Labor Market Analysis for Program Recommendation: 0955.00/Laboratory Science Technology *(Clinical Genetics and Molecular Biologist Scientist)*

Orange County Center of Excellence, September 2024

(data valid thru December 2024)

Summary

Program LMI Endorsement	Endorsed: All LMI Criteria Met	☒	Endorsed: Some LMI Criteria Met	☐	Not LMI Endorsed	☐

Program LMI Endorsement Criteria		
Supply Gap:	Yes ☑	No ☐
	Comments: there is projected to be **1,078 annual job openings** throughout Los Angeles and Orange counties for *clinical laboratory technologists and technicians*, which **is more than the 48 awards conferred by educational institutions.**	
Living Wage: (Entry-Level, 25th)	Yes ☑	No ☐
	Comments: **typical entry-level hourly wages *clinical laboratory technologists and technicians* are $23.26, which is above the OC living wage of $20.63.**	
Education:	Yes ☑	No ☐
	Comments: Though *clinical laboratory technologists and technicians* typically requires a bachelor's degree**, more than one-third of workers in the field have completed some college or an associate degree as their highest level of education.**	

Emerging Occupation(s)	
Yes ☐	*No* ☑
Comments: N/A	

The Orange County Center of Excellence for Labor Market Research (OC COE) prepared this report to determine whether there is a supply gap in the Los Angeles/Orange County regional labor market related to one middle-skill occupations:

- Clinical Laboratory Technologists and Technicians

This occupation is most closely related to the Clinical Genetic Molecular Biologists Scientist (CGMBS) License issued by the California Department of Public Health (CDPH. According to CDPH, a person licensed as a CGMBS:

- May use molecular biology techniques to perform a clinical laboratory test or examination for the detection of any disease affecting humans.
- Performs testing in clinical genetic molecular biology in a laboratory certified under CLIA for performing high complexity testing in clinical molecular genetic biology.[1]

[1] https://www.cdph.ca.gov/Programs/OSPHLD/LFS/Pages/CLS-GMB.aspx

To qualify for this license, a bachelor's degree or higher is required in a biological science, clinical laboratory science, or genetics-related field.

This report includes traditional labor market data, as well as online job postings data, for *clinical laboratory technologists and technicians*. An additional analysis of online job postings that specifically request a CGMBS license is included to better understand the variety of occupations that may benefit from this license, as well as potential upskilling opportunities for incumbent workers.

Based on the available data there appears be a supply gap for *clinical laboratory technologists and technicians*. Additionally, typical entry-level hourly wages are above the living wage and typical education requirements for this occupation aligns with a community college education. **Therefore, due to all the regional labor market criteria being met, the COE endorses this proposed program.**

Exhibit 1 lists the occupational demand, supply, typical entry-level education, and educational attainment for the occupations included in this report.

Exhibit 1: Labor Market Endorsement Summary

Occupation (SOC)	Demand (Annual Openings)	Supply (CC and Non-CC)	Entry-Level Hourly Earnings (25th Percentile)	Typical Entry-Level Education	Community College Educational Attainment
Clinical Laboratory Technologists and Technicians (29-2018)	LA: 710 OC: 368	LA: 24 OC: 24	OC: $23.26	Bachelor's degree	40%
Total	**1,078**	**48**	**N/A**	**N/A**	**N/A**

Demand:

- The number of jobs for *clinical laboratory technologists and technicians* are projected to increase 10% through 2027, equating to 1,078 annual job openings.
- Hourly entry-level wages for *clinical laboratory technologists and technicians* are $23.26, which is above the OC living wage of $20.63.
- There were 6,002 online job postings for *clinical laboratory technologists and technicians* over the past 12 months. The highest number of postings were for laboratory technicians, laboratory assistants, and medical laboratory technicians.
    - Additionally, there were 239 online job postings that specifically requested a CGMBS license over the past 12 months. The top occupations for these postings were *medical scientists, except epidemiologists*; *medical and health services managers*; and *clinical laboratory technologists and technicians*.
- The typical entry-level education for *clinical laboratory technologists and technicians* is a bachelor's degree.
- Approximately 40% of workers in the field have completed some college or an associate degree as their highest level of educational attainment.

Supply:

- There was an average of 48 awards conferred by 2 community colleges in Los Angeles and Orange Counties from 2019 to 2022.

- The Regan Career Institute in Los Angeles County is the only non-community college institution that conferred awards from 2019 to 2021; only one award was conferred in the 2020-21 academic year.
- Currently, no Orange County community colleges offer courses listed under the Laboratory Science Technology (0955.00) TOP code. Therefore, student outcomes data is unavailable.

Demand

Occupational Projections:

Exhibit 2 shows the annual percent change in jobs for *clinical laboratory technologists and technicians* from 2017 through 2027. Though there was a 7% decline across all occupations from 2019 to 2020 due to the COVID-19 pandemic, employment for this occupation increased 2% during the same period in Orange County and increased another 5% in 2021. Employment for this occupation is projected to grow at a slightly higher rate compared to all occupations through 2027.

