



Pointing
the way
FORWARD

2018-2019 Annual Report



Wisconsin State
Laboratory of Hygiene
UNIVERSITY OF WISCONSIN-MADISON

A Message From WSLH Director Jamie Schauer

I am deeply honored and proud to serve as Director of the WSLH and to have the opportunity to work with WSLH staff to fulfill our mission of supporting public health across the State of Wisconsin and beyond.

For those of you that have not met me, I would like to give a brief introduction and hope that we will have the opportunity to meet in the near future.

I was hired in 1998 to join the UW-Madison faculty with a joint appointment between the Department of Civil and Environmental Engineering and the WSLH. My research, teaching and laboratory testing activities have focused on air quality, and together with the staff at the WSLH, we have positioned the WSLH to be a leading laboratory supporting air pollution monitoring, air pollution management, and air pollution health studies. I am committed to advancing policy-relevant science and have been fortunate to be able to use science as a forum for local and global engagement.



In July 2017, I was appointed as the Director of the WSLH and maintained my appointment as a faculty member in the College of Engineering. In the first 18 months of my tenure, we have undergone a strategic planning process to help chart our future and to assure we can provide the laboratory testing needed to support public health and safety, environmental protection, and emergency preparedness. As you can see in this annual report, we have also been able to grow and expand the impact of our programs over time. The stories included in this report reflect what the WSLH does for the people of Wisconsin, the United States, and around the world.

The WSLH is very fortunate to be part of UW-Madison and to have so many dedicated and extremely accomplished staff members. They exemplify the Wisconsin Idea and have "Forward" encoded in their DNA.

I am committed to continuing to build strong relationships with our stakeholders and partners and hope that we can work together to advance public health and benefit the people of Wisconsin and beyond.

Jamie Schauer, PhD, PE, MBA

New Instrumentation Will Help Tell Full Story of Wisconsin's Opioid Epidemic

Every year the WSLH Forensic Toxicology Section performs more than 20,000 alcohol and drug tests for Operating While Intoxicated (OWI) enforcement, motor vehicle death investigations, and Coroner and Medical Examiner death investigations. Their test results help public safety and facilitate getting families answers about the death of their loved ones. But, the test results haven't been able to tell the full story.

As each week seems to bring a new headline about the expansion of the opioid abuse epidemic in Wisconsin and nationally, it's not just the usual drugs like heroin and prescription opioid drugs causing the problems. Now it's synthetic drugs like fentanyl analogs and synthetic cannabinoids.

Historically, the WSLH Forensic Toxicology Section hasn't had the testing instrumentation needed to detect these synthetic drugs in the 6,000 drug tests performed annually – until now.

Through a partnership with the Wisconsin Department of Health Services, the WSLH Forensic

Toxicology Section has purchased a Quadrupole Time of Flight (QToF) instrument that will enable the laboratory to expand the scope and capabilities of the total number of drugs tested and detect synthetic drugs, such as fentanyl analogs and synthetic cannabinoids.

Results from this instrument will help provide better data on the ongoing opioid problem in Wisconsin – both in drivers and in death investigations. It will also help Wisconsin decision makers at the local and state level gain a better understanding of the scope of the problem, helping them make more data-driven decisions regarding drug treatment and deterrent programs for their community.

And for the grieving families whose loved ones' deaths are being investigated by local coroners or medical examiners - they now may be able to get the full story.

WSLH Chemist Ryan Pieters loads samples into the QToF instrument.



Grant Focuses on Newborn Screening, Genetic Testing in Plain Communities

As a Co-Principal Investigator, Wisconsin State Laboratory of Hygiene Newborn Screening Laboratory Co-Director and University of Wisconsin Professor of Pediatrics Mei Baker, MD, and Principal Investigator UW Pediatrics Associate Professor Christine Seeroogy, MD, received a three-year, \$120,000 Baldwin Wisconsin Idea Endowment Grant for their project, "Development and Implementation of Rapid Genetic Test to Improve Health Outcomes in Wisconsin Plain Newborns."

Their project aims to develop and offer a new approach to early diagnosis of medically important genetic disorders in Amish and Old Order Mennonite - collectively referred to as Plain - children of Wisconsin through routine newborn screening along with development and implementation of a rapid and low-cost genetic test.

The objectives of this project are informed by the findings of the investigators' community partnership collaboration with a rural family medicine doctor in the Driftless region of Wisconsin, Dr. James DeLine. In collaboration with the newly established Center for Special Children in LaFarge, WI, this project will engage Plain community members throughout Wisconsin to improve early diagnosis of genetic disorders now known to occur in Wisconsin.

