and surgeons, all other (29-1069)	5,675	6,281	606	11%	1,105	$81.58
Total	**115,579**	**131,333**	**15,754**	**14%**	**25,727**	

*Data provided is for Nursing aides, orderlies, and assistants (31-1012). Labor market data was not available for Nursing Assistants (a newly coded occupation). Nursing assistants were previously categorized under SOC 31-1012.

**Nurse Practitioner is a new occupation in the Standard Occupational Classification (SOC) system. Therefore, wage data is not yet available.

Appendix C – Healthcare Programs by Type of Credential Awarded in the Inland Empire

Program Name	ROP Cert	CC Cert	CC Associate	4 year Associate	Bachelor's Degree	4 year Cert	Master's Degree	Professional Degree	Total
Dental									
Dental Assistant	3	2	2						**7**
Dental Laboratory Technician		1	1						**2**
Dental Hygienist			1		2				**3**
Dentistry						1		2	**3**
TOTAL Dental	**3**	**3**	**4**	**0**	**2**	**1**	**0**	**2**	**15**
Direct Care									
Acute Care Nursing	3								**3**
Licensed Vocational Nursing	2	6	4						**12**
Certified Nurse Assistant	4	7							**11**
Home Health Aide	2	5							**7**
Introduction to Nursing	1								**1**
Occupational Therapy							1	1	**2**
Occupational Therapy Assistant				1					**1**
Physical Therapy							1	1	**2**
Physical Therapy Technician	2			1					**3**
Respiratory Care/Therapy		2	2		1	1			**6**
TOTAL Direct Care	**14**	**20**	**6**	**2**	**1**	**1**	**2**	**2**	**48**
Technical									
Anatomy							1	1	**2**
Audiology			1		1		1		**3**
Biostatistics							1		**1**
Biochemistry					2			1	**3**
Biochemistry and Molecular Biology							1	1	**2**
Clinical Lab Science/Medical Tech					1				**1**
Cytotechnology					1				**1**
Diagnostic Medical Sonography	2	2	2		1	1			**8**
Emergency Medical Technology	4	6	1		1				**12**
Medical Microbiology/Bacteriology								1	**1**
Microbiology, General								1	**1**
Nuclear Medicine Technology						1			**1**
Paramedic		2	2						**4**
Pharmacy Technology	6	2	2					1	**11**
Psychiatric Technician		1	1						**2**
Radiologic Technology		1	2	1	1				**5**
TOTAL Technical	**12**	**14**	**11**	**1**	**8**	**2**	**4**	**6**	**58**

(continued on the next page)

Program Name	ROP Cert	CC Cert	CC Associate	4 year Associate	Bachelor's Degree	4 year Cert	Master's Degree	Professional Degree	Total
Clerical-Administrative									
Medical Administrative	5	1	2						**8**
Health Information/Medical Records Administration					1				**1**
Health/Health Care Administration					1		2		**3**
Medical Insurance Coding Specialist	2								**2**
TOTAL Clerical-Administrative	**7**	**1**	**2**	**0**	**2**	**0**	**2**	**0**	**14**
PCP & Physician-related									
Registered Nursing		1	7	1	3			1	**13**
Clinical Nurse Specialist/Advanced							5		**5**
Clinical Medical Assisting	3	4	3						**10**
Medicine								1	**1**
Physician Assistant		1	1				1		**3**
TOTAL PCP & Physician-related	**3**	**6**	**11**	**1**	**3**	**0**	**6**	**2**	**32**
Public Health & Human Serv.									
Clinical Nutrition							1	1	**2**
Clinical Psychology							1	1	**2**
Clinical/Medical Social Work								1	**1**
Counseling Psychology							1		**1**
Dietetics/Dietitian					2		1		**3**
Epidemiology							1	1	**2**
Health and Wellness, General								1	**1**
Health Services					2		1		**3**
Human Services					1				**1**
International Public Health							1		**1**
Maternal and Child Health							1		**1**
Psychology, General			4		5		3	2	**14**
Public Health Education and						1	1	1	**3**
Social Work					2		1		**3**
Speech Language Pathology					1		1		**2**
TOTAL Public Health & HS	0	**0**	**4**	**0**	**13**	**1**	**14**	**8**	**40**
TOTAL ALL PROGRAMS	**39**	**44**	**38**	**4**	**29**	**5**	**28**	**20**	**207**

