

**The Clinical Laboratory Workforce:
Understanding the
Challenges to Meeting
Current and Future Needs**

Blueprint for Action

Edna C. Garcia, MPH;
Iman Kundu, MPH;
and Melissa A. Kelly, PhD
American Society for Clinical Pathology



American Society for
Clinical Pathology

Background	4
Needs and Aims	5
Key Actors and Audiences	6
Recommendations	7
Aim 1: Increase the visibility of clinical laboratory occupations	8
Recommendation 1: Encourage interest in clinical laboratory career education and training by exposing elementary and middle school students to the laboratory field	8
Recommendation 2: Promote visibility of the clinical laboratory occupations in high school, college campuses, and professional groups.....	9
Recommendation 3: Support education programs and clinical training.	11
Recommendation 4: Promote consistent use of occupational titles and roles.	13
Aim 2: Expand and improve workforce recruitment and retention of laboratory professionals	14
Recommendation 5: Refine recruitment strategies to find qualified laboratory professionals.....	14
Recommendation 6: Encourage professional development and promote job satisfaction.....	15
Recommendation 7: Examine opportunities for on-the-job training.	17
Aim 3: Continually increase the diversity and inclusion of the clinical laboratory workforce	18
Recommendation 8: Promote diversity in academic recruitment.....	18
Recommendation 9 Encourage employer efforts to increase workforce diversity.	20
Priorities and Opportunities	21
Recommendation 10: Develop a nationwide coalition and campaign for action that would support the laboratory workforce of the future.	21
Recommendation 11: Form a workforce steering committee.	21
Recommendation 12: Secure funding to implement blueprint recommendations.	21
Conclusion	23
Next Steps	23
References	24
APPENDIX A: Key Actors and Audiences	26
APPENDIX B: ASCP Career Ambassadors 2.0	28
APPENDIX C: ASCP Foundation Visibility Campaigns	29



Given the essential role of the laboratory workforce in the healthcare system, it is especially important both to understand the factors contributing to the challenges that affect the current supply of and pathways into clinical laboratory professions, as well as to determine how to address them. This document provides a synopsis of the challenges and barriers identified in the study, *Clinical Laboratory Workforce: Understanding the Challenges to Meeting Current and Future Needs*,¹ and outlines a blueprint of potential interventions to strengthen the clinical laboratory professional workforce.

BACKGROUND

There have been ongoing concerns for decades about the supply of clinical laboratory personnel.² Although the workforce is varied in terms of roles and professions, the types of tasks they perform, the types of qualifications needed, and the level of educational experience required to enter the field, many common challenges face the current state and future of the field. The challenges include a declining number of accredited education programs and the resulting decline in the number of students entering these programs, shortages of qualified personnel, and increased demands due to vacancy rates, testing volumes, task automation, and limited opportunities for career and wage progression. For example, medical laboratory technicians, phlebotomists, and histotechnicians, which comprised approximately 30% of the respondents of the ASCP 2019 Wage Survey³, had some of the highest vacancy rates found by the ASCP 2018 Vacancy Survey.² These rates reflect the challenge of finding new, qualified personnel to fill vacant positions, as well as retaining personnel in existing, critical roles. Also affecting the demand is the use of more complex testing, which necessitates more specialized staff.

The need for greater diversity (including gender, race, and ethnicity) is another challenge to be addressed to strengthen the pathways into the field. Ensuring diversity within the healthcare workforce, across the skills spectrum and career stages, has been a national priority.^{4,5} Additional work to increase the diversity of the pool of qualified clinical laboratory personnel is needed.

The COVID-19 pandemic has posed an unprecedented challenge for the clinical laboratory workforce, much as it has for the nation's healthcare systems. Across the country, laboratory professionals are performing complex diagnostic tests for COVID-19 and developing innovative testing methods. Yet in many laboratories, demand for non-COVID-19-related testing is down. Workforce data collected by ASCP in June and July 2020 from laboratory personnel in management-level positions or in human resources (HR) departments highlight how the pandemic has affected laboratories and what strategies they have used to maintain laboratory operations, particularly around changes in testing and staffing.⁶ The Bureau of Labor Statistics (BLS) labor projections

calculated before the COVID-19 pandemic that suggested a growing demand for laboratory professionals are likely to be on track.⁷ What remains uncertain, though, is whether the pandemic will accelerate future shortages in the field of clinical laboratory medicine.

A new study (also referred to as Garcia et al) was recently conducted by ASCP in partnership with CHWS focusing on six roles selected from the broader population of roles/professions that make up the clinical laboratory workforce. The results of the study highlight how laboratory personnel and their institutions were handling the challenges, specifically how they were addressing recruitment and retention (including attracting students, filling vacancies, meeting an increased volume of tests, competing for workers within and outside the clinical laboratory field, and identifying qualified professionals).¹ The study also examined factors contributing to successful models for recruiting and retaining a qualified and diverse clinical laboratory workforce, as well as the barriers and facilitators. This blueprint summarizes the needs identified from the report and recommended actions to address challenges and barriers supported by the report findings.



NEEDS AND AIMS

Results from interviews and focus groups conducted for the study, Garcia et al, strongly emphasize that meeting future workforce needs will require actions by and collaboration among a wide range of stakeholders. These groups include the laboratory (e.g., institutions and employers), laboratory training programs, and professional organizations. By implementing the actions outlined in the blueprint, they can collectively improve the recognition of the current clinical laboratory workforce, increase the opportunities for new entrants into the workforce, and strengthen the pathways into and among these careers.

The recommendations outlined in the blueprint address three sets of overarching aims gleaned from the results of the study:

- **Aim 1:** Increase the visibility of clinical laboratory occupations
- **Aim 2:** Expand and improve workforce recruitment and retention
- **Aim 3:** Continually increase the diversity and inclusion of the clinical laboratory workforce

Although one of the outcomes of the COVID-19 pandemic has been to increase public awareness of the role that the laboratory plays in health care, there is an ongoing need to further increase the visibility of laboratory personnel and the roles and professions that the laboratory has to offer. Increased visibility can help strengthen pathways into the clinical laboratory workforce by exposing post-secondary (community college and university) students and high school students to potential careers in the laboratory and encouraging them to pursue training programs in these areas. According to the stakeholders, there is also a need to expose younger students to these opportunities, to help stimulate and sustain their interest in the field.¹

As shown in **Figure 1**, this type of outreach can also facilitate employment recruitment by not only increasing the supply of potential job candidates but also helping to ensure the clinical preparedness of the pool of prospective laboratory professionals. Also related to workforce recruitment and retention, stakeholders indicated that there is a need to cultivate and sustain positive work environments and workplace cultures that recognize the essential contributions that laboratory professionals make to patient care and support their efforts.¹