Outcomes to be measured include assessment of health outcomes and family perceptions of genetic testing. Achieving the project goal will not only improve the health of this underserved population of children in Wisconsin but will be informative to newborn screening and genetic testing for all newborns.



The Baldwin Wisconsin Idea Endowment is a competitive grant program that fosters public engagement and the advancement of the Wisconsin Idea, the notion that the knowledge and solutions generated at UW-Madison will benefit the people of Wisconsin, the nation, and the world.

Non-Traditional Students “Major” in Genetics and Newborn Screening

The Wisconsin State Laboratory of Hygiene's campus facility was bustling with “students” on July 26-27, 2018, as 12 grandparent-grandkid pairs “majored” in genetics and newborn screening as part of the University of Wisconsin-Madison's Grandparents University (GPU).

GPU started in 2001 and runs for two consecutive days for three consecutive weeks every July. Grandparents and grandkids choose from more than 20+ “majors”, earning a GPU “degree” at the end of their stay on campus.

Newborn Screening Co-Director Patrice Held, PhD, heard about GPU from a personal contact and got the ball rolling.

“I reached out to the organizers to learn details about GPU and whether our laboratory would be

a good ‘major’ to consider for the program,” Held said. “They were very excited to have us participate! And I thought it would be a great opportunity for us as well.”

The Cytogenetics/Molecular Genetics and Newborn Screening Laboratories teamed up to create a “major” for Grandparents University. Because of the size of the group, grandparent-grandkid pairs were split into two groups, with one group visiting newborn screening and the other visiting genetics on Thursday afternoon and then switching for the Friday morning session.

According to WSLH Genetic Counselor Kimberly Anderson, “Our overall learning objectives were to: learn about how your inherited genes influence who you are and how your body functions; tour the cytogenetics and newborn screening departments at the State Laboratory of Hygiene and work hands-on with the chemists and cytogeneticists to learn how they use genetic information to help sick babies.”

Anderson adds that for the genetics portion of the “major”, cytogenetics and molecular genetics staff walked the grandparents and grandkids through the steps of DNA extraction and gel electrophoresis. Students were able to extract (precipitate) their own DNA from their saliva and watch how different molecularly weighted colored solutions moved through an agarose gel. They also discussed how chromosomal imbalances can lead to genetic disorders, looked at human and mouse chromosomes under the microscope and learned the basic steps in chromosome identification and analysis.

For newborn screening, students had a mystery to solve – which disorder did their “baby” have?

WSLH Chemist Michelle Berry explains, “In newborn screening (NBS) we created mock NBS reports with just numerical values. Our students’ job was to go



Molecular Geneticist Maureen McCormack demonstrates loading a gel with colored solution. GPU students then loaded their own gels and watched how different molecularly-weighted colored solutions moved through the agarose gel.

into specific areas of the lab and learn about what diseases we screen for, how we screen for them, how the instrumentation works and what the treatment is for each disease we diagnose."

Stations included:

- Cystic fibrosis mutation - where each grandparent-grandkid pair flipped the paternal coins to determine their own genetic mutation status
- Endocrine - where each pair developed their own biotinidase enzyme activity
- NBS specimen card receiving - where each pair was able to number NBS cards and use the automated punchers to punch fake specimens for lab use
- Hemoglobinopathies - where pairs learned about gel electrophoresis and were able to read their own gels
- Mass Spectrometry - where pairs learned about phenylketonuria (PKU) and were able use automated pipettes
- SCID (Severe Combined Immune Deficiency) - where pairs were able to see an automated pipettor in action

At the conclusion, every participant shared which disease their pretend baby was identified with and were invited to try a PKU formula used for supplemental nutrition by people diagnosed with PKU.



Newborn Screening Chemist Mike Hansen explains how the WSLH screens newborn babies for hemoglobin disorders like sickle cell disease and others. Students also read gels, just like the NBS chemists do.

Held said the newborn screening portion was definitely a team effort.

"Almost everyone took part. The 'students' rotated through each of the different sections. A chemist in each section described the work to the students, but the other chemists had to work 'extra' hard to cover all the testing for the days."

A few days later Dr. Held heard from one of the grandparents –

"We are so very happy that we were able to attend the Grandparent's University Genetics major this year! It was one of our favorite majors. And this was our last year to attend GPU, so we had a great finale! Every staff member was exceptional; the material was extremely interesting and well-presented (loved the hands-on opportunities); and learning about the services you provide and the research you do was an extremely rewarding experience. Thanks to all of you!"

