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To: Supervisor Janice Hahn, Chair
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Supervisor Kathryn Barger

From: Sachi A. Hamai
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Board of Supervisors
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REPORT ON COUNTY HEALTH CARE WORKFORCE ANALYSIS AND FORECASTING (ITEM NO. 3, AGENDA OF NOVEMBER 20, 2018)

On November 20, 2018, the Board of Supervisors (Board) adopted a motion by Supervisor Solis directing the Chief Executive Office (CEO) to collaborate with the Departments of Health Services, Mental Health, and Public Health (collectively referred to as the Health Departments), to engage a consultant to conduct an analysis and forecast of workforce changes and needs across the Health Departments focusing on entry and mid-level health care support and extender occupations. The motion further specified that the workforce needs of the Health Departments should be evaluated against those of the broader health services industry. Finally, the motion directed an analysis of the student population and outcomes at Los Angeles County's College of Nursing and Allied Health (CONAH), and the merits of developing new capacity for CONAH to serve as a central entity for training workers to meet Health Departments' workforce needs.

In February 2019, the CEO engaged Beacon Economics (Beacon) to perform the analysis and forecast requested in the motion. Beacon interviewed stakeholders across the three Health Departments as well as at CONAH, Service Employees International Union (SEIU) Local 721, and the Department of Human Resources (DHR). Beacon compiled data from the interviews as well as from job classification listings, job vacancy reports, salary schedules, turnover rates, and retirement projections to analyze the workforce needs of the Health Departments. These needs were compared with those of the County region, as well as the State to determine and forecast workforce opportunities in health care support and extender occupations, and to develop recommendations to meet those opportunities. The analysis and recommendations are described in detail in the attached report.

The report, entitled the Los Angeles County Health Care Workforce Analysis and Recommendations, references and incorporates several ongoing and recent initiatives that have impacted, or may impact many of the opportunities described in the analysis. One such initiative is the Countywide Hiring Innovation Project led by the Department of Human Resources, which seeks to enhance hiring and recruitment for the County by utilizing real-time data, streamlining processes, and enhancing recruitment marketing techniques. Some of the recommendations in this report align with ongoing efforts by the Hiring Innovation Project.

Two workforce development programs are also referenced. The first is the Preparing Los Angeles for County Employment (PLACE) program, which Health Departments have participated in, and which creates pipelines for individuals with high barriers to employment to attain permanent County employment in entry-level jobs with good career pathways, such as many of the target occupations detailed in this report. The second is a program recently completed by DHS and the Workforce Development, Aging and Community Services Department to train County clients to become certified nursing attendants eligible to be hired in the County, which led to over 150 individuals hired.

Report Summary

Beacon provides recommendations for shared workforce development strategies while recognizing that there are unique workforce needs at each separate Health Department. The recommendations focus on the areas of talent attraction, acquisition, retention and cultivation, as well as the Health Departments' missions and programmatic goals. The abridged recommendations are as follows:

1. Launch a robust marketing initiative that includes a dedicated recruitment website for job opportunities across the three Health Departments.
2. Expedite the hiring process and clearly articulate to candidates the expectations and timeline around the process. This effort should include consideration of replacing the "banding" system currently used for County assessments.
3. Convene a working group to update job titles and classifications in the Health Departments to be more consistent with the broader health care market.
4. Prioritize internal communication strategies articulating the value proposition of working at the Health Departments and highlighting development opportunities.
5. Develop a robust skills and competency inventory and translate it into an actionable work plan for addressing future skills gaps.

6. Engage an ongoing collective workforce initiative to develop workforce development strategies and consider applying successful models to meet workforce needs and provide opportunities to communities served.

The report also provides an occupational analysis of 20 target support and extender occupations, prioritized by consideration of four factors: 1) largest employing, 2) highest paying, 3) fastest growing, and 4) greatest future need. These four factors were assessed at the regional level, and according to the data from the Health Departments. The analysis of occupations articulates opportunity in both the County region as a whole, as well as the specific opportunity in the Health Departments. It is important to note that future opportunity in the County region does not necessarily translate to the same level of opportunity within each of the Health Departments. For each target occupation, the occupational analysis provides a breakdown of employment numbers, wage trends, demographics, necessary skills and abilities, and a future forecast of opportunity. The report also includes a data analysis and overview of CONAH.

If you have any questions concerning this report, please contact Julia Orozco at (213) 974-1151, or jorozco@ceo.lacounty.gov.

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Attachment

c: Executive Office, Board of Supervisors
 Health Agency
 Health Services
 Human Resources
 Mental Health
 Public Health



L.A. COUNTY

Health Care Workforce Analysis and Recommendations

Prepared by Beacon Economics



L.A. COUNTY

Health Care Workforce Analysis and Recommendations

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Founded in 2007, Beacon Economics, an LLC and certified Small Business Enterprise (SBE) with the State of California, is an independent research and consulting firm dedicated to delivering accurate, insightful, and objective economic analysis. Employing unique proprietary models, vast databases, and sophisticated data processing, the company specializes in services such as industry analysis, economic policy analysis, economic impact analysis, and real estate market analysis. Beacon Economics equips its clients with both the data and analysis required to understand the significance of on-the-ground realities and make informed business and policy decisions.

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Commissioned by County of Los Angeles,
Chief Executive Office

At 4,084 square miles, Los Angeles County is one of the nation's largest counties. It is also its most populous, with nearly 10 million residents accounting for approximately 27 percent of California's population. As a subdivision of the state, County of Los Angeles is charged with providing numerous services that affect the lives of all residents, including law enforcement, tax collection, public health protection, public social services, elections and flood control.



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The contents of this report are based on information derived from carefully selected sources Beacon Economics believe are reasonable. We do not guarantee its accuracy or completeness and nothing in this document shall be construed to be a representation of such a guarantee.

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PREFACE

The Departments of Health Services (DHS, the second largest municipal health system in the United States); Mental Health (DMH, the largest municipal mental health system in the United States), and Public Health (DPH, tasked with protecting the health and wellbeing of 10 million county residents), employ a large, diverse, and specialized workforce. Given the size, scope, and mandate, the Departments are positioned to provide entry level jobs, career pathways, and family-sustaining employment for the county's current and future labor force. As the population of Southern California grows and ages, the health care industry will continue to be a key driver of economic activity.

The Los Angeles County Chief Executive Office engaged Beacon Economics to assess health care support and extender occupations in the L.A. County Health Departments. Beacon Economics was tasked with evaluating the future workforce needs of Health Departments and those of the broader health services industry, both locally and nationally, in order to identify the opportunities and challenges facing the L.A. County Health Departments.

Key goals of the Los Angeles County Chief Executive Office in commissioning this report include identifying priority issues for the Health Departments within the broader health care industry, and recommending action to improve talent acquisition, cultivation, and retention, including, but not limited to, workforce development programs.



Terminology

Occupation; Standard Occupational Classification (SOC)

DEFINITION

An occupation is a grouping of a number of individual jobs. Thus, an occupational definition is a collective description of a number of similar individual jobs performed, with minor variations, in different establishments. Occupational classification schemes such as the SOC organize millions of jobs into discrete occupations on the basis of their similarities as determined by the schemes' classification principles.

Occupational classification schemes examine and organize the millions of jobs and tens of thousands of job titles in the economy into occupations based on their similarities as determined by the scheme's classification principles. The organizing principle of the SOC system is *work performed* rather than job title, so there are far fewer occupation codes in the SOC than there are jobs in the economy.

EXAMPLE OF USAGE

Medical Transcriptionists comprise 49 filled and 58 budgeted positions in the L.A. County^{*} Health Departments, all of whom are employed within the Department of Health Services (DHS).

Medical Transcriptionists
SOC Code: 31-9094

^{*} For the purposes of this report, "L.A. County" refers to the county government and its entities while "County of Los Angeles" refers to the geographic region.

Los Angeles County Job Classification(s); Classification(s); Class Title(s)	
DEFINITION	The Classification and Compensation Administration Division in the Chief Executive Office establishes and maintains County job classifications. In many cases, job titles (or Class Titles) intrinsically represent jobs, rather than true occupations as defined in the SOC. Specifically, a job is a set of work activities performed by an individual. The exact set of activities varies depending on the size and organization of the establishment and is often, but not always, unique to that individual worker.
EXAMPLE OF USAGE	Medical Transcriptionists make up a small portion of total support and extender occupations throughout the County of Los Angeles, and California. Within the L.A. County Health Departments this occupation is composed of the <i>Medical Stenographer</i> and <i>Medical Transcriber Typist</i> classifications.
Support and Extender Classification(s)	
DEFINITION	For purposes of this report a Support and Extender Classification Refers to one of the 191 unique L.A. County Health Departments' job classifications identified by Beacon Economics and Health Departments Stakeholders. The full list can be referenced in the report appendix.

Support and Extender Occupation(s)	
DEFINITION	For purposes of this report, a Support and Extender Occupation refers to one of the 72 SOC occupations identified by Beacon Economics and Health Departments Stakeholders. The full list can be referenced in the report appendix.
Target Occupation(s)	
DEFINITION	For purposes of this report a target occupation refers to one of the following: Substance Abuse and Behavioral Disorder Counselors; Medical and Clinical Laboratory Technicians Environmental Science and Protection Technicians, including Health; Medical Transcriptionists; Medical and Health Services Managers; Computer Occupations, All Other; Pharmacy Aides; Mental Health Counselors; Psychiatric Technicians; Community Health Workers; Nurse Anesthetists; Registered Nurses; Healthcare Social Workers; Computer and Information Systems Managers; Nursing Assistants; Medical Records and Health Information Technicians; Management Analysts; Human Resources Specialists; Training and Development Managers.
EXAMPLE OF USAGE	Throughout the County of Los Angeles, Medical Transcriptionists have increased by 31.1% between 2012 and 2017, with employment going from 1,350 to 1,770 workers. Growth in the County of Los Angeles for Medical Transcriptionists has far outpaced California where the growth rate was roughly 8.5%.

EXECUTIVE SUMMARY

In recent years the Los Angeles County Board of Supervisors has focused on enabling stronger collaboration on priority issues across the Departments of Health Services (DHS), Public Health (DPH) and Mental Health (DMH).

Among the priorities has been creation of a more coherent system to develop and oversee shared workforce strategies across all three departments and ensure continual alignment with the changing models of delivery of care in the broader health care industry.

The public health realities facing the health departments, including an aging population, an increasing homeless population, increases in chronic disease, and the threat of natural disasters present a looming convergence of workforce challenges. Additionally, there are, at present, job classifications in the departments with high levels of vacancies and without significant action these gaps in talent will be exacerbated by drivers outside the County's control.

This report draws from a number of data sources to define and analyze health care support and extender occupations and to offer a conceptual roadmap for supporting the health departments' ability to provide workforce opportunity to the region's residents and pursue talent development strategies to make that opportunity more equitable. The report describes a variety of specific challenges and some actions that can be taken.



A Shared Workforce Development Strategy

The investment in a robust infrastructure for workforce development is necessary for the health departments to meet an increasing demand for healthcare and an increased need for healthcare workers. A clearly defined shared strategy would serve to coordinate efforts, resources, and strategies across health departments in order to address shared challenges, amplify synergies, and tap collective opportunities. Talent attraction, acquisition, cultivation, and retention would each offer a key pillar to the departmental strategies.

Talent Attraction

Understanding the diverse constituencies and audiences the health departments serve is a fundamental part of successful talent attraction. The existing communication and marketing strategy around talent fails to articulate the full value of employment with the health departments. The health departments should strive to be the employers of choice for healthcare professionals. In order to attract and retain the most talented people – regardless of background – the way the health departments speak and deliver communications must reflect the diversity of the audiences they serve.





RECOMMENDATION 1a: The health departments, in partnership with DHR and other relevant county stakeholders, should prioritize and fund a robust on-going marketing initiative aimed at recruiting applicants throughout the diverse communities the departments serve.

The classification structure prevents talent development synergies and hampers the ability of departments to benchmark against the broader health care ecosystem.

The Los Angeles County health departments' missions provide an inherent advantage in building internal and external brand strength. The mission and values of the health departments provide a powerful recruitment tool and should be deployed as such. Each department should highlight its own mission and goals but the missions can be integrated into a shared brand, such as serving the public and protecting and improving the health and wellbeing of the County's communities.

RECOMMENDATION 1b: Given the size of the health departments, the recruitment initiative should include a dedicated recruitment website for departments' job opportunities. This website would provide the opportunity for each department to offer a unique value proposition and message for potential applicants and allow the health departments to better compete with peer organizations for talent.

Given the relevance of service-orientation to healthcare workers, departmental stakeholders suggested a unique recruitment site for the health departments, one that would uniquely proposition the opportunity that is working for the L.A. County Health Departments. With an independent recruitment site, the health departments may be able to more accurately represent the job descriptions for open positions. The recruitment website can appeal to a broad audience interested in public service in healthcare while clearly representing the different missions of each department.

Talent Acquisition

The complex hiring process results in the departments losing strong candidates and passing on grant opportunities that require rapid staffing. Stakeholders across all three health departments ranked challenges related to the County's recruitment and hiring process among the most urgent challenges facing the departments. The County's recruitment process and application requirements are perceived by the health departments as a severe barrier to acquiring new talent and more broadly competing successfully with the private sector for healthcare professionals. Early analysis by the Department of Human Resources (DHR) indicates the hiring process averaged 216 days in 2018.

RECOMMENDATION 2: Expedite and clearly articulate the County's hiring process and provide estimated timelines for external applicants. Provide candidates a clear understanding of where their application is in the hiring process and communicate regularly in order to articulate expectations around the process. Health Departments should collaborate with DHR to reduce hiring times through process improvements.

The civil service exam process was highlighted as one of the most tangible examples of the recruitment process' challenges. Many potential candidates are not aware of the exam, and the time associated with the exam process and this lack of awareness provides an additional barrier to entry. Entry level applicants are often unable to financially sustain their household over an extended period of six months or more while they wait for an update on their application. The time period of the exams is a challenge not only for external candidates but for the departments as well: departmental stakeholders spoke to their inability to open and process exams in a timely manner generally, and specifically in a manner responsive to health needs that evolve dynamically over the course of any given year. DHR in conjunction with the departments have begun engaging in various initiatives to speed up the hiring process including the Hiring Innovation Project, however, more should be done. The sharing of eligibility lists across departments and the shift away from the civil service banding mechanism provide two important ways of expediting process.

The civil service exam's banding mechanism, while intended to level the playing field, might be working against a maximally inclusive and diverse employee pool at the County's health departments. Developing standardized communication templates will not only help the County engage with applicants but will also standardize the communications between the County and potential talent.

RECOMMENDATION 2a: The health departments, in collaboration with DHR, should develop guiding principles and procedures that clearly organize application process communication and inform engagement with applicants throughout the examination administration and selection process. The departments should partner with DHR to improve exam bulletins to better promote opportunities and serve as a recruitment tool themselves.

RECOMMENDATION 2b: The health departments should collaborate with DHR to identify replacement tools or ranking assessments to update the 'banding' system with a testing component that would allow more flexibility to categorize applicants based on a pass/fail assessment in order to achieve a maximally inclusive and diverse employee pool. Additionally, the departments should facilitate the sharing of eligibility lists more freely.

More could be done to improve the transparency of the civil service exam process, which would help set applicants' expectations. And changes that allow for more flexible exam timing and a faster onboarding process would reduce some barriers to acquiring talent. The importance of a transparent process and timely onboarding process will be vital as the growing share of Millennials and Generation Z in the labor force heighten expectations of policies and practices that provide flexibility and transparency.

RECOMMENDATION 3: The health departments, in partnership with DHR, the Classification and Compensation Administration Division and other relevant county stakeholders, should convene a working group to ensure job classifications are consistent with the broader healthcare market. The working group should identify opportunities to update job titles and classifications to better reflect healthcare industry norms and correspond to widely used labor force and industry data sources for ease in future benchmarking and recruiting. The long term strength of a workforce development strategy will require the ability to easily benchmark for goal setting against various industry labor force indicators that are not easily accessible.

The classification structure prevents talent development synergies and hampers the ability of departments to benchmark against the broader health care ecosystem. The County's job classifications are not consistently reflective of the scopes of work, roles, and responsibilities of open positions particularly those that change more quickly with the industry as it evolves. Jobs integrated with technology are more vulnerable to this challenge, while positions requiring tech skills tend to already be more difficult for the County's health departments to recruit.

The fragmented nature of existing workforce development efforts are often established on a need-by-need basis with a single classification in focus. The health departments' employees are organized into 1,119 unique civil service classifications and such an expansive set of classifications work against the development of a coherent shared workforce strategy. It should be noted that many discrete classifica-

tions are necessary in the Health Departments due to the strict regulation requirements and certifications for specific healthcare roles. However, a common language and framework based on position competencies and skills that extends across departments will help facilitate stakeholder collaboration across the departments and provide the necessary foundation for ongoing comprehensive assessments and goal-setting over short, intermediate, and long-term horizons.

Cultivation and Retention

The health departments' missions, policy objectives, and communications strategies are mutually dependent – they should work together and be developed in tandem. How the departments communicate is as important as what is communicated. Cross departmental joint communication planning will help promote shared objectives, improve processes and relationships, reduce duplication, and improve efficiency.

RECOMMENDATION 4: The health departments should prioritize internal communications efforts around departmental missions and departmental professional development opportunities. An internally facing communication strategy that begins at orientation would clearly articulate the value proposition of working at the health departments and highlight opportunities around professional development and engagement and help support ongoing retention efforts.

Two major challenges that should form the foundation of shared workforce strategies specific to talent cultivation and retention include: (1) Community-oriented skills development

and (2) the occupation-agnostic diffusion of technology across the healthcare industry.

RECOMMENDATION 5: The health departments should develop a robust skills and competency inventory of their existing workforce in conjunction with Recommendation 3. A continually monitored and updated inventory will be essential to informing future hiring and workforce training investments.

RECOMMENDATION 5a: The health departments' inventory should be translated into an actionable work plan for addressing future skills gaps across mission-critical occupations as part of the ongoing shared workforce strategies. As technology continues to automate routine tasks in healthcare, it will become all the more essential that the health departments have a plan to remediate gaps on a timely basis and provide the health departments' workforce an opportunity to develop skills that compliment technology adoption in the healthcare industry.

Across occupations, there is a need for community-oriented skillsets including multi-stakeholder management, client-facing communication skills, and more specifically culturally sensitive communication skills. A number of the target occupations highlighted in this report touch a community-oriented skillset including community health workers, healthcare social workers, and substance abuse and behavioral disorder counselors. While good communication skills have long been a cornerstone of effective healthcare, trends in healthcare delivery and patient centered care have heightened their



importance. As healthcare delivery moves from a highly centralized, facility-oriented schema to a more decentralized, systems-oriented approach that includes key touchpoints among and in communities directly, frontline communication strategies and general stakeholder management skills are increasingly useful to healthcare practitioners. Though this is a general trend in health care, it should be noted that the Health Departments will also continue facility-oriented healthcare, such as operating acute care and rehabilitation hospitals.

As is the case in other quickly evolving industries, a number of high priority occupations in health care touch this skillset including computer occupations, computer and information systems managers, medical record and health information technicians, medical transcriptionists, word processors and typists. One departmental stakeholder stated unequivocally that the single biggest skills gap for inbound applications was computer and technology skills. At the same time, tech-related positions were also cited as good opportunities for upskilling across the three departments. Many tech-related positions across industries including healthcare are simultaneously most vulnerable to technological advancement including automation technologies and most in demand; they are also, not coincidentally, among the most difficult to hire for.

A Collective Impact Approach to Support Workforce Development Efforts

Changing patient needs and public health changes, alongside medical and technological advances, will require all frontline employees across the health departments to acquire new skills and adopt new ways of working over the next decade. A collective workforce initiative would focus on workforce and skills needed across departments and provide a “macro” view of resources available for workforce strategy and development and lay the groundwork for addressing future workforce challenges.

RECOMMENDATION 6: The health departments should engage an ongoing collective workforce initiative that regularly convenes stakeholders across departments along with DHR to provide a centralized hub for workforce development strategy. This ongoing collective workforce initiative would serve as a central repository of knowledge to better inform the health departments efforts and reduce unnecessary duplication of workforce development efforts under a long term strategy that clearly aligns with departmental missions and programmatic goals.

An ongoing stakeholder convening has the potential to serve as a central repository of knowledge and potentially inform the health departments' efforts. The ability to share emerging trends cross-departmentally, provide an outlet for creative dialogue among departmental decisionmakers and evaluate internal data could provide a foundation for capacity building and foster a unified voice for the health departments to capitalize on workforce development opportunities.

There have been recent successful workforce development initiatives that can serve as a model for future efforts to provide pipelines into support and extender occupations in the health departments. The Worker Education and Resource Center (WERC) has partnered with the CEO to create a County High Road Employment Partnership program, called Preparing Los Angeles for County Employment (PLACE), which creates pipelines for individuals with high barriers to employment to obtain permanent County jobs while also seeking to diversify the County workforce and address inequities in employment. DHS in particular has participated in the pilot PLACE program, with 15 intermediate clerks and over 20 custodians hired at DHS' LAC+USC Medical Center through WERC's high road program, and plans for additional DHS cohorts in Fiscal Year 19-20. WERC is a nonprofit specializing in workforce development programs to place people into public service and has worked with the County of Los Angeles, and particularly the Health Departments, for nearly 20 years.

DHS also worked closely with WDACS and DHR on a recent initiative to train County clients to become certified nursing attendants eligible to be hired in the department. As of the summer of 2019, this partnership placed 151 individuals who

were County clients into Nursing Attendant I positions in DHS at the LAC+USC, Olive View and Harbor-UCLA medical centers.

WDACS and WERC should be included in the collective workforce initiative, along with DHR, to support the coordination of workforce development programs to fulfill the opportunities available in the Health Departments. The initiative should consider applying the successful models of both the PLACE and Certified Nursing Attendant programs to other opportunities, while also exploring and developing other models to meet the workforce needs of the Health Departments while providing opportunities to the communities they serve. Additional programs described by stakeholders that could be considered are rotation placements, facilitated cross-departmental internships, and cross-departmental mentorship, particularly for non-licensed positions.

Looking to the Future

This report analyzes a subset of healthcare occupations in the Los Angeles CountyHealth Departments and provides a conceptual roadmap for supporting the Health Departments' ability to provide workforce opportunity to the County's residents. The challenges highlighted in this report offer exciting opportunities to better prepare the Departments to address broad challenges including changing demographics and public health risks while simultaneously pursuing robust talent development strategies that make economic opportunity and prosperity more equitable to the region's diverse communities.



A close-up photograph of a person in a white medical coat. A red stethoscope is draped around their neck. They are holding a silver tablet computer with both hands. The background is blurred, suggesting an outdoor setting.

Talent Needs: Introduction and Context

TALENT NEEDS IN HEALTHCARE OVERVIEW

Healthcare has proven to be one of the county's most resilient industries. During the Great Recession, the County of Los Angeles shed roughly 362,000 jobs from peak to trough, but the health care industry remained unscathed and continued to add jobs despite the business cycle taking a nosedive.



This bodes well for the future of employment in health care and related industries. If a massive recession is unable to bring the industry to its knees, then the outlook in the near term remains favorable regardless of broader macroeconomic conditions. The regulatory landscape has also been a boon to the industry, due in part to the Affordable Care Act. The county has seen a substantial rise in the share of residents who have health insurance, with the percent of the Civilian Noninstitutionalized Population without health insurance declining from 22.6% in 2009 to 9.0% in 2017. The health care sector is an important part of the Los Angeles County economy because it supports a diverse array of educational attainment and skill sets. It remains one of the top performing industries in the local economy, accounting for nearly 16% of all employment in the county – a share that has more than doubled since 1990 – making it the largest major industry in the county.

Demographics remain a key factor in the industry's future. According to the California Department of Finance, Los Angeles County has added nearly 453,000 new residents over the last ten years. Keep in mind that population increases have two sources: net migration and natural increases (births minus deaths). The birthrate in the County of Los Angeles has steadily declined over the last couple of decades, and that trend is likely to continue. In 2018, the total number of births in the county was under 115,000 – the lowest level since 1976 when the population was 70% of today's figure. Total net migration (both foreign and domestic) has been erratic over the last couple of decades, but mostly in the red. Net foreign immigration has been positive but has declined from the highs of the early 1990s, although still not enough to put total net migration into positive figures.



“The health care sector is an important part of the Los Angeles County economy because it supports a diverse array of educational attainment and skill sets.”

This has significant implications for the overall age pyramid and, in turn, the health care industry since use of health care services increases exponentially with age. The foreign-born population is noticeably older than the native-born population. In 2017, the median age of foreign-born residents in the county was 49.2, more than 76% higher than the 27.9 median age of native-born residents. What's more, according to the latest estimates compiled by the American Community Survey, one in three (34.3%) residents of Los Angeles County is foreign born. Even though population growth has been slowing, the overall population is ageing.

Demographers at the California Department of Finance also project a substantial rise in the county's elderly population over the next two decades. This shift in demographics has major implications for the future. With large numbers of baby boomers reaching retirement age in 2011, and the youngest turning 65 in 2029, the aging population will create an increase in demand for health care and supportive services. Caring for an aging population will require a shift in resources because of the costs associated with senior health care needs. This transition could place a larger burden on taxpayers, as one of the longer-term concerns is how to provide financial support to the retired population.

With all these factors in play, employment in health care is projected to grow at a solid clip, much faster than overall job growth for the county. Demographic forces will play a key role in the longer term, but policy could also shape the industry in the near term as many voters have marked health care as a top priority for prospective candidates to address. Health care

“With large numbers of baby boomers reaching retirement age in 2011, and the youngest turning 65 in 2029, the aging population will create an increase in demand for health care and supportive services.”

presents an opportunity for both major parties heading into the 2020 election, and some candidates are planning to provide government care to everyone – known as Medicare for All. The Trump administration has expressed interest in forcing insurance agencies to publicize the negotiated rates they pay for services. The White House also wants doctors and hospitals to give patients their total price of care before they get services or treatment, whether or not the health care provider is in the patient's insurance network.¹ Regardless of the outcome of the 2020 presidential election, health care will remain a hot-button issue, with the regulatory landscape adding new positions to achieve either party's objectives for a more efficient and expansive health care system.

¹ Armour, Stephanie. “White House Wants Patients to Know Health-Care Prices Up Front.” *The Wall Street Journal*. https://www.wsj.com/articles/white-house-pushes-for-more-transparency-on-health-care-prices-11557945220?mod=article_inline

DEFINING HEALTH CARE EXTENDER CLASSIFICATIONS AND OCCUPATIONS

The L.A. County government overall employs 111,800 individuals across 2,386 job classifications. The L.A. County Health Departments employ over 35,000 individuals in three departments — the Department of Health Services (DHS), the Department of Mental Health (DMH), and the Department of Public Health (DPH). The Health Departments' employees **are organized into 1,119 unique civil service classifications** — 916 in DHS, 431 in DPH, and 266 in DMH.

This report draws from a number of data sources to define and analyze health care support and extender occupations, and to offer a conceptual roadmap for supporting the Health Department's ability to provide workforce opportunity to the region's residents and pursue the talent development strategies that make opportunity more equitable.

The goal was to examine occupations that are key to the health care ecosystem, that support health care practitioners and technicians (e.g. Anesthesiologists, General Practitioners, Gynecologists, Surgeons, Psychiatrists), positions that often

require advanced education beyond an associate degree. Using the Bureau of Labor Statistics (BLS) Health Care and Support Occupations definition² provided a useful starting point for the analysis. However, after meeting with county and department stakeholders, it was determined that a broader classification was necessary to address stakeholder goals for the engagement. Across the departments, the classification series that reflected the highest and most urgent needs extended beyond the strict BLS definition.

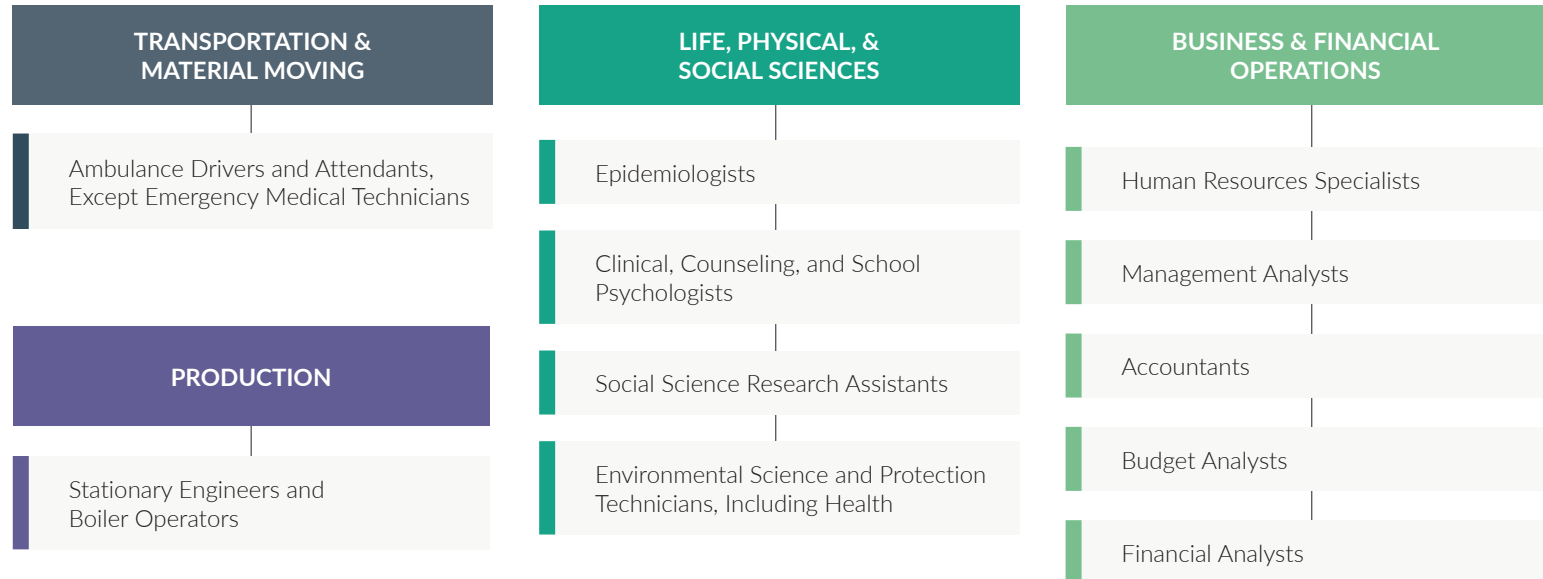
Los Angeles County job classifications each include (1) a definition, (2) examples of duties, and (3) requirements including any necessary training or experience. This descriptive data allowed stakeholders to weigh in to assist in better defining what they specify as a support and extender classification in their respective health fields. For the purpose of this report and the analysis in the following chapters, **192 of the 1,119 unique classifications in the Health Departments were flagged as support and extender job classifications.**

² <https://www.bls.gov/oes/current/oes310000.htm>



HEALTHCARE EXTENDER AND SUPPORT OCCUPATIONS PER STAKEHOLDER ENGAGEMENT

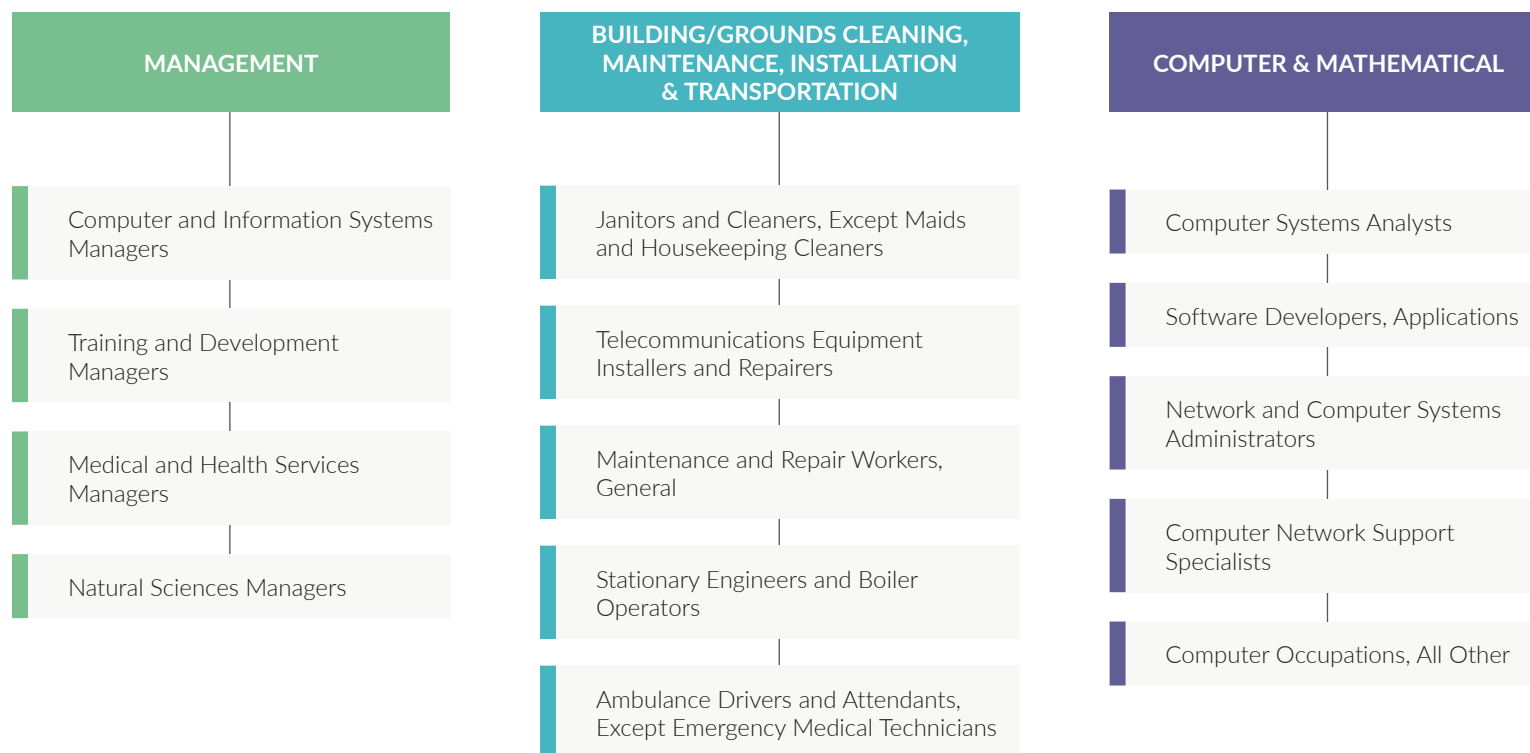
72 Occupations Across 10 Groupings (Capturing 192 Classifications)

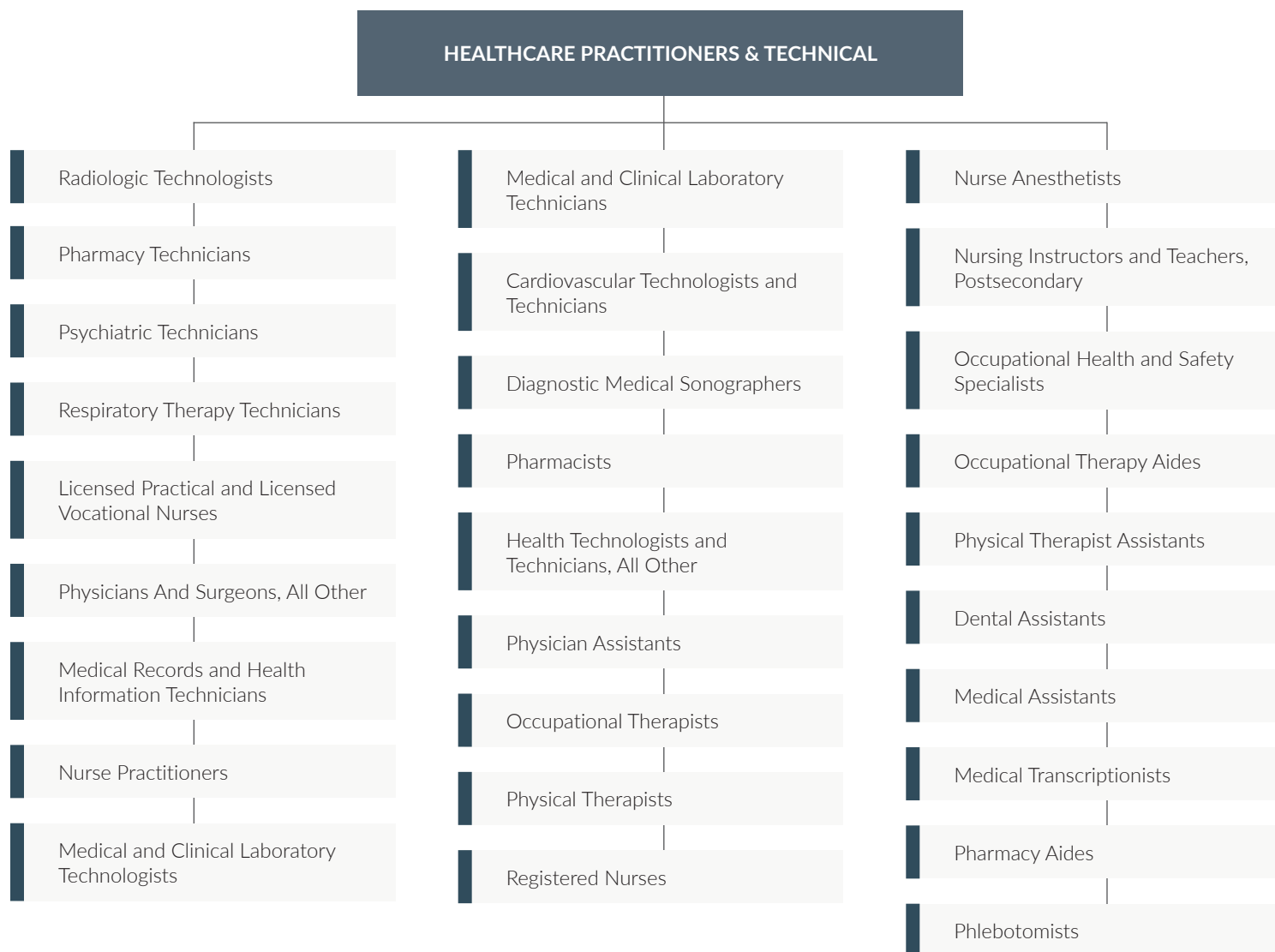




HEALTHCARE EXTENDER AND SUPPORT OCCUPATIONS PER STAKEHOLDER ENGAGEMENT

72 Occupations Across 10 Groupings (Capturing 192 Classifications) cont.

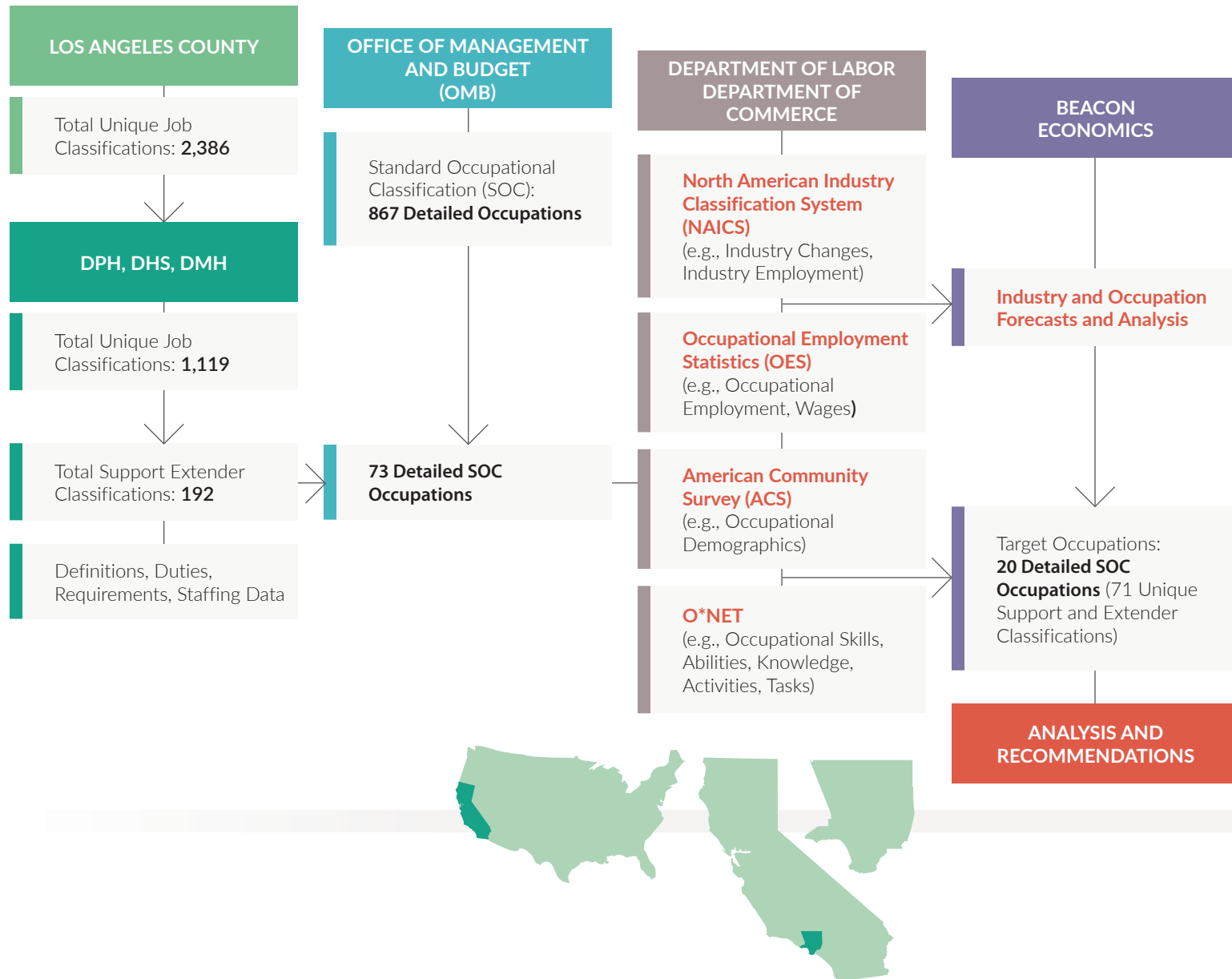




VALUE AND UTILITY OF EXPANDED DEFINITION

To provide an assessment of health care support and extender occupations across the three L.A. County Health Departments it was vital to organize a robust coding scheme in order to compare each Departments' workforce needs in both geography and the broader health care industry. The 192 support and extender job classifications were then mapped onto 72 SOC occupations in order to organize the job classifications into discrete occupations for analysis.

UTILITY OF DEFINITION: Workflow Across Federal, State and Local Datasets



DEPARTMENTAL OVERVIEW ACROSS SUPPORT AND EXTENDER

The support and extender occupational mix across departments (DMH, DPH, and DHS) is heavily concentrated in nursing occupations. Of the more than 25,000 budgeted support and extender occupations³, 28.1% are Registered Nurses. The second largest share of budgeted support and extender occupations is in the related Nursing Assistants occupation, which comprise 9.2% of total support and extender occupations. Put another way, Registered Nurses and Nursing Assistants comprise more than a third (37.3%) of all budgeted support and extender occupations in the county's retirement projections. This differs from the overall mix compared to support and extender occupations employment in the County of Los Angeles Region, which had Registered Nurses and Nursing Assistants at 8.3% and 3.4%, respectively.

³These figures are based on departmental retirement projections.

While Registered Nurses comprised a large share in County of Los Angeles (8.3%), they are second to Office Clerks, which represent 9.5% of support and extender occupations at the county level. Nursing Assistants also rank noticeably lower at the county level. At 3.4% they represent the ninth largest in terms of overall employment share.

We define a vacancy as the difference between budgeted positions and filled positions according to data from May 2019 when the analysis was performed.

Across the departments, 1,653 vacancies exist in the top 10 support and extender occupations. These represent 57% of all support and extender occupations vacancies. Notably, the top two occupations by number of vacancies are Nursing Assistants (300⁴) and Registered Nurses (286).

⁴ 150+ Nursing Assistant vacancies were purposely held open for a program with WDACS to train County Clients to become CNAs. Those vacancies have been filled as of the writing of this analysis.



Registered Nurses and Nursing Assistants comprise more than a third (37.3%) of all budgeted support and extender occupations in the County's retirement projections.

LA COUNTY HEALTH DEPARTMENTS OCCUPATIONS IN CONTEXT

VACANCIES	OCCUPATIONS	% SHARE HEALTH DEPARTMENTS	% SHARE LA COUNTY	% SHARE NATIONAL	% VACANT HEALTH DEPARTMENTS
300 ⁵	Nursing Assistants	9	3	4	13
286	Registered Nurses	28	8	8	4
252	Word Processors and Typists	6	1	0	16
203	Customer Service Representatives	5	6	8	16
147	Office Clerks, General	3	9	9	17
109	Executive Secretaries and Executive Administrative Assistants	2	2	2	19
101	Community Health Workers	1	0	0	31
98	Licensed Practical and Licensed Vocational Nurses	3	2	2	12
90	Medical Records and Health Information Technicians	1	1	1	25
67	Environmental Science and Protection Technicians, Including Health	2	0	0	11

⁵ 150+ Nursing Assistant vacancies were purposely held open for a program with WDACS to train County Clients to become CNAs. Those vacancies have been filled as of the writing of this analysis.



The vacancy rate is defined as the number of vacancies divided by the number of budgeted positions.

The vacancy rates of the 73 SOC occupation titles of the Health Departments have a median of 12.6% and range from -1.6% to 100%. Computer Occupations, All Other has a 100% vacancy rate (one vacancy of one budgeted)⁶. The second highest vacancy rate is Interpreters and Translators (74%). Substance Abuse and Behavioral Disorder Counselors, Community Health Workers, and Social Science Research Assistants have the next highest vacancy rates, ranging between 31% and 27%.

LA COUNTY HEALTH DEPARTMENTS OCCUPATIONS IN CONTEXT

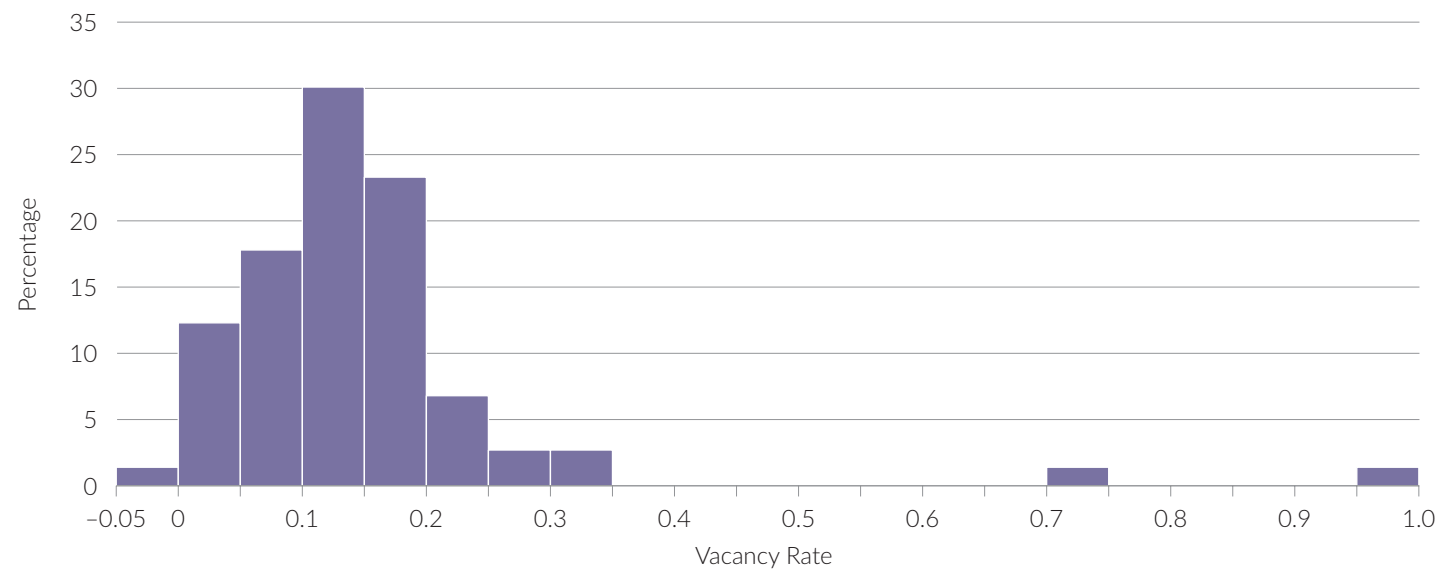
VACANCIES	OCCUPATIONS	% SHARE HEALTH DEPARTMENTS	% SHARE LA COUNTY	% SHARE NATIONAL	% VACANT HEALTH DEPARTMENTS
1 ⁷	Computer Occupations, All Other	0.0	1.0	0.9	100
63	Interpreters and Translators	0.3	0.2	0.2	74
39	Substance Abuse and Behavioral Disorder Counselors	0.5	0.2		31
101	Community Health Workers	1.3	0.1	0.2	31
24	Social Science Research Assistants	0.3	0.1	0.1	27
48	Respiratory Therapy Technicians	0.7	0.0	0.0	27
90	Medical Records and Health Information Technicians	1.4	0.6	0.6	25
28	Financial Analysts	0.5	0.9	0.9	22
57	Accountants and Auditors	1.1	4.3	3.6	21
15	Health Educators	0.3	0.2	0.2	21

⁶ The 100% vacancy rate for "Computer Occupations, All Other" is based on a single position.

⁷ See previous footnote.



HISTOGRAM OF VACANCY RATES



Sources: LA County HR Data; Analysis by Beacon Economics

The top 10 occupational titles by percent share in the Health Departments' aggregate are listed below. The percentage share of Customer Service Representatives in the County of Los Angeles is 2.5 percentage points less than the comparable percentage share in the United States. The County of Los Angeles percentage share of Registered Nurses is also 0.6 percentage points less than the United States, while Nursing Assistants are 1.0 percentage points less than the same category in the United States. The County of Los Angeles has a 0.8 percentage point larger percentage share of Word Processors and Typists compared to the United States.

The percentage shares of various occupations in the County of Los Angeles differ notably from the Health Departments' aggregate. The percentage share of Registered Nurses in the Health Departments' aggregate is 20.2 percentage points larger than that of the County of Los Angeles; the percentage share of Nursing Assistants is 6.0 percentage points larger. Office Clerks, on the other hand, have a percentage share that is 5.7 percentage points smaller in the Health Departments' aggregate compared to the County of Los Angeles. Similar differences exist when comparing the Health Departments' aggregate to the United States.

TOP 10 OCCUPATIONAL TITLES BY PERCENT SHARE IN LA COUNTY HEALTH DEPARTMENTS

OCCUPATIONS	PERCENT SHARE HEALTH DEPARTMENTS	PERCENT SHARE LA COUNTY	PERCENT SHARE NATIONAL
Registered Nurses	28.1	7.9	8.5
Nursing Assistants	9.2	3.2	4.2
Word Processors and Typists	6.1	1	0.2
Customer Service Representatives	5	5.5	8.1
Office Clerks, General	3.4	9.1	8.6
Licensed Practical and Licensed Vocational Nurses	3.2	1.9	2
Environmental Science and Protection Technicians, Including Health	2.4	0.1	0.1
Executive Secretaries and Executive Administrative Assistants	2.3	2.4	1.7
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	1.8	5.4	6.3
Budget Analysts	1.7	0.2	0.2

DEFINING AND PRIORITIZING TARGET OCCUPATIONS

In order to provide a practical set of next steps, this analysis has devised a plan for, first, identifying target occupations of the 72 support and extender occupations in the Health Departments, and second, for creating a prioritization scheme among those target occupations. Thus, the remainder of this analysis focuses on 20 specified target occupations which will then be prioritized by opportunity.

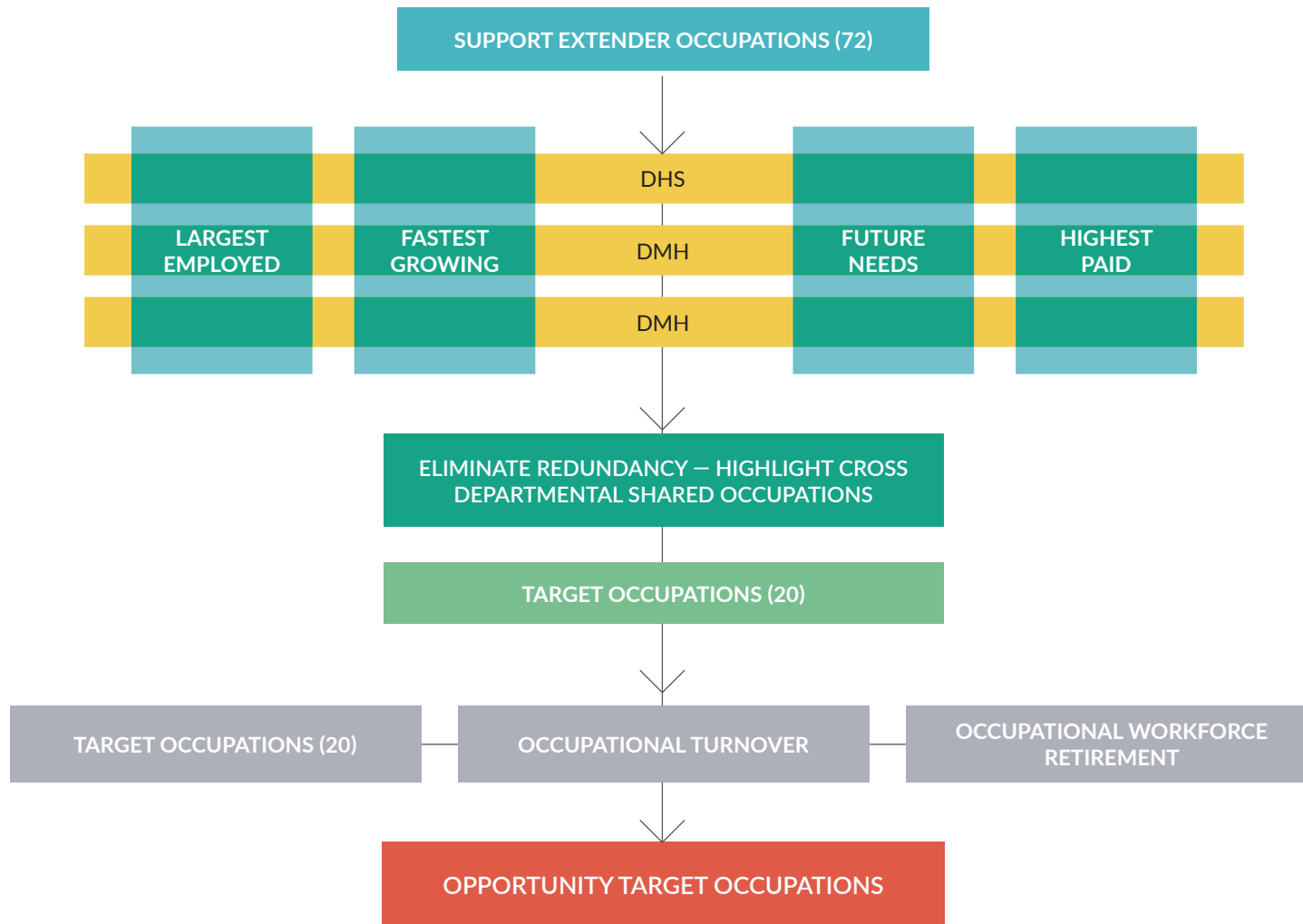
To identify target occupations, categories including (1) largest employing, (2) highest paying, (3) fastest growing, and (4) greatest future need were used to group and order the 72 occupations. Largest employing and future need categories were defined using Health Departments data, specifically budgeted position counts for largest employing and retirement projections for greatest future need. For the highest paying and fastest growing categories, federal data for the County of Los Angeles was used due to the lack of a consistent time series around wages and employment counts for the Health Departments. Therefore, two of the four categories relied on Health Departments data to inform prioritization, and the remaining two categories relied on federal data for the County of Los Angeles, balancing the prioritization scheme between dynamics potentially specific to the Health Departments and broader dynamics at play in the County

of Los Angeles health care industry.

The top three occupations in each of the four categories — largest employing, highest paying, fastest growing, and greatest future need — were first determined among the global set of occupations in the Health Departments. As expected, given DHS's disproportionate representation in a department-agnostic set of data for the Health Departments at large, this first exercise reflected those occupational trends at play in the largest department of the three. To compensate for this disproportionate representation of one department, the exercise to determine the largest employing, highest paying, fastest growing, and greatest future need occupations was then repeated for the exclusive subset of occupations that are shared by all three departments. Any unique occupations that were presented as priorities were added to the list of target occupations. This exercise was then repeated for each department in isolation and, again, any unique occupations were added to the global list of target occupations.

Ultimately, 20 target occupations resulted from this strategic analysis. A visualization of that process is reflected on the next page.



TARGET OCCUPATION PRIORITIZATION MODEL



TALENT NEEDS: TARGET OCCUPATIONS AND THE COST OF LIVING

The cost of living for health care workers varies based on occupation. In 2017, Eight of the twenty targeted occupations had over 50% of their workers considered rent burdened (30% or more of their pretax income would be needed to afford the median rent price in Los Angeles County). These occupations are Medical and Clinical Laboratory Technicians, Nursing Assistants, Medical Transcriptionists, Pharmacy Aides, Substance Abuse and Behavioral Disorder Counselors, Medical Records and Health Information Technicians, Community Health Workers, Mental Health Counselors, and Word Processors and Typists.

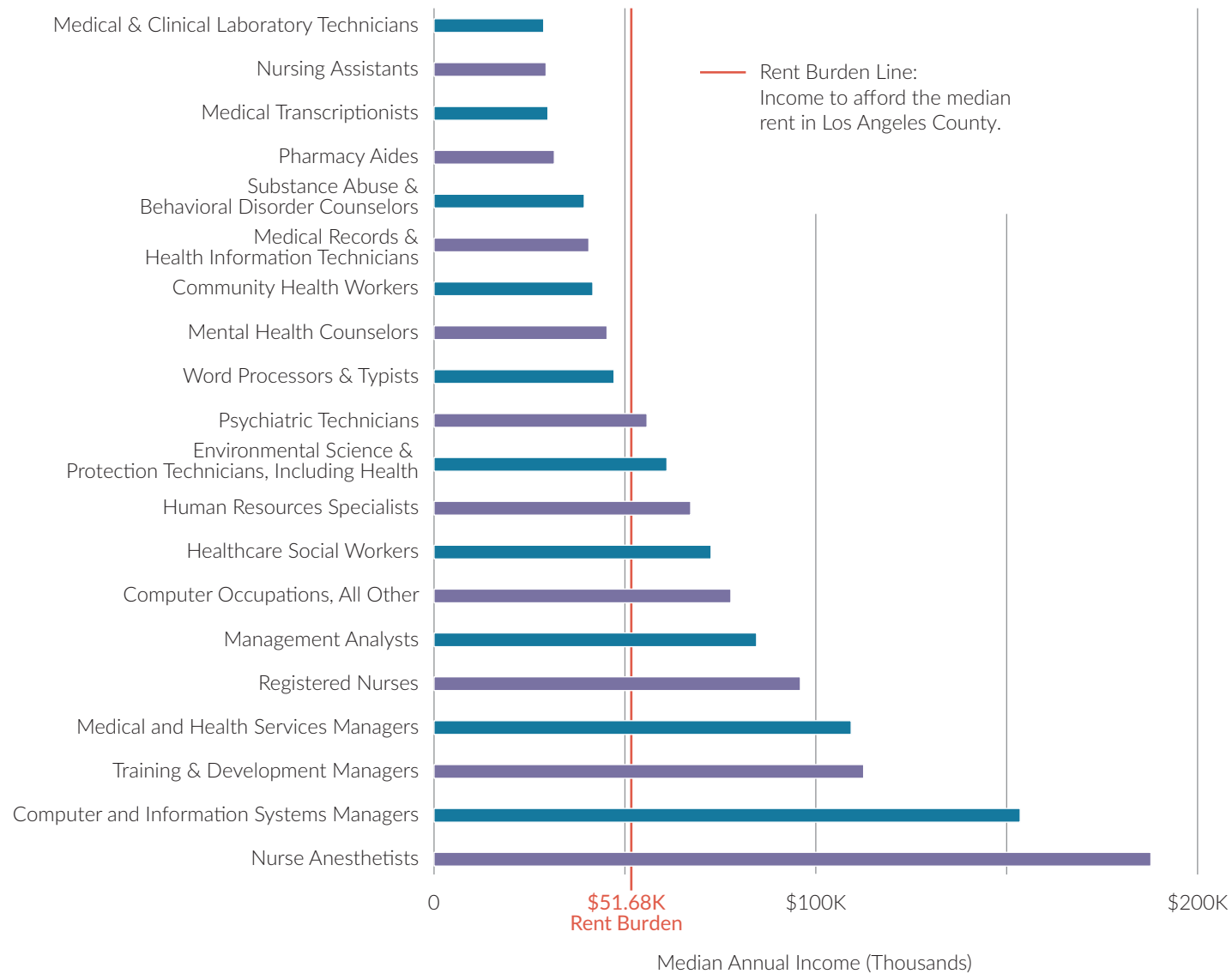
Over 90% of Nursing Assistants are rent burdened, while Pharmacy Aides, Substance Abuse and Behavioral Disorder Counselors, and Medical and Clinical Laboratory Technicians represent the other most widely impacted of the target

occupations, each with over 75% of their workers in the Health Departments' aggregate rent burdened in 2017.

Six of the twenty targeted occupations have fewer than 10% of their workers rent burdened. These occupations are Nurse Anesthetists, Computer and Information Systems Managers, Training and Development Managers, Registered Nurses, Medical and Health Services Managers, and Management Analysts.

