

Wyoming PHL: At Home on the Range

With nearly 100,000 square miles of territory—encompassing virtually all of the spectacular Yellowstone and Grand Teton national parks—Wyoming is the ninth largest state. And with not quite 500,000 residents, it is also the least populous.

Richard Harris, manager of the Wyoming public health laboratory (WPHL), said of his home, “This is a frontier state. This is the range.” With more pronghorn antelope than people—and not more than 50,000 people in any one locale—the major engines of commerce are mineral extraction, ranching and tourism. Unsurprisingly, the official sport of the “cowboy state” is rodeo. Said Harris, “If you haven’t been out West, Wyoming is hard to figure out ... Everything is a matter of scale.” A *Salmonella* outbreak affecting over 100 people in a youth facility not long ago qualified as “a big event.” So did an *E. coli* O157:H7 outbreak, ultimately traced back to the spring-fed water system of a small town. “Could have been wildlife contamination,” said Harris. In 2001-2002, snowboarders in the Big Horn Mountains became infected with norovirus and carried it home to six states. Authorities estimate that as many as 200 people were infected. Another big event.

Investigations for each of these incidents were ably supported by microbiologists at the WPHL. As the only source of clinical public health laboratory services in the state, Harris’s staff of 30 does everything from PulseNet testing to bacteriological drinking water analyses to bioterrorism-related work.

“Being part of a smaller health department,” Harris said, “you can network a lot better.” Laboratory

personnel have a close working relationship with public health program staff and state veterinary laboratorians, with whom they collaborate to investigate outbreaks involving organisms that infect both people and domesticated animals, such as horses, cattle and buffalo. WPHL staff members were even recently involved in a pulse field presentation at a national veterinary laboratory conference.

“Over the last six years,” said Harris, “we’ve implemented molecular techniques. We never had them before.”

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Now in addition to classic microbiology, the laboratory performs real-time polymerase chain reaction (PCR) testing, nucleic acid sequencing and pulsed field gel electrophoresis—a DNA-based subtyping method—to characterize organisms associated with infectious disease and food and waterborne illness.

“Chlamydia is one of our major problems,” said Harris. “West Nile virus was very big in 2003. We’ve been seeing increases in pertussis. Norovirus is fairly random, but we’ve been seeing a lot in nursing homes. Hepatitis is associated with a major methamphetamine problem. Being a western state, plague and *Brucella* are endemic in our wildlife, and we also have hantavirus. We test for all of those.”

The single highest volume service performed by the laboratory,

however, is drug testing. The WPHL performs screening and confirmatory testing on over 50,000 specimens a year on behalf of state and local agencies operating offender, probation and/or rehabilitation programs. State agency support for this service represents about 15% of the laboratory’s \$2.5 million annual budget; the remainder comes from general state revenue and federal grants.

The laboratory also runs the state’s Intoximeter breath analysis program, including a large training component for police officers. Earlier this year,

Governor Dave Freudenthal presented the WPHL with an award for its support for Wyoming’s impaired driving program. The public health laboratory is currently in the process of implementing oral fluid testing for drug screening.

“Substance abuse is a common western problem,” said Harris. Three years ago, a Hepatitis B outbreak linked to intravenous drug use affected 50 people in one location—another significant event in this rural area.

Four years ago, the WPHL became one of the founding members of the Rocky Mountain Biomonitoring Consortium, a group of six state public health laboratories sharing resources to monitor human exposure to environmental contaminants in the Rocky Mountain region. So far, the consortium has conducted baseline studies on exposure to

arsenic in drinking water and on exposure to thiodiglycol, an industrial chemical that also happens to be a mustard gas metabolite. The WPHL contributed administrative and quality assurance support, as well as clinical specimens from state residents.

Perhaps the most innovative laboratory activity of late has to do with development of the Wyoming Laboratory Response Network—a chain of laboratories with varying responsibilities for the detection of public health threats such as bioterrorism and emerging infectious diseases. Using federal bioterrorism funding, the WPHL has provided capacity-building grants—on the order of \$5,000 to \$20,000—to each of the 34 sentinel laboratories in the state.

“Most states have too many clinical labs to do this,” said Harris. “Most of our labs are in rural communities and these grants have significant impact. It’s helped with our community relations and coordination with the laboratories. We have a very good training coordinator—Gale Stevens—and she has been very dynamic in building our network.”

The WPHL also produces a laboratory newsletter (sent to the 34 clinical laboratories as well as infection control practitioners), sends unidentified isolates to hospital laboratories twice a year for proficiency testing, provides clinical laboratory training to hospital laboratory technicians and trains HAZMAT teams on the collection and transport of environmental samples.

The WPHL itself sits in Cheyenne—in the southeast corner of the state, more in the prairie than the mountains. The laboratory occupies 12,000 square feet on the top floor of a five-story building, above the state health agency. From his office window, Harris looks out upon the

state supreme court and capitol buildings.

The WPHL’s 35-year-old building was never intended to house a laboratory and has required a number of modifications through the years, especially with the introduction of state-of-the-art molecular test methods. Harris said, “Clearly it does not resemble the new, modern public health laboratories being built. At all.”

The addition of a cell culture laboratory and a BSL-3 suite for tuberculosis and bioterrorism testing has helped, but Harris considers these upgrades stop-gap measures. “A new laboratory is at the top of my priority list,” he said, “but these are very complicated processes and I’m still at the beginning stages.”

A second challenge is staffing. Although the WPHL currently has just two vacancies, it has experienced fairly high turnover in the past few years. And recruiting microbiologists and chemists can be a challenge in a state of small towns. Said Harris, “We’re not very competitive for salaries and we don’t have a large recruiting population to draw from. We have one four-year university in the state and do not have a med tech program.”

Cross-training is a challenge as well. Harris noted that “it’s hard to do a lot of cross-training when you’re only one deep in each section on the microbiology side.” He said, “Workforce challenges are pretty consistent and won’t go away right away.”

Nevertheless, the laboratory has been lucky with the staff already onboard. “The quality of your staff is critical to getting the lab work done,” said Harris. “As the lab director, all I try to do is to help my supervisors with difficult issues and go out and represent the lab. The staff does all the

hard work.” Aggressive screening and a heavy focus on “getting the right mix of people” has yielded a motivated staff and an exceptional work environment.

Wanda Manley, the laboratory’s pulse field microbiologist, recently received a CDC/APHL PulseNet award. Angela Van Houten received the Wyoming Public Health Association (WPHA) leadership award for her role as the lab’s bioterrorism coordinator. And Harris himself was the recipient of a WPHA award in honor of Carl Blank, a former WPHL director and an icon in the field of public health laboratory practice for his work at CDC and APHL.

Looking ahead, Harris said, “This is an outstanding time to be in public health. It’s going through dynamic changes: emerging diseases, all-hazards response issues. The role of the public health laboratory has really changed. It’s very challenging and very exciting in the laboratory from a disease standpoint.”

Harris segued into public health laboratory practice in 1999, following a 21-year career as a clinical microbiologist with the US Army. He claims no “point of origin,” having grown up in a military family. But one thing’s for sure: he loves Wyoming. “I really like the front range, so I enjoy the West. Wide open spaces. Being out around the mountains. Cheyenne is a small town, but I’m very comfortable here.”

Future goals include the new laboratory facility, enhanced quality assurance, retaining the laboratory’s top-notch staff, implementing a laboratory information management system and simply keeping up with the latest technological developments. Said Harris, “We have a lot to do.”