“International Gold Standard” Air Pollution Monitoring Program Moves to WSLH

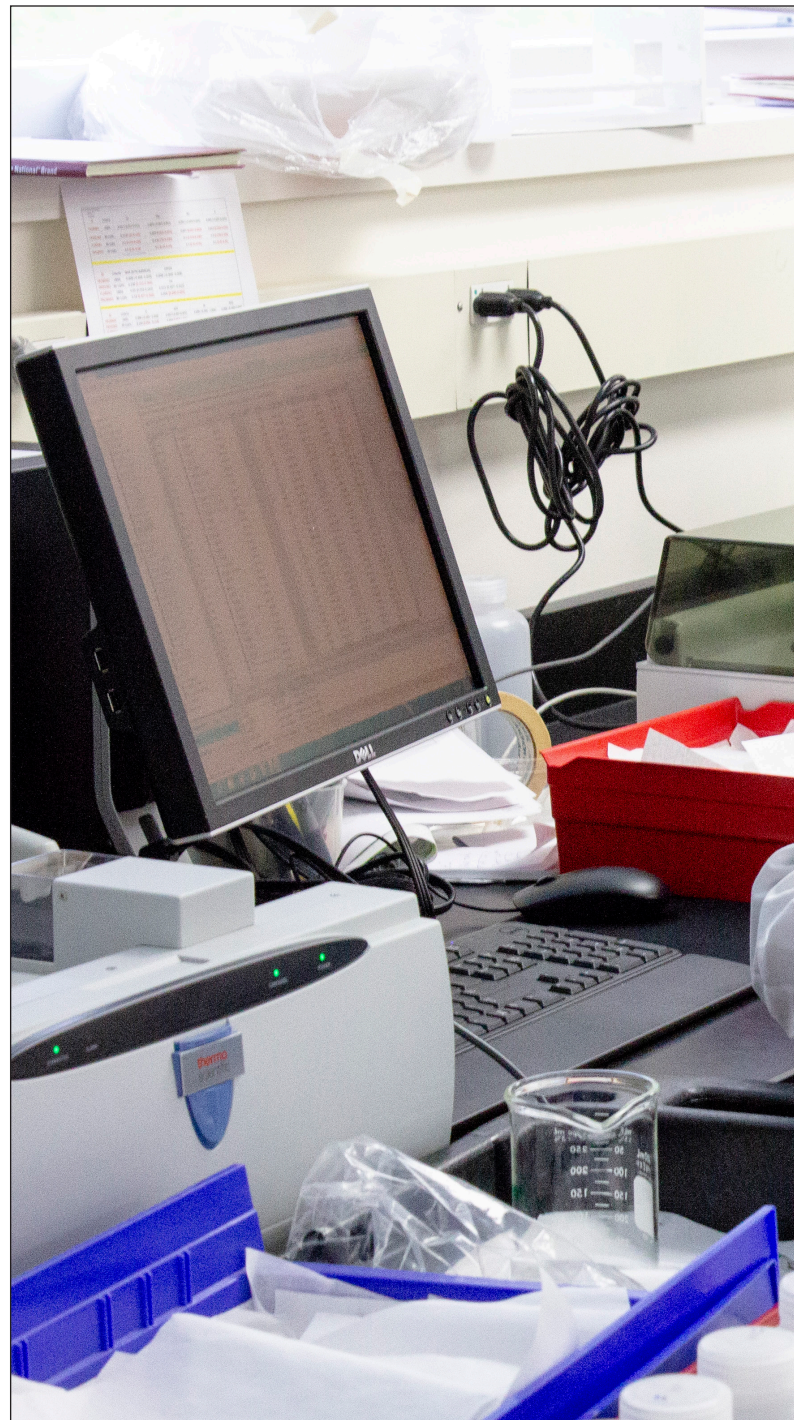
Forty years ago scientists concerned about the negative impacts of acid rain and atmospheric deposition on crops, rangelands, forests, surface waters, and other natural and cultural resources began a cooperative monitoring program that grew into the National Atmospheric Deposition Program (NADP). In 2018, NADP moved its Central Analytical Laboratory (CAL) and Program Office (PO) to the Wisconsin State Laboratory of Hygiene.

NADP serves public and environmental health, science, education and agriculture by monitoring North America's precipitation and atmosphere for a range of chemicals and uses that data to determine time and space trends for concentration and deposition.

NADP data have been used for decades to understand and solve real world problems impacting people and the planet, including helping to facilitate cleaner water, healthier air quality, more productive fisheries, smarter environmental planning, improved air quality and climate forecasting, stronger roads and buildings, and responsible environmental stewardship.

“NADP is the international gold standard for long-term, high quality air pollutant monitoring and has been in operation for 40 years. The program aligns quite well with both the WSLH's mission as well as the Wisconsin Idea,” said WSLH Director and UW-Madison Civil and Environmental Engineering Professor Jamie Schauer, the principal investigator for the NADP.

