

In Michigan, Defining the Next Generation of PHL Practice

“ I don't want to limit ourselves in terms of how we think . . . ”

In many ways Michigan is a state of surprises. Known as the home of Motown and the American auto industry, Michigan is popularly associated with the cities of Detroit and Grosse Point. But the state is also home to a number of American Indian tribes and the largest Arab community in the US.

While three quarters of the state's 10 million residents are clustered in a few metropolitan areas, the remainder is scattered across a wide geographic area that includes some of the more rural and ruggedly beautiful sections of America. It takes as long to drive from Detroit, in the southeast corner of the state, to Washington, DC, as it does to drive from Detroit to the Upper Peninsula town of Calumet. Hunting and fishing are such an ingrained part of the state culture that the state public health laboratory routinely analyzes fish tissue for

privatized in 1998—now BioPort Corporation®—the institutional culture that enabled such an operation to prosper is still in evidence. Frances (“Francie”) Pouch Downes, director of the Michigan public health laboratory, explained that “research was always part of the mandate here and they recruited people who were interested in it.”

Practicing Innovative Science

That interest is reflected in a public health laboratory history rich with innovations, such as the development of the Khan test for syphilis and the initial isolation of pathogenic *E. coli* (stemming from research on infantile diarrhea). This inquisitive, solution-focused approach to laboratory practice continues under Downes' leadership today. The Michigan public health laboratory was among the first five state

to a growing shortage of skilled laboratory scientists. Identifying a role for the public health laboratory in these non-traditional areas has placed Downes' shop in the forefront of a trend—some might say *paradigm shift*—that takes laboratory scientists away from the bench and out into the community.

Exploring the Lab's Role in the Obesity Crisis

Consider obesity. Michigan suffers the third highest obesity rate in the nation; 60% of state adults are either overweight or obese. The state public health laboratory is responding in two ways. Since 1992 it has provided doctoral-level scientists to serve as the CLIA directors of local public health laboratories that perform glucose monitoring, cholesterol screening and related tests. The state-level scientists provide quality assurance oversight and leadership to assure continued CLIA certification and a high caliber of service in support of public health prevention and awareness programs. Downes herself is the CLIA director not only for the state public health laboratory, but for the local public health laboratory serving the Grand Rapids area.

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toxic chemicals, generating data that is used as the basis for fishing advisories.

The state is surprising in other ways as well. For 70 years the state of Michigan actively manufactured biological products; at various times turning out smallpox, rabies and anthrax vaccines. Although the state biologics facility was

laboratories to acquire Level III test capabilities for chemical terrorism and is one of only two public health laboratories performing tuberculosis genotyping in the US.

Recently, the laboratory has been exploring ways to address contemporary health challenges ranging from obesity

“The other thing we're doing,” said Downes, “and I hope we'll be getting into more, is helping to promote statewide best practices for testing of public health significance that is done in clinical labs.” Currently the state public health laboratory is training clinical laboratorians to calculate glomerular filtration rates (GFRs) using a formula that hinges on creatinine, a value that clinical laboratories routinely generate. Downes said the GFR is a good measure of the progression of kidney failure—often associated with obesity and with

obesity-related diabetes—and can be used to identify people at risk of needing future dialysis. The idea is to catch the disease progression early on when diet and exercise might prevent irreversible kidney damage. Downes emphasized that the state public health laboratory doesn't do any of the testing involved. Rather, the state's role is "to work with the clinical lab community to develop (the GFR) as a best practice."

Helping Fend Off Drug-Resistant Bugs

Another topic that has propelled state scientists to work closely with the private sector is *Staph*. The Michigan public health laboratory detected the first case of vancomycin-resistant *Staphylococcus aureus* (VRSA) in the world and the state has been home to four of five VRSA cases reported in the US. "I like to think we have such good relations with our clinical labs that we found out about VRSA sooner [than other states]," said Downes, "but I'm beginning to think something else is going on because we're isolating it at regular intervals and other states aren't."