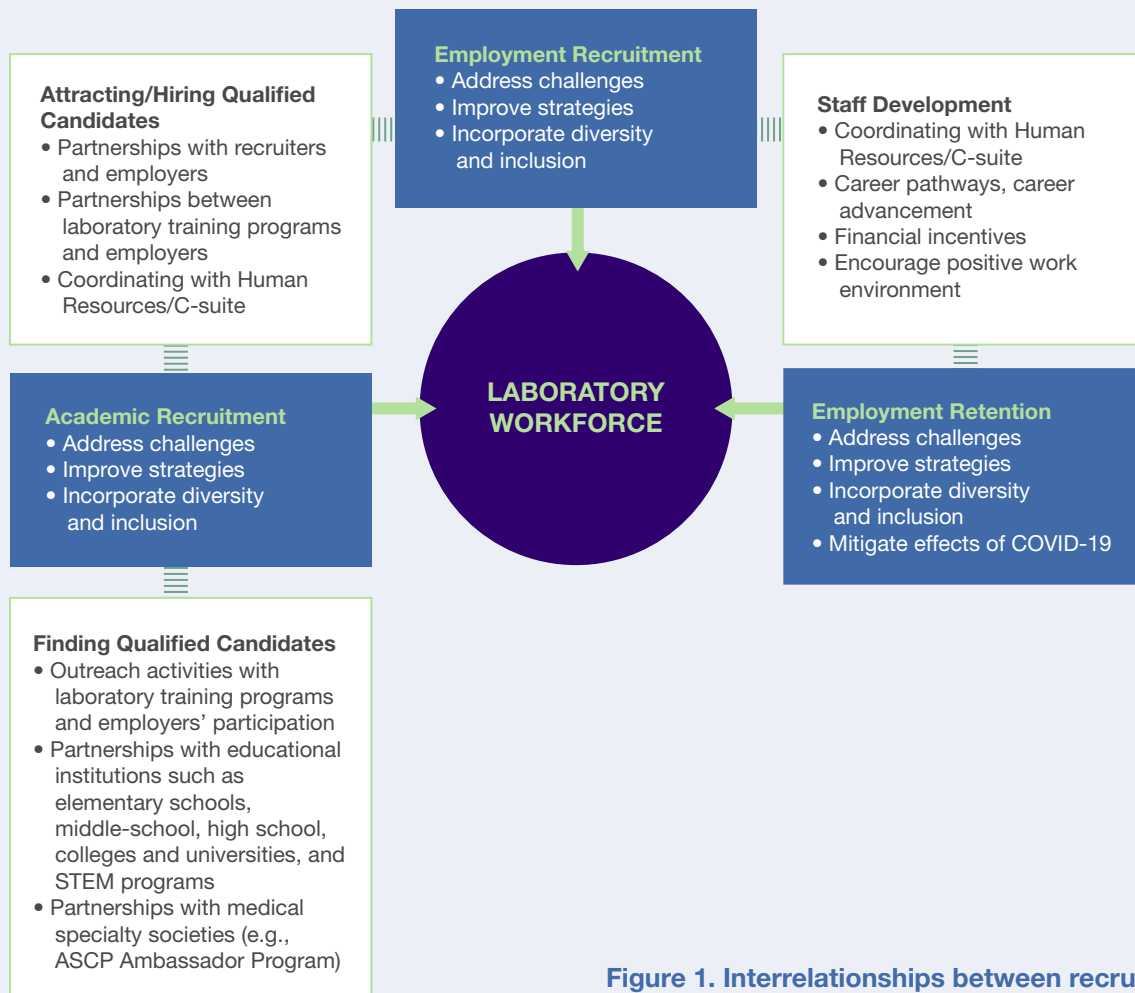


Figure 1. Interrelationships between recruitment and retention of the clinical laboratory workforce

These supports include financial incentives, continuing education, flexible work scheduling, recognition of value to healthcare teams, and opportunities for professional development and career advancement.

Amid all of these efforts, the report by Garcia et al revealed that there is an overarching need to address diversity and inclusion.¹ Building awareness of the importance of a diverse and inclusive workforce is a first step toward developing and implementing recruitment strategies that reach students from underrepresented groups and encourage them to pursue careers in the laboratory profession. It is vital to provide resources to promote academic retention, especially among students who may be underprepared for their academic training programs. Similarly, it is important to help support existing laboratory personnel by providing opportunities for growth and addressing concerns such as burnout.

KEY ACTORS AND AUDIENCES

Addressing the current and future needs of the clinical laboratory workforce requires a collective effort by numerous levels and groups

of stakeholders, including the laboratory employers, laboratory training programs, and professional organizations (see **Appendix A** for definitions).

The key actors listed in **Figure 2** are the key entities that would execute the strategies and activities outlined in the Recommendations section. In addition, several key audiences can play a role in shaping the clinical laboratory workforce through their partnership and collaboration with the key actors. Many key actors also have the overlapping role of key audiences (**Appendix A**). The ways in which these audiences would be engaged in addressing the needs of the clinical laboratory workforce will vary, with some being more directly engaged and others being more tangentially involved.

In the tables on the following pages, ASCP is used as an umbrella term to describe other groups within the organization that would contribute to the implementation of recommendations (e.g., ASCP Workforce Steering Committee, ASCP Career Ambassadors Team [**Appendix B**], ASCP Foundation Visibility Campaign [**Appendix C**], and ASCP Marketing and Membership Team).

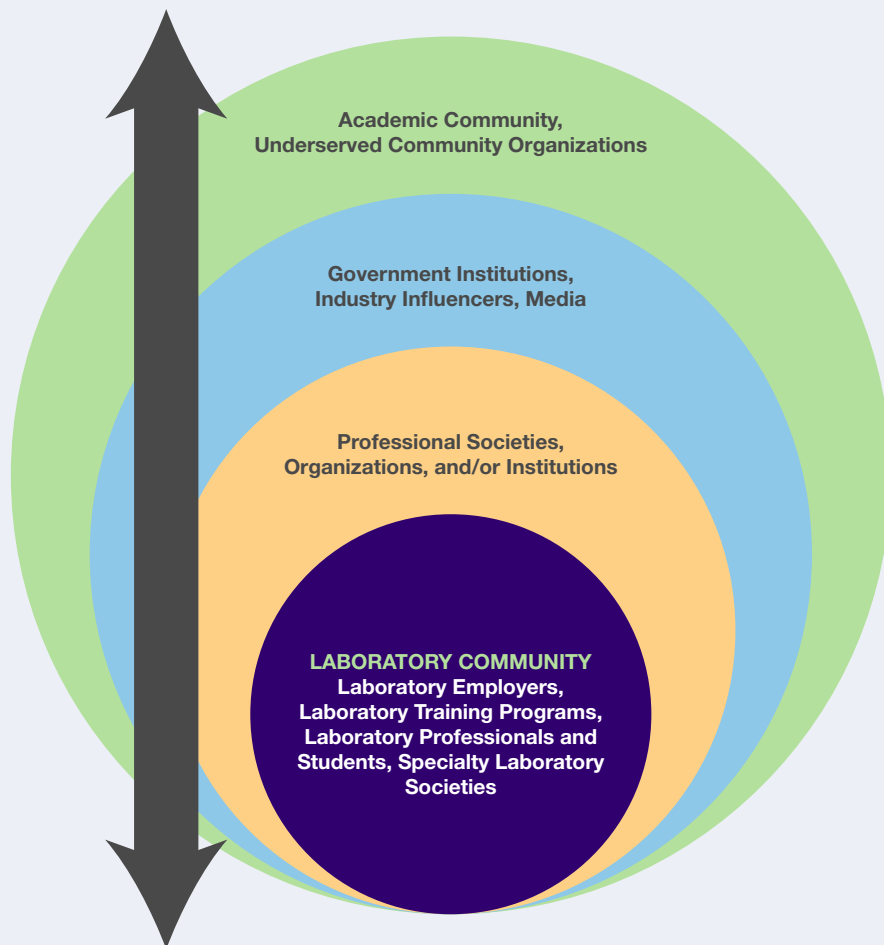


Figure 2. Levels of influence on the pathways to and supply of clinical laboratory personnel

Recommendations

This section presents recommendations with action items aligned with the three focus areas to help address several of the challenges and needs facing the clinical laboratory workforce.

AIM 1: INCREASE THE VISIBILITY OF CLINICAL LABORATORY OCCUPATIONS.

A lack of awareness about clinical laboratory careers in the general public—a workforce that is almost invisible to anyone who is not already working in healthcare—constrains new entrants to careers in clinical laboratory occupations. Stakeholders from the study suggested a variety of ways to increase the visibility of these occupations, especially among younger age groups.¹ Recommendations for improving the visibility of the target roles/professions engage a range of stakeholders, starting far upstream of actual entry into the workforce. For example, strategic activities with young students (e.g., at the elementary and middle school level) can help pique their interest in the types of work that laboratory personnel do, increasing their exposure to a broad range of laboratory-related fields. These types of activities also have the potential to propagate upwards to parents and families, as the students and their teachers discuss what they learn. Furthermore, forming collaborative partnerships and networks can be especially beneficial for reaching broad populations of students, especially in geographic areas where access to healthcare fields or training may be limited.

Recommendation 1: Encourage interest in clinical laboratory career education and training by exposing elementary and middle school students to the laboratory field.

Data from the study by Garcia et al¹ show few existing activities exposing elementary and middle school students to the laboratory field compared with high school and colleges. Outreach efforts designed for students at the elementary and middle school level could include in-school activities such as “career days” where laboratory personnel visit the school and demonstrate examples of the types of tasks they perform in the laboratories and enlist the students to assist in age-appropriate activities. Activities could also include in-lab “shadowships” in which students visit local laboratories to see laboratory professionals in action, preparing biological specimens, performing tests, and so on.

1A. Form partnerships or networks with school administrators, guidance counselors, and science, technology, engineering, and medicine (STEM) educators to develop ongoing laboratory activities designed for elementary and middle school students.