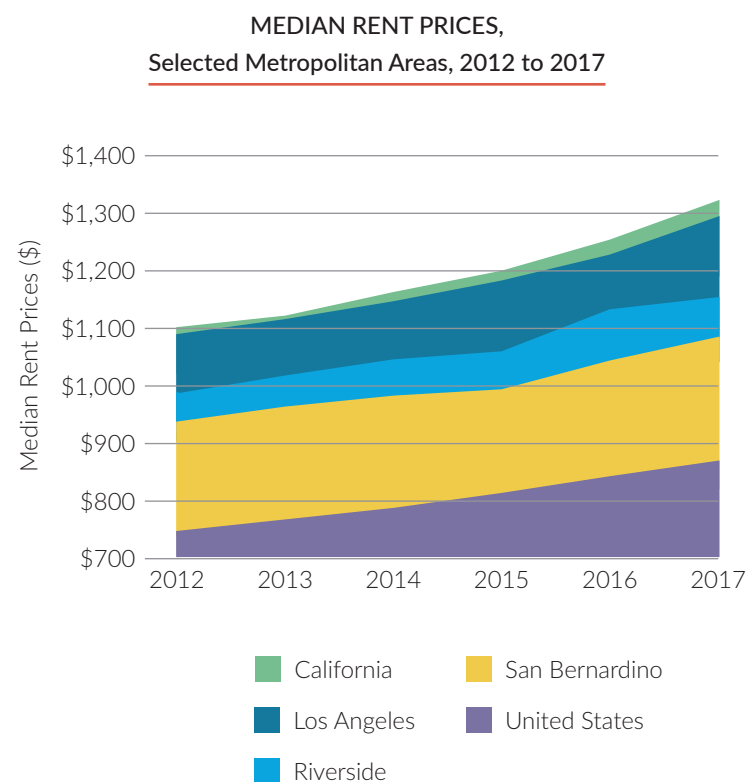
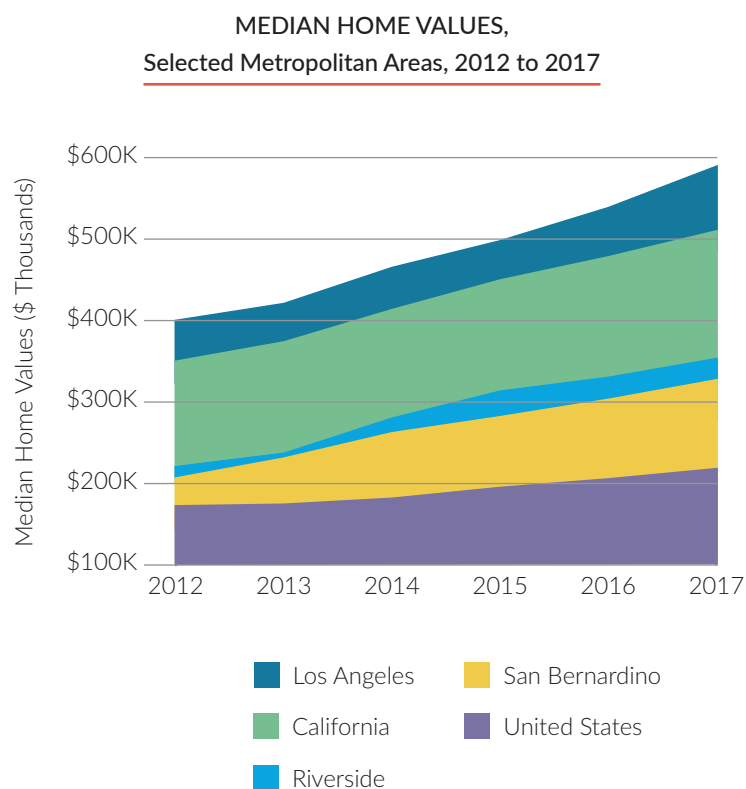
Between 25% and 50% of the employees from the following occupations are rent burdened: All Other Computer Occupations, Word Processors and Typists, Environmental Science and Protection Technicians, and Psychiatric Technicians. Only 10% to 25% of Human Resources Specialists and Health Care Social Workers are rent burdened.

2017 MEDIAN WAGES FOR TARGET OCCUPATIONS V. RENT BURDEN INCOME LEVEL



Sources: 1-Year ACS; Analysis by Beacon Economics

Home prices are on the rise across the nation, particularly in California. While the median home price in the United States rose 27% from 2012 to 2017, California median home prices increased by 46% over the same period. Home price increases in the County of Los Angeles moved in lockstep with the state as a whole. The median home price increased by \$189,200, or 47%. San Bernardino and Riverside Counties have seen larger percent increases of 58% and 60%, respectively, although homes in these regions are still more affordable. In 2017, the median home price in the County of Los Angeles was \$588,700, while in Riverside and San Bernardino it was \$352,700 and \$326,600, respectively.



Sources: 1-Year ACS; Analysis by Beacon Economics

Rents are also on the rise in the United States. In 2017, median contract rents were 16% higher than in 2012. California rents were no exception, rising by 20% over the same period. While San Bernardino and Riverside Counties have seen the biggest percentage change in home prices over the last five years, Los Angeles County has experienced the fastest rate of rent increases. In fact, the year over year median rent price of County of Los Angeles has increased by a larger percentage in each of the last five years, with a 5.4% annual increase in 2017.

The challenge of recruiting a skilled workforce during a housing affordability crisis is significant. With rapid increases to housing and rental costs in County of Los Angeles and surrounding regions, workers earning less than \$51,680 in 2017 were confronted with the choice of being rent burdened, increasing their commute times, or migrating out of state to a location with a more favorable cost of living.

TALENT NEEDS: TOP OPPORTUNITY OCCUPATIONS

As described above, 20 target occupations were identified for this analysis and then prioritized by opportunity. To prioritize among the 20 targets, each occupation was given an opportunity score.

The opportunity score was comprised of three different data indicators determined to be key inputs to understanding future need. Those three indicators include (1) Beacon's projected employment growth of the occupation for the County of Los Angeles region; (2) Health Departments' projection of opportunity based on retirements, and (3) turnover rate within L.A. County government entities. It should be noted that the target occupations identified under this analysis represent opportunity across the County of Los Angeles region and includes the Health Departments, but is not always related to them. In other words, occupational opportunity that exists in the County of Los Angeles does not necessarily translate to the Health Departments.

Using their opportunity scores, the 20 occupations were then grouped into high opportunity occupations (1-6), medium opportunity occupations (7-13), and low opportunity

occupations (14-20). The scoring methodology is visualized below and the 20 target occupational profiles that follow are presented in order of their workforce development opportunity. Note that demographically, L.A. County is generally more representative of the populace among lower ranked jobs but much less so among top ranked jobs. This is true both in the Health Departments and countywide.

WORKFORCE DEVELOPMENT OPPORTUNITY OF TOP 20 OCCUPATIONS

OCCUPATION	OPPORTUNITY RANKING
Substance Abuse & Behavioral Disorder Counselors	1
Medical and Clinical Laboratory Technicians	2
Environmental Science & Protection Technicians, Including Health	3
Medical Transcriptionists	4
Medical and Health Services Managers	5
Computer Occupations, All Other	6
Pharmacy Aides	7
Mental Health Counselors	8
Psychiatric Technicians	9
Community Health Workers	10

OCCUPATION	OPPORTUNITY RANKING
Nurse Anesthetists	11
Registered Nurses	12
Healthcare Social Workers	13
Computer and Information Systems Managers	14
Nursing Assistants	15
Medical Records and Health Information Technicians	16
Word Processors and Typists	17
Management Analysts	18
Human Resources Specialists	19
Training and Development Managers	20



▽ BRAIN NETWORK
MEDICINE
BRAIN

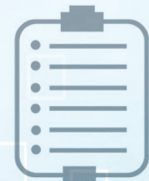
▽ BRAIN NETWORK
MEDICINE
BRAIN

△ HEALTH CARE
HEALTH CARE

49868 608 PHARMACY
49868 608 PHARMACY

HOSPITAL
HOSPITAL

MEDICAL
MEDICAL



Talent Needs: Profiles of Opportunity Occupations



1

Substance Abuse and Behavioral Disorder Counselors

SOC CODE: 21-1011

DEPARTMENTAL EXPOSURE:

- Department of Health Services (DHS): 27%
- Department of Mental Health (DMH): 44.4%
- Department of Public Health (DPH): 28.6%

Substance Abuse and Behavioral Disorder Counselors are employed in the Departments of Health Services (DHS), Mental Health (DMH) and Public Health (DPH).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	9,750
Employment Growth 2012–2017	–24.6%
Wages	\$39,340
Wages Growth 2012–2017	35.9%

L.A. HEALTH DEPARTMENTS

Budgeted Positions 2019	126
Growth in Budgeted Positions 2014–2019	68%

Illustrative Classification Examples

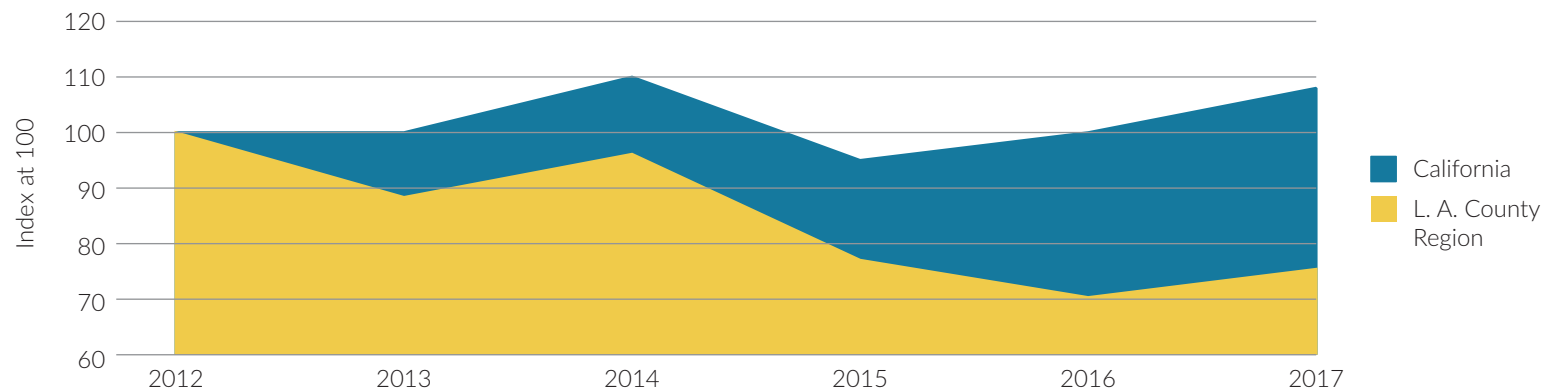
Substance Abuse Counselor
Substance Abuse Counselor Aid

EMPLOYMENT

Substance Abuse and Behavioral Disorder Counselors account for 126 budgeted and 87 filled positions within the L.A. County Health Departments. Of the 126 budgeted positions, 56 are in the Department of Mental Health, 36 in the Department of Public Health, and 34 in the Department of Health Services. Throughout the County of Los Angeles, there are 9,750 Substance Abuse and Behavioral Disorder Counselors. The share of Substance Abuse and Behavioral Disorder Counselors to total support and extender occupations in the L.A. County Health Departments is around 0.5%, however, within the Department of Mental Health, the presence of the occupation is higher at 3.5%. At 0.2%, the County of Los Angeles' share of Substance Abuse and Behavioral Disorder Counselors is lower than both the Health Departments as a whole and DMH.

Employment in the field of Substance Abuse and Behavioral Disorder Counselors has dropped by a significant margin throughout the County of Los Angeles, contracting by 24.6% between 2012 and 2017, a loss of almost 700 workers. Conversely, California's employment growth in Substance Abuse and Behavioral Disorder Counselors has gone up by 7.6%, reaching 9,750 in 2017. According to data from the Department of Human Resources, the turnover rate for Substance Abuse and Behavioral Disorder Counselors is around 6.7% in the L.A. Health Departments, slightly higher than the average turnover rate for the Health Departments across all occupations (5.5%).

EMPLOYMENT: Substance Abuse and Behavioral Disorder Counselors, 2012-2017



Source: Bureau of Labor Statistics; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (1-6)

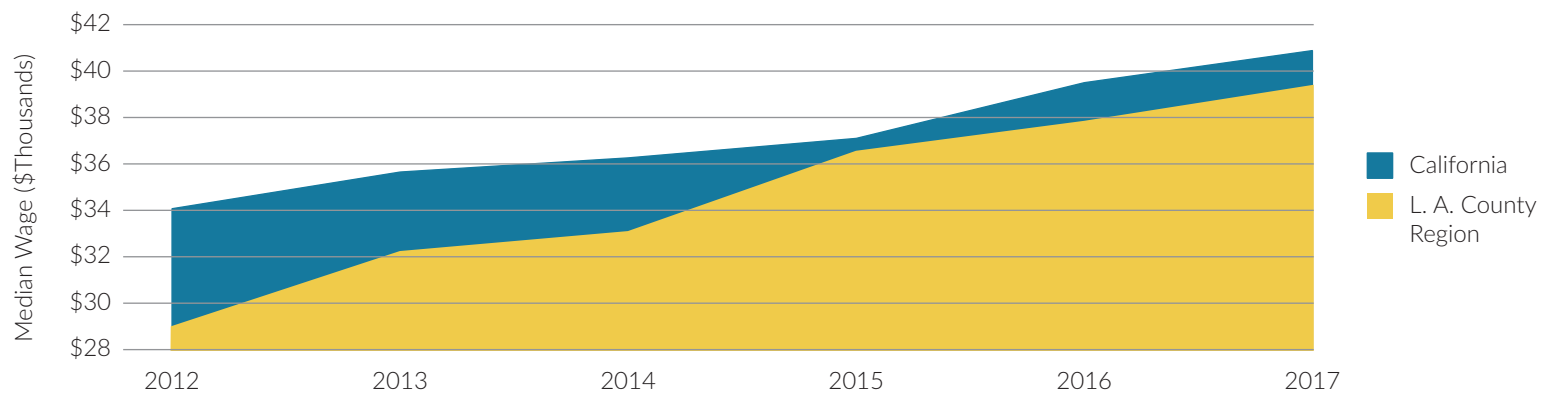
TARGET OCCUPATION 1: Substance Abuse and Behavioral Disorder Counselors

WAGES

The median wage for Substance Abuse and Behavioral Disorder Counselors has been trending in the opposite direction of employment, with strong growth rates in the County of Los Angeles. Median wages for Substance Abuse and Behavioral Disorder Counselors rose by 35.9% between 2012 and 2017, reaching \$39,340 in the latter year. In comparison, California's median wage for the occupation went up by 20% in the same period, but remains higher at \$40,880.



MEDIAN WAGE: Substance Abuse and Behavioral Disorder Counselors, 2012-2017



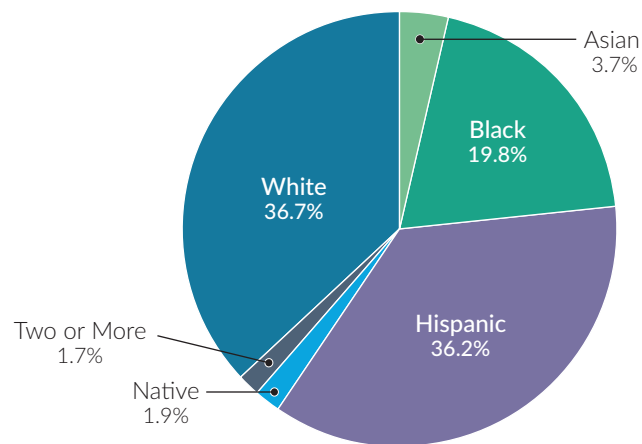
Source: Bureau of Labor Statistics; Analysis by Beacon Economics

DEMOGRAPHICS: Ethnic/Racial Composition

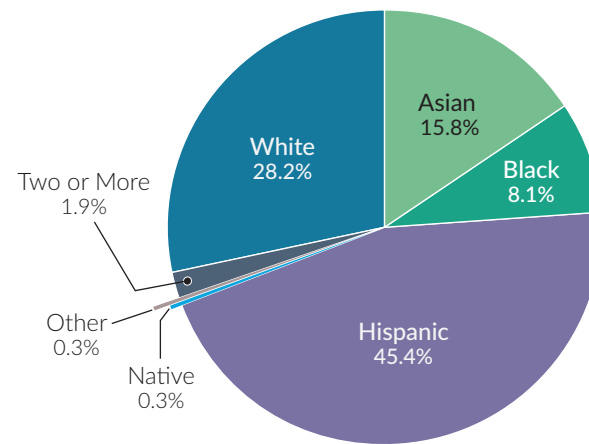
The ethnic and racial composition for Substance Abuse and Behavioral Disorder Counselors differs slightly with the worker background for the County of Los Angeles as a whole (employed population aged 16 and over). The largest group of Substance Abuse and Behavioral Disorder Counselors is White (36.7%). In comparison, White workers make up 28.2% of employment in the County of Los Angeles as of 2017. Hispanics are the largest group of workers in the County of Los Angeles, accounting for 45% of the employed

population; 36% of Substance Abuse and Behavioral Disorder Counselors in the County of Los Angeles are Hispanic. Black workers account for a large share of Substance Abuse and Behavioral Disorder Counselors, comprising almost 20% of the occupation, whereas in the County of Los Angeles, Black workers make up 8.1% of the employed population.

**L.A. COUNTY REGION: Substance Abuse and Behavioral Counselors,
Ethnic/Racial Composition, 2017**



**L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017**



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (1-6)

TARGET OCCUPATION 1: Substance Abuse and Behavioral Disorder Counselors

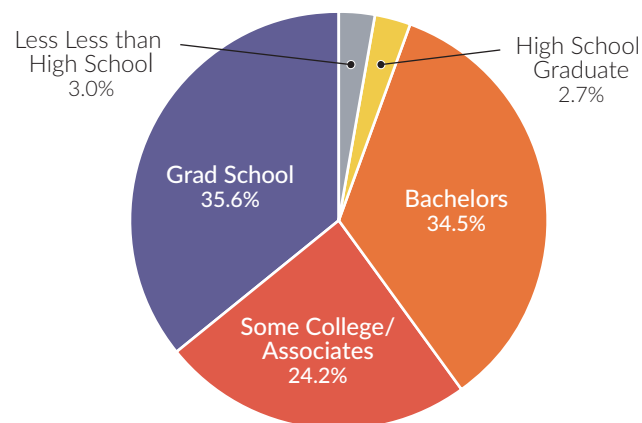
DEMOGRAPHICS: Educational Attainment

Educational attainment levels in Substance Abuse and Behavioral Disorder Counselors vary slightly, but there is a lot more emphasis on higher education. This is probably due to a broader understanding of mental health and behavioral studies raising educational requirements in the profession. As of 2017, 35.6% of Substance Abuse and Behavioral Disorder Counselors have a graduate degree, 34.5% have a bachelor's degree, and roughly 5.7% have a high school diploma or less.

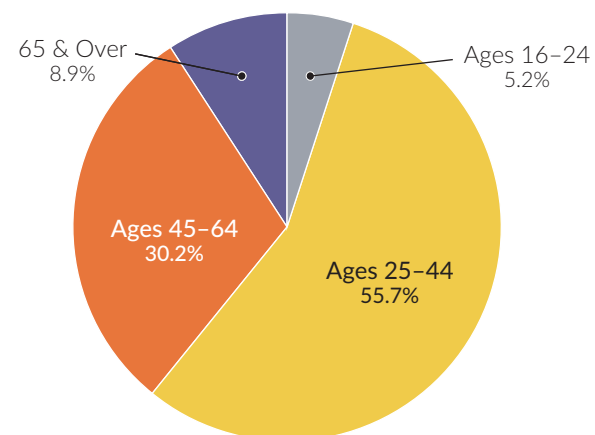
DEMOGRAPHICS: Age Breakdown

Substance Abuse and Behavioral Disorder Counselors are most likely to fall into the following age groups: 25 to 44 (56%), 45 to 64 (30%), and 65 and over (8.9%). Subsequently, data from the Department of Human Resources indicates that 12.8% of Substance Abuse and Behavioral Disorder Counselors in the L.A. County Health Departments are projected to retire within three years or less.

L.A. COUNTY REGION: Substance Abuse and Behavioral Counselors,
Educational Attainment, 2017



L.A. COUNTY REGION: Substance Abuse and Behavioral Counselors,
Age Distribution, 2017

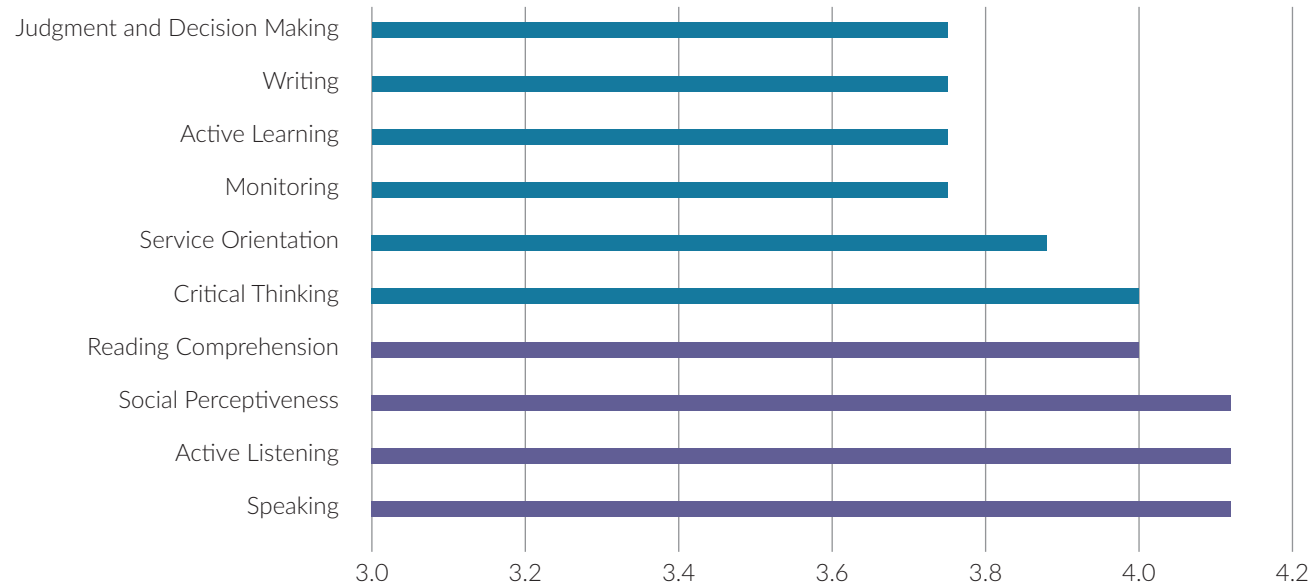


Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

Substance Abuse and Behavioral Disorder Counselors deal with patients who require assistance with substance addiction and abuse, as well as with prevention programs and the treatment of behavioral disorders. As such, skills including listening, effective communication and understanding of patient reaction and behavior are vital to the profession (see Figure below).

NATIONAL: Substance Abuse and Behavioral Disorder Counselors, Importance of Skill (Scale of 1-5)



Source: O*NET; Analysis by Beacon Economics

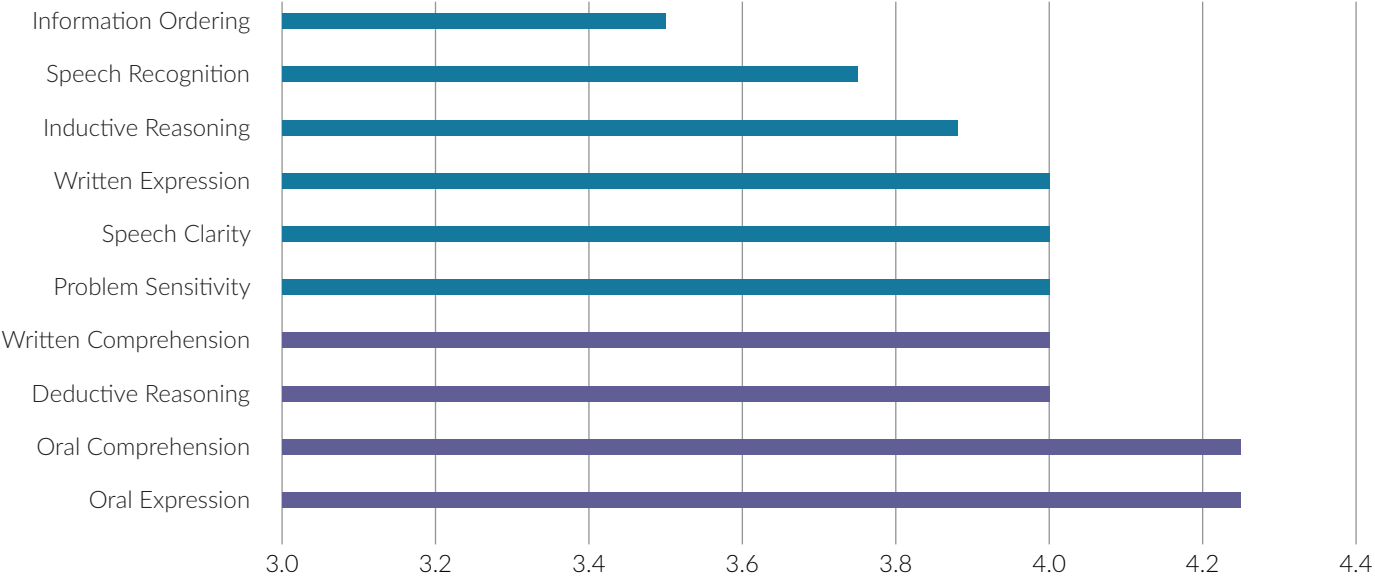
OPPORTUNITY OCCUPATIONS (1-6)

OCCUPATION 1: Substance Abuse and Behavioral Disorder Counselors

ABILITIES

Due to the face-to-face nature of the relationship between councilor and patient, abilities that are valued in the profession rely heavily on oral comprehension and expression. Problem solving and deductive reasoning are also important given that counselors are required to assess a patient's needs and offer practical solutions to their problems.

NATIONAL: Substance Abuse and Behavioral Disorder Counselors, Highest Rated Abilities (Scale of 1-5)



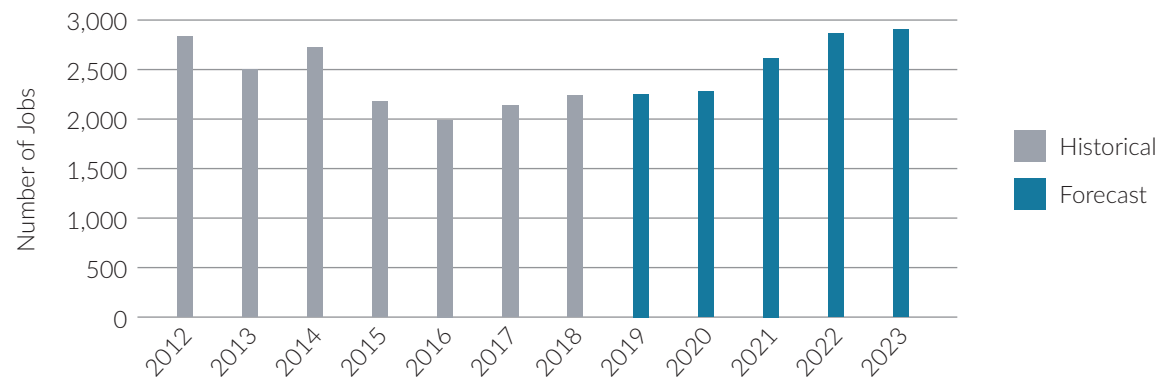
Source: O*NET; Analysis by Beacon Economics

FORECAST: Substance Abuse and Behavioral Disorder Counselors

In accordance with previous forecasts related to mental health issues, Beacon Economics believe that public sentiment over homelessness will support future employment prospects for Substance Abuse and Behavioral Disorder Counselors. Recent estimates indicated double-digit increases in the county's homeless in 2019, with 29% reporting a serious mental illness and/or substance abuse disorder. In our view, it's likely that the recent rise in homelessness will result in additional funding to address the issue, which will enable the county to employ more counselors in response.

In terms of urgency in the L.A. County Health Departments, Substance Abuse and Behavioral Disorder Counselors rank ninth on our list of target health care support and extender occupations, with nearly 13% of positions at risk from retirement in the next three years. Additionally, Substance Abuse and Behavioral Disorder Counselors rank fourth on our list of turnover rates, and there are 39 vacant positions out of a budgeted 126, which further supports our view of strengthened employment figures.

**PROJECTIONS: Substance Abuse and Behavioral Disorder Counselors,
LA County Region, 2012 to 2023**



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

2

Medical and Clinical Laboratory Technicians

SOC CODE: 29-2012

DEPARTMENTAL EXPOSURE:

- Department of Health Services (DHS): 84.8%
- Department of Public Health (DPH): 15.2%

Medical and Clinical Laboratory Technicians are employed primarily in the Department of Health Services (DHS), with a smaller number in the Department of Public Health (DPH).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	5,720
Employment Growth 2012-2017	6.7%
Wages	\$38,930
Wages Growth 2012-2017	6.7%

L.A. HEALTH DEPARTMENTS

Budgeted Positions 2019	165
Growth in Budgeted Positions 2014-2019	-2.9%

Illustrative Classification Examples

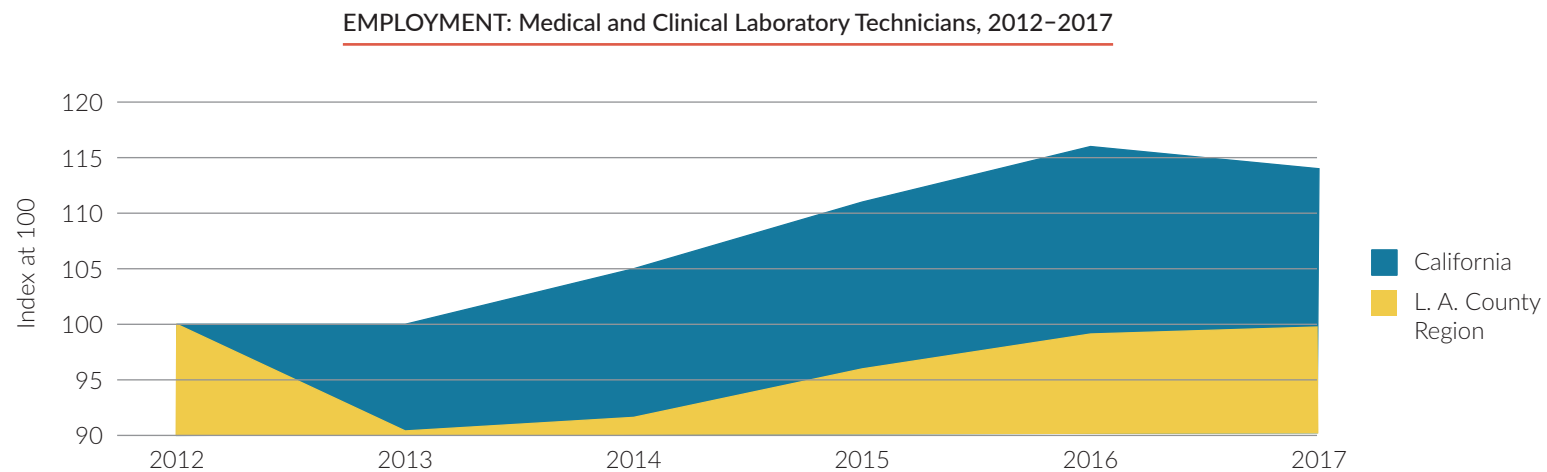
Laboratory Assistant

EMPLOYMENT

Medical and Clinical Laboratory Technicians accounted for 139 filled and 165 budgeted positions in the L.A. County Health Departments, with 140 allocated to the Department of Health Services (DHS) and the rest employed by the Department of Public Health (DPH). The County of Los Angeles overall employs roughly 5,720 Medical and Clinical Laboratory Technicians in all industries. The occupational share of Medical and Clinical Laboratory Technicians to total extender occupations is below 1% in the L.A. County Health Departments (0.7%), the County of L.A. (0.6%) and the statewide share (0.5%). Across departments, the shares of Medical and Clinical Laboratory Technicians are reflective of the Department's ratio, with both DHS and DPH at 0.7%.

Overall, the share of Medical and Clinical Laboratory Technicians to the mix of total extender occupations is low in the L.A. County Health Departments, the County of Los Angeles and California.

Employment throughout the County of Los Angeles for Medical and Clinical Laboratory Technicians declined -0.2% overall between 2012 and 2017. This was a result of a significant slump between 2012 and 2013. Since then, figures have been slowly trending upwards. In fact, between 2013 and 2017, employment levels have gone up by 13.6%. In comparison, the statewide five-year growth has been stronger than the County of Los Angeles'. Between 2012 and 2017, Medical and Clinical Laboratory Technician employment has gone up by 13.8%, reaching roughly 18,170 workers. Between 2016 and 2017, California has taken a sharper turn downwards in employment, while the County of Los Angeles has seen mild growth.



Source: Bureau of Labor Statistics; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (1-6)

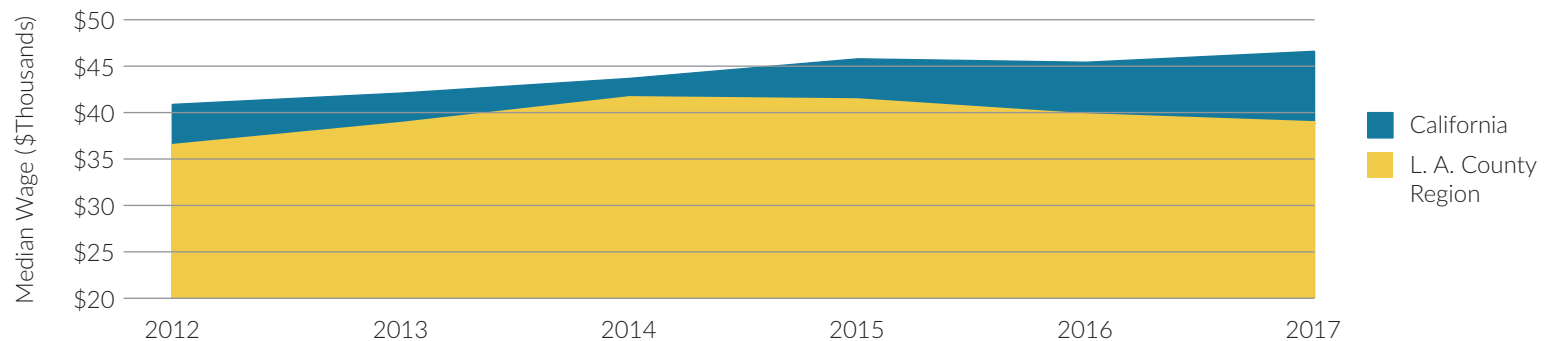
TARGET OCCUPATION 2: Medical and Clinical Laboratory Technicians

WAGES

The median wage for Medical and Clinical Laboratory Technicians rose by 6.7% throughout the County of L.A. between 2012 and 2017, reaching \$38,930. California's median wage in 2017 was higher, at \$46,600 – and the five-year growth outpaced that of the county at 14% between 2012 and 2017. Median wages have been slightly sedated in the County of Los Angeles since 2014, possibly due to the increase in employment which has been shifting the median wages down as a result of entry level positions being employed with lower wages.



MEDIAN WAGE: Medical and Clinical Laboratory Technicians, 2012-2017



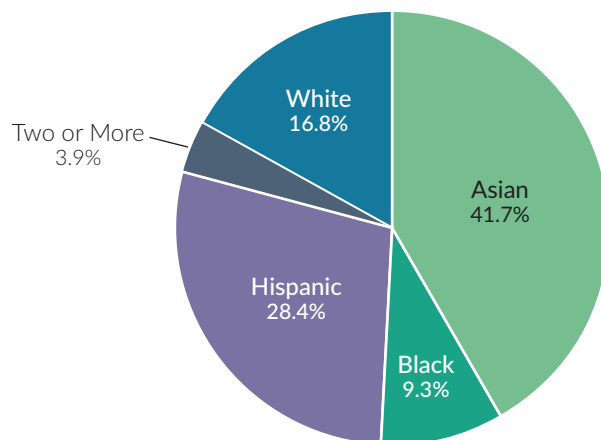
Source: Bureau of Labor Statistics; Analysis by Beacon Economics

DEMOGRAPHICS: Ethnic/Racial Composition

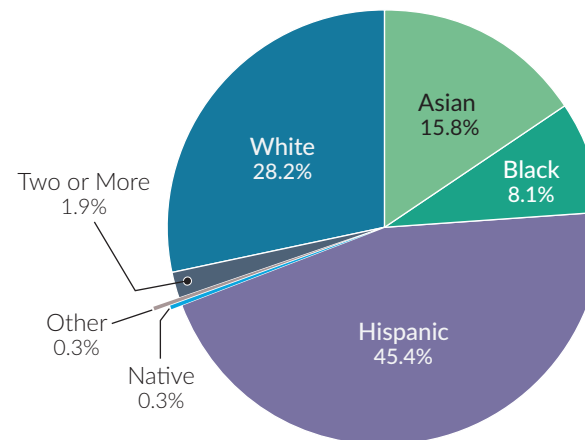
The ethnic and racial composition of Medical and Clinical Laboratory Technicians differs slightly overall when compared to the County of Los Angeles' civilian employed population. Asians comprise the largest sector of Medical and Clinical Laboratory Technicians (42% in 2017), while making up 15.8% of the County of Los Angeles employed population overall. Hispanics are the most employed group in the County of Los Angeles, accounting for 45% of the employed population.

For Medical and Clinical Laboratory Technicians they account for just over 28%. White individuals comprise 28.2% of the employed civilian population, and 16.8% of Medical and Clinical Laboratory Technicians. Black individuals employed as Medical and Clinical Laboratory Technicians largely reflect the share of Black workers in the County of Los Angeles overall – 9.3% and 8.1% respectively.

**L.A. COUNTY REGION: Medical and Clinical Laboratory Technicians,
Ethnic/Racial Composition, 2017**



**L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017**



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

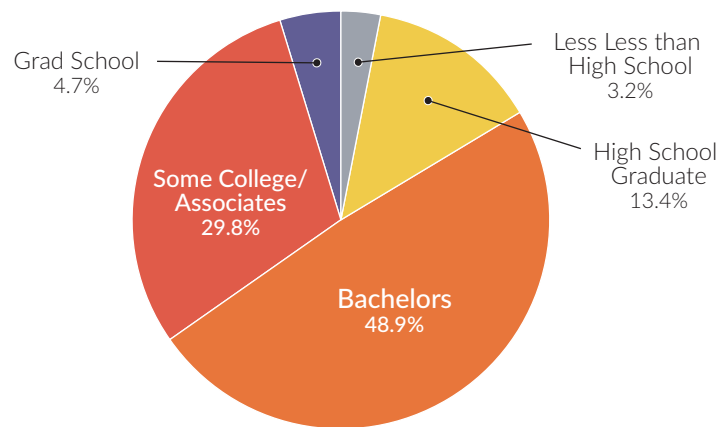
OPPORTUNITY OCCUPATIONS (1-6)

TARGET OCCUPATION 2: Medical and Clinical Laboratory Technicians

DEMOGRAPHICS: Educational Attainment

The educational attainment levels of Medical and Clinical Laboratory Technicians in the County of L.A range from high school diploma to graduate degree. The largest share of workers in the field (48.9%) have attained a bachelor's degree. Individuals with some form of college education or an associate degree comprised 30% of Medical and Clinical Laboratory Technicians, while graduate degree holders were about 4.7% of workers. Not all employees in the occupation are required to have higher education, with Individuals with a high school diploma or less comprising about 16.6% of total workers.

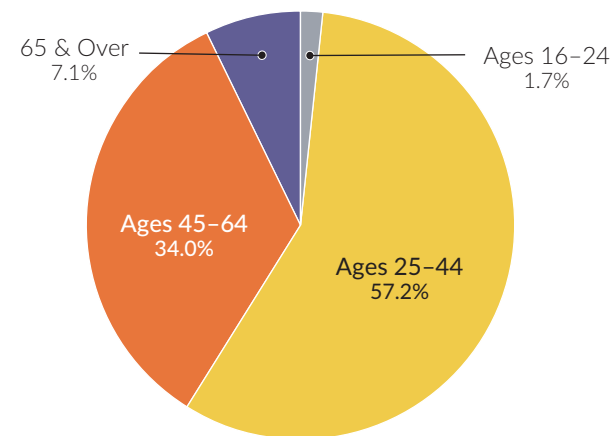
L.A. COUNTY REGION: Medical and Clinical Laboratory Technicians,
Educational Attainment, 2017



DEMOGRAPHICS: Age Breakdown

Most Medical and Clinical Laboratory Technicians (57.2%) fall between the ages of 25 and 44. There are also notable shares of higher aged individuals, with the percentage of workers between the ages of 45 and 64 at 33.9%, and those aged 65 and over at 7.1%. As a result, the Department of Human Resources at L.A. County estimates that 13.3% of workers currently in the field are projected to retire in three years or less.

L.A. COUNTY REGION: Medical and Clinical Laboratory Technicians,
Age Distribution, 2017

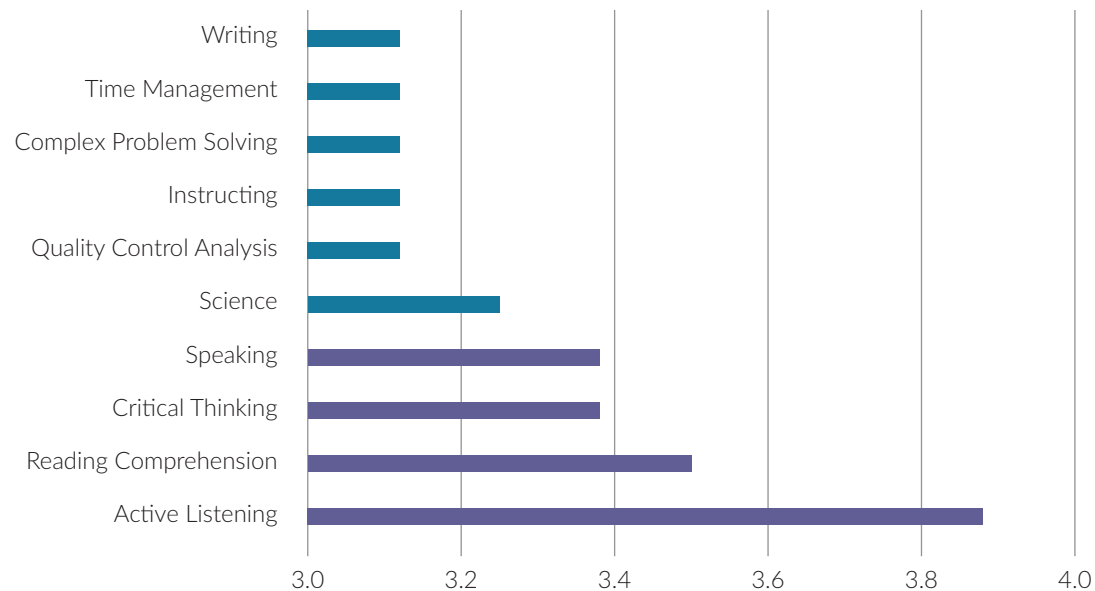


Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

Medical and Clinical Laboratory Technicians are responsible for assessing and performing laboratory tests, including blood and disease work for analysis. This involves working closely with colleagues, carefully assessing samples, accounting for errors or problems and solving them accordingly. As such, the most highly rated skills in the profession are active listening, comprehension, critical thinking and effective communication.

NATIONAL: Medical and Clinical Laboratory Technicians, Importance of Skill (Scale of 1-5)



Source: O*NET; Analysis by Beacon Economics

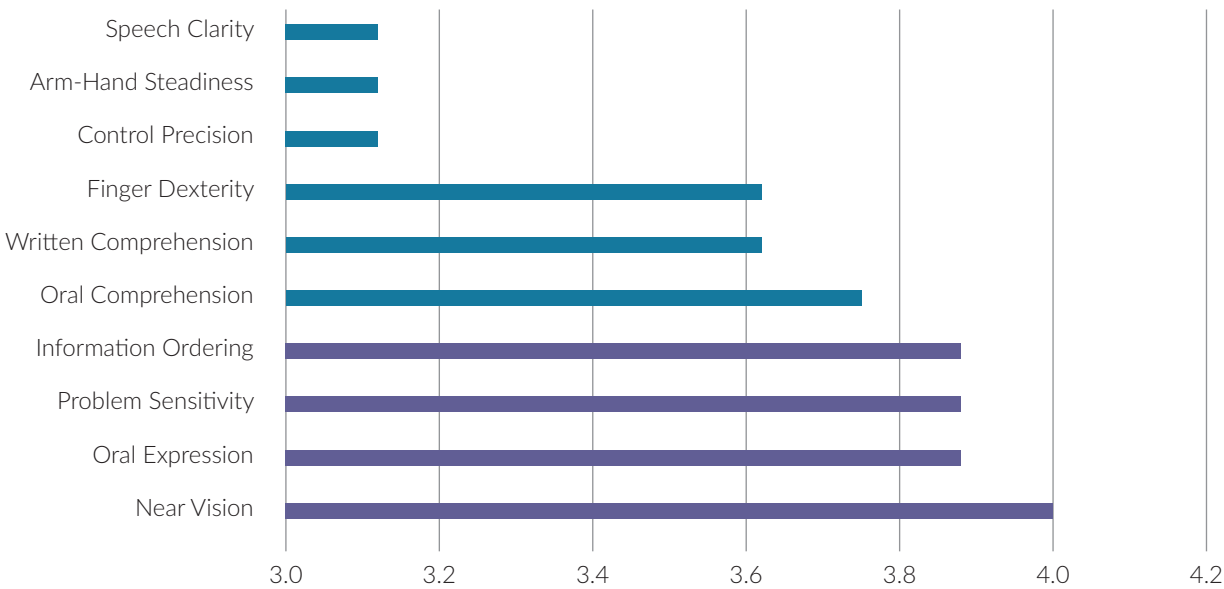
OPPORTUNITY OCCUPATIONS (1-6)

TARGET OCCUPATION 2: Medical and Clinical Laboratory Technicians

ABILITIES

The mostly highly rated abilities for a Medical and Clinical Laboratory Technician include correct processing of information, effective communication, and near vision.

NATIONAL: Medical and Clinical Laboratory Technicians, Highest Rated Abilities (Scale of 1-5)

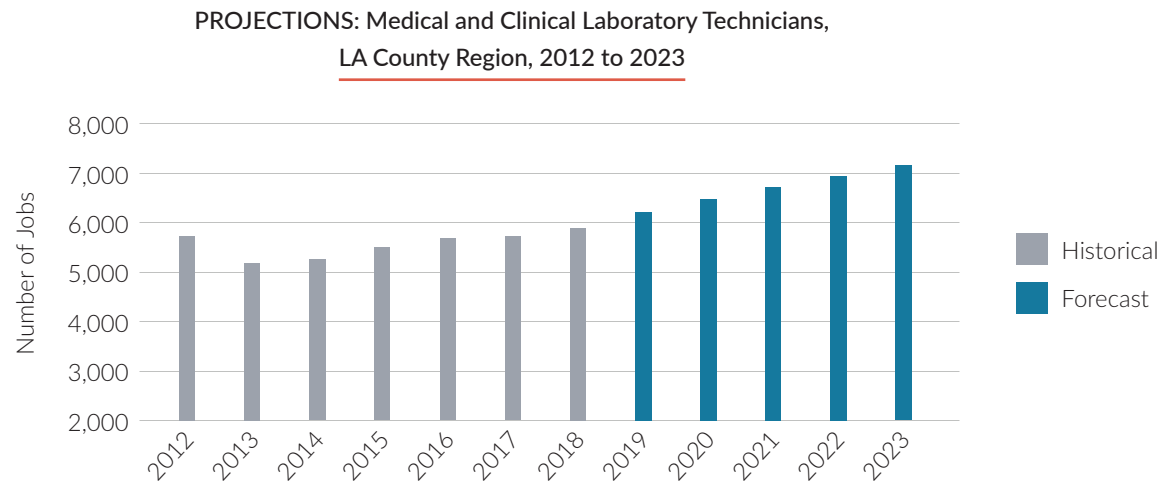


Source: O*NET; Analysis by Beacon Economics

FORECAST: Medical and Clinical Laboratory Technicians

Employment for Medical and Clinical Laboratory Technicians is forecast to grow by more than 1,200 positions between 2019 and 2023. Our optimism stems from a growing need to diagnose medical conditions through the use of laboratory procedures and to maintain the equipment for diagnosis and treatment. At the County of Los Angeles level, this field experienced declining overall job counts between 2012 and 2013, but growth has been steady since then. Nationally,

the Bureau of Labor Statistics also projects that the industry will expand at an above average rate. The turnover rate for employment in this occupation ranks third in our list of target support and extender occupations, and the percentage of current positions in the L.A. County Health Departments that are at risk based on internal retirement projections (13.3%) should be of note to county officials.



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

3

Environmental Science and Protection Technicians, Including Health

SOC CODE: 19-4091

DEPARTMENTAL EXPOSURE:

- Department of Public Health (DPH): 100%

All positions for Environmental Science and Protection Technicians in the County of Los Angeles are found in the Department of Public Health (DPH).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	750
Employment Growth 2012-2017	177.8%
Wages	\$61,010
Wages Growth 2012-2017	36.2%

L.A. HEALTH DEPARTMENTS

Budgeted Positions 2019	615
Growth in Budgeted Positions 2014-2019	-1.4%

Illustrative Classification Examples

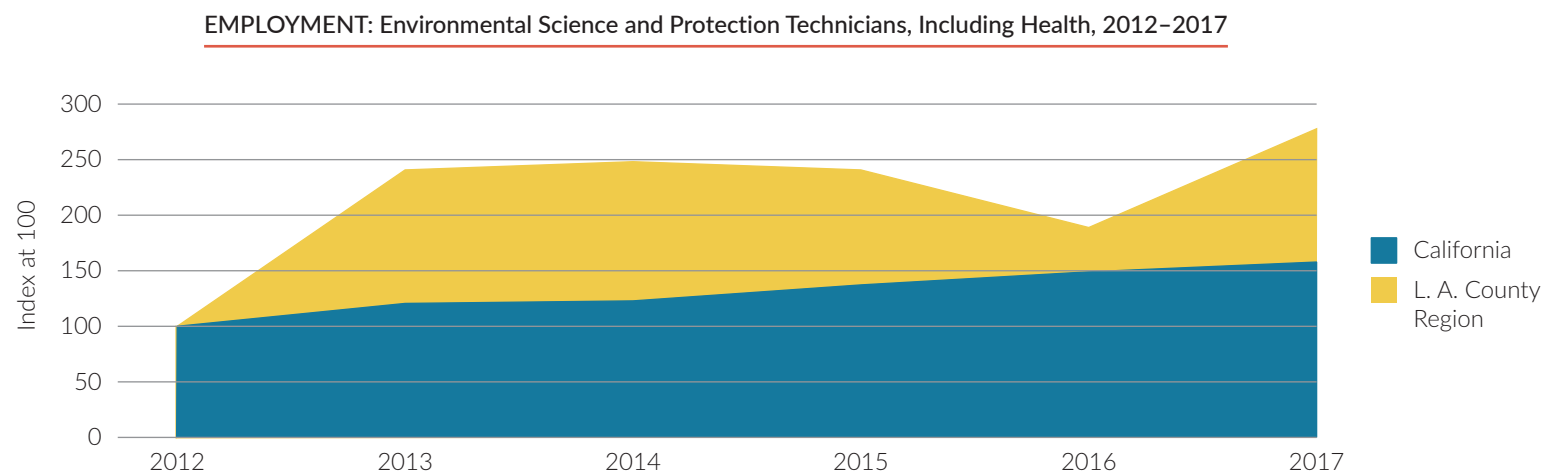
Environmental Health Technician
Environmental Health Specialist, I-IV

EMPLOYMENT

As of 2017, Environmental Science and Protection Technicians accounted for 615 budgeted positions in the Department of Public Health, of which 548 are filled. In the County of Los Angeles, there are 750 positions in total, meaning that the L.A. County Health Departments accounts for more than 80% of Environmental Science and Protection Technicians in the county. Environmental Science and Protection Technicians account for 2.4% of total extender occupations in the L.A. County Health Departments (specifically DPH) overall. In contrast, the share of Environmental Science and Protection Technicians to total extender occupations in the County of Los Angeles as a whole is 0.1%, which happens to be the same share of Environmental Science and Protection Technicians to total extender occupations in California.

While Environmental Science and Protection Technician (including Health) is not a dominant occupation in terms of employment for the L.A. County Health Departments, it is almost unique to it, especially when shares of the L.A. County Health Departments are compared to the county and state as a whole.

Environmental Science and Protection Technicians saw a significant jump in employment for the County of Los Angeles between 2012 and 2017, growing by 177.8% , with the number of employees increasing from 270 to 750 in the same period. This is more than three times the growth seen in California, where Environmental Science and Protection Technicians has grown by 57.8%, increasing from 3,060 employees to 4,830 between 2012 and 2017. While the statewide growth has been consistent, the County of Los Angeles experienced two large increases in employment, one in 2012, and another in 2016.



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

OPPORTUNITY OCCUPATIONS (1-6)

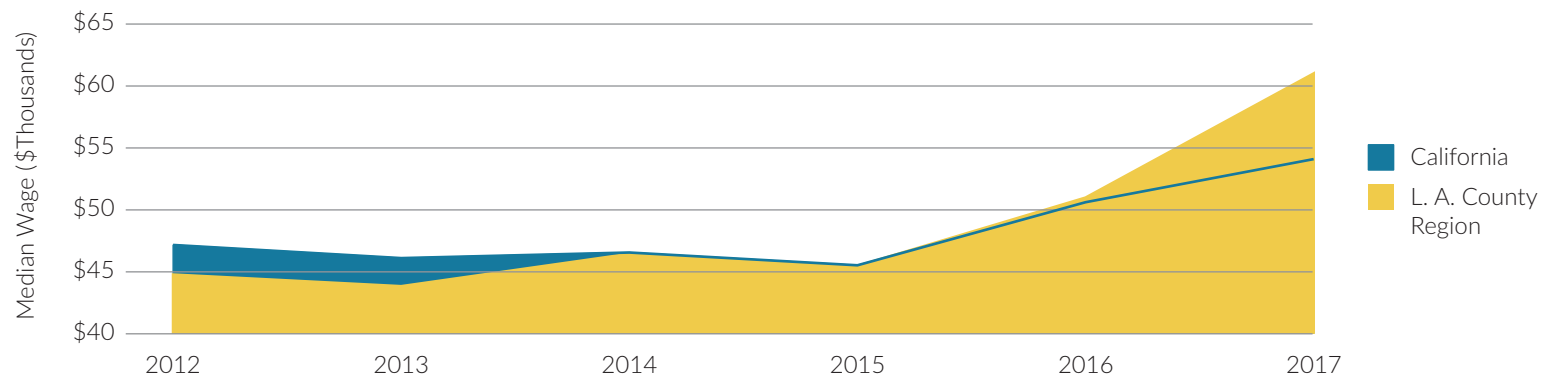
TARGET OCCUPATION 3: Environmental Science and Protection Technicians, Including Health

WAGES

Median wages for Environmental Science and Protection Technicians have been on the rise for both the County of Los Angeles and California, with sharper growth for the state. Between 2012 and 2017, wages for Environmental Science and Protection Technicians increased by 36.2% in the County of Los Angeles, reaching over \$61,000 in 2017. In contrast, at 14.7%, California's five-year wage growth was less than half of the county's, with wages reaching \$54,100 in 2017.



MEDIAN WAGE: Environmental Science and Protection Technicians, Including Health, 2012-2017



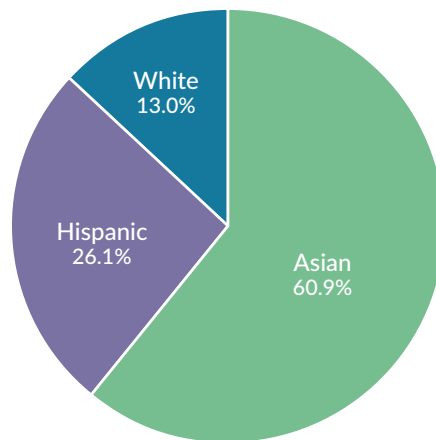
Source: Bureau of Labor Statistics; Analysis by Beacon Economics

DEMOGRAPHICS: Ethnic/Racial Composition

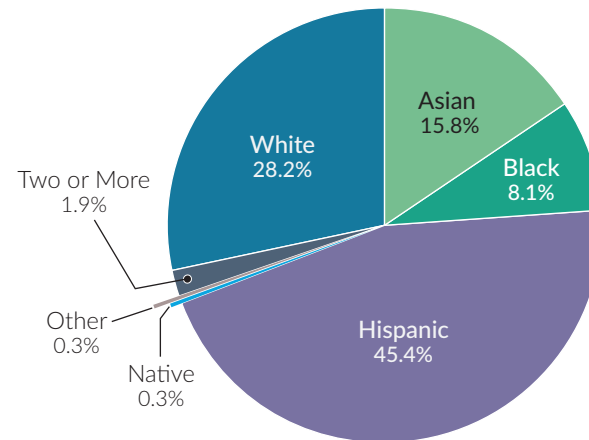
The racial and ethnic composition for Environmental Science and Protection Technicians differs from the county's labor pool (the County of Los Angeles workers aged 16 and over). Almost 61% of Environmental Science and Protection Technicians in the County of Los Angeles are Asian. In contrast, 45% of the

county's total labor pool is Hispanic. As of 2017, Hispanics accounted for 26% of Environmental Science and Protection Technicians, while 13% were white (compared to 28.2% for the county labor pool as a whole).

L.A. COUNTY REGION: Environmental Science and Protection Technicians, Including Health Ethnic/Racial Composition, 2017



L.A. COUNTY REGION: Residents Aged 16 and Up Ethnic/Racial Composition, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (1-6)

TARGET OCCUPATION 3: Environmental Science and Protection Technicians, Including Health

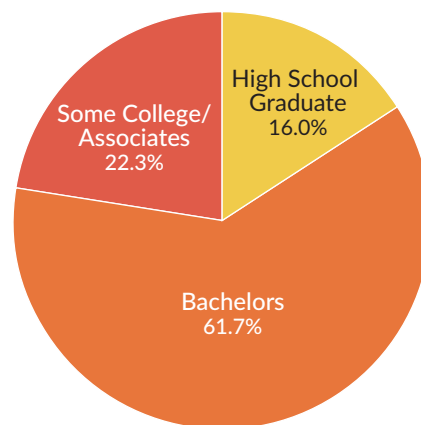
DEMOGRAPHICS: Educational Attainment

In terms of educational attainment, Environmental Science and Protection Technicians are mainly composed of individuals with a bachelor's degree (61.8%). This is followed by workers who have attained some college education or an associate degree (roughly 22.3%). The smallest number are high school graduates, who account for 16%.

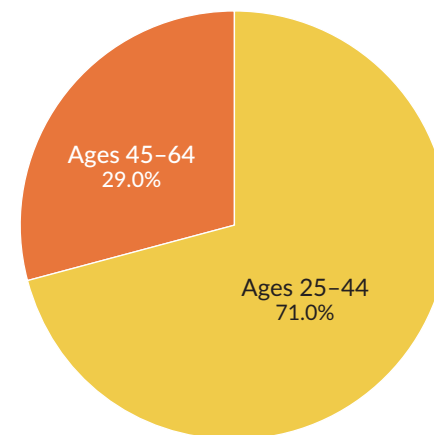
DEMOGRAPHICS: Age Breakdown

The overwhelming majority of Environmental Science and Protection Technicians in the County of L.A fall into the 25 to 44 age range, with the remainder spread out between the ages of 45 and 64. The lack of technicians between the ages of 16 and 24 is probably related to the high percentage of college graduates in the field.

L.A. COUNTY REGION: Environmental Science and Protection Technicians, Including Health, Educational Attainment, 2017



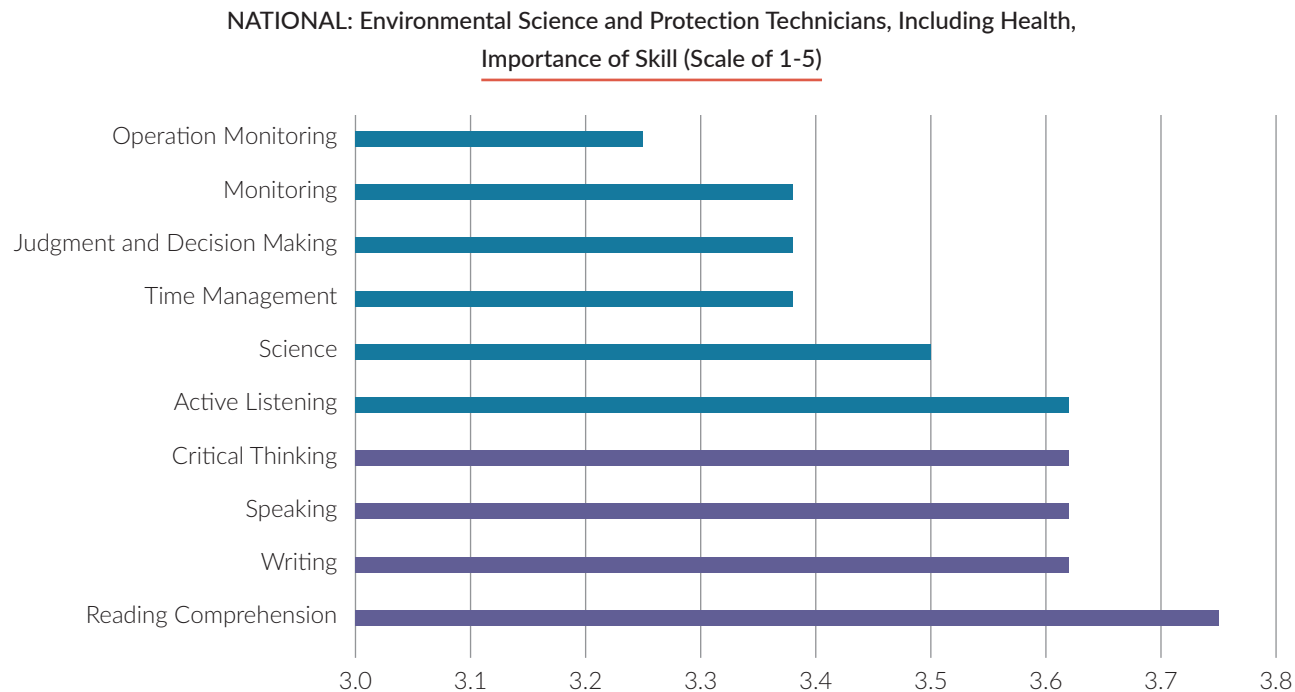
L.A. COUNTY REGION: Environmental Science and Protection Technicians, Including Health, Age Distribution, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

Given the heavy emphasis on observational analysis and data recording, the most important skills required by an Environmental Science and Protection Technician are reading comprehension, writing and critical thinking. Sound judgment, decision-making and active listening are also deemed valuable assets.