Exhibit 2: Annual Percent Change in Jobs for Clinical Laboratory Technologists and Technicians, 2017-2027

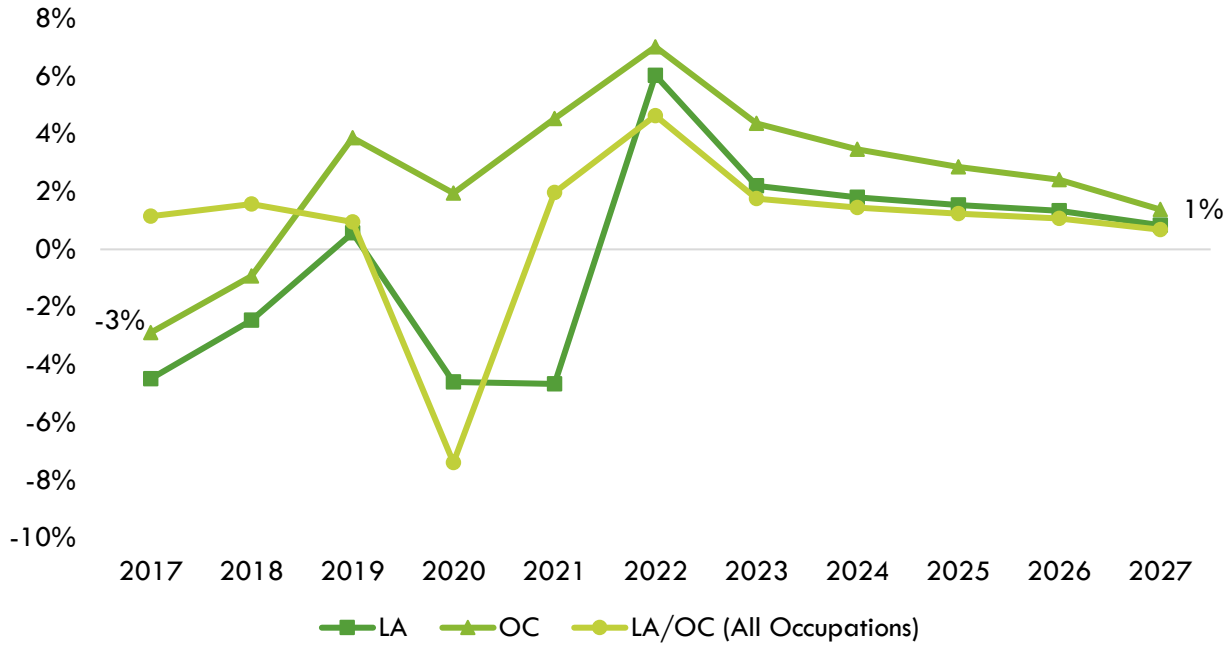


Exhibit 3 shows the five-year occupational demand projections for *clinical laboratory technologists and technicians*. In Los Angeles/Orange County, the number of jobs related to this occupation is projected to increase by 10% through 2027. There is projected to be 1,078 jobs available annually.

Exhibit 3: Occupational Demand in Los Angeles and Orange Counties[2]

Geography	2022 Jobs	2027 Jobs	2022-2027 Change	2022-2027 % Change	Annual Openings
Los Angeles	8,113	8,759	646	8%	710
Orange	3,512	4,050	538	15%	368
Total	**11,625**	**12,809**	**1,184**	**10%**	**1,078**

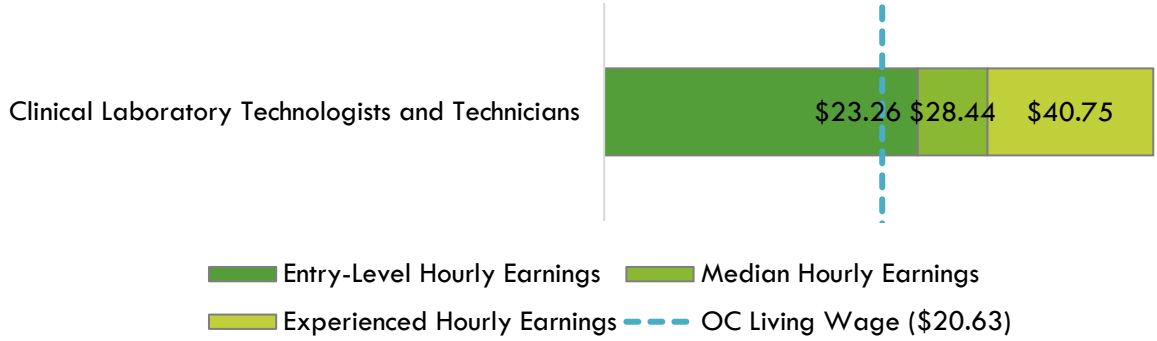
[2] Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

Wages:

The labor market endorsement in this report considers the entry-level hourly wages for *clinical laboratory technologists and technicians* in Orange County as they relate to the county's living wage. Los Angeles County wages are included below in order to provide a complete analysis of the LA/OC region.