Key Actors	Target Audiences	Suggested Tasks
ASCP	<ul style="list-style-type: none"> ASCP members/volunteers Laboratory training programs 	<ul style="list-style-type: none"> Recruit volunteer laboratory professionals from ASCP's membership (e.g., within the ASCP Career Ambassador 2.0 program) to participate in outreach activities for the target audience. Form partnerships with laboratory training programs and laboratories to recruit volunteers to participate in outreach activities for the target audience. Expand ASCP Career Ambassador 2.0 to advance volunteer activities. Provide incentives/stipends to Career Ambassador 2.0 volunteers and other laboratory professional volunteers for their community outreach efforts at recruitment and awareness building.
Laboratory training programs	<ul style="list-style-type: none"> Elementary and middle school administrators Guidance counselors or associations STEM educators or associations Elementary and middle school students 	<ul style="list-style-type: none"> Form partnerships with elementary and middle school administrators, guidance counselors, and STEM educators to facilitate outreach activities for the target audience. Establish relationship with national and state organizations supporting school career development counselors and STEM teachers to provide resources on laboratory careers.
Laboratory professionals	<ul style="list-style-type: none"> Elementary and middle school administrators Guidance counselors STEM educators Elementary and middle school students 	<ul style="list-style-type: none"> Collaborate with teachers and STEM educators to develop activities geared towards the target audience. Form partnerships with elementary and middle school administrators, guidance counselors, and STEM educators to facilitate outreach activities for the target audience.

Recommendation 2: Promote visibility of the clinical laboratory occupations in high school, college campuses, and professional groups.

As some individuals enter the laboratory field directly from high school or community college, it is especially important to promote visibility of potential careers in the field at this point in their academic careers. This may encourage individuals to consider laboratory careers and sign up for classes that can help prepare them for entry into the laboratory workforce or for future laboratory training.

2A. Design and distribute resources that show the different types of laboratory professions and opportunities in the field to high schools, colleges, universities, and student support organizations that assist students across the country.

Key Actors	Target Audiences	Suggested Activities
ASCP	<ul style="list-style-type: none"> • School administrators • Guidance counselors • High school students • Community college and university students • Student support organizations 	<ul style="list-style-type: none"> • Conduct research on audience needs to guide the creation of core messaging and design of creative content regarding career information (e.g., ASCP research on recruitment of medical laboratory professionals⁹). • Distribute audience-specific materials in a variety of venues including STEM career fairs, high schools, colleges, universities, and community organizations that support students. <ul style="list-style-type: none"> - Develop fact sheets or other resources (for laboratory professionals and others) articulating the various ways in which the laboratory contributes to patient care, hospital operations, and referring clinicians' practice.
Laboratory training programs	<ul style="list-style-type: none"> • School administrators • Guidance counselors • High school students • Community college and university students • Student support organizations 	<ul style="list-style-type: none"> • Distribute audience-specific materials in a variety of venues including STEM career fairs, high schools, colleges, universities, and community organizations that support students.
Laboratory professionals	<ul style="list-style-type: none"> • School administrators • Guidance counselors • High school students • Community college and university students • Student support organizations 	<ul style="list-style-type: none"> • Distribute audience-specific materials in a variety of venues including STEM career fairs, high schools, colleges, universities, and community organizations that support students.
Specialty laboratory societies	<ul style="list-style-type: none"> • School administrators • Guidance counselors • High school students • Community college and university students • Student support organizations 	<ul style="list-style-type: none"> • Provide input and feedback on specialty-related materials and resources developed by ASCP regarding career information. • Distribute audience-specific materials in a variety of venues including STEM career fairs, high schools, colleges, universities, and community organizations that support students.

2B. Promote awareness by networking with academic, employer, and professional clubs/ societies, and propose formation of laboratory professional clubs on-campus.

Key Actors	Target Audiences	Activities
Laboratory training programs	<ul style="list-style-type: none"> • High school and college administrators • Guidance counselors • Community college and university students 	<ul style="list-style-type: none"> • Partner with colleges and universities to form professional clubs (e.g., MLA club, histology society) to increase visibility of the profession. • Recruit volunteer laboratory professionals to act as mentors.
Laboratory professionals	<ul style="list-style-type: none"> • School administrators • Guidance counselors • Community college and university students 	<ul style="list-style-type: none"> • Partner with laboratory training programs and volunteer as a mentor and resource for these professional clubs.
Specialty laboratory societies and professional societies and/or organizations	<ul style="list-style-type: none"> • School administrators • Guidance counselors • Community college and university students 	<ul style="list-style-type: none"> • Act as a resource of information to laboratory training programs and club members on laboratory careers.
ASCP	<ul style="list-style-type: none"> • School administrators • Guidance counselors • Community college and university students 	<ul style="list-style-type: none"> • Provide seed grants to the academic community to start a professional club on campus.

2C. Investigate program models that leverage funding partnerships to create education and training opportunities in fields including clinical laboratory sciences.

Key Actors	Target Audiences	Activities
ASCP	<ul style="list-style-type: none"> • Student support organizations • Laboratory training programs 	<ul style="list-style-type: none"> • Research the efforts of organizations that provide student support through scholarships and training in technical careers (e.g., Avera Academy⁹, Build Dakota Scholarship¹⁰, and HOSA-Future Health Professionals¹¹). • Partner with these organizations to promote laboratory careers and provide them with seed grants/stipends to support students interested in entering the laboratory profession (the student support organizations will then provide tuition support, stipends or scholarships from the seed grants to potential students to attend formal educational programs). • Encourage students to join these programs and health science teachers to be advisors.
Laboratory employers	<ul style="list-style-type: none"> • Laboratory professionals • Laboratory training programs 	<ul style="list-style-type: none"> • Explore the “grow your own” concept of recruiting laboratory professionals used by some institutions¹ by providing free tuition, stipends, or scholarships to potential students to attend formal educational programs.

Recommendation 3: Support education programs and clinical training.

Converging with the need to increase the visibility of the clinical laboratory professions is the need to ensure that future students have access to the requisite education and training, given how academic recruitment feeds into employment recruitment (**Figure 1**).¹ Yet, the limited, declining number of laboratory training programs is a significant barrier to strengthening the opportunities to enter into a clinical laboratory profession. Shortages of opportunities for clinical training limit downstream recruitment to fill increasing vacancies in laboratory positions.

Action is needed to provide adequate funding for training programs across the United States, especially in community and technical colleges where budget cuts frequently threaten programs that have comparatively expensive clinical training components.¹ Communicating the importance of careers in the clinical laboratory field to the larger academic/education community can help support training programs by making a case for safeguarding existing program funding and potentially increasing future funding. Not only can employer partners play a role in this advocacy, but they can also provide support by offering opportunities for clinical training at laboratory sites in conjunction with the education programs.

3A. Communicate and emphasize the importance of careers in the clinical laboratory field to government institutions and educational institutions/organizations.

Key Actors	Target Audiences	Suggested Tasks
ASCP and other partners (e.g., other specialty laboratory societies and/or professional organizations, University of Washington Center for Health Workforce Studies [UW CHWS])	<ul style="list-style-type: none"> • Government institutions • Laboratory training programs • Laboratory employers 	<ul style="list-style-type: none"> • Set up meetings with Congress and federal agencies (e.g., Health Resources and Services Administration [HRSA], Department of Education) to elevate clinical training programs to prevent closure; offer tuition support and reimbursement; and explore the potential to expand opportunities for loan repayment and scholarships for clinical laboratory occupations (e.g., student loan forgiveness). • Advocate against program closures. • Advocate to increase funding for laboratory training programs. • Invite other specialty laboratory societies/organizations to join ASCP in advocacy. • Identify appropriate incentives (e.g., tax incentives, to encourage clinical laboratories to serve as training sites for laboratory professionals).
Potential grant/funding organizations (e.g., HRSA Siemens Foundation)	<ul style="list-style-type: none"> • ASCP • Other specialty laboratory societies and/or organizations • Laboratory training programs • Other partners (e.g., UW CHWS) 	<ul style="list-style-type: none"> • Support additional research to identify effective/successful best practices to ensure adequate clinical training for students in clinical laboratory education programs (with emphasis on ensuring a variety of types of clinical settings and access to clinical training opportunities across geographic areas/regions [i.e., rural as well as urban] in all parts of the country).
Laboratory employers	<ul style="list-style-type: none"> • Laboratory training programs • Community and technical colleges (other relevant education/training programs) 	<ul style="list-style-type: none"> • Provide clinical training sites and employment resources for students in clinical laboratory programs.

3B. Encourage more research to identify successful best practices that prevent closure of clinical training programs.