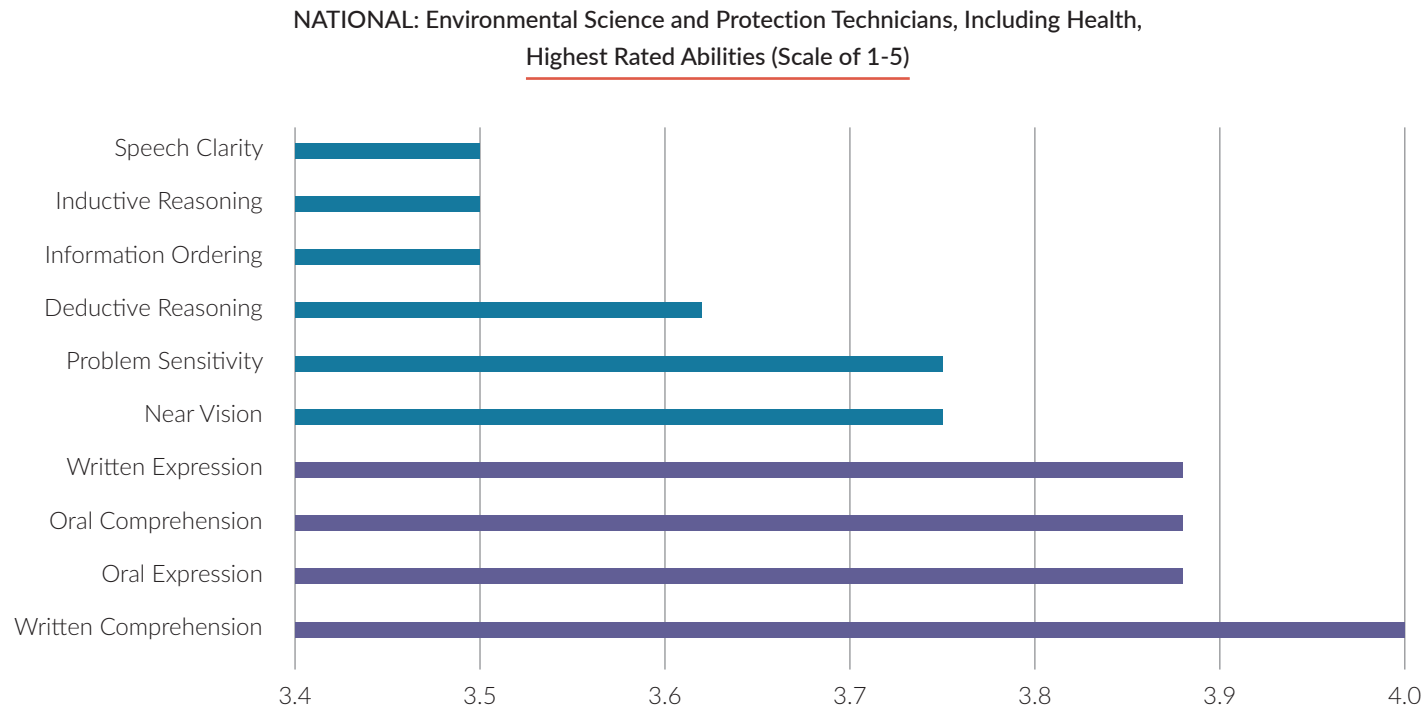
Source: O*NET; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (1-6)

TARGET OCCUPATION 3: Environmental Science and Protection Technicians, Including Health

ABILITIES

The ability to express results and methodology concisely is essential to the work of an Environmental Science and Protection Technician. It's no surprise then that comprehension, both written and oral, top the list of indispensable abilities.



Source: O*NET; Analysis by Beacon Economics

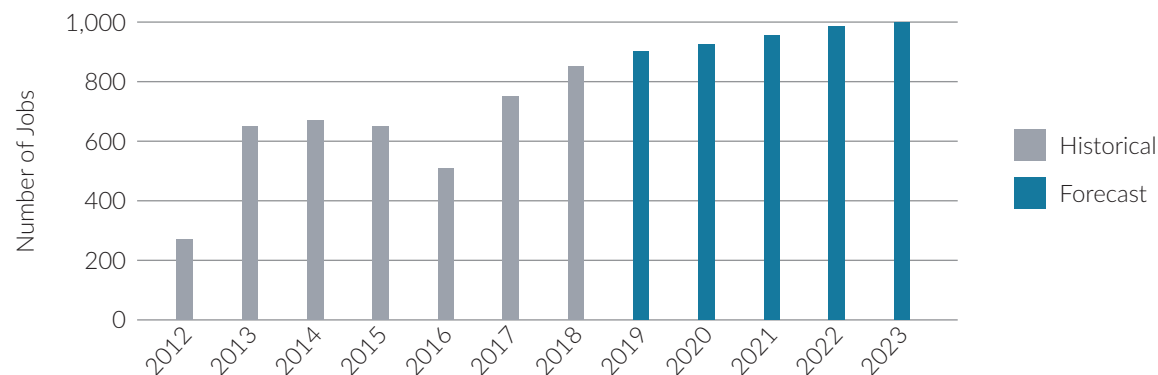
FORECAST: Environmental Science and Protection Technicians, Including Health

Employment in Environmental Science and Protection Technicians, Including Health is primarily comprised of classification codes that relate to Environmental Health Technicians and Environmental Health Specialists. This industry has experienced minor fluctuations in recent years, but the broader trend since 2017 has been growth. From 2012 to 2017, total employment in the County of Los Angeles increased 36.2%, roughly three times the rate at the national level. Our current projections predict continued growth in the near term — roughly 175 new positions added between 2019 and 2023 for a total of 1,000 jobs in the County.

The L.A. County Health Departments have budgeted for a large number of jobs in this field, a total of 615 positions, with 67 vacant at the time of writing. This professional group is engaged

in techniques and procedures for conducting environmental health inspections, investigations, and enforcement, as well as the application of these techniques and procedures in the field, in compliance with federal, state, and county public health laws, and with policies and procedures governing the environmental health program. We remain optimistic that employment in this sector will grow at a solid clip, as there is a growing need to monitor and comply with existing (and potential) regulations. What's more, the large number of vacancies in the county Health Departments, coupled with prospects for growth, further support the notion that this is an occupational mix to pay attention to. And although the average turnover rate amongst these occupations is not high (5.11%), the share of positions that are flagged as red (high retirement risk in the next three years) is relatively high (16.7%) and therefore shouldn't be overlooked in the coming years.

PROJECTIONS: Environmental Science and Protection Technicians, Including Health, LA County Region, 2012 to 2023



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

4

Medical Transcriptionists

SOC CODE: 31-9094

DEPARTMENTAL EXPOSURE:

- Department of Health Services (DHS): 100%

All of the positions for Medical Transcriptionists in the L.A. County Health Departments are employed by the Department of Health Services (DHS).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	1,770
Employment Growth 2012-2017	31.1%
Wages	\$29,830
Wages Growth 2012-2017	-37.7%

L.A. HEALTH DEPARTMENTS

Budgeted Positions 2019	58
Growth in Budgeted Positions 2014-2019	-26.6%

Illustrative Classification Examples

Medical Stenographer

Medical Transcriber Typist

EMPLOYMENT

Medical Transcriptionists comprise 49 filled and 58 budgeted positions, all of whom are employed within the Department of Health Services (DHS). The County of Los Angeles employs roughly 1,770 Medical Transcriptionists in all industries.

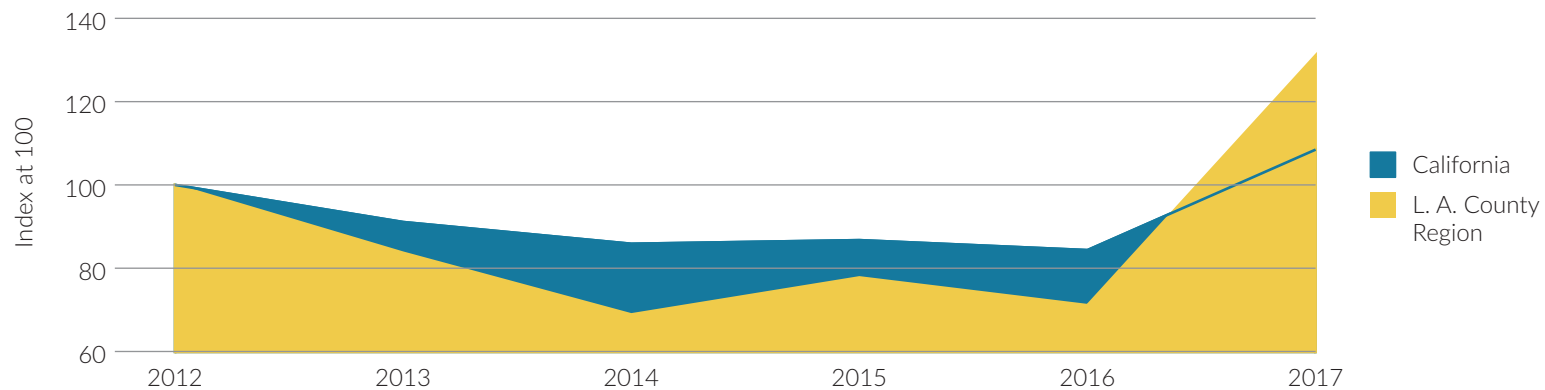
Medical Transcriptionists account for small portions of extender occupations, both in the L.A. County Health Departments and the County of Los Angeles overall. Within the Health Departments, Medical Transcriptionists make up 0.2% of total extender occupations, with the County of Los Angeles also having the same ratio. The statewide ratio is slightly lower than the county's and Department's – at 0.1% of extender occupations.

Overall, Medical Transcriptionists make up a small portion of total extender occupations throughout the L.A. County Health Departments, the County of Los Angeles and California. Since the

Department of Health Services (DHS) employs the most extender occupations, the share of Medical Transcriptionists there was small as well.

Throughout the County of Los Angeles, Medical Transcriptionists increased by 31.1% between 2012 and 2017, with employment going from 1,350 to 1,770 workers. Growth in the County of Los Angeles for Medical Transcriptionists has far outpaced California, where the growth rate was roughly 8.5%. The large increase that the County of Los Angeles has experienced is primarily due to a surge in employment between 2016 and 2017, where the number of workers increased from 960 to 1,770. While a significant surge, this trend also occurred across the state, with employment increasing from 3,880 to 4,990 workers.

EMPLOYMENT: Medical Transcriptionists, 2012–2017



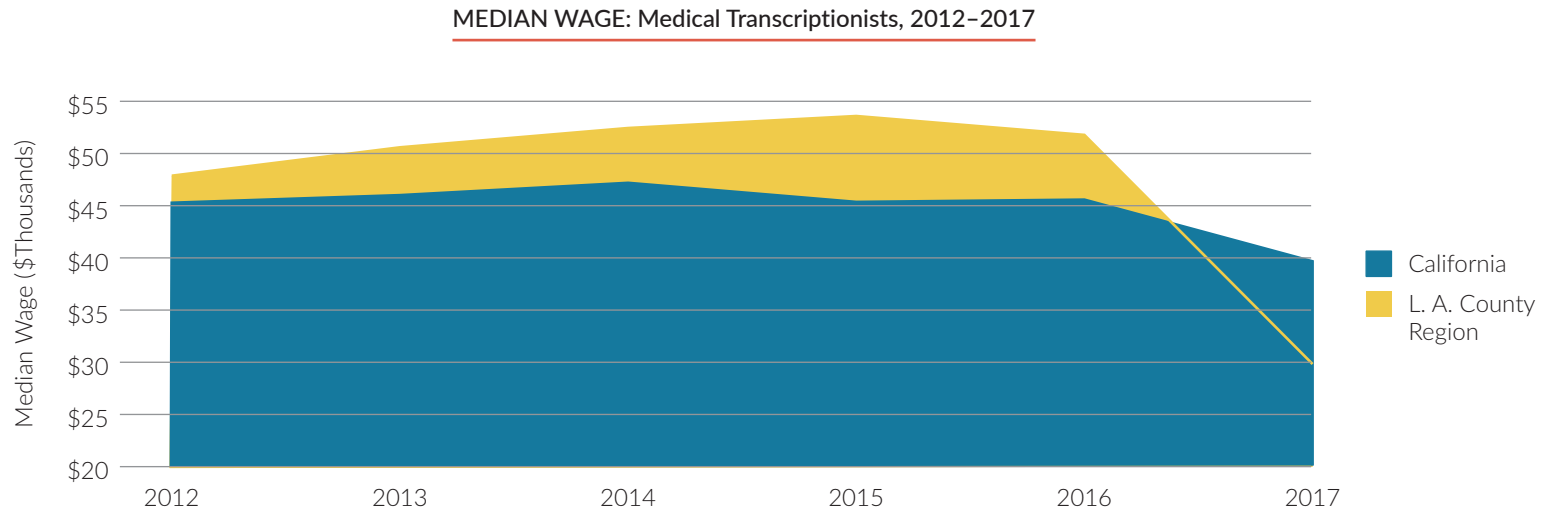
Source: Bureau of Labor Statistics; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (1-6)

TARGET OCCUPATION 4: Medical Transcriptionists

WAGES

While employment saw a significant increase between 2012 and 2017, median wages for Medical Transcriptionists dropped in the same five-year period. Throughout the County of Los Angeles, median wages fell by 37.7% between 2012 and 2017, reaching \$29,830. This could be the result of increases in employment, which in turn have likely added entry-level positions that have shifted the median wage down. The California median wage has also fallen, albeit not as severely as the County of Los Angeles. In 2017, California's median wage for Medical Transcriptionists was \$39,670, down 12.4% from 2012.

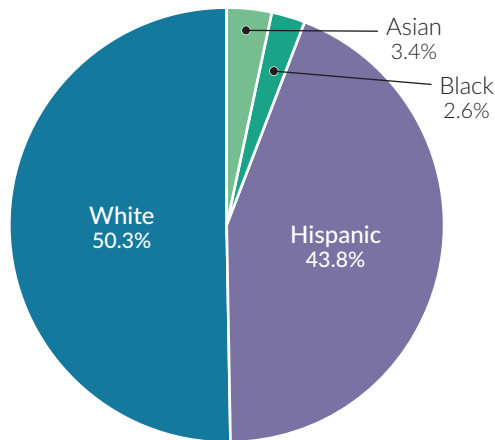


Source: Bureau of Labor Statistics; Analysis by Beacon Economics

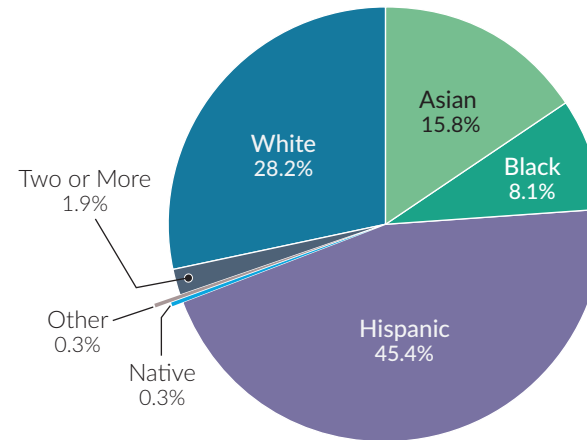
DEMOGRAPHICS: Ethnic/Racial Composition

Medical Transcriptionists are composed primarily of White workers (50%) and Hispanics (44%). This differs from the racial and ethnic composition of the county's civilian employed population (age 16 and over), where the largest group of workers are Hispanic (45%), followed by White (28.2%) and Asian (15.8%). Black workers in the Medical Transcription field make up roughly 2.6% of employees, lower than the county average of 8.1%.

**L.A. COUNTY REGION: Medical Transcriptionists,
Ethnic/Racial Composition, 2017**



**L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017**



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

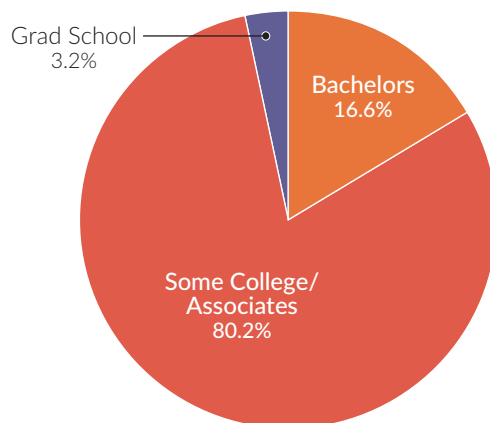
OPPORTUNITY OCCUPATIONS (1-6)

TARGET OCCUPATION 4: Medical Transcriptionists

DEMOGRAPHICS: Educational Attainment

Medical Transcriptionists require a minimum level of education. The majority of Medical Transcriptionists in the County of Los Angeles (80%) have some college education or an associate degree. 16.6% have a bachelor's degree, while the remainder have some form of graduate degree.

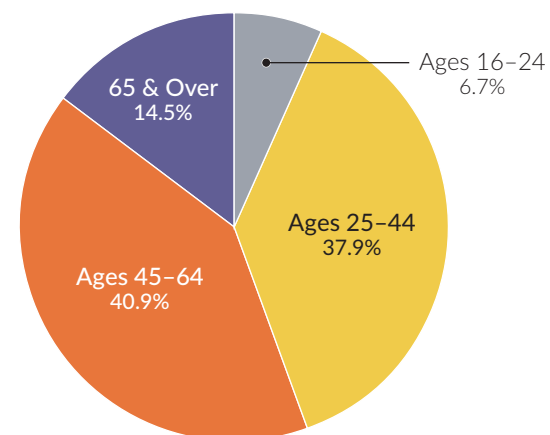
L.A. COUNTY REGION: Medical Transcriptionists,
Educational Attainment, 2017



DEMOGRAPHICS: Age Breakdown

The age distribution among Medical Transcriptionists varies, but there is a relatively high level of older workers. Most Medical Transcriptionists (41%) fall between the ages of 45 and 64. However, a significant number (14.5%) are over the age of 65. As such, the Department of Human Resources has indicated a higher than average retirement projection for Medical Transcriptionists in the L.A. County Health Departments, with up to 17.7% expected to retired within three years or less.

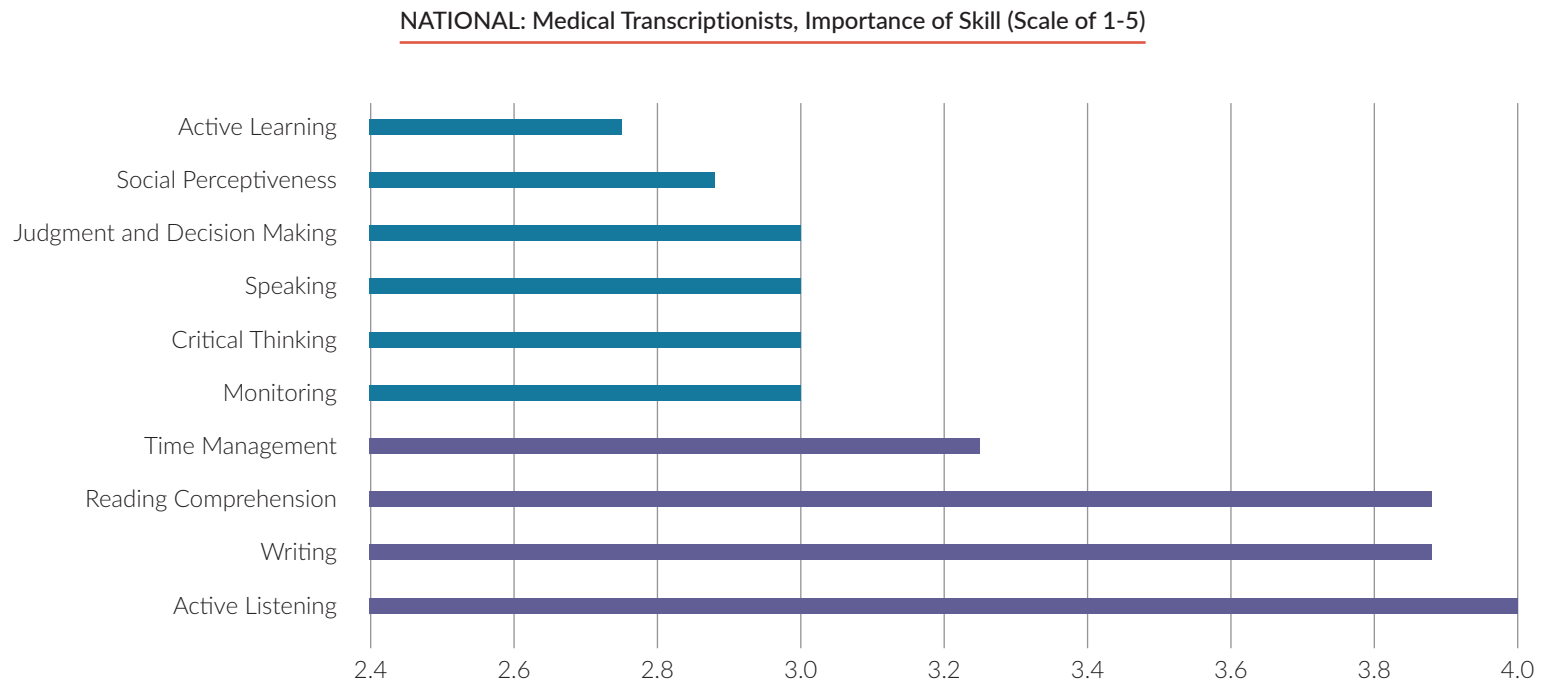
L.A. COUNTY REGION: Medical Transcriptionists,
Age Distribution, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

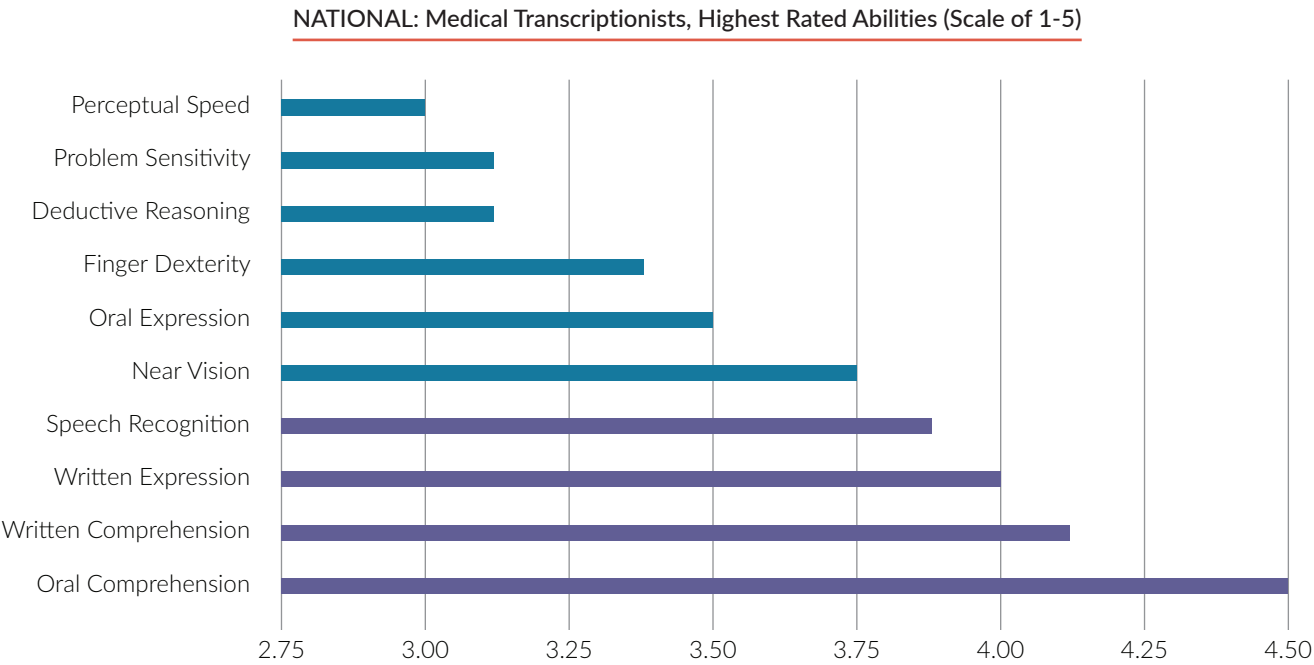
Medical Transcriptionists' responsibilities include transcribing reports by physicians from various recordings, office visits and other health operations. As such, the job demands a high aptitude for listening, writing and reading comprehension.



Source: O*NET; Analysis by Beacon Economics

ABILITIES

The highest rated abilities for Medical Transcriptionists are obtaining and processing information, specifically oral and written comprehension, both of which are vital to the understanding of material and transcribing medical records. Perceptual speed and deductive reasoning are also listed in the top ten abilities, with oral and written comprehension the most highly rated.



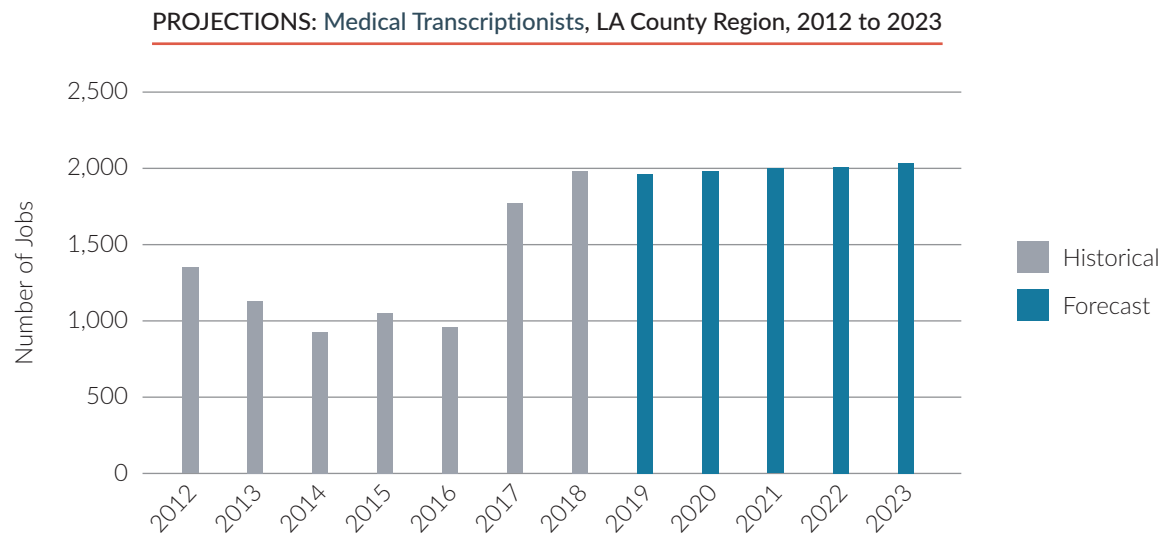
Source: O*NET; Analysis by Beacon Economics

FORECAST: Medical Transcriptionists

Medical Transcriptionists operate in a similar setting to Word Processors and Typists, but there have been some signs of life in the most recent employment estimates. Our current projections for the industry suggest a positive outlook in the near term. This is at odds with national and state projections, although Beacon Economics wouldn't be surprised if the industry were to move sideways or into the red. Arguably these occupations should be within the Word Processors and Typists occupational mix, but Beacon Economics felt it was necessary to distinguish class codes that are more oriented toward medical transcription than general typing or word processing.

Medical Transcriptionists are often tasked with transcribing and converting into written reports the voice recordings

of physicians and other health care workers. Technological advances such as speech recognition and electronic health records software (EHR) allow physicians to create some of this documentation in the moment, reducing the need for transcriptionists. Therefore Beacon Economics is cautiously optimistic in these projections. There isn't a large number of vacant positions for Medical Transcriptionists in the L.A. County Health Departments, but there are a few red flags to make note of. Among our target list of support and extender occupations, Medical Transcriptions boast the highest average turnover rate at 11%. This occupation also has a high proportion (close to 18%) of positions that are at risk of retirement in the next three years.



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

5

Medical and Health Services Managers

SOC CODE: 11-9111

DEPARTMENTAL EXPOSURE:

- Department of Health Services (DHS): 18.5%
- Department of Mental Health (DMH): 22.2%
- Department of Public Health (DPH): 59.3%

Medical and Health Services Managers are employed in all three of L.A County Health Departments, with a majority employed in the Department of Public Health (DPH), followed by the Department of Mental Health (DMH), and Department of Health Services (DHS).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	9,200
Employment Growth 2012-2017	28.5%
Wages	\$109,260
Wages Growth 2012-2017	4.4%

L.A. HEALTH DEPARTMENTS

Budgeted Positions 2019	135
Growth in Budgeted Positions 2014-2019	-46.0%

Illustrative Classification Examples

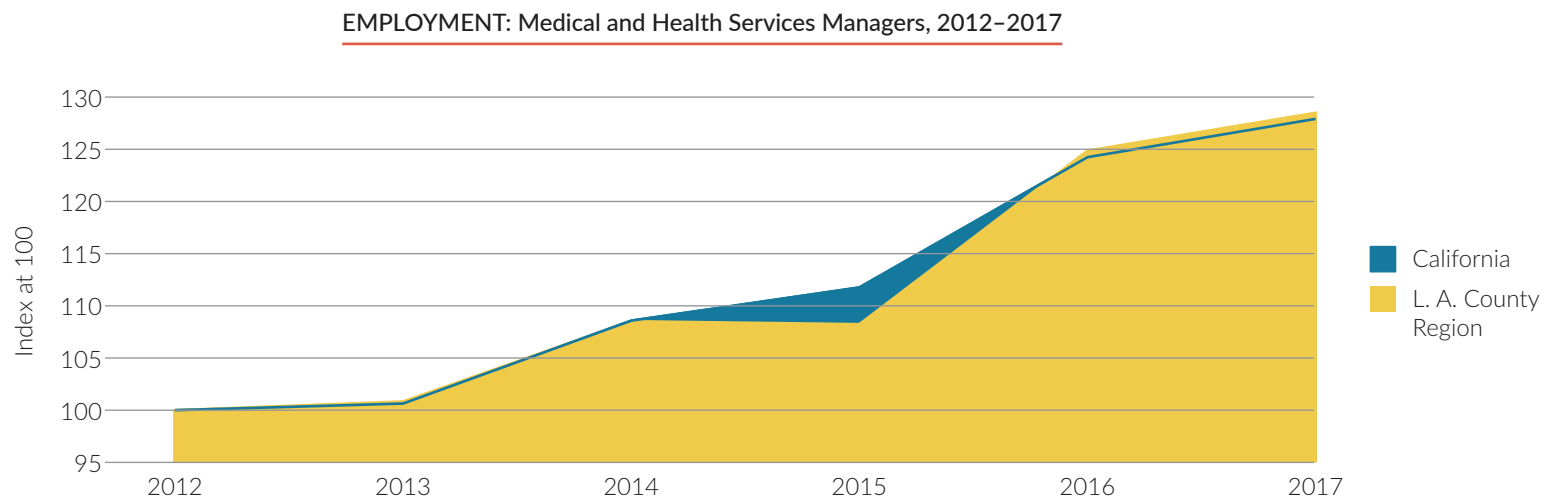
Medical Service Coordinator, CCS
Mental Health Clinical Supervisor

EMPLOYMENT

Medical and Health Services Managers are allocated 135 budgeted positions throughout the L.A. County Health Departments: 80 in the Department of Public Health (DPH), 30 in the Department of Mental Health (DMH), and 25 in the Department of Health Services (DHS). In the County of Los Angeles, there are 9,200 Medical and Health Services Managers throughout all industries. The County of Los Angeles overall accounts for a slightly higher share than the L.A. County Health Departments, but for both regions the number of workers to total extender occupations is low. L.A. County's Health Departments have a 0.5% share of Medical and Health Services Managers compared to total extender occupations, while the County of Los Angeles' share is slightly higher at 0.9%. California's share of Medical and Health Services Managers to extender occupations coincides with the County of Los Angeles' at 0.9%. Across

the departments in the L.A. County Health Departments, the Department of Public Health accounts for the largest share of Medical and Health Services Managers at 2.2%, while the Department of Mental Health accounts for 1.9%.

Employment levels for Medical and Health Services Managers rose consistently between 2012 and 2017 for the County of Los Angeles and California, with both growing at an almost parallel level. The County of Los Angeles' employment growth for Medical and Health Services Managers was 28.5% between 2012 and 2017, slightly higher than the statewide rate of 27.9% in the same period. The County of Los Angeles' employment level increased from 7,160 to 9,200 between 2012 and 2017, with a particularly strong surge in employment growth between 2015 and 2017.



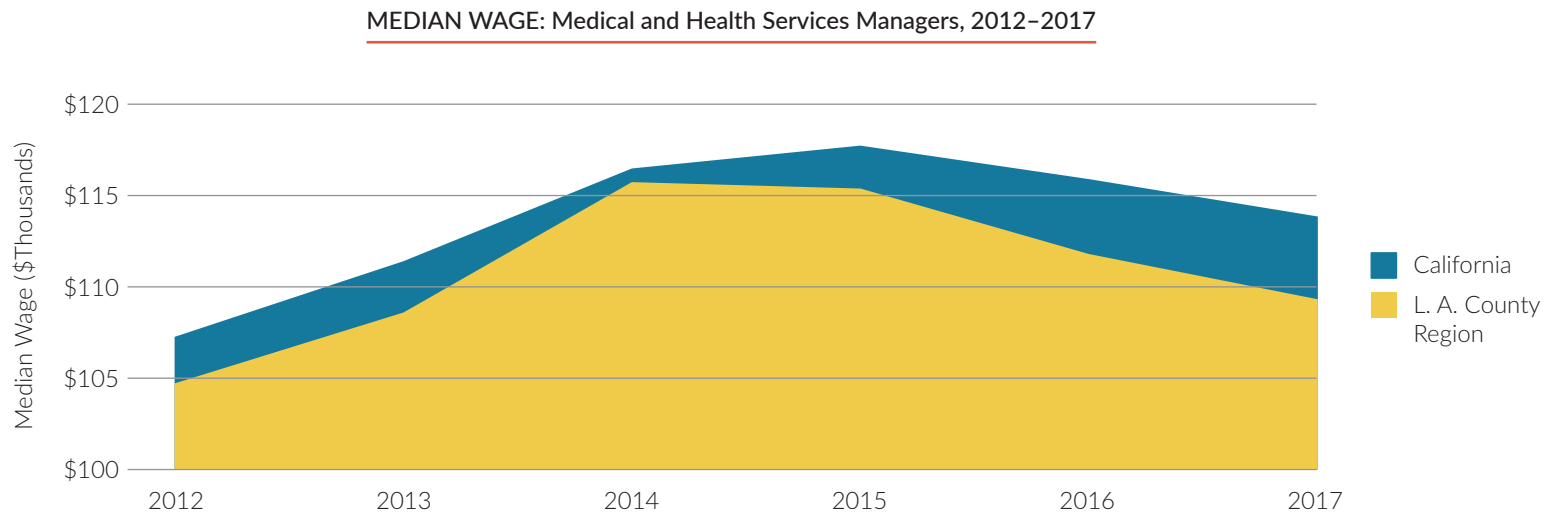
Source: Bureau of Labor Statistics; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (1-6)

TARGET OCCUPATION 5: Medical and Health Services Managers

WAGES

Median wages for Medical and Health Services Managers went up overall between 2012 and 2017 for both the County of Los Angeles and California, with a growth rate of 4.4% and 6.1% respectively. The County of Los Angeles' median wage for Medical and Health Services Managers reached \$109,260 in 2017, slightly lower than the statewide median of \$113,790 for the occupation. While median wages have gone up in the five-year period, between 2015 and 2017 the trend has begun to go down, most likely a result of consistent increases in employment shifting the median wage down.

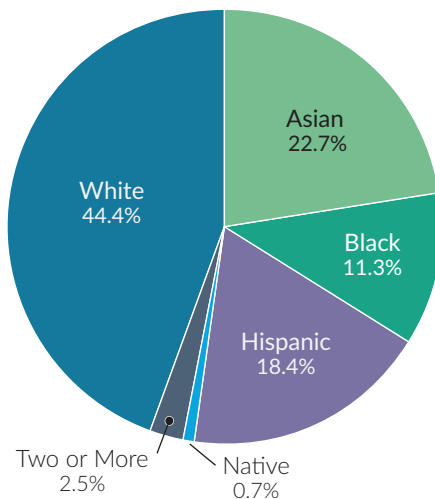


Source: Bureau of Labor Statistics; Analysis by Beacon Economics

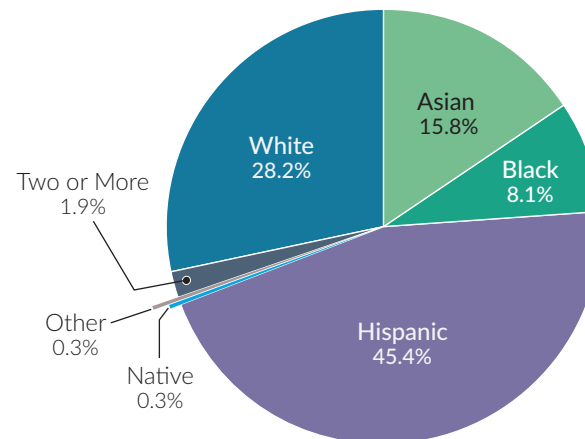
DEMOGRAPHICS: Ethnic/Racial Composition

The racial and ethnic composition of Medical and Health Services Managers differs from the County of Los Angeles civilian employed population (employed individuals aged 16 and over). The majority of Medical and Health Services Managers in the County of Los Angeles are White (44.4%), followed by Asians (22.7%), and Hispanics (18.4%). In contrast, Hispanic workers make up 45% of the County of Los Angeles labor pool, followed by Whites (28.2%) and Asians (15.8%).

L.A. COUNTY REGION: Medical and Health Services Managers,
Ethnic/Racial Composition, 2017



L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

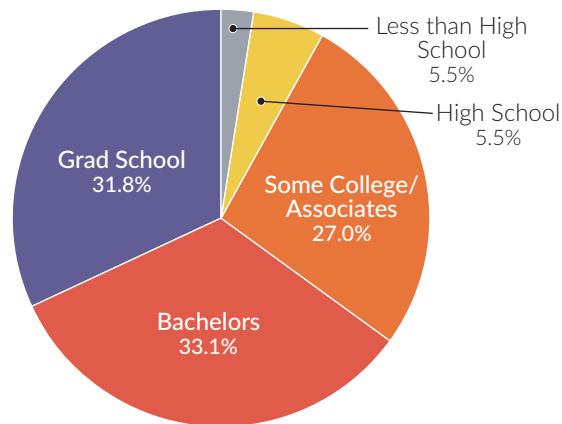
OPPORTUNITY OCCUPATIONS (1-6)

TARGET OCCUPATION 5: Medical and Health Services Managers

DEMOGRAPHICS: Educational Attainment

Medical and Health Services Managers in the County of Los Angeles exhibit relatively high levels of educational attainment – 33.1% having a graduate degree, 33.1% an associate degree, and 27% some college. Only 8% have a high school diploma or less.

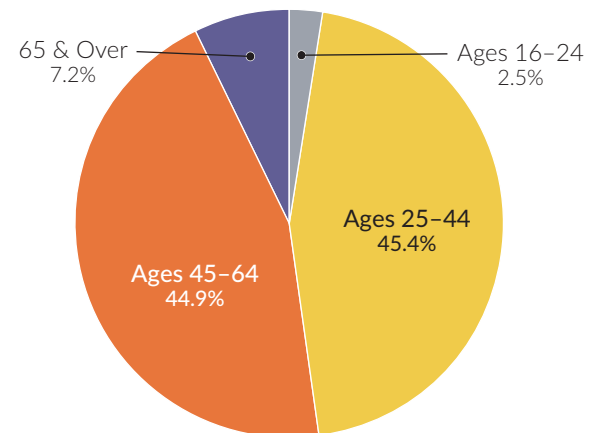
L.A. COUNTY REGION: Medical and Health Services Managers,
Educational Attainment, 2017



DEMOGRAPHICS: Age Breakdown

The age distribution among Medical and Health Services Managers is split predominantly into two age groups: 25 to 44 (45.4%) and 45 to 64 (44.9%), with a small number (7.2%) over the age of 65. This coincides with Departments of Human Resources retirement projections, which estimates that roughly 10.8% of Medical and Health Services Managers in the L.A. County Health Departments are expected to retire within three years or less.

L.A. COUNTY REGION: Medical and Health Services Managers,
Age Distribution, 2017

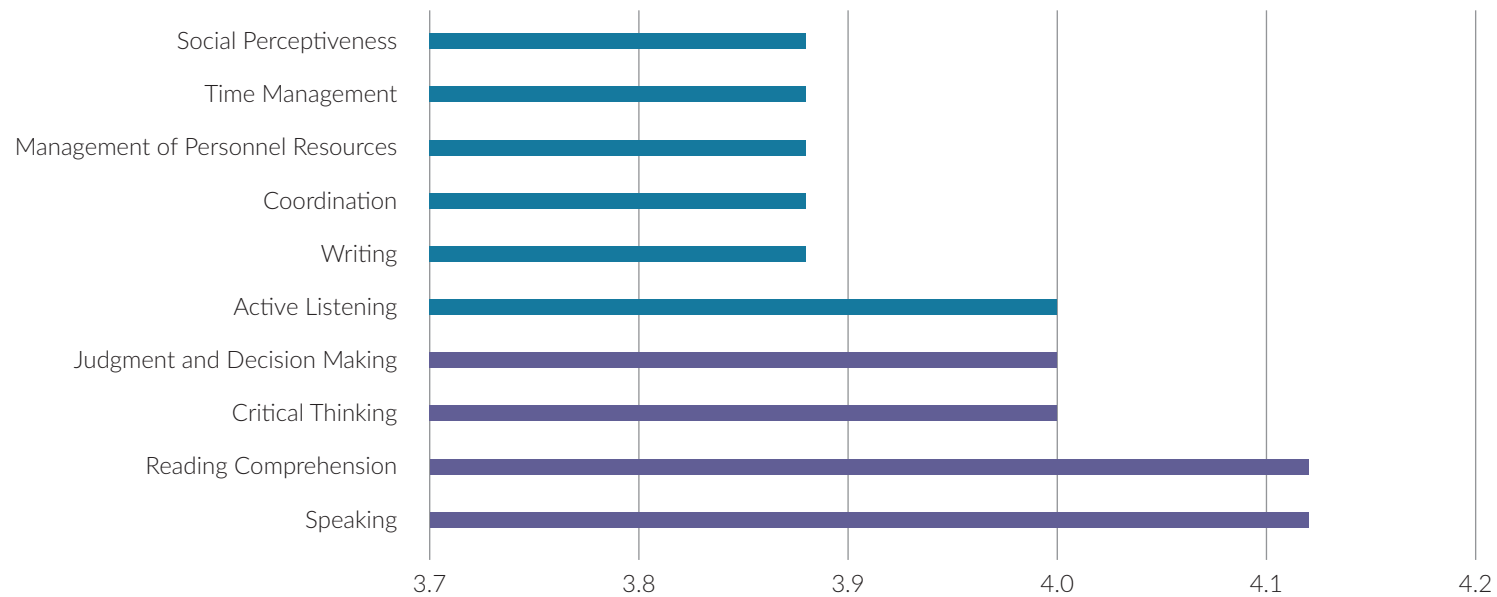


Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

Medical and Health Services Managers plan and coordinate complex medical and other services in hospitals, public agencies and other similar institutions. As such, the job requires strong communication, problem-solving and decision-making skills. Speaking, critical thinking and reading comprehension are also of paramount importance.

NATIONAL: Medical and Health Services Managers, Importance of Skill (Scale of 1-5)



Source: O*NET; Analysis by Beacon Economics

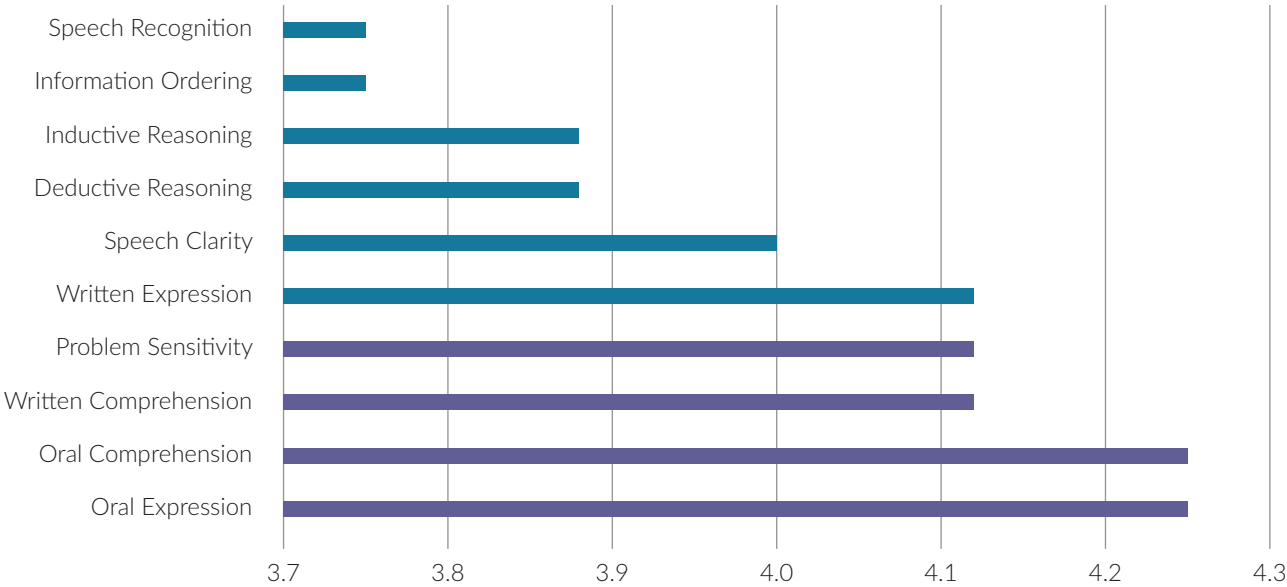
OPPORTUNITY OCCUPATIONS (1-6)

TARGET OCCUPATION 5: Medical and Health Services Managers

ABILITIES

Given the emphasis on communication, the highest rated abilities in a Medical and Health Services Manager are oral comprehension and oral expression. Written comprehension and problem sensitivity are also highly valued.

NATIONAL: Medical and Health Services Managers, Highest Rated Abilities (Scale of 1-5)



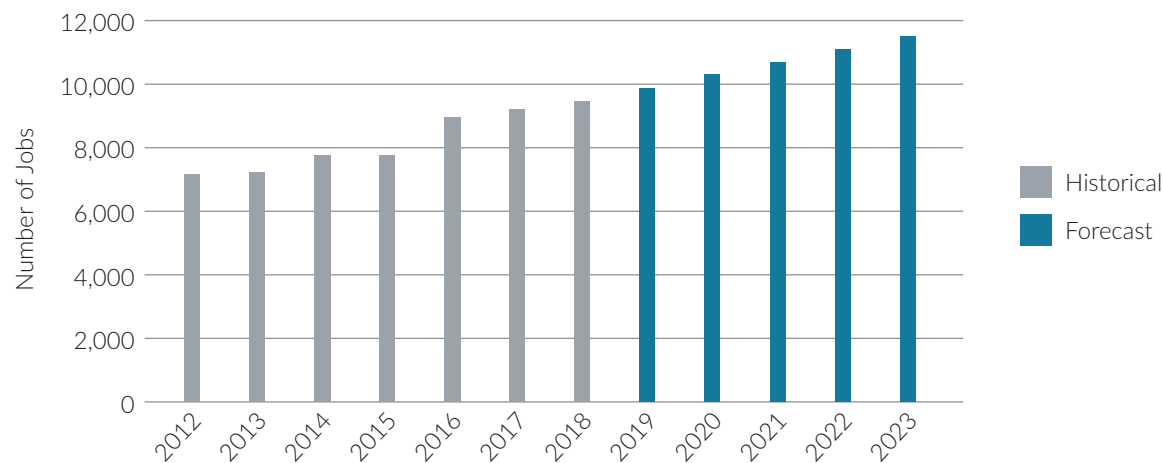
Source: O*NET; Analysis by Beacon Economics

FORECAST: Medical and Health Services Managers

The employment outlook for Medical and Health Services Managers in the coming years remains bright and is projected to grow 16% by 2023 to nearly 11,500 positions countywide. Demand for general health care workers, demographic changes, new medical procedures, and expanding health care facilities are just some of the factors that Beacon Economics predict will increase demand for Medical and Health Services Managers.

Additionally, the expansion of electronic health records bodes well for managers who will help to organize and integrate these records. The county has earmarked 135 positions in this occupation, with 22 vacancies at the time of writing. The turnover rate for Medical and Health Services Managers is not high, but it is above the median for our list of 20 target occupations. The same can be said for the share of current positions that have a retirement risk in the next three years (11%). With all these factors in mind, this is not an occupation to be overlooked.

**PROJECTIONS: Medical and Health Services Managers,
LA County Region, 2012 to 2023**



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

6

Computer Occupations, All Other

SOC CODE: 15-1199



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	9,970
Employment Growth 2012-2017	259.9%
Wages	\$77,760
Wages Growth 2012-2017	2.6%

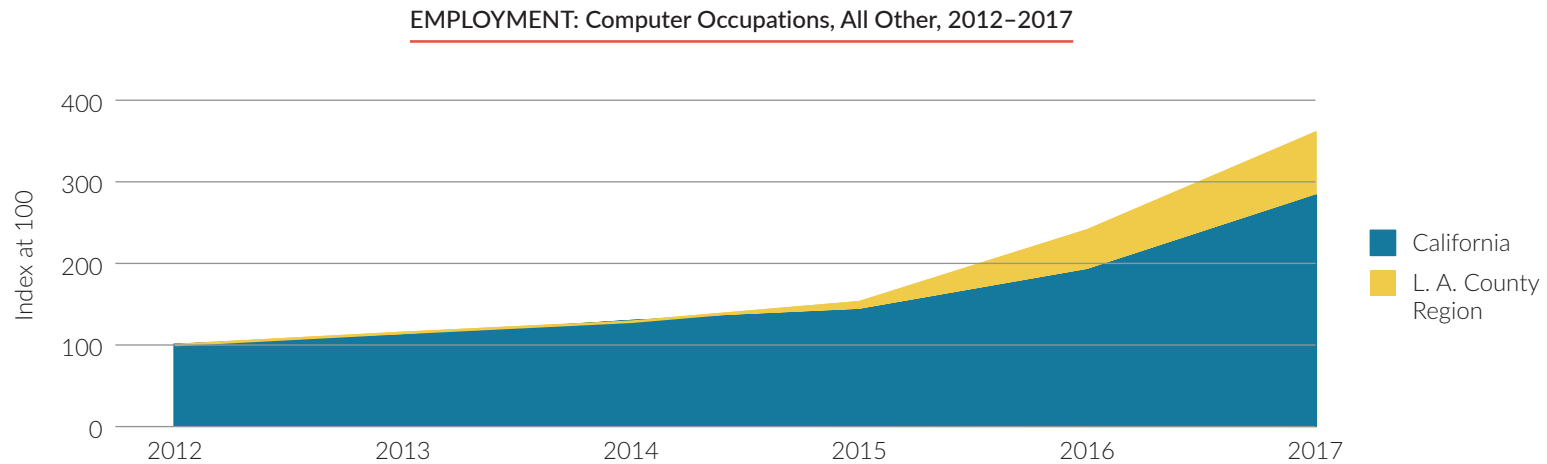


EMPLOYMENT

The County of Los Angeles employs roughly 9,970 workers in Computer Occupations (All Other). This amounts to roughly 1% of the share of occupational mix to total extender occupations, in line with the statewide share of 1.3%. While the share of occupations is still relatively low, Computer Occupations (All Other) is one of the fastest growing occupations in the County of Los Angeles.

Between 2012 and 2017, employment in Computer Occupations (All Other) in the County of Los Angeles

increased by a substantial 259.9%, the largest gain for any of the extender occupations listed. The total number of employees went from 2,770 in 2012 to 9,970 in 2017. This is not unique to the County of Los Angeles; the statewide growth was 182.3% in the same period, and total employment peaked at 47,900 in 2017. The increase in demand was noticeable after 2015, when the occupation grew by 136.3% in those two years alone.



Source: Bureau of Labor Statistics; Analysis by Beacon Economics

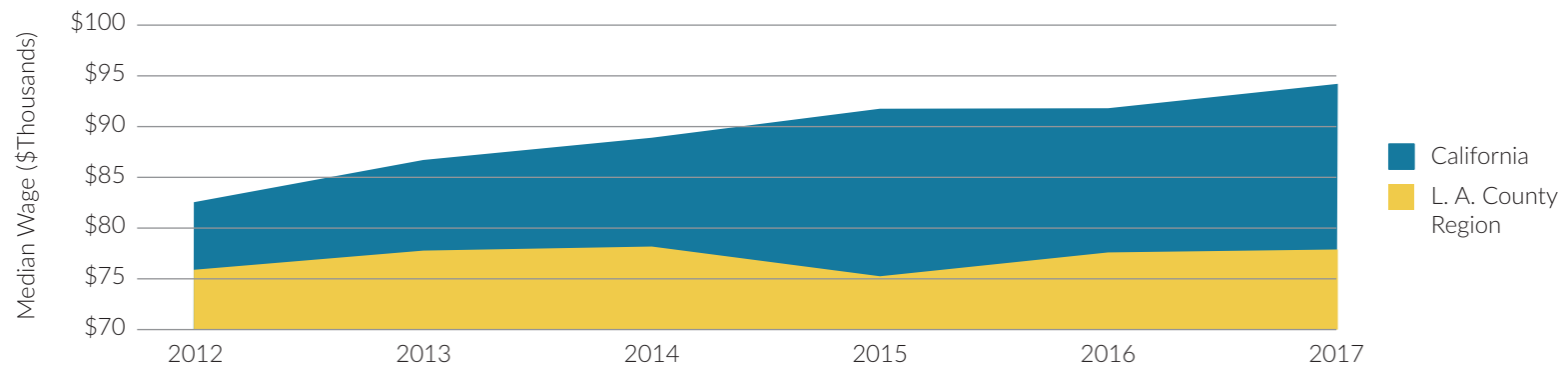
OPPORTUNITY OCCUPATIONS (1-6)

TARGET OCCUPATION 6: Computer Occupations, All Other

WAGES

Wages for Computer Occupations (All Other) saw modest growth in the County of Los Angeles between 2012 and 2017, with an increase of 2.6% to a median wage of \$77,760. While wage growth lagged behind the massive employment gains, the increase indicates that the demand was not just for entry-level positions but for higher paying positions as well, since the increase in employment did not shift the median wage down. However, wage growth in California was stronger than in the County of Los Angeles, with an upswing of 14.1% to \$94,070 between 2012 and 2017.

MEDIAN WAGE: Computer Occupations, All Other, 2012-2017

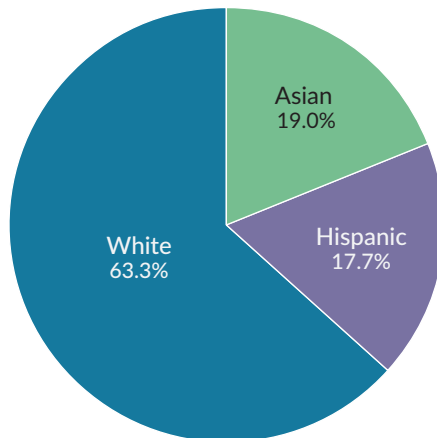


Source: Bureau of Labor Statistics; Analysis by Beacon Economics

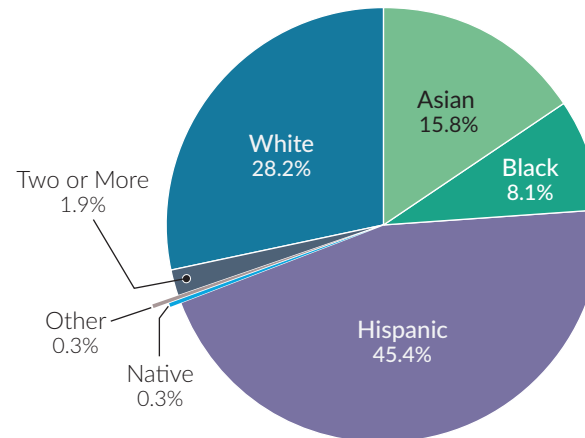
DEMOGRAPHICS: Ethnic/Racial Composition

The racial and ethnic composition of Computer Occupations (All Other) is less diverse than workers in the County of Los Angeles (employed population). Computer Occupations workers are made up of White workers (63%), Asian workers (19%) and Hispanic workers (18%). For the County of Los Angeles as a whole, Hispanics are the largest group of workers at 45%, followed by White (28.2%) and Asian (15.8%).

L.A. COUNTY REGION: Computer Occupations, All Other,
Ethnic/Racial Composition, 2017



L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (1-6)

TARGET OCCUPATION 6: Computer Occupations, All Other

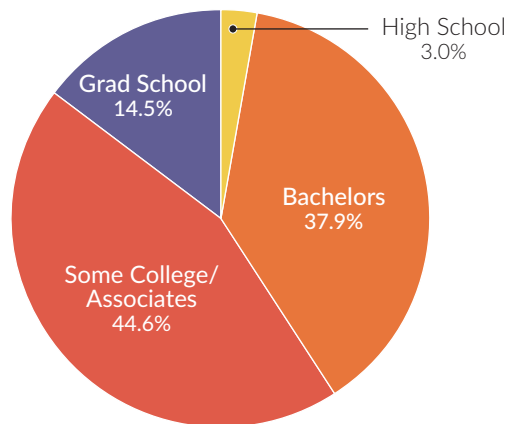
DEMOGRAPHICS: Educational Attainment

Educational requirement for Computer Occupations (All Other) indicate that a minimum of some college or an associate degree is preferred. Of the total number of workers in the field in the County of Los Angeles, only 3% have no higher education. Up to 45% have some college or an associate degree, and 37.9% have a bachelor's degree. Almost 15% of workers in Computer Occupations (All Other) have a graduate degree.

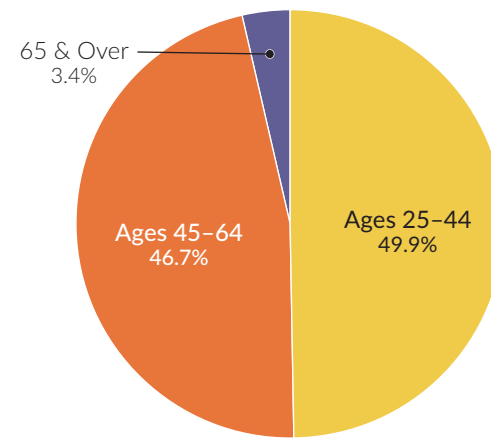
DEMOGRAPHICS: Age Breakdown

Half the employees in computer occupations, all other lie between the ages of 25 and 44 (49.9%). The remaining are between the ages of 45 and 65 (46.7%) with a small percentage aged 65 and older (3.4%).

L.A. COUNTY REGION: Computer Occupations, All Other,
Educational Attainment, 2017



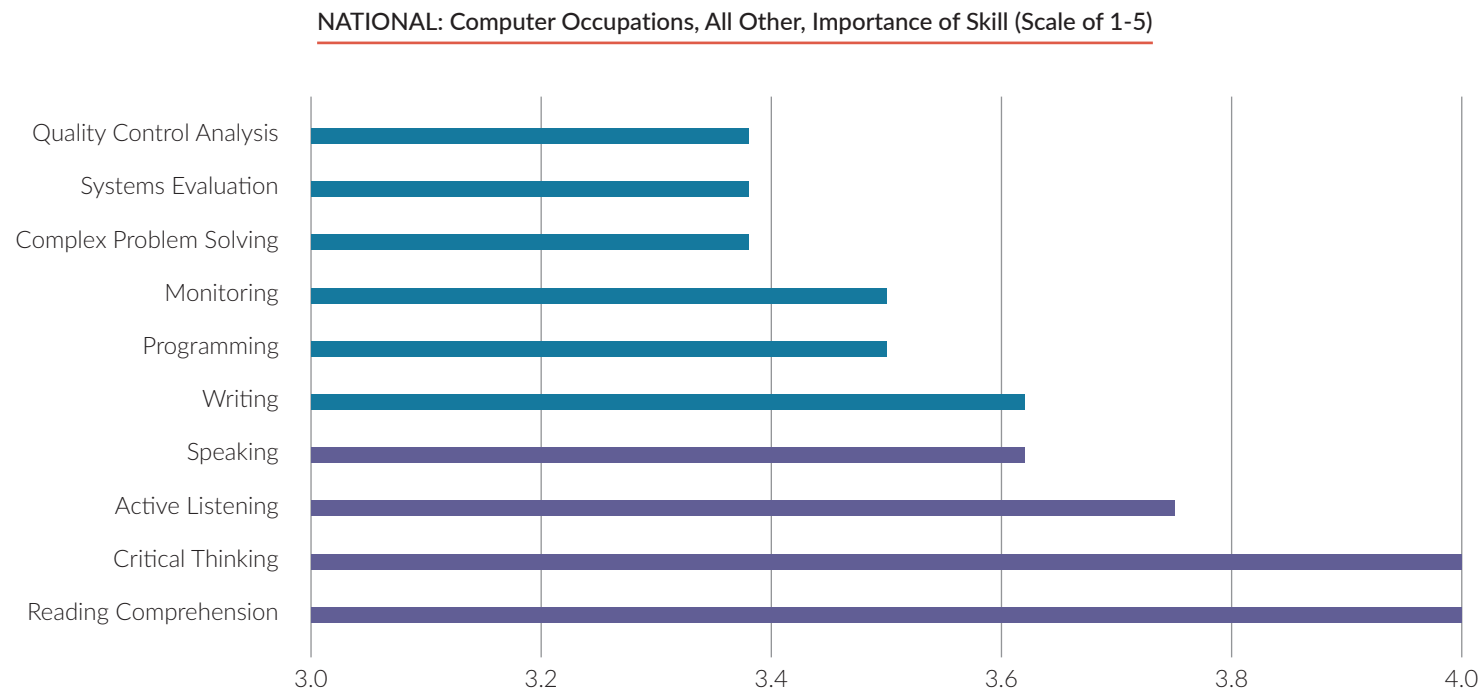
L.A. COUNTY REGION: Computer Occupations, All Other,
Age Distribution, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

Computer Occupations (All Other) is a broad field and entails a range of responsibilities depending on the specific position. But in general, problem-solving, critical thinking and comprehension and communication skills, both oral and written, are prerequisite requirements.