NADP is a cooperative effort between many different groups including federal, state, and local governmental agencies, tribal governments, educational institutions, private companies, and non-governmental agencies which provide funding,



scientific, and technical support. Funding comes from monitoring site participants and the following primary federal agencies: the National Park Service, the US Geological Survey, the National Oceanic and Atmospheric Administration, the Bureau of Land Management, the Environmental Protection Agency, the US Department of Agriculture Forest Service, and the Agricultural Research Service.

As the Central Analytical Laboratory and Program Office, the WSLH provides pre-analytic services,

WSLH Chemist Marie Assem prepares NADP samples for testing.



analytic testing and post-analytic results and data analysis for samples from more than 300 monitoring sites across the country. Data is made publicly available on the NADP website (nadp.slh.wisc.edu) and through printed reports. The Program Office at the WSLH works with NADP committees on network operations, science, education, and outreach activities.

“One of the exciting aspects of having NADP at the Wisconsin State Lab of Hygiene is the expanded

opportunities we have to collaborate with other UW departments and campuses, as well as state and tribal agencies,” said Michael Olson, NADP program coordinator. “One of our first projects is working with staff at the UW Arboretum to establish an NADP monitoring site there; linking atmospheric chemistry to long term ecological restoration.”

The NADP Central Analytical Laboratory and Program Office had been housed at the University of Illinois at Urbana-Champaign.

ARLN: Hunting “Nightmare Bacteria” in Wisconsin and Nationwide

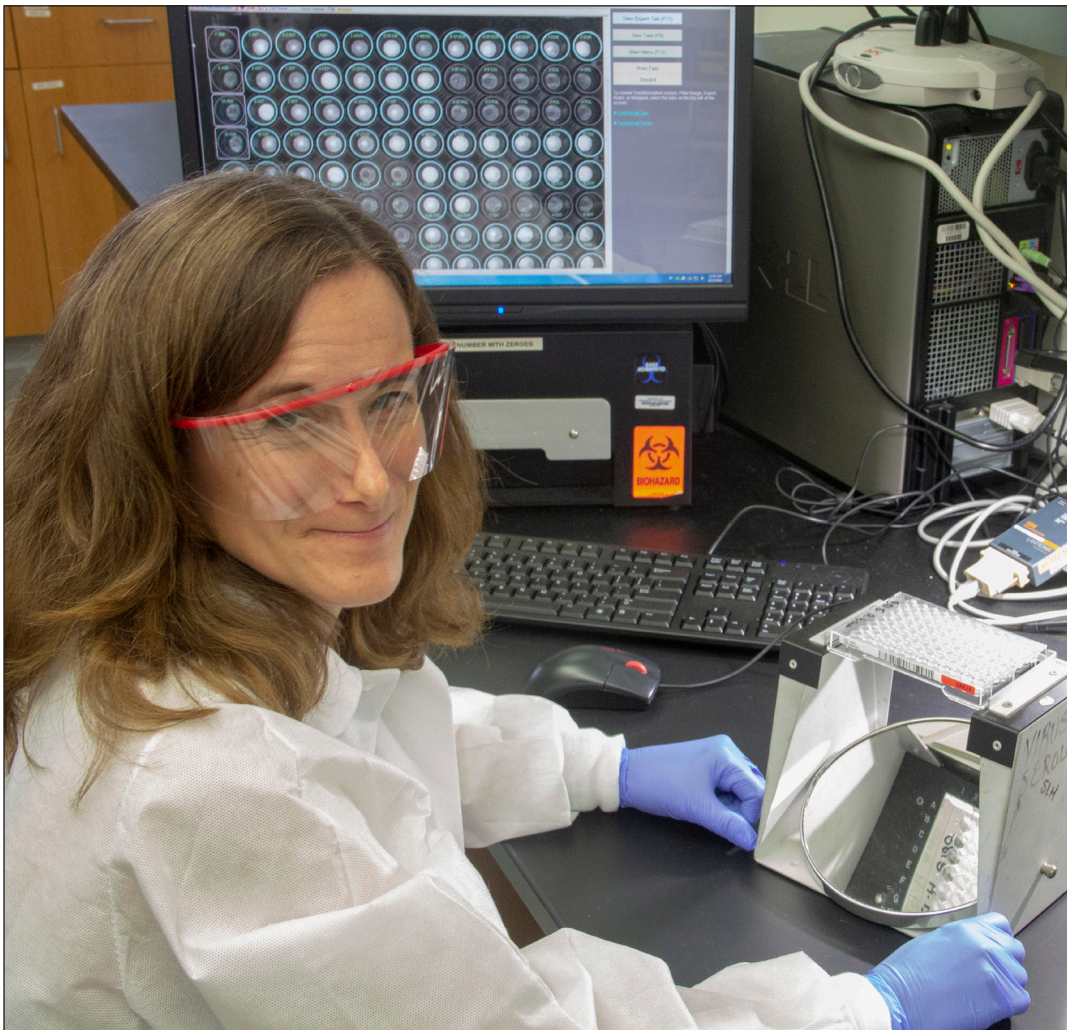
By Ann Valley, WSLH ARLN Coordinator

It is estimated that more than 2 million illnesses and 23,000 deaths occur each year in the U.S. from infections caused by antibiotic resistant (AR) organisms.