Key Actors	Target Audiences	Suggested Tasks
ASCP	<ul style="list-style-type: none"> Laboratory training programs Laboratory community 	<ul style="list-style-type: none"> Conduct research on evidence-based practices and strategies by laboratory training programs that either saved or have integrated coursework into their program to help them become “indispensable” to the institution, organization, or laboratory community (e.g., changing program name to “Medical” Laboratory Science [MLS] from Clinical Laboratory Science [CLS], partnering with a vocational college). Refer to article, <i>Strategies for Sustainability of University-Based Medical Laboratory Sciences Programs</i>, to inform advocacy for laboratory training programs.¹²

3C. Develop strategies to strengthen accredited training programs.

Key Actors	Target Audiences	Suggested Tasks
ASCP	<ul style="list-style-type: none"> Laboratory training programs Laboratory community 	<ul style="list-style-type: none"> Develop a toolkit to educate program directors on best practices. Outline networking strategies to support program graduates (job counseling, clinical training opportunities at local laboratories). Develop an “ambassadors” program (composed of ASCP volunteers) to serve in an advisory role for educating training program directors on best practices to stabilize training programs.
Laboratory training programs	<ul style="list-style-type: none"> Industry ASCP Laboratory community 	<ul style="list-style-type: none"> Partner with diagnostics groups to secure significant discounts in training equipment used by accredited training programs.

Recommendation 4: Promote consistent use of occupational titles and roles.

Efforts to promote the visibility of the workforce should also address challenges engendered by the breadth of occupations in the field. The clinical laboratory workforce is composed of multiple occupations, requiring a wide range of different education and training pathways, and there are many opportunities to achieve specialized roles within some of these occupations.¹ To the general public and individuals who are uninitiated to the field, navigating the multitude of titles used for these occupations and roles is confusing. The confusion is exacerbated by the uses of different titles in federal data sources, by different regulatory agencies, by state licensing and credentialing regulations, and within the field's accreditation and credentialing bodies. These descriptors may also differ from the labels and titles used within the laboratory (e.g., within hospitals, laboratories, and other institutions). Greater consistency and clarity of titles and roles could help support the goal of increasing visibility of these occupations and help in communicating opportunities for professional growth and career pathways in the field.

4A. Standardize and clarify the nomenclature used for roles/professions that comprise the clinical laboratory workforce.

Key Actors	Target Audiences	Suggested Tasks
ASCP and partners (e.g., other specialty laboratory societies and/or organizations, UW CHWS)	<ul style="list-style-type: none"> • Other specialty laboratory societies and/or organizations • Government institutions • Laboratory employers • Hospital administrators • HR departments 	<ul style="list-style-type: none"> • Promote action on the ASCLS and ASCP BOC position paper, <i>Standardizing the Professional Title of Medical Laboratory Professionals</i>.¹³ • Review and recommend changes to policies and regulations affecting the delineations of titles and roles of clinical laboratory occupations to promote clear and consistent use of terminology. <ul style="list-style-type: none"> - Promote developed recommendations to the target audiences. • Identify other areas where standardization of clinical laboratory titles and adoption of a standardized educational program titles is needed. <ul style="list-style-type: none"> - Strategize with Department of Labor (DOL) on how to accurately represent these occupations through the O*NET database, which describes a number of occupations and helps people explore career options.¹⁴⁻¹⁶ • Set up meetings with government workforce entities (e.g., BLS) to discuss potential updates to the 2018 Standard Occupation Codes (SOC) terminologies. Promote the use of updated titles, and collect data for MLTs/CLTs, separate from the current title MLSs/CLSs in the BLS website.

4B. Promote developed recommendations (from 4A) on standardization of the nomenclature used for clinical laboratory workforce roles/professions.

Key Actors	Target Audiences	Suggested Tasks
ASCP	<ul style="list-style-type: none"> • Laboratory community 	<ul style="list-style-type: none"> • Widely disseminate the policy/regulation recommendations.
ASCP	<ul style="list-style-type: none"> • Hospital administration • HR departments 	<ul style="list-style-type: none"> • Develop educational tools for hospital administrations and HR departments across the country to help distinguish among the different types of laboratory professionals.
Laboratory professionals	<ul style="list-style-type: none"> • Hospital administration • HR departments 	<ul style="list-style-type: none"> • Hold internal open houses for colleagues in the institution who do not work in the laboratory but work with or rely on laboratory professionals directly or indirectly. • Invite the C-suite (high-level executive positions) to visit the laboratory and see how the different laboratory roles contribute to the healthcare system. • Educate the HR department and administration about the different skills, roles, and education/training requirements.

AIM 2: EXPAND AND IMPROVE WORKFORCE RECRUITMENT AND RETENTION OF LABORATORY PROFESSIONALS.

Promoting greater consistency and clarification of the titles and roles within the clinical laboratory workforce could also help address some of the challenges in both recruiting qualified candidates to meet the increasing demands and helping them, as well as existing staff, progress along career pathways that strengthen the workforce. For example, role clarifications could provide a basis for helping laboratory managers and supervisors develop or refine hiring specifications that outline the essential skills and qualifications that prospective job candidates must have. These types of specifications could not only help with screening qualified candidates but could also help expedite the hiring process and support advocacy for more competitive salaries relative to other health professions (refer to Recommendation 6). Such specifications may also help with the process of delineating clear pathways for career advancement within or across roles.

Recommendation 5: Refine recruitment strategies to find qualified laboratory professionals.

As shown in **Figure 1**, there are several potential avenues for finding qualified candidates to fill open positions in the clinical laboratory workforce. Employers can expand their access to prospective candidates by forming partnerships or collaborations with a variety of organizations, including training programs, specialty laboratory societies, and related professional organizations. Not only can these organizations be a source for qualified personnel but they can also advertise open positions among their constituents, potentially broadening the pool to a national level. This type of access may be especially vital for laboratories and other hiring organizations located in rural areas that have limited local access to pools of qualified personnel. Social media and other channels for online job postings may also have elevated importance for laboratory employers in rural areas or other areas where there are no local or regional laboratory training programs.

5A. Reach broad audiences of prospective laboratory professional candidates through partnerships and social media platforms.

Key Actors	Target Audiences	Suggested Tasks
Laboratory employers	<ul style="list-style-type: none"> Laboratory training programs Specialty laboratory societies/ professional organizations High schools, colleges, and universities 	<ul style="list-style-type: none"> Form recruitment partnerships with local/state training programs. Partner with specialty laboratory societies and professional organizations to advertise jobs. Partner with high schools, colleges, and universities to recruit students to work in the laboratory.
	<ul style="list-style-type: none"> Prospective laboratory professional job candidates 	<ul style="list-style-type: none"> Capitalize on social media and a wide array of online channels for job postings.
Rural laboratory employers	<ul style="list-style-type: none"> Laboratory training programs Laboratory students 	<ul style="list-style-type: none"> Form recruitment networks with laboratory training programs to attract and hire new graduates to work in rural areas.
ASCP and/or other specialty laboratory societies/ organizations	<ul style="list-style-type: none"> Laboratory employers Laboratory training programs Laboratory community 	<ul style="list-style-type: none"> Coordinate with DOL to expand apprenticeship opportunities under the federal Registered Apprenticeship Program and coordinate an effort to get funding to target clinical laboratory jobs.^{17,18} Establish workforce networks for laboratories and laboratory training programs in rural areas. Conduct in-depth research on laboratory workforce in rural areas to identify and target specific needs.

Recommendation 6: Encourage professional development and promote job satisfaction.

Beyond finding qualified personnel, it is also important to support their professional growth and well-being. Ways of providing this support, and ultimately strengthening job retention, are numerous and include higher compensation and other financial incentives as well as flexible scheduling that is conducive to professional development and promotes work-life balance. Addressing concerns about compensation levels is a key area on which to focus, given that historically low salaries for laboratory professionals (relative to other healthcare professionals) was cited as a recruitment challenge across the occupations, especially for phlebotomists.¹ This issue also affects employment retention as staff frequently leave the clinical laboratory workforce to pursue higher-paying professions in the medical field or other non-medical professions.

6A. Improve employment recruitment and retention by providing incentives and advocating for higher salaries.

Key Actors	Target Audiences	Suggested Tasks
Laboratory employers, hospital administrators, and HR departments	<ul style="list-style-type: none"> Laboratory professionals 	<ul style="list-style-type: none"> Offer compensation that is competitive with other employers (both within and outside the laboratory field) and commensurate with the skills and roles being performed. Offer other financial incentives such as regular pay increases, tuition incentives, and sign-on bonuses to attract candidates. Offer schedule flexibility to attract candidates and promote job satisfaction.
ASCP	<ul style="list-style-type: none"> Laboratory community Other specialty laboratory societies/ organizations 	<ul style="list-style-type: none"> Meet with government entities (HRSA, BLS, CDC/CLIA, DOL) to discuss the laboratory workforce's concerns about salaries and workforce vacancies and identify national resolutions. (Appendix A) Invite other specialty laboratory societies/ organizations to join ASCP in advocacy efforts.
ASCP	<ul style="list-style-type: none"> Government entities (CMS) 	<ul style="list-style-type: none"> Meet with CMS to share workforce issues and objectives and identify mutual goals. (Appendix A) Meet with CMS to discuss how CLIA and PAMA may be modified to remove any barriers to recruitment to the field.

