

North Carolina Laboratory System Improvement Program

Assessment Summary

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An assessment of the state public health laboratory system was conducted on 9/23/2014 in Raleigh, NC. Over 80 stakeholders participated in assessing and scoring the system based on the 10 essential public health services.



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North Carolina Public Health Laboratory System Assessment

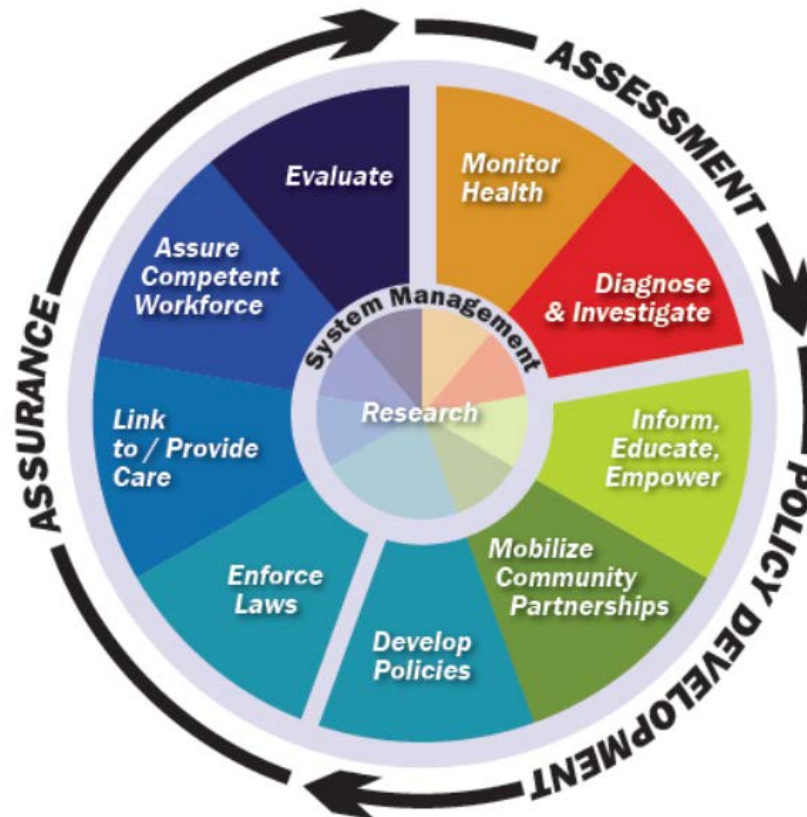
I. Executive Summary

On September 23, North Carolina became the 31st laboratory system to complete a Laboratory System Improvement Program (L-SIP) assessment. Approximately 85 partners representing various parts of the North Carolina laboratory system, such as clinical microbiology laboratories, local health departments, newborn screening advisory committee members, state veterinary and agriculture laboratories, public water supply staff, law enforcement, information technology specialists, researchers, professional society members, program staff, and members of the North Carolina (NC) General Assembly, attended the event that was held at the McKimmon Conference and Training Center in Raleigh, NC.

After welcoming remarks from Penelope Slade-Sawyer, Director of the NC Division of Public Health (DPH), Dr. Scott Zimmerman, Director of the North Carolina State Laboratory of Public Health (NCSLPH), shared examples of past collaborations between the NCSLPH and its partners. Many of these examples fell under the umbrella of essential public health services. Karen Breckenridge, Director of Quality Systems at the Association of Public Health Laboratories (APHL), provided an orientation to the laboratory system assessment process and led the entire group through a practice evaluation and voting for Essential Service #2 (Diagnose and Investigate Health Problems) as a facilitator. After the plenary, participants were divided into three breakout groups and were each assigned three of the remaining nine essential services to evaluate during the course of the day. Each breakout group had a skilled facilitator knowledgeable of public health, but not a member of the laboratory.

At the end of the assessment day, the participants gathered together for the closing plenary session where the scores for each of the Essential Services were projected onto a screen. Essential Services #3 (Inform, Educate and Empower People about Health Issues) and #6 (Enforce Laws and Regulations that Protect Health and Ensure Safety) were seen as system strengths, while Essential Services #1 (Monitor Health Status to Identify Community Health Problems), #7 (Link People to Needed Personal Health Services and Assure the Provision of Healthcare when Otherwise Unavailable) and #10 (Research for New Insights and Innovative Solutions to Health Problems) had a number of opportunities for improvement.

During the closing session, the voting results from each breakout session were shared, as well as one to three next steps, challenges, or key ideas for each essential service. Quality improvement initiatives will be developed from the NC L-SIP Assessment, as well as a strategic plan for NCSLPH. Opportunities for networking, coordination, cooperation and collaboration will be explored in order to better deliver the ten essential public health services to the people of North Carolina.



Source: <http://www.health.gov/phfunctions/public.htm>

II. Introduction

A. Purpose of L-SIP

L-SIP was developed to aid in the improved performance of both state and local public health laboratory systems, with the goal of continuous quality improvement. The Association of Public Health Laboratories (APHL) and the Centers for Disease Control and Prevention (CDC) Laboratory Science, Policy and Practice Program collaborated on development of L-SIP and the assessment tool to accomplish the following objectives:

- Assess the public health laboratory system's performance
- Plan for public health laboratory system improvements
- Implement improvement strategies for the public health laboratory system
- Evaluate the effects of the strategies on the system
- Re-assess the public health laboratory system's performance

B. Development of the L-SIP Assessment Tool

In 2002, the National Public Health Performance Standards Program (NPHPSP) was established by CDC and its partners. The NPHPSP identifies and measures the components, competencies and capacities of state and local public health systems, as well as local public health governance using standards based on the ten essential public health services. The L-SIP concept was conceived from the NPHPSP.

The L-SIP assessment tool is the foundation of the program and is intended to aid in identification of public health laboratory system strengths and gaps. The tool was developed through collaborations between laboratory experts and partners and was first used in 2007. The tool was revised in 2011 based on feedback from public health laboratory partners.

Using Model Standards, the assessment tool was designed as a way to measure performance of the entire public health laboratory system, not only the state or local public health laboratory itself. The tool includes standards set to the ideal or optimal performance by a public health laboratory system. The process depends upon the participation, support and collaboration of a wide range of stakeholders and partners that have a role in the system.

C. Framing Concepts

It is important to understand the concepts that are foundation to the L-SIP assessment. These five concepts are as follows:

1. The assessment centers around delivery of the ten essential public health services. Use of the ten essential public health services assures that the tool covers public health activities needed at both the state and local levels.
2. The assessment incorporates all of the 11 Core Functions of state public health laboratories. The APHL L-SIP User Guide contains a cross-walk of the ten essential public health services and 11 core functions in Appendix D.
3. The assessment focuses on the overall state or local public health laboratory system rather than a single organization or laboratory. This ensures that the contributions of all partners and stakeholders are recognized while assessing performance of the ten essential public health services.

4. The assessment measures against an optimal level of performance (“gold standard”) rather than a minimal level of accepted standards, allowing for continuous quality improvement of the system.
5. The assessment supports the commitment to a process of continuous improvement. System partners use the results of the L-SIP assessment process to guide planning for improvement activities that encompass the entire public health laboratory system.

D. The Ten Essential Public Health Services

1. Monitor health status to identify community health problems (ASSESSMENT)
2. Diagnose and investigate health problems and health hazards in the community (ASSESSMENT)
3. Inform, educate, and empower people about health issues (POLICY DEVELOPMENT)
4. Mobilize community partnerships to identify and solve health problems (POLICY DEVELOPMENT)
5. Develop policies and plans that support individual and community health efforts (POLICY DEVELOPMENT)
6. Enforce laws and regulations that protect health and ensure safety (ASSURANCE)
7. Link people to needed personal health services and assure the provision of health care when otherwise unavailable (ASSURANCE)
8. Assure a competent public health and personal health care workforce (ASSURANCE)
9. Evaluate effectiveness, accessibility, and quality of personal and population-based health services (ASSURANCE)
10. Research for new insights and innovative solutions to health problems (CENTERPIECE)

Source:

<http://www.health.gov/phfunctions/public.htm>

E. Eleven Core Functions of a State Public Health Laboratory

1. Disease Prevention, Control and Surveillance
2. Integrated Data Management
3. Reference and Specialized Testing
4. Environmental Health and Protection
5. Food Safety
6. Laboratory Improvement and Regulation
7. Policy Development
8. Public Health Preparedness and Response
9. Public Health Related Research
10. Training and Education
11. Partnerships and Communication

