

HAWAII STATE DEPARTMENT OF HEALTH

#### **ABSTRACT:**

**Background:** Public health laboratories across the nation face problems with an aging workforce and tangential difficulties in recruiting and retaining highly qualified employees. Chronically understaffed public health laboratories are dependent on employees who must assume broad responsibilities to sustain essential functions to support the many programs and objectives. Prospective scientists considering a career in public health are often not aware of the requirements associated with working in a laboratory regulated by the Clinical Laboratory Improvement Amendments (CLIA).

**Methods:** We applied for an APHL Innovations in Quality Public Health Practice grant and were awarded funds. We recruited four interns from three different local universities and paired each with an experienced State Laboratories Division (SLD) staff mentor. Students performed tasks that demonstrate the importance of CLIA regulations. Students also attended several directed group sessions on regulatory lab practice and quality systems.

**Results:** Surveys of mentors and interns conducted at program mid-term and conclusion indicate an overall positive response. One-on-one pairing of experienced public health professionals and students seems to be a mutually beneficial arrangement.

**Conclusion:** Students improved their understanding of CLIA earlier than expected. A program of this nature may be an effective tool to combat public health workforce shortfalls and gaps in knowledge on a local level.

#### **BACKGROUND:**

Maintaining a capable and robust public health laboratory workforce is of critical importance to ensure that high standards of science, safety, and security are employed to solve state and national problems<sup>1</sup>. As of 2006, the average age of a member of the state public health workforce was 46.6, with up to 50% of employees eligible for retirement in the next few years<sup>1</sup>. Some states have up to a 20% vacancy in the public health system, and recruiting younger professionals can be difficult<sup>1</sup>. Private sector jobs often offer a favorable salary, and the potential future workforce lacks awareness about the opportunities, work environment, and prerequisites related to public health laboratory careers – most discover public health by "accident"<sup>1</sup>. Undergraduate classroom work alone does not adequately prepare students with the knowledge, skills, and abilities to work in a laboratory regulated by the Clinical Laboratory Improvement Amendments (CLIA). The Hawaii SLD developed this program to address these problems on a local level (Table 1).

### **MATERIALS & METHODS:**

The Hawaii SLD proposed a 14-week paid internship program focused on CLIA and quality systems, which was funded by an APHL Innovations in Quality Public Health Practice award. Internship candidates were recruited using the student job website of the University of Hawaii at Manoa. SLD staff were also encouraged to recruit students by word of mouth. Four students submitted résumés and cover letters to the SLD. All four students were interviewed and were determined to be qualified for the 14-week program (Figure 1). One student was placed in each of four departments with a qualified staff mentor: Laboratory Emergency Response Program (LERP), Virology, Information Technology, and Central Services (Figure 2). We worked closely with Karen Breckenridge, APHL Director of Quality Systems, to design a CLIA-based syllabus for each intern. The syllabi were intended to assist students and mentors in designing tasks that demonstrate the importance of CLIA regulations. Students also attended several directed group sessions on regulatory lab practice and quality systems (Figure 3). Students worked between 10 and 15 hours each week and were paid a wage of \$10.00/hour. Program goals included introducing students to the knowledge, skills, and abilities necessary to work in a CLIA-regulated environment, and expanding the talent pool for future workplace vacancies. Mentors completed two surveys (mid-term and conclusion) and interns completed three surveys (beginning, mid-term, and conclusion) to evaluate the program's ability to complete the outlined goals.

#### Table 1. Workforce Problems and Internship Program Goals at the Hawaii SLD

#### Problems

1.Understaffed laboratories & aging public health workforce

2. Lack of awareness about public health careers within potential future workforce

 Difficulties recruiting/retaining qualified employees

 New graduates lack the knowledge, skills, and abilities needed to succeed in a CLIA-regulated laboratory Goals

 Employ students to help with workload; expand future potential workforce

 Allow students to experience the working environment of a public health laboratory

 Pair students with an experienced mentor to stimulate interest in public health careers

 Students perform tasks to gain K/S/A related to CLIA-regulated work

### Future Public Health Laboratory Workforce Outreach in Hawaii: CLIA-Focused Student Internship Pilot Program at the State Laboratories

Caitlin Saucier<sup>1</sup>, A. Christian Whelen<sup>1,2</sup>, Remedios Gose<sup>1</sup>, Teresa Oshiro<sup>1</sup>, Sandra Schoneman<sup>1</sup>, Roland Lee<sup>1</sup>, John Feltner<sup>1</sup>, Kent Kitagawa<sup>1</sup> <sup>1</sup> Hawaii Department of Health, State Laboratories Division; <sup>2</sup> University of Hawaii



Figure 1. Spring 2012 SLD Interns, funded by an APHL Innovations in Quality Public Practice grant. From left to right: Maria Sciulli (Chaminade University), Jade Licudine (Hawaii Pacific University), Sunja Kim (UH-Manoa) and Leilani Manglicmot (UH-Manoa).



Figure 2. Jade Licudine was paired with mentor Roland Lee in the Virology section of the SLD's Medical Microbiology Branch.



Figure 3. Dr. A.C. Whelen meets with interns and SLD mentors.

