

The Indiana Laboratory System: Focus on Environmental Laboratories

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ABSTRACT

The Indiana State Department of Health (ISDH) Laboratories are working to improve Indiana's state public health laboratory system. Environmental laboratories are key stakeholders in this system, but their needs have been largely unaddressed prior to this project. In an effort to identify and engage these laboratories, the ISDH Laboratories organized and hosted the First Annual Environmental Laboratories Meeting. The focus of this meeting was on water-testing laboratories throughout the state. Meeting objectives included issue identification, disaster recovery response, and communication efforts among system partners. Common concerns included the need for new technology and updated methods, analyst training, certification programs for analysts and sample collectors, electronic reporting, and regulation interpretation and inspection consistency. Now that these issues have been identified, they can be addressed through a combination of laboratory workgroups and collaboration with Indiana's regulatory agencies. Participants were overwhelmingly positive about the meeting's outcomes and were willing to help with future laboratory system improvement projects.

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As of August 2012, 28 states and one city have worked with the Association of Public Health Laboratories (APHL) to assess and improve their public health laboratory (PHL) systems.¹ To date, these assessments have largely focused on the role of clinical laboratories without evaluating the role of environmental laboratories. Environmental laboratories are also contributors to public health testing and have been overlooked because of the clinical focus during the improvement phase.

The Indiana Laboratory System (ILS) consists of all contributors to public health testing. These contributors include those who initiate testing and those who use test results.² The Indiana State Department of Health (ISDH) Laboratories conducted a statewide laboratory system assessment in 2009. Targeted areas for improvement included partnership development and communication plans. Relationship building, web-site use, information sharing, and collaboration were identified as potential solutions to address these issues.³ Since the ILS assessment, communication needs have been addressed with clinical laboratories.

Current collaboration and communication efforts with Indiana's clinical sentinel laboratories include the ISDH SharePoint website (<http://myshare.in.gov/ISDH/islabs/default.aspx>) and an e-mail listserv and e-mail address exclusive to the ISDH Laboratories Outreach Team (isdh-lab-info@isdh.in.gov). Clinical sentinel laboratories throughout the state are familiar with the communication and training format of the ISDH Laboratories. However, the network of Indiana's nonclinical laboratories still needs to be defined and established.

METHODS

Communication

The ISDH Office of Public Affairs designed a logo and slogan to market the concept of partnership development and network creation among nonclinical laboratories in Indiana. The logo depicts environmental, veterinary, and clinical laboratories connected within a molecule-like graphic with the slogan "Get Connected" (Figure 1).

Indiana's nonclinical laboratories were identified using resources from within ISDH, as well as from external agencies and laboratory associations. These agencies and associations included the Indiana Board of Animal Health, the Indiana Department of Environmental Management (IDEM), the Indiana American Water Works Association (IAWWA), and the Indiana Rural Water Association (IRWA). The resulting database includes contact information for dairy, veterinary,

Figure 1. The Indiana Laboratory System logo



and water laboratories. This database is housed on the ISDH Laboratories' SharePoint website. It was used to develop geographical mapping tools to serve as a general reference and to facilitate site visit scheduling. An interactive Web page map provides the name and address of the laboratory, the laboratory director's name, as well as the phone number and e-mail address of a designated contact person. This website is designed for ease of use by member laboratories and can be accessed at <http://gis.in.gov/apps/ISDH/ILSLabs>.

The ISDH Laboratories Program Advisor scheduled statewide visits with nonclinical laboratories. These visits promoted the concept of the laboratory system and provided a better understanding of their individual needs within the context of the system. ILS information packets were distributed to each laboratory. Specific resources used for these visits included travel time and hotel accommodations. Travel time was minimized by scheduling northern and southern visits in regional bundles. These face-to-face meetings were very successful and provided the data leading to the environmental focus of the meeting.⁴ The packets included the ILS flier, the interagency partnerships graphic, the U.S. Environmental Protection Agency (EPA) Water Alliance Response Plan flier, the elements of emergency response plans flier, the APHL state laboratory system graphic, the Web-mapping graphic, and

contact information for ISDH Laboratories personnel by testing section.