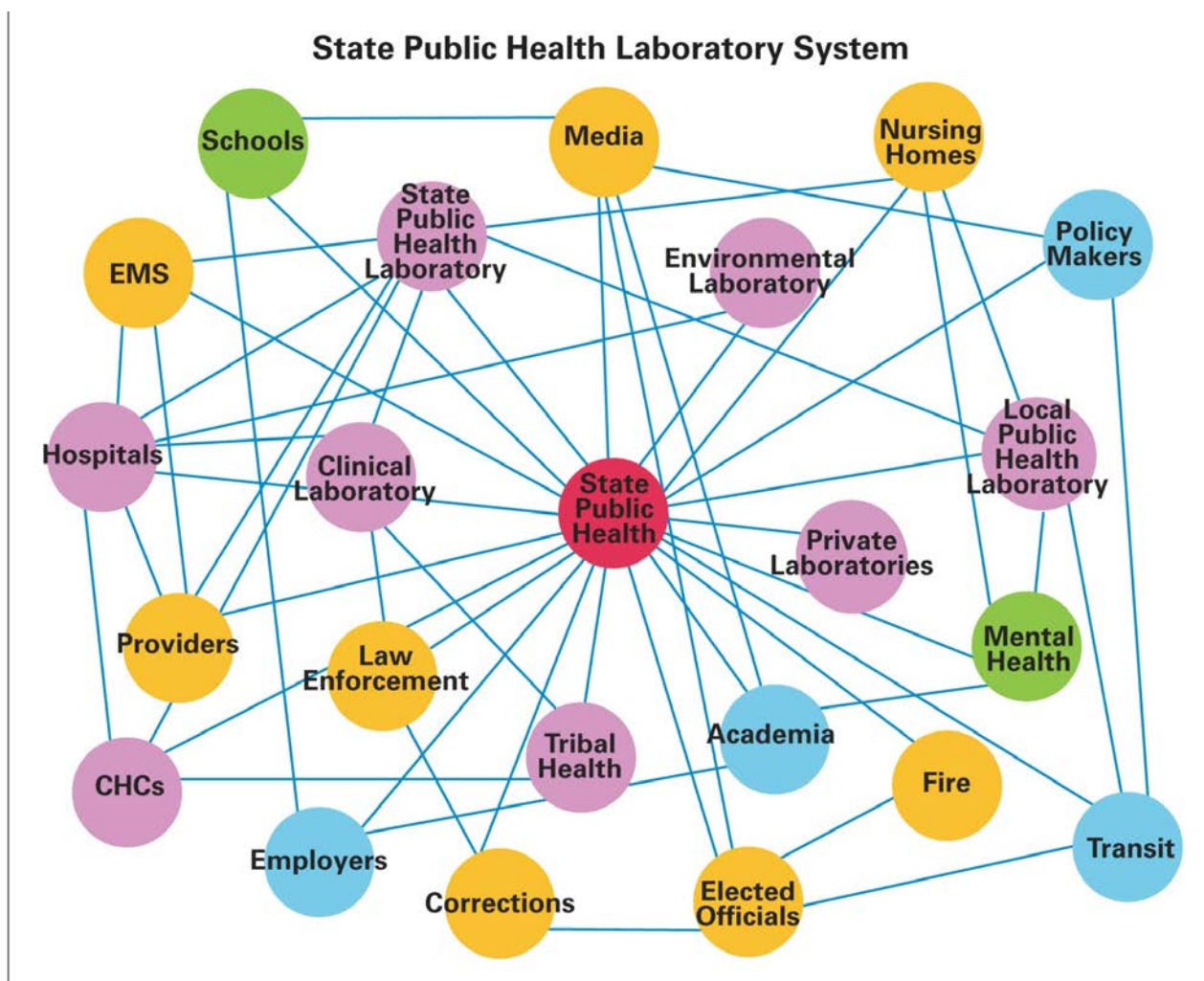
Source

http://www.aphl.org/aboutaphl/publications/documents/com_2010_corefunctionsphls.pdf

F. Definition of a state public health laboratory system

“An alliance of laboratories and other partners within a state that supports the ten essential public health services under the aegis of the state public health laboratory. The system members and

stakeholders operate in an interconnected and interdependent way to facilitate the exchange of information, optimize laboratory services, and help control and prevent disease and public health threats.”



Source: APHL User’s Guide, 2013

III. Background

It is important to understand how collaborations are required to deliver public health laboratory services. To this end, some examples of successful collaborations with laboratory system partners are provided in this section. These collaborations highlight activities in various units of the NCSLPH.

- Laboratory Preparedness (Bioterrorism and Emerging Pathogens, Chemical Terrorism and Threats)
 - Key partners in the Laboratory Preparedness arena are numerous, but include Public Health Preparedness and Response, Communicable Disease, Occupational and Environmental Epidemiology, law enforcement at all levels, first responders (fire/EMS/hazmat teams), local health departments, hospital/sentinel laboratories, poison control, and other members of the national Laboratory Response Network (LRN) plus the Centers for Disease Control and Prevention (CDC).
 - NCSLPH has participated in functional exercises, such as packaging and shipping clinical samples from NC to CDC for chemical analysis within a certain time frame, or receiving spiked clinical samples from CDC to test in NC for a variety of chemical agents and then submitting results within a certain time frame. NCSLPH has also conducted externally evaluated Homeland Security compliant exercises which tested surge capacity in Raleigh and at regional laboratories to gauge how many samples could be processed using LRN protocols with two-six trained staff persons. This required much planning and coordination with internal partners, as well as with external partners, to effectively test and assess the laboratory's capacity.
 - Response to incidents also involves key partners and protocols have been developed for sample collection, testing and reporting results. NCSLPH has found that convening and conference call early in the response to gather accurate information and plan the response activities with partners promotes a successful outcome. After the response, formalizing a report using an after action template allows those involved in the response to document what went well and what could be improved for the next response.
 - Outreach and training is a key component of Laboratory Preparedness. NCSLPH has a database of sentinel laboratory contacts that includes phone numbers and emails. Regular in-person visits are scheduled with sentinel laboratories by the outreach coordinator to ensure that they have the latest information, including 24/7 contact information for NCSLPH and Communicable Disease. Furthermore, the College of American Pathologists (CAP) Laboratory Proficiency Exercise (LPX) Proficiency Testing events have been used to test sentinel laboratories' ability to follow protocols for either notifying NCSLPH of pathogen identification or for "referring" samples for further analysis. These exercises with CAP LPX have proved useful in identifying training and outreach needs in the state public health laboratory system.
- Newborn Screening
 - The Newborn Screening (NBS) Program consists of testing dried blood spot samples from infants by the NCSLPH, a follow up program in the Women's and Children's Health (WCH) Section in the NC Division of Public Health (DPH), and medical specialists at UNC-Chapel Hill, Duke University and other health care providers around

the state. The program works very well to identify babies at risk of metabolic and inherited disorders, and has an Advisory Committee that meets regularly to assess the program. The NBS Advisory Committee includes many key stakeholders, including representatives from the NC Pediatric Society, March of Dimes and a parent representative. As an illustration of the collaboration required to introduce a new screening test to the NBS panel, addition of Cystic Fibrosis (CF), will be discussed in some detail.

- o As scientific evidence demonstrated the benefit of screening newborns for CF, the NC NBS Advisory Committee met to review the data, listen to CF medical experts, and learn from the experience of other state public health laboratories who shared their testing algorithms. Once consensus was reached that CF should be added, and there was agreement on the screening algorithm, planning began in earnest to seek funding from the NC General Assembly.
- o Key partners involved in planning for the funding request included NCSLPH, WCH Section, plus the DPH Human Resources and Budget offices. NCSLPH was charged with identifying equipment, reagents, space, and new personnel costs to initiate laboratory testing of newborns for both immunoreactive trypsinogen (IRT) screening and DNA testing for CF mutations as confirmation. WCH staff members were tasked with identifying additional positions needed for follow up and developing relationships with CF medical centers for sweat testing, the gold standard for diagnosis of CF.
- o After successfully gaining approval from the NC General Assembly to raise the newborn screening fee to cover the costs of the additional tests, the processes to add new positions to NCSLPH and WCH were started with DPH Human Resources. The processes to purchase equipment and secure contracts for reagents, and renovate existing laboratory space were also started. It is clear that without the collaboration of many stakeholders, the addition of CF screening to the panel would not have occurred. While the entire process took two years, the implementation of laboratory screening and follow up activities in April 2009 was highly successful, with very few bumps in the road. Periodic evaluation of the NBS Program continues to ensure laboratory testing and follow up practices are effective.

- Food Safety

- o Key partners in food safety activities include both NCSLPH and NC Department of Agriculture and Consumer Services (NCDA&CS) food laboratories (microbiology and chemistry), Communicable Disease Branch (CDB) Epidemiologists, Public Health Veterinarians, Environmental Health professionals, local health department staff, hospital and commercial/reference laboratories, and federal partners such as CDC, Food and Drug Administration (FDA) and United States Department of Agriculture (USDA). An excellent example of collaboration comes from the 2004 *E. coli* O157:H7 outbreak investigation at the NC State Fair.
- o In late October 2004, NC DPH CDB was notified of several cases of Hemolytic Uremic Syndrome (HUS) from area hospitals as a result of disease reporting requirements. Local health departments were notified of the potential for additional cases of HUS and the

possible link to the NC State Fair, regulated and sponsored by the NCDA&CS. Due to the likelihood of a state-wide outbreak of *E. coli* O157:H7, the NC State Epidemiologist requested assistance from CDC for additional epidemiological support for case finding and interviewing. Isolates of *E. coli* O157:H7 were genetically fingerprinted by NCSLPH to determine the outbreak pattern using pulsed-field gel electrophoresis (PFGE). Isolates from 33 positive patients and from 19 positive environmental samples that were collected where the suspect petting zoo was located during the fair were indistinguishable by PFGE analysis. In all, 108 human cases of *E. coli* O157 were reported during the outbreak, and 41 cases were lab confirmed.

