Factors Impacting the Clinical Laboratory Workforce

Critical to developing solutions to chronic and acute shortages of qualified laboratory professionals is an understanding of the environmental factors at work, dispelling myths that have formed the basis of some professional discourse.

Demographic and Workforce Trends

Clinical laboratories are not immune from the demographic trends affecting the larger workforce. Clinical laboratories will be competing for fewer available workers against other professions that are also experiencing shortages.

- In 2021, the United States experienced the slowest population growth since WWII.
- The drop off in U.S. fertility rates is beginning to make itself felt on America's college campuses. Colleges and universities had already seen **enrollment drop** by 13 percent since 2011, but a follow-on drop, the result of the Great Recession (TGR), is looming. This recession-driven drop in 18-year-olds is expected to reduce college enrollment by another 15 percent. The first children born during TGR will graduate from high school beginning in 2027.
- **Declining percentages** of high school graduates (ages 16 to 24) are enrolling in college. According to the U.S. Department of Labor, enrollment by this group has declined from 69.1% in 2018 to 61.8% in 2021. (https://www.bls.gov/opub/ted/2022/61-8-percent-of-recent-high-school-graduates-enrolled-in-college-in-october-2021.htm)
- According to the National Student Clearinghouse Research Center, the number of students enrolled at community colleges has **declined 37 percent** since 2010. This equates to 2.6 million fewer students.
- Other health professions are experiencing challenges attracting students, including pharmacy. Since reaching a peak of 17,617 applications for the 2012-2013 academic year, the number of applications through the centralized PharmCAS have **steadily declined** to just 13,006 in the 2020-2021 academic year, this is while the number of programs using the application system increased from 110 to 134.
- In November 2022, the chairman of the Federal Reserve estimated more than 2 million excess retirements occurred during COVID. He said, "current labor force shortfall of roughly 3-1/2 million people…reflects both lower-than-expected population growth and a lower labor force participation rate. The participation gap is now mostly due to excess retirements—which might now account for **more than 2 million of the 3-1/2 million shortfall** in the labor force."

Training

Training is both a gateway and a gatekeeper for qualified clinical laboratory professionals.

- Contrary to popular belief, the number of MLS and MLT programs accredited by NAACLS have both **increased** since 2008. In 2022, there were 244 MLS programs and 239 MLT programs, up from 222 and 205 respectively. This has led to an increase in MLS graduates from 2,922 in 2008 to 4,246 in 2022. MLT graduates have not seen significant growth. In 2022, there were 2,622 MLT graduates, up slightly from the 2,515 who graduated in 2008. MLT graduates did spike up to 3,410 in 2013 before dropping to their current levels.
- While it is unclear what the collective capacity and utilization of current MLS and MLT programs might be. A study by ASCP published before the pandemic showed about ¼ of the university-based programs fully enrolled and ¾ of the hospital-based programs full.
- In addition to unfilled slots, another challenge to increasing the number of graduates is capacity limits due to the availability of clinical sites. The is particularly acute for microbiology, but also blood banking.
- There is a readily available supply of college students with an aptitude for and interest in science. In the 2019/2020 academic year, more than 126,000 BS degrees in biology and biomedical sciences were awarded. More than 20,000 chemistry BS degrees were awarded that same year. While some continue to advance degrees, many, unaware of clinical laboratory science, end up not using their training.

Certification

From 2018 through 2022, 18,793 professionals were newly certified as Medical Laboratory Scientists while 12,072 were newly certified as Medical Laboratory Technicians. This represents 94% of the MLS program graduates and 84% of the MLT program graduates from NAACLS-accredited programs. New certifications noticeably dropped during 2020 but have since rebounded to near levels in 2018.