Source: O*NET; Analysis by Beacon Economics

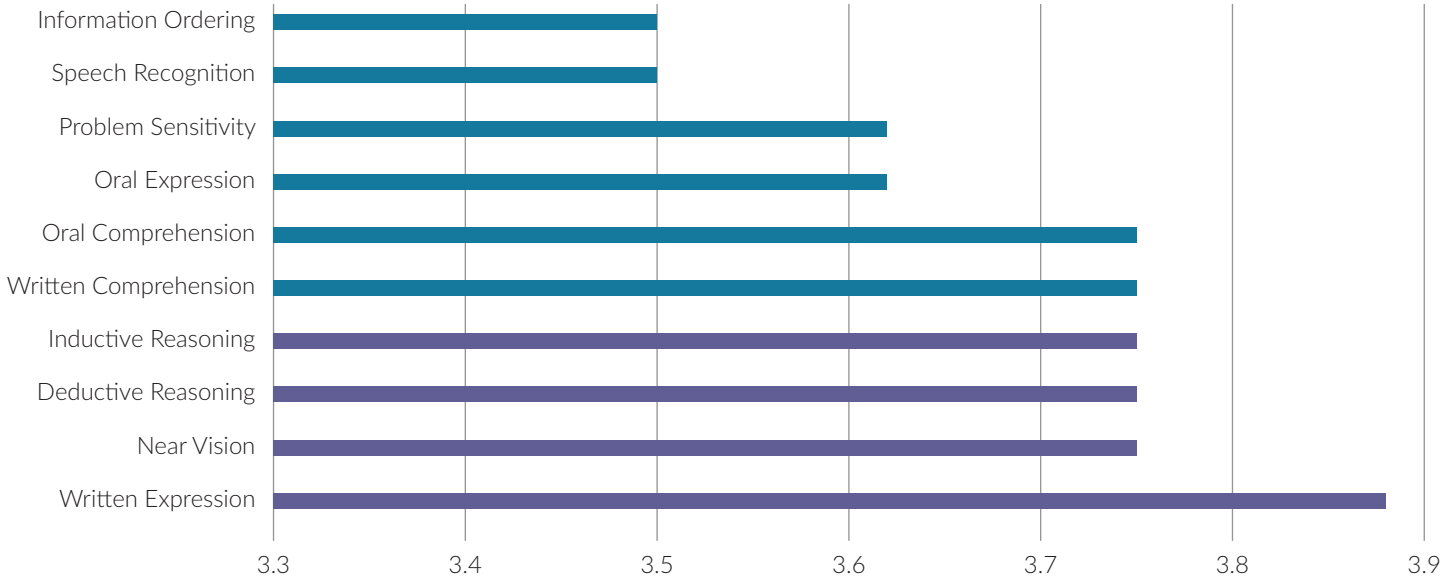
OPPORTUNITY OCCUPATIONS (1-6)

TARGET OCCUPATION 6: Computer Occupations, All Other

ABILITIES

The highest rated abilities for Computer Occupations (All Other) include written expression (essential for writing reports and general communication), near vision, and problem solving derived from inductive and deductive reasoning.

NATIONAL: Computer Occupations, All Other, Highest Rated Abilities (Scale of 1-5)



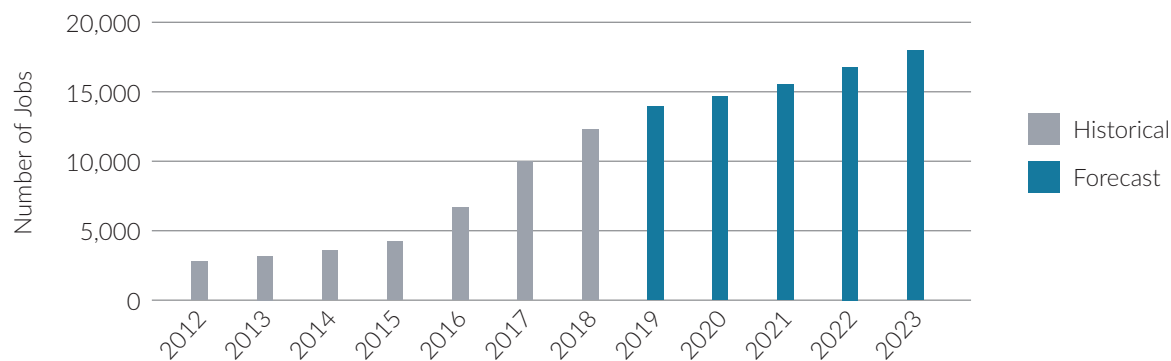
Source: O*NET; Analysis by Beacon Economics

FORECAST: Computer Occupations, All Other

Computer Occupations (All Other) is something of a catch-all group, encompassing a variety of computer-related occupations that are not classified elsewhere. As employment in this occupation grows, it is very likely that occupations such as Database Architects and Document Management Specialists will be reclassified as a separate group. Employment growth in Computer Occupations (All Other) has been robust in the County of Los Angeles, with the number of jobs more than doubling between 2012 and 2017. Job growth in this grouping has also outdistanced the national trend, which grew 70% in the same period compared to 259.9% at the county level. Keep in mind

that the county-level base was relatively low to begin with, which lends itself to higher rates of growth. Overall, Beacon Economics remain optimistic for growth in this occupation, as digitization and data abundance fuel demand for more computer occupations. Beacon Economics projects that employment growth will average 2% on a yearly basis in the next five years, slightly above projections from the California EDD (for reasons explained in a prior footnote). At the county level, this occupation is the fastest growing, but within Health Departments it represents a negligible amount of budgeted positions and there are no vacancies at the time of writing.

PROJECTIONS: Computer Occupations, All Other, LA County Region, 2012 to 2023



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 7: Pharmacy Aides

7

Pharmacy Aides

SOC CODE 31-9095

DEPARTMENTAL EXPOSURE

- Department of Health Services (DHS): 100%

All positions for pharmacy aides are found in the Department of Health Services (DHS).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	2,560
Employment Growth 2012-2017	4.5%
Wages	\$31,510
Wages Growth 2012-2017	44.1%

L. A. HEALTH DEPARTMENTS

Budgeted Positions 2019	31
Growth in Budgeted Positions 2014-2019	-13.9%

Illustrative Classification Examples

Pharmacy Helper

EMPLOYMENT

Pharmacy Aides constitute a small number of employees in the L.A. County Health Departments, with 28 out of 31 budgeted positions filled, all of which pertain to the Department of Health Services. The County of Los Angeles as a whole employs 2,560 Pharmacy Aides. Both the L.A. County Health Departments and the County of Los Angeles have a small share of Pharmacy Aides to total extender occupations – 0.1% and 0.3% respectively. This small share is reflected in statewide figures, with 0.3% of total extender occupations in California being Pharmacy Aides.

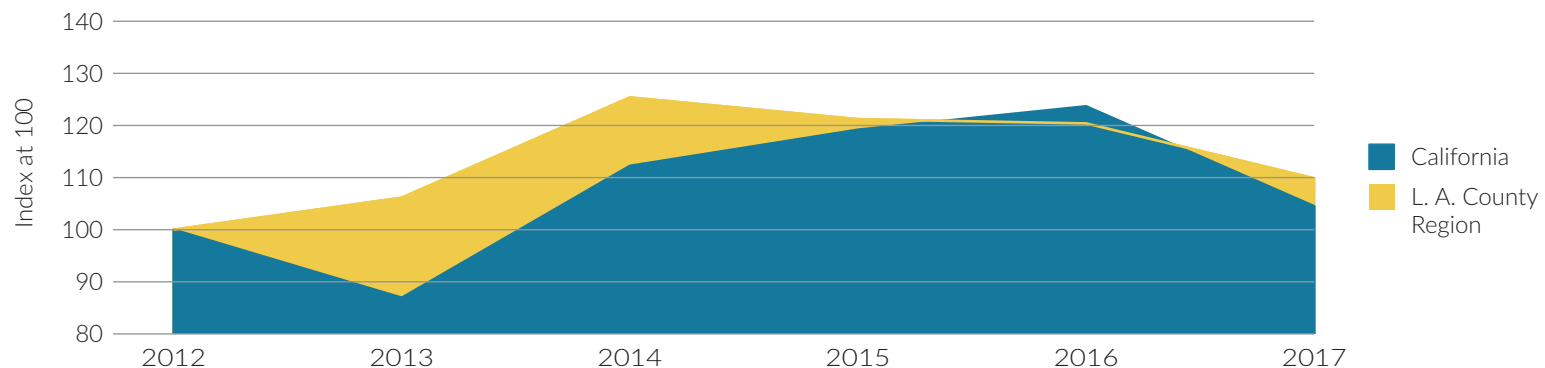
Figures for the L.A. County Health Departments reflect the demand for Pharmacy Aides in both the county and the state.

At 4.5%, employment growth for Pharmacy Aides was positive between 2012 and 2017, with the total number of workers in the County of Los Angeles growing from 2,450 to 2,560. However, California's growth in Pharmacy Aides has outpaced

the County of Los Angeles' by a significant margin, with the statewide growth at 9.8% between 2012 and 2017, as the number of workers increased from 8,630 to 9,480. The County of Los Angeles' growth had been strong between 2013 and 2016, before a steep decline between 2016 and 2017, during which almost 500 employees were lost. This decline in Pharmacy Aide employees is not unique to the County of Los Angeles. California experienced a drop in the same period, albeit not as steep.

Department of Human Resources projections indicate that 29.4% of current Pharmacy Aide positions are likely to retire in less than three years. Furthermore, 11.8% of workers are expected to retire within three to five years. Therefore, according to the current budgeted positions, nine individuals are expected to retire within the next three years, and four are expected to retire within five years. Between the latest available data and five-year projection the 31 budgeted positions are expected to see a total of 14 retirements, or more than 40% of total budgeted Pharmacy Aide positions.

EMPLOYMENT, Pharmacy Aides, 2012–2017



Source: Bureau of Labor Statistics; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

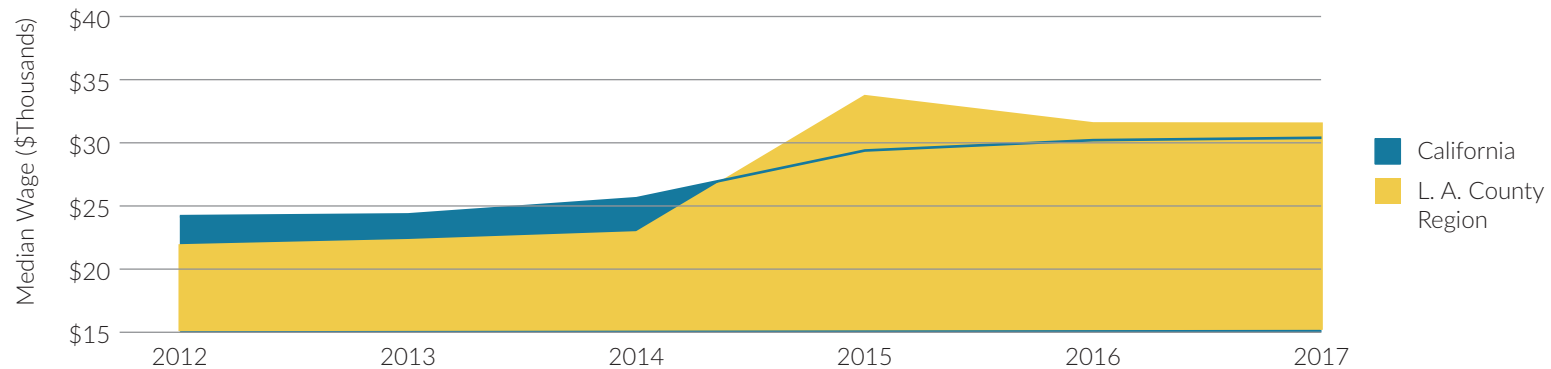
TARGET OCCUPATION 7: Pharmacy Aides

WAGES

Median wages for Pharmacy Aides in the County of Los Angeles rose up by 44.1% between 2012 and 2017, increasing from \$21,870 to \$31,510. L.A. This is slightly higher than the California median wage of \$30,400. Furthermore, statewide wage growth has been slower than the County of Los Angeles'; between 2012 and 2017, California saw an increase of 25.7%. While wages over a five-year period have been strong, they slowed down slightly between 2015 and 2017 and have lagged significantly since the strong spike in median wages for the County of Los Angeles Pharmacy Aides in 2014.



MEDIAN WAGE: Pharmacy Aides, 2012-2017

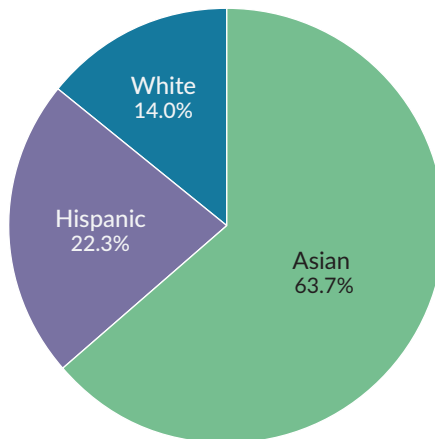


Source: Bureau of Labor Statistics; Analysis by Beacon Economics

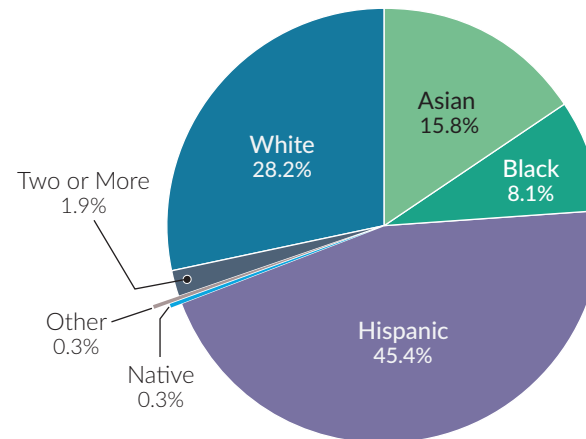
DEMOGRAPHICS: Ethnic/Racial Composition

The racial and ethnic composition of the County of Los Angeles as a whole is not reflected in the breakdown of Pharmacy Aides. The overwhelming majority of Pharmacy Aide workers in the County of L.A (63.7%) are Asian. By comparison, 45% of workers in the County of Los Angeles are Hispanic (the largest group) and 28.2% are White (the second largest). Only 22.3% of Pharmacy Aide workers in the County of Los Angeles are Hispanic, while 14.0% are White.

**L.A. COUNTY REGION: Pharmacy Aides,
Ethnic/Racial Composition, 2017**



**L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017**



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 7: Pharmacy Aides

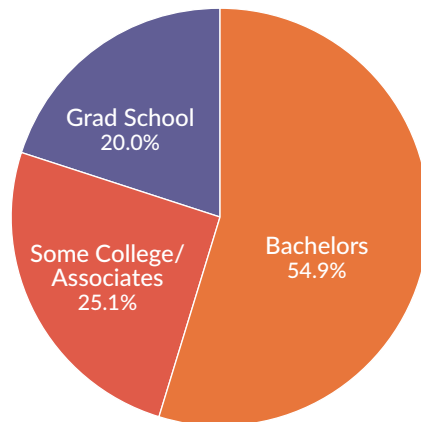
DEMOGRAPHICS: Educational Attainment

Educational requirements for Pharmacy Aides indicate a preference for more educated individuals, with 54.9% having a bachelor's degree and 20% a graduate degree. The remaining 25.2% have some college education or an associate degree.

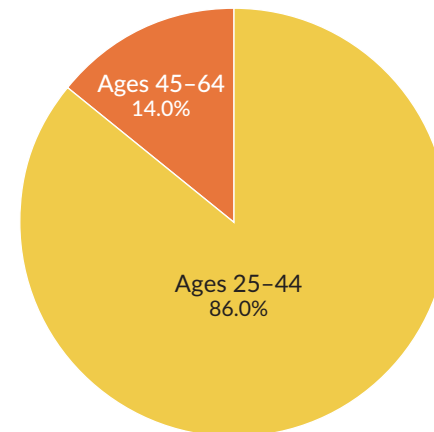
DEMOGRAPHICS: Age Breakdown

The age range for Pharmacy Aide workers in the County of Los Angeles falls into two categories: 25 to 44 and 45 to 64. The majority (86%) are 25 to 44. Workers between the age of 45 and 64 comprise 14% of Pharmacy Aide workers, and are likely to be a part of the higher projected retirement rate for the occupation.

L.A. COUNTY REGION: Pharmacy Aides,
Educational Attainment, 2017



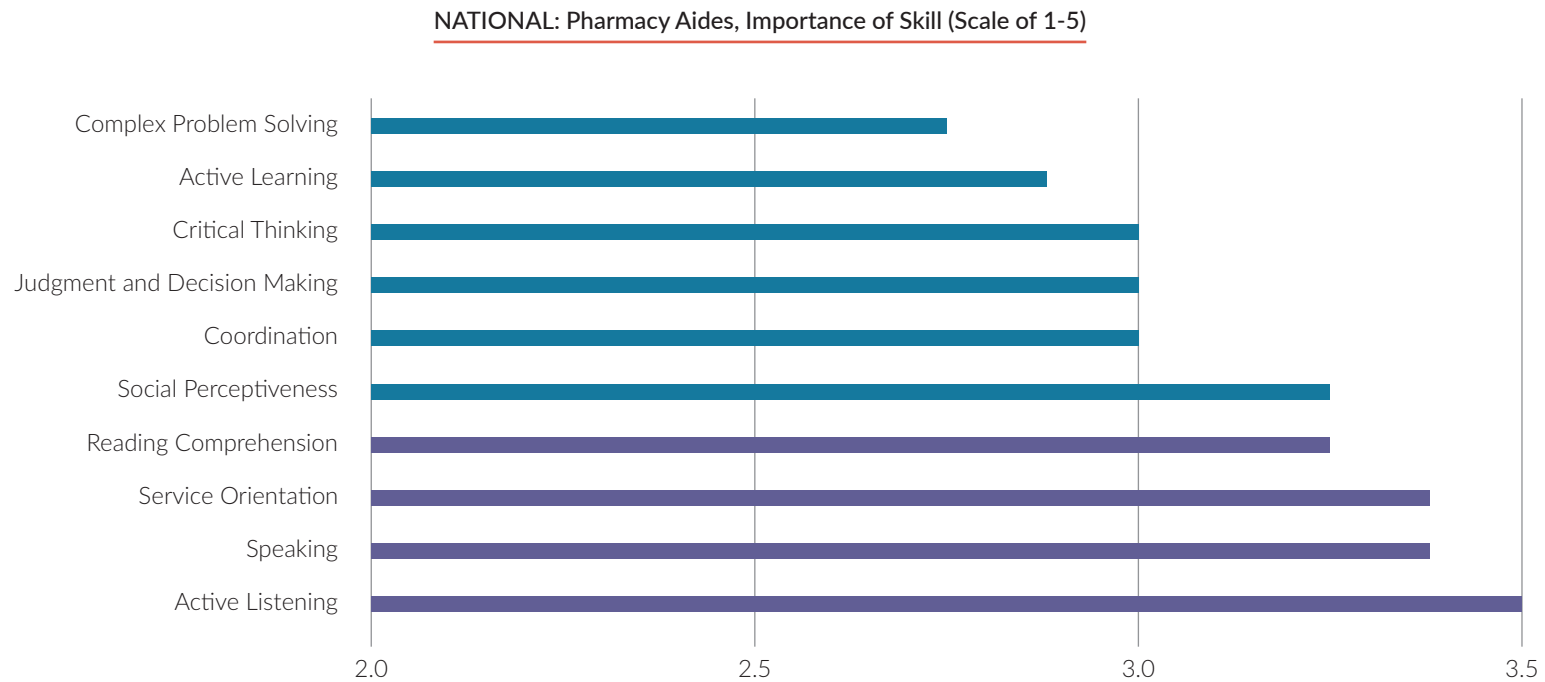
L.A. COUNTY REGION: Pharmacy Aides,
Age Distribution, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

With a job that involves customer assistance, accepting prescriptions and collecting information, skills in service, listening and communication top the list of requirements for Pharmacy Aides. Given the demands of face-to-face interaction with customers, and the necessity to understand and react to patients' needs, social perceptiveness also ranks highly.



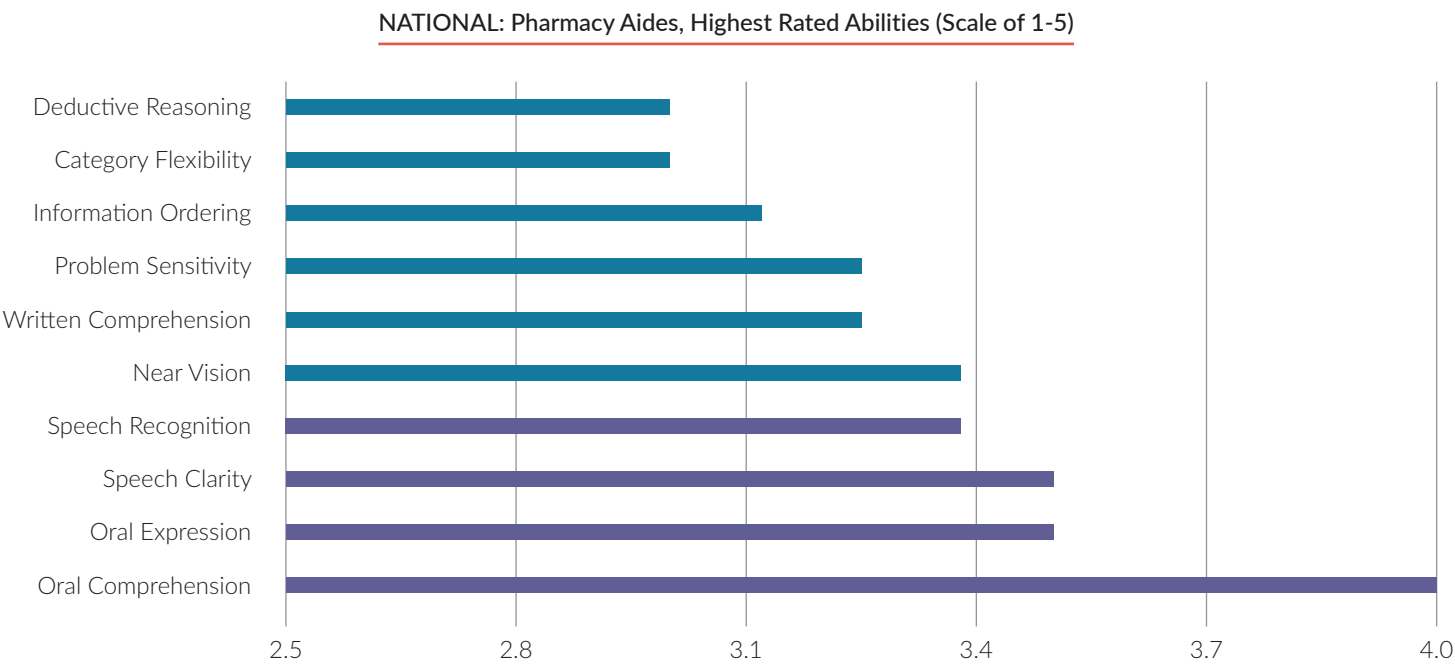
Source: O*NET; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 7: Pharmacy Aides

ABILITIES

As before, due to the amount of customer and client interaction, communication is a key skill for Pharmacy Aides. This directly correlates with the highest rated abilities for the job, which ranks oral comprehension and expression as the two most desirable abilities for Pharmacy Aides

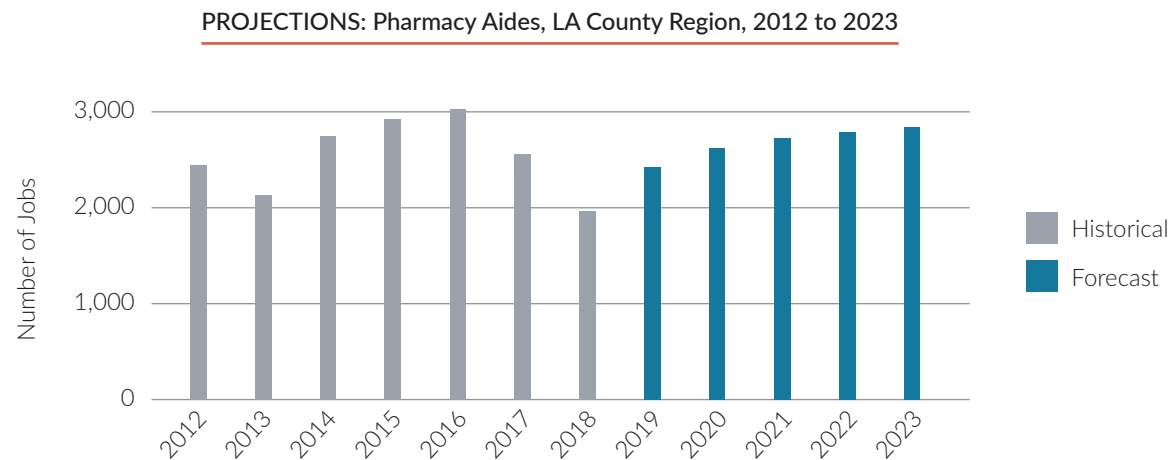


Source: O*NET; Analysis by Beacon Economics

FORECAST: Pharmacy Aides

Pharmacy Aide (not to be confused with Pharmacy Technician) employment has been somewhat mixed in terms of growth. Overall employment in the County of Los Angeles has dropped for three consecutive years, but this is likely the result of a resignation of subsets within the profession into the SOC code for Pharmacy Technicians because trends in each industry move in opposite directions.⁴ With the data discrepancy in mind, Beacon Economics have reason to believe that the industry will continue to post solid gains. The

aggregation of Pharmacy Aides and Pharmacy Technicians has been on the upswing, and although there is a potential for automation within the field, our current forecast predicts a moderate rate of growth. And while the industry is not large in terms of budgeted positions within the L.A. County Health Departments, it does have the highest percentage of current positions that are projected to become vacant amongst our target support and extender occupations and therefore deserves attention in the coming years.



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

⁴ Although Beacon Economics have not been able to verify in the OES changes documentation, Beacon Economics suspect this could be nothing more than a coding error because of the structural break in both series.

8

Mental Health Counselors

SOC CODE 21-1014

DEPARTMENTAL EXPOSURE

- Department of Health Services (DHS): 10.6%
- Department of Mental Health (DMH): 89.4%

Mental Health Counselors in the County of L.A. are employed predominantly in the Department of Mental Health (DMH), with a small number in the Department of Health Services (DHS).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	5,420
Employment Growth 2012-2017	128.5%
Wages	\$45,320
Wages Growth 2012-2017	10.2%

L. A. HEALTH DEPARTMENTS

Budgeted Positions 2019	207
Growth in Budgeted Positions 2014-2019	-49.3%

Illustrative Classification Examples

- Mental Health Counselor, R.N.
- Mental Health Services Coordinator, I-II

EMPLOYMENT

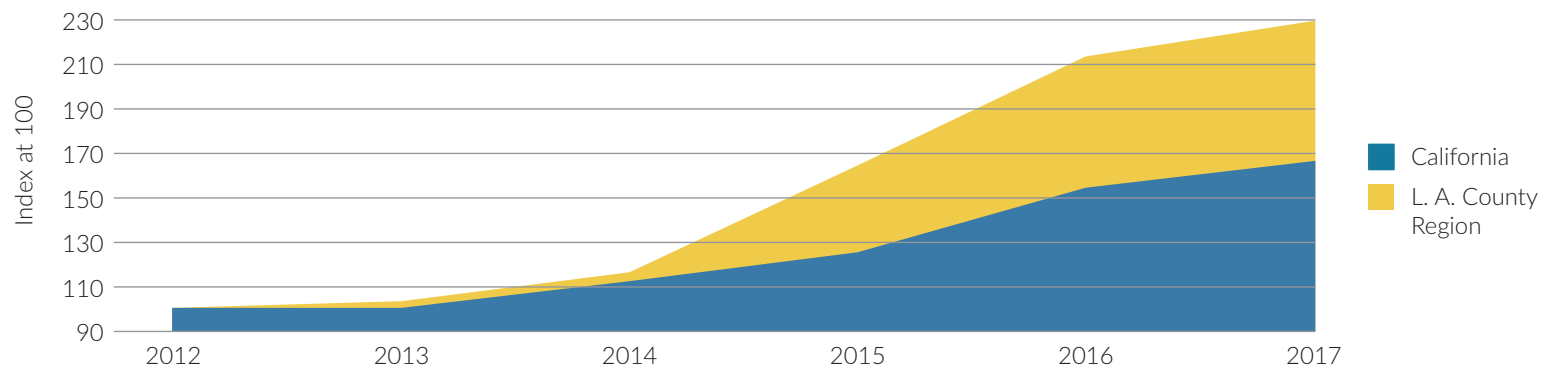
Of the 207 budgeted positions for Mental Health Counselors in the L.A. County Health Departments, 187 are filled. Of these, 185 are within the Department of Mental Health (DMH) with the remainder at the Department of Health Services (DHS).

The County of Los Angeles overall employs 5,420 Mental Health Counselors in a variety of industries. The share of Mental Health Counselors to total support and extender occupations in the L.A. County Health Departments is roughly 0.8%, just above the County of Los Angeles' share of 0.5%. While the share of Mental Health Counselors is not significant to the total number of occupations in the L.A. County Health Departments overall, the occupation is more notable interdepartmentally, specifically for the Department of Mental Health (DMH). Mental Health Counselors comprise 12.8% of the Department of Mental Health – one of the largest occupational shares within the department itself.

Mental Health Counselor is an occupation unique to the Departments of Health Services and Mental Health. However, the share of positions in the DMH is considerably higher than both the L.A. County Health Departments overall and the County of Los Angeles.

Mental Health Counselors in the County of Los Angeles rose 128.5% between 2012 and 2017. Employment has gone from 2,370 in 2012 to 5,420 in 2017. This trend has been consistent statewide, but not at the same pace. California's employment for Mental Health Counselors increased by 65.7% between 2012 and 2017, reaching a total of 16,490 workers. A large part of this increase is due to recent expansions in mental health care, as well as existing issues in the County of Los Angeles such as homelessness, a field in which Mental Health Counselors are heavily involved.

EMPLOYMENT, Mental Health Counselors, 2012-2017



Source: Bureau of Labor Statistics; Analysis by Beacon Economics

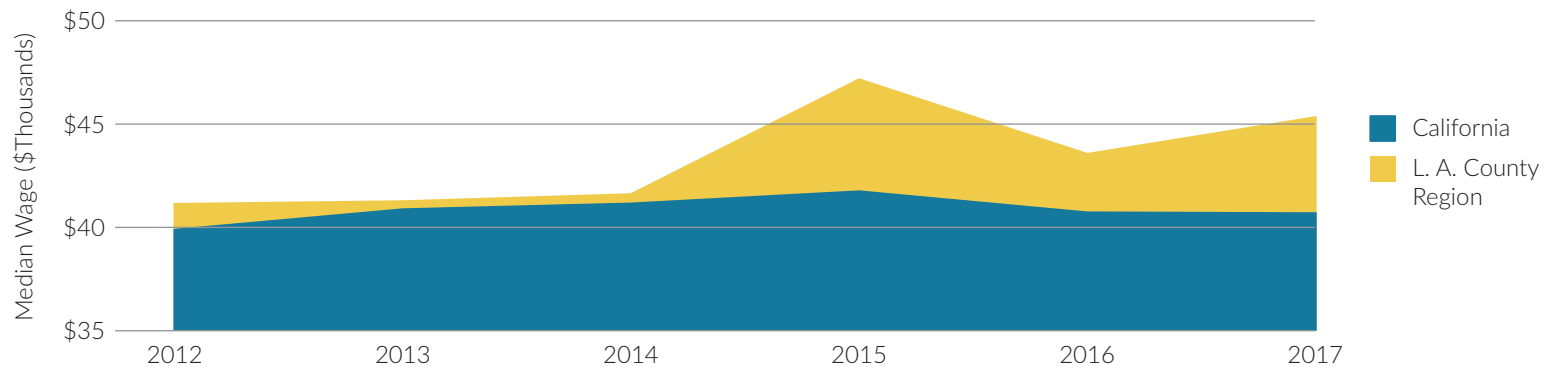
OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 8: Mental Health Counselors

WAGES

Median wages have increased steadily over the County of Los Angeles for Mental Health Counselors and outpaced California's median wage growth. Between 2012 and 2017, the County of Los Angeles' median wage for Mental Health Counselors grew by 10.2%, compared to California's 2.0% growth. The County of Los Angeles' median wage remained higher than California's in 2017 – \$45,320 compared to \$40,670. The increase in median wages coinciding with employment gains indicates high demand for Mental Health Counselors, specifically in the County of Los Angeles.

MEDIAN WAGE: Mental Health Counselors, 2012-2017



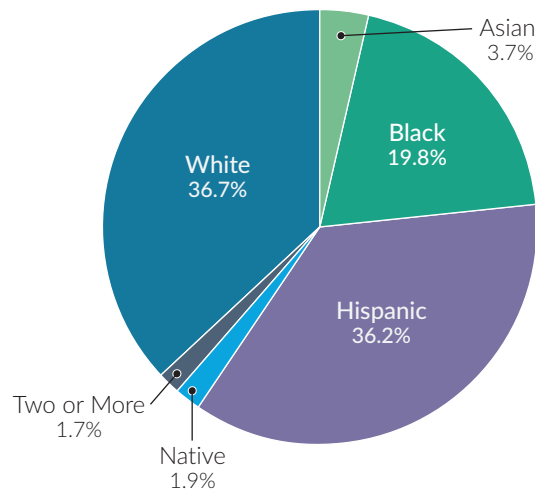
Source: Bureau of Labor Statistics; Analysis by Beacon Economics

DEMOGRAPHICS: Ethnic/Racial Composition

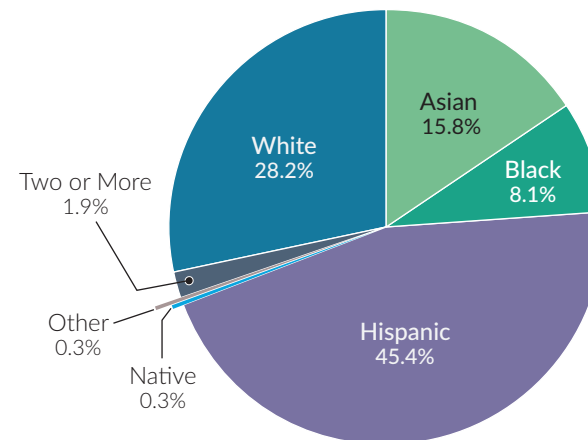
The racial and ethnic composition for Mental Health Counselors shares some similarities with those of County of Los Angeles employees overall (employed individuals aged 16 and over). White individuals make up 36.7% of Mental Health Counselors, while the share of White workers in the total employed population is roughly 28.2%. Hispanics comprise the

second largest group of Mental Health Counselors at 36.2% (at 45%, Hispanics are the largest group within the County of Los Angeles' working population). Black individuals comprise over 19% of Mental Health Counselors, a significant number when compared to the share of Black workers in the County of Los Angeles (8.1%).

L.A. COUNTY REGION: Mental Health Counselors,
Ethnic/Racial Composition, 2017



L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 8: Mental Health Counselors

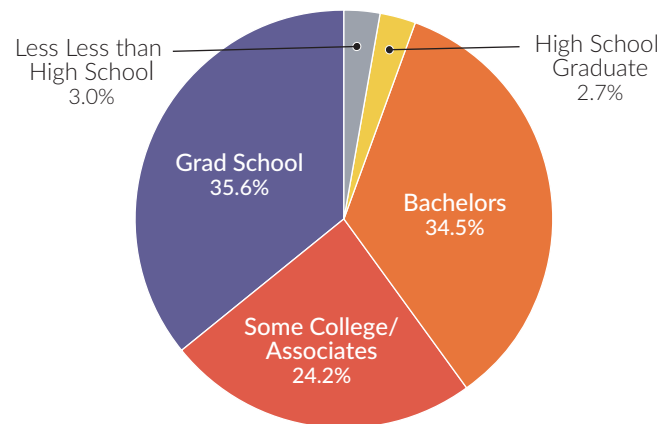
DEMOGRAPHICS: Educational Attainment

Graduate degree holders account for the largest share of Mental Health Counselors at 35.6%, followed closely by those with a bachelor's degree (34.5%). Mental Health Counselors with some form of college education or an associate degree comprise the third largest group (24.2%), while those with a high school diploma or less are a small minority at 5.7%.

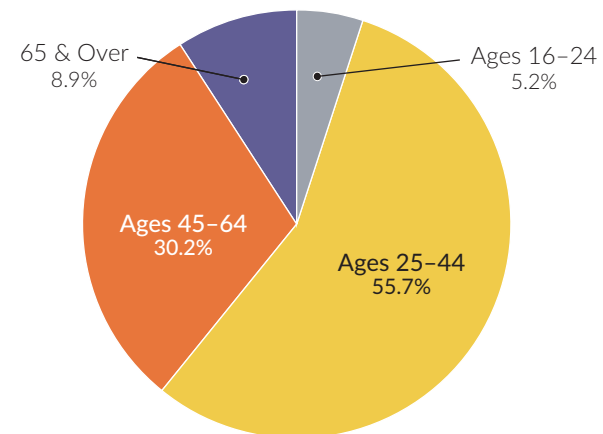
DEMOGRAPHICS: Age Breakdown

The age of Mental Health Counselors spans a wide range in the County of Los Angeles. The majority (55.7%) are in the 25 to 44 bracket, while 30.1% are 45 to 64 and 8.9% are 65 and older. This highlights the retirement projections for the occupation. The Department of Human Resources indicates that roughly 16.1% of Mental Health Counselors are projected to retire within three years or less.

L.A. COUNTY REGION: Mental Health Counselors,
Educational Attainment, 2017



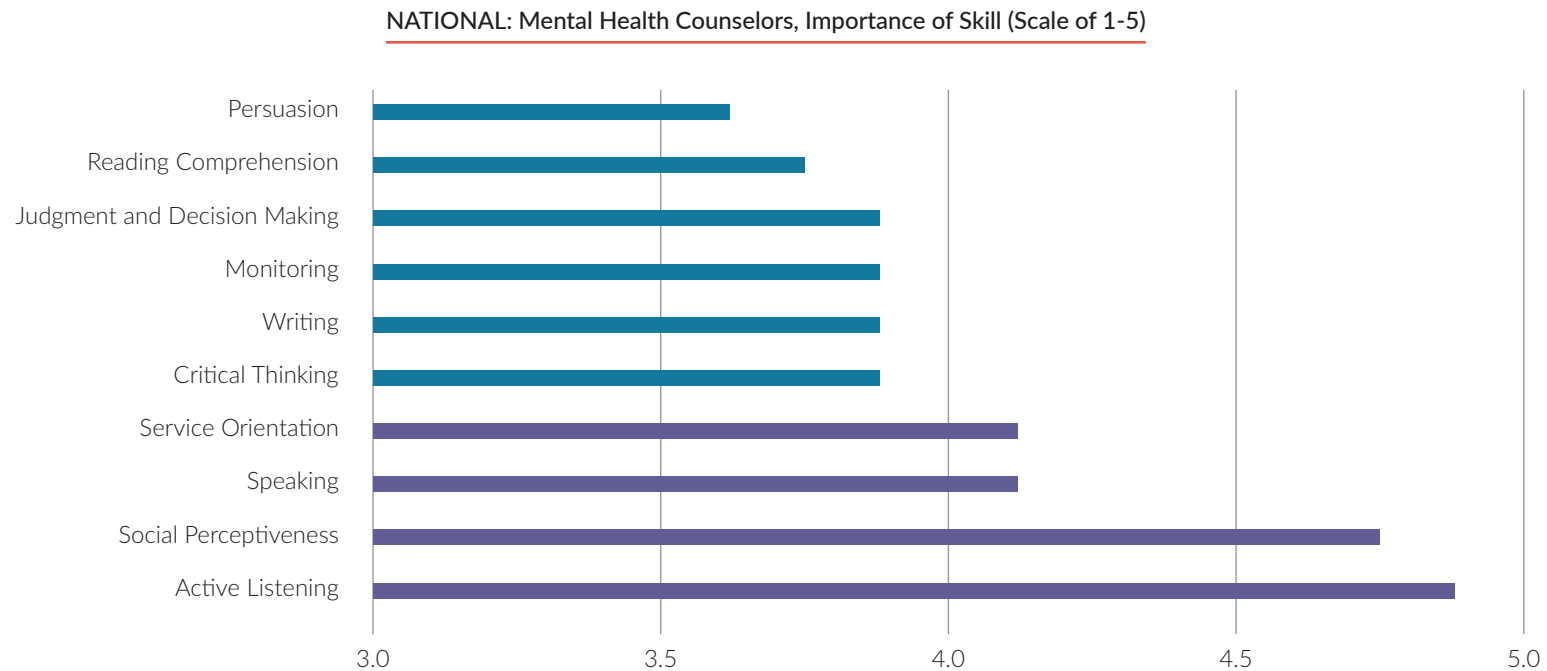
L.A. COUNTY REGION: Mental Health Counselors,
Age Distribution, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

From interacting with often troubled clients to offering support on mental and emotional health, Mental Health Counselors have a wide variety of responsibilities. As such, it is vital for a Mental Health Counselor to have highly developed skills in communication and social awareness, abetted by strong critical thinking, service orientation and decision-making.



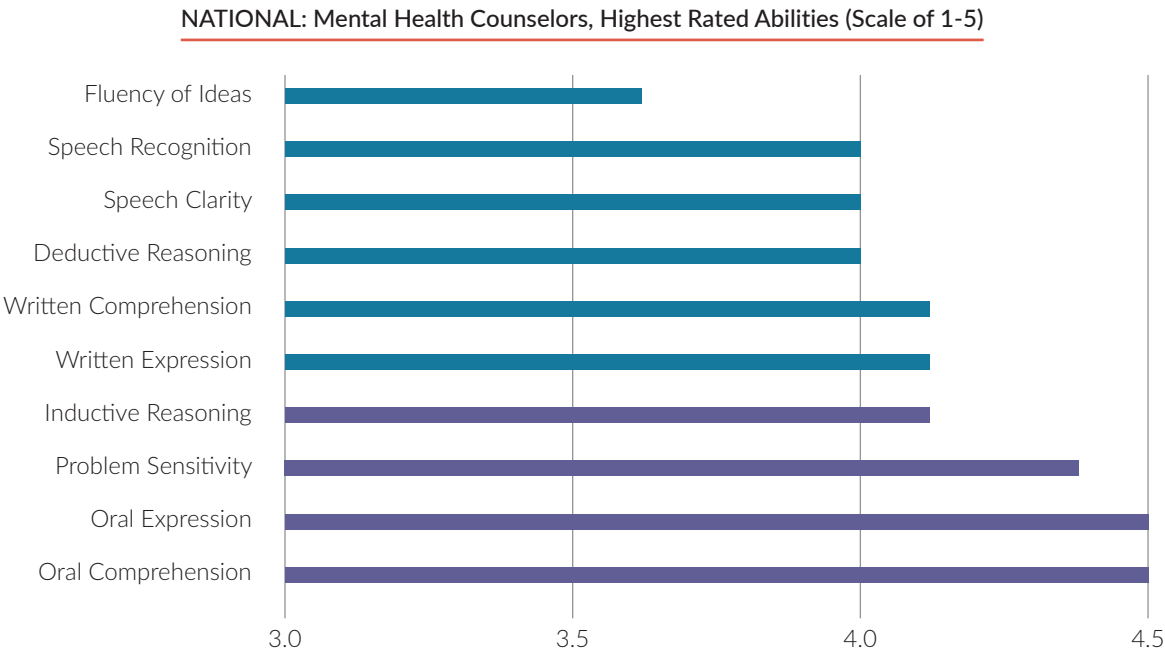
Source: O*NET; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 8: Mental Health Counselors

ABILITIES

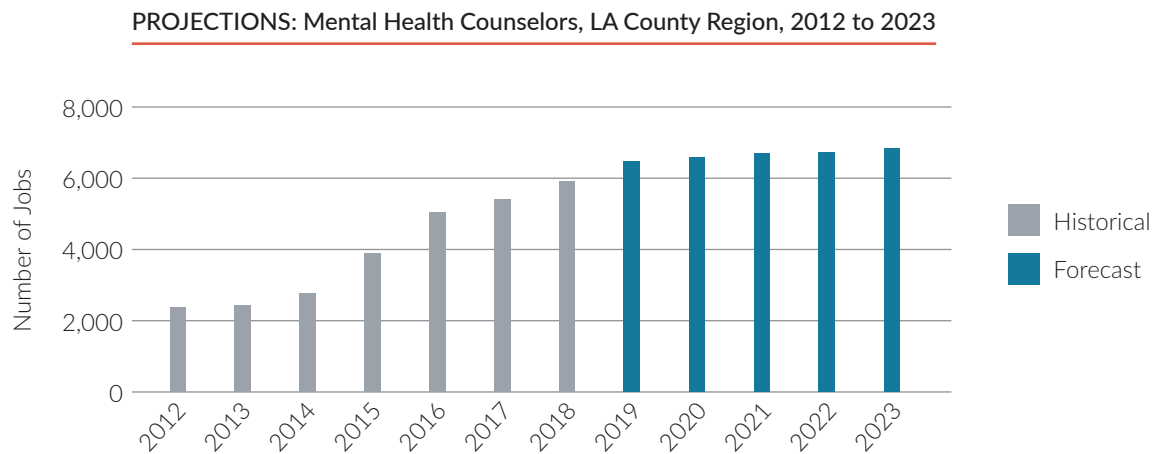
Given the demands of effective interaction between counselor and patient, the highest rated abilities for Mental Health Counselors are oral communication and problem sensitivity. Problem assessment and inductive reasoning are also vital in analyzing patients' needs and developing strategies to address them.



Source: O*NET; Analysis by Beacon Economics

FORECAST: Mental Health Counselors

The outlook for Mental Health Counselors remains bright. There has been a steady acceleration in employment in this industry and that bodes well from a purely statistical standpoint, assuming past trends provide an insight to the future. More important is local policy and public awareness. Despite efforts to reduce overall homelessness counts, the most recent census of homelessness in the County of Los Angeles showed a surprising uptick.



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

9

Psychiatric Technicians

SOC CODE 29-2053

DEPARTMENTAL EXPOSURE

- Department of Mental Health (DMH): 100%

Psychiatric Technicians in the L.A County Health Departments are all employed by the Department of Mental Health (DMH).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	1,130
Employment Growth 2012-2017	-36.9%
Wages	\$55,790
Wages Growth 2012-2017	12.2%

L. A. HEALTH DEPARTMENTS

Budgeted Positions 2019	76
Growth in Budgeted Positions 2014-2019	-26.2%

Illustrative Classification Examples

Psychiatric Technician, II-III

EMPLOYMENT

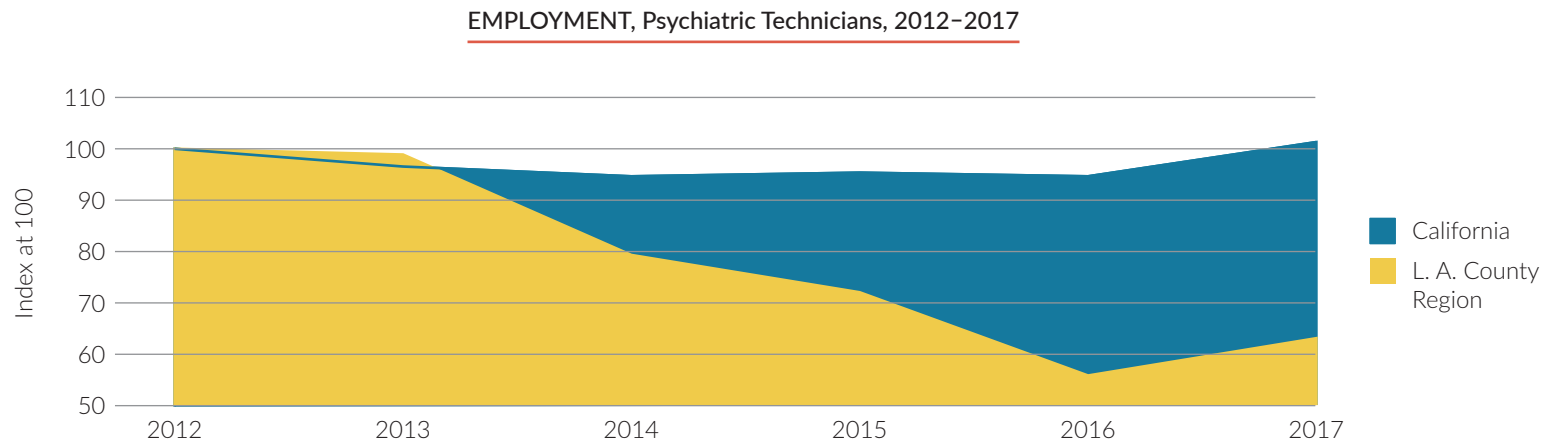
With 68 of 76 budgeted positions filled, Psychiatric Technician is one of few occupations in the L.A. County Health Departments that exists entirely within the Department of Mental Health. The County of Los Angeles employs 1,130 Psychiatric Technicians, indicating that the Department of Mental Health accounts for roughly 6.7% of them. The shares of Psychiatric Technicians to total extender occupations, however, lie low among the L.A. County Health Departments, the County of Los Angeles and statewide figures. For the L.A. County Health Departments and the County of Los Angeles, the shares of Psychiatric Technicians to extender occupations is 0.3% and 0.1% respectively, while California's share is roughly 0.2%. However, for the Department of Mental Health there is a higher presence Psychiatric Technicians, who account for 4.7% of extender occupations.

Psychiatric Technicians are employed by the Department of Mental Health, where the department accounts for a larger share of total extender occupations when compared to the L.A. County

Health Departments, the County of Los Angeles and California.

The employment trend for Psychiatric Technicians was in decline between 2012 and 2017 for the County of L.A., while employment stagnated across the state. The number of Psychiatric Technicians in the County of L.A decreased by 36.9% between 2012 and 2017, falling from 1,790 employees to roughly 1,130. In contrast, California's Psychiatric Technicians has increased from 8,400 to 8,510 within the same time period – increasing by 1.3%.

The turnover rate for Psychiatric Technicians is slightly higher than average in the L.A. County Health Departments, which could explain the downwards trend in employment throughout the county. The average turnover rate for the L.A. County Health Departments is roughly 5.5%; the rate for Psychiatric Technicians is 6.6%. This indicates more people leaving the profession than is average for the Health Departments as a whole.



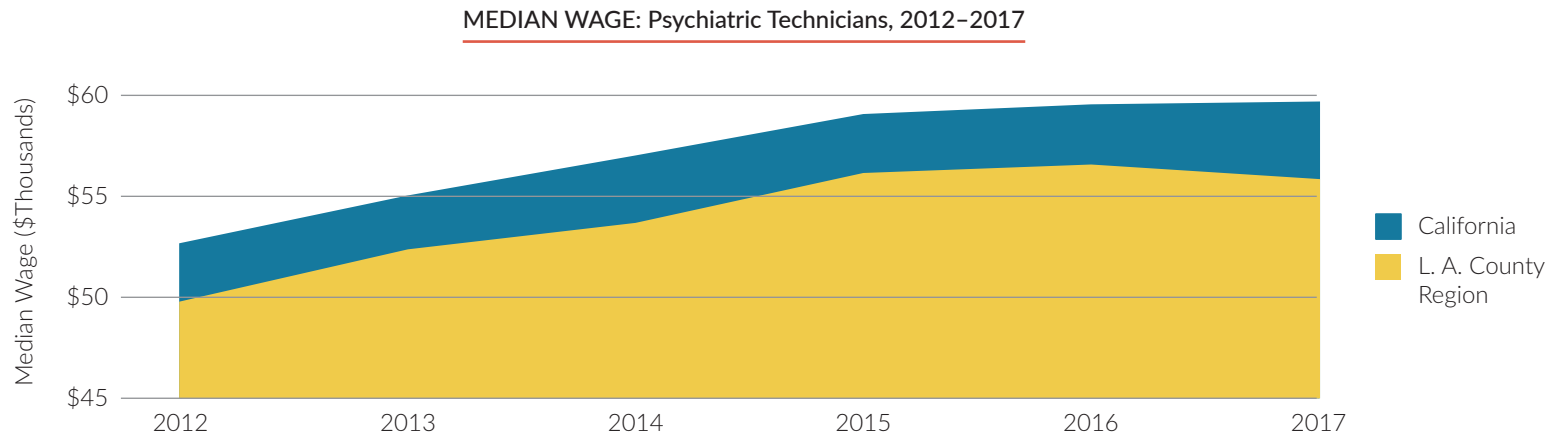
Source: Bureau of Labor Statistics; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 9: Psychiatric Technicians

WAGES

Median wages for Psychiatric Technicians in the County of Los Angeles increased steadily between 2012 and 2017. This may be attributed to employees leaving the field, which tends to drive the median up since higher turnover is generally associated with the lower end of the wage scale. Between 2012 and 2017, median wages for Psychiatric Technicians rose by 12.2% in the County of Los Angeles, slightly below California's 13.3% growth rate. At \$55,790, median wages in the County of Los Angeles remain below the statewide median of \$59,630.

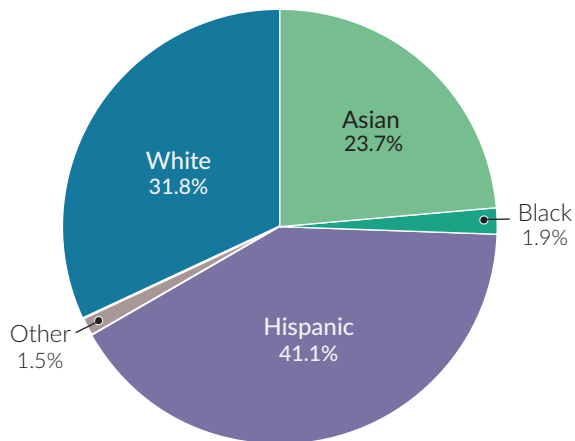


Source: Bureau of Labor Statistics; Analysis by Beacon Economics

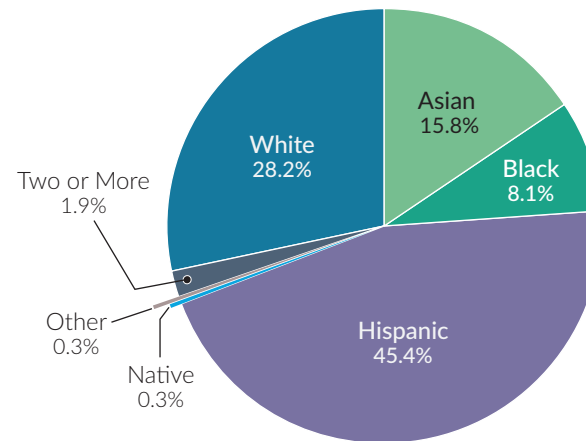
DEMOGRAPHICS: Ethnic/Racial Composition

The ethnic and racial composition for Psychiatric Technicians broadly reflects the ethnic and racial distribution for the County of Los Angeles' employed population. The majority of Psychiatric Technicians in the County of Los Angeles are Hispanic, representing 41% of the occupation. This correlates to the County of Los Angeles' employed population, where Hispanics account for 45% of the workers. 32% of Psychiatric Technicians are White, which reflects the ratio in the County of Los Angeles workforce of 28.2%. Black workers in the County of Los Angeles make up 8.1% of the population, but only account for 1.9% of Psychiatric Technicians.

L.A. COUNTY REGION: Psychiatric Technicians,
Ethnic/Racial Composition, 2017



L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

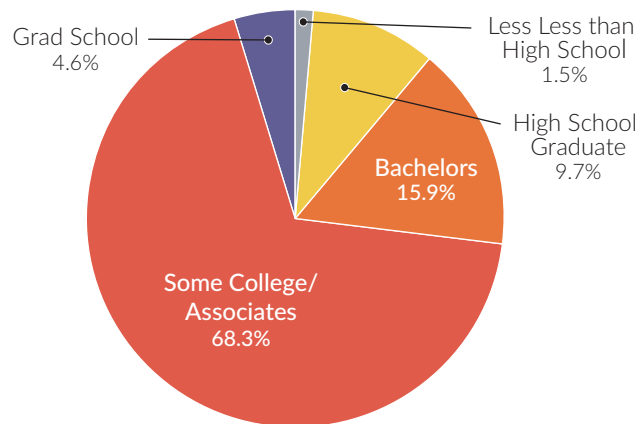
OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 9: Psychiatric Technicians

DEMOGRAPHICS: Educational Attainment

Psychiatric Technicians represent educational achievement at all levels, from high school diploma to graduate degree. That said, most Psychiatric Technicians (68.3%) have at least some college or an associate degree. Bachelor's degree holders are the next largest group (15.9%), followed by those with a high school diploma or less (11.3%). At the opposite end of the scale, graduate degree holders account for 4.6%.

L.A. COUNTY REGION: Psychiatric Technicians,
Educational Attainment, 2017

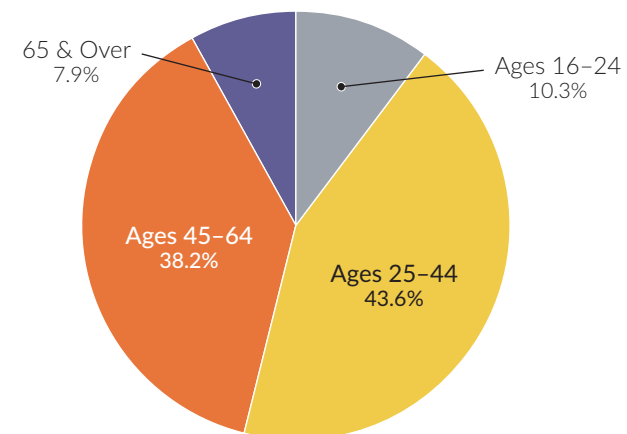


DEMOGRAPHICS: Age Breakdown

Psychiatric Technicians in the County of Los Angeles represent a wide range of age groups. The majority (43.6%) are between 25 and 44 years of age; 38% are between 45 and 64; 10.3% are between 16 and 24; and 7.9% are 65 and over.

Retirement projections are high for Psychiatric Technicians in the L.A. County Health Departments. According to data from the Department of Human Resources, up to 18.6% of Psychiatric Technicians are expected to retire within three years or less.

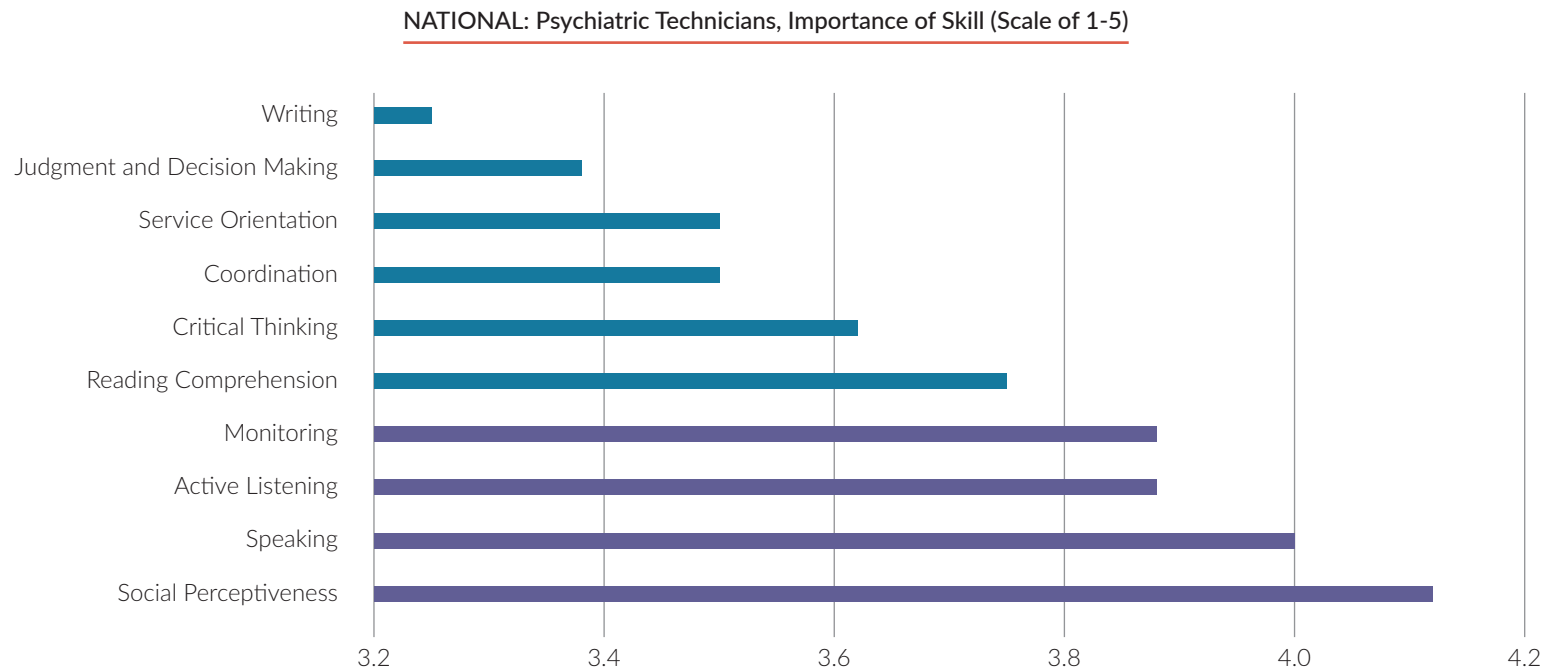
L.A. COUNTY REGION: Psychiatric Technicians,
Age Distribution, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

As well as coordinating with physicians and other health practitioners, Psychiatric Technicians work closely with people who have mental and emotional conditions. As such, it is important for them to be aware of client behavior and reaction, and to relay and receive information effectively. In general, strong communication skills are essential.



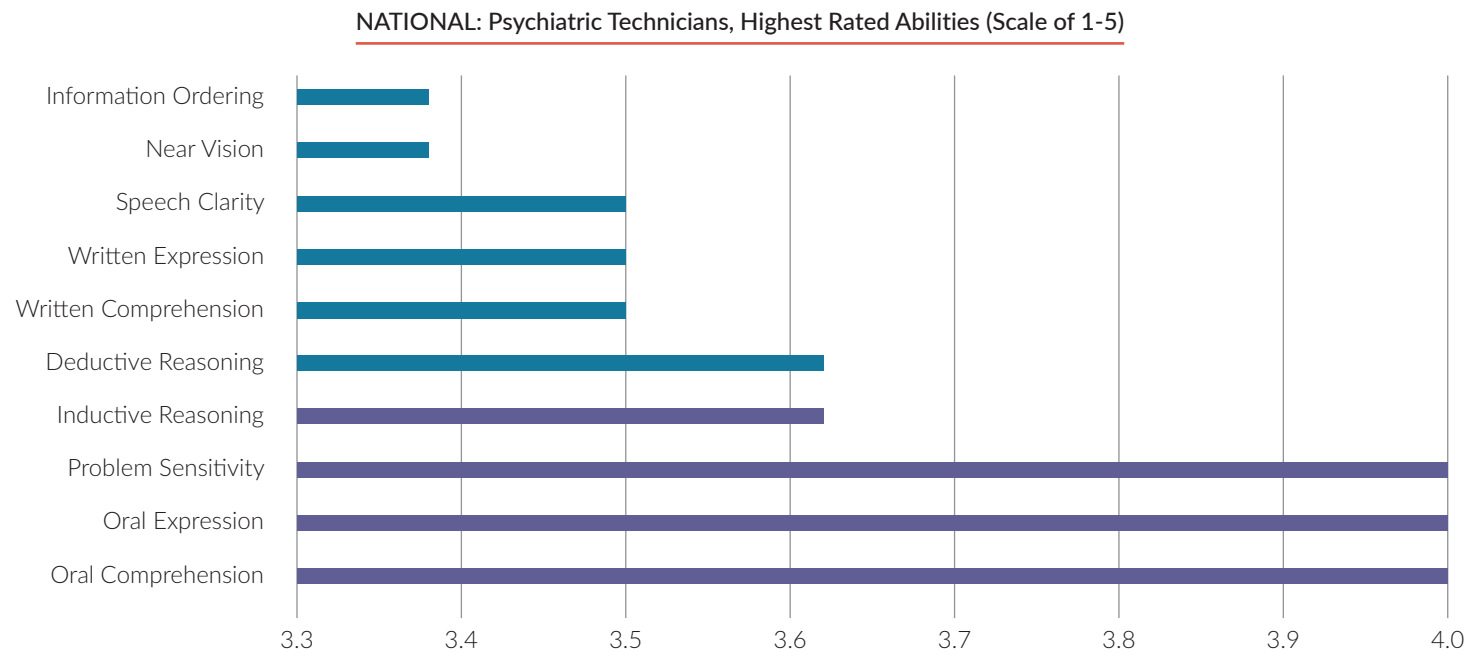
Source: O*NET; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 9: Psychiatric Technicians

ABILITIES

The abilities that a Psychiatric Technician looks to develop rely heavily on oral communication and comprehension – abilities essential to effective interaction with clients and colleagues. Other abilities essential to assessing and addressing patients' needs include inductive and deductive reasoning, problem sensitivity and written comprehension.