- o Obtaining isolates required the cooperation of hospital and reference laboratories in sending them to the NCSLPH for confirmation and PFGE analysis. Hospital based epidemiologists, state epidemiologists, local health department staff and CDC epidemiologists worked together to find potential cases, conduct interviews using a standard questionnaire and then analyze the data to determine the most likely source of the exposure. By early December 2004, it was clear that most cases occurred at the location of the petting zoo, where extensive animal and human contact occurred.
 - o As a result of this large outbreak, the Sanford School of Public Policy at Duke University conducted a study to determine if changes were necessary in petting zoo attractions to protect public health. As a result of the outbreak investigation and recommendations from the study and the DPH, Aiden's Law was passed by the NC General Assembly in 2005. This law required petting zoos to be permitted only after a physical inspection of the animals occurred. This example represents cooperation during a large outbreak investigation at the local, state and federal levels, and how the investigation and science informed changes in policy and state law.
- Environmental Health
 - o Key partners in protecting the environment and public health in North Carolina include NCSLPH Environmental Sciences Unit, NC Department of Environment and Natural Resources Public Water Supply Section in the Division of Water Quality, Occupational and Environmental Epidemiology (OEE), local health departments, public and private water utilities and federal partners such as the Environmental Protection Agency (EPA) and FDA (Grade A Milk Program). The Certification Unit at the NCSLPH provides training and certification related to the Safe Drinking Water Act to ensure laboratories are in compliance and personnel are well trained in the EPA-approved methods.
 - o One example of collaboration among the many partners involved enactment of the Private Well Water statute and related rules. Due to the rural nature of much of the state, many residents rely on private well water for their source of drinking water. There were no national standards for this type of water and typically, well water was tested only when a problem was apparent. In 2007, the NC General Assembly passed a statute requiring all newly constructed wells to be permitted through an inspection and laboratory testing process. Local health departments were tasked with the inspection and

permitting process, while the NCSLPH provided microbiological and inorganic chemical analysis. OEE toxicologists provided risk assessments based on the laboratory analysis. Based on available data, public health concerns and unified messages from the DPH and the Public Water Supply Section, rules and statutes were created to protect the public.

- o Blood lead screening and environmental investigations provide another example of effective collaboration among key partners. In the state of NC, children receiving Medicaid are required to be screened for elevated lead levels at 2 years and 5 years of age, prior to beginning kindergarten. Samples are submitted to NCSLPH by private health care providers as well as local health departments. If a lead level of concern is identified in a child, repeat testing occurs and potentially an investigation of the home may be initiated. Environmental samples, such as paint chips, soil, dust wipes or other suspect materials, are tested by the NCSLPH to help identify the source of the lead. The Childhood Lead Poisoning Prevention Program and NCSLPH have worked in tandem for many years to successfully reduce the number of children with elevated blood lead levels. This program is considered a public health success story thanks to strong collaborations and effective partnerships at the local, state and federal levels.
- Workforce Development
 - o The partners involved in assuring a competent public health laboratory system workforce include the NCSLPH Laboratory Improvement Unit (focused on training and consultation), Medical Laboratory Technologist/Clinical Laboratory Scientist degree programs at area universities and community colleges, and the NC Department of Public Instruction through Science, Technology, Engineering and Math (STEM) initiatives. In addition, APHL, CDC and other professional organizations like the CAP, offering numerous continuing education opportunities specifically designed for laboratory staff.
 - o The NCSLPH Laboratory Improvement Unit provides training to local health department staff members that perform laboratory testing. These trainings are a combination of on-line offerings and hands-on training that address the need for training on proper microscope use, performing Gram stains, wet mounts and identifying *Neisseria gonorrhoeae*. They also provide competency assessments to local health department staff to ensure staff members are performing these tests correctly. In addition, a one day conference devoted to laboratory issues is held each fall (Clinical Laboratory Day) and attendees receive continuing education credit.
 - o NCSLPH has agreements with local universities and community colleges to provide rotations for their students in a public health laboratory environment. The University of North Carolina at Chapel Hill requires Clinical Microbiology Program fellows to spend three weeks in a Public Health rotation, and Wake Technical and Community College requires their medical technology students to spend at least two weeks observing tests performed at NCSLPH, particularly in Microbiology and Virology/Serology laboratories.
 - o NCSLPH, in collaboration with North Carolina State University (NC SU) College of Agriculture and Life Sciences, received a grant from the Association of Schools of Public Health to support four paid student interns during the summer of 2009. Each student was assigned to an area of the laboratory to learn microbiological testing processes and to

conduct research and present a poster. One of these students continued to work as a student part-time after the internship, and eventually was admitted to a local medical school having gained a strong background in public health.

- Knowing the importance of reaching students early to share the excitement of a career in laboratory science, NCSLPH partnered with the NC Department of Public Instruction to reach students before they are graduating from high school. In the summer of 2013, NCSLPH hosted a STEM Science Fair in which middle school/high school age students were invited to participate in experiments and tour the laboratory. Members of the NCSLPH volunteered their time on a weekend to work at the Fair and guide students through the various experiments. There was much positive feedback from students and parents that attended. The parents and students requested that this become a regular event so more students could benefit from exposure to real-world laboratory science.
- Research
 - Key partners in the area of public health laboratory research includes partners in academic, manufacturers of kits, medical devices or instruments and APHL and CDC.
 - NCSLPH was awarded a multi-year research contract via APHL to develop a next generation sub-typing method for *Listeria monocytogenes*. The goal was to find a DNA-sequenced based method that was faster than PFGE, but retained enough discriminatory power to be helpful in outbreak situations. NCSLPH partnered with an *L. monocytogenes* expert at NCSU Food Science Department, Dr. Sophia Kathariou, to create a large panel of isolates and to provide background information on numerous environmental isolates. Through this support, a multi-locus variable number tandem repeat analysis method was published in the *Journal of Clinical Microbiology*, and single nucleotide polymorphism (SNP) analysis was also explored as another alternative to PFGE.
 - NCSLPH partnered with the University of North Carolina at Chapel Hill to determine the need for biomonitoring of pregnant women for heavy metals (Arsenic, Cadmium, Lead and Mercury). It is well established that fetal exposure to heavy metals and other contaminants negatively impacts the development of the fetus, but was unclear what levels the population of pregnant women in North Carolina may have. The results of the pilot study, based on blood samples collected from pregnant women in selected counties, were published in *PLoS One* in March 2012.
 - NCSLPH has partnered with a manufacturer of matrix-assisted laser desorption/ionization-time of flight (MALDI-TOF) mass spectrometry instruments to investigate the utility of this technology for identification of certain microorganisms. Many laboratories are exploring the use of this technology in the novel arena of Clinical Microbiology to address the growing concern for expansion non-culture based laboratory methods that do not yield an isolate for surveillance and sub-typing analysis. As an example, PulseNet relies on isolates of *E. coli* O157, *Salmonella* and *Listeria monocytogenes* to be submitted to state and local public health laboratories for DNA fingerprinting.

IV. Assessment Process

The assessment process begins with commitment of laboratory leadership to the L-SIP assessment, formation of a steering committee and selection of a project coordinator. The NCSLPH began these critical planning steps in June 2014. Early decisions included choosing an L-SIP Assessment date, finding a venue, and selecting key stakeholders to invite to the day-long meeting. Support from APHL was instrumental for a quick start, and the L-SIP User's Guide was the roadmap to planning a successful meeting.

The project timeline provided in the User's Guide allowed for a realistic planning period and for major tasks to be assigned a leader from the steering committee and a target deadline for each task to be completed. In this way, key stakeholders in the state public health laboratory system and facilitators were identified and invited well in advance of the chosen L-SIP Assessment date. Background information (the definition of a state public health laboratory system, the ten essential public health services and the 11 core functions of a state public health laboratory) was disseminated to participants. As the L-SIP Assessment day grew closer, additional information from the L-SIP Assessment Tool and breakout group assignments was shared so that participants could focus on the three essential public health services they would be responsible for evaluating.

During the day-long meeting, participants evaluate the performance of the state public health laboratory system in supporting the delivery of the ten essential public health services. A skilled, trained facilitator was assigned to one of three breakout groups and led the group through a discussion of the key ideas and specific examples related to the essential public health service. After a healthy discussion, a vote was taken to determine the level of activity for that service or key idea, and in some cases, further discussion was needed to clarify disparate voting results, and a re-vote was taken. Themetakers (NCSLPH laboratory staff) assigned to each breakout group captured key ideas from the discussion, results of voting, next steps and parking lot issues.

The approach using the L-SIP Assessment Tool for facilitated discussion, themetaking and scoring allows for all ten essential public health services to be evaluated in one day. At the end of the assessment day, summary scores, significant challenges and prioritized next steps are shared with all participants. The next steps are used to develop a quality improvement plan that will engage key stakeholders in making system improvements. Information gathered from the L-SIP Assessment is shared with participants in a timely manner to maintain engagement of stakeholders in continuous quality improvement initiatives that improve the state public health laboratory system.