Graduates and New Certifications 2018-2022 (NAACLS, ASCP BOC, and AMT)

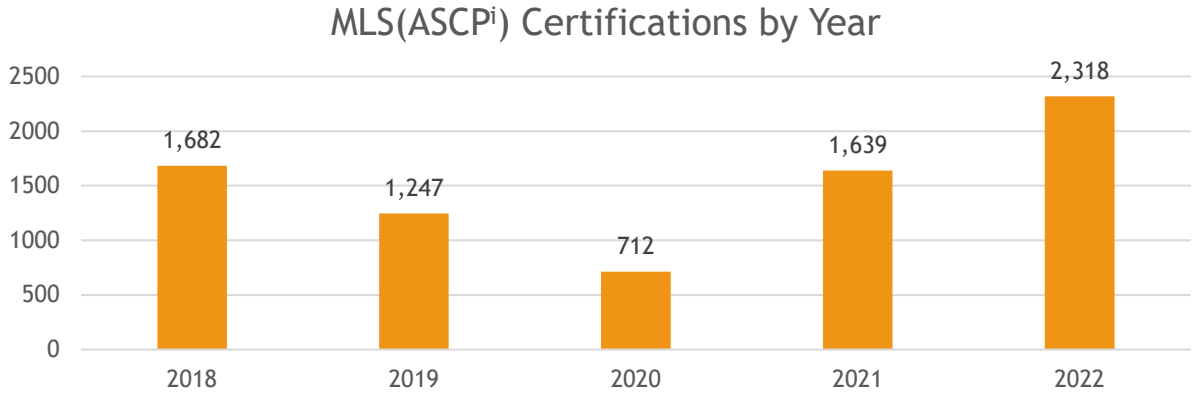
	Graduates		Certifications		Conversion Rate	
	MLS	**MLT**	**MLS**	**MLT**	**MLS**	**MLT**
2018	3,772	3,160	4,051	2,707	107.40%	85.66%
2019	3,899	2,932	3,737	2,619	95.85%	89.32%
2020	3,964	2,848	3,502	2,331	88.35%	81.85%
2021	4,114	2,844	3,690	2,275	89.69%	79.99%
2022	4,246	2,622	3,813	2,140	89.80%	81.62%
Total	**19,995**	**14,406**	**18,793**	**12,072**	**93.99%**	**83.80%**
Per Anum	3,999	2,881	3,759	2,414		

Not all new MLS certifications represent new professionals. The ASCP BOC reports that 21% of the newly certified Medical Laboratory Scientists (3,962 individuals) had previously been certified Medical Laboratory Technicians. This **reduces the net increase** in total certified personnel.

There are robust pathways to certification for Medical Laboratory Scientists and Medical Laboratory Technicians via the ASCP Board of Certification (BOC) and American Medical Technologists (AMT). Both ASCP BOC and AMT have pathways for military-trained professionals to become certified.

- https://www.ascp.org/content/board-of-certification/get-credentialed#
- https://americanmedtech.org/Medical-Laboratory-Scientist

International certification of Medical Laboratory Scientists via the ASCP BOC, which has seen a dramatic rebound since 2020, could serve as another source of professionals in the United States, but current federal policy limits immigration relative to historical standards.



Success Stories

There are notable success stories in recent years that can be emulated by other programs and institutions to increase the system's capacity to produce clinical laboratory professionals.

- ARUP Laboratories and the University of Utah secured $3 million in federal funding to build a new Advanced Practice Clinical Laboratory Training Center. The school anticipates the training center, which will be on the ARUP campus at University of Utah Research Park, will enable the university to reach its goal of doubling the number of annual graduates to 80.
- Prior to the COVID-19 pandemic, the CLS program at East Carolina University was in danger of closing. Since that time, the program director built a relationship with the biology program at the school to increase awareness of the CLS major, leading to a doubling of new enrollment in the program for the 2023-2024 academic year.