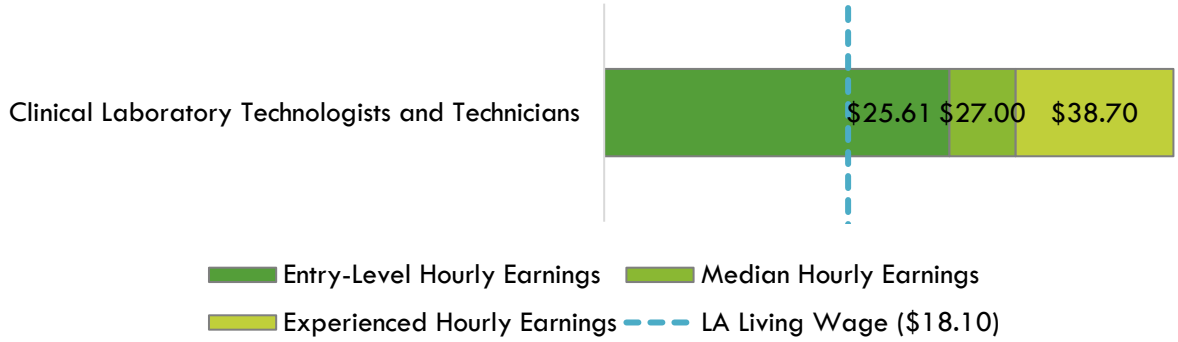
The typical entry-level wages for *clinical laboratory technologists and technicians* are $23.63, which is above the living wage for one adult ($20.63 in Orange County). Orange County's average wages ($32.88) are slightly lower than the average statewide wage of $33.17 for these occupations. Exhibit 4 shows the wage range for *clinical laboratory technologists and technicians* in Orange County and how it compares to the regional living wage.

Exhibit 4: Wages by Occupation in Orange County



The typical entry-level wages for *clinical laboratory technologists and technicians* are $22.08, which is above the living wage for one adult ($18.10 in Los Angeles County). Los Angeles County's average wages ($31.24) are below the average statewide wage of $33.17 for these occupations. Exhibit 5 shows the wage range for *clinical laboratory technologists and technicians* in Los Angeles County and how it compares to the regional living wage.

Exhibit 5: Wages by Occupation in Los Angeles County



Job Postings:

Important Online Job Postings Data Note: *Online job postings data is sourced from Lightcast, a labor market analytics firm that scrapes, collects, and organizes data from online job boards such as LinkedIn, Indeed, Glassdoor, Monster, GovernmentJobs.com, and thousands more. Lightcast uses natural language processing (NLP) to determine the related company, industry, occupation, and other information for each job posting. However, NLP has limitations that include understanding contextual words of phrases; determining differences in words that can be used as nouns, verbs, and/or adjectives; and misspellings or grammatical errors.*[3] *For these reasons, job postings could be assigned to the wrong employer, industry, or occupation within Lightcast's database.*

Additionally, there are several limitations when analyzing job postings. A single job posting may not represent a single job opening, as employers may be creating a pool of candidates for future openings or hiring for multiple positions with a single posting. Additionally, not all jobs are posted online, and jobs may be filled through other methods such as internal promotion, word-of-mouth advertising, physical job boards, or a variety of other channels.

The following sections include an analysis of online job postings specifically for *clinical laboratory technologists and technicians*, as well as all postings that requested a CGMBS license – regardless of occupation. It is important to note that Lightcast, the source of online job postings data for this analysis, does not include a CGMBS license in its database of licenses and certifications. Therefore, keywords such as "CGMBS" and "clinical genetic and molecular biologist scientist" were used to identify postings specifically related to CGMBS.

Occupation Job Postings

There were 6,002 online job postings related to *clinical laboratory technologists and technicians* listed in the past 12 months, as shown in Exhibit 6. The most frequently posted job titles for this occupation were laboratory technicians, laboratory assistants, and medical laboratory technicians.

Exhibit 6: Number of Job Postings by Occupation (n=6,002)

Occupation	Job Postings	Percentage of Job Postings
Clinical Laboratory Technologists and Technicians	6,002	100%

The top employers in the region, by number of job postings, are shown in Exhibit 7.