6B. Provide opportunities for career progression (upward mobility).

Key Actors	Target Audiences	Suggested Tasks
Laboratory employers, hospital administrators, and HR departments	<ul style="list-style-type: none"> Laboratory professionals 	<ul style="list-style-type: none"> Implement tier levels for different types of laboratory roles (e.g., for phlebotomists and histotechnicians). Offer increased compensation with elevated job titles. Provide incentives (e.g., stipends, scholarships, tuition reimbursements, subsidized dependent care) to employees who are pursuing an advanced degree, continuing education, or leadership training. Pair laboratory staff with a mentor to help build their leadership skills.

6C. Support roles that encourage laboratory professionals to work at the top of their highest skill level that is within their scope of practice, promote employee engagement, and address burnout.

Key Actors	Target Audiences	Suggested Tasks
Laboratory training programs and laboratory employers	<ul style="list-style-type: none"> • New laboratory training graduates • Current laboratory training students 	<ul style="list-style-type: none"> • Develop a better understanding of the expectations of laboratory professionals currently entering the workforce (following their graduation) to ensure their clinical preparedness. <ul style="list-style-type: none"> - Align expectations among the graduates, training programs, and employers. • Provide cross training between the digital skills needed for artificial intelligence (AI) and clinical laboratory to create a new hybrid occupation that understands both the technology and the more technical skills of the occupation.
Laboratory employers	<ul style="list-style-type: none"> • Laboratory professionals 	<ul style="list-style-type: none"> • Keep staff actively and intellectually engaged by providing in-house education/professional development. • Encourage staff to pursue professional development activities. • Promote staff involvement on team projects.
Laboratory employers, hospital administrators, and Human Resources	<ul style="list-style-type: none"> • Laboratory professionals 	<ul style="list-style-type: none"> • Offer flexible work schedules and reallocate workloads (e.g., to facilitate enrollment in continuing education and help address burnout). • Cultivate a positive work environment by encouraging open dialogue between staff and supervisors/managers. • Recognize employees for their work (e.g., offering retention/milestone bonuses or public recognition of the staff's contribution to patient care). • Promote recognition of laboratory occupations' contributions to healthcare teams.
ASCP	<ul style="list-style-type: none"> • Laboratory community 	<ul style="list-style-type: none"> • Identify the variations in state scope of practice and see where there may be barriers to clinical laboratory professionals working at the top of their skill levels. Develop a white paper or landscape review, and tie it to diversity and inclusion as state licensure may serve as a financial or logistical barrier to entry. • Conduct and publish research on staff engagement and burnout.¹⁹ • Develop resources for laboratory staff on promoting engagement and preventing burnout.

Recommendation 7: Examine opportunities for on-the-job training.

Where the reduction in training programs is adversely impacting the future supply of qualified job candidates, increased on-the-job training may be a way to address the increasing demand for qualified laboratory professionals. For example, offering on-the-job training may enable some laboratory employers to hire lower-level, less-qualified job candidates whom they will train for their positions. This strategy can enlarge the pool of prospective job candidates. In some cases, it can also facilitate the employee orientation/onboarding process if the laboratory is able to hire existing staff who are working in other roles in the organization and are already familiar with the organization's structure, systems, and policies.

However, there are both internal and external factors to consider when organizations are exploring the viability of offering on-the-job training for specific occupational roles. For example, laboratories interested in providing on-the-job training must ensure that the training is consistent with the Clinical Laboratory Improvement Amendment regulations. Some states have licensure requirements that limit laboratories from offering on-the-job training. Another factor to consider in examining the viability of on-the-job training at an organizational level is whether the organization has the infrastructure to support on-site training or whether they would need access to local academic settings (e.g., community colleges, technical colleges). The organization's climate and compensation structure are related factors to consider, such as whether staff who moved into a position or role via on-the-job training would earn the same salary and have the same promotion opportunities as staff who entered the position/role with the desired degree or qualifications.

7A. Explore on-the-job training opportunities as a way to address the workforce shortage.

Key Actors	Target Audiences	Suggested Tasks
Laboratory employers, hospital administrators, and specialty laboratory societies/ organizations	<ul style="list-style-type: none"> Laboratory professionals Laboratory training programs 	<ul style="list-style-type: none"> Examine where investment in on-the-job training can counteract the decline in training programs and/or can help facilitate employment recruitment (e.g., for employees seeking education that costs less than pursuing an academic degree or who want to work in the laboratory while in training).
ASCP and other partners (e.g., other specialty laboratory societies and/or organizations, UW CHWS)	<ul style="list-style-type: none"> Government institutions 	<ul style="list-style-type: none"> Meet with DOL around opportunities for national-level clinical laboratory workforce advancement (e.g., using Workforce Investment Opportunity Act funding). Meet with DOL to discuss on-the-job training opportunities in laboratories that experience shortage of personnel. Coordinate with DOL to expand apprenticeship opportunities under the federal registered apprenticeship program, and coordinate an effort to get funding to target clinical laboratory jobs.^{17,18}

AIM 3: CONTINUALLY INCREASE THE DIVERSITY AND INCLUSION OF THE CLINICAL LABORATORY WORKFORCE

To address issues of diversity and inclusion, examination of the underlying concerns about equity (whether it be equitable access to education or employment) is necessary. Greater diversity in terms of gender, age, and race/ethnicity would help make the laboratory workforce more representative of the general population. It includes promoting greater diversity in laboratory training programs. Thus, a focus on diversity and inclusion in workforce recruitment extends along the entire career pathway, from academic recruitment (into laboratory training programs) to employee recruitment to employee retention.

Recommendation 8: Promote diversity in academic recruitment.

The study by Garcia et al found that although there were perceptions that the representation of minorities and underrepresented groups in the student body of laboratory training programs reflected the diversity of the program’s surrounding communities, there is also a need for more strategic engagement to ensure diversity.¹ Collaborative efforts across multiple levels are vital to help ensure that program-level recruitment efforts align with institutional-level strategies for ensuring a diverse student body and promoting diversity of new entrants into the laboratory professions. Furthermore, it is important to provide students with multiple types of support to help them succeed once they enter an academic training program (e.g., financial support, academic support, professional guidance, coaching, and mentoring).

8A. Identify groups, agencies, and other organizations that support students from underserved communities, and form partnerships to promote laboratory careers.

Key Actors	Target Audiences	Suggested Tasks
ASCP	<ul style="list-style-type: none"> • Laboratory training programs • Laboratories • Grades 1-12, community college, and university students 	<ul style="list-style-type: none"> • Identify and collaborate with underserved community organizations that support students in their communities to promote laboratory careers (e.g., national, state, and local STEM-oriented organizations, Faces for the Future²⁰). • Offer incentives to participating entities in promoting laboratory occupations among underrepresented groups. • Offer grants to STEM-oriented organizations that support underrepresented students. • Develop and implement an engagement plan for volunteers and influencers (including sharing promotional materials and resources and managing relationships) to promote laboratory careers. • Implement Recommendation 7A to support students from underrepresented communities.
Underserved community organizations	<ul style="list-style-type: none"> • Laboratory training programs • Laboratories • Grades 1-12, community college, and university students 	<ul style="list-style-type: none"> • Engage in outreach with students, parents, and counselors in underserved communities to highlight laboratory careers and opportunities. • Engage in outreach and partnerships with laboratory employers and training programs to develop internships for students from underserved communities. • Develop student support activities, such as coaching students from underrepresented groups on applying for scholarships and completing job applications. • Provide mentorship for students who are interested in exploring careers in the laboratory.

8B. Develop resources to address educational barriers and underlying inequities to promote opportunities in the clinical laboratory professions.