- ☐ Orient to process
- ☐ Review & discuss
 - ☐ Capture issues to address later
 - ☐ Gain consensus responses
- ☐ Input responses
 - ☐ For each ES identify the top 1-3 next steps
- ☐ Discuss results & evaluate process
- ☐ Summarize next steps

V. Summary, Results, Analysis

Essential Service #1: Monitor health status to identify community health problems

Overall Score=32.7 (Moderate Activity)

Key idea 1.1.1: The state public health laboratory system identifies infectious disease and environmental sentinel events, monitors trends, and participates in state and federal surveillance systems.

Rating: Significant (3)

Strengths: Examples include recreational/ocean beach and shellfish monitoring; NC Electronic Disease Surveillance System (NCEDSS) for reportable diseases; and air monitoring (radionuclides). Having laboratories as a government entity allows surveillance systems to exist statewide. Incident management teams include laboratories early on, leading to support of the laboratory.

Challenges: There is some delay in electronic reporting so customers would like to get closer to real time laboratory reporting, especially for toxic/waste spill events. The local health department would like a “ping” from the state public health laboratory when results are complete. The state public health laboratory needs to be at the table for health information exchange meetings. Agriculture has data to share with Epidemiology and should be part of the surveillance system.

Key idea 1.1.2: The state public health laboratory system monitors congenital, inherited and metabolic diseases of newborns and participates in state and federal surveillance systems.

Rating: Significant (3)

Challenges: Parent education about newborn screening is not effective (not comprehensive or consistent) despite information being made available by the laboratory and the program. The state program does not always get follow up information from providers who are forced to use certain laboratories other than the state public health laboratory. Adding a disorder to the newborn screening panel requires fiscal research and fee approval by the NC General Assembly. The process for adding a new disorder to the panel needs examination and revision.

Key idea 1.1.3: The state public health laboratory system supports the monitoring of chronic disease trends by participating in state and federal systems.

Rating: Minimal (1)

Strength: The State Center for Health Statistics maintains a central cancer registry.

Challenges: Many stakeholders felt there was a lack of knowledge of this key idea and there seemed to be a lack of monitoring systems. The state public health laboratory has performed Pap screening for many years for local health department patients, but no other chronic disease testing. Medicaid has some data about chronic diseases but it is not state-specific.

Key idea 1.2.1: The state public health laboratory system has a secure, accountable and integrated information management system for data storage, analysis, retrieval and exchange.

Rating: Minimal (1)

Strength: There is a lot of public health information available.

Challenges: System to system communication is lacking so without bi-directional flow of information, local health departments cannot get results into patient chart. The NC Health Information System (HIS) system is eight years old and is not Health Level 7 (HL7) certified. Health Information Exchange (HIE) is the answer, but it is not ready yet and will require ongoing maintenance and updating.

Key idea 1.2.2: The state public health laboratory system partners collaborate to strengthen electronic surveillance systems.

Rating: Moderate (2)

Strengths: State Center for Health Statistics--environmental health tracking information is provided nationally via CDC and environmental laboratory results are obtain via NCSLPH. The safe drinking water system monitors over 6000 systems and reports data to CDC.

Challenges: For Agriculture, eLEXNET is outdated and data cannot be retrieved. PulseNet and CaliciNet submissions are limited to public health laboratories. Non-culture methods will affect current surveillance systems that depend on isolates. We don't know what we don't know (Do we collect data no one uses? Do we collect data others don't know about? Is there data we should be collecting? Is the data being collected being evaluated by our partners or us?)

Essential Service #2: Diagnose and investigate health problems and health hazards in the community

Overall Score: 67.0 (Significant Activity)

Key idea 2.1.1: The state public health laboratory system assures the effective provision of service at the highest quality to assist in the detection, diagnosis and investigation of all significant health problems and hazards.

Rating: Significant (3)

Strengths: Laboratories are regulated and certified accredited by national organizations (CLIA/CMS, CAP, USDA, FDA, and EPA). NCSLPH has a Quality Manager and participates in APHL/CDC work groups. Conference calls convened during emergency situations with Epidemiology, Preparedness and other subject matter experts facilitates positive outcomes.

Challenges: Laboratories need to keep up with technological advances. Requiring samples to be sent via state laboratory to CDC tends to cause delays. Labs experience manpower and workforce shortages. Current workforce to perform in Biological Safety Level-3 (BSL-3) environment is insufficient. Need to figure out how to use sentinel laboratories as surge capacity during events.

Key ideas 2.1.2: The state public health laboratory system has the necessary capacity, authority, and preparations in place to rapidly respond to emergencies that affect the public's health.

Rating: Significant (3)

Strengths: Environmental laboratories have capacity.

Challenges: Emerging infectious diseases are a challenge due to waiting for CDC to release assays to state public health laboratory. The contract/memorandum of agreement process is an obstacle for laboratory Continuity of Operations Plans. Need to define the capacity of the system and desired tests and collaborate to achieve system capacity.

Essential Service #3: Inform, educate and empower people about health issues

Overall Score: 75.3 (Optimal Activity)

Key idea 3.1.1: The state public health laboratory system creates and delivers consistent information to community partners about relevant health issues associated with laboratory services.

Rating: Optimal (4)

Strengths: Communication via list serves is frequent and consistent. After Action Reports are done well and are consistent. There is good communication beyond electronic, via conference call or in person. When information (newborn screening or epidemiology related) is provided to the NC Pediatric Society, it is shared with its members. Regarding sickle cell program, communication between the program and community based organizations is seamless.

Challenges: Partners have trouble getting results from private laboratories.

Key idea 3.1.2: The state public health laboratory system creates and provides educational opportunities to health and non-health community partners.

Rating: Significant (3)

Challenges: Public health does not have a voice or a consistent message/brand. The public only hears about public health in the context of outbreaks, disasters, etc. The system does some outreach, but through specific programs only. The media cares about the problem “du jour.”

Key idea 3.2.1: Relationship building opportunities are employed to empower community partners.

Rating: Significant (3)

Strengths: Partnerships with NCSLPH Environmental Sciences Unit and NC Department of Environment and Natural Resources (DENR) and public water suppliers/public utilities. Preparations for the US Open golf tournament and Democratic National Convention are examples of vast partnerships and exposure for public health. Seeking grant funding is an opportunity for relationship building and collaboration.

Challenges: Current relationships are program-specific.

Essential Service #4: Mobilize community partnerships and solve health problems

Overall Score: 67.0 (Significant Activity)

Key idea 4.1.1: Partners in the state public health laboratory system develop and maintain relationships to formalize and sustain an effective system.

Rating: Significant (3)

Strengths: The newborn screening program is a good example of such a system. Also the TB Control program and laboratory partnership is strong. Laboratory Certification at the NCSLPH/Environmental Sciences is a great partner.

Challenges: Each partner needs to understand their role in the public health laboratory system. Funding does not allow for full surveillance, such as biomonitoring. There is a need for more formal and informal meetings at the state, regional and local level to discuss issues. There is also a need for a better definition of partnerships required to deliver essential services.

Key idea 4.2.1: State public health laboratory system partners communicate effectively in regular, timely and effective ways to support collaboration.

Rating: Significant (3)

Strengths: The Laboratory Forum (clinical microbiology laboratory directors and epidemiologists) meet regularly, as does the newborn screening advisory committee. Established emergency communication systems are in place and they work well. Micronet list serv and LabOratory newsletter are laboratory-based communication tools that are effective.

Challenges: Availability of staff to attend routine meetings is an issue. Sometimes laboratory not included in meetings. Routine communications are a challenge and sometimes communication occurs, but without a clear outcome.

Key idea 4.3.1: The state public health laboratory system works together to share existing resources and to identify new resources to assist in identifying and solving health issues.

Rating: Significant (3)

Strengths: The TB program and laboratory use CDC and Michigan for specialized services. The NBS program collaborated with Duke University on a grant to fund SCID testing. Electronic reporting from NCSLPH to Communicable Disease branch is in place, and NCEDSS has many users.

Challenges: Most grants for the laboratory come through the Communicable Disease Branch in program-specific ways. Health informatics funding is provided to meet a specific need and not to develop a comprehensive system due to piece-meal funding.

Essential Service #5: Develop policies and plans that support individual and community health efforts

Overall Score: 55.7 (Significant Activity)

Key idea 5.1.1: The state public health laboratory system obtains input from diverse partners and constituencies to develop new policies and plans and to modify existing ones.

Rating: Significant (3)

Strengths: The *Brucella* guidance document was produced from the Lab Response Forum members. Memoranda of Agreement are in place between Public Health and Agriculture.

Challenges: Communicating across the system is difficult. Ensuring there is not duplication of services between agencies needs to be addressed. There is a need for a centralized policy manual as well as a program-specific policy manual. Document control needs a better solution.

Key idea 5.2.1: The state public health laboratory system and partners contribute their expertise and resources using science and data to inform and influence policy.

Rating: Moderate (2)

Strengths: Agriculture adopts the Code of Federal Regulations.

Challenges: Funding is cut, but labs are expected to maintain services (for example, monitoring antibiotic resistance). There is a state statute that prevents a county from charging patients for sexually transmitted infections, assuming state appropriations will cover it, but these funds no longer exist.

Key idea 5.3.1: The plans and policies that affect the state public health laboratory system are routinely evaluated, updated and disseminated.

