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Research Report

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Characteristics of California's EMT and Paramedic Workforce

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Abstract / Overview
Since the beginning of the COVID-19 pandemic employers have experienced great difficulty recruiting and retaining emergency medical technicians (EMTs) and paramedics. This situation highlights the need to learn more about the supply, distribution, and demographic characteristics of EMTs and paramedics as well as the pipeline of new EMTs and paramedics that are trained in the state. This report synthesizes findings from analyses of multiple sources of data describing California's EMTs and paramedics. The report also acknowledges limitations of these data sources and makes recommendations for filling gaps in the availability of data that are critical to understanding this segment of the emergency medical services (EMS) workforce and strengthening its ability to meet Californians' needs for emergency medical services.

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Key Findings

Emergency medical technicians (EMTs) and paramedics play critical roles in delivering emergency services to Californians. They respond to many of the 911 calls placed across the state, assess and treat people onsite, and transport them to health care facilities when necessary. Since the beginning of the COVID-19 pandemic employers have reported increased difficulty recruiting and retaining EMTs and paramedics. In light of this situation, there is a compelling need to learn more about the supply, distribution, and demographic characteristics of EMTs and paramedics as well as the pipeline of new EMTs and paramedics that are trained in the state.

Data from the California Emergency Medical Services Authority (EMSA) and several national sources were analyzed to determine what conclusions can be drawn about California's EMT and paramedic workforces from existing data sources, and to identify information needed to improve understanding of these critical occupations. Findings regarding EMT and paramedic employment and demographic characteristics were compared to findings for California's overall workforce, firefighters, police officers, registered nurses (RNs), licensed vocational nurses (LVNs), and nursing assistants. Firefighters and police officers were chosen for comparison because they are other types of emergency first responders. Nursing occupations were selected because they are the largest segment of the health care workforce.

Trend in Number of Certified EMTs and Licensed Paramedics

- Over the past decade, the number of new EMT certifications issued annually in California increased from approximately 7,900 to approximately 9,200.
- In contrast, the number of new paramedic licenses issued annually fluctuated within a narrow range from 1,200 to 1,400.

Estimated Size of California's EMT Workforce and Paramedic Workforce

- The most plausible estimates suggest that California has approximately 12,000 employed EMTs and 10,000 employed paramedics.
- However, EMSA certification and licensure data identify more than 63,000 certified EMTs and more than 23,000 licensed paramedics. A substantial share of certified EMTs and licensed paramedics are likely employed in other public safety occupations (e.g. police officers), in other healthcare occupations (e.g. registered nursing), or serve as a volunteer.

Geographic Distribution of Certified EMTs and Licensed Paramedics

- Ratios of certified EMTs or licensed paramedics per capita vary widely across California's counties.
- Less densely populated rural counties have substantially more certified EMTs and licensed paramedics per capita than more densely populated urban counties.

Employment Characteristics

- Most EMTs and paramedics in California are employed full-time and work for private companies.
- The median annual income for EMTs employed in full-time positions was approximately 80 percent of the state-wide median for people employed in all fields ($38,386 versus $46,460).

- The median annual income for paramedics employed in full-time positions ($51,573) was approximately 55 percent of the median annual incomes earned by registered nurses ($92,831), police officers ($94,915), and firefighters ($95,969).

Demographic Characteristics

- EMTs and paramedics are younger than California's overall labor force.
- EMTs and paramedics are predominantly male.
- EMTs and paramedics are less racially and ethnically diverse than California's general population and the state's labor force overall.
- Foreign-born persons account for very small proportions of both EMTs and paramedics.
- EMTs and paramedics are less likely to speak a language other than English compared to RNs, LVNs, nursing assistants, California's overall labor force, and the state's population.
- The proportion of EMTs or paramedics with a bachelor's or higher degree is lower than in California's overall workforce.

Educational Pipeline

- According to data sourced from EMSA, as of June 2022, there were 309 EMS workforce training programs, including 216 EMT-Basic programs, 6 advanced EMT (AEMT programs), and 39 paramedic programs (excluding refresher programs for certified EMTs and licensed paramedics).
  - Fifty-four of California's 58 counties have an EMT-Basic training program; the only exceptions are four small rural counties.
  - In contrast, only 24 of the state's 58 counties have a paramedic training program, with few programs located in counties in the Central Valley and the Sierra Nevada mountains.
  - Seventy-four percent of EMT training programs and 44 percent of paramedic training programs are operated by fire departments, hospitals, and other organizations that are outside the formal postsecondary education system.
- Describing the educational pipeline is challenging because of the very limited data that are available. EMSA maintains only a roster of approved programs and does not report information about numbers of graduates and their characteristics. The Integrated Postsecondary Education Data System (IPEDS) provides much more detailed information, but only accounts for approximately half of the state's paramedic training programs and less than one-quarter of the EMT-Basic training programs.
- Analyses of the IPEDS data specific to EMT and paramedic training programs suggest that:
  - The number of EMT and paramedic training programs offered by postsecondary education institutions has grown significantly over the past decade, and that this growth has occurred almost entirely within the California Community College system.
  - One private, not-for-profit university accounts for approximately 10 percent of persons completing EMT/paramedic education programs.

- Seventy percent of all completers have been male and 30 percent female.
- Over the past decade, the percentage of completers who are Hispanic or Latino has increased substantially and the percentage of completers who are white has decreased substantially.

Conclusion

Describing California's EMT workforce and paramedic workforce and the education and training pipelines that supply new entrants is challenging due to the limits of available data. Currently, official records maintained as part of the EMT certification and paramedic licensure process do not include information that could be used to determine whether those who maintain their certification and licensure are employed as either EMTs or paramedics, leading to discrepancies with estimates derived from other sources of data. Collection of data on demographic characteristics is incomplete. In addition, most of the providers of EMT or paramedic training in California do not systematically report information about the individuals who complete their programs. These facts make it difficult to conclude whether the findings presented here are broadly representative of EMTs and paramedics in California, or its EMS educational pipeline.

The available data also do not provide information about the career trajectories of EMTs and paramedics. Anecdotal reports suggest that many leave EMS due to burnout or to enter other occupations that pay higher wages. The limited racial/ethnic diversity among EMTs and paramedics also raises questions about the extent to which EMS workplaces foster equity and inclusion. Given the difficulties that EMS employers are experiencing, systematic collection of information about career trajectories would enhance understanding of the reasons why EMTs and paramedics leave EMS, which could provide insights for improving recruitment and retention in these critical occupations.

Recommendations

This assessment of existing data on California's EMTs and paramedics suggests that the state would benefit from investment of additional resources to expand collection and analysis of information about these segments of the EMS workforce. Specifically,

- Leverage EMSA's authority to certify EMTs and license paramedics to collect additional workforce data.
    - Require EMSA to collect information from EMTs and paramedics about their demographic and employment characteristics when they renew their certification or license in a manner consistent with requirements for licensing boards that are part of the California Department of Consumer Affairs.
    - Require all EMT and paramedic education programs to provide data to EMSA regarding numbers of graduates and their demographic characteristics.
- Provide EMSA with sufficient resources to analyze these data or partner with another state agency or other entity with expertise in health workforce analysis and present findings on an annual basis.
- Conduct research on the career trajectories of EMTs and paramedics to estimate the rates at which they exit the EMS field, the fields they subsequently enter, and the reasons why they leave EMS.
- Conduct research on the climate for diversity, equity, and inclusion in EMS agencies.

Introduction

In 2020, over 25 million 911 calls were placed in California (National 911 Program, 2020). Many of these 911 calls concerned people with health care needs. California's emergency medical technicians (EMTs) and paramedics responded to these calls, assessed and treated people onsite, and transported them to health care facilities when necessary. Depending on the circumstances, they worked alone or alongside firefighters, police officers, or other first responders.

Since the beginning of the COVID-19 pandemic employers across the United States have reported increased difficulty recruiting and retaining EMTs and paramedics (Weixel, 2021). EMS agencies in California have had difficulty maintaining EMS services due to staffing shortages (Fu, 2022; Jaramishian, 2022; Wilson, 2022), and many EMTs and paramedics are working extensive overtime hours which may negatively affect their health and safety (Trujillo, 2022). Rates of turnover among EMTs and paramedics are also high. According to a survey of 258 emergency medical services (EMS) providers nationwide conducted by the American Ambulance Association, annual turnover among EMTs and paramedics ranges from 20 percent to 30 percent (Weixel, 2021).

California also has one of the most racially/ethnically diverse populations of any state and is home to many recent immigrants who do not speak English well. The demographics of the state's population raise questions about the extent to which the state's EMTs and paramedics can provide racially/ethnically and linguistically concordant care, which have been shown to improve patients' trust, perceptions of quality of care, and health outcomes.