Some multidrug resistant organisms, known as Carbapenemase-Producing Enterobacteriaceae and *Pseudomonas aeruginosa* (CP-CRE and CP-PA), are considered “nightmare bacteria” because they are resistant to multiple drug classes. When infections occur, these resistance genes make it very difficult as they limit the ability of many different antibiotics to treat the infection. These infections can happen anywhere, but many severe cases related to antibiotic resistance occur in healthcare settings where patients are most vulnerable.

The Wisconsin State Laboratory of Hygiene is one of seven Antibiotic Resistant (AR) Laboratory Network Regional Labs funded through the Centers for Disease Control and Prevention (CDC) to boost state and local testing capacity and technology to detect, respond to, and prevent AR threats across the nation.

Scientists in the WSLH Communicable Disease Division perform specialized testing for clinical laboratories across Wisconsin as well as support colleagues in Illinois, Indiana, Ohio, Michigan and Kentucky to detect and identify cases of novel antibiotic resistance. When one of these “nightmare bacteria” was detected in a skilled nursing facility, jurisdictional epidemiologists reached out to the WSLH for help. From state surveillance and work with the CDC, epidemi-



ARLN Coordinator Ann Valley reads antibiotic susceptibility plates.

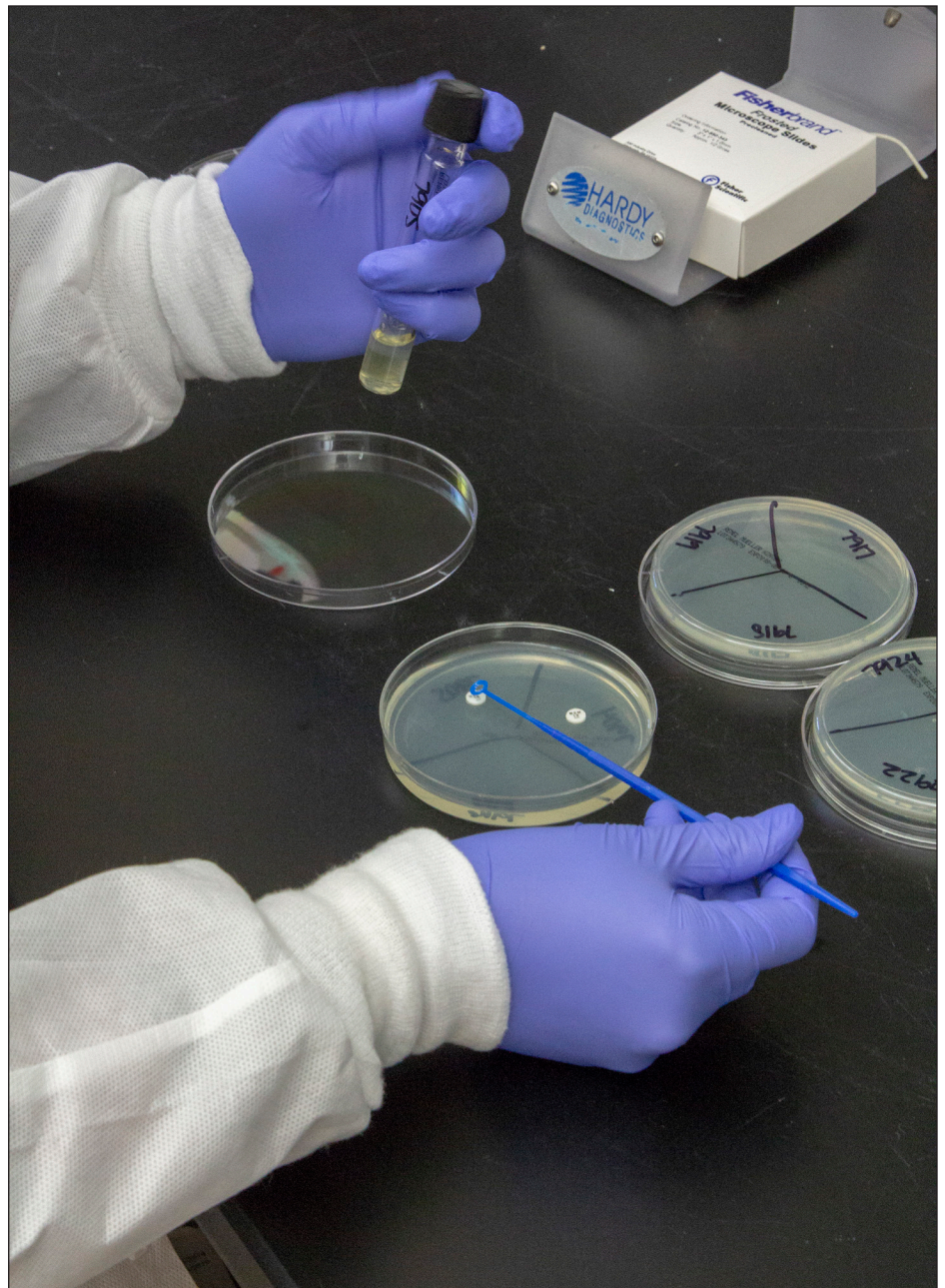
ologists had identified 25 residents within the facility colonized with the highly resistant strain of bacteria known to possess the carbapenemase resistance gene VIM (Verona Integron-mediated metallo-beta-lactamase).