Laboratorians from Indiana's water laboratories were invited to the First Annual Environmental Laboratories Meeting held on June 25, 2012. Invitations were sent via the LabInfo e-mail notification system, which was previously used only for communication with the clinical sentinel laboratories.⁴ In addition, professional organizations such as IAWWA and IRWA agreed to forward the invitation to their members to inform smaller municipal water facilities. By using electronic forms of communication, the invitation was easily forwarded to additional participants.

Meeting focus

The meeting was divided into two main discussion sessions entitled Scenario Response and Table Talk. Scenario Response consisted of three separate scenarios focused on disaster recovery. It also served as a networking icebreaker. Scenario 1 described a passing thunderstorm resulting in widespread flooding, power outages, and closure of a local health department. Scenario 2 recalled a recent ice storm covering much of the Midwest that resulted in the loss of utilities and water with recovery time unknown. Scenario 3 depicted increased reporting of patients in area hospitals with watery diarrhea consistent with cryptosporidiosis along with statistics of mortality, surge in testing, and recreational area closures.⁴ During the Scenario Response portion, attendees were given the opportunity to

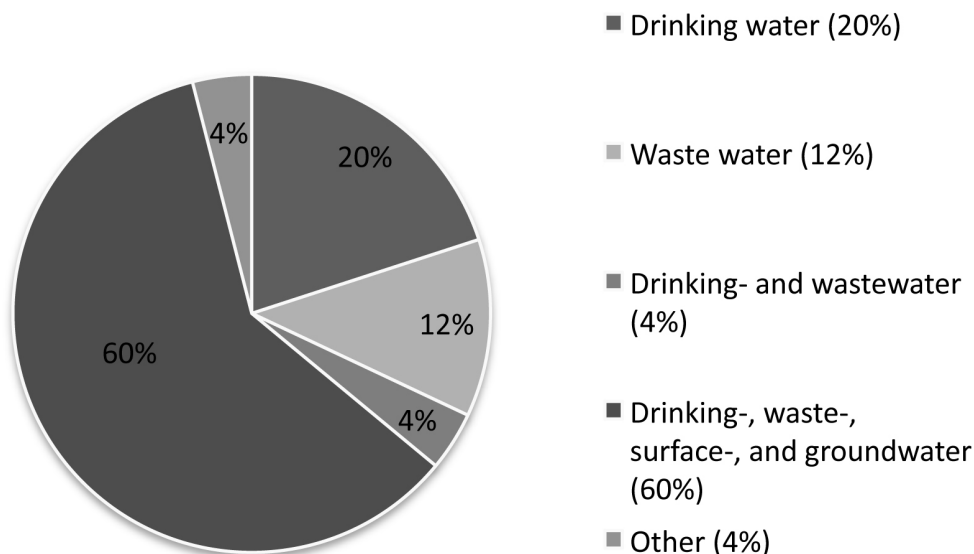
converse in small, informal groups and share information and stories from their respective laboratories. A representative from each small group then addressed the larger group about the disaster recovery plans for his or her discussion group. The Table Talk session was an opportunity for attendees to voice their concerns and discuss issues affecting their individual laboratories.

OUTCOMES

None of the laboratories involved in this project had prior knowledge of the system or their part in it; however, all were receptive to learning about the ILS. The water laboratories were especially concerned with understanding their role within the system and how to improve system-related processes. Issues associated with wastewater laboratory certification, analyst certification, new methods, electronic reporting to IDEM, and proficiency testing frequency were identified during initial site visits. To better understand and address these issues, water laboratories were the focus of the First Annual Environmental Laboratories Meeting.