In light of these circumstances, there is a compelling need to learn more about the supply, distribution, and demographic characteristics of EMTs and paramedics as well as the entities that train new EMTs and paramedics in the state. This report synthesizes data from multiple sources to describe the size, distribution, employment patterns, and demographic characteristics of California's EMTs and paramedics. The report also highlights the limitations of these data sources and makes recommendations for filling gaps in the availability of data that would inform efforts to enhance the ability of California's EMTs and paramedics to meet the public's needs.

To place information regarding the employment and demographic characteristics of EMTs and paramedics in context, findings for these occupations were compared to findings for California's overall workforce, firefighters, police officers, registered nurses (RNs), licensed vocational nurses (LVNs), and nursing assistants. Firefighters and police officers were chosen for comparison because they are other types of emergency first responders. Nursing occupations were selected because they are the largest health care occupations (Laughlin, 2021).

Methods

The findings presented in this report are derived from three principal data sources:

- ***California Emergency Medical Services Authority (EMSA) certification and licensing data*** – California law grants EMSA the authority to certify emergency medical technicians (EMTs) and license paramedics (Health and Safety Code § 1797.170 to 1797.172). EMSA data were used describe the trend in new certifications and licenses issued annually, to calculate county-level rates of certified EMTs and licensed paramedics per capita, and to geocode the location of EMSA-approved EMT and paramedic training programs.
- ***2015-2019 American Community Survey (ACS), 5-year Public Use Microdata Sample (PUMS)*** – ACS data were used to estimate annual earnings, and selected employment and demographic characteristics of EMTs, paramedics, and comparison occupations.

- ***Integrated Postsecondary Education Data System (IPEDS), Completions Survey*** – IPEDS data were used to describe the number of graduates of EMT and paramedic training programs in California and their gender and racial and ethnic composition.

In addition to these three sources, we used estimates of occupational employment derived from the Bureau of Labor Statistics (BLS), Occupational Employment Statistics (OES) as a benchmark comparison for the employment estimates derived from the ACS. Finally, we used general population estimates sourced from the California Department of Finance, Demographic Research Unit to calculate the number of certified EMTs and licensed paramedics per capita for each of California's counties.

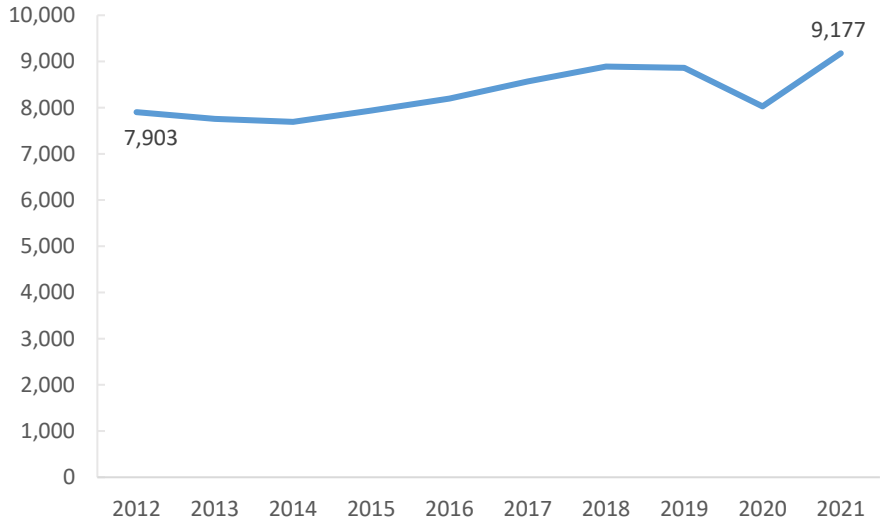
Additional information about these data sources can be found in Appendix B.

Findings

Trend in Number of Certified EMTs and Licensed Paramedics

Figure 1 (below) presents data sourced from the California Emergency Medical Services Authority (EMSA) regarding the number of new emergency medical technician (EMT) certifications issued annually from 2012 to 2021. The data show that the number of new EMT certifications issued annually has steadily increased over the past decade. In 2012, 7,903 new certifications were issued and by 2021, that number increased to 9,177. These data also show that during the first year of the COVID-19 pandemic (2020), the number of certifications issued declined approximately 9 percent, before rebounding in 2021.

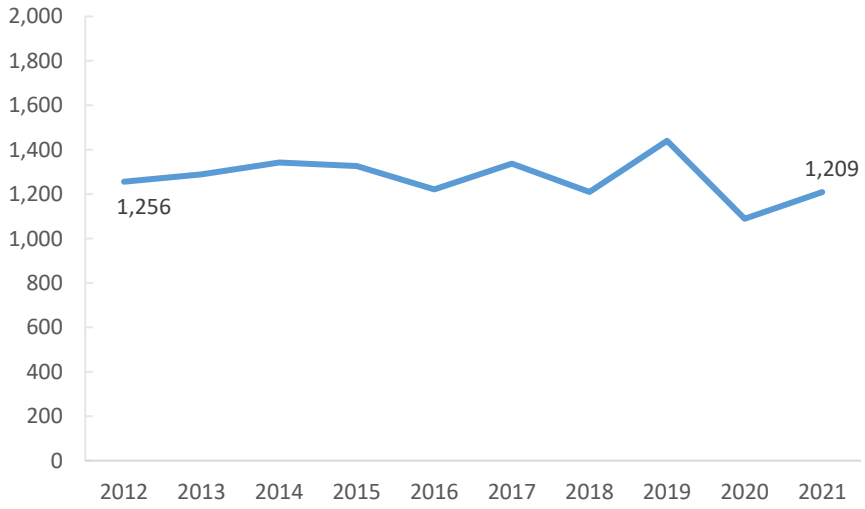
Figure 1. Annual Number of New EMT Certifications Issued, California, 2012-2021



Source: California Emergency Medical Services Authority

Figure 2 displays data from EMSA regarding the annual number of new paramedic licenses issued from 2012 to 2021. The total number of new paramedic licenses issued annually has fluctuated within a narrow range during this period, from approximately 1,200 to 1,400 per year. As with new EMT certifications, these data show a drop in new licenses issued in the first year of the COVID-19 pandemic. Over the past decade, approximately one new paramedic license has been issued for every 6 to 7 new EMT certifications issued annually.

Figure 2. Annual Number of New Paramedic Licenses Issued, California, 2012-2021



Source: California Emergency Medical Services Authority

Estimated Size of California's EMT Workforce and Paramedic Workforce

Table 1 compares the number of actively certified EMTs and licensed paramedics (sourced from EMSA) with employment estimates derived from the 2019 Bureau of Labor Statistics (BLS) Occupational Employment Statistics (OES) survey and the 2015-2019 American Community Survey (ACS) 5-year Public Use Microdata Sample (PUMS). According to EMSA, in 2019 there were approximately 64,000 actively certified EMTs and more than 23,000 actively licensed paramedics in California. These numbers differ substantially from employment estimates derived from the BLS OES survey and the 2015-2019 ACS 5-year PUMS. The BLS data, which combines EMTs and paramedics into a single occupational group, estimated that a total of 22,000 EMTs and paramedics were employed in California in 2019. Similarly, according to the 2015-2019 ACS 5-year PUMS data, approximately 12,300 EMTs and 10,100 paramedics were employed in California during this period.

Table 1. Estimated Employment versus Certified or Licensed Personnel, EMTs and Paramedics, California

Data Source	EMT	Paramedic	Total
CA EMS (2019)	63,926	23,355	87,281
BLS OES Survey (2019)	Not available		21,990*
ACS 5-year PUMS (2015-2019)	12,300	10,118	22,418

*The OES employment estimate combines EMTs and paramedics into a single category.

Several factors likely contribute to the differences between these estimates. The EMSA data likely include certified EMTs and licensed paramedics who are not primarily employed in these occupations. EMSA does not collect information about the individual's occupation as part of the certification or licensure process, but it is highly probable that the EMSA data are capturing persons who work as administrators in various agencies with responsibility for public safety, as well as administrators and directors of programs that provide EMS education and training. The EMSA data likely also include persons working in law enforcement or fire suppression, or persons employed in an unrelated field but who provide their services as a volunteer (which may occur frequently in rural parts of the state). Although estimates of employment derived from sample-based surveys (i.e. BLS, ACS)

have some margin of error, that fact is unlikely to account for the large differences between estimated employment and the number of persons who maintain active certification or licensure. We believe that the sample-based employment estimates are likely to be closer to the true numbers of EMTs and paramedics actively working in these occupations in California.