Scientists at the WSLH worked with the epidemiologists to perform hundreds of colonization screens on patients within this facility to determine if transmission of the resistance had occurred to other patients. In the meantime, health officials were working with staff from the skilled nursing facility to implement infection control measures to avoid the spread of resistance from one resident to another.

After detecting 13 new colonized patients early on in the screening, WSLH testing showed there was no further transmission of the resistance gene to other residents.

In 2017, WSLH implemented new testing capabilities for these resistant bacteria, including a phenotypic screen for carbapenemases, antimicrobial susceptibility testing, PCR assays to detect new resistance genes and colonization screening from patient swabs.

The data obtained from this testing is shared with CDC and state



WSLH Microbiologist Danielle Lower performs an mSIM test to detect carbapenemases, which are genes that make bacteria resistant to certain classes of antibiotics.

health departments to help detect resistance and respond to cases in real time to prevent transmission in healthcare settings.

Through routine surveillance in Wisconsin, WSLH scientists identified 71 CP-CRE infections in the last year.

Pandemic Influenza – Are We Ready (Again?)



Masked Red Cross attendants in St. Louis removing the body of a flu victim

*National Archives
165-WW-269-B-3*

2018 marks the 100th anniversary of what's become known as the Great Pandemic.

It's estimated that 50 million people died worldwide in less than a year from a novel influenza virus that raced around the globe – swiftly killing not just the very young and the very old, but also adults in the prime of their lives.

In this centennial year, Pete Shult, PhD, WSLH associate director and director of the Communicable Disease Division and Emergency Response, has repeatedly been asked one question – “If the world saw another influenza pandemic would we be better prepared?”

His answer is Yes, no doubt – but with caveats.

“We actually have seen three influenza pandemics since the Great Pandemic – in 1957, 1968 and 2009.

While none was as severe as 1918, the scientific, public health and medical communities learned from each of them, and, accordingly, responded to the next one that much better,” Shult said.

Since 2001, the federal government has funneled significant resources into emergency preparedness at the local, state and national level, including influenza preparedness. As one element of this enhanced preparedness, the WSLH is funded to be a National Influenza Reference Center (NIRC) – one of just three in the country. These centers have been created to expand CDC's influenza surveillance and response capacity within the U.S.

As a NIRC, WSLH scientists test patient specimens not just from Wisconsin but also from 16 other states to detect novel or reassorted viruses, which could potentially lead to a pandemic, and detect and monitor antiviral resistance. This data is transferred to the

Centers for Disease Control and Prevention (CDC). The WSLH also facilitates the transfer of data to CDC from clinical laboratories in Wisconsin.