Source: O*NET; Analysis by Beacon Economics

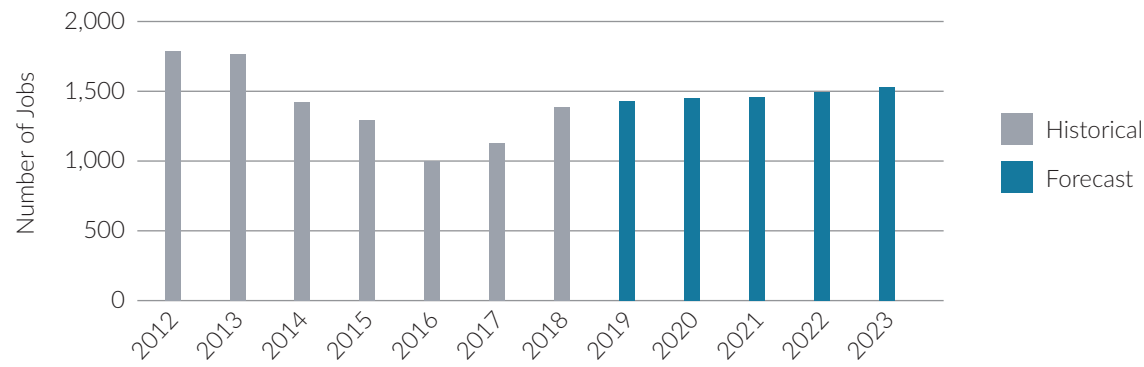
FORECAST: Psychiatric Technicians

Employment for Psychiatric Technicians has been noticeably weak in recent years, as marked by steep declines at the County regional level. From 2012 to 2017, the total number of positions for Psychiatric Technicians in the County Los Angeles declined by nearly 37%. To a far lesser extent, this was also the case at the national level, with employment declining 1.2%. Employment bottomed out in 2016, but according to recent estimates has since turned a corner. Our projections suggest that employment will begin to pick up in the coming years. This is predicated on assumptions detailed in the outlook for Mental Health Counselors.

In general, Beacon Economics is optimistic that mental-health related occupations will grow in the near term, as the recent

homeless counts have attracted a lot of public attention. Housing is just one of the issues attributed to rising homelessness, but mental health issues among the homeless is another concern that Beacon Economics believes will boost funding. Psychiatric Technicians are tasked with caring for people who have mental illness and developmental disabilities, therefore Beacon Economics think employment will pick up as more funds are earmarked to address homelessness. The L.A. County Health Departments has budgeted 76 positions, with eight vacant at the time of writing. The turnover rate for this occupation is above the median for our support and extender occupation list, with nearly one in 10 Psychiatric Technicians predicted to retired within three years.

PROJECTIONS: Psychiatric Technicians, LA County Region, 2012 to 2023



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

10

Community Health Workers

SOC CODE 21-1094

DEPARTMENTAL EXPOSURE

- Department of Health Services (DHS): 50.5%
- Department of Mental Health (DMH): 11.9%
- Department of Public Health (DPH): 37.7%

Community Health Workers are spread across L.A. County Health Departments. The Department of Health Services employs the majority (50.5%), followed by the Department of Public Health (37.7%), and The Department of Mental Health (11.9%).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	1,390
Employment Growth 2012-2017	25.2%
Wages	\$41,600
Wages Growth 2012-2017	13.8%

L. A. HEALTH DEPARTMENTS

Budgeted Positions 2019	329
Growth in Budgeted Positions 2014-2019	-0.9%

Illustrative Classification Examples

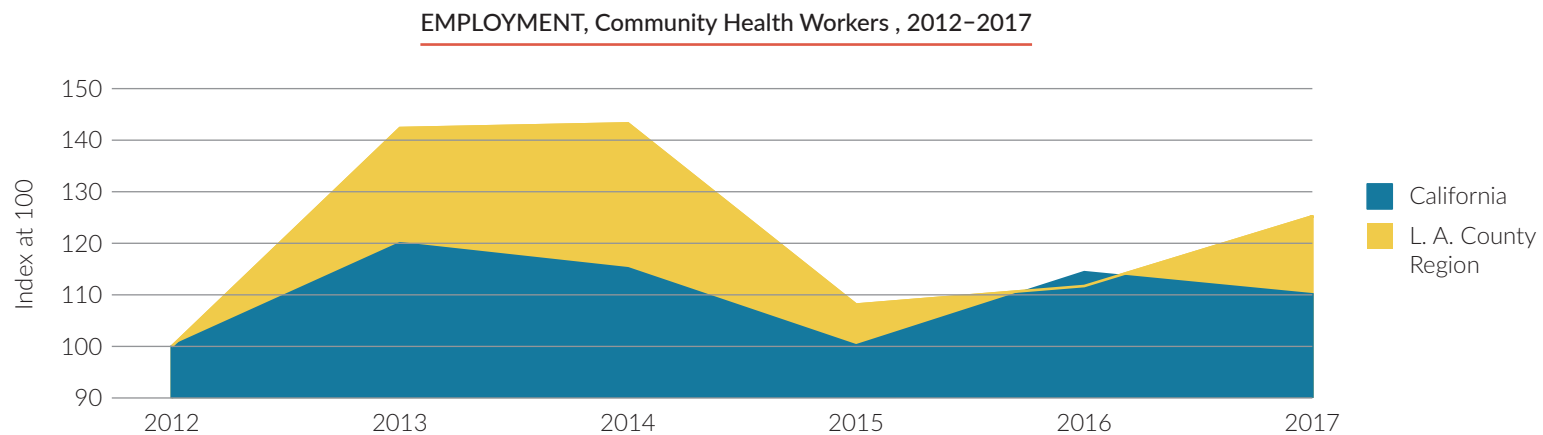
- Community Health Worker
- Senior Community Worker
- Community Services Counselor

EMPLOYMENT

The number of budgeted positions for Community Health Workers in the L.A. County Health Departments reached 329. Of these, 166 were located within the Department of Health Services, 124 in the Department of Public Health, and 39 in the Department of Mental Health. In comparison, the County of Los Angeles as a whole employs 1,390 Community Health Workers in all industries. The share of Community Health Workers to total extender occupations is slightly higher in the L.A. County Health Departments, at 1.3%, as opposed to the County of Los Angeles overall, where the share is 0.1%. The most significant share of Community Health Workers to any of the departments in the L.A. County Health Departments is

the Department of Public Health, where Community Health Workers account for 4.5% of total extender occupations. In contrast, Community Health Workers in the Department of Mental Health make up 2.4% of extender occupations, and in the Department of Health Services the share is significantly lower at 0.8%.

The share of Community Health Workers to the broad extender occupational mix does not influence the L.A. County Health Departments or the County of Los Angeles overall, but are notable to the interdepartmental shares, particularly with the Public Health.



Source: Bureau of Labor Statistics; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

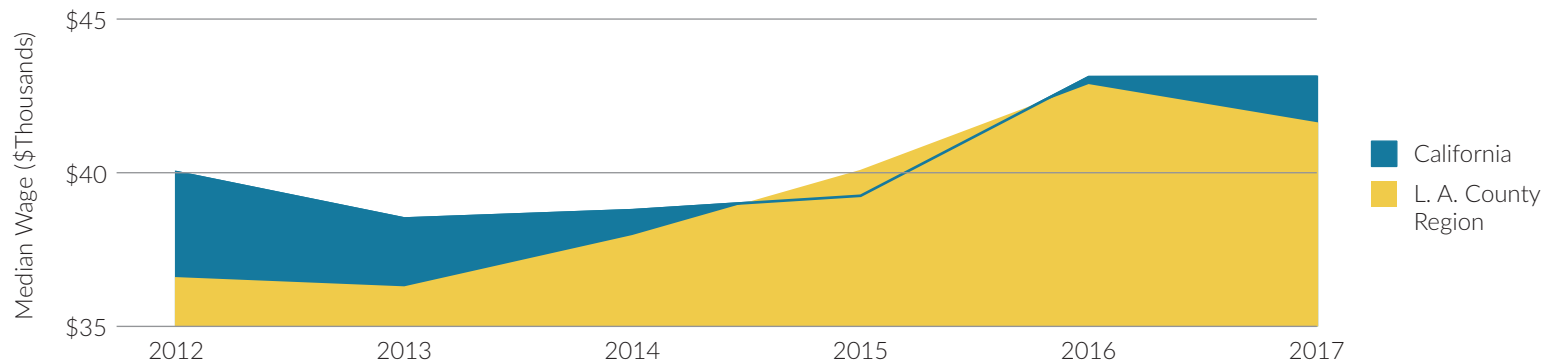
TARGET OCCUPATION 10: Community Health Workers

WAGES

The employment trends may have been volatile for Community Health Workers, but median wage levels been much more consistent. Between 2012 and 2017, wages for Community Health Workers in the County of Los Angeles increased by 13.8% to \$41,600. In contrast, wages have gone up by 7.7% for Community Health Workers in California overall, yet sit slightly above the County of Los Angeles' at \$43,120. While wages saw a consistent rise between 2012 and 2016, they have trended downwards recently in the County of Los Angeles.



MEDIAN WAGE: Community Health Workers , 2012-2017

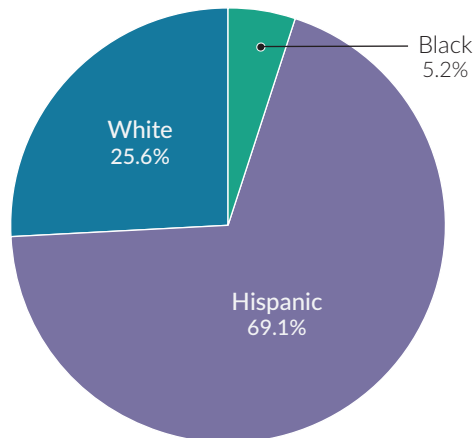


Source: Bureau of Labor Statistics; Analysis by Beacon Economics

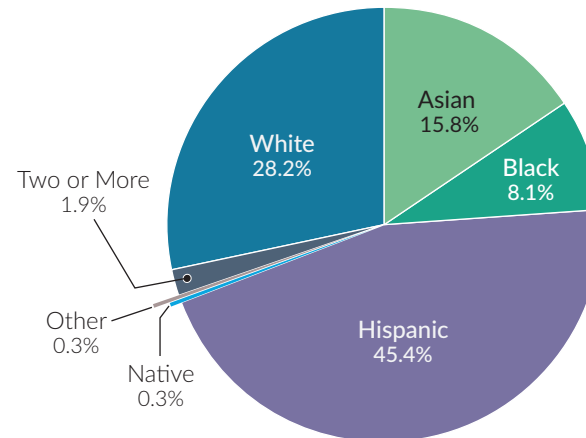
DEMOGRAPHICS: Ethnic/Racial Composition

The ethnic and racial composition of Community Health Workers is broadly similar to that of the County of Los Angeles workforce overall (defined as civilian employed population aged 16 and over). 69.1% of Community Health Workers are Hispanic, compared to 45% of the county workforce; 25.6% are White, compared to 28.2% of the county workforce, while Black employees comprise 5.2% of Community Health Workers, slightly lower than the county workforce share of 8.1%.

**L.A. COUNTY REGION: Community Health Workers ,
Ethnic/Racial Composition, 2017**



**L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017**



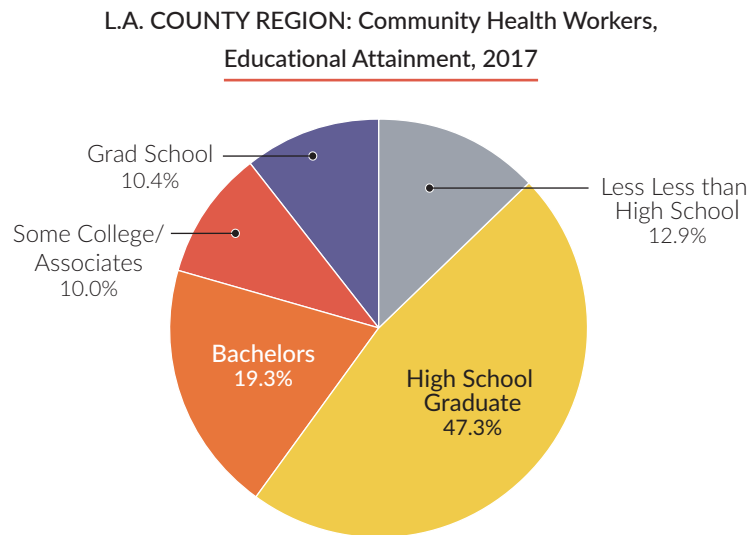
Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 10: Community Health Workers

DEMOGRAPHICS: Educational Attainment

The levels of educational attainment for Community Health Workers range from less than high school diploma (12.9%), to those with less than a high school diploma (12.9%). The majority of Community Health Workers (47.3%) are high school graduates, while a significant portion (19.3%) hold a bachelor's degree.

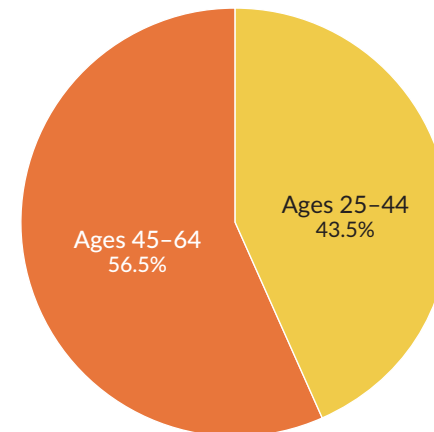


DEMOGRAPHICS: Age Breakdown

The age distribution for Community Health Workers is split into two main groups: 45 to 64, and 25 to 44.

Data from the Department of Human Resources indicate that roughly 9.3% of Community Health Workers are expected to retire within the next three years.

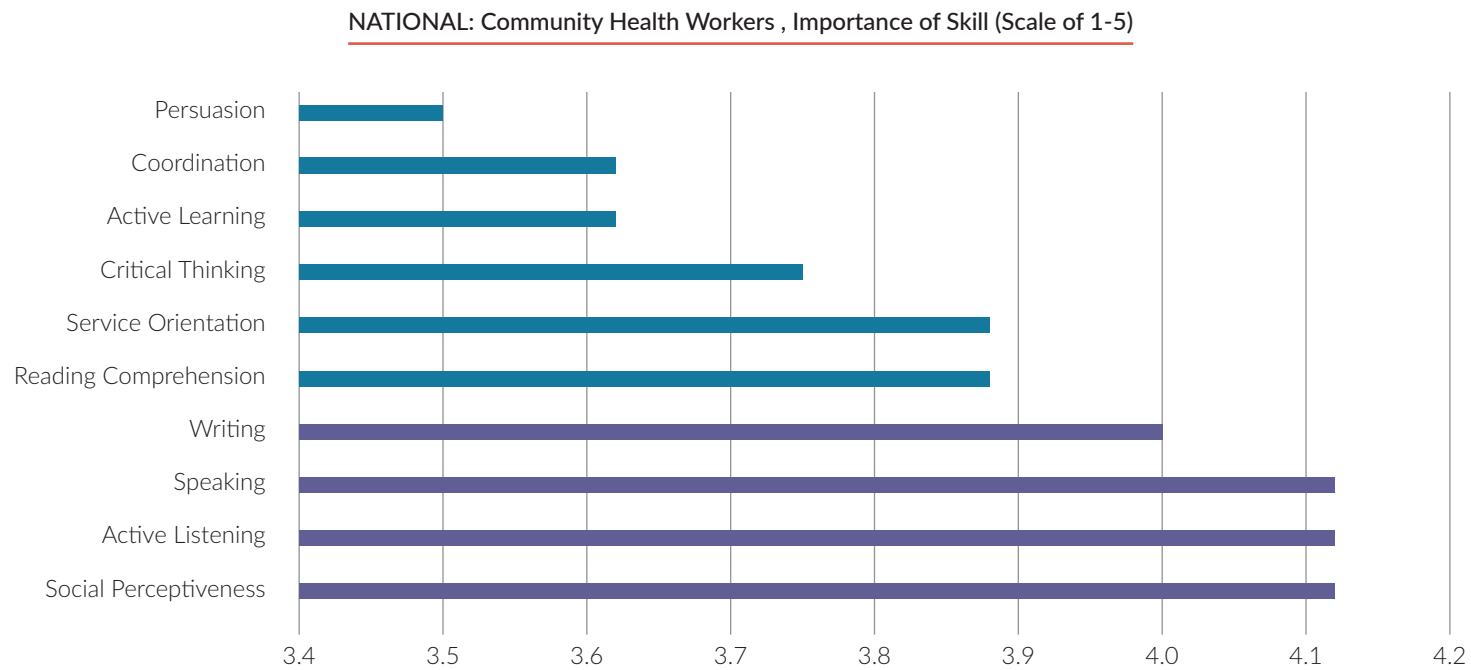
L.A. COUNTY REGION: Community Health Workers,
Age Distribution, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

Community Health Workers rely on direct communication and interaction with the communities they serve and, as such, skills such as social perceptiveness and effective communication are the most highly rated.



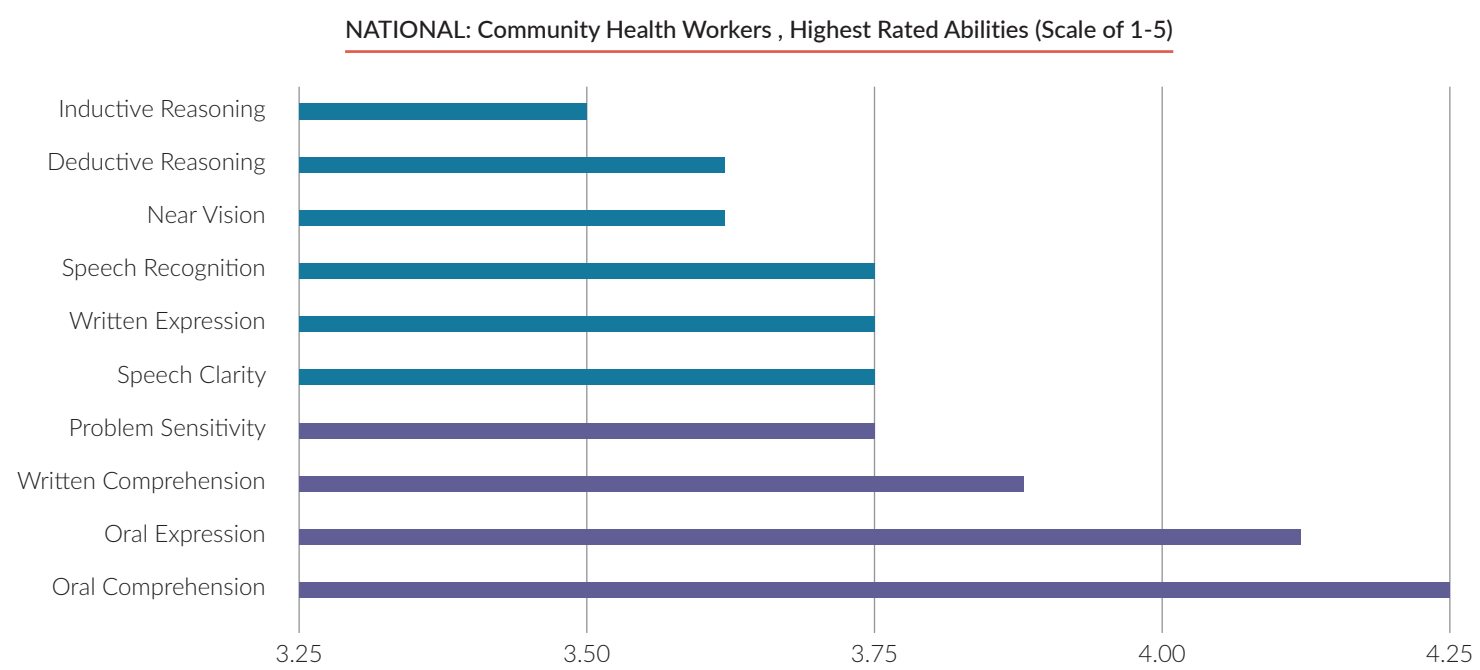
Source: O*NET; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 10: Community Health Workers

ABILITIES

As the skills required to be a Community Health Worker involve communication and social perceptiveness, it's no surprise that the highest rated abilities for the occupation include oral comprehension and expression, writing comprehension, and problem sensitivity.



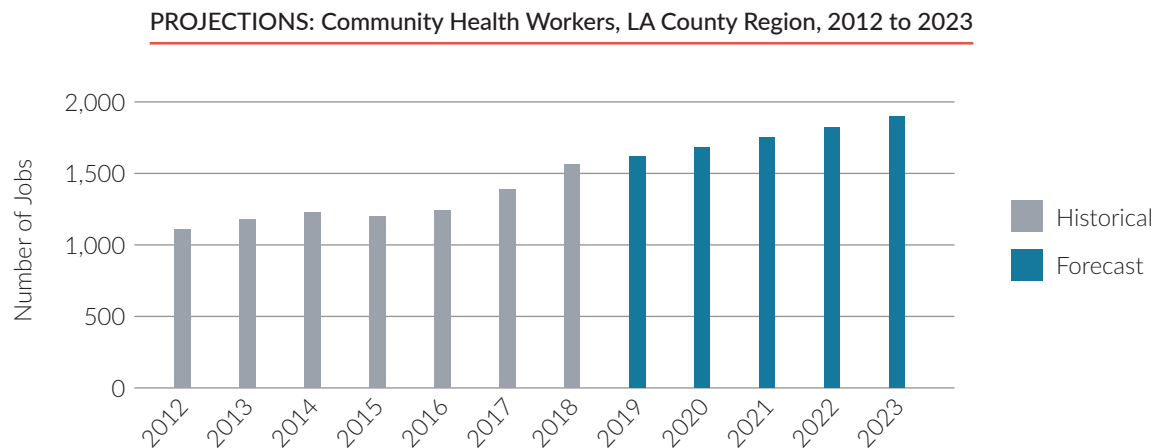
Source: O*NET; Analysis by Beacon Economics

FORECAST: Community Health Workers

Serving one of the most populous regions in the state, Community Health Workers will continue to enjoy steady employment growth as demand for health care services increases. The stable upward trajectory of this occupation bodes well for the future, with the total number of positions at nearly 2,000 by 2023. Community Health Workers have detailed knowledge of the communities they serve and work to develop and implement strategies to improve the health of those communities. A prime example in the County of Los Angeles is the PLACE Program (Policies for Livable, Active Communities and Environments), which is dedicated to fostering policy change that supports the

development of healthy, safe and active environments for all Los Angeles County residents (this PLACE program should not be confused with “Preparing Los Angeles for County Employment”, another program within the County that uses the PLACE acronym).

At 101, the L.A. County Health Departments currently has a large number of vacant positions for Community Health Workers. This profession boasts a relatively low level of turnover (4.7%), but County Health Departments projections suggest 9.3% of Community Health Workers will retire within the next three years.



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

11

Nurse Anesthetists

SOC CODE 29-1151

DEPARTMENTAL EXPOSURE

- Department of Health Services (DHS): 100%

All positions for Nurse Anesthetists in the L.A. County Health Departments are found in the Department of Health Services (DHS).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	430
Employment Growth 2012-2017	59.3%
Wages	\$187,780
Wages Growth 2012-2017	12.4%

L. A. HEALTH DEPARTMENTS

Budgeted Positions 2019	62
Growth in Budgeted Positions 2014-2019	-3.1%

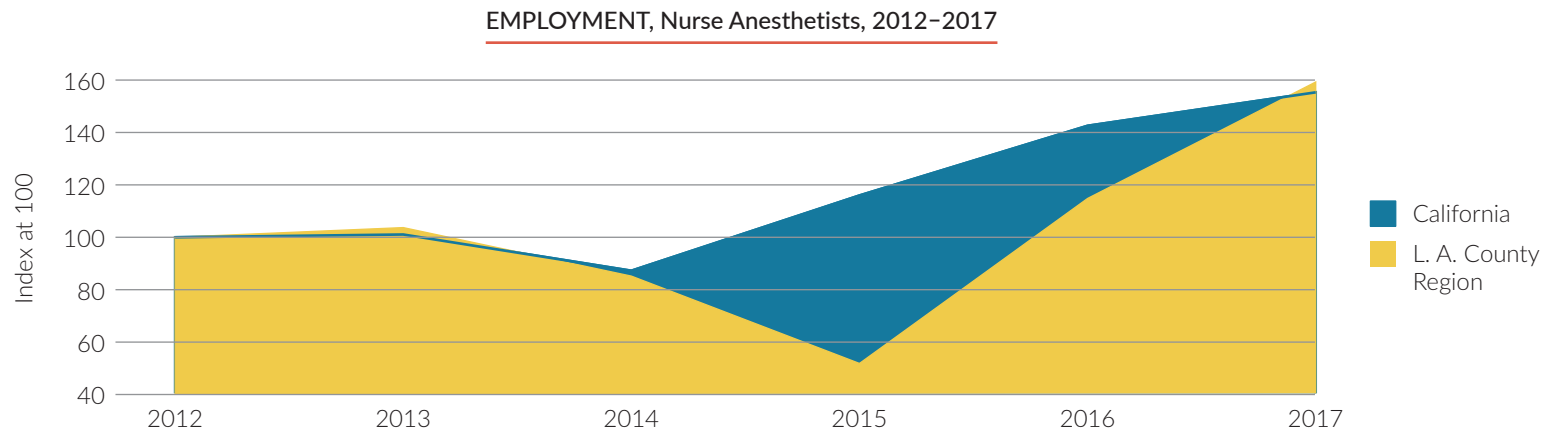
Illustrative Classification Examples

Nurse Anesthetist, II

EMPLOYMENT

Across the L.A. County Health Departments, Nurse Anesthetists comprise 62 budgeted and 63 filled positions. In the County of Los Angeles as a whole, there are approximately 430 Nurse Anesthetists. Nurse Anesthetists make up a small share of total extender occupation positions in both the L.A. County Health Departments and the County of Los Angeles as a whole. Within the Health Departments, Nurse Anesthetists make up 0.2% of total extender occupations. Throughout the county as a whole, Nurse Anesthetists comprise a negligible 0.04% of total extender occupations. The budgeted positions across the L.A. County Health Departments constitute 14.4% of the total Nurse Anesthetists' positions located across the County of Los Angeles as a whole. Furthermore, with only 1,460 Nurse Anesthetists located across the state, the L.A. County Health Departments, and the Department of Health Services in particular, composes 4.2% of the positions statewide.

Between 2012 and 2017, 160 Nurse Anesthetists were added to the County of Los Angeles as a whole, with a growth rate of 59.3% and a total number of 430 Nurse Anesthetists as of 2017. The County's growth rate was slightly higher than California's, where positions increased by 55.3% between 2012 and 2017, bringing the total up to 1,460 positions as of 2017. More recently, the County of Los Angeles saw a strong 207.1% in growth in Nurse Anesthetists between 2015 and 2017.



Source: Bureau of Labor Statistics; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

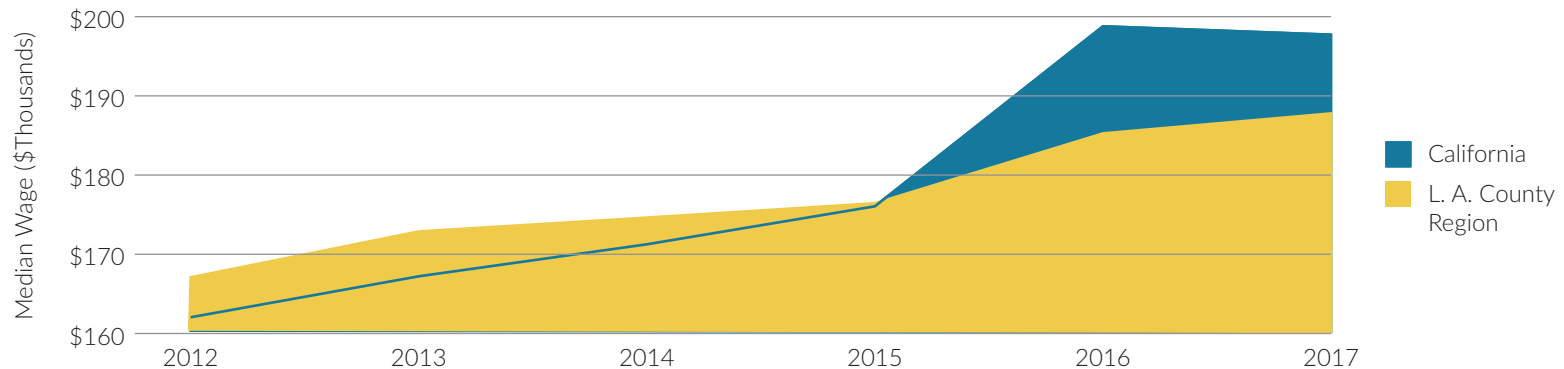
TARGET OCCUPATION 11: Nurse Anesthetists

WAGES

Median wages for Nurse Anesthetists grew steadily between 2012 and 2017, with wages increasing by 12.4% to \$187,780. Growth in wages averaged 2.4% during the five-year period. However, in the County of Los Angeles, Nurse Anesthetists' median wage lags behind California, which, as of 2017, reached \$197,720 – up 22.0% from 2012. Annual average growth has been higher in the state as well – 4.2% annually between 2012 and 2017. From 2012 to 2015, the County of Los Angeles was ahead of the state in median wages for Nurse Anesthetists. However, a large spike in 2015 drove California ahead of the County of Los Angeles.



MEDIAN WAGE: Nurse Anesthetists, 2012-2017

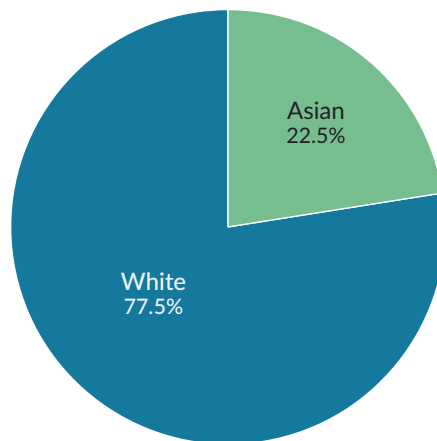


Source: Bureau of Labor Statistics; Analysis by Beacon Economics

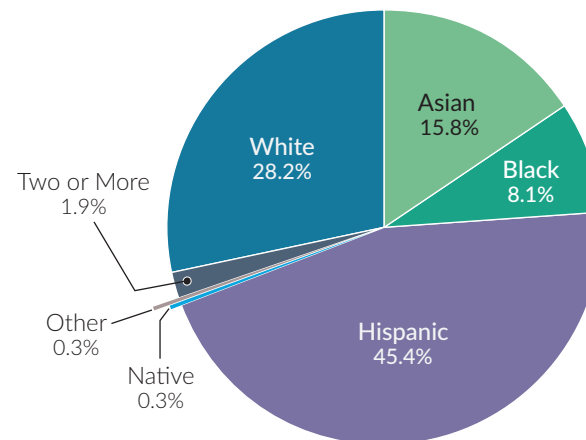
DEMOGRAPHICS: Ethnic/Racial Composition

The racial and ethnic composition of Nurse Anesthetists in the County of Los Angeles is markedly different from the County of Los Angeles workforce as a whole. For example, the County of L.A. workforce is divided primarily into three ethnic/racial groups: Hispanic (45%), White (28.2%), Asian (15.8%) and Black (8%). By comparison, Nurse Anesthetists in the County of Los Angeles comprise just two racial/ethnic groups: Asian (78%) and White (22%).

L.A. COUNTY REGION: Nurse Anesthetists,
Ethnic/Racial Composition, 2017



L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

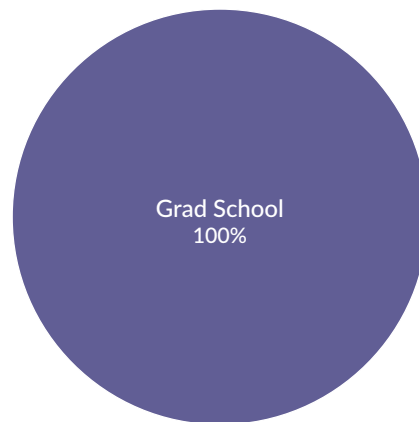
OPPORTUNITY OCCUPATIONS (7–13)

TARGET OCCUPATION 11: Nurse Anesthetists

DEMOGRAPHICS: Educational Attainment

Since administering anesthesia requires a specific qualification, 100% of Nurse Anesthetists have a graduate degree.

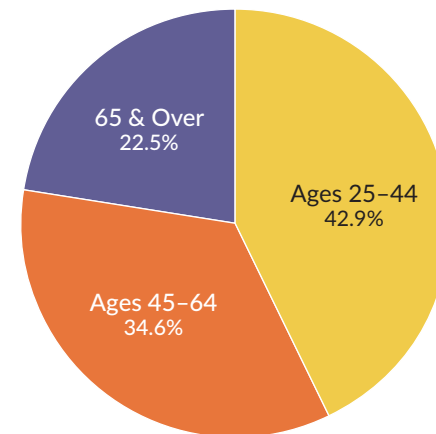
L.A. COUNTY REGION: Nurse Anesthetists,
Educational Attainment, 2017



DEMOGRAPHICS: Age Breakdown

The majority of Nurse Anesthetists in the County of Los Angeles (42.9%) fall into the 25 to 44 age bracket. 34.6% are 45 to 64, while a relatively large number (22.5%) are 65 and older. However, for Health Departments positions as a whole, the Department of Human Resources has projected that employees expected to retire in less than three years is at 9.3%, and those expected to retire between three and five years 5.6%..

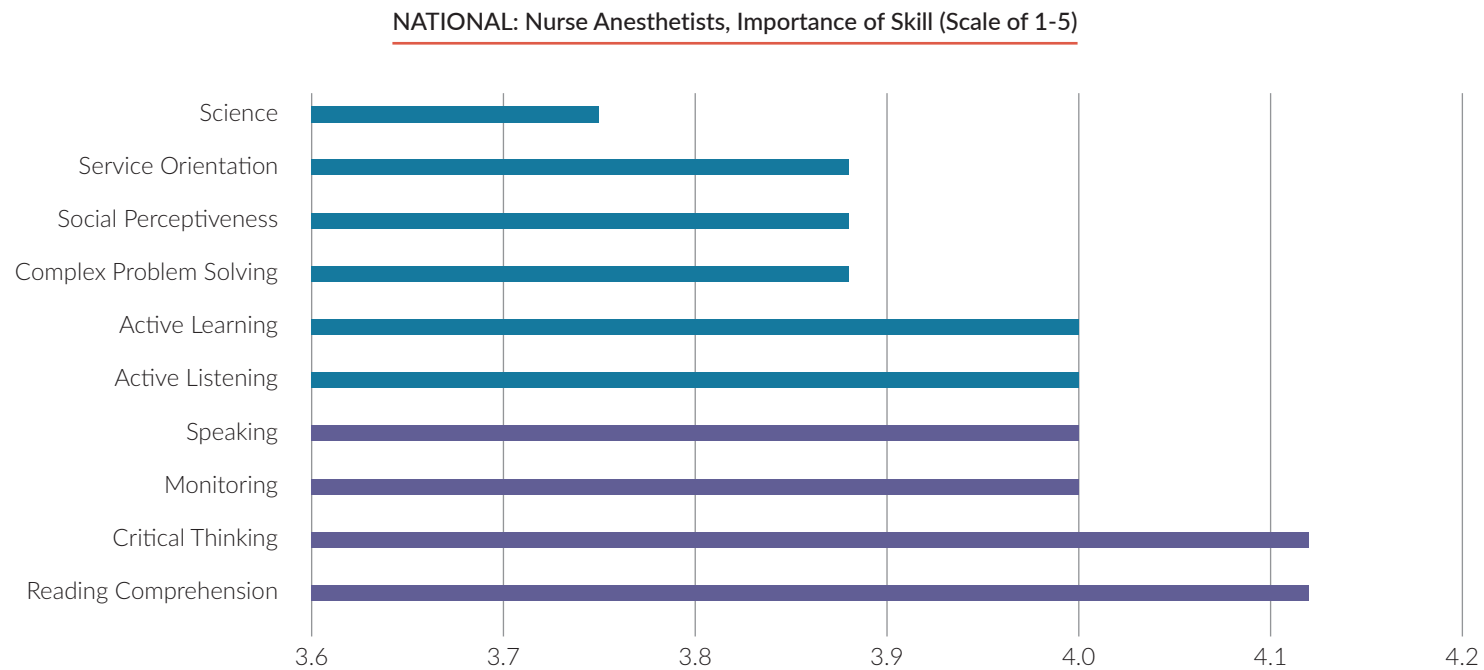
L.A. COUNTY REGION: Nurse Anesthetists,
Age Distribution, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

Nurse Anesthetist is a highly demanding profession that requires the administering of anesthesia during surgeries and other medical procedures. As such, critical thinking and reading comprehension are rated the most important skills. Also, communication between physicians and Nurse Anesthetists is vital, hence speaking, listening and learning skills also rank highly.



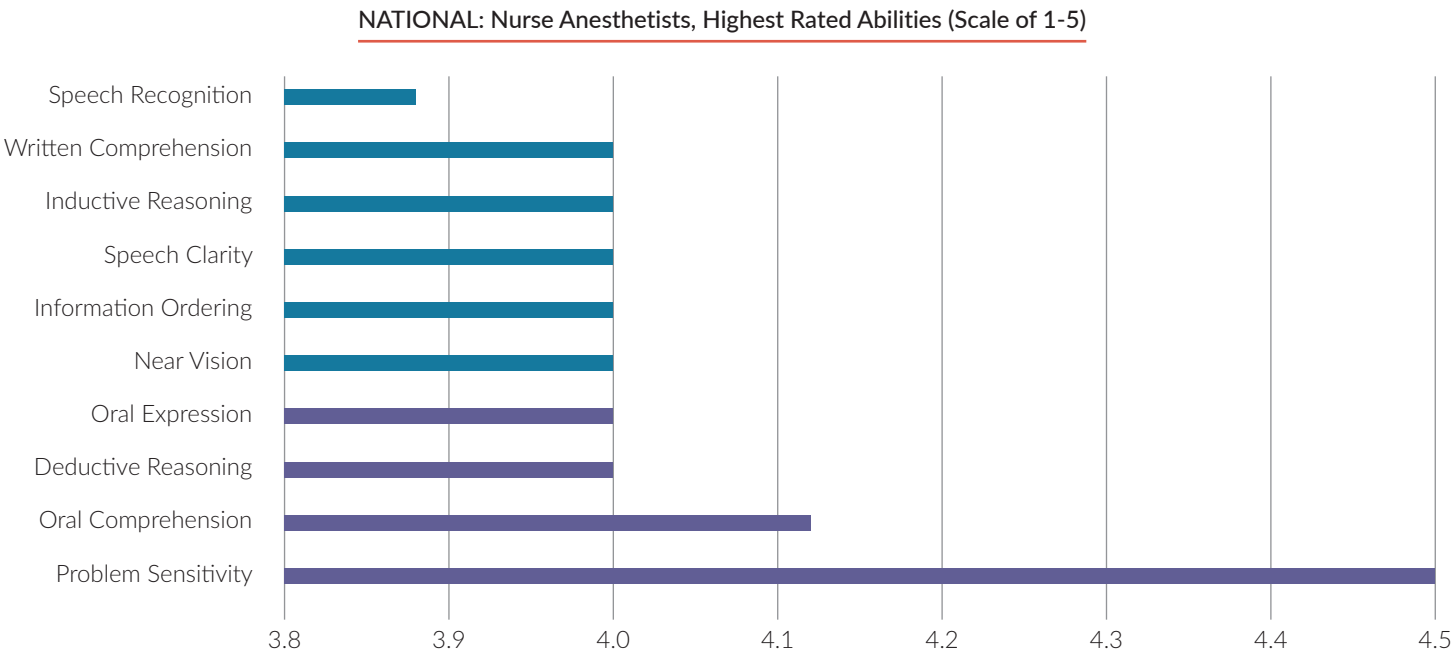
Source: O*NET; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 11: Nurse Anesthetists

ABILITIES

Given the demands of the job, problem sensitivity is by far the most valued ability in a Nurse Anesthetist. Oral comprehension, deductive reasoning and oral expression are also important to the profession.

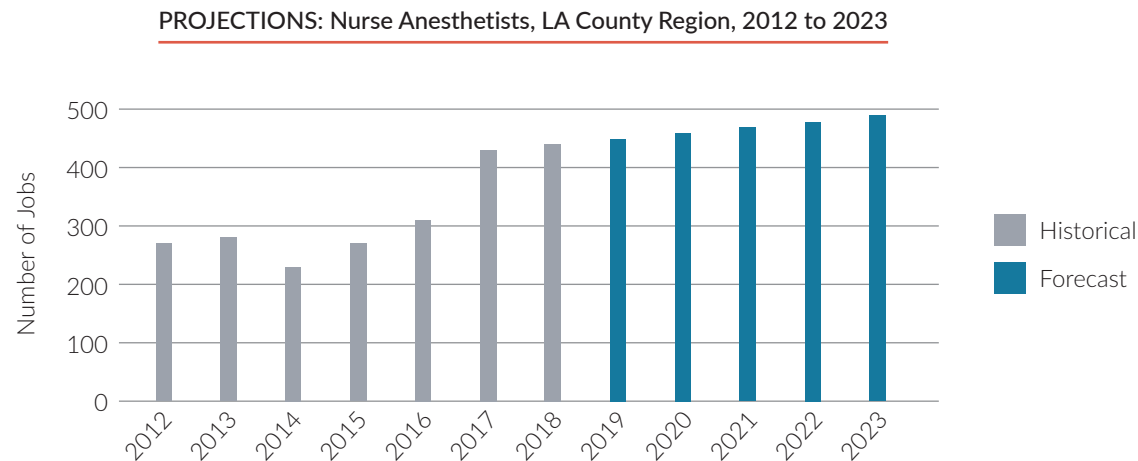


Source: O*NET; Analysis by Beacon Economics

FORECAST: Nurse Anesthetists

Nurse Anesthetist is the highest paying occupations in our list of health care support and extender occupations. Although they make up a small share of total occupations in the County of Los Angeles, there has been a substantial uptick in employment in recent years. Our current projections for this occupation are roughly in line with the average rate of growth predicted by the California Employment Development Department (EDD), both of which are above the average rate at the national level. Optimism for growth in this occupation

stems from an increased emphasis on preventative care, advances in surgical techniques and procedures, and an ageing population. In the Health Departments, there are more Nurse Anesthetists ordinances than there are budgeted, which implies a negative vacancy. Despite the pay, turnover rate for Nurse Anesthetists is among the highest of our target support and extender occupations, and roughly one in ten positions is flagged for retirement in the coming years, which should be of note to county officials.



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

12 Registered Nurse

SOC CODE 29-1141

DEPARTMENTAL EXPOSURE

- Department of Health Services (DHS): 88.9%
- Department of Mental Health (DMH): 0.3%
- Department of Public Health (DPH): 10.8%

Registered Nurses are primarily employed by the Department of Health Services (DHS). A minority are employed by the Department of Public Health (DPH), and less than 1% are employed by the Department of Mental Health (DMH).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	79,420
Employment Growth 2012-2017	14.2%
Wages	\$95,960
Wages Growth 2012-2017	11.2%

L. A. HEALTH DEPARTMENTS

Budgeted Positions 2019	7,101
Growth in Budgeted Positions 2014-2019	22.2%

Illustrative Classification Examples

Registered Nurse I-III
Public Health Nurse
Program Specialist, PHN

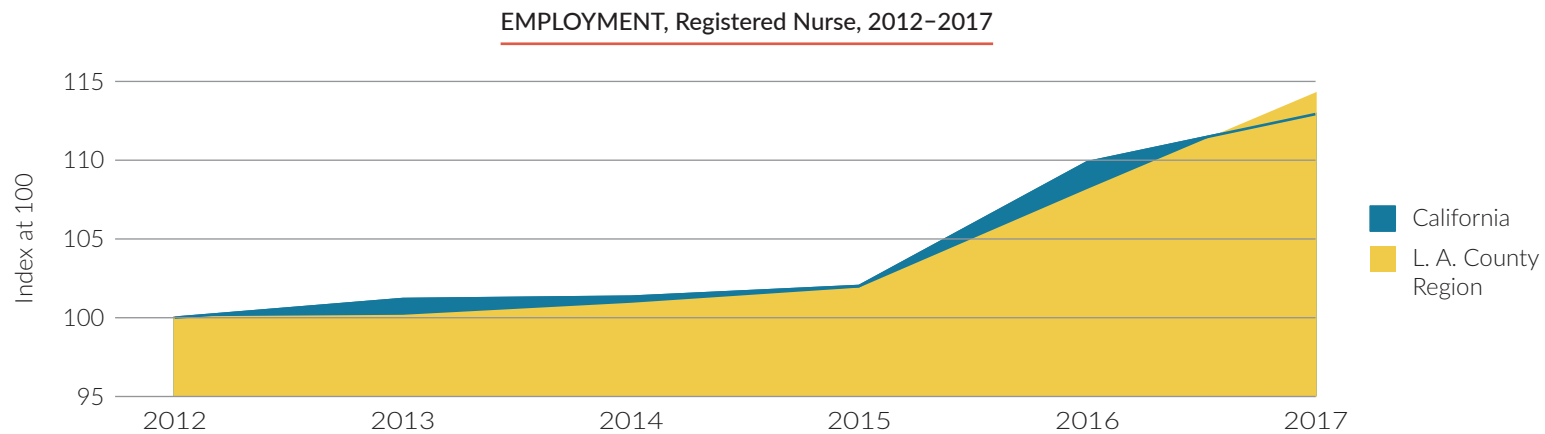
EMPLOYMENT

With over 6,800 of the 7,101 budgeted positions filled, Registered Nurses easily outnumber any other group of Health Departments employees. In the County of Los Angeles, roughly 79,420 Registered Nurses are employed in all industries, including health care and government. When comparing the occupational mix of extender occupations in the County of Los Angeles to that of the L.A. County Health Departments, the difference in the share of Registered Nurses is significant. Registered Nurses account for 28.1% of total extender occupations at the L.A. County Health Departments; for the County of Los Angeles overall, they comprise only 7.9% of extender occupations. Compared to the state's occupational mix of extender occupations, California's share of Registered Nurses to total extender occupations was 7.5% in 2017, very similar to that of the County of Los Angeles and, again, much

lower than the L.A. County Health Department's share over the same period.

Compared to the county and the state overall, Registered Nurses have outsized significance at the L.A. County Health Departments, and they are particularly important to the DHS from an employment perspective.

Employment for Registered Nurses in the County of Los Angeles grew by 14.2% between 2012 and 2017, increasing from 69,540 to 79,420. By comparison, employment for Registered Nurses in California grew slightly slower at 12.9%, increasing from 250,000 to 282,300 between 2012 and 2017. The sharp uptake from 2015 could be a result of the Affordable Care Act requiring more Registered Nurses.



Source: Bureau of Labor Statistics; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

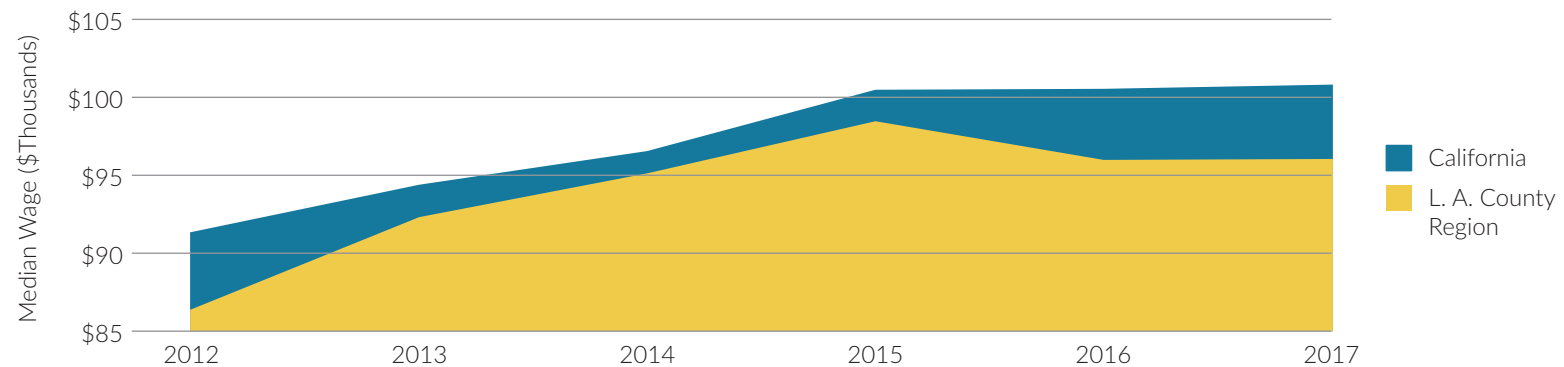
TARGET OCCUPATION 12: Registered Nurse

WAGES

Median wages for Registered Nurses in the County of Los Angeles have lagged behind the statewide median for the last few years. As of 2017, median wages for Registered Nurses in the County of Los Angeles reached \$95,960, up 11.2% from 2012. In comparison, the median wage for Registered Nurses in California reached \$100,730 in 2017, reflecting a five-year growth rate of 10.4%. Between 2015 and 2017, wages have levelled out slightly, possibly as a result of increased employment which may have shifted the median wage down.



MEDIAN WAGE: Registered Nurse, 2012-2017

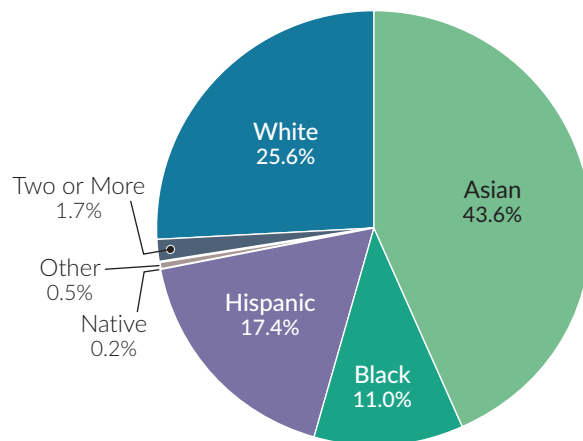


Source: Bureau of Labor Statistics; Analysis by Beacon Economics

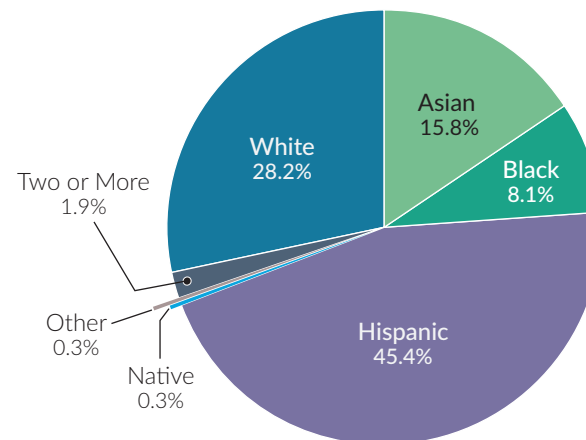
DEMOGRAPHICS: Ethnic/Racial Composition

The racial and ethnic composition for Registered Nurses in the County of Los Angeles differs from the county's collective labor pool (county residents over the age of 16). In the County of Los Angeles, the majority of the working population aged 16 and over is Hispanic (45%), followed by White (28%), Asian (15.8%), and Black (8%). However, as of 2017, the racial/ethnic breakdown for Registered Nurses in the County of Los Angeles was: Asian (44%), White (26%), Hispanic (17%), and Black (11%).

L.A. COUNTY REGION: Registered Nurse,
Ethnic/Racial Composition, 2017



L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7–13)

TARGET OCCUPATION 12: Registered Nurse

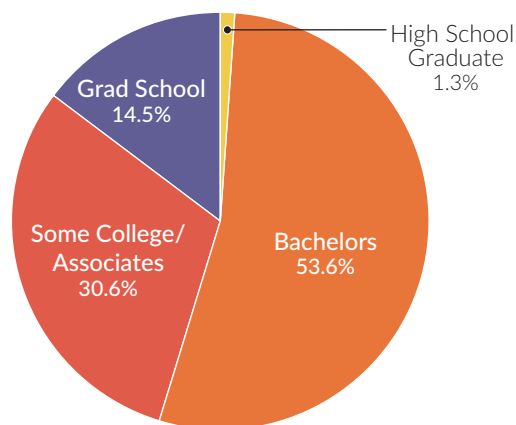
DEMOGRAPHICS: Educational Attainment

69% of Registered Nurses in the County of Los Angeles have a bachelor's degree or higher. Of these, roughly 54% have a bachelor's degree, while 15% have a graduate degree. Registered Nurses with an associate degree/some college account for 31%, the second highest percentage. As the job demands a high level of skill and training, just 1% of Registered Nurses in the County of Los Angeles have only a high school diploma.

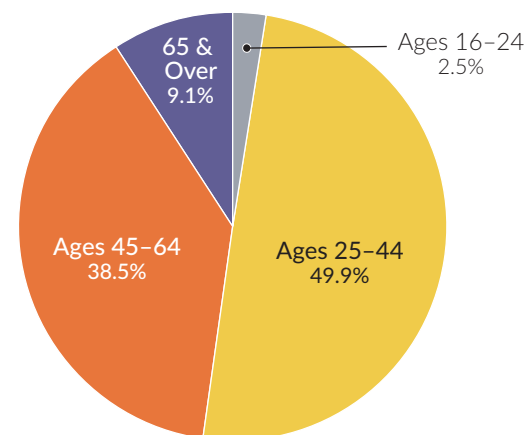
DEMOGRAPHICS: Age Breakdown

Half of Registered Nurses in the County of Los Angeles are between the ages of 25 and 44, while only 2% are below the age of 25 (this can probably be attributed, in part at least, to educational requirements). Nurses between the ages of 45 and 64 account for 38% of the total, while nurses aged 65 and over represent only 9%.

L.A. COUNTY REGION: Registered Nurse,
Educational Attainment, 2017



L.A. COUNTY REGION: Registered Nurse,
Age Distribution, 2017

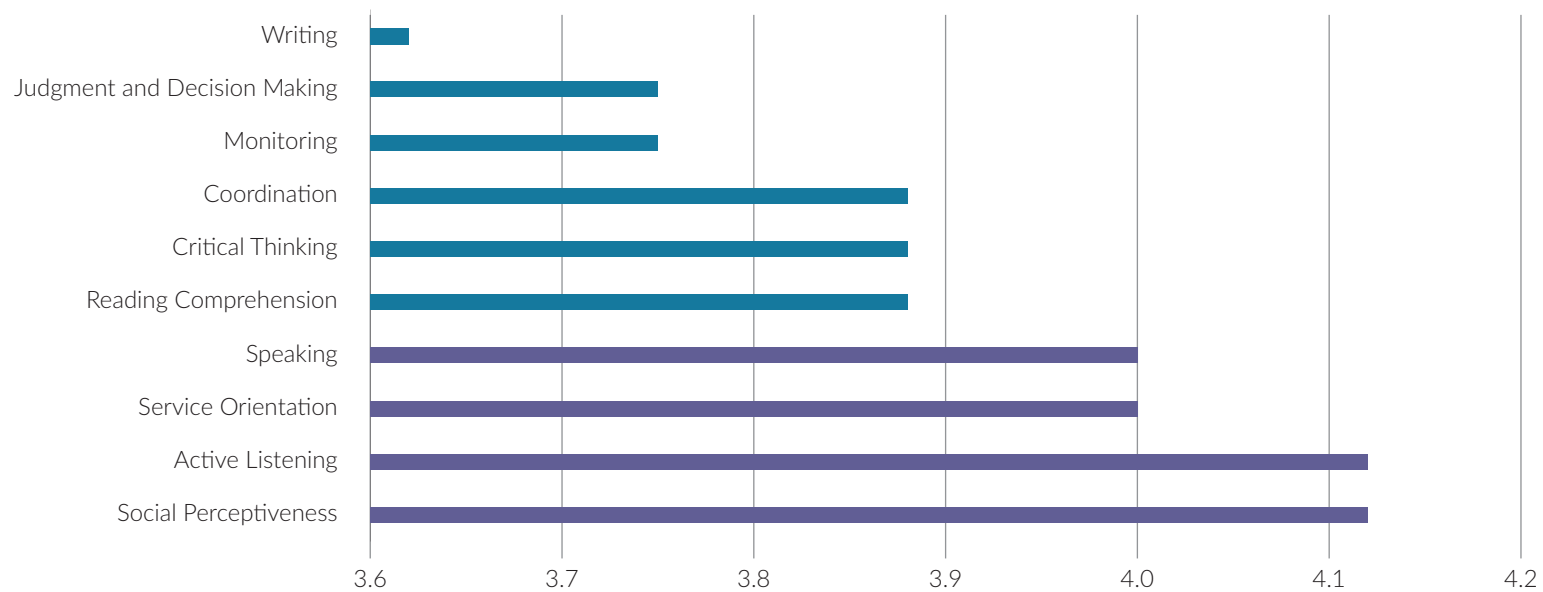


Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

Responsibilities for a Registered Nurses are many and varied. Given the demands of the profession, patient care in particular, active listening and social perceptiveness are the most valued skills for a Registered Nurse.

NATIONAL: Registered Nurse, Importance of Skill (Scale of 1-5)



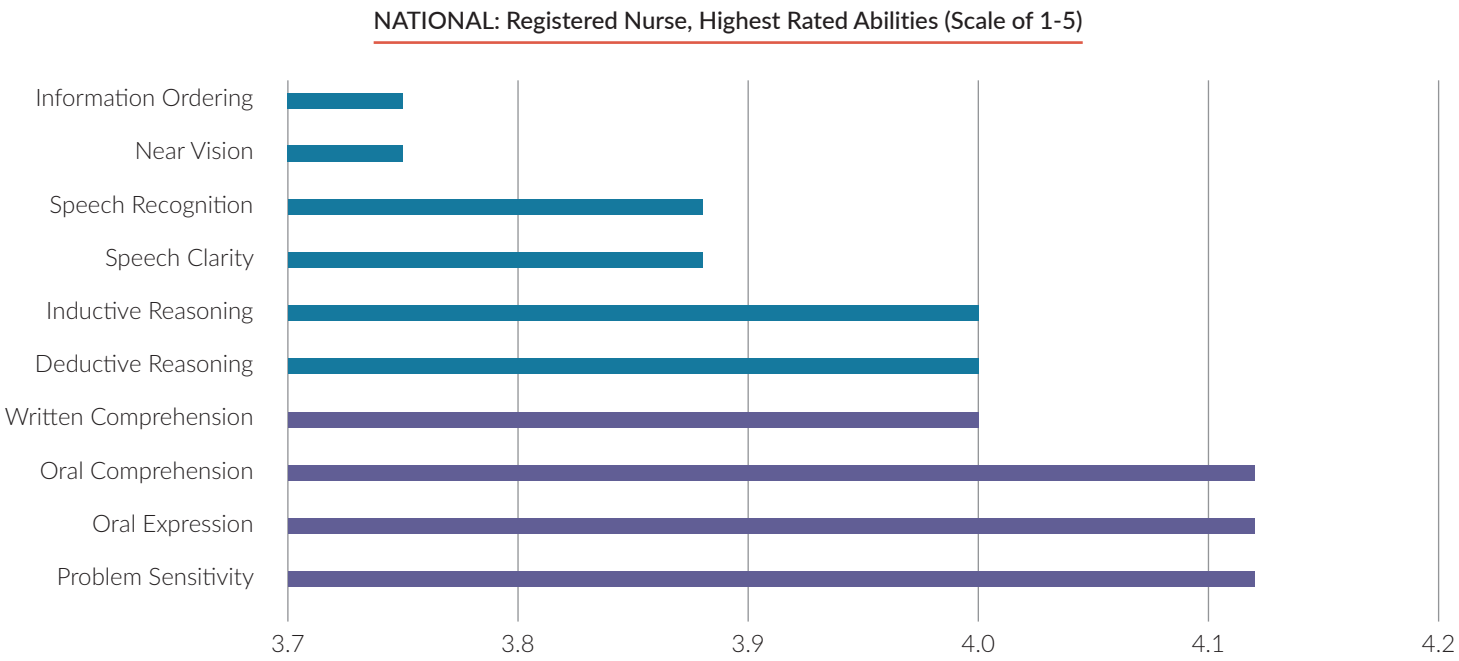
Source: O*NET; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 12: Registered Nurse

ABILITIES

The top-rated abilities for a Registered Nurses tie in with the skills listed above and fully reflect the nature of the job. Oral expression and comprehension outweigh written comprehension, while problem sensitivity is of paramount importance.



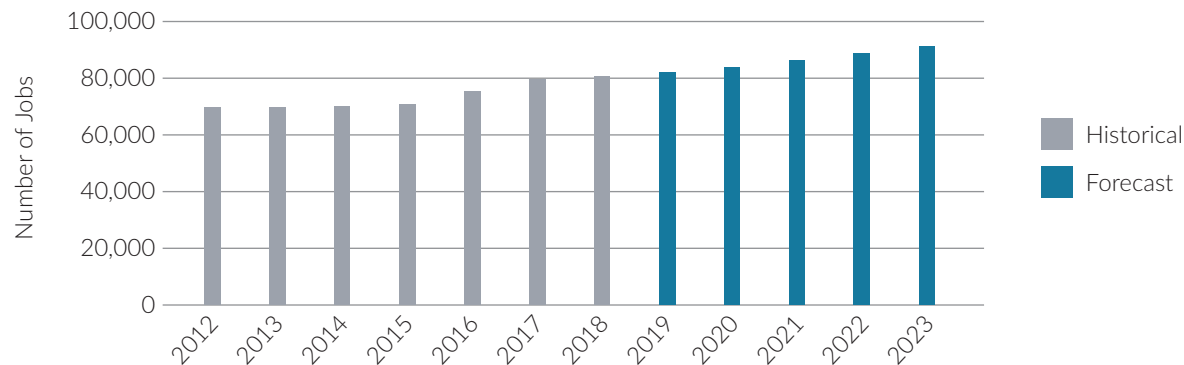
Source: O*NET; Analysis by Beacon Economics

FORECAST: Registered Nurse

Registered Nurses comprise the lion's share of both ordinance and budgeted positions in our list of health care support and extender occupations, and there is little doubt that employment prospects for Registered Nurses are rosy. Both the California EDD and the BLS agree, projecting solid growth in the industry. That should come as no surprise; demand for nurses will continue to rise as the local population ages.