Appendix D – ROCP Healthcare Programs in the Inland Empire

Program Name	Baldy View	Colton-Redlands-Yucaipa	Riverside	San Bernardino
Introduction to Health Careers				
Acute Care - Hospital Occupations			x	
Allied Health Occupations			x	
Health Careers Fundamentals			x	
Health Care Occupations			x	
Health Careers Preparation		x		
Health Science			x	
Hospital/Community Health Services				
Hospital/Medical Services Occupations	x	x		
Hospital Health Careers				x
Introduction to Health Careers			x	x
Introduction to Hospital Careers				x
Medical Math	x		x	
Medical Terminology		x	x	x
Medical Core	x			
Dental				
Registered Dental Assistant	x		x	x
Direct Care				
Acute Care Nursing		x	x	x
Certified Nursing Assistant	x	x	x	x
Clinical Medical Assistant	x	x	x	x
Home Health Aide		x	x	
Introduction to Nursing Careers				x
Licensed Vocational Nursing	x	x		
Physical Therapy Aide		x		x
Technical				
Diagnostic Medical Services (EKG Technician)			x	x
Emergency Medical Technician/First Responder	x		x	x
Emergency Medical Technician Recertification	x			
Pharmacy Assistant/Clerk	x		x	
Pharmacy Technician	x	x	x	x
Clerical-Administrative				
Administrative Medical Assistant			x	x
Medical Records Clerk/Specialist				x
Medical Front Office	x			x
Medical Insurance Billing			x	x

Appendix E – Community College Healthcare Programs in the Inland Empire

C-Certificate; AD-Associate Degree	Barstow College	Chaffey College	College of the Desert	Copper Mountain College	Crafton Hills College	Moreno Valley College	Mt San Jacinto College	Palo Verde College	Riverside City College	San Bernardino Valley College	Victor Valley College
Dental											
Dental Assistant		C, AD				C, AD					
Dental Hygienist						AD					
Dental Laboratory Technician						C, AD					
Direct Care											
Certified Nurse Assistant		C	C	C			C	C	C		C
Home Health Aide		C	C	C			C				C
Licensed Vocational Nursing		C, AD	C, AD	C, AD			C	C	C, AD		
Registered Nursing		AD	AD	AD			AD		AD	AD	C, AD
Respiratory Care/Therapy					C, AD						C, AD
Technical											
Audiology					AD						
Diagnostic Medical Sonography					C, AD		C, AD				
Emergency Medical Services				C	C, AD	C	C	C			C
Paramedic					C, AD	C, AD					AD
Pharmacy Technology		C, AD								C, AD	
Psychiatric Technician										C, AD	
Radiologic Technology		AD			C, AD						
Clerical-Administrative											
Administrative Medical Assisting	AD	C, AD									
PCP & Physician-related											
Clinical Medical Assisting	C, AD					C, AD	C, AD				C
Physician Assistant						C, AD					
Public Health & Human Services											
Psychology, general		AD	AD	AD	AD						

Appendix F – University Healthcare Programs in the Inland Empire

ADP - Associate Degree; C - Certificate; GC - Graduate Certificate; BD-Bachelor's Degree; MS-Master's Degree; PD - Professional/Graduate Degree	California Baptist University	California State University, San Bernardino	La Sierra University	Loma Linda University	University of California, Riverside	University of Redlands
Dental						
Dentistry				PD		
Pediatric Dentistry/Pedodontics				GC, PD		
Dental Hygienist			BD	BD		
Direct Care						
Nursing	MS	MS		MS		
Occupational Therapy				MS, PD		
Occupational Therapy Assistant				ADP		
Pediatric Nursing				MS		
Physical Therapy				MS, PD		
Physical Therapy Technician				ADP		
Registered Nursing	BD	BD		ADP, BD		
Respiratory Care/Therapy				GC, BD		
Technical						
Anatomy				MS, PD		
Audiology						BD, MS
Biostatistics				MS		
Biochemistry			BD	PD	BD	
Biochemistry and Molecular Biology					MS, PD	
Clinical Lab Science/Medical Technology				BD		
Cytotechnology				BD		
Emergency Medical Services				BD		
Medical Microbiology and Bacteriology				PD		
Microbiology, general					PD	
Nuclear Medicine Technology				C		
Pharmacy				PD		
Radiologic Technology				ADP, BD		
Clerical-Administrative						
Health/Health Care Administration		MS		BD, MS		
Health Information/Medical Records Administration				BD		
Primary Care Providers and Physicians-related						
Clinical Nurse Specialist				MS		
Medicine				PD		
Physician Assistant				MS		
Registered Nursing				PD		