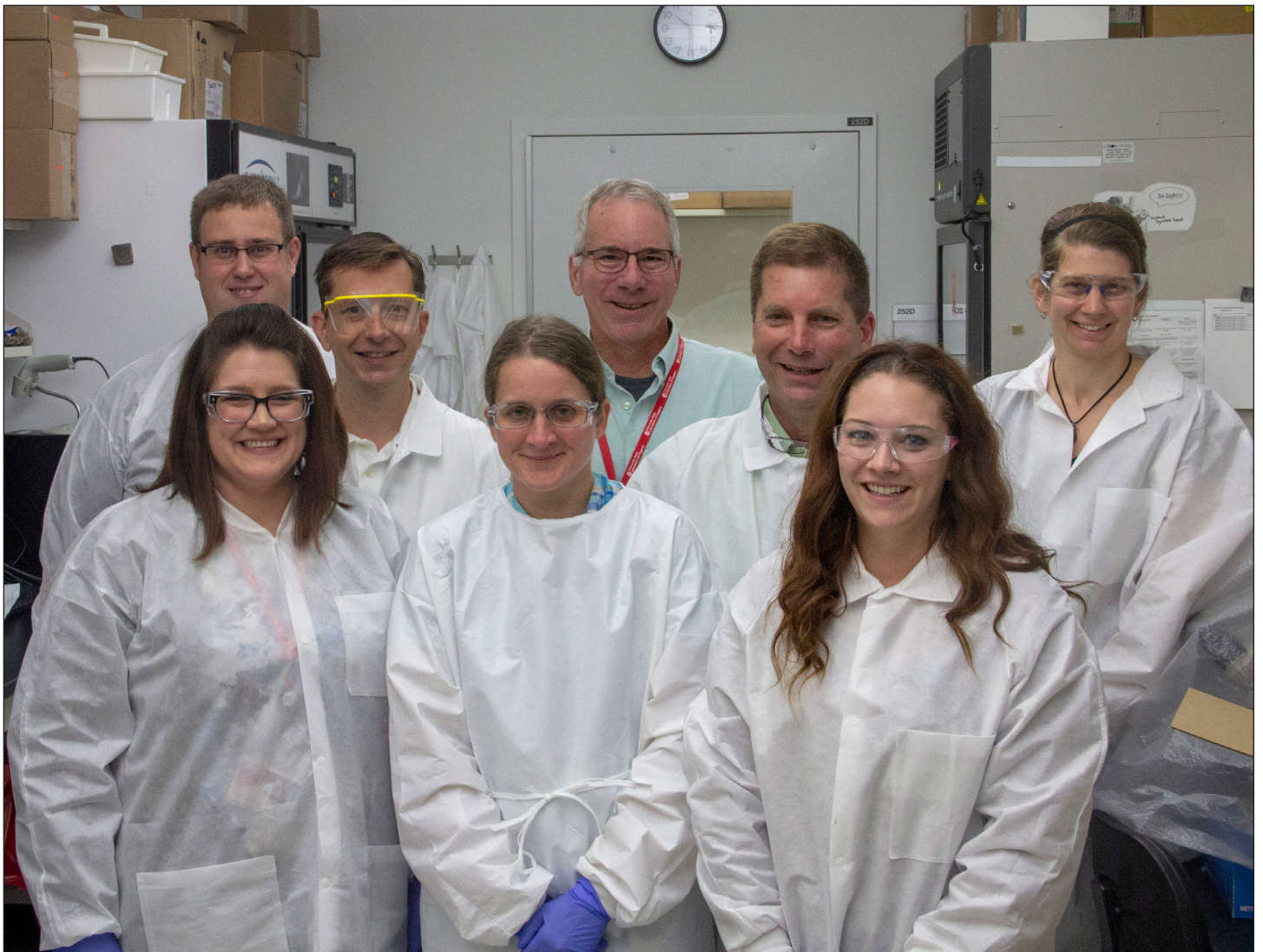
CDC scientists use the data collected from the three NIRCS and other surveillance networks to gain situational awareness of what influenza viruses are circulating, what antiviral medications are working, and what flu strains to include in next year's vaccine.

Shult rates the United States influenza preparedness about a "5 or 6" on a scale of 1 (unprepared) to 10 (super-prepared).

"Although the testing technology and surveillance capabilities in the United States are state-of-the-art,

that's not true across the globe, and that impacts us here at home," explained Shult. "We also see gaps in vaccine readiness, antiviral effectiveness, in healthcare system infrastructure to respond to a large epidemic, and a clear understanding of the virus and human host immune response.

"As someone who has worked with flu my entire career, I have learned to never underestimate it," reflected Shult. "If another novel influenza virus started circulating, we would definitely discover it and be able to test for it sooner. But the response to a pandemic involves so many different parts of the public health and healthcare infrastructure; it will still be a difficult challenge."



Dr. Pete Shult (rear, center) and the WSLH Flu Fighting Team - (front row, from left): Samantha Scott, Tonya Danz and Kyley Guenther; (back row, from left): Rich Griesser, Erik Reisdorf, Pete Shult, Tim Davis and Erika Hanson

Accolades for WSLH's Chemical Emergency Response Team

One of the WSLH's important duties is being Wisconsin's primary emergency response laboratory. And as with many of our state roles, our impact is felt far beyond Wisconsin's borders.

The WSLH is funded by the Centers for Disease Control and Prevention (CDC) to be a Level 1 chemical emergency response laboratory – 1 of only 10 in the country. In September 2018, the WSLH Chemical Emergency Response Team was honored with two awards from the CDC's national Laboratory Response Network (LRN) for their work.