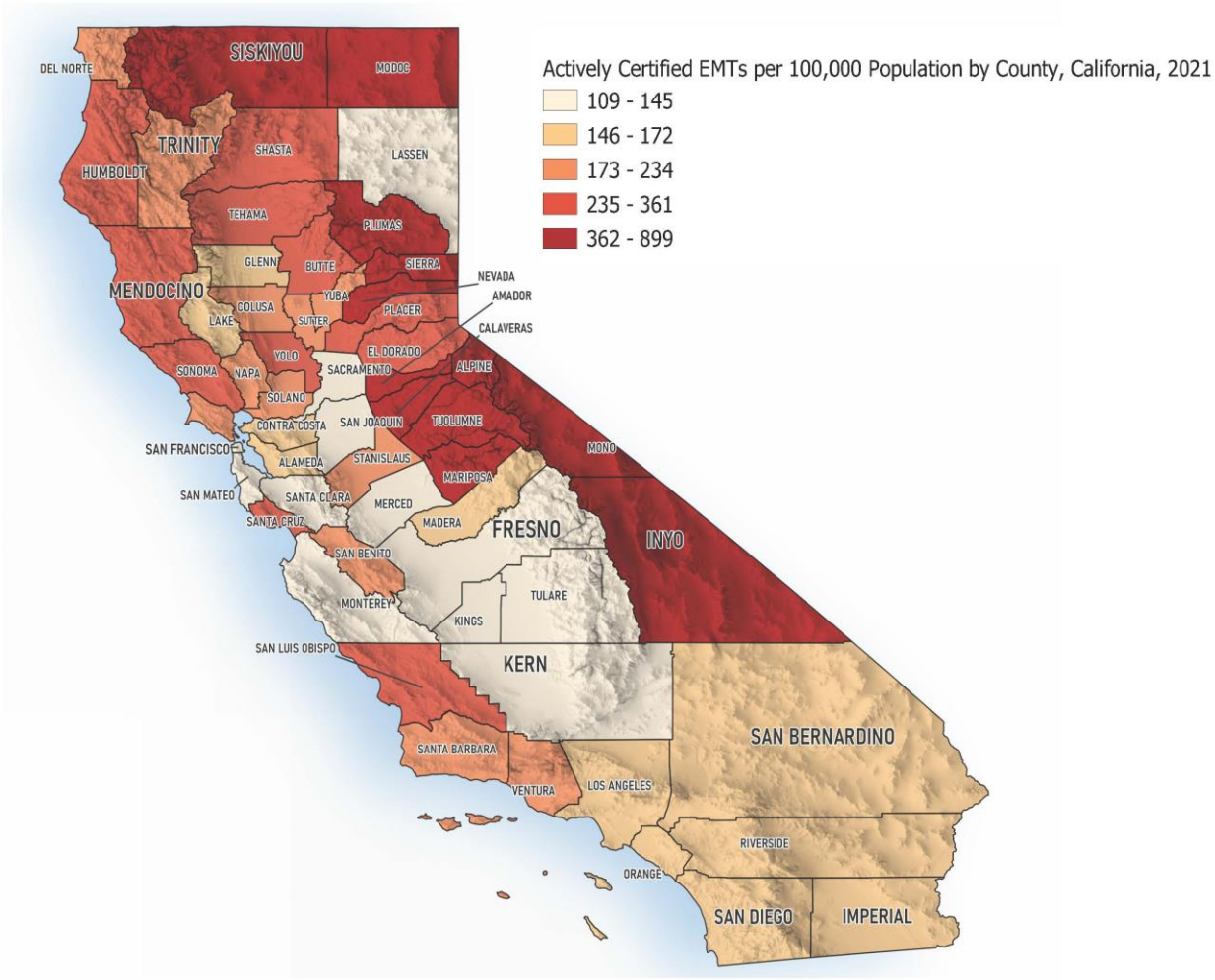
Geographic Distribution of Certified EMTs and Licensed Paramedics

According to EMSA certification and licensing data, only 22 of 58 counties in California experienced an increase in the number of both EMTs and paramedics between 2015 and 2021. (County level data regarding numbers of EMTs and paramedics were not available for prior years.) The majority of counties experienced either no change or a decline in number for one or both occupations.

Actively Certified EMTs per Capita

Information about the geographic distribution of EMTs and paramedics per capita was obtained from EMSA. EMTs and paramedics with active licenses are required to report their "address of record," which does not necessarily correspond to their place of work. Figure 3 is a map showing the 2021 ratio of actively certified EMTs per 100,000 population for each of California's 58 counties. The map indicates that there is a wide variation in the number of EMTs per capita across counties. Many of the less densely populated counties in California had more EMTs and paramedics per capita than counties that have large, densely populated urban centers. For example, the ratio of EMTs per 100,000 population in Calaveras County was 415; in Los Angeles, that ratio was 155.

Figure 3. Actively Certified EMTs per 100,000 Population by County, California, 2021

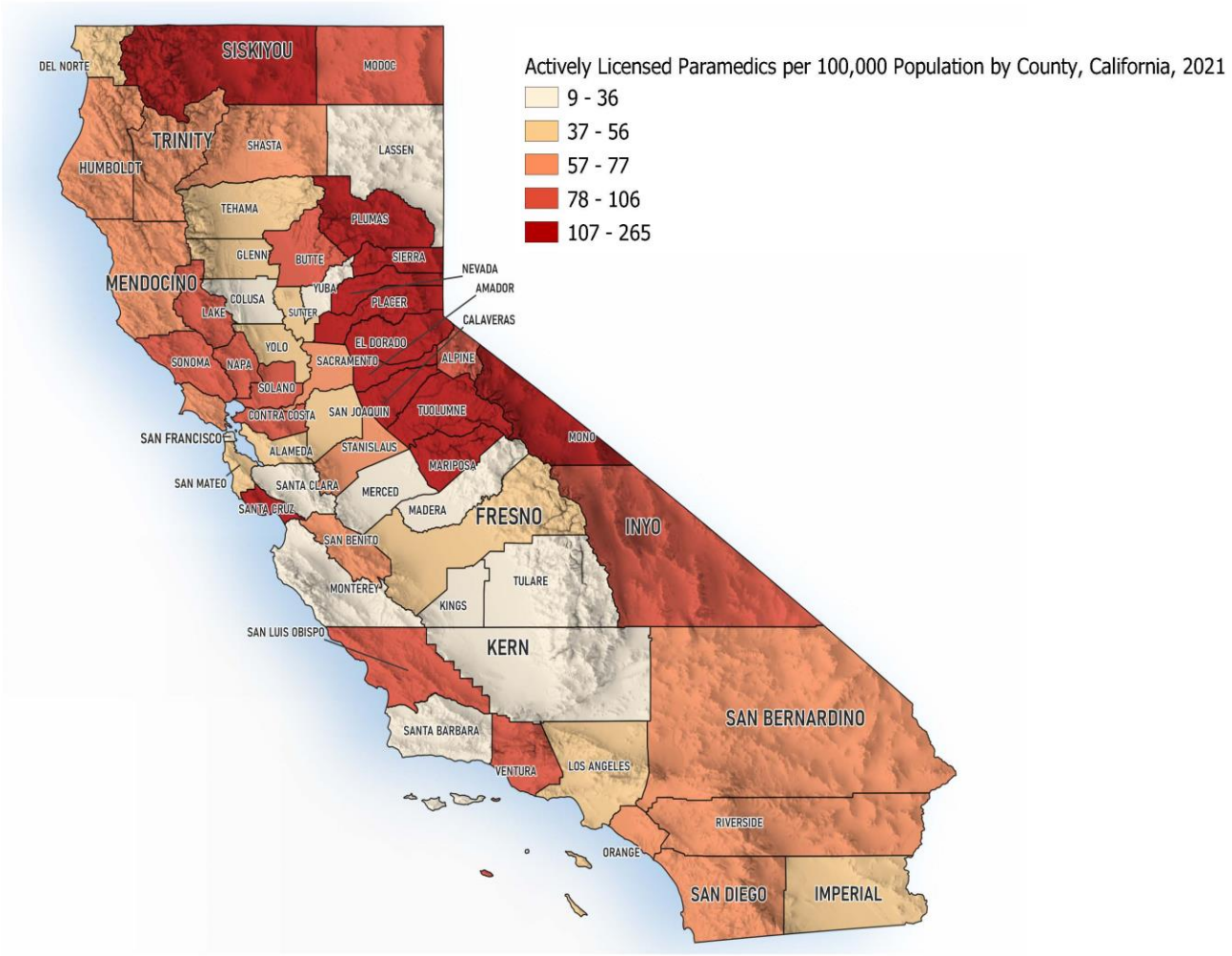


Source: California Emergency Medical Services Authority

Actively Licensed Paramedics per Capita

Figure 4 is a map showing the 2021 ratio of actively licensed paramedics per 100,000 population for each of California's 58 counties. Again, it is important to acknowledge that these data describe the "address of record" for active personnel, which may not correspond to place of work. As with certified EMTs, Figure 6 indicates that the number of licensed paramedics per capita varies widely across counties in California, and that per capita rates do not always correlate with population density. In 2021, Amador County had 127 licensed paramedics per 100,000 population, while in San Francisco County that ratio was 25 per 100,000 population.