Exhibit 7: Top Employers by Number of Job Postings (n=6,002)

Employer	Job Postings	Percentage of Job Postings
University of California	369	6%
Actalent	269	4%
Providence	180	3%
University of Southern California	125	2%
Siemens Healthineers	124	2%
Labcorp Drug Development	103	2%
Hoag Health System	89	1%
Cedars-Sinai	86	1%
Aya Healthcare	69	1%
Kelly Services	65	1%

[3] K. R. Chowdhary, Fundamentals of Artificial Intelligence (Basingstoke: Springer Nature, 2020), https://link.springer.com/book/10.1007/978-81-322-3972-7.

The top specialized, soft, and computer skills listed by those most frequently mentioned in job postings (denoted in parentheses) are shown in Exhibit 8.

Exhibit 8: Top Skills by Number of Job Postings (n=6,002)

Top Specialized Skills	Top Soft Skills	Top Computer Skills
Medical Laboratory (1,319)	Communications (1,907)	Microsoft Excel (348)
Laboratory Equipment (970)	Quality Control (1,187)	Microsoft Office (323)
Biology (898)	Detail Oriented (1,088)	Microsoft PowerPoint (187)
Chemistry (842)	Troubleshooting (Problem Solving) (731)	Microsoft Outlook (184)
Phlebotomy (666)	Research (687)	Microsoft Word (168)
Laboratory Experience (654)	Customer Service (678)	Spreadsheets (104)
Laboratory Testing (633)	Management (665)	Laboratory Information Management Systems (101)
Data Entry (570)	Operations (643)	Python (Programming Language) (43)
Standard Operating Procedure (514)	Problem Solving (575)	Epic EMR (36)
Cath Lab (504)	Clerical Works (572)	Laboratory Management System (36)

CGMBS Job Postings

There were 239 online job postings that specifically required a CGMBS license in the past 12 months. Exhibit 9 shows the top occupations that requested this license. Notably, nearly 75% of the postings were for *medical scientists, except epidemiologists*. This occupation typically requires a doctoral or professional. Notably, there were only 20 postings for *clinical laboratory technologists and technicians* that requested a CGMBS license. These 20 postings represent less than 1% of all postings for *clinical laboratory technologists and technicians*.

Exhibit 9: Number of Job Postings by Occupation (n=239)

Occupation	Job Postings	Percentage of Job Postings
Medical Scientists, Except Epidemiologists	176	74%
Medical and Health Services Managers	26	11%
Clinical Laboratory Technologists and Technicians	***20***	***8%***
Managers, All Other	6	3%
Natural Sciences Managers	3	1%
Operations Research Analysts	2	1%
Health Technologists and Technicians, All Other	2	1%
Instructional Coordinators	1	0.4%
Healthcare Support Workers, All Other	1	0.4%

The top employers, by number of job postings, that requested a CGMBS license are listed in Exhibit 10.

Exhibit 10: Top Employers by Number of Job Postings (n=239)

Employer	Job Postings	Percentage of Job Postings
Providence	97	41%
Ambry Genetics	16	7%
Kelly Services	13	5%
Sharp Healthcare	13	5%
Healthtrackrx	7	3%
University of California	7	3%
Club Staffing	4	2%
Actalent	3	1%
City of Hope	3	1%
Diagnostic Laboratory Science	3	1%

The top specialized, soft, and computer skills listed by those most frequently mentioned in job postings (denoted in parentheses) are shown in Exhibit 11.

Exhibit 11: Top Skills by Number of Job Postings (n=239)

Top Specialized Skills	Top Soft Skills	Top Computer Skills
Clinical Laboratory Science (222)	Communications (69)	Laboratory Management System (17)
Molecular Biology (197)	Quality Assurance (68)	System Software (13)
Medical Laboratory (190)	Quality Control (52)	Laboratory Information Management Systems (4)
Hematology (144)	Detail Oriented (50)	R (Programming Language) (4)
Biochemistry (138)	Clerical Works (47)	Microsoft Access (2)
Biology (84)	Leadership (43)	C# (Programming Language) (1)
Microbiology (59)	Operations (43)	Google Workspace (1)
Chemistry (52)	Problem Solving (38)	Microsoft Excel (1)
Blood Banking (48)	Management (37)	Microsoft Office (1)
Specimen Processing (47)	Customer Service (36)	Microsoft PowerPoint (1)

Educational Attainment:

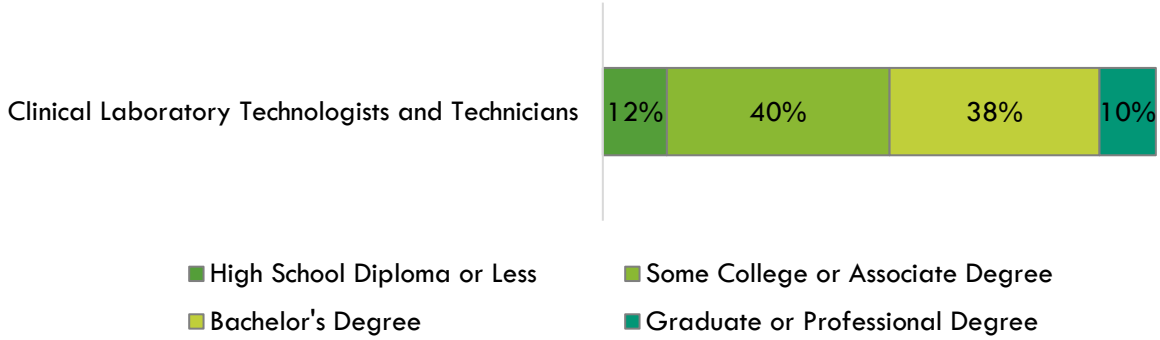
The Bureau of Labor Statistics (BLS) lists a bachelor's degree as the typical entry-level education for *clinical laboratory technologists and technicians*. However, the national-level educational attainment data indicates 40% of workers in the field have completed some college or an associate degree as their highest level of education. Exhibit 12 shows the educational attainment for this occupation.

Of the 60% of the cumulative job postings for *clinical laboratory technologists and technicians* that listed a minimum education requirement in Los Angeles/Orange County, 68% (2,445) requested a high school diploma or an associate degree and 32% (1,157) requested a bachelor's, master's, or doctoral degree.

According to the California Department of Public Health, a bachelor's degree or higher is required in a biological science, clinical laboratory science, or genetics-related field to qualify for the CGMBS license.

Of the 78% of the cumulative job postings that requested a CGMBS license and listed a minimum education requirement in Los Angeles/Orange County, 98% (183) requested a bachelor's, master's, or doctoral degree and 2% (4) requested a high school diploma or an associate degree.

Exhibit 12: National-level Educational Attainment for Occupations



Educational Supply

Community College Supply:

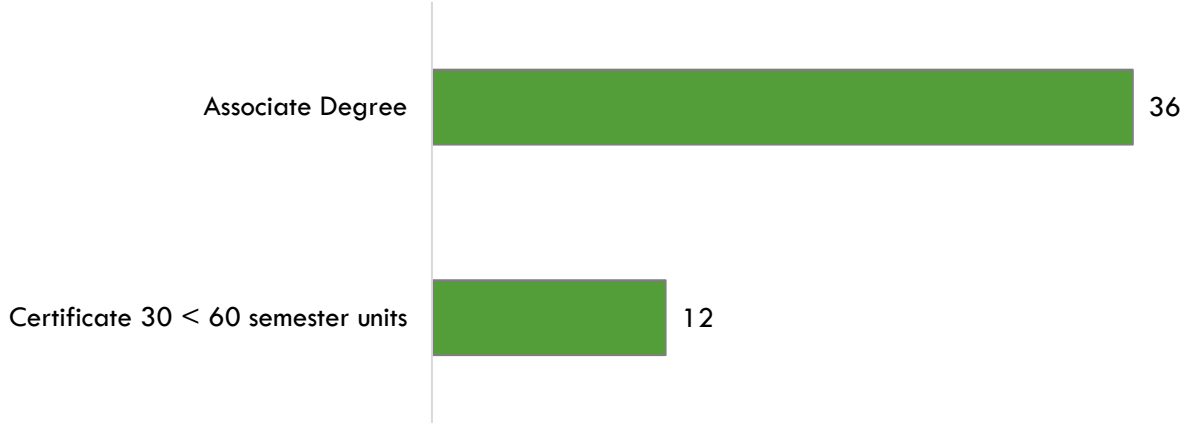
Exhibit 13 shows the three-year average number of awards conferred by community colleges in the related TOP codes: Laboratory Science Technology (0955.00) and Medical Laboratory Technology (1205.00). Only two colleges, Mt. San Antonio and Saddleback, confer awards under these two TOP codes. Over the past 12 months, there were no other related program recommendation requests from regional community colleges.

Exhibit 13: Regional Community College Awards (Certificates and Degrees), 2019-2022

TOP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
0955.00	Laboratory Science Technology	Mt San Antonio	1	5	4	3
		LA Subtotal	**1**	**5**	**4**	**3**
		-	-	-	-	-
		OC Subtotal	**-**	**-**	**-**	**-**
		Supply Subtotal/Average	**1**	**5**	**4**	**3**
1205.00	Medical Laboratory Technology	Mt San Antonio	11	26	27	21
		LA Subtotal	**11**	**26**	**27**	**21**
		Saddleback	29	27	17	24
		OC Subtotal	**29**	**27**	**17**	**24**
		Supply Subtotal/Average	**40**	**53**	**44**	**45**
		Supply Total/Average	**41**	**58**	**48**	**48**

Exhibit 14 shows the annual average community college awards by type from 2019-20 to 2021-22 The majority of the awards are associate degrees, followed by certificates between 30 and less than 60 semester units.