The overall share of Los Angeles County Health Departments Registered Nurses that are projected to retire in the next three years is 9%, and the average turnover rate is 6.4%. Countywide, the nursing occupation faces similar challenges with nearly all of the nurses in the County of Los Angeles over the ages of 45, with roughly one in ten over the age of 65.

PROJECTIONS: Registered Nurse, LA County Region, 2012 to 2023



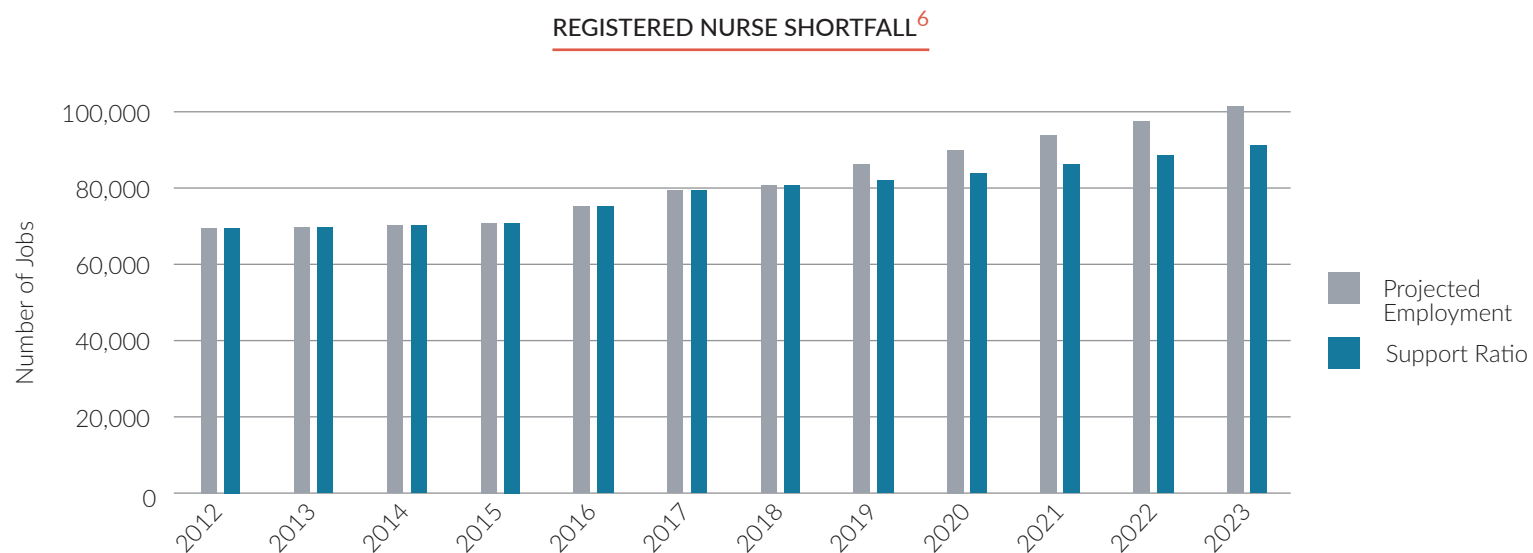
Source: Bureau of Labor Statistics; Forecast by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 12: Registered Nurse

FORECAST: Registered Nurse cont.

Budgetary constraints aside, there is also the issue of how many nurses will be needed to accommodate a population that is both ageing and living longer. As it stands, staffing levels are arguably insufficient to meet demand at the state level. California's nursing shortage is well documented, and California's nurse-to-population ratio has ranked 48th in the nation for the past 10 years.⁵



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

⁵ <https://www.workingnurse.com/articles/The-Nursing-Shortage-Paradox-in-California>

⁶ One way to gauge how many nurses will be needed locally is to look at the ratio of the elderly population to Registered Nurses. The figure above takes the average of that ratio and applies it to the California Department of Finance's projections for the elderly population to back out an 'implied support ratio.' This is done because elders consume more health care services than younger cohorts, and looking at population-to-nurse ratios doesn't accurately account for the ageing of the population. Compared to our forecast, it's clear the shortfall will compound over time as both the population ages and people live longer. On the surface our projected employment for Registered Nurses might look pessimistic, but the Beacon Economics average growth rate is higher than that of the California EDD, and, by 2023 Beacon Economics' projections for Registered Nurses for the County of Los Angeles are **above** where the California EDD projects Registered Nurses will be in 2026.

13 Health Care Social Workers

SOC CODE 21-1022

DEPARTMENTAL EXPOSURE

- Department of Health Services (DHS): 96.7%
- Department of Public Health (DPH): 3.3%

Healthcare Social Workers are predominantly employed by the Department of Health Services (DHS), with almost 98% of the budgeted positions allocated there. The Department of Public Health (DPH) accounts for the remainder.



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	5,970
Employment Growth 2012-2017	85.4%
Wages	\$72,570
Wages Growth 2012-2017	17.9%

L. A. HEALTH DEPARTMENTS

Budgeted Positions 2019	369
Growth in Budgeted Positions 2014-2019	-17.1%

Illustrative Classification Examples

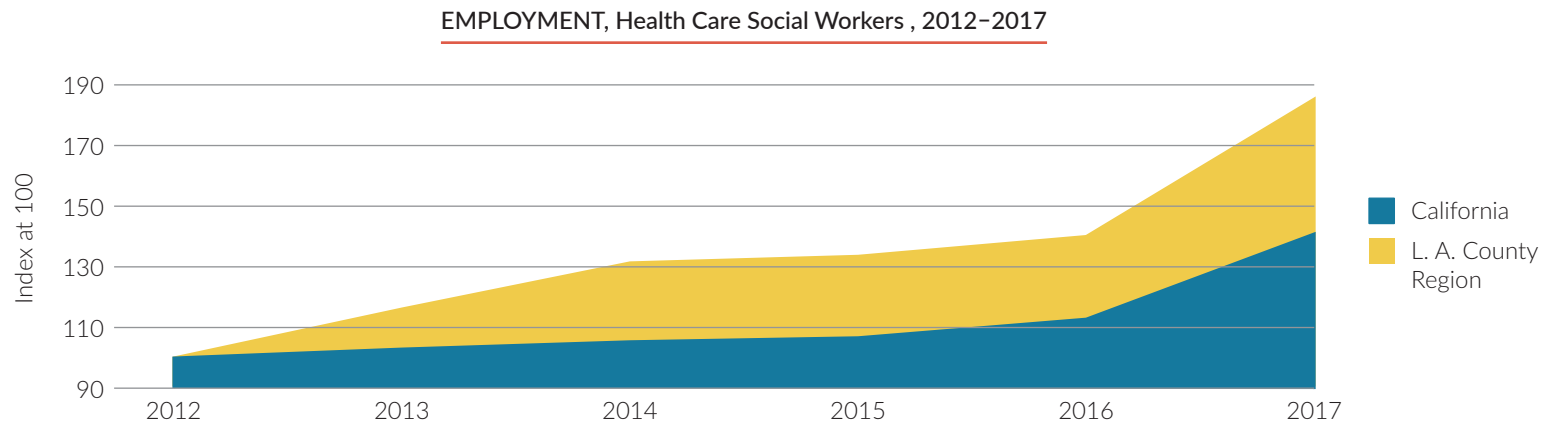
Medical Case Worker, II
Clinical Social Worker
Senior Clinical Social Worker

EMPLOYMENT

Throughout the L.A. County Health Departments, there are 369 budgeted position for Health Care Social Workers, with 357 allocated to the Department of Health Services (DHS) and the remaining 12 employed within the Department of Public Health (DPH). In the County of Los Angeles as a whole, there were 5,970 Health Care Social Workers employed in all industries. The occupational mix of extender occupations in the L.A. County Health Departments relative to the County of Los Angeles overall indicates a minor disparity in the share of Health Care Social Workers. For the L.A. County Health Departments, Healthcare Social Workers represent 1.5% of extender occupations across all departments. Even at the Department of Health Services, where most of the budgeted positions are allocated, the share of Health Care Social Workers remains at

roughly 1.8%. By comparison, the County of Los Angeles' share of Health Care Social Workers is roughly 0.6% of total extender occupations, similar to California's share of 0.5%.

Employment in Health Care Social Workers rose significantly in the County of Los Angeles between 2012 and 2017, with a growth rate of 85.4% and the total number of workers reaching 5,970. At 40.9%, California's growth rate was half of the County of Los Angeles', with employment increasing from 12,880 to 18,150 between 2012 and 2017. Employment in LA County shows no sign of slowing down, as indicated by the year over year increase between 2016 and 2017 for the County of Los Angeles, where Health Care Social Workers expanded by 32.4%.



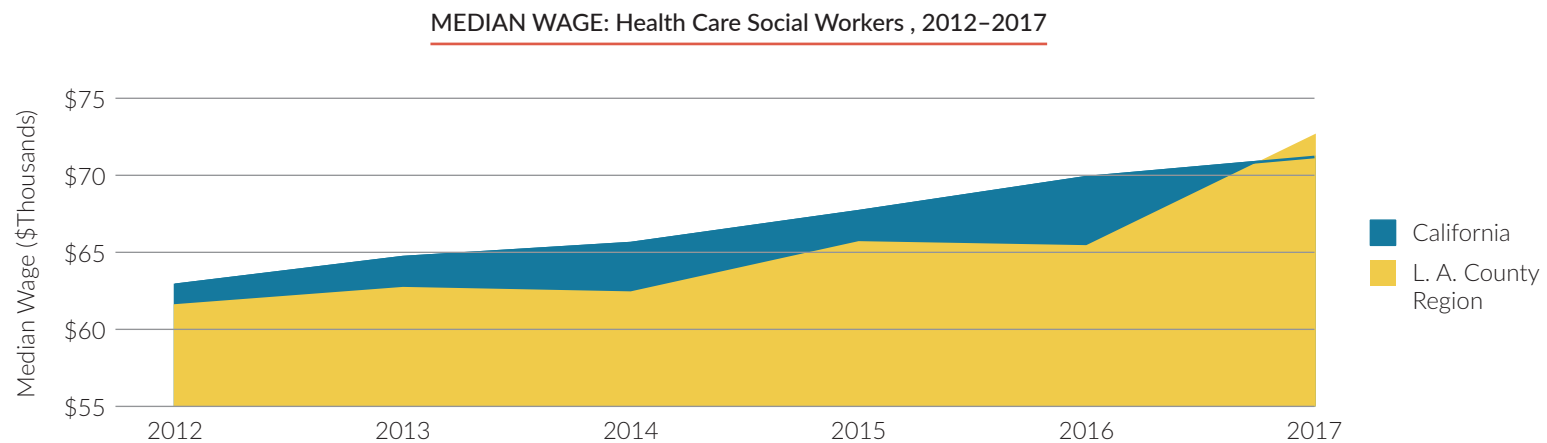
Source: ACS Public Use Microdata Sample. Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 13: Health Care Social Workers

WAGES

In 2017, median wages for Health Care Social Workers reached \$72,570 in the County of Los Angeles, overtaking the median wage for California (\$71,190). The County of Los Angeles wages increased by 17.9% between 2012 and 2017, outpacing California's median wage growth of 13.2%. In keeping with employment figures, the County of Los Angeles saw a strong upswing for Health Care Social Workers' wages between 2016 and 2017, with a year over year growth of 11.0%.

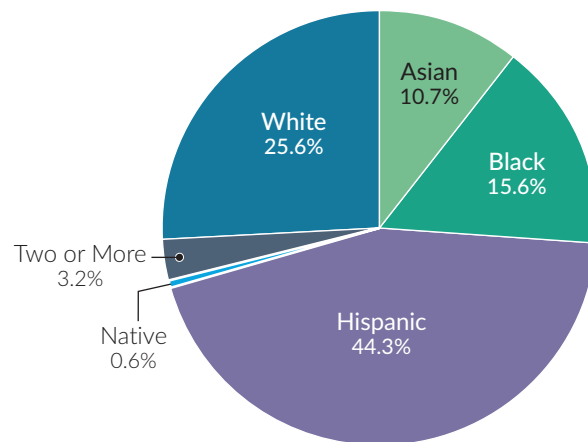


Source: ACS Public Use Microdata Sample. Analysis by Beacon Economics

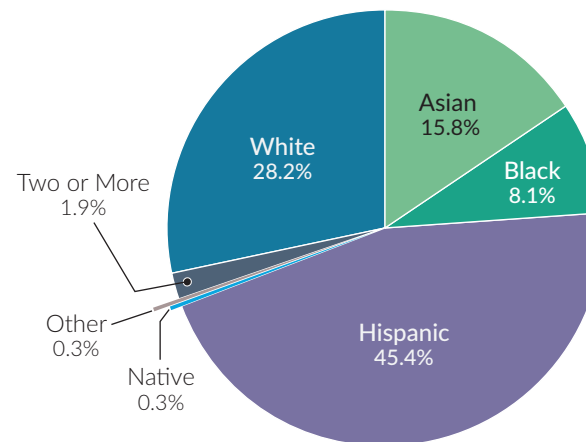
DEMOGRAPHICS: Ethnic/Racial Composition

The ethnic and racial composition for Health Care Social Workers is similar to the County of Los Angeles workforce overall. Both Health Care Social Workers in the L.A. County Health Departments and the county workforce (civilians employed over the age of 16) exhibit a Hispanic majority (44.3% and 45% respectively). White individuals account for 26% of Health Care Social Workers, reflecting the 28% of White individuals in the County of Los Angeles workforce. The number of Black Health Care Social Workers (15.6%) is higher than Black workers in the County of Los Angeles workforce (8.1%).

L.A. COUNTY REGION: Health Care Social Workers ,
Ethnic/Racial Composition, 2017



L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017



Source: ACS Public Use Microdata Sample. Analysis by Beacon Economics

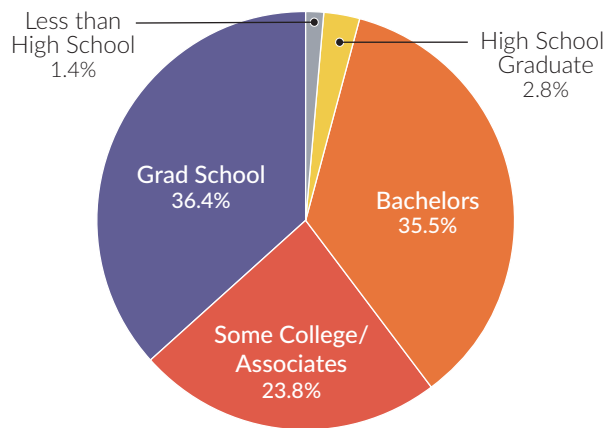
OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 13: Health Care Social Workers

DEMOGRAPHICS: Educational Attainment

Healthcare Social Workers in the County of Los Angeles generally have a high level of educational. The two major categories are workers with a graduate degree (36.4%), and those with a bachelor's degree (35.5%). Health Care Social Workers with some college or an associate degree make up 23.8%, while those with a high school diploma or less comprise only 4.2%.

L.A. COUNTY REGION: Health Care Social Workers,
Educational Attainment, 2017

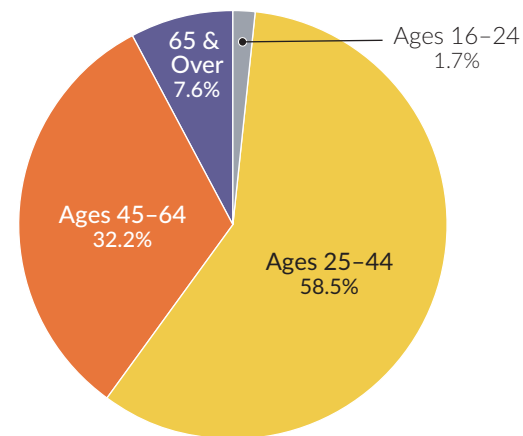


DEMOGRAPHICS: Age Breakdown

Age distribution among Health Care Social Workers varies within the County of Los Angeles. The majority (58.5%) are 24 to 44, while 32.2% are between 45 and 64. Given the standards of higher education required, younger Health Care Social Workers are rare, with only 1.7% in the County of Los Angeles between the ages of 16 and 24.

Although 8% of Health Care Social Workers are aged 65 and over, there is no cause for concern with regards to retirement projections. According to data from the Department of Human Resources, 5.6% are projected to retire within three years or less.

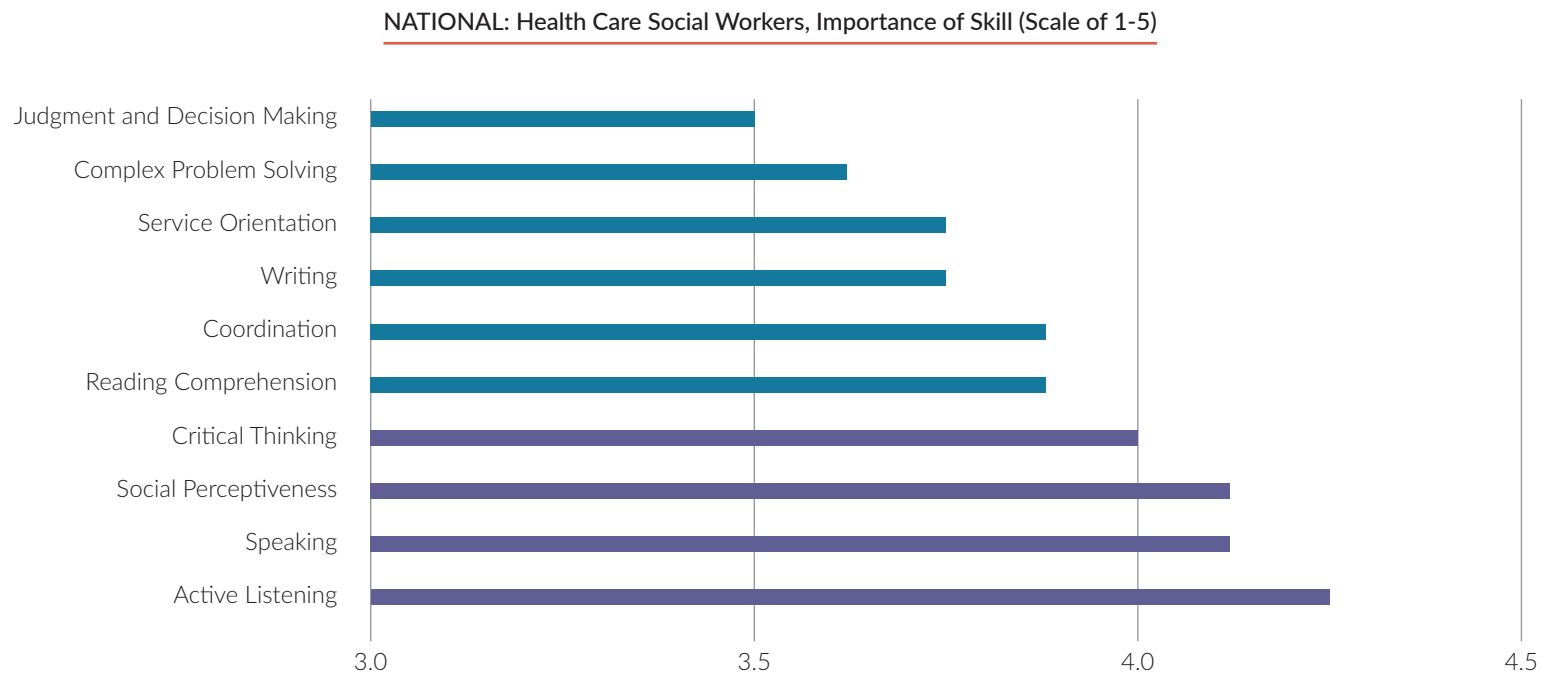
L.A. COUNTY REGION: Health Care Social Workers,
Age Distribution, 2017



Source: ACS Public Use Microdata Sample. Analysis by Beacon Economics

SKILLS

Healthcare Social Workers have an occupation that is intensively interactive with their communities and, as such, relies heavily on effective communication skills, social awareness, problem solving and, most importantly, active listening



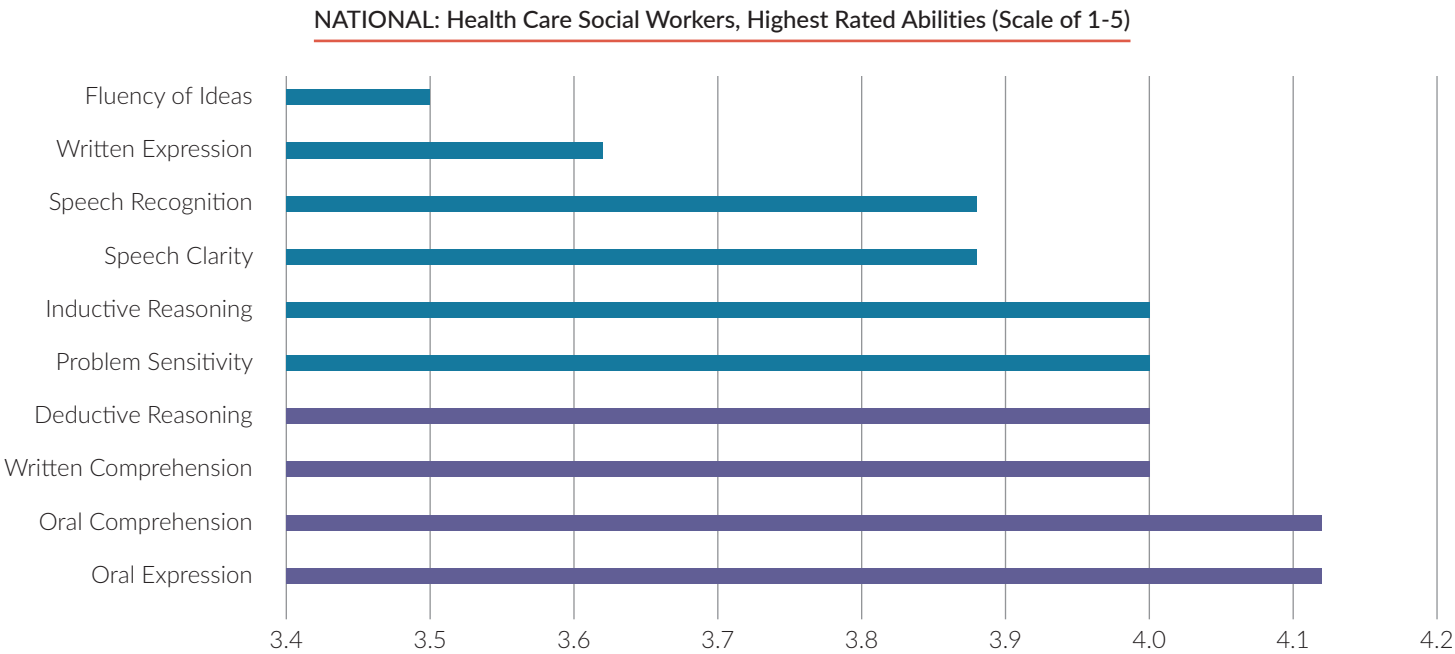
Source: ACS Public Use Microdata Sample. Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (7-13)

TARGET OCCUPATION 13: Health Care Social Workers

ABILITIES

Allied to problem sensitivity and deductive reasoning, oral comprehension and oral expression – the ability to listen and respond effectively – are crucial abilities in the field of Health Care Social Work.



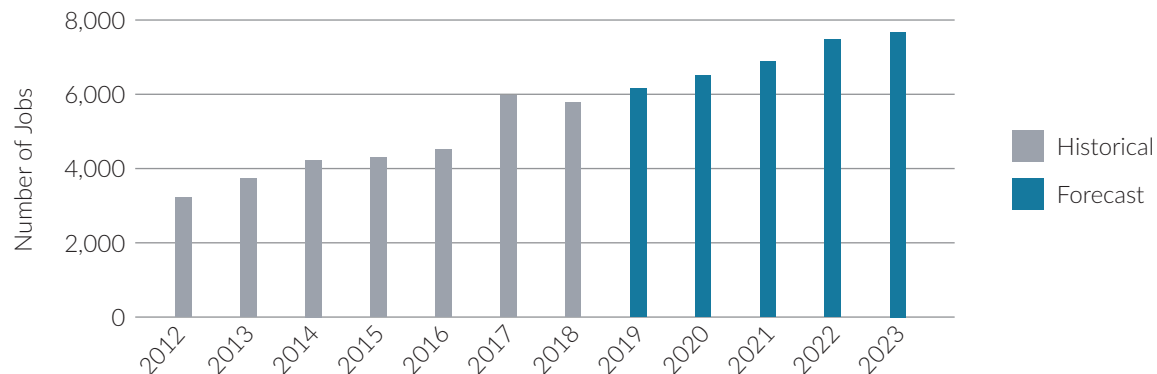
Source: ACS Public Use Microdata Sample. Analysis by Beacon Economics

FORECAST: Health Care Social Workers

Healthcare Social workers are a subset of the Social Workers aggregation, which also includes Child and Family Social Workers and Mental Health and Substance Social Workers. Health care Social Workers play a key role in the health care industry as a support and extender occupation, as workers in this occupation help patients understand their diagnoses and make the necessary adjustments to their lifestyle, housing, or health care. Employment opportunities for Health Care Social workers are expected to grow at a steady rate in line with historic trends.

The trend in employment both locally and nationally has been a stable one, with employment growing by 85.4% between 2012 and 2017, more than four times the national rate. Demand for Health Care Social Workers is forecast to increase to accommodate the growing needs of an aging population. The L.A. County Health Departments are cognizant of the growing demand for Health Care Social Workers and have budgeted more than 350 positions, with 16% of those vacant at the time of writing, making it a key position to keep an eye on. The good news is that there is relatively low turnover in this group (roughly 4%), and the share of current positions that are likely to be vacated for retirement is only 5.62%.

PROJECTIONS: Health Care Social Workers, LA County Region, 2012 to 2023



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

14

Computer and Information Systems Managers

SOC CODE 11-3021

DEPARTMENTAL EXPOSURE

- Department of Health Services (DHS): 60%
- Department of Mental Health (DMH): 26.2%
- Department of Public Health (DPH): 13.8%

Computer and Information Systems Managers are found primarily within the Department of Health Services (DHS), followed by the Department of Mental Health (DMH), and the Department of Public Health (DPH).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	10,340
Employment Growth 2012-2017	16.7%
Wages	\$153,530
Wages Growth 2012-2017	16.9%

L.A. HEALTH DEPARTMENTS

Budgeted Positions 2019	65
Growth in Budgeted Positions 2014-2019	4.8%

Illustrative Classification Examples

Principal Information Systems Analyst

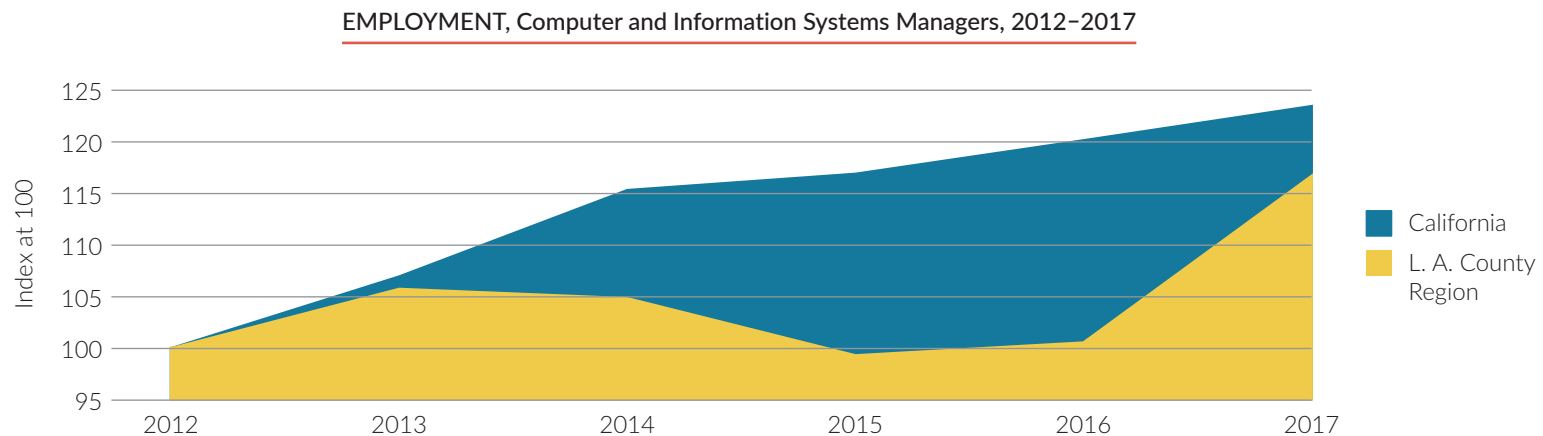
EMPLOYMENT

There are 65 budgeted positions for Computer and Information Systems Managers in the L.A. County Health Departments, with 62 positions filled. The distribution of Computer and Information Systems Managers across L.A. County Health Departments varies, with 39 budgeted positions at the Department of Health Services (DHS), 17 budgeted positions at the Department of Mental Health (DMH), and nine budgeted positions at the Department of Public Health (DPH).

Computer and Information Systems Managers comprise 0.3% of LA County Health Department's extender occupations—lower than the County of Los Angeles' overall total of extender occupations, where the share of Computer and Information

Systems Managers is 1.0%. At 1.4%, the share of the occupation statewide is higher than both the L.A. County Health Departments and the County of Los Angeles overall.

After a downward trend from 2013 to 2016, employment for Computer and Information Systems Managers saw a rise between 2016 and 2017. Between 2012 and 2017, employment for Computer and Information Systems Managers in the County of Los Angeles rose by 16.7%, increasing from 8,860 to 10,340 workers. California's growth in Computer and Information Systems Managers outpaced that of the County of Los Angeles with a statewide upswing of 23.5% between 2012 and 2017.



Source: Bureau of Labor Statistics; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (14–20)

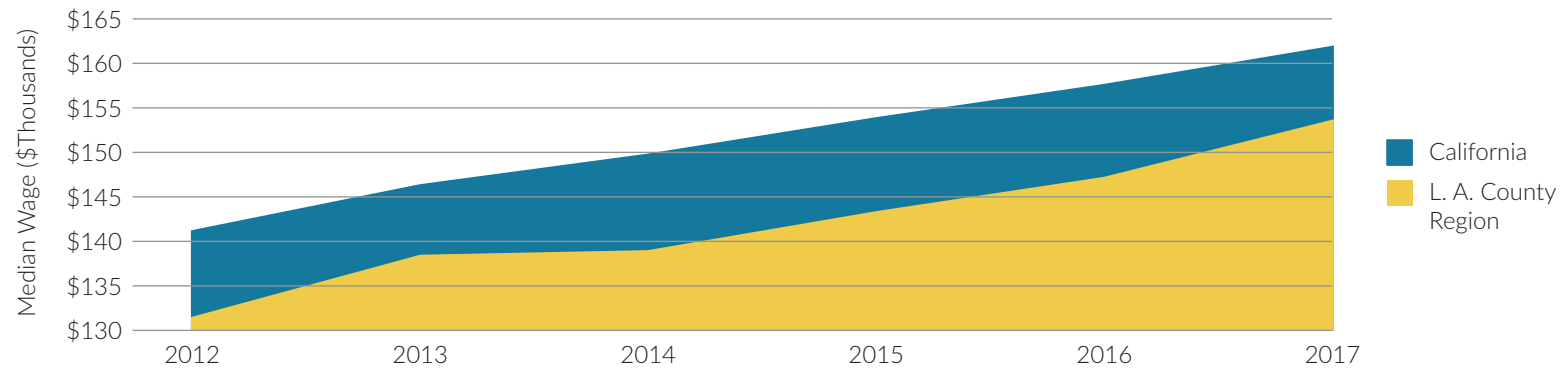
TARGET OCCUPATION 14: Computer and Information Systems Managers

WAGES

Median wages for Computer and Information Systems Managers saw a consistent rise between 2012 and 2017. Over the five-year period, wages in the County of Los Angeles increased by 16.9%, reaching \$153,530 in 2017. Median wages for Computer and Information Systems Managers remain higher in California, yet growth was slower between 2012 and 2017, where the state saw an increase of 14.7% as the median wage reached \$161,830.



MEDIAN WAGE: Computer and Information Systems Managers, 2012–2017

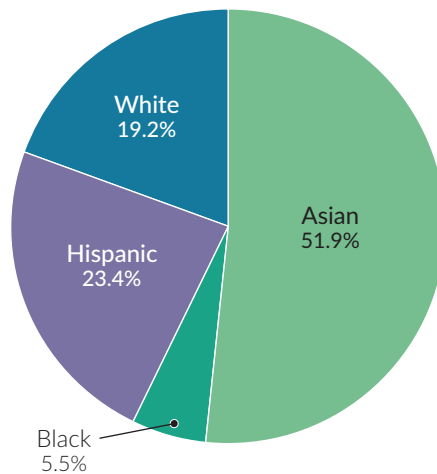


Source: Bureau of Labor Statistics; Analysis by Beacon Economics

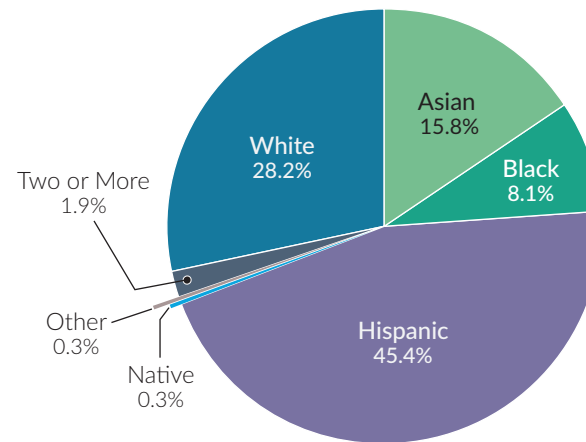
DEMOGRAPHICS: Ethnic/Racial Composition

Computer and Information Systems Managers encompasses a diverse array of workers: 51.9% are Asian, 23.4% are Hispanic, 19.1% are White, and 5.5% are Black. This does not reflect the makeup of the county workforce (employed civilians aged 16 and over). The breakdown there is: Hispanic (45%), White (28.2%), Asian (15.8%) and Black (8.1%).

L.A. COUNTY REGION: Computer and Information Systems Managers,
Ethnic/Racial Composition, 2017



L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (14–20)

TARGET OCCUPATION 14: Computer and Information Systems Managers

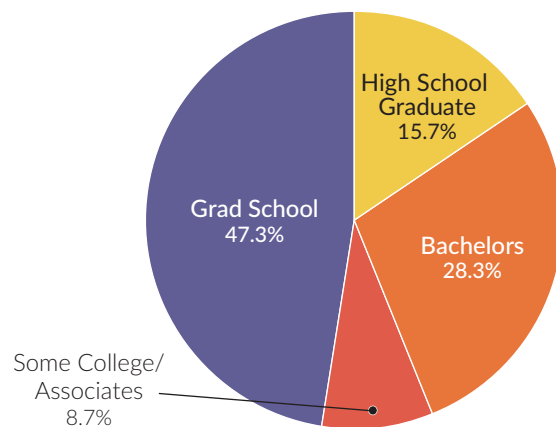
DEMOGRAPHICS: Educational Attainment

The range of educational attainment for Computer and Information Systems Managers varies from graduate degree to high school diploma. Employees with a graduate degree make up the largest portion (47.3%), with bachelor's degree holders at 28.3%, high school graduates at 15.7%, and some college/associate degree at 8.7%. The diverse range of educational attainment is likely a result of increasing educational requirements for employment in the profession.

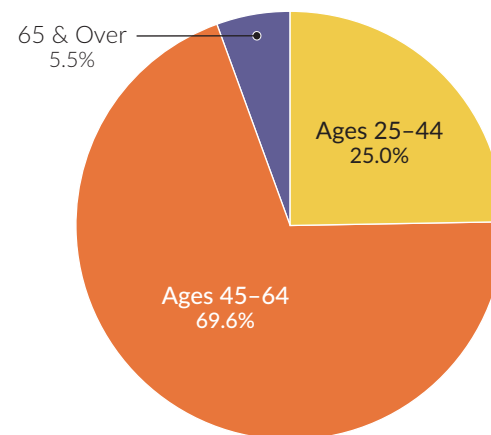
DEMOGRAPHICS: Age Breakdown

An overwhelming majority of Computer and Information Systems Managers (roughly 65%) fall into the 45 to 64 age bracket. Of the remainder, 25% are between 25 and 44, and 5% are 65 and older. This will impact retirement projections. As noted in data by the Department of Human Resources, up to 9.7% of Computer and Information Systems Managers in the L.A. County Health Departments are expected to retire within less than three years.

L.A. COUNTY REGION: Computer and Information Systems Managers,
Educational Attainment, 2017



L.A. COUNTY REGION: Computer and Information Systems Managers,
Age Distribution, 2017

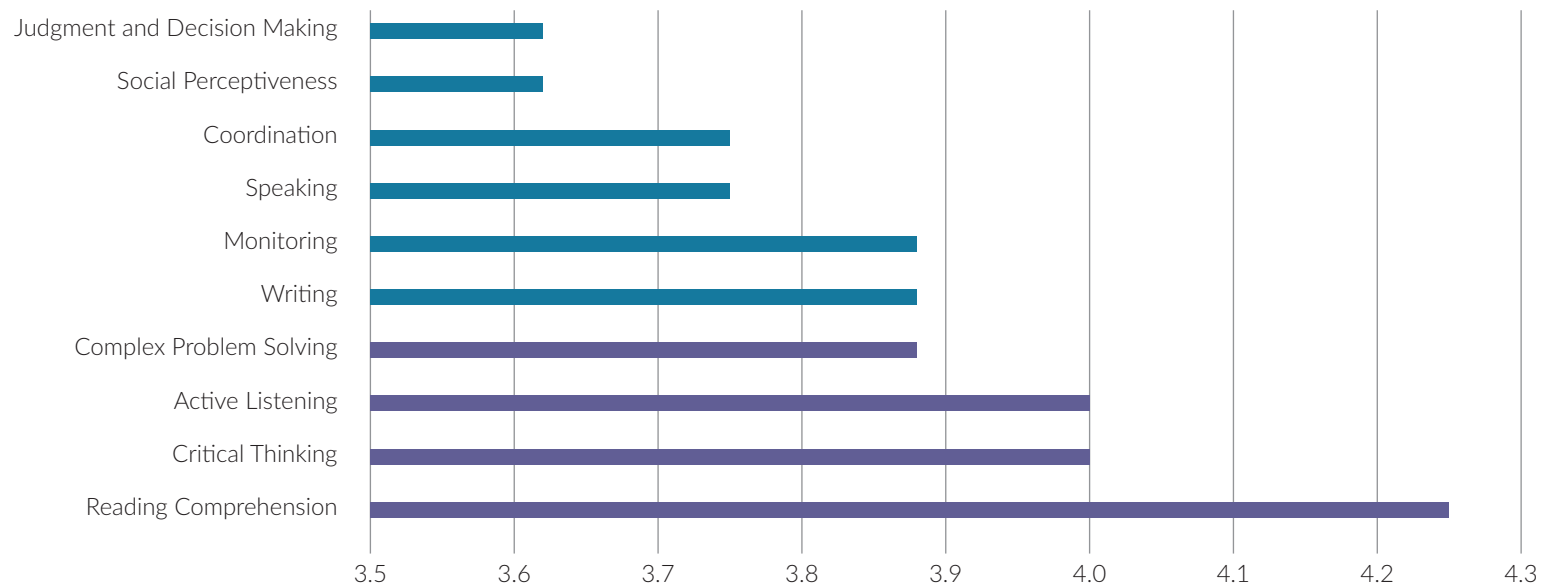


Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

Computer and Information Systems Managers analyze their department's computer needs, assess upgrades and plan and direct installation of hardware and software. As such, while problem solving, critical thinking and active listening are important, by far the most highly rated skill is reading comprehension.

NATIONAL: Computer and Information Systems Managers, Importance of Skill (Scale of 1-5)



Source: O*NET; Analysis by Beacon Economics

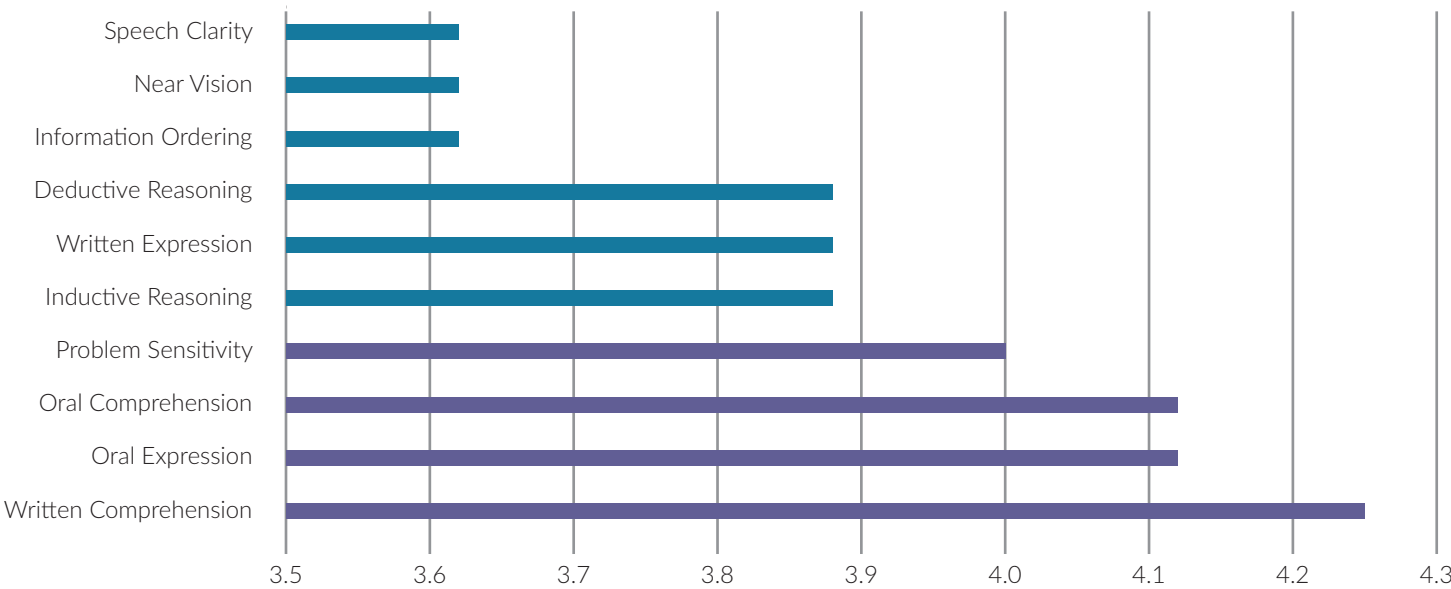
OPPORTUNITY OCCUPATIONS (14-20)

TARGET OCCUPATION 14: Computer and Information Systems Managers

ABILITIES

As above, while other attributes (problem sensitivity, oral comprehension, oral expression) are valuable in a Computer and Information Systems Manager, written comprehension is the highest rated ability by a considerable margin..

NATIONAL: Computer and Information Systems Managers, Highest Rated Abilities (Scale of 1-5)



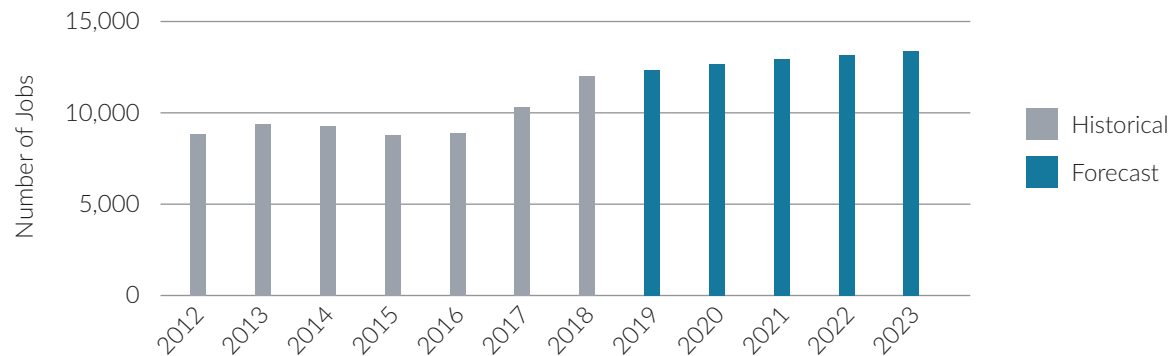
Source: O*NET; Analysis by Beacon Economics

FORECAST: Computer and Information Systems Managers

Employment for Computer and Information Systems Managers has been growing at a solid clip, both nationally and locally. Total employment increased 16.7% between 2012 and 2017 in the County of Los Angeles, slightly behind the 18.1% national rate. Employment had moved sideways until recent years, and Beacon Economics believe that solid employment gains are likely to continue in the near term. At the national level, the Bureau of Labor Statistics projects that employment in this occupation will grow at a faster rate compared to the average for all occupations. This is in line with our current projections, which call for sustained

growth in the near term of close to 2% per year on average. This is slightly above California EDD projections⁷, but Beacon Economics expect demand to remain strong as firms increasingly expand their operations to digital platforms. The prospects for growth are further supported by the need to strengthen cybersecurity. The L.A. County Health Departments have budgeted 65 positions within this occupation, with minimal vacancies at the time of writing. The weighted-average turnover rate for classification codes within this occupational grouping is 4.05%, and internal retirement projections are less than 10%.

PROJECTIONS: Computer and Information Systems Managers, LA County Region, 2012 to 2023



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

⁷ A general point to note: The California EDD provides occupational projections between 2016 and 2026, whereas Beacon Economics have made projections for the forecast period from 2019 to 2023. To compare apples to apples, we're comparing the average rate of growth over each time period. In general, our projections tend to be a little higher because we're looking at a shorter time horizon, and longer-term projections have a wider confidence interval in the later years of the forecast horizon, which translates into less certainty around point estimates the further you're looking out. What's more, longer-term projections do not assume (and rightly so) that there will be a downturn over the forecast period. The result is less slack in the labor market, which in turn reduces the amount of labor available and therefore leads to lower growth rates as the time horizon gets larger. The end result is that, in general, our forecasts will have higher rates of average growth because our time horizon is shorter and growth rates for employment tend to decay as the number of forecast periods get larger.

15

Nursing Assistants

SOC CODE 31-1014

DEPARTMENTAL EXPOSURE

- Department of Health Services: 100%

All positions for Nursing Assistants in the L.A. County Health Departments are found in the Department of Health Services (DHS).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	32,430
Employment Growth 2012-2017	2.3%
Wages	\$29,350
Wages Growth 2012-2017	9.0%

L.A. HEALTH DEPARTMENTS

Budgeted Positions 2019	2,339
Growth in Budgeted Positions 2014-2019	68.2%

Illustrative Classification Examples

Clinic Nursing Attendant, I-II
Unit Support Assistant
Nursing Attendant, I-III

EMPLOYMENT

In 2017, Nursing Assistants accounted for 2,339 budgeted positions in the L.A. County Health Departments, of which 2,039 were filled. Department of Health Services accounted for all the positions, with 100% allocation of Nursing Assistants*. The Department of Health Services' total budgeted positions were 20,013 in 2017, 11.7% of which were accounted for by Nursing Assistants. Furthermore, Nursing Assistants made up 9.2% of the total budgeted occupations for the L.A. County Health Departments overall. In contrast, the share of Nursing Assistants to the total extender occupation count for L.A. County was 3.2% in 2017, while California's was 2.6%, with both regions falling lower than the L.A. County Health Departments's share.

The turnover rate for Nursing Assistants was 6.2% in 2017, slightly higher than the 5.6% mean turnover rate for the Department of Health Services as a whole.

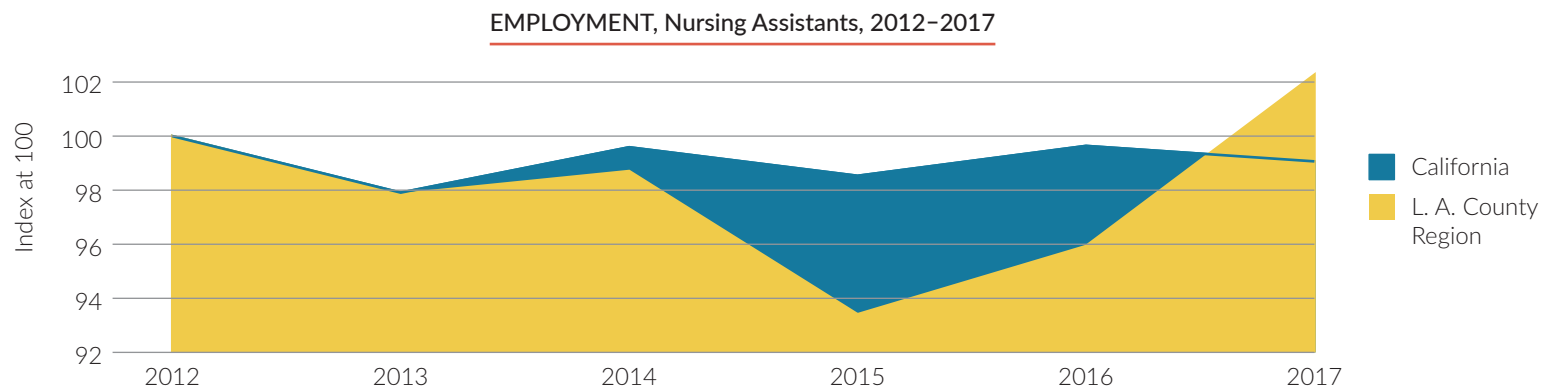
Nursing Assistants have one of the highest shares to total

occupations in the L.A. County Health Departments, specifically the Department of Health Services. The trend in the County of Los Angeles and California falls behind with regards to employment of Nursing Assistants relative to total occupations.

Between 2012 and 2017, employment for Nursing Assistants grew by 2.3% in the County of L.A – increasing from 31,710 positions to 32,430 within that time frame. In contrast, California's employment of Nursing Assistants has dropped by 0.9%, falling from 99,500 occupations to 98,570 between 2012 and 2017.

Nursing Assistant employment in the County of Los Angeles fell briefly between 2014 and 2015, before picking up and showing strong growth over the past two years. The County of Los Angeles' average year over year growth between 2012 and 2017 was 0.5% for Nursing Assistants, higher compared to the statewide average of -0.2%.

* 150+ Nursing Assistant vacancies were purposely held open for a program with WDACS to train County Clients to become CNAs. Those vacancies have been filled as of the writing of this analysis.



Source: Bureau of Labor Statistics; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (14-20)

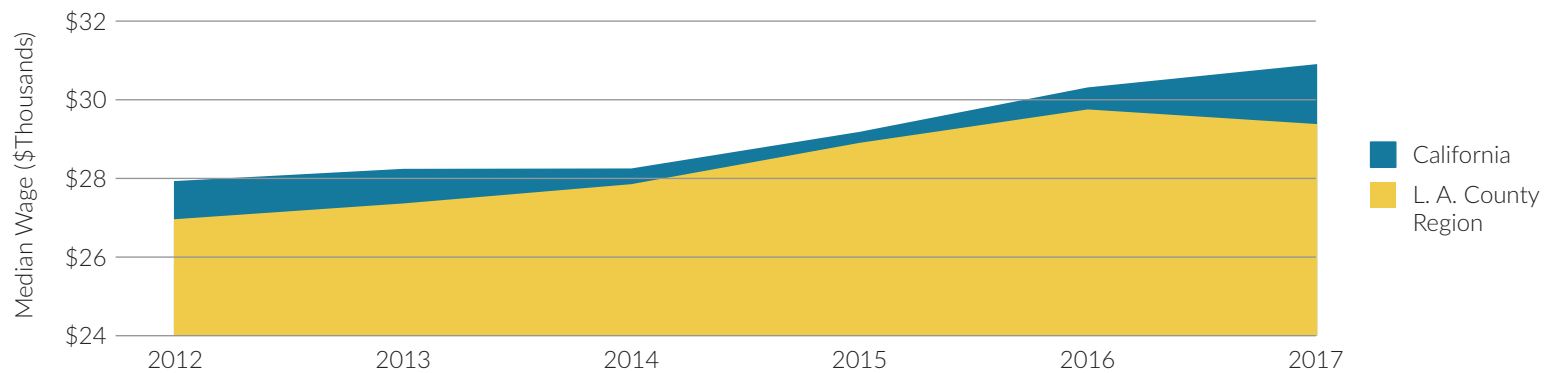
TARGET OCCUPATION 15: Nursing Assistants

WAGES

Median wages for Registered Nurses have run parallel to the occupation's statewide median over the past few years. In 2017, the median wage for Nursing Assistants in the County of Los Angeles reached \$29,350, slightly lower than California's median wage of \$30,870 for the occupation. The County of L.A.'s five-year wage growth was 9.0% between 2012 and 2017, while California's was 10.6%.



MEDIAN WAGE: Nursing Assistants, 2012-2017

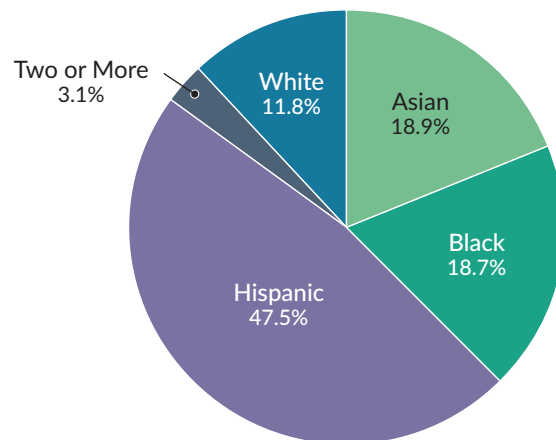


Source: Bureau of Labor Statistics; Analysis by Beacon Economics

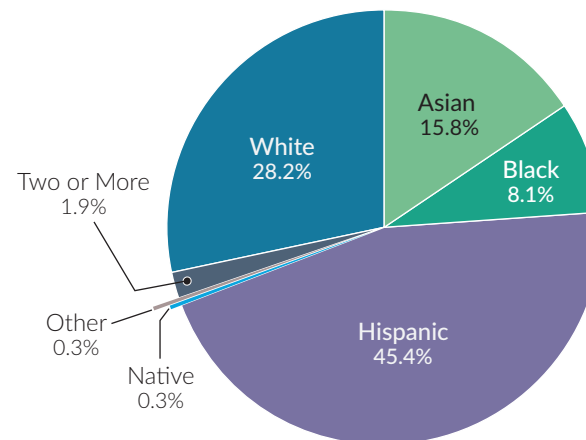
DEMOGRAPHICS: Ethnic/Racial Composition

The racial and ethnic composition of Nursing Assistants in the County of Los Angeles reflects certain aspects of the county's total labor pool (residents aged 16 and over). The majority of Nursing Assistants (48%) are Hispanic, which closely correlates to the 45% of Hispanics in the County of Los Angeles workforce. Black and Asians make up 18.7% and 18.9% respectively of the county Nursing Assistants. Corresponding figures in the county labor pool are Black (8.1%) and Asian (15.8%).

L.A. COUNTY REGION: Nursing Assistants,
Ethnic/Racial Composition, 2017



L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

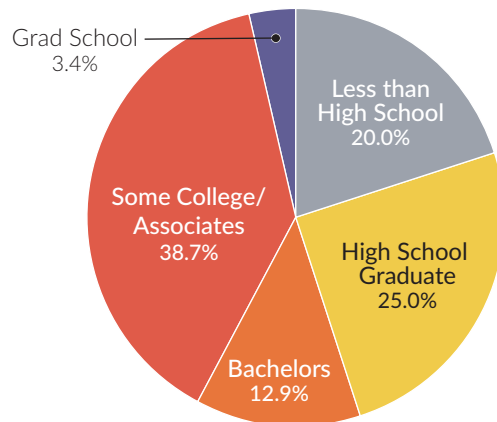
OPPORTUNITY OCCUPATIONS (14–20)

TARGET OCCUPATION 15: Nursing Assistants

DEMOGRAPHICS: Educational Attainment

The level of education for Nursing Assistants in the County of Los Angeles varies greatly. In 2017, 39% of Nursing Assistants had some college or an associate degree, 12.9% had a bachelor's degree, while 3.4% had a graduate degree. High school graduates accounted for 25% of the occupation, while those without a high school diploma accounted for 20%.

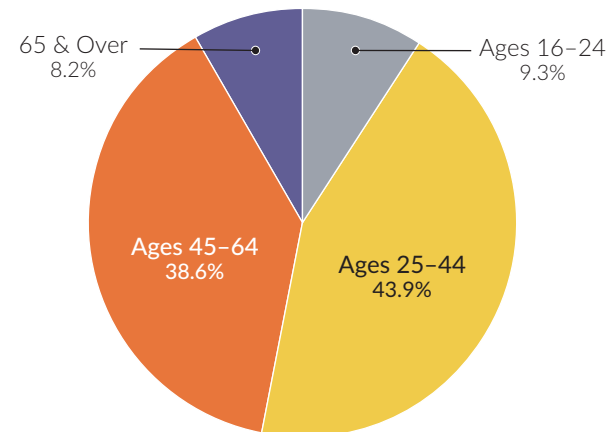
L.A. COUNTY REGION: Nursing Assistants,
Educational Attainment, 2017



DEMOGRAPHICS: Age Breakdown

The majority of Nursing Assistants in the County of Los Angeles (43.9%) are between the ages 25 and 44; those aged 45 to 64 account for 38.7%. There are opportunities for younger people in the occupation, with 9.3% of Nursing Assistants aged 16 to 24. Older workers comprise the smallest number of employees, with only 8.2% of Nursing Assistants aged 65 and older.

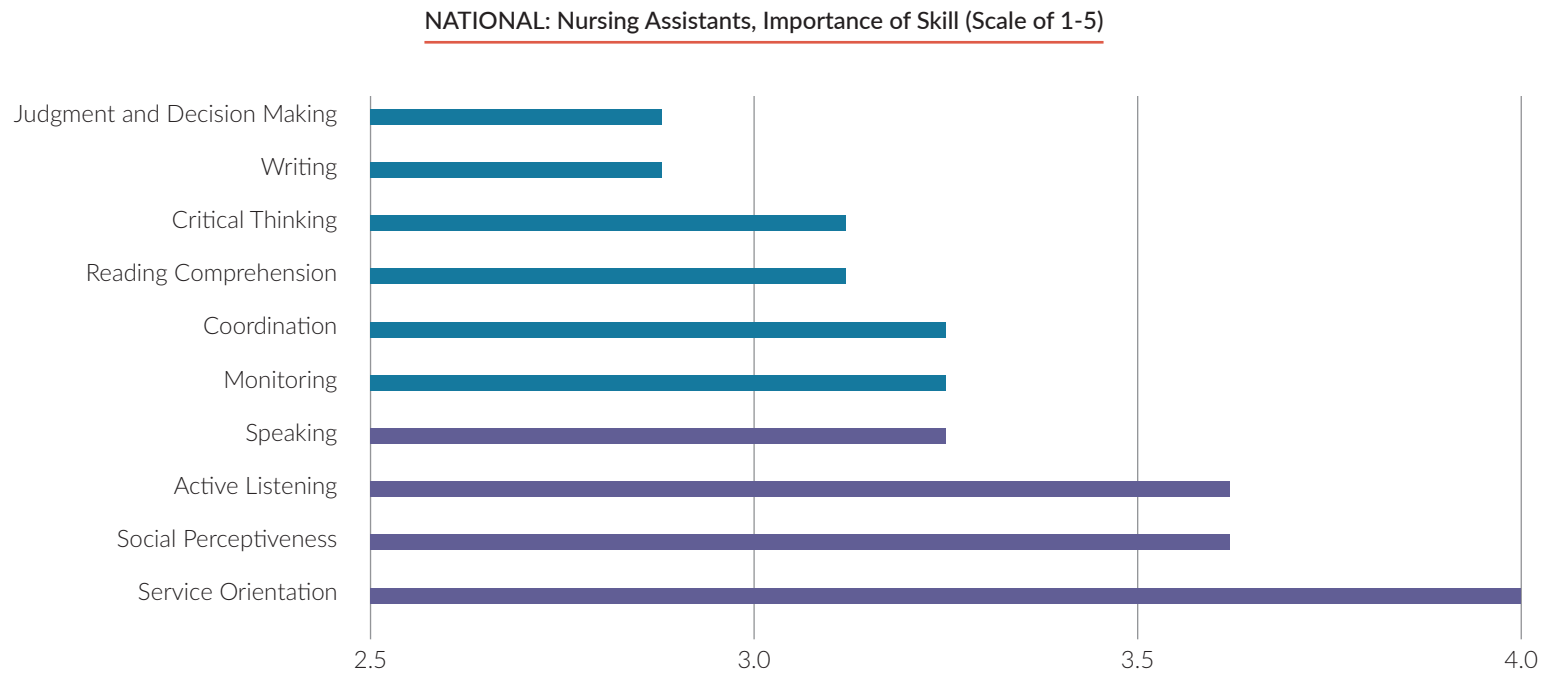
L.A. COUNTY REGION: Nursing Assistants,
Age Distribution, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

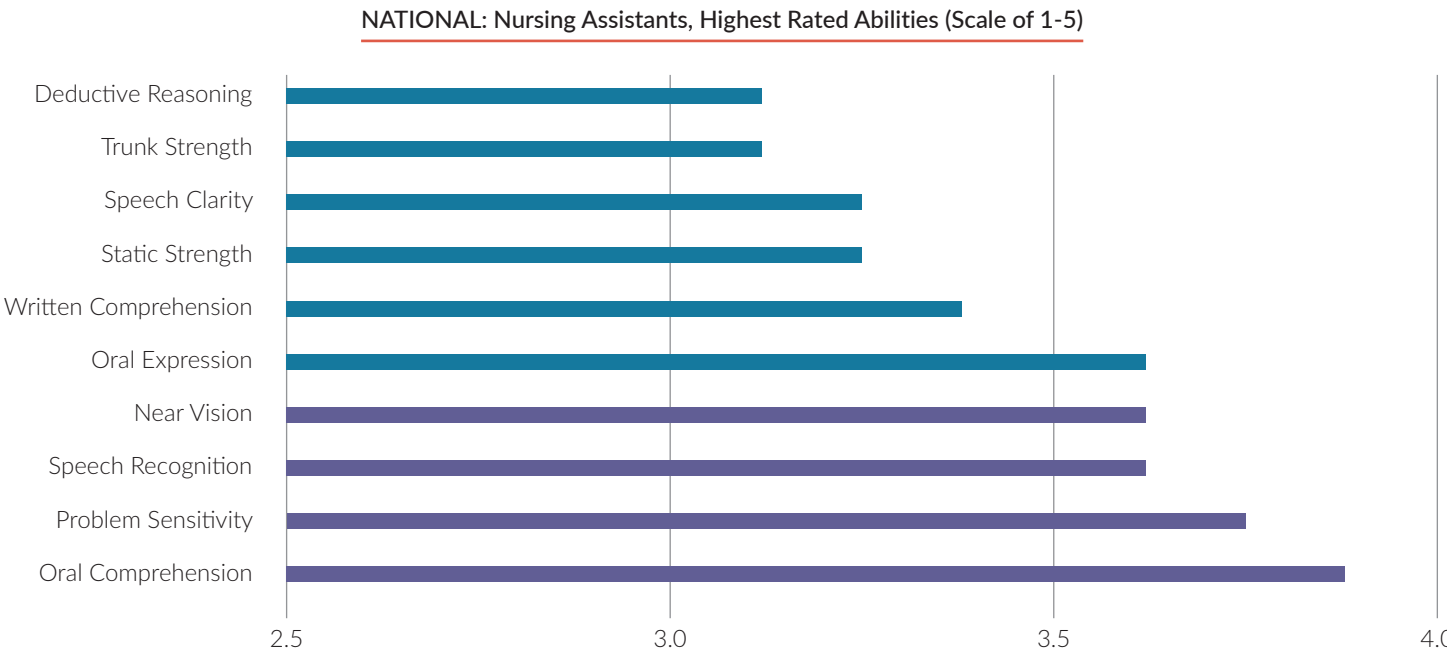
Nursing Assistants provide basic care to patients and assist them in daily activities they may find difficult to perform on their own. As such, service orientation tops the list of important skills, closely followed by social perceptiveness and active listening.