#### **RESULTS:**

Both interns and mentors were surveyed at multiple times during the 14-week period. Interns completed a survey early in the program to help their mentor understand their knowledge, skills, and abilities. Interns ranked their proficiency on a scale of 1 to 5, with 1 indicating "no knowledge" and 5 indicating "I am proficient". Knowledge, skills, and abilities surveyed included laboratory safety, quality control, Standard Operating Procedures, public health principles, basic microbiology, and CLIA regulations (Table 2). Interns were also surveyed at program mid-term and conclusion to measure the change in their understanding of key program concepts, as well as their satisfaction with the program as a whole (Table 3). Mentors were surveyed at program mid-term and conclusion to evaluate intern performance and mentor satisfaction with the program (Table 4). Questions were open-ended or respondents were asked to respond on a scale of 1 through 5, with 1 indicating "strongly disagree" and 5 indicating "strongly agree. Overall, mentor responses were slightly more positive at program conclusion compared to mid-term (based on 13 question survey). Student responses remained fairly consistent between program mid-term and conclusion (based on 15 question survey). At program mid-term, interns had their syllabi over halfway completed (59%, 62%, 100%, and 100%) with an aggregate completion rate of 79%. Upon completion of the program, all interns had completed all CLIA-related objectives on the syllabus and had an aggregate task completion rate of 93% (77%, 97%, 100%, and 100%).

# Table 2. Averaged Student Responses to Early Program Knowledge Survey (1 = No Knowledge, 5 = Proficiency)

Understand purpose of CLIA	2.5
Understand categories of tests by complexity	2
Understand categories of laboratories performing CLIA regulated tests	2
Understand proficiency testing purpose and requirements	2.25
Understand pre-analytic, analytic, and post-analytic quality management	1.25
Understand personnel categories and requirements for non-waived testing	1.25
Understand personnel competency assessment theory and practice	1.5
Understand requirements under Hawaii State Law and Administrative Rules 110.1	1
Understand purpose of quality systems in a public health laboratory	2.75
Understand HIPPA laws and protocol	
Understand importance of an SOP	3.5
	· ·

## Table 3. Averaged Student Responses to Program Surveys (1 = Strongly Disagree, 5 = Strongly Agree)

	Mid-Term	
"I have improved my understanding of principles of public health"	4.75	
"I understand how CLIA principles are integral to public health laboratory science"		
"I am considering public health laboratory science as a career"		
"I would recommend this internship to other students"	4.75	
"I would take/recommend this internship if it paid less"	4.25	
"I would take/recommend this internship if it was unpaid"	4.25	
"I would take/recommend this internship for college credit"	4.75	

### Table 4. Averaged Mentor Responses to Program Surveys(1 = Strongly Disagree, 5 = Strongly Agree)

"Sometimes it's hard for me to find things for interns to do"

"Mentoring a student has been a valuable experience for me"

"Student interns provide valuable assistance with my workload"

"I would recommend mentoring a student to other SLD staff members"

Mid-Term 2.25 3.25 3.75



Figure 5: Sum	nary of Internship Survey Feedback
Successful A	spects of Internship Pilot Program
Students enjoy departments)	ed variety in their duties (ex: spending time in differe
Students enjoy	ed the mentored relationship and building career
Students realiz	ed the importance of careful work to ensure accurate
Students impro	ved communications skills
<b>Jentors</b> enjoy	ed having extra help for tasks
<b>Mentors</b> enjoy	ed learning about their own teaching style
<b>Mentors</b> enjoy	ed helping students learn
Students liked glassware, usi	learning practical skills (ex: use of PPE, cleaning ng instruments correctly)
Students appre	ciated career advice from experienced professionals
Challenges of	Internship Pilot Program
Occasional dif	iculties finding enough tasks for interns
Some students	and mentors would like more departmental rotation
Some students earlier in the p	and mentors would like more background lectures rogram
Some schedul certain tasks a	ng issues with students not being available when re performed
Some mentors ield as the dep	would like an intern with a declared major in the sam
Some students to work up to 2	wanted to spend more time in the lab (would be willi 0 hrs. per week)
Suggested Ac	tions to Facilitate Long-Term Internship Program
Create more s	tructured activities for "down time"
Consider a rot	ation-based internship program
Consider more aboratory wor	intensive background training before students start
Encourage stri	cter scheduling of students; consider summer interns mic conflicts
Consider more	specific hiring criteria for certain departments
Consider more practical (allow	intensive internship so Select Agent clearance is ving students to participate in more lab activities)
Pair with unive	reities to offer internship for credit

Pair with universities to offer internship for credit Identify long-term funding sources; consider lower-paid or unpaid program

### **CONCLUSIONS:**

 Interns reported much improved understanding of CLIA earlier than anticipated (mid-term survey).
 Both interns and mentors reported positive experiences, although interns tended to be more positive.

3. Both groups reported a desire to keep interns busier.

4. Intern-mentor pairing worked well, but did limit experience diversity.

5. Summer program may work better due to class and travel challenges.

6. Interns reported they would recommend internship to others, and would participate even if it was lower paid, unpaid, or credit only.

**References:** 1 Perlino, Courtney M. 2006. The Public Health Workforce Shortage: Left Unchecked, Will We Be Protected? American Public Health Association Issue Brief.

**Acknowledgements:** We gratefully acknowledge the Association of Public Health Laboratories and the Centers for Disease Control and Prevention for the resources required for this study. Special thanks to Karen Breckenridge of APHL for her assistance with this project. Thank you to Elsie Cristobal and Rebecca Sciulli for their administrative assistance. Thanks to our interns Maria Sciulli, Jade Licudine, Sunja Kim, and Leilani Manglicmot for their willingness to participate in a pilot project.



Conclusion
2.25
3.75
3.5
4