Figure 4. Actively Licensed Paramedics per 100,000 Population by County, California, 2021



Source: California Emergency Medical Services Authority

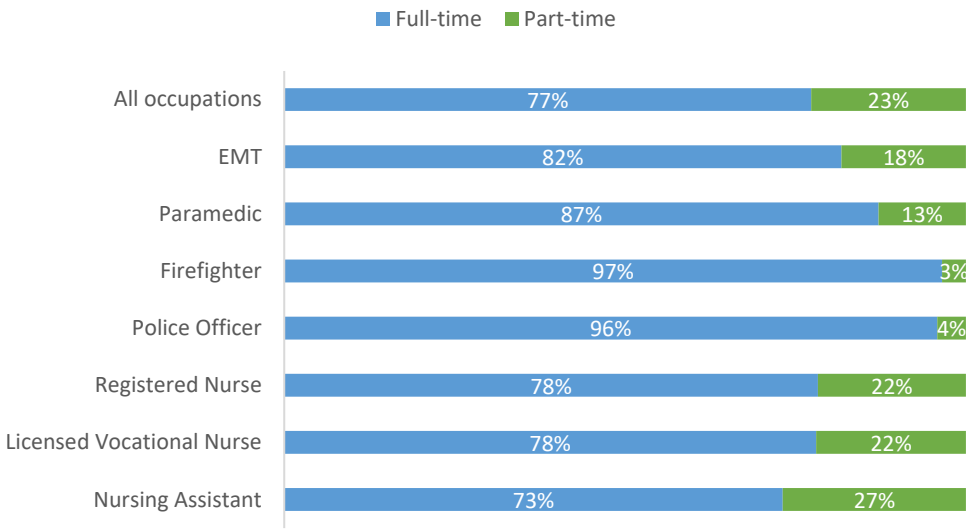
Employment Characteristics

Although the ACS is not designed to measure occupation-specific rates of labor force participation or unemployment, it does provide information about the employment status reported by survey respondents. Eighty-eight percent of EMTs and 90 percent of paramedics in the 2015-2019 ACS 5-year PUMS data reported that they were employed at the time of the survey. Almost all the individuals who reported their occupation as either EMT or paramedic, but who were not employed, were identified as being "not in the labor force". Estimates derived from the ACS also indicate that during the period from 2015 to 2019, approximately 87 percent of EMTs reported that their employer was a private company, versus 13 percent who reported employment with a government agency. For paramedics, 76 percent reported employment with a private company, while 24 percent reported that they were an employee of a government agency.

Full-time Versus Part-time Employment Status

Figure 5 shows that most EMTs (82 percent) and paramedics (87 percent) were employed full-time, measured as working 35 or more hours per week. These proportions were higher than average; across all occupations, approximately 77 percent of California's labor force works full-time. EMTs and paramedics were also more likely to work full-time compared to registered nurses (RN), licensed vocational nurses (LVN), and nursing assistants. However, they were less likely to work full-time compared to both firefighters and police officers.

Figure 5. Full-time vs. Part-time Employment Status by Occupation, California

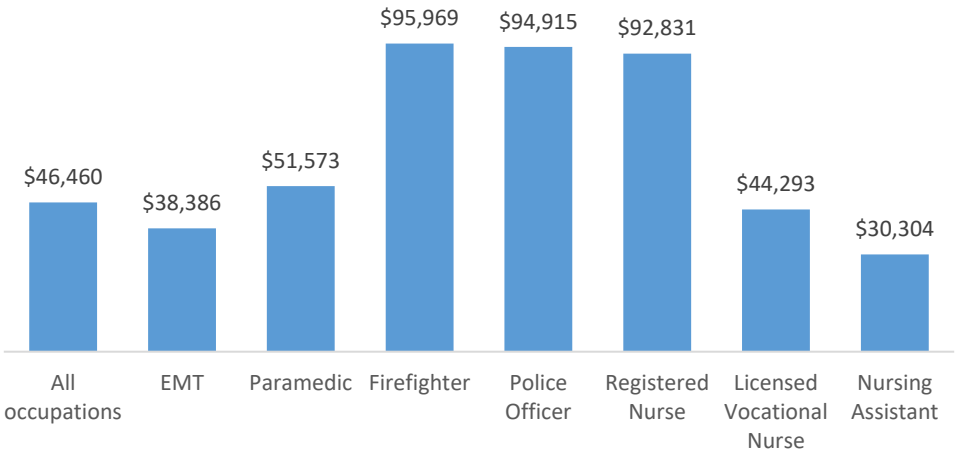


Source: 2015-2019 American Community Survey, 5-year PUMS.

Median Annual Wages

Figure 6 shows the estimated median annual wage by occupation for EMTs, paramedics, RNs, LVNs, nursing assistants, firefighters, and police officers who reported full-time employment (35 or more hours per week). Both paramedics and EMTs earned considerably less than RNs, firefighters, and police officers. The median annual wage earned by paramedics was approximately 55 percent of the amount earned by these other occupations, and for EMTs it was closer to 40 percent. The estimated median annual wage earned by full-time EMTs was below the statewide median for all occupations.

Figure 6. Median Annual Wage (Full-time Employment) by Occupation, California



Source: 2015-2019 American Community Survey, 5-year PUMS.

Demographic Characteristics

Age

Table 2 presents estimates of the median age for EMTs and paramedics, in addition to the other selected occupations and California's labor force overall during the time period from 2015 to 2019. The median ages of 29 for EMTs and 32 for paramedics were much lower than median ages among nursing occupations, firefighters, police officers, and the state's labor force overall.

Table 2. Median Age by Occupation, California

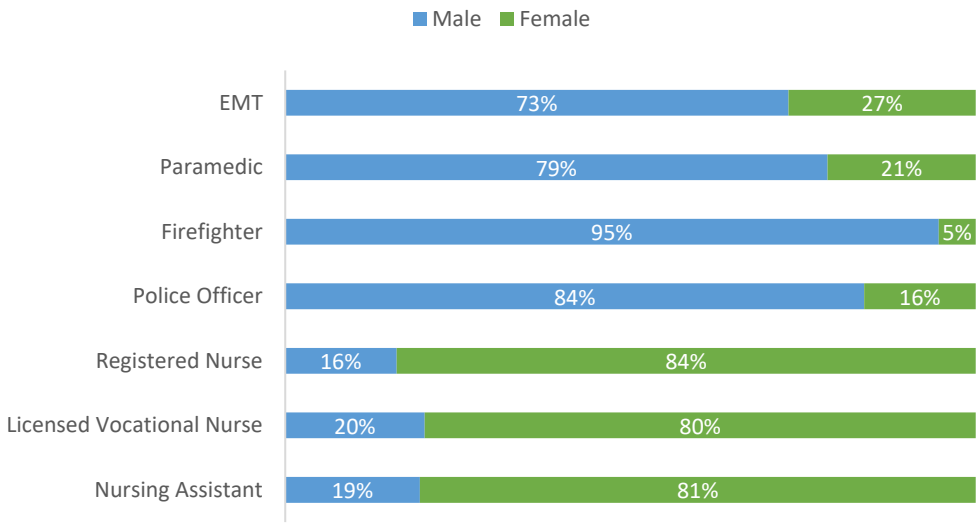
Occupation	Median Age
All occupations	40
EMT	29
Paramedic	32
Firefighter	37
Police Officer	38
Registered Nurse	44
Licensed Vocational Nurse	40
Nursing Assistant	41

Source: 2015-2019 American Community Survey, 5-year PUMS.

Gender

Employed EMTs and paramedics were predominantly male, though to a much lesser extent than firefighters and police officers. The proportions of females among EMTs and paramedics was much smaller than the proportions among RNs, LVNs, or nursing assistants.