Source: O*NET; Analysis by Beacon Economics

ABILITIES

Given that a Nursing Assistant's primary duty is to provide basic care to patients, it's no surprise that oral comprehension and problem sensitivity are the occupation's most highly valued abilities.



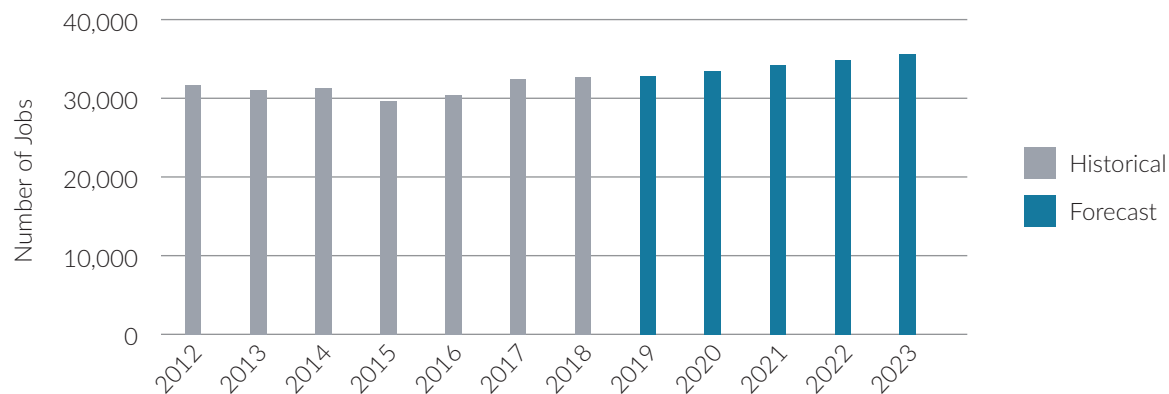
Source: O*NET; Analysis by Beacon Economics

FORECAST: Nursing Assistants

In line with our projections for Registered Nurses (and for similar reasons outlined in our outlook for Registered Nurses), Beacon Economics forecast Nursing Assistants occupational employment to grow at a steady pace, totaling roughly 35,650 in the County of Los Angeles by 2023. We have reason to believe that there will be a similar shortfall to that of Registered Nurses in this occupation, based on projections of the county's ageing population. At the time of writing, there were over 100 vacant positions in the L.A. County Health Departments. Note that this does not include the 150+ Nursing Assistant vacancies purposely held open for a program to train County Clients to become CNAs. Those vacancies

have been filled as of the writing of this analysis. One area of concern is the median wage that Nursing Assistants earned in the County of Los Angeles. According to the Occupational Employment Statistics, a Nursing Assistant in the County of Los Angeles earned an annual median wage that was 6.6% higher than the national median. Compare that to Registered Nurses, who earned a median annual income 37% above the national median. Economic theory suggests that increases in wages will lead to increases in the supply of workers, and the low wage that Nursing Assistants earn should be of concern to those responsible for filling the vacant positions.

PROJECTIONS: Nursing Assistants, LA County Region, 2012 to 2023



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

16

Medical Records and Health Information Technicians

SOC CODE 29-2071

DEPARTMENTAL EXPOSURE

- Department of Health Services (DHS): 91.5%
- Department of Public Health (DPH): 8.5%

Medical Records and Health Information Technicians are predominantly employed in the L.A. County Health Department of Health Services (DHS). A minority are employed at the Department of Public Health (DPH).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	6,420
Employment Growth 2012–2017	28.7%
Wages	\$40,560
Wages Growth 2012–2017	12.4%

L.A. HEALTH DEPARTMENTS

Budgeted Positions 2019	366
Growth in Budgeted Positions 2014–2019	8.3%

Illustrative Classification Examples

Public Health Registrar
Health Information Associate
Medical Electronics Technician

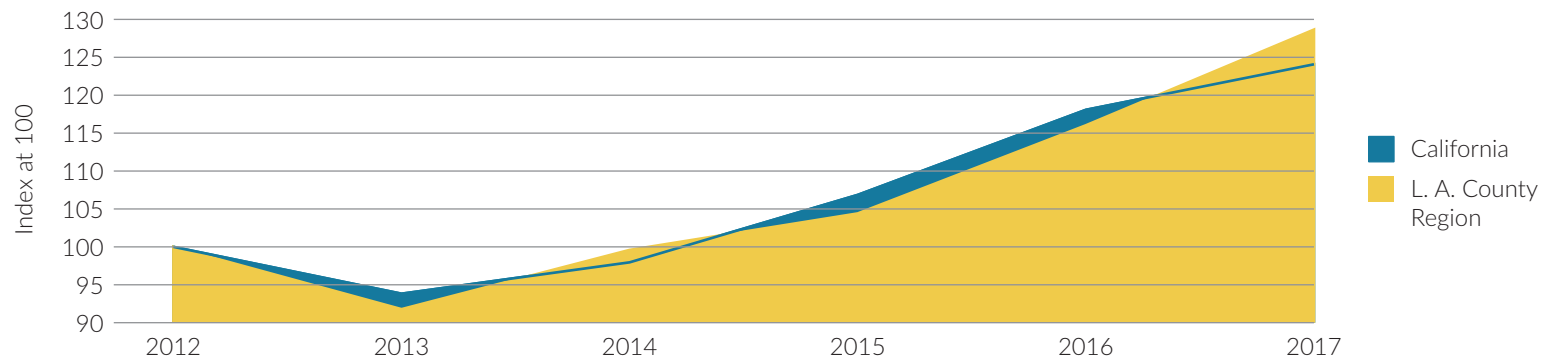
EMPLOYMENT

Medical Records and Health Information Technicians have 276 filled positions and 366 budgeted positions overall at the L.A. County Health Departments. the County of Los Angeles has 6,420 Medical Records and Health Information Technicians in various industries. The share of Medical Records and Health Information Technicians to total extender occupations is slightly lower county- and statewide compared to the L.A. County Health Departments. For the Departments, Medical Records and Health Information Technicians account for 1.4% of total extender occupations, while countywide the share is 0.6%, as it is for California overall. Although the Department of Health Services accounts for 335 of the 366 budgeted positions, the share of Medical Records and Health Information Technicians to total extender occupations in the Department is 1.7%, slightly higher than that of the L.A. County Health Departments.

Overall, the L.A. County Health Departments, the County of L.A. and California have low shares of Medical Records and Health Information Technicians relative to total extender occupations. The Department of Health Services also has a small share, despite having a higher ratio when compared to the L.A. County Health Departments.

Employment for Medical Records and Health Information Technicians has been on an upward trend since 2013 in both California and the County of Los Angeles. Between 2012 and 2017, employment for the County of Los Angeles' Medical Records and Health Information Technicians increased by 28.7%, from 4,990 workers to 6,420. California's five-year employment growth was slightly weaker, with a growth rate of 24.1% between 2012 and 2017. The upswing is probably due to this sector's move to digitize records and information.

EMPLOYMENT, Medical Records and Health Information Technicians, 2012-2017



Source: Bureau of Labor Statistics; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (14–20)

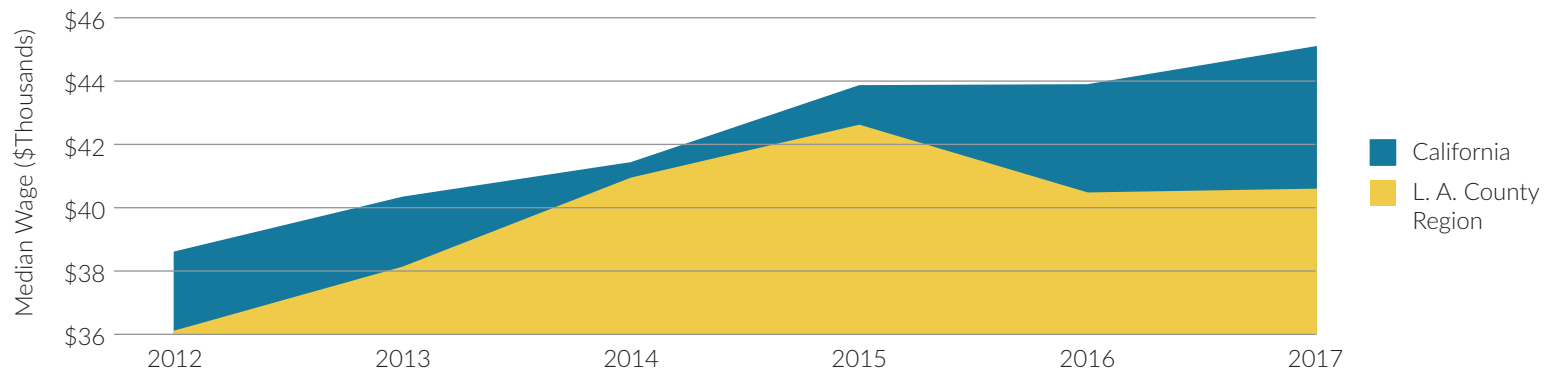
TARGET OCCUPATION 16: Medical Records and Health Information Technicians

WAGES

Median wages for Medical Records and Health Information Technicians in the County of Los Angeles have remained lower than California's, at \$40,560 compared to \$45,060. The five-year wage growth in the County of Los Angeles was 12.4% between 2012 and 2017, slightly slower than California's 16.8% for the same period. Increased wages and employment indicates that demand for workers in this occupation has been consistently increasing over the five-year period.



MEDIAN WAGE: Medical Records and Health Information Technicians, 2012–2017



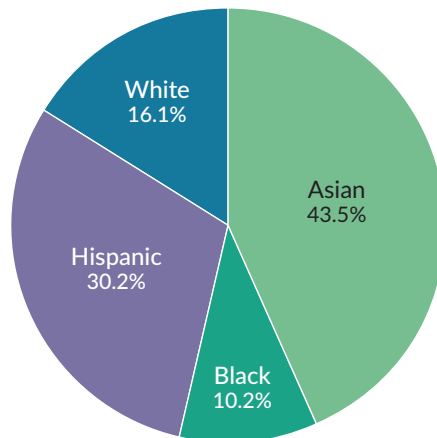
Source: Bureau of Labor Statistics; Analysis by Beacon Economics

DEMOGRAPHICS: Ethnic/Racial Composition

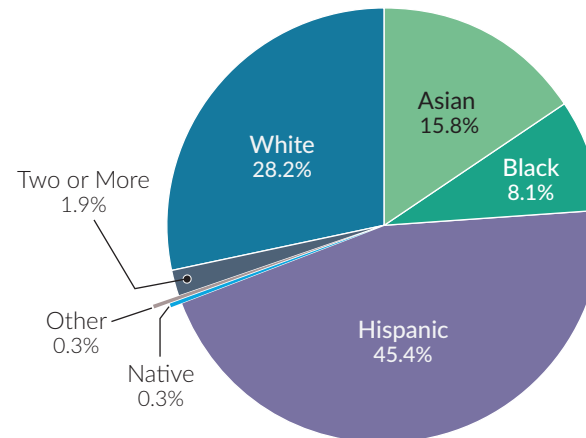
The racial and ethnic makeup of Medical Records and Health Information Technicians diverges slightly from the county workforce. The breakdown is: Asian (43%), Hispanic (30%), White (16.1%) and Black (10.2%).

Figures for the County of Los Angeles workforce as a whole are: Hispanic (45%), White (28.2%), Asian (15.8%), and Black (8.1%).

L.A. COUNTY REGION: Medical Records and Health Information Technicians, Ethnic/Racial Composition, 2017



L.A. COUNTY REGION: Residents Aged 16 and Up, Ethnic/Racial Composition, 2017



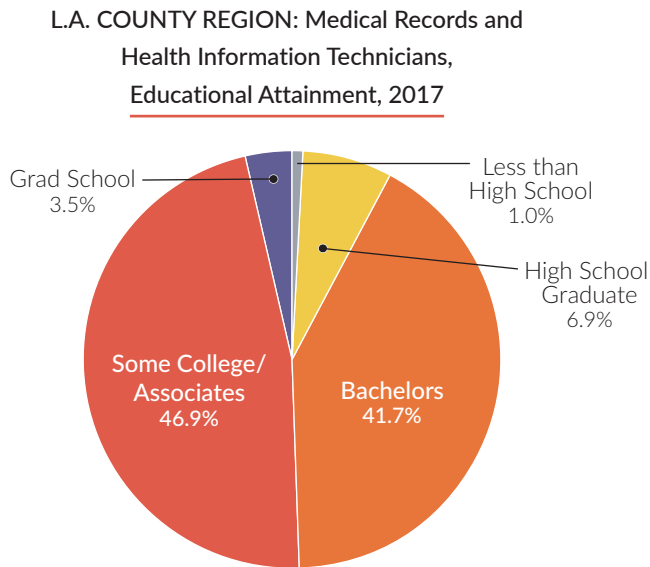
Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (14–20)

TARGET OCCUPATION 16: Medical Records and Health Information Technicians

DEMOGRAPHICS: Educational Attainment

The educational attainments of Medical Records and Health Information Technicians lean heavily towards some college or a bachelor's degree. Holders of an associate degree, or those who have some college experience, account for 46.9%, while those with a bachelor's degree account for 41.7%. The remainder are high school graduates (6.9%), graduate degree holders (3.5%), and those without a high school diploma (1.0%).

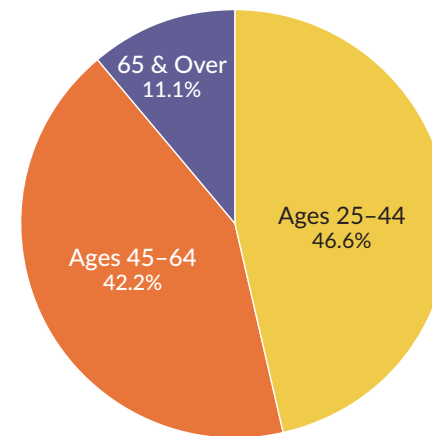


DEMOGRAPHICS: Age Breakdown

Age distribution among Medical Records and Health Information Technicians ranges from 25 to over 65. The largest age group in the County of Los Angeles is 25 to 44, accounting for 46.6% of Medical Records and Health Information Technicians. Employees between the ages of 45 and 64 represent 42.2% of the occupation, while those above the age of 65 represent 11.1%.

Retirement projections for Medical Records and Health Information Technicians in the L.A. County Health Departments suggest that 15.9% are likely to retire within three years or less.

L.A. COUNTY REGION: Medical Records and Health Information Technicians, Age Distribution, 2017

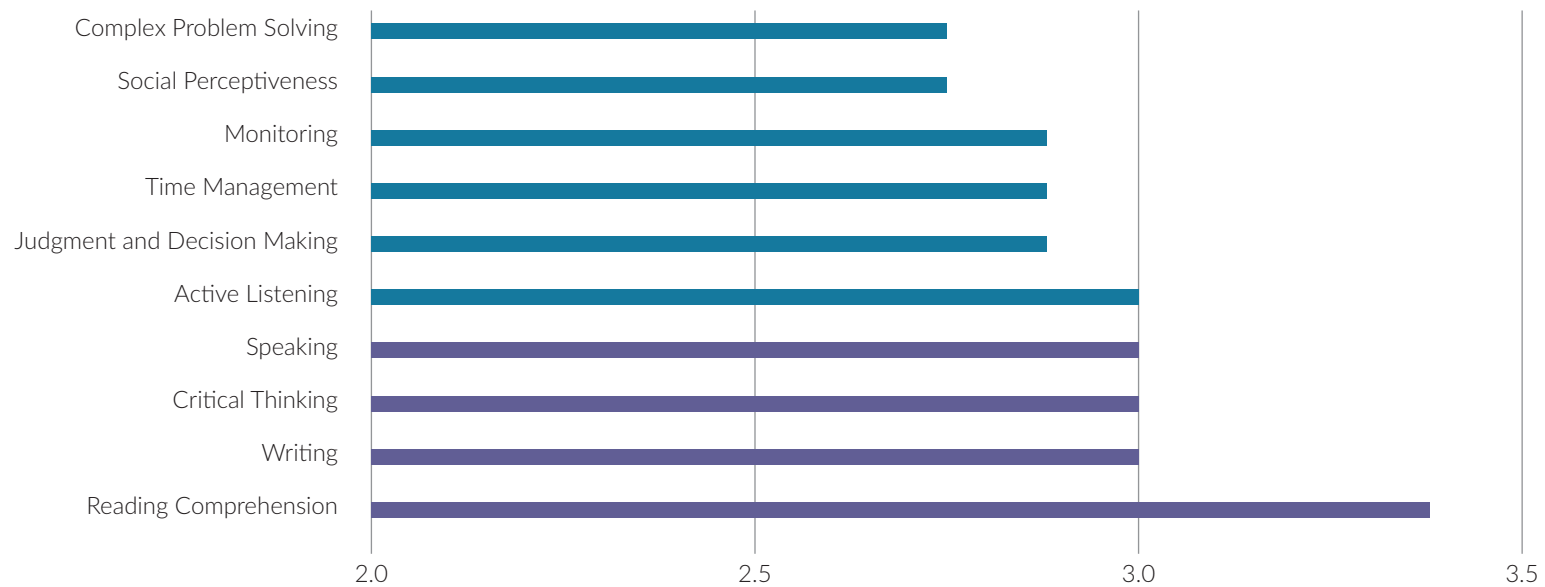


Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

Medical Records and Health Information Technicians manage health information data, maintaining quality, accuracy, accessibility, and security of information in both paper files and electronic systems. Thus, communication, critical thinking, writing and, above all, reading comprehension skills are rated most highly.

NATIONAL: Medical Records and Health Information Technicians, Importance of Skill (Scale of 1-5)



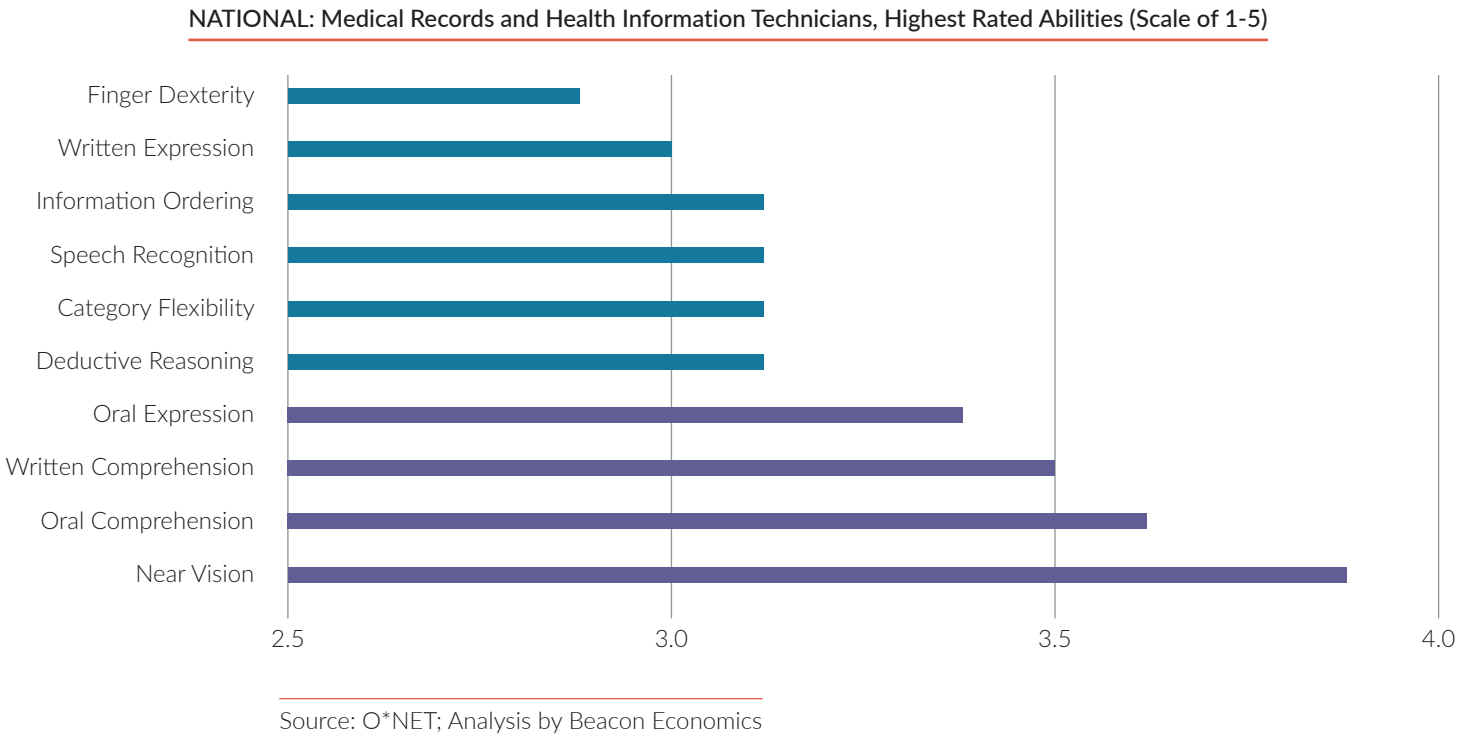
Source: O*NET; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (14-20)

TARGET OCCUPATION 16: Medical Records and Health Information Technicians

ABILITIES

In keeping with the skills that are valued in a Medical Records and Health Information Technician, written comprehension scores highly in terms of abilities, as do oral expression and comprehension. Even so, in reflection of the job’s particular responsibilities, near vision tops the list..

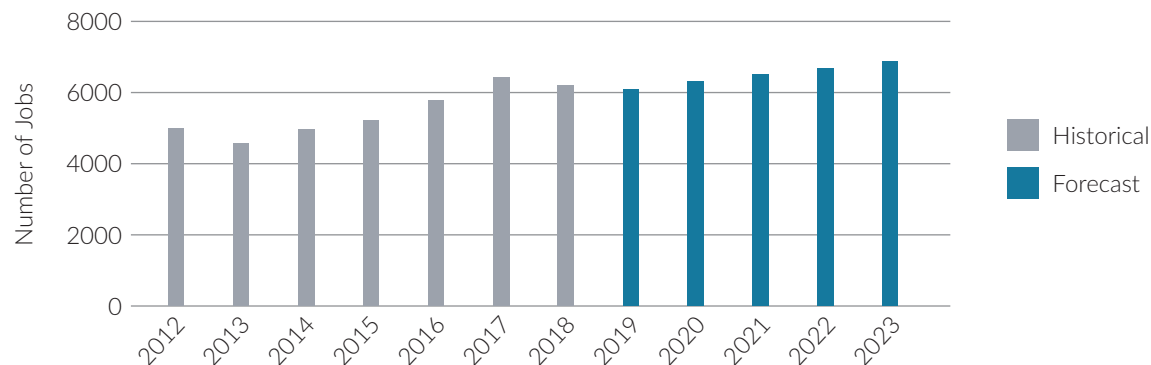


FORECAST: Medical Records and Health Information Technicians

Employment for Medical Records and Health Information Technicians is projected to grow 11% between 2018 and 2023, marginally below our overall rate for total support and extender occupations in our target list. Employment growth in this industry was somewhat muted between 2017 and 2018, but the longer-run trend has seen an increase in employment of 28.7%, more than double the national rate. The widespread use of electronic health records by health care insurance agencies will further support employment opportunities in all areas in the health care industry.

There are a large number of vacant positions in the L.A. County Health Departments. At the time of writing, there were 90 vacant positions (out of 366 budgeted), making it one of the highest ranking occupations in terms of vacancy rates. The good news is that this occupation has a very low turnover rate compared to our target support and extender occupations (ranked 19th), but it boasts an above average (defined here as the median in our list of target occupations) rate of retirement risk in the next three years.

PROJECTIONS: Medical Records and Health Information Technicians, LA County Region, 2012 to 2023



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

17

Word Processors and Typists

SOC CODE 43-9022

DEPARTMENTAL EXPOSURE

- Department of Health Services (DHS): 66.3%
- Department of Mental Health (DMH): 1.4%
- Department of Public Health (DPH): 32.3%

The majority of Word Processors and Typists are found in the Department of Health Services (DHS), and the Department of Public Health (DPH). Less than 2% are employed at the Department of Mental Health (DMH).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	9,620
Employment Growth 2012-2017	-14.2%
Wages	\$47,150
Wages Growth 2012-2017	25.7%

L.A. HEALTH DEPARTMENTS

Budgeted Positions 2019	1,554
Growth in Budgeted Positions 2014-2019	-27.4%

Illustrative Classification Examples

Intermediate Stenographer
Intermediate Typist-Clerk
Senior Typist-Clerk

EMPLOYMENT

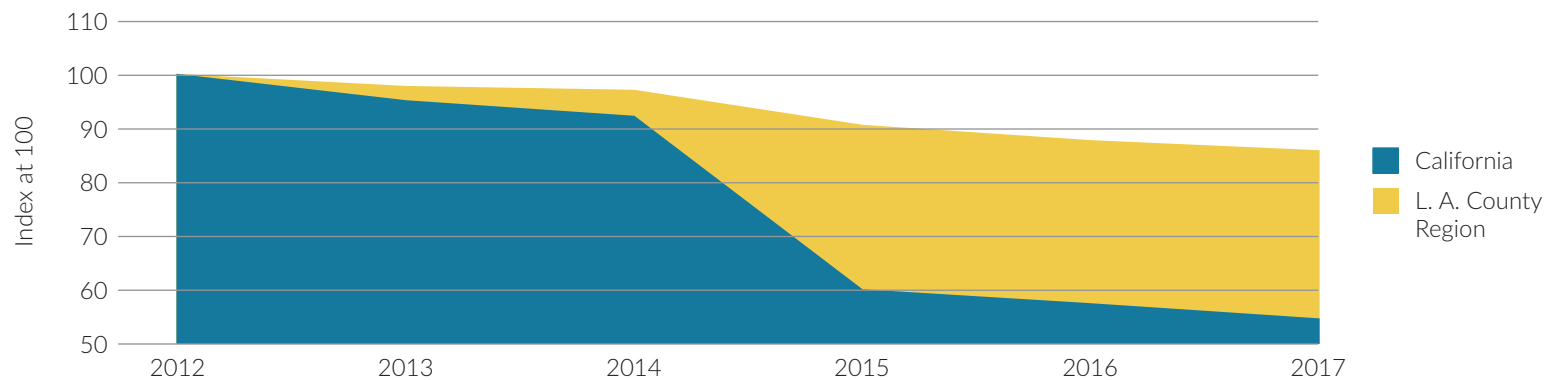
There are 1,554 budgeted positions for Word Processors and Typists at the L.A. County Health Departments, with over 1,300 of them filled. In the County of Los Angeles as a whole, there are approximately 9,620 Word Processors and Typists in all industries. The occupational mix of extender occupations in the L.A. County Health Departments shows that Word Processors and Typists are more dominant in comparison to overall county and state shares. Word Processors and Typists account for 6.1% of total extender occupations in the L.A. County Health Departments, while the share for the County of Los Angeles as a whole is roughly 1.0%. Compared to the state's occupational mix of extender occupations, California's share of Word Processors and Typists is, at 0.4%, lower than both the county overall and the L.A. County Health Departments.

Word Processors and Typists have a higher share of employment

overall in the L.A. County Health Departments when compared to the County of Los Angeles and California, and they are particularly prominent at the Department of Health Services and the Department of Public Health. Recently, DHS and other departments have participated in the PLACE high road employment program to fill typist clerk positions with individuals from target populations.

Employment for Word Processors and Typists saw a decline between 2012 and 2017 in both the County of Los Angeles and California. The County of Los Angeles' employment in Word Processors and Typists has fallen by 14.2% over the past five years, down from 11,210 to 9,620. California's decline was even more severe, with a contraction of 45.5% between 2012 and 2017. Automation and waning demand are almost certainly the cause of this.

EMPLOYMENT, Word Processors and Typists, 2012-2017



Source: Bureau of Labor Statistics; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (14-20)

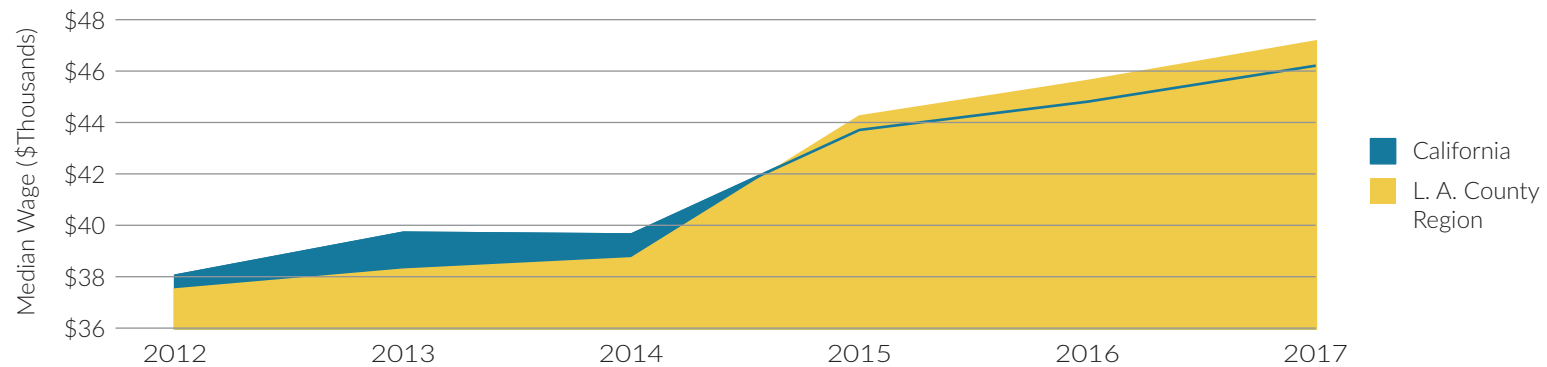
TARGET OCCUPATION 17: Word Processors and Typists

WAGES

In contrast to employment trends, median wages have been on the rise for Word Processors and Typists, likely due to shrinking employment driving median wages up. The median wage for Word Processors and Typists grew by 25.7% between 2012 and 2017, reaching \$47,150. California's wage trend has been similar, growing 21.5% in the same period, with wages reaching \$46,210 in 2017.



MEDIAN WAGE: Word Processors and Typists, 2012-2017

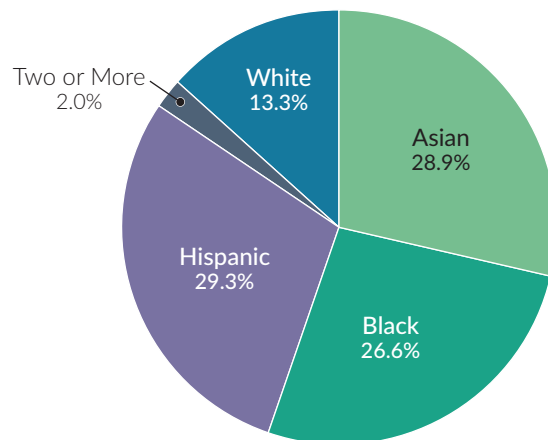


Source: Bureau of Labor Statistics; Analysis by Beacon Economics

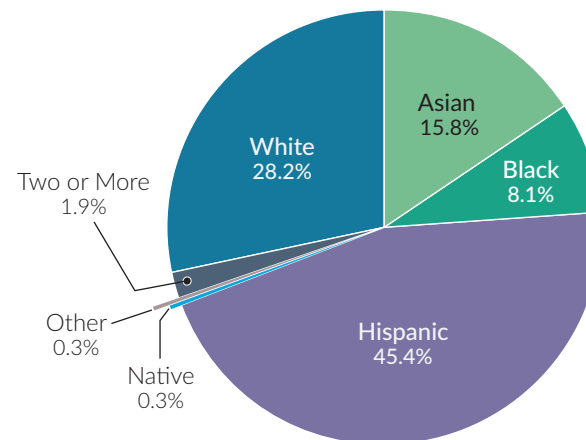
DEMOGRAPHICS: Ethnic/Racial Composition

The racial and ethnic composition of Word Processors and Typists is diverse and differs from that of the County of Los Angeles workforce (employed civilians aged 16 and over). The largest racial and ethnic groups for Word Processors and Typists in the County of Los Angeles is Hispanic (29.3%), followed by Asian (28.9%), and Black (26.6%). In comparison, Hispanics make up 45% of the workforce in the County of Los Angeles, followed by White at 28.2%, Asians at 15.8% and Black at 8.1%.

L.A. COUNTY REGION: Word Processors and Typists,
Ethnic/Racial Composition, 2017



L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (14–20)

TARGET OCCUPATION 17: Word Processors and Typists

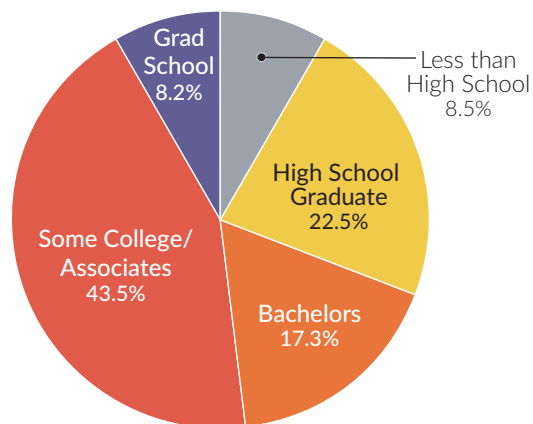
DEMOGRAPHICS: Educational Attainment

Educational attainment of Word Processors and Typists varies widely, ranging from high school diploma to graduate degree. The most common education level for Word Processors and Typists is some college or an associate degree (43.5%). High school graduates comprise 22% of Word Processors and Typists, bachelor's degree holders account for 17.3%, while graduate degree holders account for 8.2%.

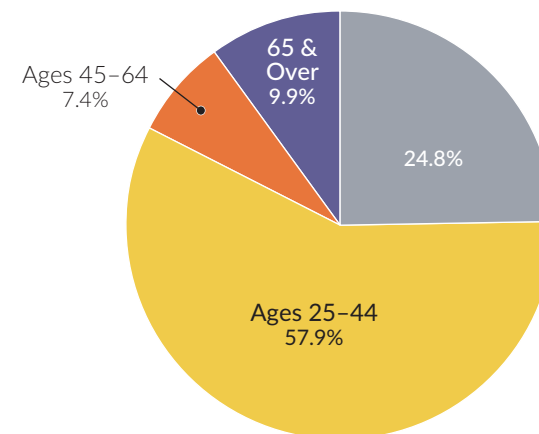
DEMOGRAPHICS: Age Breakdown

The majority of Word Processors and Typists in the County of Los Angeles (57.9%) are between the ages of 25 and 44. There are a considerable number of younger workers in the occupation, with around 25% in the 16 to 24 age bracket. This is likely due to the less restrictive educational requirements for the position. The share of Word Processors and Typists aged 65 and over is 9.9%. As such, retirement projections from the Department of Human Resources indicate that 14.4% of Word Processors and Typists in the L.A. County Health Departments are likely retire in three years or less.

L.A. COUNTY REGION: Word Processors and Typists,
Educational Attainment, 2017



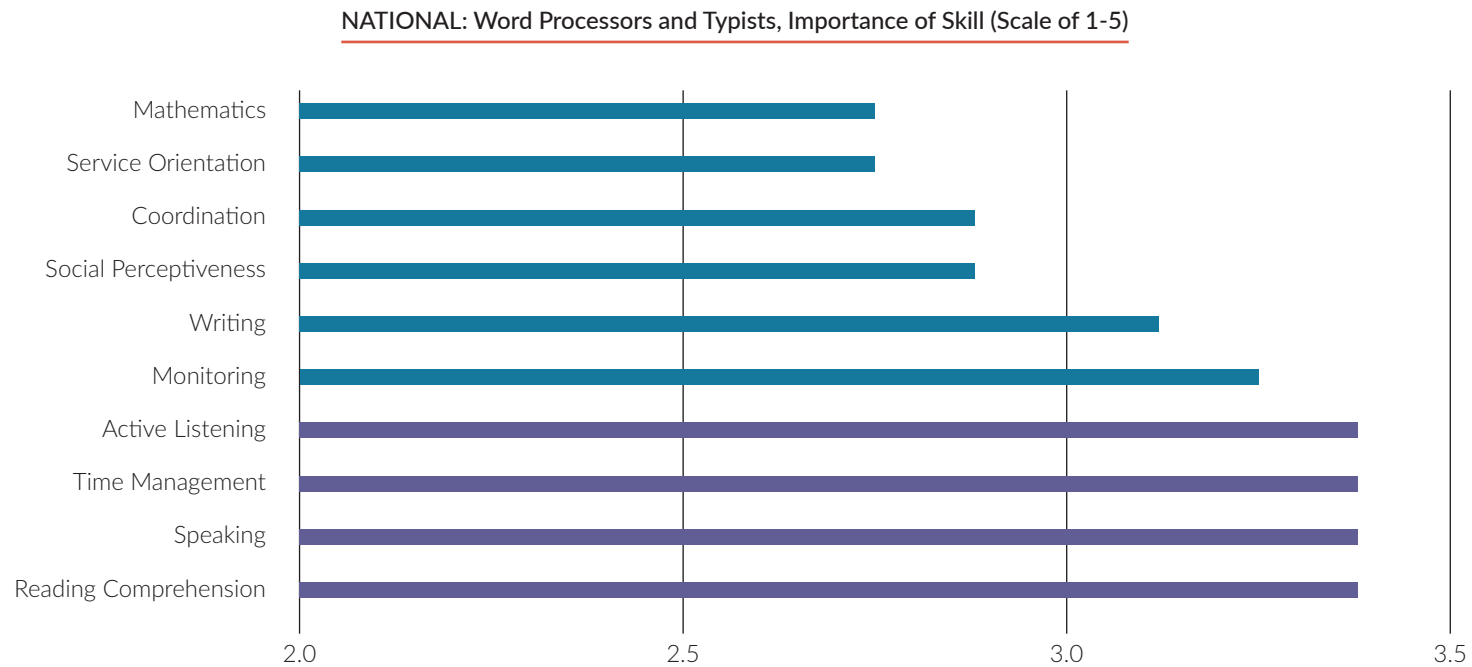
L.A. COUNTY REGION: Word Processors and Typists,
Age Distribution, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

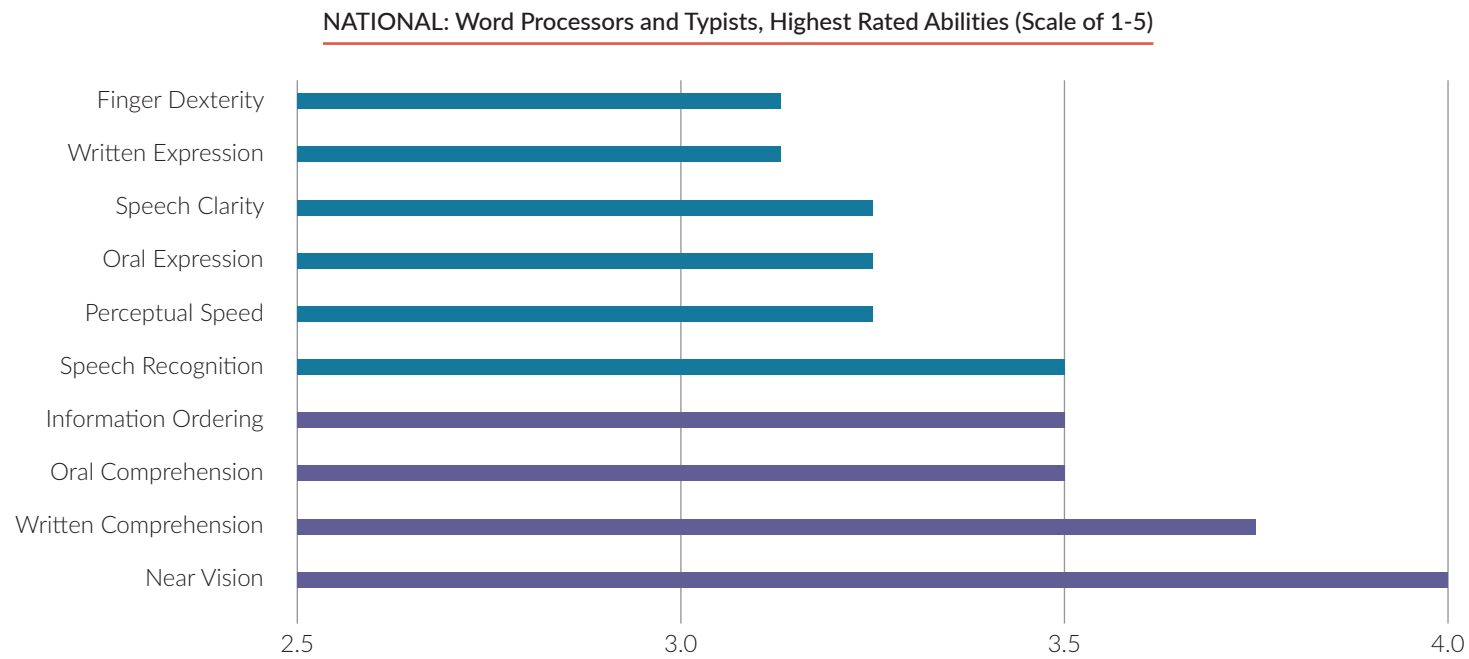
The responsibilities of a Word Processor and Typist entails transcribing letters, reports and other material as well as certain clerical responsibilities. As such, the skills required rely heavily on organization, attention to detail, writing, and communication.



Source: O*NET; Analysis by Beacon Economics

ABILITIES

In correlation with the skills listed above, the most highly rated abilities for Word Processors and Typists lean towards organization, and oral and written comprehension, with near vision topping the list.



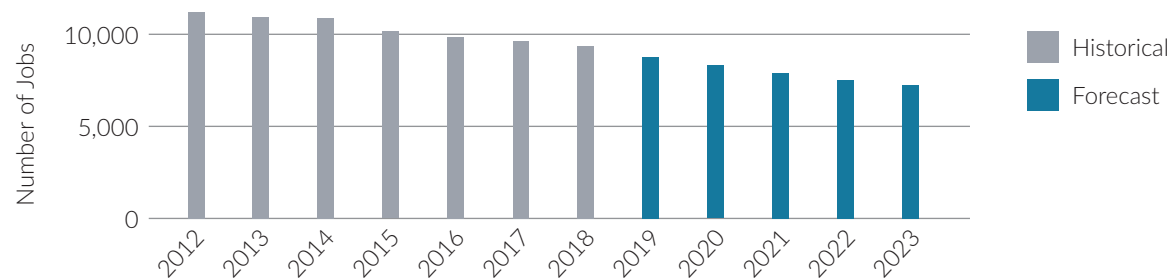
Source: O*NET; Analysis by Beacon Economics

FORECAST: Word Processors and Typists

The employment outlook for Word Processors and Typists is the gloomiest of our target support and extender occupations. The broader trend in the industry has been a steady decline at both the local and national level. In addition, Beacon Economics' projections are more pessimistic than those provided by the California EDD. At the county level Beacon Economics forecast the number of occupations to drop below 8,000 by 2021, with much of the decline in demand due to technological advances such as speech recognition software. The extent to which automation will replace jobs is still speculative at this point, but researchers have made efforts to quantify the probability of computerization for a given occupation, and Word Processors and Typists have an estimated probability of 81%.⁸

Occupations that are at heightened risk of automation tend to experience more severe declines during economic recessions. In more stable times, when the economy is expanding, firms are concerned more with market share than cost savings, but when a recession hits they are forced to cut costs, which typically means adopting cost-saving technology (this is why industries like manufacturing have had such weak recoveries in the last three decades). While Beacon Economics will not assume there is a recession on the horizon, these are important factors to consider for the future. Despite some strong headwinds, the L.A. County Health Departments has 252 vacancies in this occupational grouping, the third highest amongst our 20-target support and extender occupations. Note that there are hiring delays associated with Typist Clerks because all L.A. County departments typically hire from the same eligible lists.

PROJECTIONS: Word Processors and Typists, LA County Region, 2012 to 2023



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

⁸ Frey, Carl Benedikt, and Michael A. Osborne. "The future of employment: how susceptible are jobs to computerisation?." Technological forecasting and social change 114 (2017): 254-280.

18

Management Analysts

SOC CODE 13-1111

DEPARTMENTAL EXPOSURE

- Department of Health Services (DHS): 18.9%
- Department of Mental Health (DMH): 55.2%
- Department of Public Health (DPH): 25.9%

Management Analysts are spread over three departments in the L.A. County Health Departments. The Department of Mental Health (DMH) accounts for the largest portion, followed by the Department of Public Health (DPH) and the Department of Health Services (DHS).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	21,290
Employment Growth 2012-2017	30.9%
Wages	\$84,490
Wages Growth 2012-2017	1.1%

L.A. HEALTH DEPARTMENTS

Budgeted Positions 2019	297
Growth in Budgeted Positions 2014-2019	53.9%

Illustrative Classification Examples

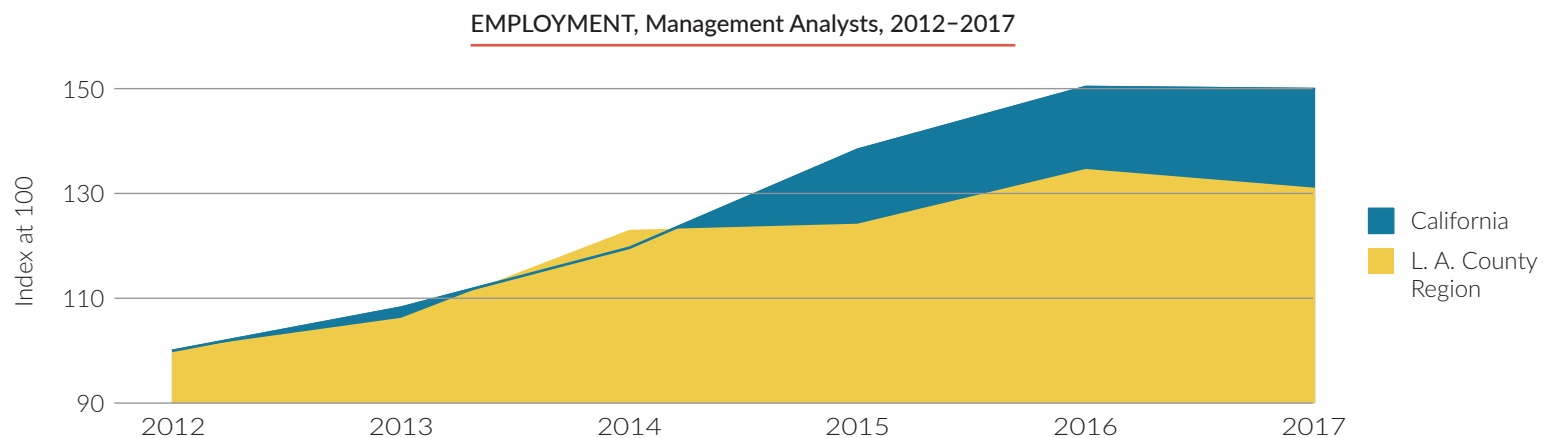
Management Analyst
Health Program Analyst, I-III

EMPLOYMENT

There are 297 budgeted positions for Management Analysts in the L.A. County Health Departments, 259 of which are filled. The Department of Mental Health accounts for the largest portion of Management Analysts, with 164 budgeted positions. As a share of total extender occupations, the L.A. County Health Departments falls slightly behind that of both the County of Los Angeles as a whole and California. The share of Management Analysts to total extender occupations in the L.A. County Health Departments is 1.1%, while the share for the County of Los Angeles as a whole is 2.1%. California's occupational mix of extender occupations correlates more closely to the County of Los Angeles, with the share of Management Analysts at 2.7%. On a departmental level, the share of Management Analysts to total extender occupations plays a more significant part – especially for the Department

of Mental Health, where Management Analysts comprise roughly 10.1% of total extender occupations.

Employment for Management Analysts saw a positive trend between 2012 and 2017, albeit with a recent slowdown in the County of Los Angeles. In the five-year period, the County of Los Angeles' employment in Management Analysts increased by 30.9%, going from 16,270 employees to 21,290. California has experienced even stronger growths, expanding by 49.9% between 2012 and 2017, with employment topping 102,000 in 2017. The average year over year growth between 2012 and 2017 for the County of Los Angeles has been fairly strong, with a yearly growth of 5.7% for Management Analysts. California's annual average growth has been slightly higher, at 8.1%.



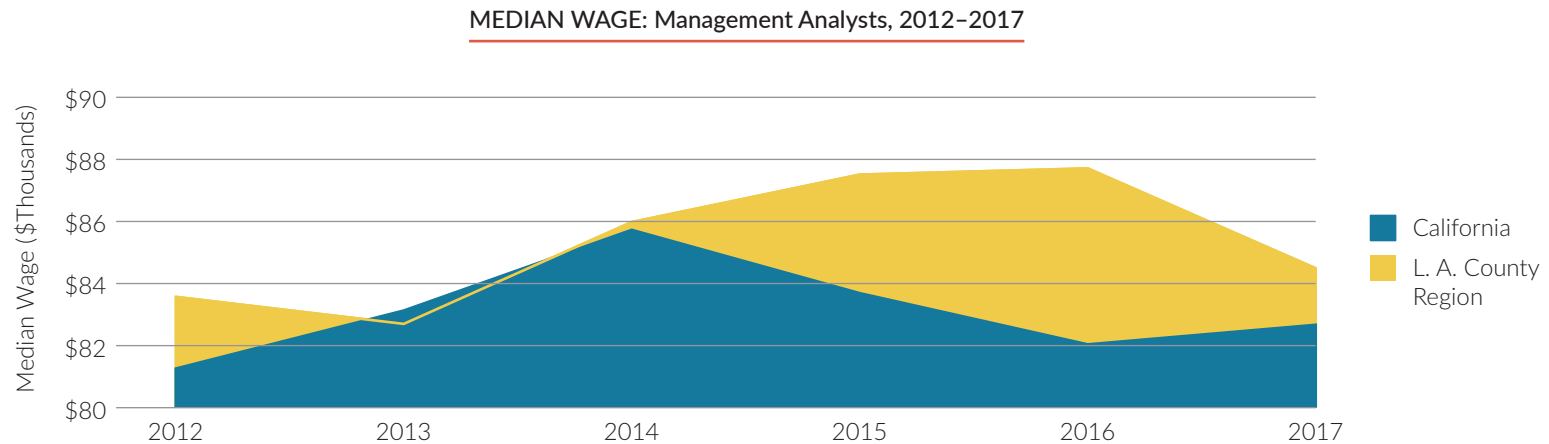
Source: Bureau of Labor Statistics; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (14–20)

TARGET OCCUPATION 18: Management Analysts

WAGES

Median wages have been stagnant for Management Analysts in both the County of Los Angeles and California. Between 2012 and 2017, median wages for Management Analysts rose by just 1.1%, reaching \$84,490 in 2017. In comparison, California's median wage has gone up by 1.7%, with a lower median wage than the County of Los Angeles at \$82,670. This could be down to steady increases in employment over the past five years at the lower end of the wage scale.

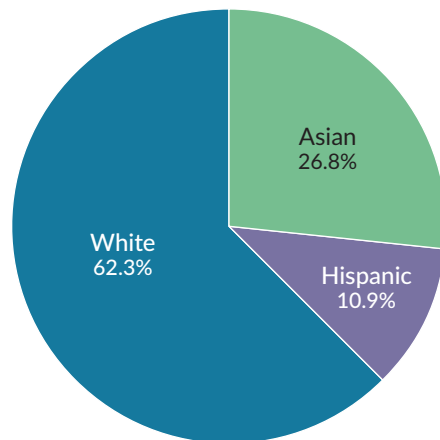


Source: Bureau of Labor Statistics; Analysis by Beacon Economics

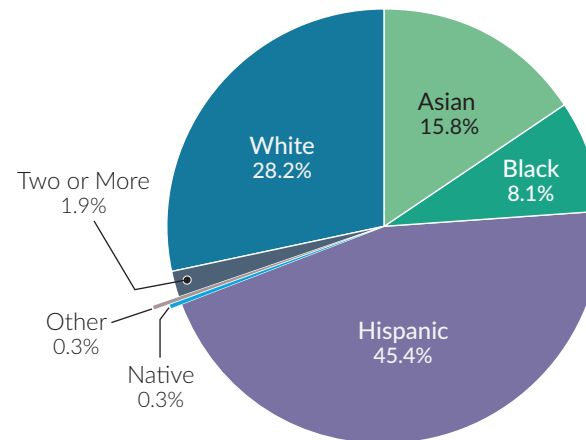
DEMOGRAPHICS: Ethnic/Racial Composition

The ethnic and racial composition of Management Analysts in the County of Los Angeles is primarily White (62.3%), followed by Asian (26.8%) and Hispanic (10.9%). This differs from the County of Los Angeles workforce overall (employed civilians over the age of 16), which is 45% Hispanic; 28.2% White; 15.8% Asian; and 8.1% Black.

L.A. COUNTY REGION: Management Analysts,
Ethnic/Racial Composition, 2017



L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

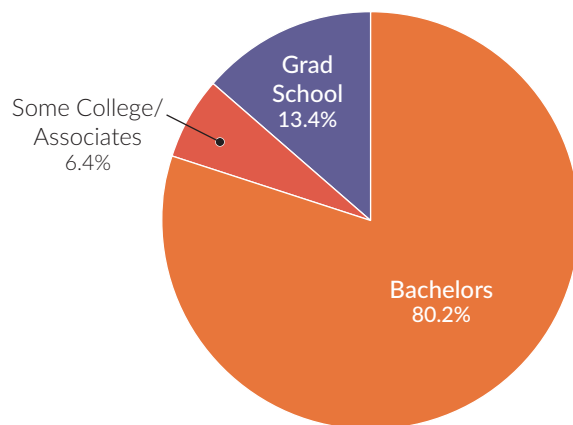
OPPORTUNITY OCCUPATIONS (14–20)

TARGET OCCUPATION 18 Management Analysts

DEMOGRAPHICS: Educational Attainment

Management Analyst is a position that requires educational attainment beyond a high school diploma. Over 80% of Management Analysts in the County of Los Angeles have a bachelor's degree, 13.4% have a graduate degree, while only 6.4% have an associate degree or some college.

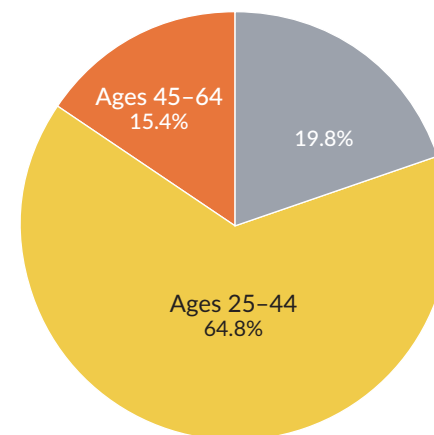
L.A. COUNTY REGION: Management Analysts,
Educational Attainment, 2017



DEMOGRAPHICS: Age Breakdown

The age distribution for Management Analysts skews young in the County of Los Angeles, with the majority (64.8%) in the 25 to 44 age bracket. Around 20% are between 16 and 24, while only 15% are between 45 and 64. This relatively youthful profile means low retirement projections. According to data from the Department of Human Resources, only 6.0% of current Management Analysts with the L.A. County Health Departments are expected to retire within three years.

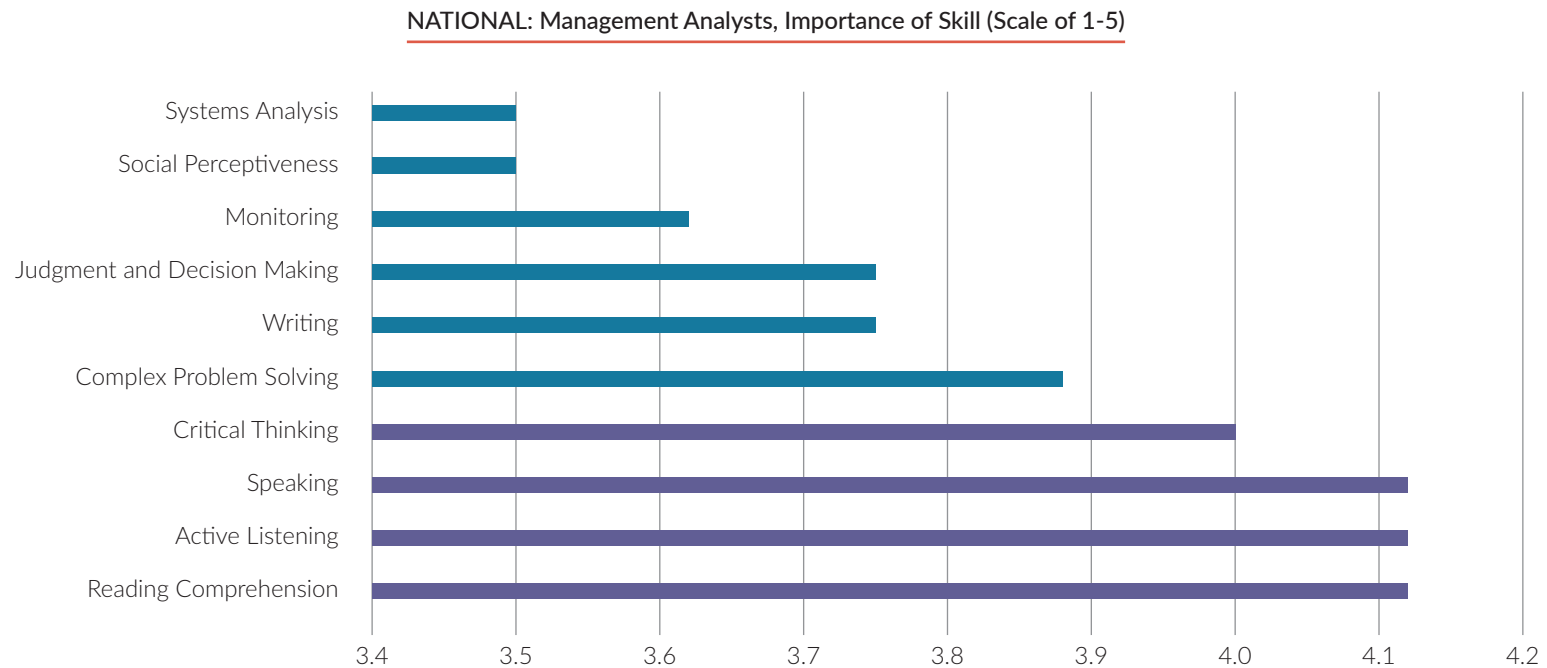
L.A. COUNTY REGION: Management Analysts,
Age Distribution, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

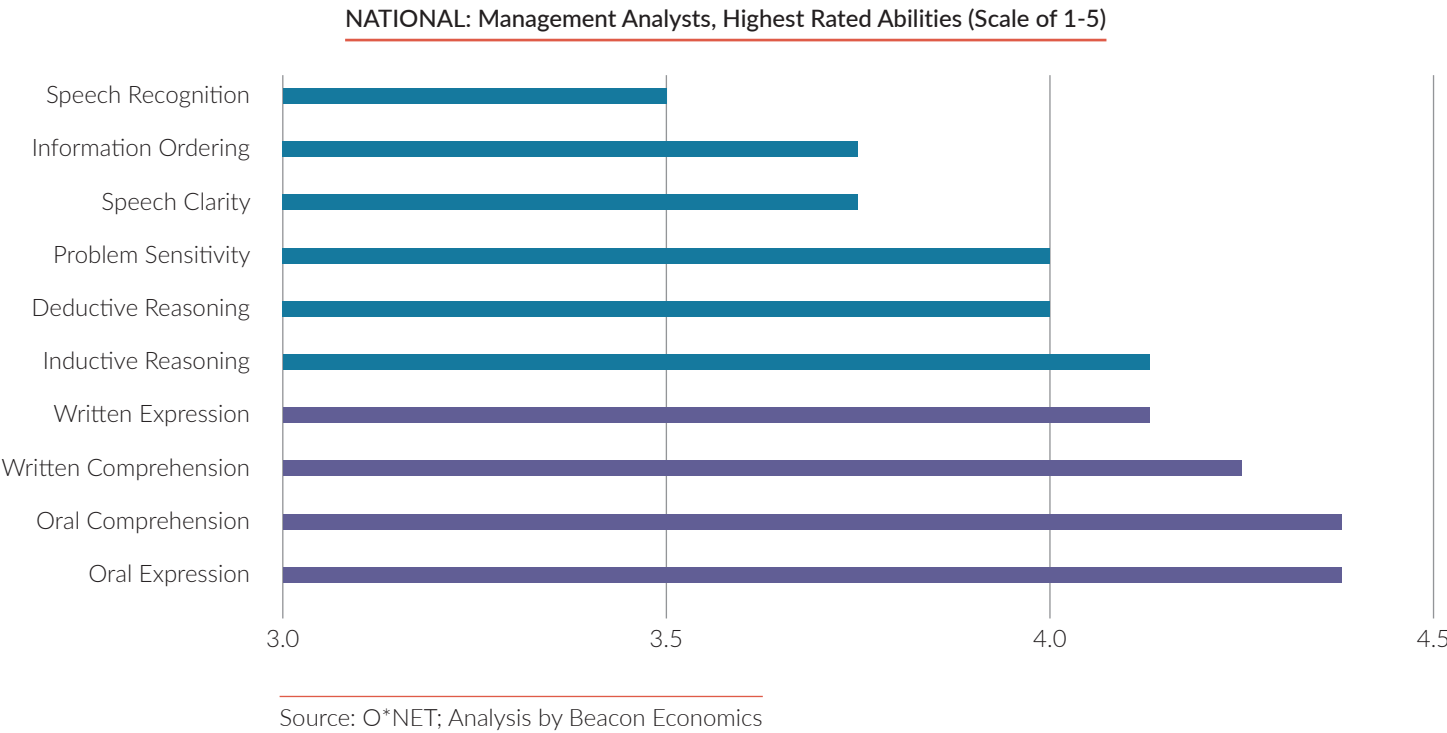
The responsibilities of a management analyst include organizational studies, evaluations and designing systems and procedures, all tasks that require critical thinking, problem solving, and strong communication skills.