To address the problem, the laboratory used a small pot of National Laboratory System grant money to develop a series of antibiograms—lists of the bacteria circulating within healthcare facilities and the drugs-of-choice to kill them. Even before laboratory tests reveal the exact strain of the bug infecting patients, clinicians can use the antibiogram as the basis for deciding the first round of treatment.

Recruiting Young Students

Workforce problems have been yet

another stimulus for creative problem-solving and partnering. The Michigan laboratory has 146 full-time employees and about eight vacancies; four of them stemming from recent retirements. Two of the vacancies are at the doctoral level and, said Downes, "that's where we're finding it most challenging to recruit." Facing not only a state, but a national shortage of laboratory scientists—and the closure of several laboratory training

includes a model curriculum and teaching materials and has been distributed to thousands of high school teachers across the state.

For those students who pursue clinical laboratory science training and for practicing laboratory professionals, the Michigan public health laboratory offers mini-internships lasting anywhere from one day to two weeks. Students rotate



The Michigan public health laboratory.

programs in Michigan—Downes and her staff realized some years ago that proactive measures were necessary to meet the laboratory's future staffing needs.

Thus, in 2002 the state laboratory—based in Lansing—began working with nearby Michigan State University and other institutions with clinical laboratory education programs to develop a tool to interest high school students in laboratory science careers. The tool

through the various testing labs, attend meetings and, said Downes, "get a better perspective on how work the clinical labs do ties in with public health laboratory work and with disease control."

Facing Down a State Recession

But some problems have proved more intractable than others, even for the forward-thinking staff at this laboratory.

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The downsizing of the three big US motor companies, for example, has rippled through the state economy right to the doors of the public health laboratory. “We’re in a recession; we’ve been in a recession,” said Downes. With a state unemployment rate that exceeds the national average and recent news of massive Ford Motor Company layoffs, state funding is becoming less and less secure.

More than a third of the public health laboratory’s \$21 million annual budget now comes from the state in the form of either general or restricted funds. While Downes noted that federal funding has been generous, she said, “The problem is that it’s extremely categorical.” Thus, Downes is looking for ways to up the roughly \$4 million the laboratory collects annually in fees (much of it now coming from newborn screening).

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Without additional funds, some vacancies may have to go unfilled and a much-needed expansion of the laboratory’s Hepatitis C testing program may have to wait.

Fortunately, Downes’ background reveals an adventurous streak that makes her particularly well-suited to provide vision and leadership in such a challenging environment. After earning a degree in medical technology, the Indiana native joined the Peace Corps, where she became interested in public health while working in a hospital labo-

ratory in Niger. Two years later she returned to the US, earned a graduate degree from the University of North Carolina at Chapel Hill, worked for a few years as a scientist in the Michigan public health laboratory and then went back to Africa—this time with a husband and three young children. Upon her second homecoming, Downes resumed work at the Michigan laboratory and became its director in 1999.

Today, her interest in the African continent is satisfied through work with the APHL Global AIDS Project, which has enabled her to make several trips to Botswana for laboratory capacity assessment and training. The Michigan public health laboratory is also hosting a visiting scientist from the Ivory Coast.

Despite funding and staffing challenges, Downes has plenty of exciting develop-

ments to distract her, such as a new modular all-hazards laboratory and the beginning of some investigational work to carve out a role for the laboratory in the growing field of genomics. All in all, she said, “I love my job. I think I have the best job anywhere—ever. I have the best people to work with. I’m right in the middle of everything that happens in terms of health. I like living in Michigan. It’s a perfect fit.”

in December in Honolulu, Hawaii. Lee works in the California Department of Health Services.

Sy Nakao presented the New York State Department of Health’s Draft BioWatch Response Protocol at the Metropolitan Bioterrorism Epidemiology and Surveillance Workgroup in November in Albany. Nakao recently completed a rotation in the Bioterrorism Epidemiology Program at the New York Department of Health.

Gillian Genrich presented a poster at the 1st International Conference of the Journal of Travel Medicine and Infectious Disease in London in November. “Post-Mortem Diagnosis of *Plasmodium falciparum* in Four Travelers Using a Novel Immunohistochemical Assay Targeting Histidine-Rich Protein-2” was based on her work in CDC’s Division of Viral and Rickettsial Diseases.

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