Figure 7. Gender Composition by Occupation, California

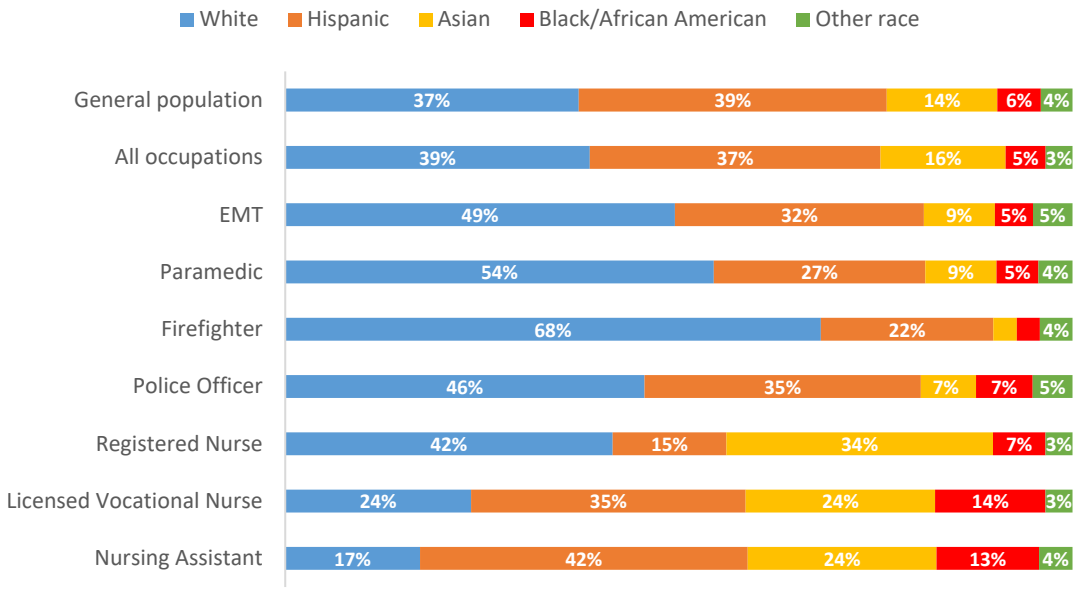


Source: 2015-2019 American Community Survey, 5-year PUMS.

Race and Ethnicity

Employed EMTs and paramedics were less racially and ethnically diverse than persons in nursing occupations, California's overall labor force, and the state's population. Figure 8 shows that the proportion of EMTs (49 percent) and paramedics (54 percent) who were white was similar to that of police officers (46 percent), smaller than firefighters (68 percent), but larger compared with nursing, the overall labor force, and the general population. Compared with the general population and California's overall workforce, the Asian and Hispanic or Latino populations were underrepresented among both EMTs and paramedics. In contrast, the Asian population was heavily overrepresented among nursing occupations. Figure 8 also shows that Black or African Americans were employed as EMTs or paramedics in proportions consistent with their representation across California's workforce and general population.

Figure 8. Racial and Ethnic Composition by Occupation, California



Source: 2015-2019 American Community Survey, 5-year PUMS.

Note: Other race includes American Indian or Alaska Native, Native Hawaiian or Pacific Islander, Two or more races, and Some other race.

Table 3 shows there were differences in the median age by race and ethnicity across the selected occupations. Among EMTs and paramedics, Black or African Americans had the highest median age; this was also true among firefighters and police officers. In general, the median age of Hispanic or Latinos was lower than other racial and ethnic groups, for both the selected occupations and California's labor force overall.

Table 3. Median Age by Race and Ethnicity, and by Occupation, California

Occupation	White	Hispanic	Asian	Black/ African American	Other race
All occupations	44	37	42	40	36
EMT	29	28	28	32	27
Paramedic	33	29	33	35	32
Firefighter	36	36	42	47	38
Police Officer	39	37	39	43	39
Registered Nurse	47	39	42	47	40
Licensed Vocational Nurse	44	34	40	44	37
Nursing Assistant	38	38	47	40	40

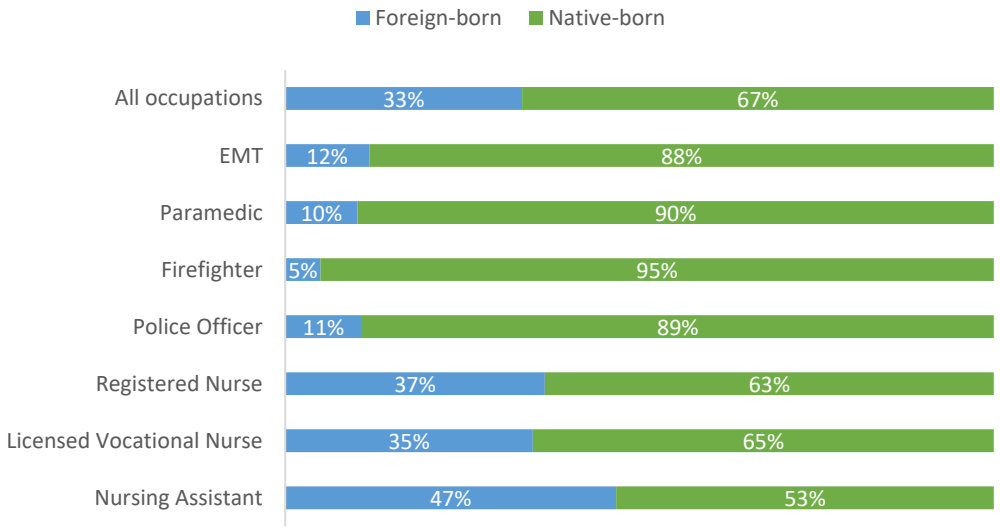
Source: 2015-2019 American Community Survey, 5-year PUMS.

Note: Other race includes American Indian or Alaska Native, Native Hawaiian or Pacific Islander, Two or more races, and Some other race.

Native Versus Foreign-born

Figure 9 shows that approximately one-third of California's labor force was foreign-born. It also illustrates that foreign-born persons account for a large proportion of the state's RN workforce (37 percent), LVN workforce (35 percent), and those employed as nursing assistants (47 percent). In contrast, foreign-born persons account for very small proportions of both EMTs and paramedics, as well as police officers and firefighters.

Figure 9. Foreign-born Composition by Occupation, California

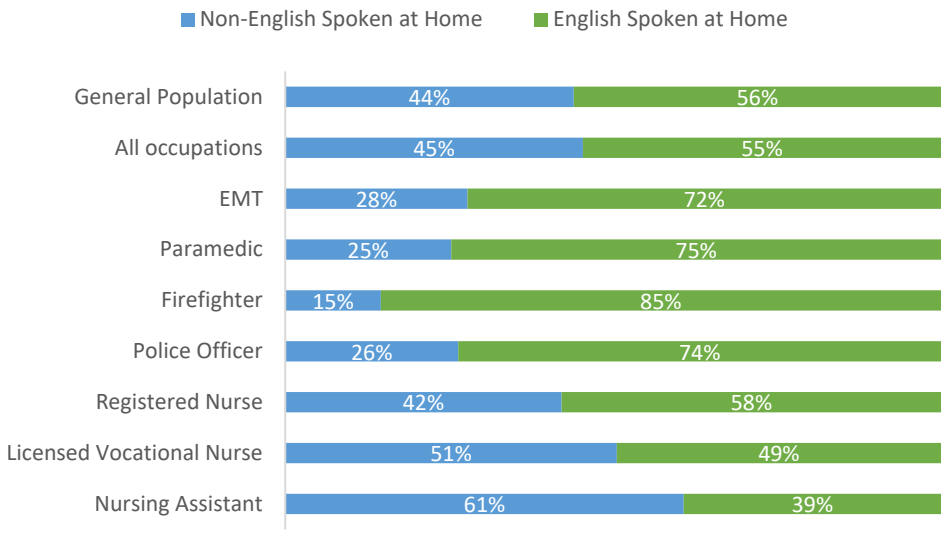


Source: 2015-2019 American Community Survey, 5-year PUMS.

Language Spoken at Home

Figure 10 shows that the proportions of EMTs and paramedics in California speaking a non-English language at home were similar to police officers, much larger than firefighters, but much smaller than any of the nursing occupations and California's workforce overall. This finding may reflect the low percentages of foreign-born persons among EMTs and paramedics. Among EMTs and paramedics speaking a non-English language at home, two-thirds spoke Spanish. With the exception of RNs, Spanish was by far the most frequently spoken non-English language among the professions compared in Figure 10. Among RNs, Tagalog was the most common non-English language spoken in the home, a finding that reflects the large proportion of RNs who are Filipino (21 percent).