Exhibit 14: Annual Average Community College Awards by Type, 2019-2022



Community College Student Outcomes:

Exhibit 15 shows the Strong Workforce Program (SWP) metrics for laboratory science technology programs in California. Currently, there are no community colleges that offer courses or programs under this TOP code. Therefore, there is no outcomes data for the Orange County region or RSCCD. Throughout the state, there were only 39 students enrolled in laboratory science technology programs. Therefore, several metrics are unavailable. However, 77% of students completed 9 or more career education units and 14 students earned a degree or certificate; the same number transferred.

Exhibit 15: Laboratory Science Technology (0955.00) Strong Workforce Program Metrics, 2020-21[4]

SWP Metric	RSCCD	OC Region	California
SWP Students	N/A	N/A	39
SWP Students Who Earned 9 or More Career Education Units in the District in a Single Year	N/A	N/A	77%
SWP Students Who Completed a Noncredit CTE or Workforce Preparation Course	N/A	N/A	Insufficient Data
SWP Students Who Earned a Degree or Certificate or Attained Apprenticeship Journey Status	N/A	N/A	14
SWP Students Who Transferred to a Four-Year Postsecondary Institution (2019-20)	N/A	N/A	14
SWP Students with a Job Closely Related to Their Field of Study (2019-20)	N/A	N/A	Insufficient Data
Median Annual Earnings for SWP Exiting Students	N/A	N/A	Insufficient Data
Median Change in Earnings for SWP Exiting Students	N/A	N/A	Insufficient Data
SWP Exiting Students Who Attained the Living Wage	N/A	N/A	Insufficient Data

Non-Community College Supply:

For a comprehensive regional supply analysis, it is also important to consider the supply from other institutions in the region that provide training programs for *clinical laboratory technologists and technicians*. Exhibit 16 shows the annual and two-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Code: Clinical/Medical Laboratory Technician. Regan Career Institute in Los Angeles County is the only non-community college institution that conferred awards under this CIP code.

Exhibit 16: Regional Non-Community College Awards, 2019-2021

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	3-Year Award Average
51.1004	Clinical/Medical Laboratory Technician	Regan Career Institute	0	1	0
		Supply Total/Average	**0**	**1**	**0**

[4] All SWP metrics are for 2020-21 unless otherwise noted.

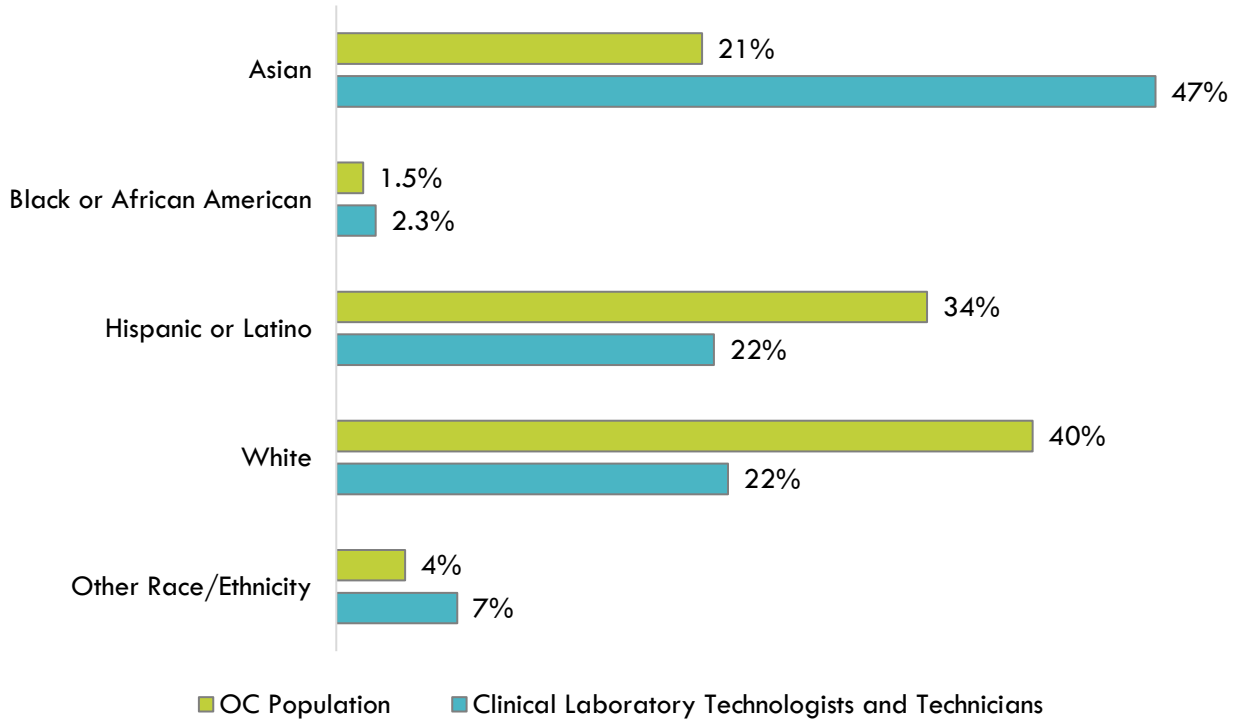
Regional Demographics

This section analyzes demographic data for the Orange County population as well occupational data for the purpose of identifying potential diversity and equity issues that can be addressed by community college programs. Student demographic data is not available because no community colleges in Orange County currently offer a laboratory science technology program.