Source: O*NET; Analysis by Beacon Economics

ABILITIES

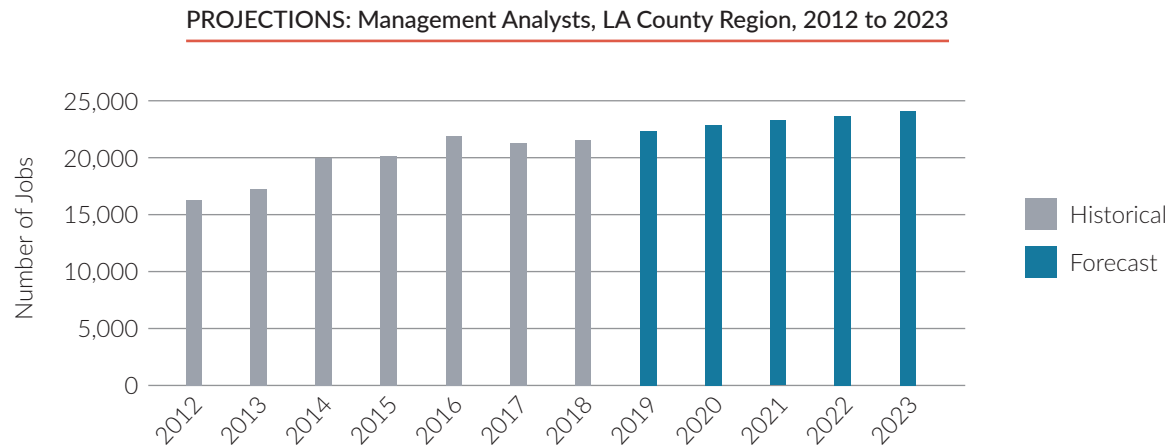
Reflecting the skills listed above, the most highly regarded abilities in a Management Analyst relate to cogent and effective communication, both oral and written.



FORECAST: Management Analysts

Management Analyst is another occupation that Beacon Economics projects will post steady increases in the coming years. Employment in this occupation is expected to grow as companies continue to seek ways to improve efficiency while managing costs. At the county level, employment in the occupation has grown by roughly 31% over the last five years, much faster than the national level of 22%. Our current

outlook for the industry stems from widespread and growing concerns over cost-management. These concerns affect all sectors of the economy, but are particularly prevalent and keenly felt in local government. At the time of writing, the turnover rate for class codes within this occupation is relatively low (3.6%) and so are internal retirement projections over the next three years (6%).



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

19

Human Resource Specialists

SOC CODE 13-1071

DEPARTMENTAL EXPOSURE

- Department of Health Services (DHS): 75.8%
- Department of Mental Health (DMH): 24.2%

Human Resource Specialists are employed by the Department of Health Services and the Department of Mental Health.



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	15,360
Employment Growth 2012-2017	32.0%
Wages	\$67,220
Wages Growth 2012-2017	2.7%

L.A. HEALTH DEPARTMENTS

Budgeted Positions 2019	66
Growth in Budgeted Positions 2014-2019	-5.7%

Illustrative Classification Examples

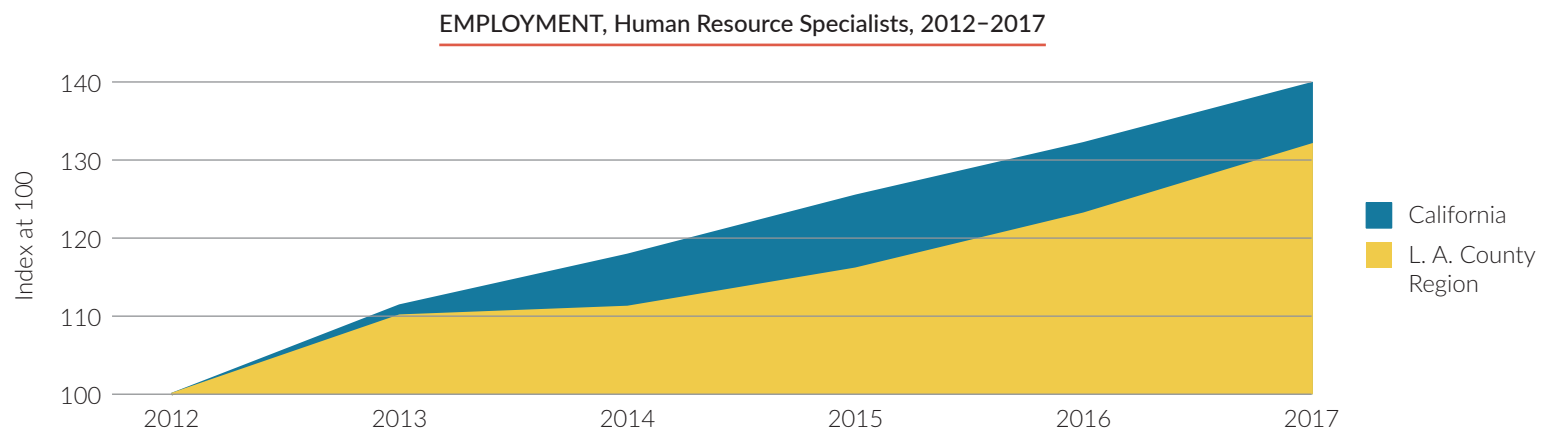
Senior Departmental Personnel Technician

EMPLOYMENT

The L.A. County Health Departments has approximately 66 budgeted positions for Human Resource Specialists, 58 of them filled. The Department of Health Services accommodates 50 budgeted positions, while 16 are budgeted to the Department of Mental Health. Across all industries in the County of Los Angeles, the number of Human Resource Specialists was 15,360 in 2017. The share of Human Resource Specialists in the County of Los Angeles and California relative to total extender occupations was 1.5% and 1.6% respectively. In comparison, the County of Los Angeles' share is much lower than either the county or the state, with Human Resource Specialists accounting for 0.3% of total extender occupations in the Departments overall.

In total, Human Resource Specialists account for small shares of extender occupations in the L.A. County Health Departments, in the County of Los Angeles and across the state. Departmental occupational shares are also quite low, with Human Resource Specialists in both the Department of Health Services and Department of Mental Health accounting for less than 1.0% of extender occupations.

The number of Human Resource Specialists in the County of Los Angeles climbed steadily between 2012 and 2017, yet at a slightly lower level than the statewide trend. Between 2012 and 2017, county employment figures for Human Resource Specialists rose 32%, increasing from 11,640 to 15,360. By comparison, California's five-year growth was 39.8% for the same period.



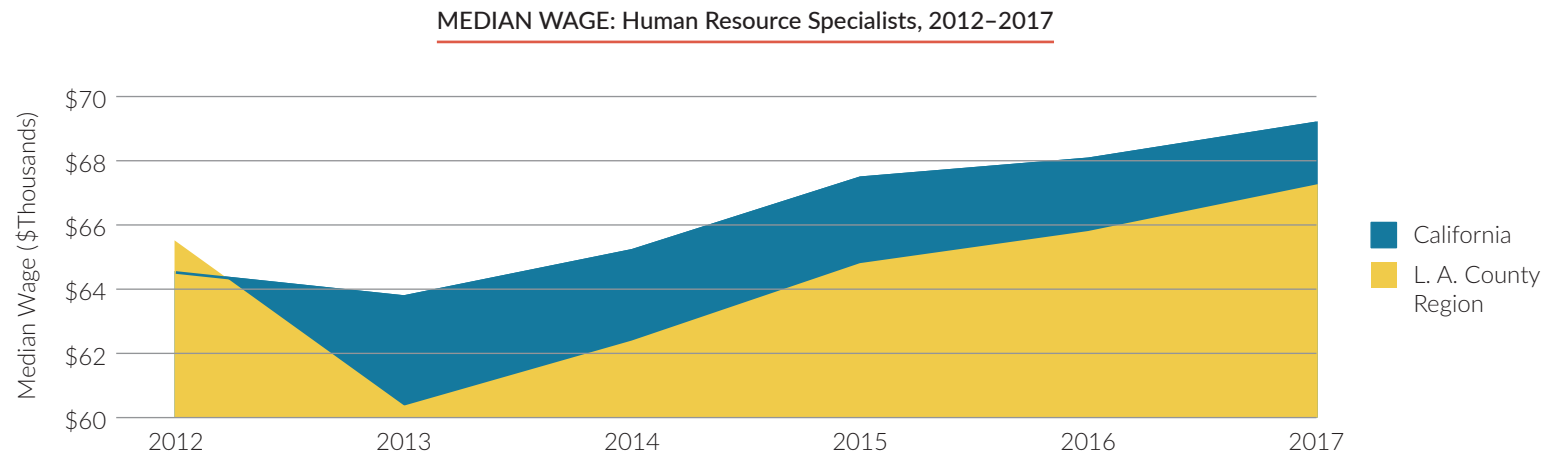
Source: Bureau of Labor Statistics; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (14–20)

TARGET OCCUPATION 19: Human Resource Specialists

WAGES

Median wages for Human Resource Specialists in the County of Los Angeles rose 2.7% between 2012 and 2017, lower than California's 7.2% in the same period. The County of Los Angeles' median wage reached \$67,220 in 2017, slightly lower than the statewide median wage of \$69,180. The consistent increase in employment could have suppressed increased median wage growth by the addition of workers at entry-level or below median wage levels.

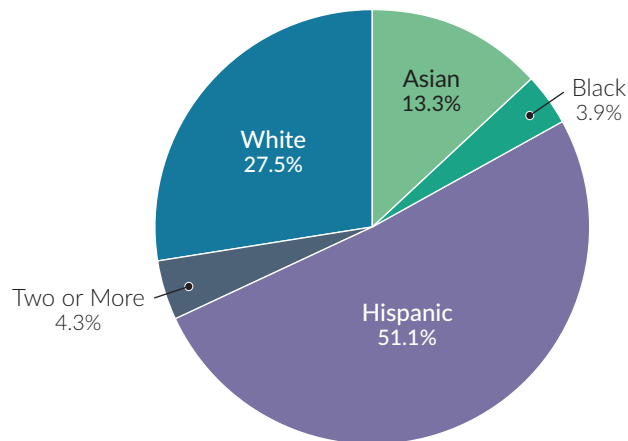


Source: Bureau of Labor Statistics; Analysis by Beacon Economics

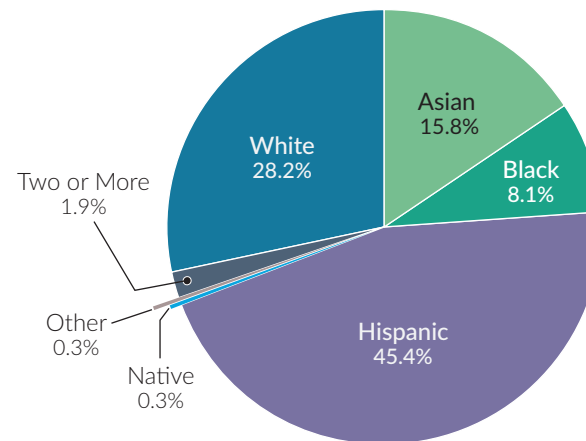
DEMOGRAPHICS: Ethnic/Racial Composition

The racial/ethnic makeup of Human Resource Specialists in the County of Los Angeles closely resembles the county workforce in general, with Hispanic at 51%; White at 27.5%; Asian at 13.3% and Black at 4%. Breakdown for the county workforce (employed civilians 16 and over) is: Hispanic (45%); White (28.2%); Asian (15.8%); and Black (8.1%).

L.A. COUNTY REGION: Human Resource Specialists,
Ethnic/Racial Composition, 2017



L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

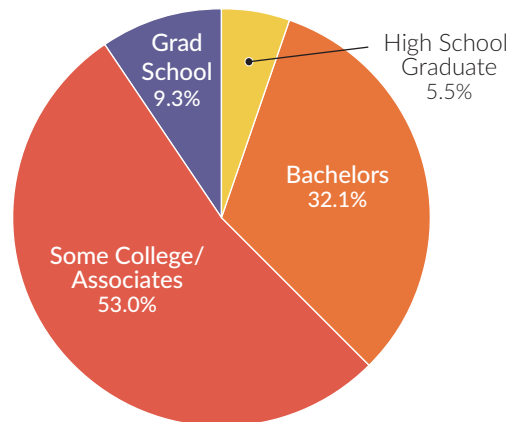
OPPORTUNITY OCCUPATIONS (14–20)

TARGET OCCUPATION 19: Human Resource Specialists

DEMOGRAPHICS: Educational Attainment

A substantial majority of the County of Los Angeles' Human Resource Specialists (53%) have an associate degree or some college, suggesting a preference for relatively well qualified workers. This is born out by the number who hold either a bachelor's degree (32%) or a graduate degree (9.3%). Only 6% of the county's Human Resource Specialists have a high school diploma alone.

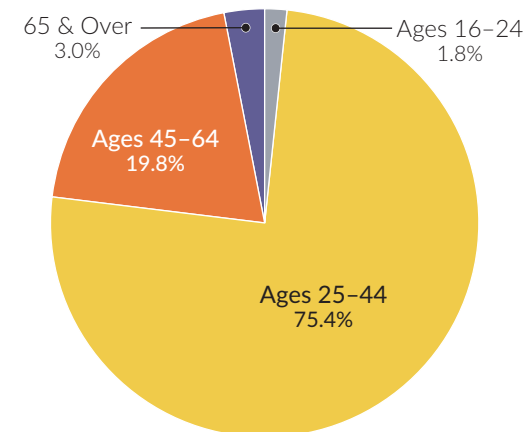
L.A. COUNTY REGION: Human Resource Specialists,
Educational Attainment, 2017



DEMOGRAPHICS: Age Breakdown

At roughly 74.5%, the overwhelming majority of Human Resource Specialists in the County of Los Angeles are between 25 and 44. Those 45 to 64 account for 19.8% of the occupation. These figures have a marked effect on retirement projections. Data collected from the Department of Human Resources indicate that 4.8% of Human Resource Specialists are expected to retire within three years or less.

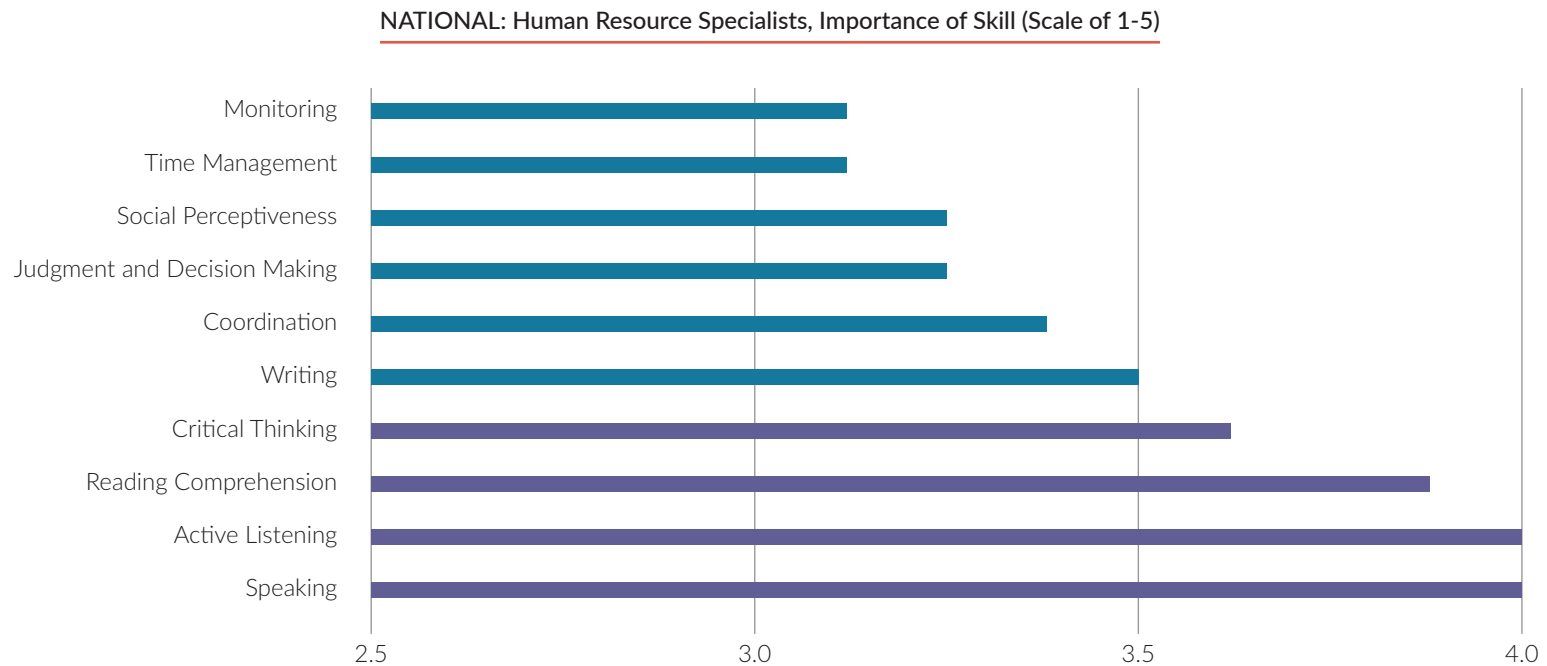
L.A. COUNTY REGION: Human Resource Specialists,
Age Distribution, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

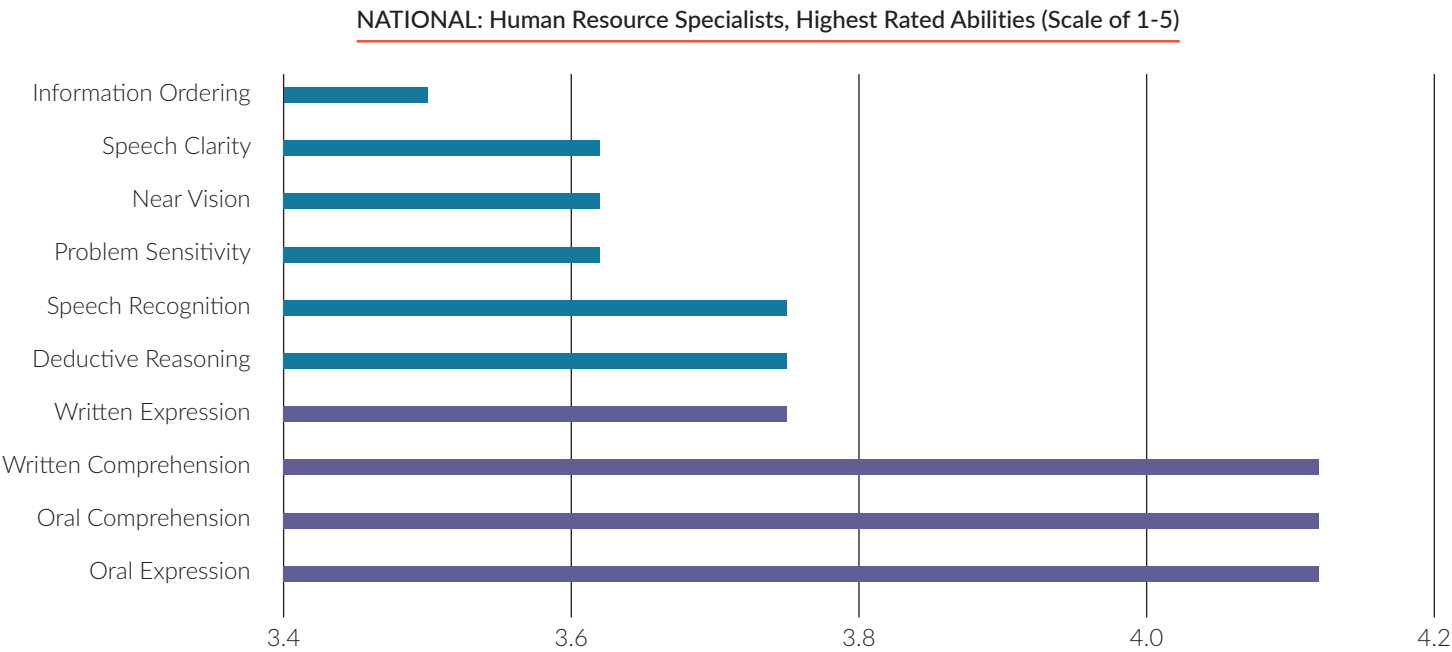
Human Resource Specialists recruit, screen, interview, and place workers. They also handle tasks related to employee relations, compensation and benefits, and training. It's no surprise then that critical thinking joins reading comprehension, active listening, and speaking at the top of the list of highly rated skills.



Source: O*NET; Analysis by Beacon Economics

ABILITIES

Given the nature of the job, as outlined above, abilities that facilitate effective communication – especially oral expression and written and oral comprehension – are most highly valued in Human Resource Specialists.

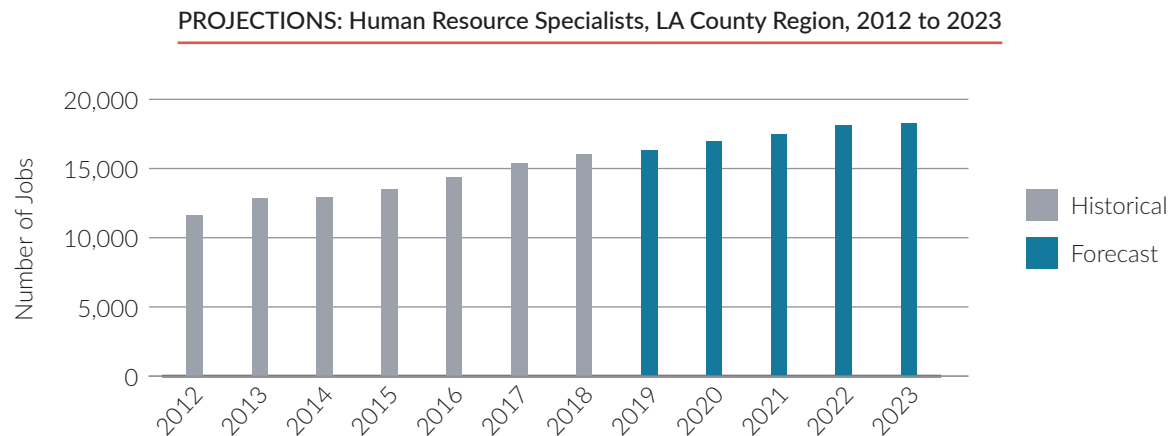


Source: O*NET; Analysis by Beacon Economics

FORECAST: Human Resource Specialists

Employment prospects for Human Resource Specialists remain bright. From 2012 to 2017, employment in the occupation increased 32% in the County of Los Angeles; at the national level, that figure was an impressive 40.5% increase during that same period. Projected moderate-pace growth at the national level is in line with Beacon Economics' projection

for the County of Los Angeles, which forecasts an additional 2,000 positions between 2019 and 2023. Urgency is not a concern for the L.A. County Health Departments. At the time of writing, the turnover rate for class codes within this occupation is relatively low (roughly 3.1%), as are internal retirement projections for the next three years.



Source: Bureau of Labor Statistics; Forecast by Beacon Economics

20

Training and Development Managers

SOC CODE 11-3131

DEPARTMENTAL EXPOSURE

- Department of Mental Health (DMH): 100%

All of the budgeted positions in the L.A. County Health Departments for Training and Development Managers are employed within the Department of Mental Health (DMH).



SNAPSHOT PROFILE

L. A. COUNTY REGION

Employment	870
Employment Growth 2012-2017	24.3%
Wages	\$112,530
Wages Growth 2012-2017	4.4%

L.A. HEALTH DEPARTMENTS

Budgeted Positions 2019	44
Growth in Budgeted Positions 2014-2019	15.8%

Illustrative Classification Examples

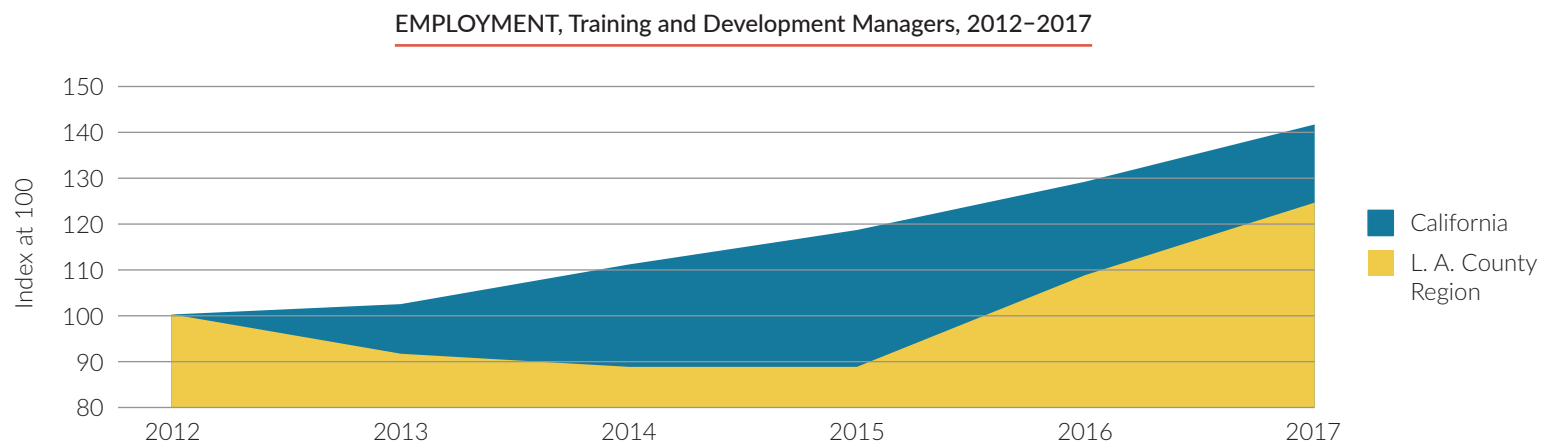
Training Coordinator, Mental Health

EMPLOYMENT

Training and Development Managers have 42 filled and 44 budgeted positions in the L.A. County Health Departments, all of which are at the DMH. The County of Los Angeles overall employs 870 Training and Development Managers in all industries. The share of Training and Development Managers in terms of total extender occupations is very low for the L.A. County Health Departments, the County of Los Angeles and California, all of which have a share of 0.1%, with the exception of the Health Departments at 0.2%. Overall, the Department of Mental Health has relatively few budgeted positions in comparison to the Department of Health Services and the Department of Public Health. Even so, the share of Training and Development Managers to total extender occupations in the Department of Mental Health is only around 2.8%.

Training and Development Managers do not account for a significant portion of total extender occupations in the L.A. County Health Departments, the County of Los Angeles or California overall. The share is also low at a departmental level, with Training and Development Managers accounting for only a small portion of occupations in the Department of Mental Health.

Employment for Training and Development Managers was on a downward trend between 2012 and 2015, the opposite of what was happening statewide. More recently, the trend has picked up as employment saw a sharp upturn between 2015 and 2017. The County of Los Angeles' employment level rose 24.3% for Training and Development Managers between 2012 and 2017, increasing from 700 to 870 occupations. This is much lower than California's five-year growth of 41.4%.



Source: Bureau of Labor Statistics; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (14-20)

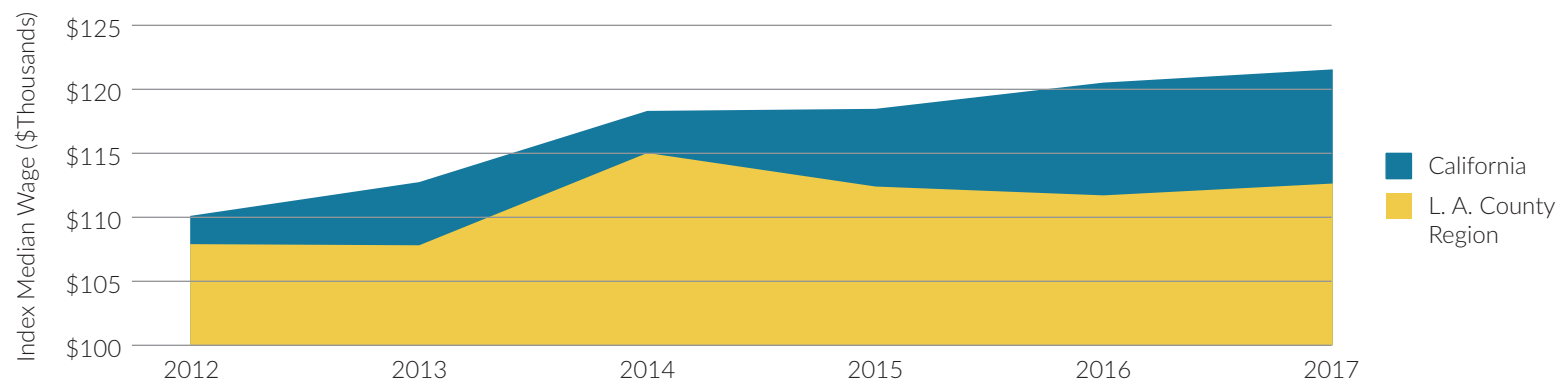
TARGET OCCUPATION 20: Training and Development Managers

WAGES

Median wage increases for Training and Development Managers have been slower in the County of Los Angeles than in California as a whole. Between 2012 and 2017, the median wage for Training and Development Managers increased by 4.4%, from \$107,800 to \$112,530. In contrast, California's median wage for the occupation increased by 10.4%, reaching \$121,450 in 2017.



MEDIAN WAGE: Training and Development Managers, 2012-2017

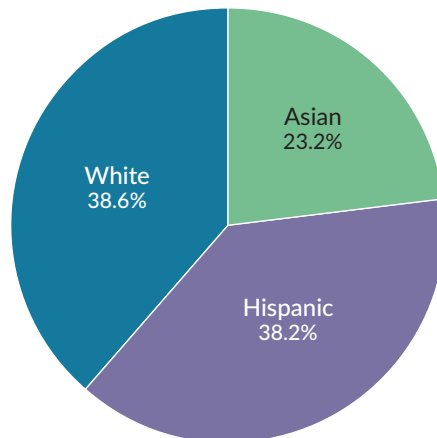


Source: Bureau of Labor Statistics; Analysis by Beacon Economics

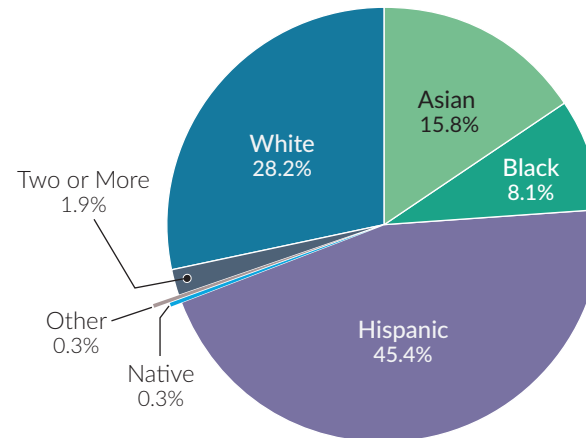
DEMOGRAPHICS: Ethnic/Racial Composition

Training and Development Managers in the County of Los Angeles are comprised entirely of three ethnic and racial groups. The largest share, by a small margin, is White (38.6%), followed by Hispanic (38.2%); and Asian (23.1%). This differs significantly from the racial/ethnic makeup of the county workforce in general, which is: Hispanic (45%); White (28.2%); Asian (15.8%) and Black (8.1%).

L.A. COUNTY REGION: Training and Development Managers,
Ethnic/Racial Composition, 2017



L.A. COUNTY REGION: Residents Aged 16 and Up,
Ethnic/Racial Composition, 2017



Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

OPPORTUNITY OCCUPATIONS (14-20)

TARGET OCCUPATION 20: Training and Development Managers

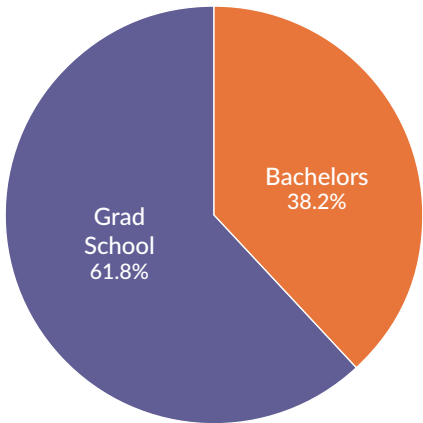
DEMOGRAPHICS: Educational Attainment

The entry level requirement for a Training and Development Manager is a bachelor's degree. Around 60% of Training and Development Managers in the County of Los Angeles also hold a graduate degree.

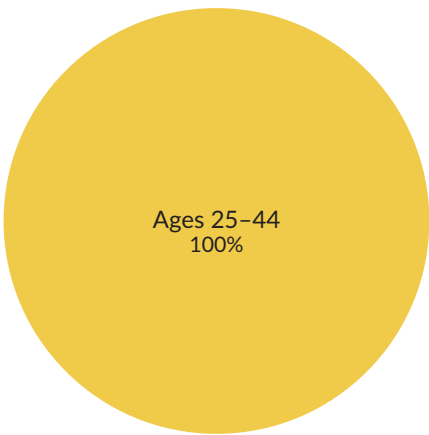
DEMOGRAPHICS: Age Breakdown

100% of Training and Development Managers in the County of Los Angeles fall into the 25 to 44 age bracket. In consequence, data from the Department of Human Resources estimates that only 4.8% of them are expected to retire within three years or less.

L.A. COUNTY REGION: Training and Development Managers,
Educational Attainment, 2017



L.A. COUNTY REGION: Training and Development Managers,
Age Distribution, 2017

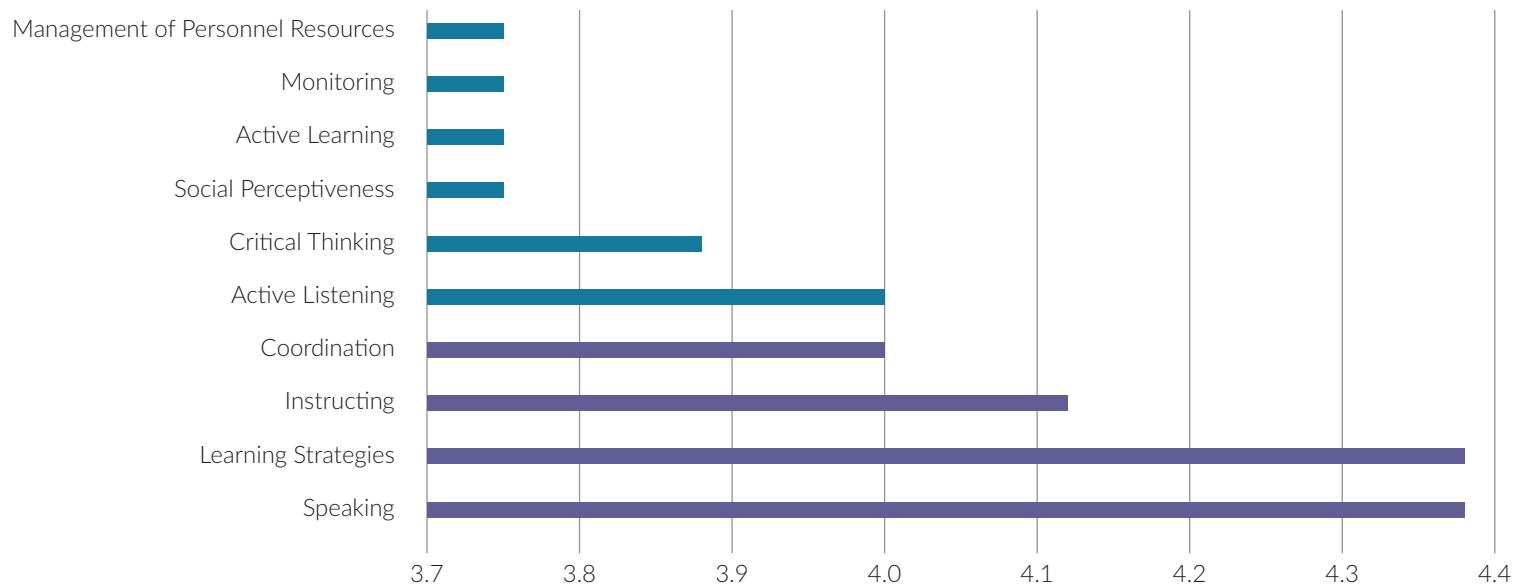


Source: 1-Year ACS Public Use Microdata Sample; Analysis by Beacon Economics

SKILLS

Training and Development Managers oversee staff and plan, direct and coordinate programs aimed at enhancing the knowledge of employees. As such, communication and leadership skills are essential to the occupation.

NATIONAL: Training and Development Managers, Importance of Skill (Scale of 1-5)



Source: O*NET; Analysis by Beacon Economics

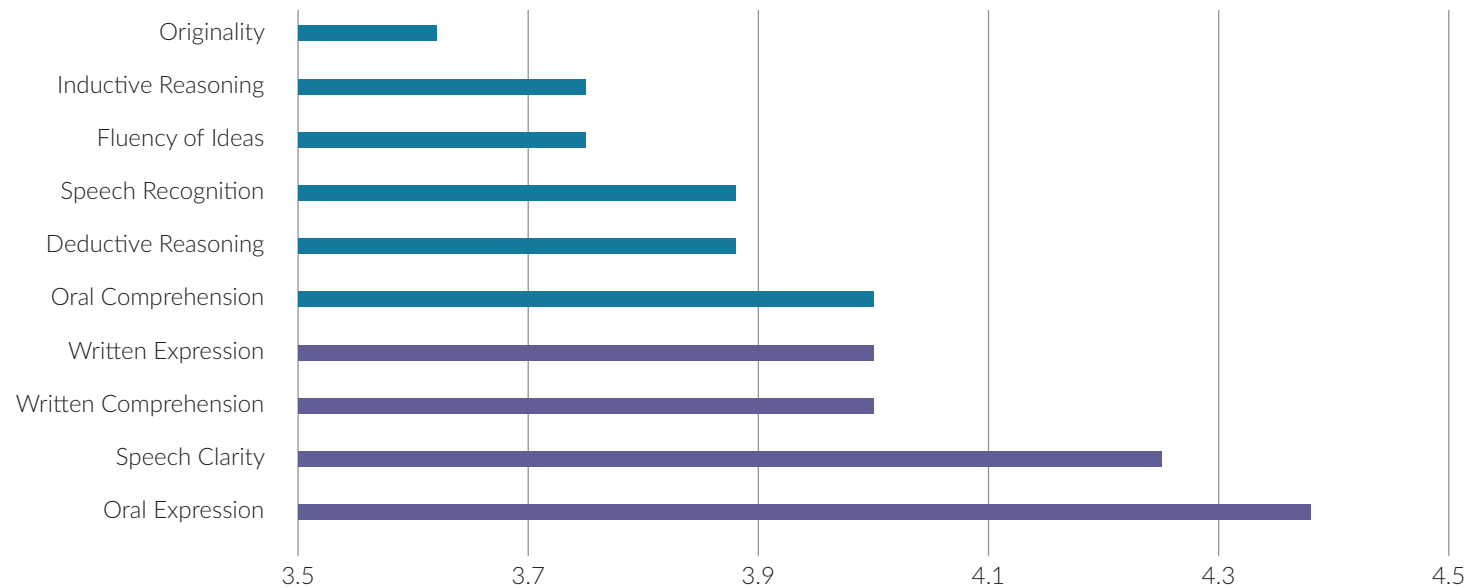
OPPORTUNITY OCCUPATIONS (14-20)

TARGET OCCUPATION 20: Training and Development Managers

ABILITIES

Highly valued abilities in a Training and Development Manager place emphasis on speaking, writing and oral comprehension.

NATIONAL: Training and Development Managers, Highest Rated Abilities (Scale of 1-5)



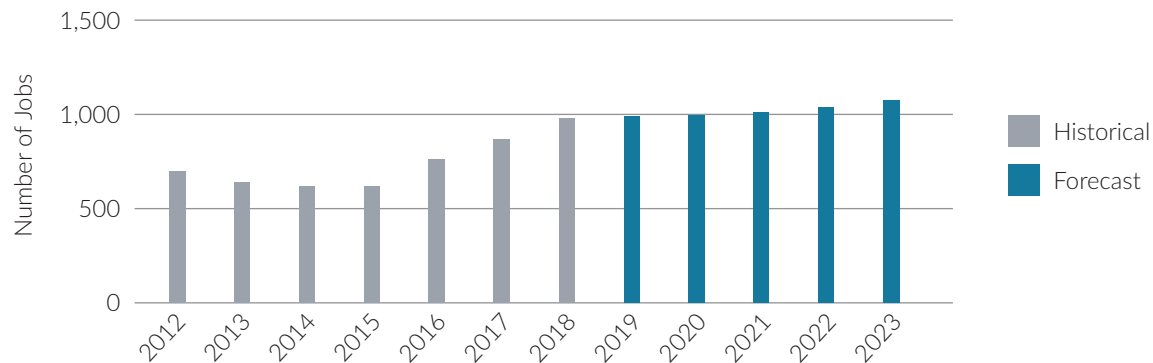
Source: O*NET; Analysis by Beacon Economics

FORECAST: Training and Development Managers

Employment for Training and Development Managers has been on an upswing in recent years, a promising reversal from the decline that occurred from 2012 to 2015. Since then, payrolls have expanded at a steady rate, with close to 1,000 positions in the County of Los Angeles overall. Training and Development Managers are typically employed in the Professional, Scientific, and Technical Services industry, but roughly 9-10% of positions nationally are within the health care industry.

The occupation comprises a very small share of overall employment in the County of Los Angeles, but is nonetheless projected to post steady employment gains as training methods and learning technology are expected to continue in the near future. At the of writing, there were two vacant positions for Training and Development Managers in the L.A. County Health Departments. The occupation has a low turnover rate and a low projected rate for retirements.

PROJECTIONS: Training and Development Managers, LA County Region, 2012 to 2023



Source: Bureau of Labor Statistics; Forecast by Beacon Economics



CONAH Demographics

CONAH OVERVIEW

The College of Nursing and Allied Health (CONAH) is a public community college owned and operated by the County of Los Angeles. Its mission is “to provide learning centered educational programs and career development opportunities for health care students in support of the Los Angeles County Department of Health Services.”



CONAH has three programs: The School of Nursing; Education and Consulting Services; and the Division of Allied Health Continuing Education. The school offers an associate degree in Nursing as well as continuing education courses open to licensed vocational (LVN) nurses to renew their certifications.

From 2013 to 2018, the School of Nursing graduated an average of 44 students per semester. Of the 440 Registered Nurse (RN) graduates in the School of Nursing, 75% were hired — 322, or 98%, were employed in the County of Los Angeles. 54% were hired by DHS, with 95% of those retained for longer than two years. Of these, 203 (86%) were employed at Los Angeles County+USC Medical Center (LAC+USC MC).

The Education and Consulting Services division (EDCOS) offers professional development classes and courses to nursing staff throughout DHS. In Spring 2018, EDCOS offered 378 classes to 7,585 students, compared to the 218 students enrolled in the School of Nursing.

In 2017, the age of CONAH School of Nursing students ranged from 20 to 60. These students were predominately

female (80%), and predominately minorities (73%): Hispanics made up the largest racial group at 35% (13.5 percentage points less than Los Angeles County as a whole). Black students made up 4%, Filipino students made up 13%, and all other Asian students made up an additional 18%. Combined, this was twice the percentage (15.5%) of Asians in Los Angeles County.

COMPARISON OF SCHOOL OF NURSING DEMOGRAPHICS WITH THE LA COUNTY POPULATION

		CONAH FALL 2017	LA COUNTY
Female		80%	50%
Male		20%	50%
Age Range		20–60	
ETHNICITY	Minorities	73%	73.5%
	Caucasian	27%	26.5%
	Black	4%	9.1%
	Hispanic	35%	48.5%
	Native American	1%	1.5%
	Asian	18%	15.5%
	Filipino	13%	
	2+ Races	2%	3.0%

Source: OES Program Review and IE Reports, U.S. Census Bureau: State and County Quick Facts: LAC 2016

Regarding student outcomes, the multi-year averages from academic year 2013-2014 to academic year 2016-2017 are as follows: 62% of students from the original cohort completed the program on time, while 80% completed their degree within 150% of estimated time to degree. 96% of students passed the National Council Licensure Examination (NCLEX) exam on their first attempt. 73% of graduates were employed 12 months after graduation. 55% of graduates were employed by DHS, while many of the other graduates were employed by private sector hospitals.

STUDENT ACHIEVEMENT DATA

CONAH has established Institution-set standards for assessing various measures of student success and institutional effectiveness. The data are analyzed and utilized for institutional improvement.

DATA ELEMENT	DEFINITION OF THE MEASURE	INSTITUTION-SET STANDARD	MOST RECENT AY'S PERFORMANCE 2016 – 2017	PREVIOUS AY 2015 – 2016	MULTI-YEAR AVERAGE 2013 – 2014 TO 2016 – 2017
Course Completion Rate	Percentage of students who do not withdraw from class and who receive a valid grade	85%	95%	91%	94%
Course Success Rate	Percentage of students who receive a passing/satisfactory grade	85%	92%	92%	92%
Course Attrition Rate	Percentage of students withdrawn or failed from a course	15%	12%	16%	14%
Degree Completion Rate	Percentage of students from the original cohort that completed the program				
• On-time		68%	63%	64%	62%
• 150%		75%	84%	76%	80%



DATA ELEMENT	DEFINITION OF THE MEASURE	INSTITUTION-SET STANDARD	MOST RECENT AY'S PERFORMANCE 2016 - 2017	PREVIOUS AY 2015 - 2016	MULTI-YEAR AVERAGE 2013 - 2014 TO 2016 - 2017
NCLEX Pass Rate	Percentage of students who passed the NCLEX exam for the first time	85%	95%	98%	96%
Job Placement Rate	Percentage of graduates who are employed 12 months after graduation	70%	61%	69%	73%
DHS Hiring Rate	Percentage of graduates who are employed by DHS after graduation	50%	52%	52%	55%
Employer Satisfaction Survey	Rating of Graduate Performance	>3.0	4.25	3.81	3.98

WORKFORCE OPPORTUNITY OF THE FUTURE

CONTEXT: The Age of Automation and the Los Angeles County Health Departments

There exists strong desire to promote collaboration across the County's three health departments in order to streamline the healthcare system for efficiency and better serve the County's communities at large.

Despite recent efforts, there remain significant challenges around coordination and collaboration among the health departments with regard to talent acquisition, talent retention, and talent development. Leadership across the three departments expressed strong interest in better coordination and the benefits thereof, including resource optimization, better preparedness for emergencies through cross-training, and a more holistic, coherent approach to patient care. Yet, there is a need for a strategic roadmap articulating with specificity how that coordination may be executed, and increasingly over time, in the context of current bureaucratic infrastructure and resource constraints. The L.A. County Health Departments stand to play a key role in devising and leading the execution of such coordination; workforce development is an optimal nexus of need and opportunity on which to focus.

The broader economy-wide conversation around automation further justifies a focus on talent and workforce development, as industries scurry to keep pace with technological change and the skills workers must possess to perform well alongside those transformations. While predictions about the automation probabilities of certain occupations or jobs are alluring, they are rarely accurate or useful insofar as they obscure the fundamental ways technology has generally shaped and reshaped work historically, which is not by occupation but by task. Occupations can be conceived of as a bundle of routine and non-routine tasks, some of which are vulnerable to automation and some of which are not. Findings from the American Economic Association's 2018 proceedings on the Economic Consequences of AI and Robotics suggest few, if any, occupations are characterized by tasks that are all suitable for machine learning.¹ Further, history and continued research suggest that tasks that cannot be substituted by technology are often complimented by it, boosting employment and the human-centered competitive advantage workers have over technology.² Not only are the impacts of automation on occupations unpredictable in the theoretical realm of academic research, but in reality, any impacts that can be to an extent theoretically predicted, are often redirected and reshaped by cost implications, regulatory considerations, political pressures, and social movements. In no industry are these influences more relevant than they are in healthcare, one of the most regulated, policy-driven, and outcomes-oriented sectors.

Identifying the types of tasks that are most vulnerable to automation is also not as straightforward as many job apocalypse narratives might suggest. Physical/manual competencies are not the only ones susceptible to tech-based automation. In fact, data processing and input skills marked the largest predicted decline across the 25 skillsets studied in a recent report authored by the McKinsey Global Institute.³ This decline is likely to impact white collar jobs across industry sectors. However, industry context also plays an important role. On the perceived 'other end' of the skills spectrum from data processing skills, physical skills are expected to see an increase in need in the healthcare sector while at the same time they are expected to decline in manufacturing. Similarly, demand for basic literacy is expected to decline by 27% in banking and insurance but rise by 12% in healthcare.⁴ Communication skills are also expected to increase in demand in the healthcare industry, as interaction with patients increasingly becomes a cornerstone for successful preventive care and decentralized, community-based care systems grow in popularity.

The L.A. County Health Departments may target a wide array of skills across occupations, and thus across departments, in order to prepare for future skills demand. Thinking about skills and competencies unbundled from their occupational categories and their departmental homes is the first step in devising a future-oriented workforce development strategy.

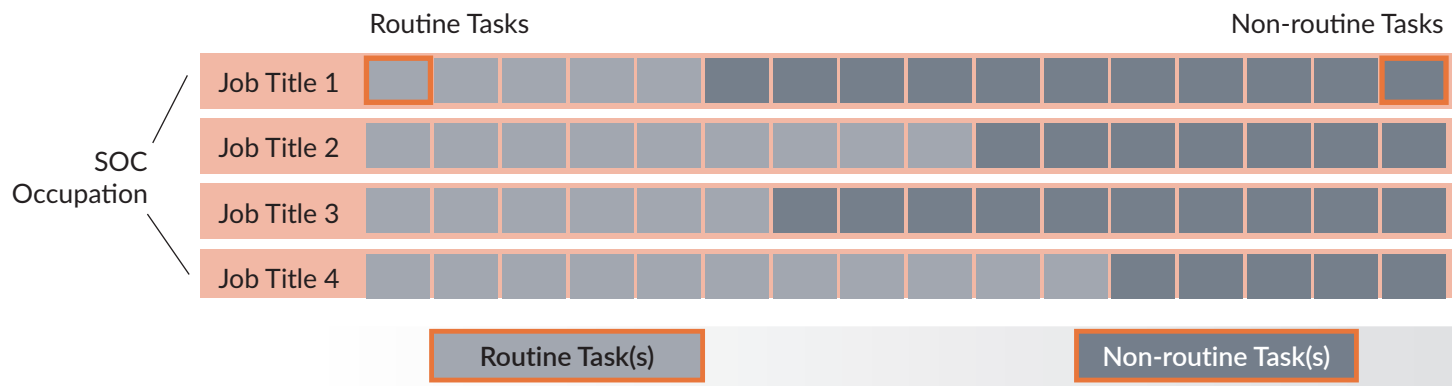
¹ [https://www.ey.com/Publication/vwLUAssets/ey-future-of-work-insights-report/\\$FILE/ey-future-of-work-insights-report.pdf](https://www.ey.com/Publication/vwLUAssets/ey-future-of-work-insights-report/$FILE/ey-future-of-work-insights-report.pdf)

² [https://www.ey.com/Publication/vwLUAssets/ey-future-of-work-insights-report/\\$FILE/ey-future-of-work-insights-report.pdf](https://www.ey.com/Publication/vwLUAssets/ey-future-of-work-insights-report/$FILE/ey-future-of-work-insights-report.pdf)

³ <https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Future%20of%20Organizations/Skill%20shift%20Automation%20and%20the%20future%20of%20the%20workforce/MGI-Skill-Shift-Automation-and-future-of-the-workforce-May-2018.ashx>

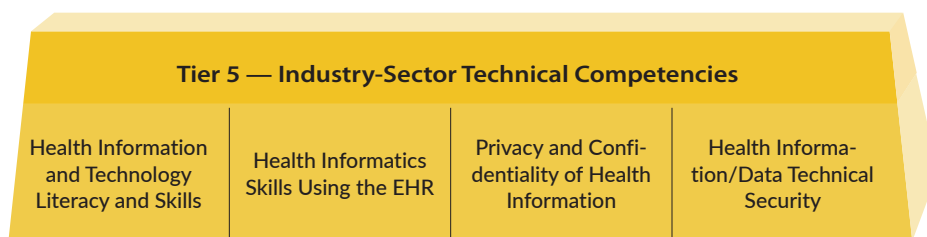
⁴ <https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Future%20of%20Organizations/Skill%20shift%20Automation%20and%20the%20future%20of%20the%20workforce/MGI-Skill-Shift-Automation-and-future-of-the-workforce-May-2018.ashx>

CONCEPTUAL MAPPING OF CLASSIFICATIONS TO WORKFORCE DEVELOPMENT STRATEGY PRIORITIZING RESOURCES AND PREPARING FOR AUTOMATION OF ROUTINE TASKS



Industry Specific Competencies: Represent a sub-set of industry-wide competencies that are specific to an industry sector.

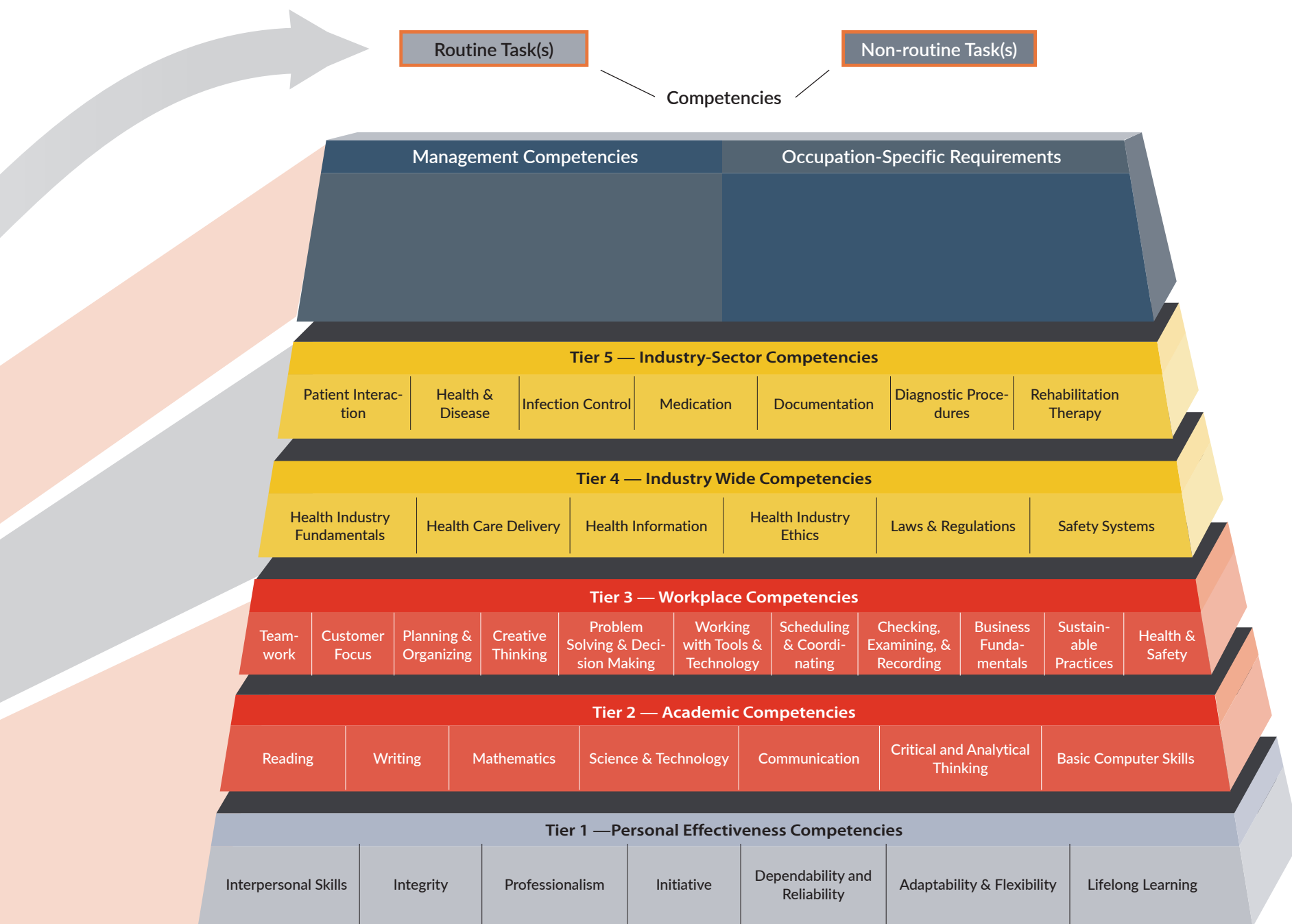
Workforce Development Programming should empower Department-wide career lattices.



Industry Specific Competencies: Represent industry-wide technical competencies needed to create career lattices within an industry. Cross-cutting, as they allow a worker to move easily across industry sub-sectors

Foundational Competencies: Represent readiness skills that the County demands across departments.

Workforce Development Programming can occur outside of the Health Departments' lens.





A Collective Impact Approach to Supporting Future Departmental Workforce Needs: Continuing Education

With regard to talent retention, departmental stakeholders spoke at length about the difficulties of resourcing and coordinating continuing education and upskilling programs given the demands placed on their full-time workforce. One departmental stakeholder commented, “Even if there are all the right, data-driven classes available, many employees cannot take advantage [of them] due to time off or covering of shifts.” Not only is institutional support required to resource the employee’s time spent in class, but high-level logistical coordination is also necessary in a healthcare environment as fast-paced and high-need as the County Health Departments’.

Location was also cited as a major barrier to employee participation in the County’s current or planned upskilling and continuing education programs. Many departmental

stakeholders noted the need for a large, centrally-located space if current employees from all three departments are expected to actively participate in workforce development programming.

Colocation was put forward in the Health Departments’ strategic goals as a solution for providing more integrated services, particularly to clients using services from multiple departments who, in turn, tend to be higher-need clients. Colocation could also be a key component of collective workforce development programming across the Departments’ Further, a shared location dedicated to both the integrated treatment of high-need patients, including vulnerable populations, and to cross-departmental employee training may be well-positioned for grant funding.

Community Oriented Skills

Beacon Economics identified two major themes in cross-departmental skills gaps. The first is the need for community-oriented skillsets including multi-stakeholder management, client-facing communication skills, and, more specifically, culturally sensitive communication skills. A number of the target occupations touch a community-oriented skillset including Community Health Workers, Healthcare Social Workers, and Substance Abuse and Behavioral Disorder Councilors.

Good communication skills have long been a cornerstone of effective healthcare, and trends in healthcare delivery and patient-centered care have only heightened their importance. As healthcare delivery moves from a highly-centralized, facility-oriented schema to a more decentralized, systems-oriented approach, frontline communication skills are increasingly vital to the generation of positive health outcomes.

Similarly, as healthcare systems cultivate operationally relevant touchpoints among and in communities directly, multi stake- holder-management skills are becoming part of the healthcare practitioner's toolbox. As an example, the L.A. County Health Departments' Goal 1.5 invokes community-

based skills both in terms of linking patients to primary prevention services and support, and connecting them to community-based recovery.

As one departmental stakeholder explained, "Community health nursing has always been part of our curriculum, but looking to the future, there are opportunities to train Community Health Workers in response to technical employment opportunities that require them going out into the community and performing front line assessments."

Given the Health Departments' diverse clientele, many stakeholders also underlined the importance of cultural



competence, including language skills. Among the goals outlined in the Department of Mental Health's current Strategic Plan are (1) to eliminate disparities in mental health services, especially those related to race, ethnicity, and culture; and (2) to enhance the community's social and emotional well-being through collaborative partnership. "We try as much as possible," said one departmental stakeholder, "to have our employee population match our client population." The skills need around cultural competencies provides a mandate for more inclusive recruitment strategies. Members of diverse communities with diverse experiences reflective of the Health Departments' clientele are not only assets themselves as employees of the Departments, but they can and should be seen as resources for the Departments. A recent analysis of workforce diversity in healthcare by Policy Link stressed the importance of inclusiveness as a means of lowering racial and ethnic health inequities.⁹ Federally qualified health centers, community health centers, and

school-based health centers have all been used to implement nontraditional on-the-ground training in an effort to recruit a more diverse healthcare workforce, targeting those communities that are most under-represented.

As healthcare strategies become more preventive in nature and more nuanced in approach, multi-stakeholder collaboration was also noted as a growing trend. While the Department of Public Health highlighted this need in particular as an entity that regularly crafts and leads multi-stakeholder coalitions with partners outside of the healthcare community, stakeholders across the three departments touched on the growing need to improve their employees' stakeholder management skills. As a departmental representative explained, "We want all of our employees to have the ability to be out in the field or in the district communicating not just with our clients and patients, but with our broader set of partners, businesses and other community-based organizations."

Tech-adjacent Skills

With regard to growing cross-departmental skills, the second theme Beacon Economics identified was tech-integrated and tech-adjacent skills.

As is the case in other quickly evolving industries, a number of the high priority occupations touch a tech-oriented skillset, including Computer Occupations, Computer and Information Systems Managers, Medical Record and Health Information Technicians, Medical Transcriptionists, and Word Processors and Typists.

A study on digitization in the American workforce found that a significant number of jobs require a medium to high level of digital skills. To overcome challenges associated with the tech-skills gap, there needs to be a focus on digital literacy specifically among underrepresented groups least exposed to tech-based tools and training.¹⁰ The report indicates that tuition reimbursement programs have become popular following the Great Recession and costs for corporate training bundles have largely decreased due to online training modules.



One departmental stakeholder stated unequivocally that the single biggest gap for unqualified inbound applicants was computer and technology skills. At the same time, tech-related positions were also cited as good opportunities for upskilling across the three departments. Many tech-integrated positions in industries including healthcare are simultaneously most vulnerable to automation and (currently) also most in demand. Further, they are -- not coincidentally -- among the most difficult positions to fill. With the implementation of systems like Iris and Orchid, County employees can be more actively involved in the development and deployment of new technology that delivers care via the Health Departments system. The better versed they become in this technology, the more willing they will be to invest their own time and energy in learning it and using it most effectively.