Rating: Moderate (2)

Strengths: NCSLPH and CDB Epidemiologists meet on a regular basis around different programs (e.g. quarterly for foodborne). The LabOratory newsletter is disseminated quarterly and may have policies incorporated.

Challenges: There is no mechanism to fund regular meetings statewide. We need one location for all critical information to be placed so it can be more easily updated [e.g. Suspicious Substance Response Guidelines (SSRG)]. Applying International Standards Organization (ISO) standards to laboratories and non-laboratory agencies/stakeholders could be beneficial but daunting.

Essential Service #6: Enforce laws and regulations that protect health and ensure Safety

Overall Score: 75.3 (Optimal Activity)

Key idea 6.1.1: The state public health laboratory system is actively involved in the review and revision of laws and regulations pertaining to laboratory practices.

Rating: Optimal (4)

Strengths: There is an ongoing process of reviewing statutes and rules that impact the laboratory. The laboratory has an opportunity to review and provide comments to liaisons when laws affect the laboratory. There is a point of contact in the Attorney General's office for public health issues related to statutes/rules.

Challenges: Sometimes laboratory is approached after rules are changed so the rules are driving the laboratory.

Key idea 6.1.2: The state public health laboratory system encourages and promoted compliance by all laboratories in the system with all laws and regulations pertaining to laboratory practice.

Rating: Significant (3)

Strengths: Laboratory Certification Office in the NCSLPH Environmental Sciences Unit provides regular inspection services to partners. Laboratory Improvement Unit at NCSLPH provides a CLIA-qualified laboratory director and regional technical consultants for moderate complexity local health department laboratories on the NC CLIA Contract. Packaging and shipping training is provided to partners. Outreach on changes occurs, such as changes to Safety Data Sheet information provided by manufacturers and changes to Select Agent rules.

Challenges: There is a need for proficiency testing for the system, not just individual laboratories. There is a need to define responsibility for quality assessment within the system.

Key idea 6.2.1: The state public health laboratory system has the appropriate resources to provide or support enforcement functions for laws and regulations.

Rating: Significant (3)

Strengths: Public water systems can administer fines and while food sanitation inspectors cannot collect fines, they can take action. Enforcement lies in the programmatic areas. Restaurant scores are posted for the public to see.

Challenges: The laboratory does not enforce laws. Working with military bases around infectious diseases and newborn screening will require assistance from CDC and local health departments to improve reporting and communication. Explore communications with Veteran's Affairs hospitals in NC (Durham, Salisbury and Fayetteville).

Essential Service #7: Link people to needed personal health services and assure the provision of healthcare when otherwise unavailable

Overall Score: 33 (Moderate Activity)

Key idea 7.1.1: The state public health laboratory system identifies laboratory service needs and collaborates to fill gaps.

Rating: Moderate (2)

Strengths: Local hospital laboratories are available for faster turn-around time

Challenges: Turn-around time at NCSLPH is slow and the operating hours are restrictive. Surge capacity is a concern for NCSLPH. NCSLPH only bills Medicaid. There are known gaps for emerging conditions. Assuring services is very complex—how do we determine who picks up the slack when services not readily available?

Key idea 7.1.2: The state public health laboratory system provides timely and easily accessed quality services across the jurisdiction.

Rating: Moderate (2)

Strengths: NCSLPH is very helpful with questions and state-wide experts are available.

Challenges: The state courier is not always accurate and timely and has no tracking system. There is not timely reporting of results.

Essential Service #8: Assure a competent public health and personal healthcare Workforce

Overall Score: 50 (Moderate Activity)

Key idea 8.1.1: All laboratories within the state public health laboratory system identify position requirements and qualifications; assess competencies; and evaluate performance for all laboratory workforce categories across the entire scope of testing.

Rating: Significant (3)

Strengths: Market assessments have been completed. Position descriptions are updated every few years. NCSLPH sends out competencies for local health department laboratories and hosts 3600 hours of training annually.

Challenges: There is a shortage of qualified workers. Salaries are not competitive with private sector to retain and recruit experienced staff. Insufficient budget to increase salaries and there are constraints on pay policies (promotions limited to 10%). Reclassification of positions is on hold. Mecklenburg and Wake County each have separate systems from rest of local health departments. Some local health department managers are unaware of state positions so there may be opportunities to share and collaborate. NCSLPH focuses on local health department training, which limits target audiences and opportunities for marketing training.

Key idea 8.2.1: The state public health laboratory system maintains an environment to attract and retain highly qualified staff.

Rating: Moderate (2)

Strengths: Emphasize positives about public health laboratory careers: new facility, free parking, routine hours, family friendly, benefits. Emerging infectious diseases are exciting as are outbreak responses.

Challenges: We need a consolidated job database/website for the public health laboratory system. We need to develop partnerships with UNC and other university/college campuses to do interviews with upcoming graduates and participate in career fairs.

Key idea 8.3.1: The state public health laboratory system works to assure a competent workforce by encouraging and supporting staff development through training, education and mentoring.

Rating: Significant (3)

Strengths: CDC offers fellowships/internships and there are TB online training opportunities for laboratorians. The Building Enterprise Access for NC's Core Operation Needs (BEACON) Training Management System is now available to log training hours.

Challenges: Need to consult with academic partners to develop Doctorate in Public Health graduate programs to increase number of qualified candidates. Develop a way to offer training opportunities in molecular diagnostics.

Key idea 8.3.2: The state public health laboratory system identifies and addresses current and future workforce shortage issues.

Rating: Moderate (2)

Strengths: Opportunities for collaborations with academia and industry partners and career fairs with young children through STEM programs.

Challenges: Succession planning is more reactive and proactive and needs to be more methodical. Many positions do not have opportunity for advancement. There are restrictions on in-range adjustments for state positions. There is a need for new skills in the laboratory (molecular advances) and in information technology/informatics.

Essential Service #9: Evaluate effectiveness, accessibility, and quality of personal and population-based services

Overall Score: 38.7 (Moderate Activity)

Key idea 9.1.1: The state public health laboratory system range of service, as defined by its mission and purpose, is evaluated on a regular basis.

Rating: Moderate (2)

Strengths: Public health epidemiologists stationed at several areas around the state. The Laboratory Response Forum is effective.

Challenges: There is no structure in place for system management and no mission statement exists. There is a need for operational oversight of the system that includes all partners.

Key idea 9.2.1: The effectiveness of the personal and population-based laboratory services provided throughout the state is regularly evaluated.

Rating: Moderate (2)

Strengths: The newborn screening program is the clearest example of monitoring outcomes over time in that babies are identified with potential disorders and followed up to ensure they see a medical specialist for diagnosis and monitoring of the child. When the first *E. coli* O157:H7 outbreak related to the NC State Fair occurred, laws were changed to reduce the risk of such an outbreak occurring again. This required cooperation among Agriculture, Public Health and policymakers.

Challenges: There are not clear metrics for evaluating the system performance. Follow up activities are not publicized, even though after-action reports are done. There is separation of the system components and disconnects between some partners. Lack of connectivity hampers communication between county and state.

Key idea 9.2.2: The availability of the personal and population-based laboratory services provided throughout the state is regularly evaluated.

Rating: Moderate (2)

Strengths: As a whole, NC has strong outreach.

Challenges: Some areas of the state are not given a voice. We need to determine what is a public health service versus a clinical laboratory service.

Key idea 9.2.3: The quality of the personal and population-based laboratory services provided throughout the state is regularly evaluated.

Rating: Significant (3)

Strengths: Quality is the bread and butter of laboratories. CAP and Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) are strict with accreditation standards, but basis of their standards is CLIA/CMS.

Challenges: As a system, we do not know if quality measures are actively used and monitored. There is a need for a customer satisfaction survey of the system.

Essential Service #10: Research for insights and innovative solutions to health

Problems

Overall Score: 33 (Moderate Activity)

Key idea 10.1.1: The state public health laboratory system has adequate capacity to plan research and innovation activities.

Rating: Moderate (2)

Strengths: Program-specific initiatives are effective (such as Vector-borne Disease Working Group, newborn screening pilot programs and sexually transmitted diseases/infertility prevention program).

Challenges: Applying for grants through the state system is lengthy and prohibits meeting grant deadlines. We need to develop stronger ties to academia.

Key idea 10.2.1: The state public health laboratory system promotes research and innovative solutions.

Rating: Moderate (2)

Strengths: CDC writes into grants a requirement for staff to travel to key meetings. An advisory group can affect change and progress, and the Vector-borne Diseases working group is an example of this.

Challenges: The lack of funding, staffing, state travel limitations, competing priorities, advocacy and avoiding conflict of interest with private companies are real obstacles to promoting research and innovative solutions.

VI. Discussion and Next Steps

Assessing the ten essential public health services using the APHL Assessment Tool for State Public Health Laboratory Systems allowed stakeholders in the system to identify relative strengths and weaknesses compared to the gold standard or ideal system. The discussion of key ideas and voting on the level of performance for each key idea shed light on the areas of high performance and those most in need of improvement. Two of the highest scoring essential services and four of the lowest scoring essential services are discussed below.