Ethnicity:

Exhibit 17 shows the ethnicity the overall Orange County population, as well as *clinical laboratory technologists and technicians*. Notably, 47% of *clinical laboratory technologists and technicians* are Asian, which is more than double the population (21%). Conversely, 22% of *clinical laboratory technologists and technicians* are Hispanic or Latino or white. These figures a significantly lower than the population, where Hispanic or Latino accounts for 34% and white accounts for 40%.

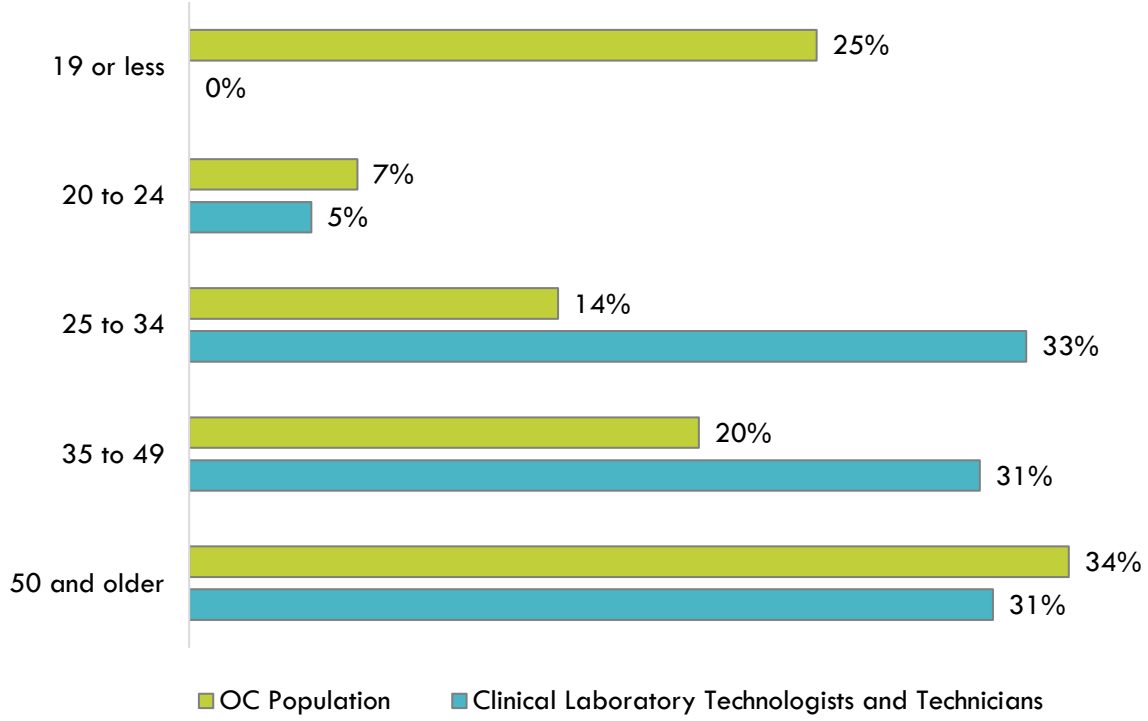
Exhibit 17: Program and County Demographics by Ethnicity



Age:

Exhibit 18 shows the overall age of the Orange County population, as well as *clinical laboratory technologists and technicians*. Notably, 33% of *clinical laboratory technologists and technicians* are 25 to 34, which is more than double the population (14%).

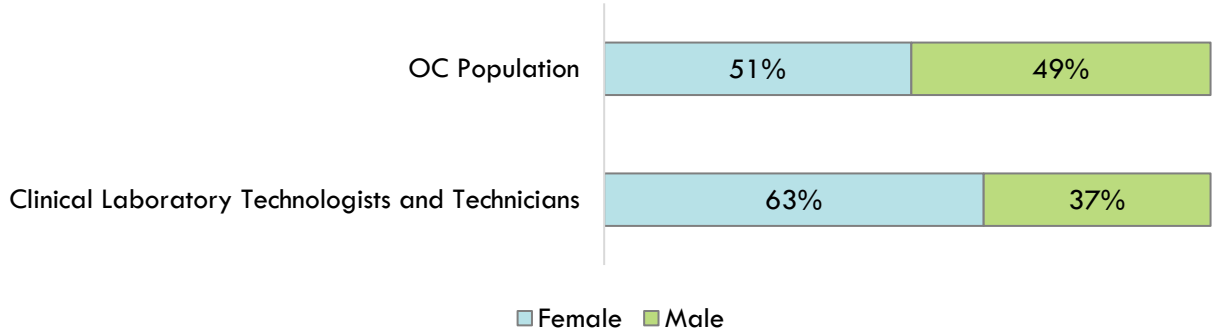
Exhibit 18: Program and County Demographics by Age



Sex:

Exhibit 19 shows the sex of the overall Orange County population as well as *clinical laboratory technologists and technicians*. Though the population is split nearly evenly, 63% of *clinical laboratory technologists and technicians* are women.