Figure 10. Language Spoken at Home by Occupation, California

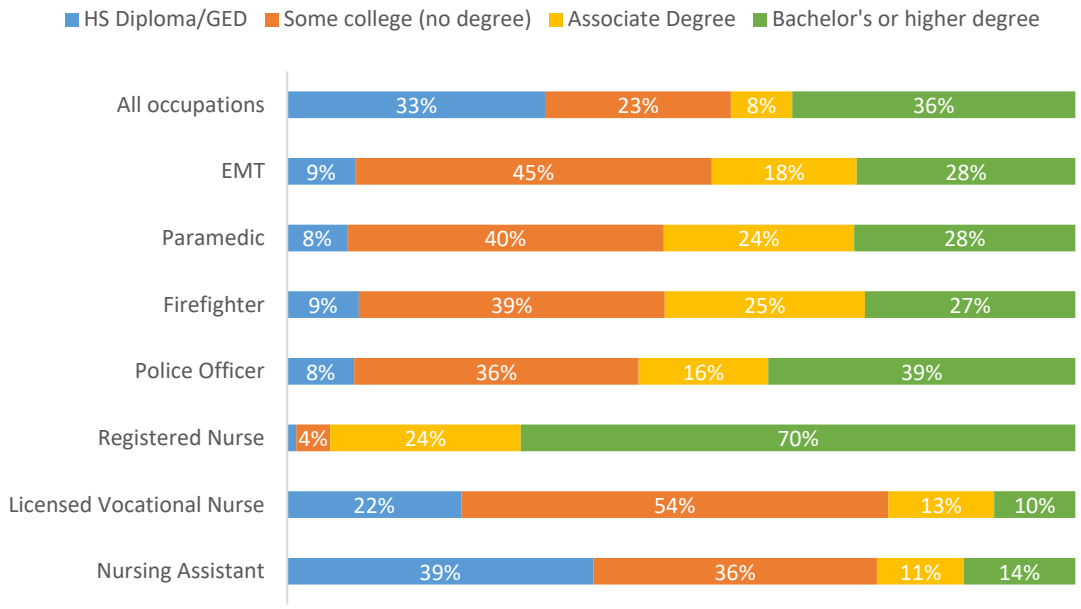


Source: 2015-2019 American Community Survey, 5-year PUMS.

Educational Attainment

Educational attainment among EMTs and paramedics is concentrated at the associate degree level or below. The proportion of EMTs or paramedics with a bachelor's or higher degree is lower than California's overall workforce. Figure 11 shows that the education level of EMTs and paramedics is very similar to firefighters, but that police officers are much more likely to possess a bachelor's or higher degree. Over the past 20 years, there has been an emphasis on expanding the number of RNs trained at the bachelor's degree level, so it is not surprising to see that educational attainment for RNs starkly contrasts with the other occupations presented in Figure 11.

Figure 11. Educational Attainment by Occupation, California



Source: 2015-2019 American Community Survey, 5-year PUMS.

Educational Pipeline

Emergency medical services (EMS) education and training has a well-defined structure with four discrete levels that correspond to skills, competencies, and scope of work, as well as certification and licensure:

- Emergency Medical Responder (EMR),
- EMT-Basic,
- Advanced EMT (AEMT), and
- Paramedic.

EMRs are trained to perform immediate lifesaving care and to assist higher-level personnel at the scene of a medical emergency or during transport. EMR training is typically 60 hours in length. EMTs are trained not only to provide lifesaving care, but also possess the skills needed to stabilize and safely transport patients. California regulations specifies that EMT training programs must be at least 170 hours in length (22 C.C.R § 9.2.3). Relative to the EMT, the AEMT scope of practice includes more advanced emergency medical procedures and the ability to administer some pharmacological interventions. AEMT training programs in California are required to be at least 160 hours in length (in addition to the basic EMT training), including 40 hours of supervised field internship (22 C.C.R. § 9.3.3). Paramedics have the broadest scope of work and provide the most advanced level of prehospital care among EMS personnel, including performing invasive procedures, administering pharmacological interventions, as well as interpreting diagnostic tests and imaging. California requires that paramedic training programs be no less than 1,094 hours in length, including 480 hours of supervised field internship (22 C.C.R. § 9.4.3).

Number of Educational Programs

There are 309 EMS training programs currently approved by the California Emergency Medical Services Authority (EMSA) or local emergency medical services agencies (not including 24 EMT-refresher courses, which provide the required number of hours and content needed for actively certified EMTs to renew their state certification).

Table 4 (below) shows their distribution by type of program, who the program provides service to (public or employees-only), and whether student data is reported publicly through the Integrated Postsecondary Education Data System (IPEDS) – a battery of surveys administered by the US Department of Education to all postsecondary institutions that participate in federal student aid programs.

Table 4 indicates that 90 percent of all paramedic training programs (35 of 39) and 86 percent of EMT-Basic training programs (186 of 216) are open to the public. All AEMT training programs are open to the public. EMR training programs are evenly split between those that are open to the public and those that service only existing employees. Only 26 percent of approved EMT-Basic programs and 56 percent of paramedic programs report student data through IPEDS.

Table 4. Characteristics of EMS Training Programs by Program Type, California

Program Type	Total	Open to Public	Employee-only	Reports to IPEDS
EMR Programs	48	25	23	5
EMT-Basic Programs	216	186	30	51
AEMT Programs	6	6	0	1
Paramedic Programs	39	35	4	22
Total	309	252	57	79

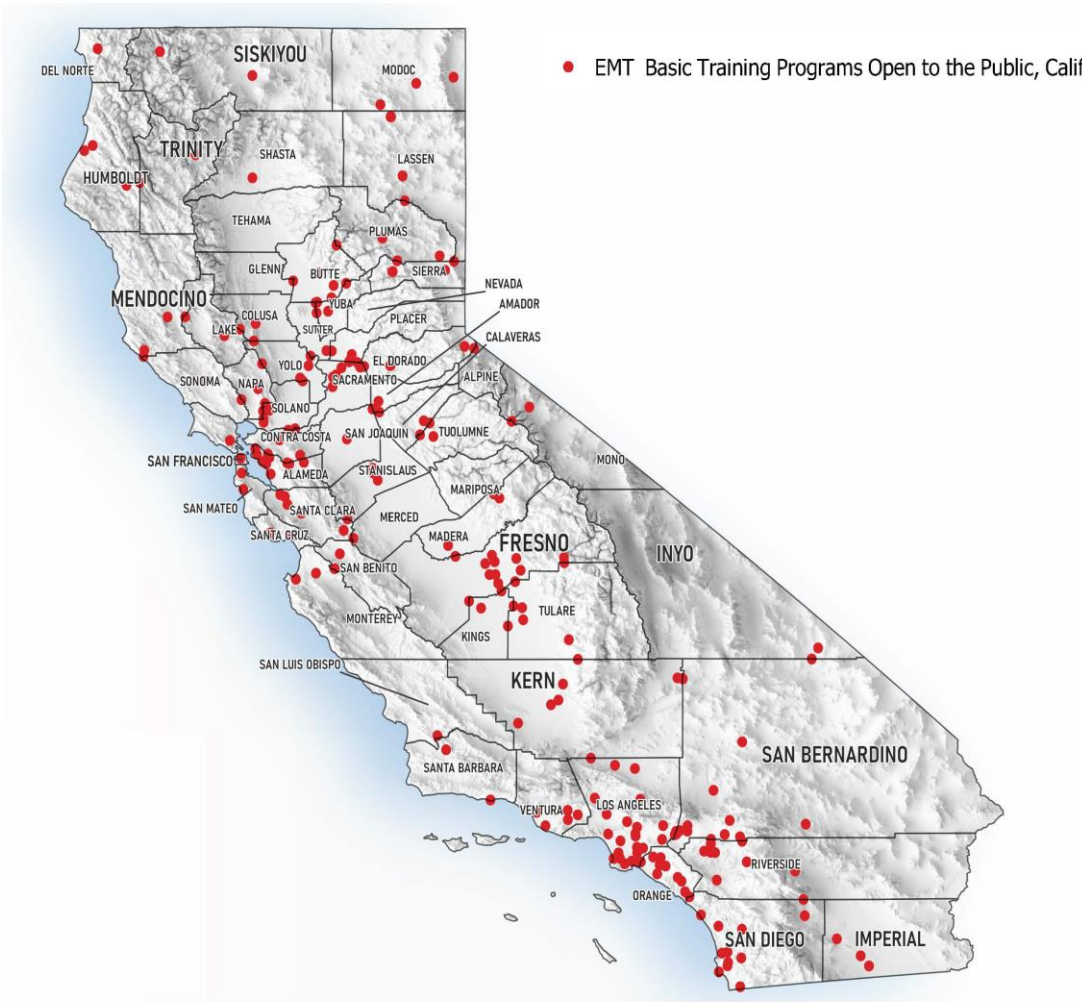
Source: California Emergency Medical Services Authority; Integrated Postsecondary Education Data System.