Areas of highest or optimal performance included Essential Services #3 and #6. Essential Service #3 (Inform, educate and empower people about health issues) identified some strong examples of delivering consistent information to community partners through the use of list serves, conference calls and program-specific outreach. Specifically noted in the discussion of this essential public health service was the seamless communication between the state Sickle Cell Program and Community Based Organizations (CBOs), as well as the partnership between the NCSLPH Environmental Sciences Unit and the NC DENR, public water suppliers and public water utilities. Essential Service #6 (Enforce laws and regulations that protect health and ensure safety) included strengths such as regular review of statutes and rules that affect laboratories, and public health in general, thanks to coordination by the attorney within the DPH. In addition, the NCSLPH Environmental Sciences Laboratory Certification Unit provides regulatory inspection services to certified drinking water laboratories, as well as timely updates on changes to the regulations. The NCSLPH Laboratory Improvement Unit provides a CLIA-qualified Laboratory Director and four Technical Consultants for over 40 local health departments participating in the NC CLIA Contract Program.

Areas of lowest or moderate performance included Essential Services #1, 7, 9, and 10. Essential Service #1 (Monitor health status to identify community health problems) discussions identified numerous information technology gaps, particularly in electronic laboratory reporting (ELR) and the ability of partners to participate in the NC HIE. The consensus was that many state systems are outdated and need updating as quickly as possible. Another area for improvement required additional information gathering to better understand the current surveillance systems for chronic diseases, other than the central cancer registry. Essential Service #7 (Link people to needed personal health services and assure the provision of healthcare when otherwise unavailable) had areas for improvement in turn-around times for laboratory results from the NCSLPH and the timeliness and accuracy of sample delivery by the state courier system. Essential Service #9 (Evaluate effectiveness, accessibility, and quality of personal and population-based services) requires some foundational work to structure the management of the public health laboratory system, and to develop a mission statement for the entire system, a novel concept for all stakeholders to embrace. Subsequently, members of the public health laboratory system can respond to a well-directed questionnaire that covers all core functions and performance metrics of the system. Essential Service #10 (Research for insights and innovative solutions to health problems) discussions focused on the need to strengthen ties with area universities, to collaborate more effectively on grant applications, and to stay abreast of cutting edge research and technology related to public health laboratory practices.

A. Essential Service #1: Monitor health status to identify community health problems

Overall Score: 32.7 (Moderate Activity)

Next Steps:

1. Add other labs to electronic reporting for more complete surveillance reports. NC HIE may be the solution.
 2. Increase communication with Epidemiology for environmental/food issues and incorporate these data into business model.
 3. Enable electronic systems to talk to each other, especially NCSLPH to LHD for laboratory results. Complete systematic gap analysis of NCSLPH informatics needs.
 4. Add Severe Combined Immunodeficiency (SCID) screening to newborn screening panel to meet recommended universal screening panel.
 5. Develop alternative funding mechanism for NCSLPH as fee-for-service is not sustainable. Rolling cost average was suggested as a potential mechanism.
 6. Increase knowledge of chronic disease testing in NC and state/federal surveillance systems to identify gaps.
- B. Essential Service #2: Diagnose and investigate health problems and health hazards in the community

Overall Score: 67.0 (Significant Activity)

Next Steps:

1. Improve two-way communication between labs and epidemiology, such as through regular meetings with key staff members.
 2. Fund 24/7 operations across public health, not just in isolated programs.
 3. Use sentinel labs as surge capacity, especially for emerging infectious diseases.
 4. Develop a way for laboratories to keep abreast of new technologies so that public health can remain on the forefront.
 5. Publish test menus on websites and include descriptions and rationale for performing the tests, plus expected turn-around-times.
 6. Develop Memoranda of Agreement with neighboring states for critical laboratory testing functions, such as newborn screening.
- C. Essential Service #3: Inform, educate and empower people about health issues

Overall Score: 75.3 (Optimal Activity)

Next Steps:

1. Identify responsibility for coordination of public health laboratory system activities. Explore oversight/coordination models used in other states (Wisconsin, e.g.).
2. Identify limitations in system resources that prevent achieving optimal services.
3. Develop a mechanism to obtain laboratory results from private laboratories when health care provider changes or program needs information.
4. Public health needs to develop a “brand” for more unified outreach. Outreach is very program-specific at this point.

D. Essential Service #4: Mobilize community partnerships and solve health problems

Overall Score: 67.0 (Significant Activity)

Next Steps:

1. Identify informatics gaps and find resources to close gaps.
2. Collaborate on grant applications to strengthen relationships and increase resources within the system.
3. Improve on relationships via routine meetings. Suggestion was to post meeting agendas and schedule so that correct staff members can attend meetings.
4. Define partnerships and roles of each member in the public health laboratory system, then establish common goals.

E. Essential Service #5: Develop policies and plans that support individual and community health efforts

Overall Score: 55.7 (Significant Activity)

Next Steps:

1. Perform a community health needs assessment.
2. Modify rules and statutes related to public health testing.
3. Convene more inclusive and more frequent program-specific forums.
4. Perform a state-wide laboratory capacity assessment to identify gaps and prevent duplication of services. Perhaps establish or update existing Memoranda of Agreement.
5. Develop a strategic plan related to financial stability and sustainability.

F. Essential Service #6: Enforce laws and regulations that protect health and ensure safety

Overall Score: 75.3 (Optimal Activity)

Next Steps:

1. Coordinate with military bases through LHD to improve reporting of infectious diseases to the state.
2. Ensure public health laboratory reviews rules/statutes on a routine basis to assess impact on public health laboratory services. Seek help of Attorney General's office liaison when help needed.
3. Assess point of care laboratory testing for reporting utility.
4. Ensure relationships with VA Hospital system in North Carolina remain strong.

G. Essential Service #7: Link people to needed personal health services and assure the provision of healthcare when otherwise unavailable

Overall Score: 33 (Moderate Activity)

Next Steps:

1. Develop flow chart or other means to communicate system-wide public health laboratory services. Formalize information re: capacities for testing and services.
2. Explore third party billing (beyond Medicaid) for NCSLPH to expand customer base and resources.
3. Determine factors that influence decision to send specimens/samples to public health versus private laboratories.
4. Explore other options for specimen transport to improve timeliness and reliability of delivery to laboratory.

H. Essential Service #8: Assure a competent public health and personal healthcare workforce

Overall Score: 50 (Moderate Activity)

Next Steps:

1. Marketing training to partners, especially on-line trainings, and expand audience beyond local health department staff when NCSLPH develops training.
2. Strengthen academic partnerships via career fairs and internships, development of degree or certificate programs, and student participation in outbreak response.
3. Share job descriptions between state and local health departments that are common to ensure consistency in responsibilities, as well as education and experience.
4. Collaborate with academia when writing grants and with vendors to increase resources.
5. Develop a strategy for succession planning in public health.
6. Develop a strategy to make salaries competitive in public health with private sector.

I. Essential Service #9: Evaluate effectiveness, accessibility, and quality of personal and population-based services

Overall Score: 38.7 (Moderate Activity)

Next Steps

1. Develop a state public health laboratory system mission statement.
2. Develop a strategy to organize and manage the state public health laboratory system.
3. Develop a survey of the state public health laboratory system based on 11 core functions of a public health laboratory to assess customer satisfaction.
4. Publicize after-action reports within public health lab system so that lessons learned can benefit the entire system.
5. Identify performance measures of the laboratory system and implement them.
6. Identify communication gaps between local, state and other system partners, especially electronic ones.

J. Essential Service #10: Research for insights and innovative solutions to health problems

Overall Score: 33 (Moderate Activity)

Next Steps:

1. Develop a nimble process for applying for grants that includes government, non-government and academic partners.
2. Establish a work group to explore cutting-edge technologies and on-the-horizon issues, such as impact of non-culture methods on isolate-based surveillance systems.
3. Establish an advisory committee for the public health laboratory system, based on successful models of the Laboratory Response Forum and Vector-borne Diseases Task Force, to make recommendations.
4. Work to improve program and laboratory relationships prior to applying for grants to assure strongest proposal is submitted.

VII. Assessment Scores and Other Materials

Essential Public Health Service	1	2	3	4	5	6	7	8	9	10
Optimal Activity			75.3			75.3				
Significant Activity		67.0		67.0	55.7					
Moderate Activity	32.7						33.0	50.0	38.7	33.0
Minimal Activity										
No Activity										

Summary

Essential Services #3 (Inform, Educate and Empower People about Health Issues) and #6 (Enforce Laws and Regulations that Protect Health and Ensure Safety) are seen as system strengths.

Essential Services #1 (Monitor Health Status to Identify Community Health Problems), #7 (Link People to Needed Personal Health Services and Assure the Provision of Healthcare when Otherwise Unavailable), #9 (Evaluate Effectiveness, Accessibility, and Quality of Personal and Population-based Services) and #10 (Research for New Insights and Innovative Solutions to Health Problems) have opportunities for improvement.