ADP - Associate Degree; C - Certificate; GC - Graduate Certificate; BD-Bachelor's Degree; MS-Master's Degree; PD - Professional/Graduate Degree	**California Baptist University**	**California State University, San Bernardino**	**La Sierra University**	**Loma Linda University**	**University of California, Riverside**	**University of Redlands**
Public Health & Human Services						
Clinical Nutrition				MS, PD		
Clinical Psychology				MS, PD		
Clinical/Medical Social Work				PD		
Counseling Psychology	MS					
Dietetics/Dietician		BD		BD, MS		
Epidemiology				MS, PD		
Health and Wellness, General				PD		
Health Services		BD		BD, MS		
Human Services, General		BD				
International Public Health				MS		
Maternal and Child Health				MS		
Psychology, general	BD	BD, MS	BD	MS, PD	BD, MS, PD	BD
Public Health Education and Promotion				GC, MS, PD		
Social Work		BD, MS	BD			
Speech Language Pathology				BD, MS		

Appendix G – Proprietary Vocational Healthcare Programs in the Inland Empire

TA - Technical Associate Degree; TC - Technical Certificate; TB - Technical Bachelor's Degree	American Career College	American College of Healthcare	CA Nurses Educational Institute	CET	Concorde Career College	Everest College	Four-D College	Franklin Career College	Intercoast College	ITT	Kaplan College	Milan College	North-West College	Platt College	San Joaquin Valley College	Summit Career College	West Coast University	Westech College
Dental																		
Dental Assisting	TC				TC	TC	TC				TC					TC		
Dental Hygienist															TA			
Direct Care																		
Licensed vocational nurse training			TC		TC		TC	TC					TC			TC		
Nursing Assistant/Aide			TC															
Registered Nursing																	TB	
Technical																		
Physical Therapy Technician		TC																
Vocational Nursing and Nursing Assistants, Other	TC																	
Respiratory Care Therapy					TA										TA			
Surgical Technology	TA	TC			TC													
Diagnostic Medical Sonographer	TC																	
Pharmacy Technician	TC	TC				TC	TC				TC	TC			TC			
Clerical-Administrative																		
Health and Medical Administrative Services, Other	TC																	TC
Health Info/Medical Records Technology										TA								
Medical Administration		TC		TC		TC						TC						
Medical Insurance Coding Specialist						TC	TC	TC										
Medical Office Assistant							TC				TC							
Primary Care Provider and Physician-related																		
Allied Health and Medical Assisting Services, Other														TA				TC
Med/Clinical Assistant	TC				TC	TC	TC	TC	TC		TC	TC	TC		TC, TA	TC		

Appendix H – Occupation and Program Completions by Cluster

Statistics provided in the following tables includes the following:

2011 Completions: Data collected include the number of degrees and certificates completed for the 2010-2011 academic year for California Community Colleges. Completion data for the 2010-2011 year were not available for 4 year institutions and Proprietary schools; for these institutions 2009-2010 data was used.

Annual Openings: The number of Openings (which includes new and replacement jobs) available each year for the period from 2011-2016.

Gap: The Gap figure denotes either an undersupply or oversupply of student completions for each occupation. An undersupply is represented as a whole number contained in parentheses and an oversupply as a whole number not contained in parentheses.

Award Level: The following legend provides a description for each of the abbreviations used in the Award Level column.

C=2 year community college certificate	TA=Technical/Proprietary school Associate degree
GC= Graduate level certificate	BD=4 year Bachelor's degree
TC=Technical/Proprietary school certificate	TB=Technical/Proprietary school Bachelor's degree
AD=2 year community college Associate degree	MS=Master's degree
ADP=Associate degree from a 4 year university	PD=Professional or Doctorate degree

Dental Cluster

Occupations	Program	Award Level	2011 Completions	Total Completions	Annual Openings	Gap: Oversupply (Undersupply)
Dentists, general (29-1021)	Dentistry	PD	97	**97**	**71**	**34**
	Pediatric Dentistry/ Pedodontics	PD	4	**8**		
		GC	4			
Dental hygienists (29-2021)	Pre-Dental Hygiene Studies	BD	2	**2**	**72**	**37**
	Dental Hygiene/Hygienist	BD	40	**107**		
		AD	8			
		TA	59			
Dental assistants (31-9091)	Dental Assisting/Assistant	AD	7	**567**	**222**	**345**
		C	32			
		TC	528			
Dental laboratory technician (51-9081)	Dental Laboratory Technician	AD	3	**8**	**4**	**4**
		C	5			