Note: Information derived from EMSA is current as of July, 2022; whether training programs report information through IPEDS is based on analysis of 2020 IPEDS Completions Survey data.

Geographic Distribution of EMT and Paramedic Training Programs

Figure 12 shows the location of EMT-Basic training programs open to the public. EMT-Basic programs are located in 54 of California's 58 counties. The only counties without a program are four rural counties: Alpine, Glenn, Nevada, and Tehama.

Figure 12. Approved EMT-Basic Training Programs Open to the Public by County, California, 2022



Source: California Emergency Medical Services Authority

Figure 13 shows paramedic training programs open to the public. Paramedic programs are located in 24 of California's 58 counties. Notably, there are no programs in much of the Central Valley region, nor counties that make up most of the Sierra Nevada mountain range.

Figure 13. Approved Paramedic Training Programs Open to the Public by County, California, 2022

Source: California Emergency Medical Services Authority

Characteristics of EMT and Paramedic Programs and Graduates

IPEDS data were used to describe characteristics of institutions that participate in federal student aid programs and offer EMT and/or paramedic education. Key data elements include gender and race/ethnicity of graduates, the level of degree or certificate awarded, and the financial control of the institution (i.e. public, private nonprofit, or private for-profit).

However, a major limitation of the IPEDS Completions data specific to EMS training programs is that it combines EMT and paramedic programs into a single field of study. Another important limitation, as shown in Table 4 (above), is that IPEDS is an incomplete source of data for describing California's EMS educational pipeline. It captures approximately half of the paramedic training programs, and less than one-quarter of all EMT-Basic training programs in California.

Despite these limitations, IPEDS data have value as the only source of demographic information about new EMT and paramedic program graduates. The completions data offer a comprehensive picture of EMT and paramedic programs offered through the California Community College system, which is an important source of training in these fields. Table 5 (below) shows that over the past decade the number of EMT and paramedic training programs offered by postsecondary education institutions has grown significantly, and that this growth has occurred among public-sector programs, which are almost entirely offered within the California Community College system. In 2011, there were 30 different community colleges providing training for EMTs and/or paramedics (out of 31 public sector institutions), but by 2020 the number had grown to 48 (of the 52 public institutions).

Table 5. Number of Programs Reporting EMT/Paramedic Graduates by Institutional Sector and Year, California

Institutional Sector	2011	2015	2020
Public	31	37	52
Private nonprofit	1	2	1
Private for-profit	1	1	1
Total Programs	33	40	55

Source: Integrated Postsecondary Education Data System, Completions Survey

Ownership of Educational Programs

Over time, the composition of program completions by institutional sector has shifted slightly. In addition to the increase in EMT and paramedic education programs at community colleges, National University, based in San Diego, CA now offers an EMT-Basic program at four campuses across the state. This expansion has resulted in a significant increase in the number of new graduates from this private nonprofit institution. In 2020, National University alone accounted for approximately 10 percent of the total number of EMT/paramedic program completions reported in IPEDS.

Table 6. EMT/Paramedic Program Completions by Institutional Sector and Year, California

Institutional Sector	2011	2015	2020
Public	97.3%	93.4%	84.9%
Private nonprofit	0.2%	2.4%	11.5%
Private for-profit	2.5%	4.2%	3.6%
Total Program Completions	2,139	2,476	3,193

Source: Integrated Postsecondary Education Data System, Completions Survey

Program Award Level

EMT/paramedic training programs predominantly award non-degree certificates. Table 7 shows that over the past decade these certificate awards have accounted for approximately 95 percent of all reported program

completions. The data also show a shift in time to completion, with the number of certificates taking less than 1 year to complete decreasing and those taking between 1 and 2 years increasing. It is likely that the longer time-to-completion certificate programs are paramedic training programs (same with the the associate degree programs), but it is unclear what can be inferred from this shift, because these data do not distinguish EMT from paramedic training programs. The share of associate degrees awarded has remained stable over the past decade.

Table 7. EMT/Paramedic Program Completions by Award Level and Year, California

Award Level	2011	2015	2020
Certificate taking less than 1 year	87.8%	83.0%	81.5%
Certificate at least 1 year but less than 2 years	7.0%	11.4%	13.3%
Associate degree	5.3%	5.6%	5.2%
Total Completions	2,139	2,476	3,193

Source: Integrated Postsecondary Education Data System, Completions Survey

Demographic Characteristics

The overall gender composition of graduates from California's EMT/paramedic programs has remained consistent over the past decade. Table 8 shows that approximately 70 percent of all completers have been male, 30 percent female. This is consistent with the 2015-2019 ACS estimates of the EMT workforce; however, the ACS-derived estimates indicate that males comprised nearly 80 percent of California's paramedic workforce. Although not shown in Table 8, the IPEDS data do indicate a difference in gender composition based on award level: males comprise a larger share of graduates that earned a 1-2 year certificate or an associate degree, compared to the less than 1-year certificate programs. It is likely that the 1-2-year certificate programs and associate degree programs are predominantly paramedic programs.

Table 8. EMT/Paramedic Program Completions by Gender and Year, California

Gender	2011	2015	2020
Male	70.9%	69.3%	69.4%
Female	29.1%	30.7%	30.6%
Total Completions	2,139	2,476	3,193

Source: Integrated Postsecondary Education Data System, Completions Survey

The IPEDS data reveal a shift in the composition of graduates by race and ethnicity, driven by an increase in the number of Hispanic or Latino students, and to a lesser extent, students who identify as multiracial. Table 9 shows that in 2011, Hispanic or Latino graduates accounted for approximately 23 percent of all program completions reported through IPEDS; in 2020, that proportion increased to 35 percent. In comparison, the 2015-2019 ACS estimates show that Hispanics or Latinos accounted for 32 percent of the EMT workforce and 27 percent of the paramedic workforce. As with the data describing gender composition, the IPEDS data (not shown in Table 9) indicate that there is a difference in racial and ethnic composition depending on program award level. The proportion of Hispanic or Latino graduates decreased and the proportion of white graduates increased in the 1-2 year certificate and associate degree programs. This would be consistent with the ACS-derived workforce

estimates that show that Hispanic or Latinos represent a smaller share of the paramedic workforce compared to the EMT workforce. In general, the IPEDS data suggest that the percentage of new graduates who are white has decreased over the past decade. However, these data are also incomplete, making it difficult to conclude definitively that the education pipeline is becoming more racially and ethnically diverse.

Table 9. EMT/Paramedic Program Completions by Race/Ethnicity and Year, California

Race/Ethnicity	2011	2015	2020
American Indian or Native Alaskan	0.8%	0.6%	0.5%
Asian	4.2%	6.7%	5.8%
Black or African American	3.1%	2.5%	2.2%
Hispanic or Latino	22.7%	30.9%	35.3%
Native Hawaiian or Pacific Islander	0.6%	0.5%	0.4%
White	60.5%	52.2%	43.5%
Two or more races	2.9%	4.8%	4.9%
Unknown	5.2%	1.8%	7.4%
Total Completions	2,139	2,476	3,193

Source: Integrated Postsecondary Education Data System, Completions Survey

Conclusion

Emergency medical technicians (EMTs) and paramedics in California earn substantially lower wages in comparison to peer occupations, including firefighters and police officers. They are also younger than workers in peer occupations and the state's overall workforce. Between 2015 and 2019, the median age of EMTs was 29 and for paramedics it was 32; the median age of California's labor force was 40. EMTs and paramedics are less racially and ethnically diverse compared to California's labor force overall, but data describing EMT and paramedic training programs indicate that the share of Hispanic or Latino graduates has grown substantially over the past decade. The share of EMTs and paramedics born outside of the United States is comparatively small, as is the share who report speaking a non-English language at home. Almost all counties in California have an EMT training program but less than half have a paramedic training program. The number of programs based at postsecondary education institutions has grown over the past decade.

Describing California's EMT workforce and paramedic workforce as well as the education and training pipeline that supplies new entrants into these occupations is challenging due to the limitations of available data. We found that sample-based estimates of the number of EMTs and paramedics employed in California conflict with the total number of personnel who are actively certified or licensed in the state. Currently, official records maintained as part of the certification and licensure process do not collect information that could be used to determine whether those who maintain their certification and licensure are employed as either EMTs or paramedics. Moreover, most of the providers of EMT or paramedic training in California do not systematically report information about the individuals who complete their programs. These facts make it difficult to conclude whether the findings presented here are broadly representative of the state's EMT workforce and paramedic workforce, or its EMS educational pipeline.