Key Actors	Target Audiences	Suggested Tasks
ASCP	<ul style="list-style-type: none"> Laboratory training programs Laboratory employers Grades 1-12, community college, and university students Underserved community organizations 	<ul style="list-style-type: none"> Design and distribute materials with a focus on removing information barriers that prevent individuals in underserved communities from learning about these careers and opportunities in the laboratory (e.g., developing laboratory career information resources in a variety of languages). Partner with underserved community organizations to distribute informational materials about the laboratory in their communities.
ASCP and UW CHWS	<ul style="list-style-type: none"> Laboratory training programs Laboratory employers Grades 1-12, community college, and university students Underserved community organizations 	<ul style="list-style-type: none"> Investigate issues around equity and access to laboratory training for students from underrepresented groups to identify ways to increase educational opportunities, increase student engagement, and promote student success.²¹⁻²⁴ Enhance data collection by conducting research on diversity of the clinical laboratory workforce using federal (e.g., census surveys) and non-federal data sources. Produce and distribute reports on diversity trends among students in laboratory training programs (use Integrated Postsecondary Education Data System database).
ASCP, National Accreditation Agency for Clinical Laboratory Sciences, laboratory training programs, other specialty laboratory societies	<ul style="list-style-type: none"> Grades 1-12, community college, and university students Underserved community organizations 	<ul style="list-style-type: none"> Develop a clearinghouse, one place to access scholarships for laboratory professionals across the country, and research various underserved community organizations that already offer scholarships for underrepresented students (e.g., Hispanic organizations).

8C. Develop a communication plan to attract students from underrepresented populations to laboratory careers.

Key Actors	Target Audiences	Suggested Tasks
ASCP	<ul style="list-style-type: none"> Laboratory training programs Laboratory employers Grades 1-12 community college, and university students Underserved community organizations 	<ul style="list-style-type: none"> Work with groups to develop and execute an integrated multi-channel communications plan (e.g., email, social media, web, print). Amplify social media and other media platform use to recruit individuals from underrepresented groups. For example, develop messages in a variety of languages to ensure message reaches the target audience in their communities. Partner with underserved community organizations to enhance the reach of the message. For example, the partners can distribute the message to their communities.

Recommendation 9 Encourage employer efforts to increase workforce diversity.

There is an ongoing need not only to increase awareness of the importance of diversity in the laboratory workforce but also to move beyond discussion to actionable, systematic efforts.¹ Within the institution, these efforts include aligning strategies for recruiting minority and underrepresented groups for the laboratory with institutional initiatives to promote synergy. They also include providing institutional supports, such as mentoring, to encourage laboratory personnel from minorities and underrepresented groups to stay in the field and promote their professional development.

9A. Increase awareness of the importance of diversity and inclusion in the laboratory.

Key Actors	Target Audiences	Suggested Tasks
Laboratory employers	<ul style="list-style-type: none"> Laboratory professionals Hospital administrators and HR departments 	<ul style="list-style-type: none"> Share information and resources about the benefits of diversity and inclusion in the laboratory. Keep laboratory supervisors/managers informed of departmental and institutional efforts to recruit personnel from underrepresented groups. Form a laboratory departmental task force to address diversity and inclusion within the laboratory. Develop employment recruitment strategies and actionable items (and move beyond discussion). <ul style="list-style-type: none"> Recruit personnel/new graduates from underrepresented groups and identify support structures to facilitate entry into the workforce. Promote partnerships and networks to broaden recruitment populations.
ASCP and/or other specialty laboratory societies	<ul style="list-style-type: none"> Laboratory community 	<ul style="list-style-type: none"> Provide opportunities for members of the laboratory community to actively promote diversity and inclusion (e.g., by implementing recommendations 8 and 9). Form a task force to address diversity and inclusion within the laboratory community. Leverage professional networks and collaborations to expand the visibility of the field to underrepresented groups.

9B. Expand mentorship and diversity training programs to retain laboratory staff from underrepresented groups.

Key Actors	Target Audiences	Suggested Tasks
Laboratory employers and laboratory directors	<ul style="list-style-type: none"> Staff managers and supervisors 	<ul style="list-style-type: none"> Develop mentorship programs that pair high-level leaders with employees from underrepresented population. Develop an employee taskforce to identify ways to promote the retention and professional development of employees from minorities and underrepresented groups. Develop diversity training programs for laboratory professionals at the institutional level.
ASCP and/or other specialty laboratory societies/ organizations	<ul style="list-style-type: none"> Laboratory community 	<ul style="list-style-type: none"> Provide opportunities for members of the laboratory community to serve as mentors (e.g., Career Ambassador 2.0).

PRIORITIES AND OPPORTUNITIES

As reflected in the array of key actors and target audiences across the recommendations, collective efforts are needed to address the needs and challenges facing the clinical laboratory workforce. These efforts would also benefit from input and guidance of cross-level advisory bodies representing the varied stakeholders. These entities, which would be created as part of next steps for the project, would oversee the execution of tasks identified in this blueprint (including the prioritization of critical needs, formulation of shared goals, and articulation of public policy recommendations).

Recommendation 10: Develop a nationwide coalition and campaign for action that would support the laboratory workforce of the future.

Guided by this blueprint and the underlying study, *Clinical Laboratory Workforce: Understanding the Challenges to Meeting Current and Future Needs*¹, ASCP will put together a national coalition of individual and organizational partners, representing a wide range of key actors and audiences, that will work together to address the clinical laboratory workforce's current challenges and future needs. The coalition will develop a campaign for action that will focus on the three aims presented in this blueprint: increasing the visibility of clinical laboratory occupations, expanding and improving workforce recruitment and retention, and continually increasing the diversity and inclusion of the clinical laboratory workforce. As part of their charter, the coalition will help disseminate materials outlined in the blueprint, help formulate shared public policy goals, and make suggestions to amplify the impact of the ensuing projects. Furthermore, they will assist in the evaluation of the success and effectiveness of interventions stemming from the recommendations and research on related factors.

Recommendation 11: Form a workforce steering committee.

To oversee the execution of the blueprint, ASCP will create a workforce steering committee, managed by ASCP staff, to develop an implementation plan addressing the top priorities, including short- and long-term goals. The committee will consist of a chair and a multidisciplinary group of members including individuals and groups invited to participate from the key actors and audiences.

Recommendation 12: Secure funding to implement blueprint recommendations.

The proposed recommendations in this blueprint require funding for operation and implementation. This report presents action items, key actors, and suggested tasks as an important first step to outline the needs of the field. Funding is especially crucial to the visibility and diversity activities where there are scarce or no resources. A potential next step is to bring together key actors to develop consensus around and prioritize action steps. Funding opportunities as well as gaps in funding will need to be identified to help carry out these actions. Coordinated funding efforts across federal and non-federal sources will also be needed.

Conclusion and Next Steps

CONCLUSION

This blueprint for action highlighted three sets of overarching aims gleaned from the results of the study, *Clinical Laboratory Workforce: Understanding the Challenges to Meeting Current and Future Needs*¹—increase the visibility of clinical laboratory occupations, expand and improve workforce recruitment and retention, and continually increase the diversity and inclusion of the clinical laboratory workforce. The proposed recommendations and tasks include suggestions shared by the study participants as well as approaches informed by workforce literature. The suggested tasks address a range of data-supported needs for increased visibility of the opportunities to become laboratory professionals, even before the prospective candidates are ready to enter the workforce. Activities geared toward elementary and middle school students should be amplified. The tasks also address concerns such as a lack of uniform, consistent use of occupational titles and roles to identify laboratory professionals, as well as the need to examine opportunities for on-the-job training to promote professional development and career pathways. In addition, the recommendations and tasks underscore a need to integrate greater diversity into efforts to strengthen both academic and employment recruitment and retention.

Among the factors that are critical to the implementation of the recommendations in this blueprint are active, strategic engagement of individuals and organizations committed to strengthening the clinical laboratory workforce and funding from philanthropic organizations to support the initiatives. Engagement includes the development of a laboratory workforce committee managed by ASCP and formation of a national coalition on middle-skills workforce development. Both groups will provide expertise and oversee ASCP-led activities from the proposed recommendations to ensure that they serve the needs of the laboratory field. Furthermore, they will assist with efforts to evaluate the resulting interventions and conduct related research on factors affecting the laboratory workforce (including diversity and the benefits for patient outcomes).

NEXT STEPS

One of the aims pursuant to the study, *Clinical Laboratory Workforce: Understanding the Challenges to Meeting Current and Future Needs*¹, is to identify interventions that could be supported by philanthropy and implemented by ASCP (and any potential partners) to address the challenges facing the clinical laboratory professional workforce, based on the research findings. Now is a time of opportunity to move these recommendations forward. Next steps include prioritizing needs and goals (with input from the advisory bodies), drafting timelines for suggested tasks organized by short-term vs long-term (i.e., whether they can be implemented within 12 months or require longer than 12 months), and securing philanthropic funding to implement the recommendations. These concerted efforts are key to a strategic plan to prepare and build a resilient laboratory workforce for the future and to meet the increasing demands that laboratory professionals face in contributing to high-quality patient care.