Source: EMSI Complete Employment - 2011.3

Direct Care Cluster

Occupations	Program	Award Level	2011 Completions	Total Completions	Annual Openings	Gap: Oversupply (Undersupply)
Registered nurses (29-1141)	Registered Nursing	BD	378	**1,211**	**959**	**252**
		TB	59			
		AD	701			
		C	73			
Licensed vocational nurses (29-2061)	Licensed Vocational Nurse	AD	54	**1,156**	**340**	**843**
		C	128			
		TC	974			
	Vocational Nursing and Nursing Assistants, Other	TC	27	**27**		
Nursing assistants (31-1014)	Certified Nursing Assistant	AD	3	**3**	**354**	**(135)**
		C	162	**162**		
	Nursing Assistant/Aide	TC	54	**54**		
Occupational therapists (31-2012)	Occupational Therapy	PD	2	**34**	**22**	**12**
		MS	32			
Physical therapists (29-1123)	Physical Therapy	PD	82	**145**	**52**	**93**
		MS	63			
Respiratory therapists (29-1126)	Respiratory Care Therapy	GC	1	**252**	**68**	**184**
		BD	10			
		AD	46			
		TA	195			
Occupational therapist assistants (31-2011)	Occupational Therapist Assistant	ADP	1	**1**	**9**	**(8)**
Physical therapist assistants (31-2021)	Physical Therapy Technician	AD	37	**37**	**24**	**15**
		TC	2	**2**		
Psychiatric technicians (29-2053)	Psychiatric/Mental Health Services Technician	AD	11	**62**	**56**	**6**
		C	51			
Respiratory therapy technicians (29-2054)	Respiratory Care Therapy	C	47	**47**	**2**	**45**
Surgical technologists (29-2055)	Surgical Technology	TA	22	**22**	**34**	**22**
		TC	34	**34**		

Source: EMSI Complete Employment - 2011.3

Technical Cluster

Occupations	Program	Award Level	2011 Completions	Total Completions	Annual Openings	Gap: Oversupply (Undersupply)
Pharmacists (29-1051)	Pharmacy	PD	61	**61**	**82**	**(21)**
Pharmacy technician (29-2052)	Pharmacy Technician	AS	13	**626**	**156**	**470**
		TA	25			
		C	49			
		TC	539			
Emergency medical technician and paramedics (29-2041)	Paramedic	C	9	**9**	**115**	**155**
	Emergency Medical Technology	BD	6	**261**		
		AS	0			
		C	255			
Diagnostic medical sonographer (29-2032)	Diagnostic Medical Sonography	AS	5	**31**	**14**	**17**
		C	10			
		TC	16			
Radiologic technologists & technicians (29-2034)	(Medical)Radiologic Technology	BD	3	**78**	**55**	**23**
		AS	65			
		C	10			
Nuclear medicine technologists (29-2033)	Nuclear Medical Technology	C	0	**0**	**4**	**(4)**
Medical scientists (19-1042)	Anatomy	PD	1	**3**	**50**	**50**
		MS	2			
	Biostatistics	MS	6	**6**		
	Biochemistry	PD	1	**91**		
		BD	90			
Microbiologists (19-1022)	Medical Microbiology and Bacteriology	PD	5	**5**	**4**	**40**
	Microbiology, General	PD	2	**2**		
	Biochemistry and Molecular Biology	PD	3	**37**		
		MS	34			
Medical and clinical lab technologists (29-2011)	Clinical Lab Science/ Medical Technology	BD	11	**11**	**26**	**(13)**
	Cytotechnology	BD	2	**2**		
Medical and clinical lab technicians (29-2012)	Clinical Lab Technician	AS	0	**0**	**28**	**(28)**
Cardiovascular technologists and technicians (29-2031)	Cardiovascular Technician	AS	0	**0**	**15**	**(15)**
Audiologists (29-1121)	Audiology/Audiologist	MS	23	**23**	**3**	**60**
		BS	40	**40**		

Source: EMSI Complete Employment - 2011.3

Clerical-Administrative Cluster

Occupations	Program	Award Level	2011 Completions	Total Completions	Annual Openings	Gap: Oversupply (Undersupply)
Medical records and health information technicians (29-2071)	Health Information/Medical Records Technology	TA	16	**16**	**64**	**186**
	Medical Insurance Coding Specialist	TC	234	**234**		
Medical and health services managers (11-9111)	Health Information/Medical Records Admin	BS	5	**5**	**102**	**(25)**
	Health/Health Care Administration	MS	67	**67**		
		BS	5	**5**		
Medical secretaries (43-6013)	Medical Administrative	AS	1	**247**	**257**	**189**
		TC	246			
	Medical Office Assistant	TC	107	**199**		
		TC	92			
Medical transcriptionists (31-9094)	Medical Transcription	C	0	**0**	**31**	**(31)**