A. L-SIP Assessment Day Agenda

NC Laboratory System Improvement Program (L-SIP) Agenda
September 23, 2014
McKimmon Conference and Training Center

Registration	8:00-8:30
Welcome, Introductions, and Overview of the Assessment Day Penelope Slade-Sawyer, Director, Division of Public Health Dr. Scott Zimmerman, Director, NCSLPH	8:30-9:15
Plenary: Essential Service (ES) #2- Diagnose and Investigate Health Problems Karen Breckenridge, APHL	9:15-10:15
Break	10:15-10:30
Breakouts: - Group A- ES #1- Monitor Health - Group B- ES #9- Evaluate Effectiveness, Accessibility, Quality - Group C- ES #8- Assure Competent Workforce	10:30-11:45
Lunch	11:45-12:30
Breakouts: - Group A- ES #7- Link People to Needed Personal Health Services - Group B- ES #10- Research - Group C- ES #4- Mobilize Partnerships	12:30-1:30
Break	1:30-1:45
Breakouts: - Group A- ES#3- Inform, Educate, and Empower - Group B- ES #5- Develop Policies and Plans - Group C- ES #6- Enforce Laws & Regulations	1:45-3:00
Break	3:00-3:15
Summary, Evaluation, and Next Steps Dr. Leslie A. Wolf, L-SIP Project Coordinator	3:15-4:30
Adjourn	4:30

B. Steering Committee Members

- ❖ Dr. Scott J. Zimmerman, Director, NCSLPH
- ❖ Dr. Lou F. Turner, Section Chief, Public Health Laboratory and Office of Chief Medical Examiner
- ❖ Michael A. Kaufman, Assistant Director for Operations, NCSLPH
- ❖ Dr. Leslie A Wolf, L-SIP Project Coordinator
- ❖ Dr. Dee Pettit, Assistant Laboratory Director, Technical Services, NCSLPH
- ❖ William “Tex” Parks, Manager, Chemical Terrorism and Threats, NCSLPH
- ❖ J. Royden Saah, Manager, Bioterrorism and Emerging Pathogens, NCSLPH
- ❖ Karen Sanderson, Quality Assurance Manager, NCSLPH
- ❖ Patricia B. Atwood, Manager, Laboratory Improvement, NCSLPH
- ❖ Ann Grush, Laboratory Consultant, Newborn Screening, NCSLPH
- ❖ Tiffany Perdue, Laboratory Consultant, Laboratory Improvement, NCSLPH
- ❖ La’Vonda Benbow, Supervisor, Mycobacteriology, NCSLPH
- ❖ Chris Goforth, Supervisor, Environmental Laboratory Certification, NCSLPH
- ❖ Joey Johnson, Supervisor, Special Serology, NCSLPH
- ❖ Denise Givens, Clerical Supervisor, Cancer Cytology, NCSLPH
- ❖ Karen Breckenridge, Director of Quality Systems, APHL
- ❖ Bertina Su, Senior Specialist, Laboratory Systems and Standards, APHL

C. Summary of Participant Evaluations

At the end of the NC L-SIP Assessment, 54 evaluations were returned. Not all evaluators responded to every item in this evaluation form.

Utility of Meeting	1-Strongly Disagree	2-Disagree	3-Neither Agree nor Disagree	4-Agree	5-Strongly Agree
Stated objectives of meeting were met				32	21
I understood the objectives of the meeting			1	31	19
Dialogue was useful			1	20	29
I support the efforts being made				10	41
Next steps are clear		1	6	32	9
Meeting was a good use of my time			3	28	20

Utility of Meeting: Additional Comments

- We had a good combination in our breakout group—environmental and clinical
- Learned a lot about who is part of the system and what they do. Next steps seem accurate and should be useful for strategic planning.
- Very organized and well done meeting. I appreciate how the schedule was followed, the opportunity for networking and dialogue.
- Found the discussion occasionally enlightening but lots of very inflated expectations. Not sure what the lab system is responsible for—seems like a very broad scope (too broad)
- Difficult to evaluate the system—need to better define expectations of state lab regarding coordination with external partners (no control over them). Need more specific metrics for each essential service.
- Was able to network and/or meet individuals I've only communicated with in emails.
- I really appreciate being invited to this meeting. I feel my level of knowledge wasn't very helpful to the group, but I will take away this information to my local health department.
- Legislative and policy changes that will be needed are not defined, but otherwise great!
- Important to do the next steps, but all must be knowledgeable of the resources needed. Otherwise this is an exercise in wishful thinking.
- Thanks for the opportunity to help define the public health laboratory system.

Meeting Arrangements	1-Strongly Disagree	2-Disagree	3-Neither Agree nor Disagree	4-Agree	5-Strongly Agree
Advance notice of meeting was adequate	1		2	13	35
Meeting Room accommodations were acceptable	1	1		15	35
Advance materials for meeting were useful	1	2	3	21	24
Advance materials were received with time to review	1	1		22	26

Meeting Arrangements: Additional Comments

- Could not hear audience comments when doing Essential Service #2. Moved chairs in breakout session for face to face discussions.
- Would have like to have all rooms closer together.
- The state lab needs to go through this process internally.
- Advance materials were confusing. What to do ahead of time? Who partners are? Focus was on system, not lab itself. Some ambiguity remains afterward with regard to specific essential services.
- Room was a little cold.
- Are participants in the meeting requesting all components of the system. May have more input without the breakout sessions.
- Very informative and useful sessions. I expect good useful things to follow.
- A little cool. Nice facility, great parking.
- Good facility—easy access. Thanks!
- Networking opportunities are just as valuable as participation. Great job getting legislators here!

Flow of Meeting	1-Strongly Disagree	2-Disagree	3-Neither Agree nor Disagree	4-Agree	5-Strongly Agree
Started on time				29	22
Objectives for meeting were clear				32	18
Agenda was followed or appropriately amended				21	29
Facilitation was effective				13	37
The “right” people were at the meeting		1	3	19	27

Flow of Meeting: Additional Comments

- Went well.
- Great discussions. Lots of experience and expertise in my group.
- Maribeth Woods great facilitator.
- Went well.
- Things moved along well.
- Great facilitators!
- I was confused by being asked to evaluate the whole “system” after receiving the invite from the lab, e.g. how to assess the mission of the system if there isn’t really a system organization. The nomenclature made it slightly confusing.
- Good balance of meetings and breaks.
- Some of the discussions were a little slow.
- Went fine.
- Some breakout groups did not have key stakeholders for key ideas.

What worked well?

- It is important to have the right people in the breakout groups. Some people learned more about public health in NC, capabilities and limitations
- I thought the tool was really good.
- Breakout sessions, good discussions.
- Having a clear document to work from.
- Having time keeper and note takers in addition to facilitator.
- Great discussion; opportunity to share with folks who had limited knowledge prior to today.
- Balance of lecture and breakout discussions.
- Openness of opinions and comfort in expression of them by different stakeholders in public health.
- The dialogue and interactions were very useful and informative.
- Discussion.
- Getting to meet people from the PH Lab System and learning of the programs.
- Breakout sessions. Good participation in breakout group.
- The tool was excellent.
- Positive discussion from different perspectives.
- Organization and facilitation.
- Format of meeting was good. Meeting new persons involved in system. Break out sessions.
- Schedule and pace of breakout sessions.
- Networking opportunities. Understanding the various participants in the system.
- Liked the way the day was broken up in sessions followed by a break. Good discussion from most folks in the group.
- The variety of disciplines represented.
- Participation was very good.
- Small groups—good mix of expertise. Example of Essential Service #2 before breaking into small groups.
- Good discussion, very diverse group.
- Very focused and directed facilitation.
- Breakouts. They were very effective and useful.
- Interactions with facilitators.
- Discussion in breakout groups.

What could be improved for future assessments?

- More clinical lab partners.
- Not sure right now. Provide more vegetarian lunch options/items ran out.
- I needed more information on most of the items. A summary of some of the facts about the status would have been helpful.
- More guidance prior to meeting on how to use tool at start of day. ES#2 completion as an example was effective.
- Narrow the scope. Pick up where this assessment left off, so narrow the scope.
- Provide overview during the initial session of the day of the definition of the SPH laboratory system with example components.
- Establish compendium of current services to know what is available, then easier to ID gaps. List of best practices already in place at each area/partner.
- Clone Dr. Zimmerman so he could be everywhere at once.
- Add component for recommendations of future actions rather than just areas for improvement.
- Impact for Infection Control at hospitals could be addressed in additional meetings. Needs being met for hospitals? Is the state lab getting what they need from the hospitals?
- Not sure.
- Consider assessing state lab by dividing groups by areas, i.e. water, food, diseases/health/epi. Define what is working well in those areas and apply to other areas.
- Keep partners abreast of changes and impact for lessons learned and implemented from today.
- More diverse representations: local health departments, hospitals and legislators.
- Baseline data/facts provided by state lab for each essential service category to facilitate evaluation.
- Nothing.
- Include members of the public—John Q. Citizen
- Prior education about the system would be helpful.
- There could have been more discussion if there was more time. This could have been a two day event.
- Have representation from community based organizations. Have APHL representative in each small group—the scope of some of the key ideas were questioned.
- Partner discussions on a more local level (i.e. regional)
- Specific focus on state lab. Confusion when combining with system.
- Some sub-items were unnecessary.
- Perhaps bringing in representatives from faith-based and community-based organizations.
- More background on lab beforehand.