There were 29 attendees representing 21 different laboratories at the Environmental Laboratories Meeting. When asked which water types each laboratory tested, attendees indicated that their laboratories test drinking water (20%); wastewater (12%); both drinking water and wastewater (4%); drinking water, surface water, groundwater, and wastewater (60%); or other (4%) (Figure 2). Half of the attendees had been in the

Figure 2. Type of water testing performed by attendees (n=25) at the First Annual Environmental Laboratories Meeting: Indianapolis, Indiana, June 25, 2012



workforce for more than 15 years, and about 35% had worked in their field for more than 20 years (Figure 3).⁴

Common concerns identified during the Table Talk session were similar to concerns addressed during site visits. Once these issues were recognized, attendees were asked to select their three highest priorities in order of importance and relevance to their respective laboratories. Scores were weighted such that the first selection was given more weight than the second and third, respectively. In order of the highest- to lowest-ranked issues, the top three issues were (1) updated methods and new technology acceptance; (2) analyst training, which was regarded as greatly needed by smaller municipalities; and (3) regulation interpretation consistencies from IDEM inspectors, which was noted among senior members of laboratories because interpretations of regulations can differ between inspections and among inspectors.

The most significant issue was the need for updated methods and new technology acceptance. Participants preferred better methods with faster turnaround times. In a follow-up survey of attendees using SurveyMonkey®,⁵ respondents reported that funding (55%) and approval of methods by the EPA (36%) were the primary barriers preventing the implementation of updated methods at their laboratories.

Evaluation results for the Environmental Laboratories Meeting indicated that 100% of the attendees

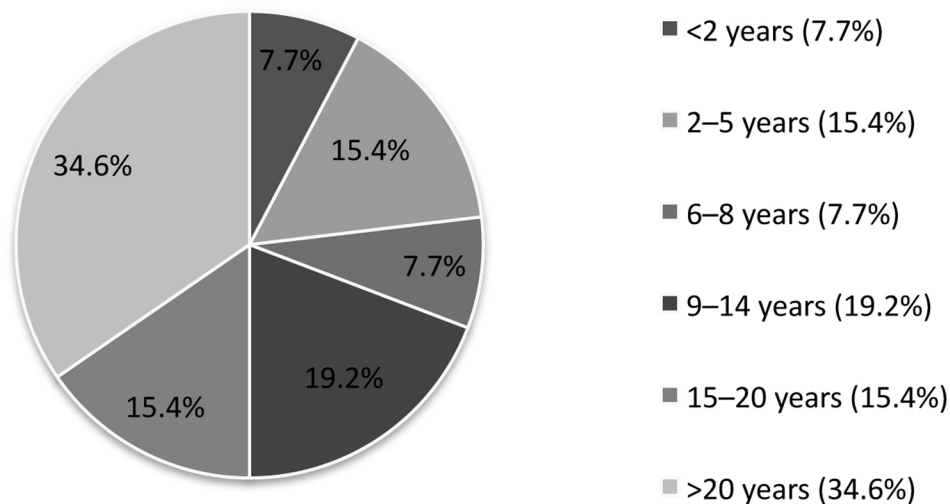
gained information, would attend again next year, and would recommend this meeting to colleagues. Furthermore, more than 80% of attendees volunteered to assist in ILS improvement activities. They offered to serve on workgroups to resolve systematic issues and workforce development activities through the production and distribution of a training video series for environmental analysts.⁴

LESSONS LEARNED

The initial site visits played a critical role in understanding the basic issues facing environmental laboratories. Ultimately, the visits gave structure to the Environmental Laboratories Meeting. Face-to-face meetings with a subset of state laboratories provided vital information. Not only were laboratories unaware of the system or their part in it, they were also unaware that the system could provide assistance in resolving process issues with state agencies. The Environmental Laboratories Meeting allowed further discussion, identification of primary issues, networking among participants, and disaster recovery planning for emergency preparedness. Attendees were also given the opportunity to volunteer to assist with future efforts to improve the ILS.