REFERENCES

1. Garcia E, Kundu I, Kelly M, Guenther G, Skillman SM, Frogner B. The Clinical Laboratory Workforce: Understanding the Challenges to Meeting Current and Future Needs. American Society for Clinical Pathology (Washington, DC) and Center for Health Workforce Studies, University of Washington (Seattle, WA), April 2021. https://ascpcdn.s3.amazonaws.com/static/ISTP/Siemens_Clinical+Laboratory+Workforce_Brochure_042721.pdf
2. Garcia E, Kundu I, Kelly M, Soles R. The American Society for Clinical Pathology's 2018 Vacancy Survey of Medical Laboratories in the United States. *Am J Clin Pathol.* 2019;152(2):155-168. doi:10.1093/ajcp/aqz046
3. Garcia E, Kundu I, Fong K. American Society for Clinical Pathology's 2019 Wage Survey of Medical Laboratories in the United States. *Am J Clin Pathol.* 2020;(aqaa197). doi:10.1093/ajcp/aqaa197
4. Snyder CR, Frogner BK, Skillman SM. Facilitating Racial and Ethnic Diversity in the Health Workforce. *J Allied Health.* 2018;47(1):58-65.
5. Health Resources and Services Administration. Goal 2: Foster a Health Care Workforce Able to Address Current and Emerging Needs. Official web site of the U.S. Health Resources & Services Administration. Published March 31, 2017. Accessed March 19, 2021. <https://www.hrsa.gov/about/strategic-plan/goal-2.html>
6. Garcia E, Kundu I, Kelly M, Soles R. Laboratory Staffing Data During COVID-19 Pandemic. Washington; 2021:1-26. https://ascpcdn.s3.amazonaws.com/static/ISTP/ASCP_Covid-19_data_web.pdf. Accessed March 18, 2021.
7. US Bureau of Labor Statistics. The Employment Situation - February 2021. News Release. Published March 5, 2021. Accessed March 19, 2021. <https://www.bls.gov/news.release/pdf/empsit.pdf>
8. Kemmerer A. ASCP Recruitment of Medical Laboratory Professionals. ASCP; 2019:1-24. <https://ascpcdn.s3.amazonaws.com/static/ISTP/Recruitment+of+Medical+Laboratory+Professionals+Project.pdf>. Accessed April 26, 2021.
9. Avera Academy: A Southeast Tech Partnership with Avera Health and the Sioux Falls School District. [southeasttech.edu](https://www.southeasttech.edu/news/2019/avera-academy-partnership.php). <https://www.southeasttech.edu/news/2019/avera-academy-partnership.php>. Published 2021. Accessed April 26, 2021.
10. Build Dakota Scholarships. [builddakotascholarships.com](https://www.builddakotascholarships.com/). <https://www.builddakotascholarships.com/>. Published 2021. Accessed April 26, 2021.
11. HOSA – Future Health Professionals. hosa.org. <https://hosa.org/>. Published 2021. Accessed April 26, 2021.
12. Behan K. Strategies for Sustainability of University-Based Medical Laboratory Sciences Programs. *Lab Med.* 2020. doi:10.1093/labmed/lmaa109
13. American Society for Clinical Pathology Board of Certification, The American Society for Clinical Laboratory Science. Standardizing the Professional Title of Medical Laboratory Professionals. Published 2019. Accessed March 11, 2021. <https://ascls.org/standardizing-the-professional-title-of-medical-laboratory-professionals/>
14. O*NET® Career Exploration Tools. O*NET Resource Center. National Center for O*NET Development. <https://www.onetcenter.org/tools.html>. Accessed 16 April 2021.
15. Skills Search. O*NET OnLine. National Center for O*NET Development. <https://www.onetonline.org/skills/>. Accessed 16 April 2021.
16. O*NET OnLine. National Center for O*NET Development. <https://www.onetonline.org/>. Accessed 16 April 2021.
17. Apprenticeship.gov. Apprenticeship.gov. <https://www.apprenticeship.gov/>. Published 2021. Accessed April 26, 2021.
18. Open Funding Opportunities. Apprenticeship.gov. <https://www.apprenticeship.gov/investments-tax-credits-and-tuition-support/open-funding-opportunities>. Published 2021. Accessed April 26, 2021.
19. Garcia E, Kundu I, Kelly M, Soles R, Mulder L, Talmon G. The American Society for Clinical Pathology's Job Satisfaction, Well-Being, and Burnout Survey of Laboratory Professionals. *Am J Clin Pathol.* 2020;153(4):470-486. doi:10.1093/ajcp/aqaa008
20. FACES for the Future Coalition – Changing the face of health. [FacesfortheFuture.org](https://facesforthefuture.org/). <https://facesforthefuture.org/>. Published 2021. Accessed April 26, 2021.
21. Ten Steps to Equity in Education. OECD; 2008:1-8. <https://www.oecd.org/education/school/39989494.pdf>. Accessed April 26, 2021.
22. Racial Equity in Education: 7 Key Points | USC Rossier. USC Rossier School of Education. <https://rossier.usc.edu/racial-equity-in-education-seven-key-points/>. Published 2021. Accessed April 26, 2021.
23. BEST PRACTICES IN EDUCATIONAL EQUITY. Hanover Research; 2017:1-31. https://www.wasa-oly.org/WASA/images/WASA/1.0%20Who%20We%20Are/1.4.1.6%20SIRS/Download_Files/LI%202017/May%2019%20-%20Best%20Practices%20in%20Educational%20Equity.pdf. Accessed April 26, 2021.
24. What Equity in Education Really Looks Like | Resilient Educator. [ResilientEducator.com](https://resilienteducator.com/classroom-resources/what-equity-really-means-in-schools/). <https://resilienteducator.com/classroom-resources/what-equity-really-means-in-schools/>. Published 2021. Accessed April 26, 2021.
25. Medical Laboratory Professionals: Who's Who in the Lab | Lab Tests Online. [labtestsonline.org](https://labtestsonline.org/articles/medical-laboratory-professionals#). <https://labtestsonline.org/articles/medical-laboratory-professionals#>. Published 2021. Accessed April 26, 2021.
26. Tomorrow's Doctors, Tomorrow's Cures. AAMC. <https://www.aamc.org/>. Published 2021. Accessed April 26, 2021.
27. Clinton Foundation. Clinton Foundation. <https://www.clintonfoundation.org/>. Published 2021. Accessed April 26, 2021.
28. Siemens Foundation | About us | Siemens USA. Siemens USA. <https://new.siemens.com/us/en/company/about/usa-foundations.html>. Published 2021. Accessed April 26, 2021.
29. CCCLW Site. CCCLW Site. <https://www.ccclw.org/>. Published 2021. Accessed April 26, 2021.
30. How to Become a School Administrator: Career and Salary Information. Teacher Certification Degrees. <https://www.teachercertificationdegrees.com/careers/school-administrator/>. Published 2021. Accessed April 26, 2021.
31. Home - American School Counselor Association (ASCA). [SchoolCounselor.org](https://www.schoolcounselor.org/). <https://www.schoolcounselor.org/>. Published 2021. Accessed April 26, 2021.
32. American College Counseling Association - Home. [CollegeCounseling.org](http://www.collegecounseling.org/). <http://www.collegecounseling.org/>. Published 2021. Accessed April 26, 2021.
33. What Is a STEM Teacher and How to Become One. <https://www.ziprecruiter.com/>. <https://www.ziprecruiter.com/Career/STEM-Teacher/What-Is-How-to-Become>. Published 2021. Accessed April 26, 2021.
34. Home - National Skills Coalition. National Skills Coalition. <https://www.nationalskillscoalition.org/>. Published 2021. Accessed April 26, 2021.

AUTHORS

AMERICAN SOCIETY FOR CLINICAL PATHOLOGY

The **American Society for Clinical Pathology** (ASCP) is a 501(c)(3) nonprofit medical specialty society representing over 100,000 members. Our members are board certified pathologists, other physicians, clinical scientists (PhDs), certified medical laboratory scientists/technologists and technicians, and educators. ASCP is one of the nation's largest medical specialty societies and is the world's largest organization representing the field of laboratory medicine and pathology. As the leading provider of continuing education for pathologists and medical laboratory personnel, ASCP enhances the quality of the profession through comprehensive educational programs, publications, and self-assessment materials. For more information: www.ascp.org

Edna C. Garcia, MPH

Institute for Science,
Technology, and Policy, ASCP

Iman Kundu, MPH

Institute for Science,
Technology, and Policy, ASCP

Melissa A. Kelly, PhD

Learning and Education
Research Division, ASCP

ACKNOWLEDGEMENTS

We are grateful to all the individuals and groups that took the time to review and contribute to the development of this blueprint for action.