Source: EMSI Complete Employment - 2011.3

Primary Care Providers and Physician-related Cluster

Occupations	Program	Award Level	2011 Completions	Total Completions	Annual Openings	Gap: Oversupply (Undersupply)
Physicians and surgeons (29-1069)	Medicine	PD	148	**148**	**221**	**(73)**
Physician assistants[71] (29-1071)	Physician Assistants	MS	24	**24**	**46**	**(22)**
		C	19	**19**		
		AD	8	**8**		
Medical assistants (31-9092)	Medical/Clinical Assistant	AD	25	**25**	**302**	**2,704**
		C	257	**257**		
		TA	120	**120**		
		TC	2,182	**2,182**		
	Allied Health and Medical Assisting Services, Other	TA	83	**83**		
		TC	339	**339**		
Nurse practitioners (29-1171)	Nursing	PD	1	**1**	**24**	**(2)**
		MS	8	**8**		
	Pediatric Nurse/Nursing	MS	7	**7**		
	Clinical Nurse Specialist	MS	6	**6**		

Source: EMSI Complete Employment - 2011.3

[71] Only Master's level completions were used to calculate gap, this occupation requires at least a Master's degree for employment.

Public Health and Human Services Cluster

Occupations	Program	Award Level	2011 Completions	Total Completions	Annual Openings	Gap: Oversupply (Undersupply)
Clinical, counseling, and school psychologists (19-3031)	Clinical Psychology	PD	7	**8**	**156**	**747**
		MS	1			
	Counseling Psychology	MS	46	**46**		
	Psychology, general	PD	21	**849**		
		MS	68			
		BD	720			
		AD	40			
Epidemiologists (19-1041)	Epidemiology	PD	2	**2**	**1**	**22**
		MS	21	**21**		
Social and human service assistants (21-1093)	Human Services, General	BD	16	**105**	**80**	**25**
		AD	39			
		C	50			
Healthcare (medical and public health) social workers (21-1022)	Clinical/Medical Social Work	PD	0	**0**	**40**	**70**
	Social Work	MS	62	**110**		
		BD	48			
Health educators (21-1091)	Health and Wellness, General	PD	5	**5**	**29**	**134**
	International Public Health	MS	30	**30**		
	Maternal and Child Health	MS	1	**1**		
	Public Health Education and Promotion	PD	1	**16**		
		MS	13			
		GC	2			
	Health Services	MS	1	**111**		
		BD	110			
Speech language pathologists (29-1127)	Speech-Language Pathology	MS	18	**25**	**41**	**(16)**
		BD	7			
Dietitians and nutritionists (29-1031)	Dietetics/Dietitian	MS	3	**49**	**27**	**41**
		BD	41			
		AD	5			
	Clinical Nutrition/Nutritionist	PD	3	**19**		
		MS	16			

Source: EMSI Complete Employment - 2011.3

Appendix I – Occupations in Oversupply

Occupation	Gap (program completions minus projected annual job openings)
Medical assistants	2,704
Licensed vocational nurses	843
Clinical, counseling, and school psychologists	747
Pharmacy technician	470
Dental assistants	345
Registered nurses	252
Medical secretaries	189
Medical records and health information technicians	186
Respiratory therapists	184
Emergency medical technicians and paramedics	155
Health educators	134
Physical therapists	93
Medical and public health social workers	70
Audiologists	60
Medical scientists, except epidemiologists	50
Respiratory therapy technicians	45
Dietitians and nutritionists	41
Microbiologists	40
Dental hygienists	37
Dentists, general	34
Social and human service assistants	25
Radiologic technologists and technicians	23
Surgical technologists	22
Epidemiologists	22
Diagnostic medical sonographer	17
Physical therapist assistants	15
Occupational therapists	12
Psychiatric technicians	6
Dental laboratory technician	4

Appendix J – Occupations in Undersupply

Occupation	Gap (program completions minus projected annual job openings)
Nursing assistants	(135)
Physicians and Surgeons	(73)
Medical transcriptionist	(31)
Medical and clinical lab technicians	(28)
Medical and health services managers	(25)
Physician assistants	(22)
Pharmacists	(21)
Speech language pathologists	(16)
Cardiovascular technologists and technicians	(15)
Medical and clinical lab technologists	(13)
Chiropractors	(12)
Occupational therapist assistants	(8)
Nurse practitioner	(5)
Nuclear medicine technologists	(4)