Exhibit 19: Program and County Demographics by Sex



Appendix A: Methodology

The OC COE prepared this report by analyzing data from occupations and education programs. Occupational data is derived from Lightcast, a labor market analytics firm that consolidates data from the California Employment Development Department (EDD), U.S. Bureau of Labor Statistics (BLS) and other government agencies. Program supply data is drawn from two systems: Taxonomy of Programs (TOP) and Classification of Instructional Programs (CIP).

Using a TOP-SOC crosswalk, the OC COE identified middle-skill jobs for which programs within these TOP codes train. Middle-skill jobs include:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

The OC COE determined labor market supply for an occupation or SOC code by analyzing the number of program completers or awards in a related TOP or CIP code. The COE developed a "supply table" with this information, which is the source of the program supply data for this report. TOP code data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP code data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data), also known as IPEDS. TOP is a system of numerical codes used at the state level to collect and report information on California community college programs and courses throughout the state that have similar outcomes. CIP codes are a taxonomy of academic disciplines at institutions of higher education in the United States and Canada. Institutions outside of the California Community College system do not use TOP codes in their reporting systems.

Data included in this analysis represent the labor market demand for relevant positions most closely related to the proposed program as expressed by the requesting college in consultation with the OC COE. Traditional labor market information was used to show current and projected employment based on data trends, as well as annual average awards granted by regional community colleges. Real-time labor market information captures job post advertisements for occupations relevant to the field of study which can signal demand and show what employers are looking for in potential employees, but is not a perfect measure of the quantity of open positions.

All representations have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. The most recent data available at the time of the analysis was examined; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

Appendix B: Data Sources

Data Type	Source
Occupational Projections, Wages, and Job Postings	Traditional labor market information data is sourced from Lightcast, a labor market analytics firm. Lightcast occupational employment data are based on final Lightcast industry data and final Lightcast staffing patterns. Wage estimates are based on Occupational Employment Statistics and the American Community Survey. For more information, see https://lightcast.io/
Living Wage	The living wage is derived from the Insight Center's California Family Needs Calculator, which measures the income necessary for an individual of family to afford basic expenses. The data assesses the cost of housing, food, child care, health care, transportation, and taxes. For more information, see: https://insightcced.org/family-needs-calculator/ The living wage for one adult in Orange County is $20.63 per hour ($42,910.40 annually). This figure is used by the CCCCO to calculate the percentage of students that attained the regional living wage.
Typical Education and Training Requirements, and Educational Attainment	The Bureau of Labor Statistics (BLS) provides information about education and training requirements for hundreds of occupations. BLS uses a system to assign categories for entry-level education, work experience in a related occupation, and typical on-the-job training to each occupation for which BLS publishes projections data. For more information, see https://www.bls.gov/emp/documentation/education/tech.htm
Emerging Occupation Descriptions, Additional Education Requirements, and Employer Preferences	The O*NET database includes information on skills, abilities, knowledges, work activities, and interests associated with occupations. For more information, see https://www.onetonline.org/help/online/
Educational Supply	The CCCCO Data Mart provides information about students, courses, student services, outcomes and faculty and staff. For more information, see: https://datamart.cccco.edu The National Center for Education Statistics (NCES) Integrated Postsecondary Integrated Data System (IPEDS) collects data on the number of postsecondary awards earned (completions). For more information, see https://nces.ed.gov/ipeds/use-the-data/survey-components/7/completions
Student Metrics and Demographics	LaunchBoard, a statewide data system supported by the California Community Colleges Chancellor's Office and hosted by Cal-PASS Plus, provides data on progress, success, employment, and earnings outcomes for California community college students. For more information, see: https://www.calpassplus.org/LaunchBoard/Home.aspx

Data Type	Source
Population and Occupation Demographics	The Census Bureau's American Community Survey (ACS) is the premier source for detailed population and housing information. For more information, see: https://www.census.gov/programs-surveys/acs Data is sourced from IPUMS USA, a database providing access to ACS and other Census Bureau data products. For more information, see: https://usa.ipums.org/usa/about.shtml

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FOR LABOR MARKET RESEARCH

September 2024
(data valid thru December 2024)