- Portland Community College was moving towards closing its program. The program directors organized the employers who hosted clinical sites and who depended on her graduates to engage directly with the school's administration.
- The University of Hawaii at Manoa, facing a budget deficit, recommended shutting down the Medical Laboratory Science program in the mistaken believe that the MLT program at Kapiolani Community College (KCC) was sufficient to staff Hawaii's laboratories. ASCLS-Hawaii and the faculty of the MLS program mobilized, but the key strategy was to mobilize the employers to correct the misimpression by the administration and avoid the cuts.
- The Saint Louis University (SLU) MLS program and Quest Diagnostics are partnering to launch an accelerated bachelor's degree program. The 16-month program will combine online academic courses with intensive hands-on learning and clinical experiences in Quest's Lenexa, Kansas, laboratory. The first cohort for the accelerated degree program is scheduled to start in the spring semester of 2023.
- Parkview Health in Fort Wayne, Indiana, a hospital-based program, has completed renovation of a student lab and also updated its program to run lab training and classroom lectures concurrently to double the number of students it's training from 9 to 20.
- NorthShore University HealthSystem MLS program, which is located at Evanston Hospital north of Chicago, doubled its enrollment capacity by rethinking how it structures its didactic and experiential learning.
- In 2022, Avera announced it would provide a $40,000 sponsorship for each of 12 students currently enrolled at University Health Center in Sioux Falls, South Dakota, partnering with the MLS program at South Dakota State University (SDSU).

Incomes

Relative incomes are weighed as one of the factors for those considering professional careers.

- Hourly salary rates for both MLS and MLT reported as part of the ASCP salary survey grew at less than the rate of inflation from 2017 to 2021. MLS hourly earnings increased 9 percent over that time while MLT earnings grew 12 percent. Changes in earnings were similar across rural, suburban, and urban areas.
- Because the Department of Labor combines the salaries of MLS and MLT for analysis, it's difficult to accurately compare incomes of comparable professionals, but it's clear that median incomes of medical laboratory scientists are lower than registered nurses, the largest of the comparable professions, though not by as much as may be perceived or in all instances.
- The effect of gender on income disparities is well established even within individual professions. The Department of Labor's Women's Bureau reports that female clinical laboratory professionals earn just 92.3% of the incomes that their male counterparts earn. The degree to which the profession, which is 70% female, may have lower salaries relative to other healthcare professions as a result, is unclear.

Demand and Retention

In addition to the supply of newly certified professionals, retention of the existing workforce and increases in demand for services impact the balance of professionals needed for the workforce.

- Growing complexity of clinical laboratory testing, more available tests, and greater utilization because the patient population has increased, and the median has grown older, suggests an increase in demand for laboratory professionals moving forward, but quantifying that with any precision is difficult. In 2018, the Bureau of Labor Statistics estimated an additional 3,500 new professionals per year would be needed to cover increased demand. In 2021, the estimate dropped to 2,180 additional professionals per year.
- The U.S. Department of Labor estimates 320,000 bachelors and associates degreed laboratory professionals are working in the United States. If each of those professionals worked a standard 40-year career, the natural annual attrition of 2.5% would require 8,000 new professionals to maintain their current numbers. This exceeds the current output of accredited educational programs by more than 1,000 annually.
- Excess retirements or resignations reduce the mean career length of laboratory professionals and accelerate the replacement cycle, increasing demand for new professionals. According to ASCP's most recent vacancy survey, more than 10% of all laboratory professionals are considering retirement in the next five years. More than 18% of those working in blood banks are considering retirement, up from 14.2% in 2020.
- In a 2020 study from ASCP drawn from thousands of survey responses showed, nearly 50% of laboratory professionals were currently experiencing burnout and almost 90% have experienced at some point in their careers. A follow up study of 2019 respondents showed that burnout had increased after the COVID-19 pandemic.
- The most recent vacancy rate survey from ASCP, released in November 2023 and covering 2022, showed increasing vacancy rates compared to 2020 in all regions of the United State and all departments within the laboratory. The mean regional increase in vacancy rates was 5.4% from 2020 to 2022.