Recommendations

This assessment of existing data on California's emergency medical technicians (EMTs) and paramedics suggests that the state would benefit from investment of additional resources to expand collection and analysis of information about segments of the EMS workforce. Specific recommendations are outlined below.

Leverage EMSA's Authority to Collect Additional Data from EMTs, Paramedics, and Training Programs

California law grants the Emergency Medical Services Authority (EMSA) the authority to certify EMTs and license paramedics. EMSA can leverage this authority to require EMTs and paramedics to report additional data. The agency currently requests data on birth dates, gender, and race/ethnicity when EMTs and paramedics renew their certification or license but many do not provide this information. Legislation should be enacted to require EMTs and paramedics to provide this information as well as information about other demographic characteristics (e.g., languages spoken), practice location, and employment characteristics in a manner consistent with Section 502 of the Business and Professions Code, which sets forth types of information that licensing boards that are part of the California Department of Consumer Affairs must request from their licensees (HCAI, 2022).

EMSA should also collect data on graduates of EMT and paramedic training programs. At present, data on graduates and their demographic characteristics are available only for programs located at colleges and universities that participate in federal student aid programs. They are not available for programs operated by fire departments, adult schools, hospitals, or other types of organizations. Because these types of organizations account for 74 percent of EMT training programs and 44 percent of paramedic training programs, the fact that they do not report any data about the training programs they operate severely limits the ability to identify trends in numbers of graduates and their demographic characteristics. EMSA should require all EMT and paramedic training programs to report data on numbers of graduates and their demographic characteristics on an annual basis.

Expanding data collection is a necessary but insufficient condition for enhancing knowledge of California's EMT and paramedic workforces. EMSA also needs adequate resources to analyze these data and utilize findings to educate policymakers and the public about EMTs and paramedics, and make decisions about workforce development. Findings should be released via reports and/or an online dashboard on an annual basis. The analyses could be performed by EMSA staff, by staff of the Department of Health Care Access and Information's Health Workforce Research Data Center, or by a contractor with expertise in health workforce analysis.

Conduct Research on Career Trajectories

California's EMTs and paramedics are younger than the state's overall workforce and its firefighters, police officers, RNs, LVNs, and nursing assistants. This finding suggests that people may be exiting these occupations to pursue careers in other fields or managerial positions in EMS agencies. In the near term, focus groups or interviews with former EMTs and paramedics could elucidate why people have left these occupations and the occupations they subsequently pursued. This qualitative research would also reveal the extent to which EMTs and paramedics leave the field due to burnout or workplace injuries. It would generate hypotheses that could be tested by collecting and analyzing longitudinal data on the career trajectories of a cohort of EMTs and paramedics.

Conduct Research on Diversity, Equity, and Inclusion

California's EMTs and paramedics are less racially/ethnically and linguistically diverse than California's overall workforce and less diverse than LVNs, an occupation that requires a similar level of education. There is a

pressing need to understand the reasons for these differences. Focus groups and other types of qualitative research could help discern the perceptions Black, Indigenous, and People of Color (BIPOC) in California have regarding EMTs and paramedics and their access to EMT and paramedic training. Longitudinal data (as referenced above under career trajectories) could be used to assess whether BIPOC EMTs and paramedics are more likely to exit the field. These two types of studies would provide insights into the extent to which the lack of diversity reflects a relative lack of interest in these occupations versus a higher rate of transition to careers in other fields. Such research on EMTs and paramedics could be complemented by qualitative studies of the climate for diversity, equity, and inclusion in EMS agencies.

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Appendix A: Actively Certified EMTs and Licensed Paramedics (Total number and per 100K Population) by County, California, 2021

	Total Number		Per 100,000 Population	
Geographic Area	EMT	Paramedic	EMT	Paramedic
California	64,198	22,522	163	57
Alameda	2,597	682	156	41
Alpine	6	1	502	84
Amador	150	51	372	127
Butte	604	170	292	82
Calaveras	188	62	415	137
Colusa	51	2	234	9
Contra Costa	1,744	933	150	80
Del Norte	55	11	199	40
El Dorado	660	506	345	265
Fresno	1,375	412	136	41
Glenn	45	11	156	38
Humboldt	337	78	249	58
Imperial	263	79	147	44
Inyo	74	20	390	105
Kern	1,308	278	144	31
Kings	192	32	127	21
Lake	111	58	164	86
Lassen	43	8	138	26
Los Angeles	15,356	3,888	155	39
Madera	230	45	147	29
Marin	516	194	199	75
Mariposa	84	20	492	117
Mendocino	240	52	265	57
Merced	345	66	122	23
Modoc	38	9	442	105
Mono	104	18	782	135
Monterey	577	145	132	33
Napa	255	108	185	79
Nevada	379	175	372	172
Orange	5,042	1,922	159	61

Placer	1,134	893	278	219
Plumas	77	28	393	143
Riverside	3,795	1,786	157	74
Sacramento	1,945	1,123	123	71
San Benito	138	49	213	76
San Bernardino	3,436	1,490	157	68
San Diego	5,290	2,266	161	69
San Francisco	991	215	117	25
San Joaquin	1,110	399	142	51
San Luis Obispo	836	269	299	96
San Mateo	991	369	132	49
Santa Barbara	927	157	209	35
Santa Clara	2,083	491	109	26
Santa Cruz	793	457	298	171
Shasta	485	119	266	65
Sierra	29	7	899	217
Siskiyou	220	47	501	107
Solano	792	397	176	88
Sonoma	1,385	499	286	103
Stanislaus	958	310	174	56
Sutter	174	53	176	54
Tehama	172	33	263	50
Trinity	37	9	231	56
Tulare	619	160	131	34
Tuolumne	235	76	429	139
Ventura	1,900	667	226	79
Yolo	511	90	235	41
Yuba	166	27	202	33

Source: California Emergency Medical Services Authority; California Department of Finance, Demographic Research Unit

Note: These data exclude persons whose address of record was outside of California.

Appendix B: Data Sources

American Community Survey

A principal source of data used to produce this report was the 2015-2019 American Community Survey (ACS) 5-year Public Use Microdata Sample (PUMS). The PUMS data allow researchers to describe population characteristics that are not provided by the summary tables published by the U.S. Census Bureau. Additional technical information about PUMS data can be found here.

The ACS is not designed specifically for analysis of individual occupations, for example EMTs or paramedics. However, because PUMS data describe population characteristics at the individual person-level (i.e. each observation in the sample represents one person's responses to the survey questions), it is possible to limit the analysis to only those individuals who report that their occupation is either EMT or paramedic (or one of the other selected occupations described in this report). Finally, the 5-year PUMS file was used to ensure a sufficient number of sample observations to generate statistically valid results. These results should be interpreted as a period estimate specific to the data collected from 2015-2019.

Integrated Postsecondary Education Data System (IPEDS)

IPEDS is one of many survey data collection tools administered by the National Center for Education Statistics, which is part of the U.S. Department of Education. IPEDS consists of a battery of annual surveys that collect a wide range of data describing postsecondary education, including enrollments, completions, and institutional characteristics from all institutions that participate in federal student aid programming. The universe of participating institutions includes more than 7,500 liberal arts colleges, research universities, community colleges, and technical/vocational schools. For this report, the authors used data from the Completions Survey, which provides information about the characteristics of students graduating from specific types of postsecondary education programs. Additional information about IPEDS and access to public data sets can be found here. These programs are organized using the Classification of Instructional Programming (CIP) code system, which defines education and training programs according to their content. Additional technical information about the CIP code system can be found here.

California Emergency Medical Services Authority (EMSA)

EMSA is the principal state agency responsible for oversight of emergency medical services (EMS), including the standards of training for EMS personnel and their respective scopes of practice. EMSA maintains an EMS Personnel Registry, which is a database recording the certification and licensing status of all EMS personnel in the state of California. Through a request for technical assistance, the authors were allowed access to selected data elements from the EMS Personnel Registry, which were used to generate key findings presented in this report.

Bureau of Labor Statistics (BLS), Occupational Employment Statistics (OES)

The OES data provide estimates of annual employment and wages for more than 800 occupations and the national, state, and metropolitan levels. The authors referenced estimated total employment for the broad occupational group of EMTs and paramedics as a benchmark comparison for estimates derived from the ACS 5-year PUMS data. Additional information about the OES survey program can be found here.

California Department of Finance, Demographic Research Unit

The Demographic Research Unit within the California Department of Finance is the official source of demographic data for the state. The authors used general population estimates sourced from the Demographic Research Unit to calculate the rate of certified EMTs and licensed paramedics per capita for each of California's counties. Additional information and access to public data sets can be found here.