CENTER FOR HEALTH WORKFORCE STUDIES AT THE UNIVERSITY OF WASHINGTON

The University of Washington Center for Health Workforce Studies at the (UW CHWS) conducts research to elevate the importance of workers in the delivery of health care in policy discussion. UW CHWS was established in 1998 with funding from the federal Health Resources and Services Administration (HRSA). It is based in the Research Section of the Department of Family Medicine, part of the University of Washington School of Medicine. For more information: familymedicine.uw.edu/chws

Bianca K. Frogner, PhD, Center for Health Workforce Studies, University of Washington

Grace A. Guenther, MPA, Center for Health Workforce Studies, University of Washington

Susan M. Skillman, MS, Center for Health Workforce Studies, University of Washington



Other contributors include Karen Brown, MS, MASCP, MLS(ASCP)^{CM}, E. Blair Holladay, PhD, MASCP, SCT(ASCP)^{CM}, LaTanya Norwood, MBA, MS, Matthew Schulze, Amy Spiczka, M.S., SCT, HTL, MB (ASCP)^{CM}, and Patricia A. Tanabe, MPA, MLS(ASCP)^{CM}. ASCP Creative Team, Martin Tyminski, MFA, and Jennifer Brinson designed and managed the layout of this document. Agnes A. Zarkadas, BA, ELS, provided editing for the report. Jeff Jacobs, MA provided executive-level support for the project.

FUNDING

This study was funded through grants to ASCP and UW CHWS by the Siemens Healthineers Fund of the Siemens Foundation.

SIEMENS | Foundation

APPENDIX A:

Key Actors and Audiences

- The **Laboratory Community** comprises laboratory employers, laboratory training programs, laboratory professionals and students, and specialty laboratory societies.
- The **Laboratory (Employers)** plays a key role in the workforce not only in terms of hiring laboratory personnel but also in being a key actor and agent in shaping the future of the workforce. They are important to engage as experience and opportunity providers. In the context of the blueprint, the laboratories are located in facilities such as hospitals (academic and non-academic), military facilities, blood centers, and government facilities, or they may be independent, such as reference laboratories, physician's office laboratories, outpatient clinic laboratories, and industry. These are places where the target professions/roles (i.e. histotechnicians, MLAs, MLTs, phlebotomists, histotechnologists, and MLSs) are employed. In addition, hospital administrators and/or HR departments also fall under this category.
- **Laboratory Training Programs** refer to academic programs that provide accredited education in clinical laboratory sciences. In the context of the blueprint, the education and training programs focus on either a related two-year associate's degree, a certification, or occupational licensing or training for the target roles/professions (e.g., histotechnicians, MLA, MLT, phlebotomists, histotechnologists, and MLS). A list of academic laboratory training programs across the country can be found from the following accrediting bodies: **NAACLS, Accrediting Bureau of Health Education Schools (ABHES)**, and Military.
 - **Program directors** are the leaders in the education and training programs who have oversight over the academic program.
- **Laboratory Students** refer to individuals who are enrolled in laboratory training programs.
- **Laboratory Professionals** are responsible for performing routine as well as highly specialized tests to diagnose and/or aid in the treatment of disease, troubleshooting (preventing and solving problems with results, specimens, or instruments), and communicating test results to the pathologist or treating health practitioner.²⁵ They cover a variety of roles and require a wide range of education and training.
- **Specialty Laboratory Societies**, which include organizations that represent different types of laboratory professions, are part of the laboratory community that works together to advance laboratory medicine and improve patient care. Examples are: American Society for Clinical Pathology (ASCP), American Association of Bioanalysts (AAB), AABB, American Association for Clinical Chemistry, Association for Molecular Pathology, Association of Genetic Technologists, American Society for Clinical Laboratory Science, American Society of Cytopathology, American Society for Microbiology, Clinical Laboratory Management Association, National Society for Histotechnology, and Philippine Association of Medical Technologists-USA (PAMET-USA).
- **Professional Societies, Organizations, and/or Institutions**, refer to groups that may or may not be laboratory-related but could potentially help advance the goals of the laboratory workforce initiatives, bring visibility to middle-skills opportunities, and drive social change. Examples are academic institutions such as UW CHWS; other relevant education/training programs; professional societies such as Association of American Medical Colleges (AAMC), Clinton Foundation, Siemens Foundation, Coordinating Council on the Clinical Laboratory Workforce (CCCLW), HOSA (Future Health Professionals).^{11, 26-29}
- **Government Institutions** refers to agencies that have policy influences on advocacy and activities related to laboratory workforce. Examples include U.S. Bureau of Labor Statistics (BLS), Centers for Disease Control and Prevention (CDC), Center for Medicare and Medicaid Services (CMS), Department of Education (DOE), Department of Labor (DOL), Health Resources and Services Administration (HRSA), and Office of Minority Health at the Department of Health and Human Services. States with laboratory professional licensure have boards that oversee regulations for personnel standards of those that work in the lab.
- **Academic Community** refers to the collective of non-laboratory institutions that may serve as the target audience for various laboratory workforce initiatives. Examples are:
 - **Academic/School administrators**, refer to individuals in school administration who work at a primary, secondary, or post-secondary school, either private or public. They may also work in adult education programs. They may be school principals, superintendents, or directors of specific school programs.³⁰
 - **Guidance counselors** refer to school personnel who guide students (e.g., in high school and middle school) in considering career choices and selecting courses based on their interests. For example, groups include the American School Counselor Association (ASCA) and the American College Counseling Association (ACCA).^{31,32}
 - **STEM educators** are educators who teach science, technology, engineering, or mathematics.³³ Example groups include the National Science Teachers Association and STEM Educators Academy, which are active in the middle school and high school levels, as well as managing clubs that help shape and guide academic choices.
 - **High school students, middle school students, elementary school students** refer to students enrolled in grades 1 through 12.
 - **Postsecondary students**, refer to students who are enrolled in colleges and universities across the country.
 - **Student support organizations**, refer to organizations that provide resources and support to students through academic and/or professional clubs, alumni organizations, specialty groups, etc.
- **Underserved Community Organizations**, refer to groups, agencies, and other organizations (including health groups, employers, work force/training agencies, etc.) that would help reach priority communities. Groups like the National Skills Coalition³⁴, Faces for the Future Coalition²⁰, American Association of Community Colleges²⁶ and others will be explored as potential partners for executing the recommendations and tasks in the blueprint.
- **Industry Influencers** are organizations like the American Clinical Laboratory Association and Association of Public Health Laboratories, who work closely with ASCP on workforce, education and policy issues.
- **Media** includes social media, laboratory trade media, and local market business media that promote not only middle-skills opportunities, but also the program at large.

APPENDIX B:

ASCP Career Ambassadors 2.0

The ASCP Career Ambassadors 2.0 operates as a network of laboratory professionals, pathologists, and resident members who introduce medical laboratory careers to high school and college students. Career Ambassadors help young people understand and appreciate the medical laboratory's role in patient care, and inspire them to pursue a career in the medical laboratory and pathology, while cultivating relationships in their community. ASCP offers its members opportunities to build the future workforce by providing them with tools and resources to give presentations about the profession at student groups and schools in their communities, career fairs, and STEM fairs. ASCP also asks our Career Ambassadors to host students at their laboratory for a few days so they get a chance to actually see what it is like to work in a laboratory. In addition to hosting internships, Ambassadors have the opportunity to host an event for ASCP members and non-members alike to learn about the Career Ambassador program.

For more information about the current program, refer to the program website: www.ascp.org/content/get-involved/ambassadors

APPENDIX C:

ASCP Foundation Visibility Campaigns

The ASCP Foundation's Laboratory Visibility Fund supports public relations and advertising campaigns designed specifically to tell the story of the laboratory. The work that medical laboratory professionals do is critical to patient care, yet is hidden from the public. The ASCP Foundation is dedicated to ensuring that our members' work is understood, respected, and valued by healthcare professionals, insurers, government, and the public.

For more information about the visibility campaign, refer to the ASCP Foundation website: www.ascp.org/content/about-ascp/ascp-foundation/increasing-laboratory-visibility