Would you participate in this process again? ☒ YES (49) ☐ NO (0)

Do you see this as a helpful tool and process? ☒ YES (49) ☐ NO (0)

Final thoughts:

- Stakeholders struggled to differentiate the system from the lab.
- Well-planned/effective means to road-mapping a 3-5 year strategic plan.
- Great opportunity to learn and discuss other parts of the system.
- The model used for the assessment worked very well.
- Don't let this die! There is a great opportunity for great change.
- Public health does a lot of good things and a few well. Items that need improving is to update computer systems and get the HIE system working. Drop the HIS system. Have better communication between groups.
- This is the first time I've thought of the NC state public health lab system as a cooperative entity. A lot of good work was begun today.
- Application of essential services language was too broad and general. Need more specific metrics derived from essential services.
- Push forward on electronic networking, i.e. NC HIE; stay current; consider 3rd party billing as sustainable; be part of the conversation to unify the state health services.
- Great meeting and partnerships gained will be valuable.
- Don't lose momentum—continue with small group meetings to share information.
- This is a good step forward! NC is well poised to be a national leader in this arena.
- Looking forward to working on next steps and making it better.
- Very good use of time/resources/energies. I hope much good emerges.
- Thanks for the invitation. Please keep us involved.
- Great day!
- I was able to understand the state public health lab better. I made connections throughout the laboratory community and found resources.
- Thanks for including my agency.
- Professionally done—excellent!
- Very good day!
- I appreciate the invitation. Thanks for a thought-provoking, interesting day. Looking forward to reading the final report.
- Good luck—I look forward to seeing how the objectives are implemented.
- Thanks for lunch.
- Excellent!
- Thanks!

D. Participant List (84 attendees)

Last Name	First Name	Title
Eakes	Susan	DHHS C-Trans Project Leader
Miller	Melissa	Director, Clinical Molecular Microbiology Laboratory; Associate Director, Clinical Microbiology-Immunology Laboratory, UNC Hospital
Smith	Steve	Health Director, Henderson County
Godette-Crawford	Regina	DHHS DHSR/OEMS
Howell	Eleanor	Director, State Center for Health Statistics
Cox	Patrick	Nuclear Facilities Surveillance Environmental Program Manager
Meeks	Darryl	DHHS Director Health Information Technology
Keziah	Barrett	NCSPH LIMS Administrator
Morris	Daisy	DHHS DPH Sickle Cell Program Supervisor
Fowler	Patti	Section Chief, Shellfish Sanitation
Pilkington	Audrey	Interim Director, NCDA&CS Food Laboratory
Zimmerman	Scott	Director, NCSLPH
Hise	Ralph	State Senator, NC General Assembly
Davies	Megan	Epidemiology Section Chief
Lodge	Robin	Lab Manager/Preparedness Coordinator, Cabarrus Health Alliance
Slade-Sawyer	Penny	Director, Division of Public Health
Casani	Julie	PHP&R Branch Head
Ireland	Eric	Deputy Health Director, Durham County Health Department
Brown	William	DHHS/DPH ENVIRONMENTAL HEALTH SPECIALIST
Dodson	Monica	Laboratory Supervisor, OWASA
Slaughter	Carolyn	Ambulatory Laboratory Services Manager, Mission Hospital
Young	Susan	Clinical Services Supervisor, Orange County Health Department
Brinson	Myra	NCSLPH VIROLOGY/SEROLOGY Manager
Price	Cindy	NCSLPH ENVIRONMENTAL SCIENCES Manager
Wooten	Maribeth	DHHS DPH Office of the State Health Director
Sanderson	Karen	NCSLPH QA Manager
Grush	Ann	NCSLPH NBS Consultant
Goforth	Chris	NCSLPH Environmental Sciences Laboratory Certification Supervisor
Sautter	Robert	Director of Microbiology, Carolinas Medical Center
Millington	David	Medical Research Professor, Duke University
Post	Karen	Director of Laboratories, NCDA&CS Veterinary Diagnostics Laboratory System
Kovar	Cheryl	DHHS DPH Family Planning/Reproductive Health Nurse Consultant
Melito	Shirley	Medical Laboratory Supervisor, New Hanover County Health Department
Ridderhof	John	CDC, Senior Advisor for Laboratory Integration
Deem	Vicki	DHHS DPH Public Health Nurse Consultant II
Moore	Amanda	PHP&R, Pharmacist

Norman	Ed	DHHS DPH Program Manager
Colling	Tandy	Newborn Screening Coordinator, Duke University Hospital
Staley	Danny	DHHS DPH Deputy Director
Melvin	James	Assistant Director, NCDA&CS Food Laboratory and Grade A Milk Program
Smith	Paula	DHHS, Dept Public Safety, Chief of Health Services/Medical Director, Adult Corrections
Turner	Lou	Section Chief, NCSLPH and OCME
Alfano-Sobsey	Edie	Laboratory Director, Wake County Human Services
Gehtland	Lisa	Research Public Health Analyst, Research Triangle Institute
Mobley	Victoria	Communicable Disease Branch Medical Epidemiologist
Williams	Carl	State Public Health Veterinarian, Communicable Disease Branch
Nash	Nancy	District Clinical Nursing Supervisor, Albemarle Regional Health District
Foust	Evelyn	Communicable Disease Branch Head
Merritt	Samuel	NCSLPH MICROBIOLOGY Manager
Burrowes	Vanessa	APHL-CDC EID Fellow
Hartsell	Fletcher	NC Senator, General Assembly
Schenck	Anna	UNC School of Public Health
Saah	J. Royden	NCSLPH Bioterrorism and Emerging Pathogens Manager
Atwood	Patricia	Laboratory Improvement Coordinator
Shehee	Mina	Epidemiology Section, Occupational and Env Epidemiology Branch Head
Page	James	FBI, Special Agent/WMD Coordinator
Rashied-Henry	Kweli	March of Dimes State Coordinator, NC Preconception Health Campaign
Fort	Marcia	DPH EHDI Program Development and Evaluation Manager
Potts	JD	Recreational Water Quality Environmental Supervisor
Combs	Brian	PHP&R Industrial Hygienist
Barkley	John	NC DOJ, Assistant Attorney General
Godreau	Jessica	DENR Section Chief, Public Water Supply
Drechsel	Rebecca	Laboratory Manager, Mecklenburg County Health Department
Moore	Zack	Communicable Disease Branch Medical Epidemiologist
Zeringue	Elizabeth	Communicable Disease Branch TB Nurse Consultant
Steece	Richard	Laboratory Director, TN Department of Health, Laboratory Services
White	Thomas	Physician , President-Elect NC Academy of Family Physicians
Freeman	Lynn	DHHS HR Manager
Kaufman	Mike	Assistant Director for Operations, NCSLPH
Chavez	Greg	DHHS DPH Human Resources Manager
Randall	Christy	RN, Newborn Screening Coordinator, UNC Hospital
Cheren	Isa	DPH Women's Health Branch Medical Consultant
Chaing	Shu	NCSLPH Newborn Screening Manager
Whitwam	Robert	Community Health Services Administrator, Forsyth County Health Department
Womble	Trent	Deputy Legislative Counsel
Robbins	Gerald	NC DOJ, Attorney General's Office
Johnson	Joey	NCSLPH Special Serology Supervisor
Breckenridge	Karen	Director, Quality Systems at APHL
Parks	William	NCSLPH Coordinator Chemical Terrorism and Threat Unit
Pettit	Dee	NCSLPH Asst. Director for Technical Services

Wolf	Leslie	NCSLPH L-SIP Project Coordinator
Benbow	La'Vonda	NCSLPH Mycobacteriology Supervisor
Perdue	Tiffany	NCSLPH Laboratory Improvement Consultant

Section VIII. List of Abbreviations

APHL=Association of Public Health Laboratories

BEACON=Building Enterprise Access for NC's Core Operation Needs

BSL=Biological Safety Level

CAP=College of American Pathologists

CBO=Community Based Organization

CDB=Communicable Disease Branch

CDC=Centers for Disease Control and Prevention

CF=Cystic Fibrosis

CLIA=Clinical Laboratory Improvement Amendments

CMS=Centers for Medicare and Medicaid Services

DENR=Department of Environment and Natural Resources

DPH=NC Division of Public Health

EPA=Environmental Protection Agency

ELR=Electronic Laboratory Reporting

FDA=Food and Drug Administration

HIE=Health Information Exchange

HIS=Health Information System

HL7=Health Level 7

HUS=Hemolytic Uremic Syndrome

IRT=Immunoreactive trypsinogen

ISO=International Standards Organization

JCAHO=Joint Commission on Accreditation of Healthcare Organizations

LHD=Local Health Department

LPX=Laboratory Proficiency Exercise

LRN=Laboratory Response Network

L-SIP=Laboratory System Improvement Program

MALDI-TOF= matrix-assisted laser desorption/ionization-time of flight

NBS=Newborn Screening

NCSLPH=North Carolina State Laboratory of Public Health

NCDA&CS=North Carolina Department of Agriculture and Consumer Services

NCEDSS=NC Electronic Disease Surveillance System

NCSU=North Carolina State University

NPHPSP=National Public Health Performance Standards Program

OEE=Occupational and Environmental Epidemiology

PFGE=Pulsed-field Gel Electrophoresis

SCID=Severe Combined Immunodeficiency

SSRG=Suspicious Substance Response Guidelines

STEM=Science, Technology, Engineering and Math

TB=Tuberculosis

USDA=United States Department of Agriculture

VA=Veteran's Affairs

WCH=Women's and Children's Health Section