The ISDH Laboratories have a leadership role in developing and promoting the ILS through active collaboration with the system's stakeholders.² The ISDH

Figure 3. Length of time^a attendees (n=26) at the First Annual Environmental Laboratories Meeting had been in the workforce: Indianapolis, Indiana, June 25, 2012



^aA parallel was noted between environmental and clinical laboratory workforces; 50% of the laboratorians attending the Environmental Laboratories Meeting had been in the workforce for ≥ 15 years. However, 22% of attendees had held their positions for ≤ 5 years, indicating some influx into the field by younger scientists.

Laboratories will fulfill this role primarily by acting as a liaison with IDEM, while also facilitating meetings and discussions among laboratories throughout the state. Several of the concerns discussed during the Environmental Laboratories Meeting will only be resolved through the collaboration of multiple laboratories and laboratory associations. These issues include analyst training, increased public outreach, and analyst certification programs. The ISDH Laboratories are facilitating and encouraging the formation of workgroups to address these issues.

Although some issues identified during the Environmental Laboratories Meeting can be resolved by the laboratories alone, other concerns need to be addressed in different ways. Indiana environmental laboratories are regulated by IDEM, not the ISDH. Although all laboratories included in this project perform testing that impacts the health of the public, these individual laboratories are not well-equipped to contact and work with IDEM on issue resolution. As a partner state-level agency, the ISDH Laboratories regularly work with IDEM and can bring concerns to quarterly ISDH Laboratories/IDEM meetings for discussion. Several regulatory-related issues, such as electronic reporting, regulation interpretation, and inspection consistencies, were identified during the Environmental Laboratory Meeting. Key environmental laboratorians from throughout the state will be invited to attend these meetings to provide additional input.

Even though environmental laboratories perform testing of public health importance and play a critical role in disaster preparedness and recovery efforts, the recognition of environmental laboratories as a fundamental component of the PHL system improvement program is a relatively recent development. The existence of the Water Laboratory Alliance, the Environmental Response Laboratory Network, and the Laboratory Response Network for Chemical Threats efforts are vitally important in the improvement of state laboratory systems. However, given the scope of this project and the information gathered from the initial site visits, it was clear that improving communication efforts in Indiana is the necessary first step in improving the environmental component of the ILS. Progress has been made with clinical sentinel laboratories regarding communication, training, and outreach, but similar growth is needed with the environmental laboratories. Fortunately, Indiana's water laboratories are interested in improving the ILS.

In an effort to apply these lessons to other environmental or nonclinical laboratories within the state, the ISDH Laboratories have implemented quarterly partner meetings with the Food Protection Division

and have strengthened outreach and communication efforts with local health departments and environmental health specialists. These efforts allow the ISDH Laboratories to engage the data users in the laboratory system. In addition to the laboratories that generate data, data users are also considered primary stakeholders in the laboratory system.¹

CONCLUSIONS

This project allowed for the exploration of the nonclinical laboratory portion of the ILS and the strengthening of those relationships. Environmental laboratories in Indiana have been overlooked during the building of the clinical sentinel areas of the system. The state PHL system is a new concept to member laboratories in Indiana and in many other states. The lack of awareness of the state system indicates that marketing and outreach are essential to moving forward in system improvement activities.

However, for marketing and outreach to be effective, basic communication networks must be established. In fact, communication with these member laboratories is the foundation of a successful system. Without appropriate communication, there cannot be emergency preparedness, effective disaster recovery, timely public policy change, or necessary workforce development. In fact, many of the issues identified through this project, during site visits, and at the Environmental Laboratories Meeting will be addressed through avenues provided by the ILS.

Ultimately, the realization that the system is fluid is the key to building the ILS from an environmental perspective. People and test systems change, technology and environmental threats change, and, therefore, the needs of the system will change. Improving these systems requires communication, funding, time, and patience.

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