The WSLH team received the LRN Award for Excellence in Methodology and Technology Evaluation for their rapid response to the ongoing brodifacoum (anticoagulant rat poison) exposures from synthetic cannabinoid use. The team developed and implemented a quantitative test method for brodifacoum in blood – the first such method developed in the U.S. In addition, the award cited the WSLH team's work with a biomarker for chlorine exposure and development of reference materials for blood metals and Lewisite metabolite.

The second honor was for CDC COOP Support of the Nitrogen Mustards Metabolite Method. This

award acknowledged both testing the WSLH team performed on behalf of CDC when their own capabilities were limited, as well as the team's efforts to characterize reference materials required by the LRN to perform the nitrogen mustards panel.

CST Award

In October, Chemical Emergency Response Assistant Coordinator Meshel Lange was awarded the U.S. Army's *Commander's Award for Public Service* by the Wisconsin National Guard 54th Civil Support Team (CST).

Lange is the WSLH's main contact for Wisconsin's HazMat teams and the CST. Her award recognized the vital role she plays as a resource to help identify unknown weapons of mass destruction (WMD) threats, trainer to optimize protocols for the 54th CST as well as their response partners nationwide, and communication link between the LRN, CST, HazMat teams, and the WSLH - leading to increased proficiency in the emergency response mission and agency interoperability.

Lange is only the 11th recipient of the 54th CST award and she was given the distinguished title of 54th CST's 23rd team member.



The WSLH Chemical Emergency Response Team (front row, from left): Bill Krick and Erin Meinholz holding the CDC awards. Bill and Erin developed the quantitative clinical test method for brodifacoum; Karyn Blake, Meshel Lange and Irvin Palmer; (back row, from left) Matt Roach, Christa Dahman and Noel Stanton.

Spreading the Wisconsin Idea Around the World

The historic Wisconsin Idea definition of the boundaries of the university being the boundaries of the state expanded significantly in 2018 when Jamie Schauer, WSLH Director and Peterson-Radar-Hawnn Professor of Civil and Environmental Engineering at UW-Madison, was named a 2018 U.S. Science Envoy by the U.S. Department of State.

U.S. Science Envoys engage internationally at the citizen and government levels to enhance relationships between other nations and the United States, develop partnerships, and improve collaboration. Science Envoys leverage their international leadership, influence, and expertise in priority countries to advance solutions to shared science and technology challenges. Science Envoys travel as private citizens and help inform the Department of State, a variety of U.S. government agencies, and the scientific community about opportunities for science and technology cooperation.

As a Science Envoy for Air Quality, Schauer will highlight American scientific strategies and technologies for mitigating poor air quality, with a focus on South Asia. Since 2010, there have been 18 U.S. Science Envoys.



WSLH Director
Jamie Schauer (left)
with U.S. State
Department
representatives at
the U.S. Embassy in
India.

Behind them is a
PM_{2.5} air quality
monitor.

Joint WSLH-UW Academic Appointments

Many WSLH senior scientists have joint appointments in academic departments at UW-Madison, as well as other UW System schools.

University of Wisconsin-Madison

School of Medicine and Public Health

James Schauer, *Affiliate Faculty, Population Health Sciences*

Daniel Kurtycz, *Professor (CHS), Pathology and Laboratory Medicine*

Mei Baker, *Professor (CHS), Pediatrics; Affiliate Faculty, Population Health Sciences, Pathology and Laboratory Medicine*

Patrice Held, *Assistant Professor (CHS), Pediatrics; Affiliate Faculty, Population Health Sciences*

Vanessa Horner, *Assistant Professor (CHS), Pathology and Laboratory Medicine*

Jennifer Laffin, *Associate Professor (CHS), Pediatrics-Genetics and Metabolism; Affiliate Faculty, Pathology and Laboratory Medicine, Medical Genetics*

Ronald Schell, *Professor, Medical Microbiology and Immunology*

Peter Shult, *Clinical Professor (Affiliate Faculty), Medical Microbiology and Immunology*

Kaitlin Sundling, *Clinical Instructor, Pathology and Laboratory Medicine*

College of Engineering

James Schauer, *Peterson-Rader-Hawn Professor, Civil and Environmental Engineering; Affiliate Faculty, Chemical and Biological Engineering, Mechanical Engineering; Program Faculty, Environmental Chemistry Program*

Martin Shafer, *Associate Scientist, Environmental Chemistry & Technology*

Michael Olson, *Faculty Associate, Civil and Environmental Engineering*

College of Agricultural and Life Sciences

Nancy Wade, *Clinical Instructor, Genetics*

Changhong Ye, *Clinical Instructor, Genetics*

University of Wisconsin-Milwaukee

Zilber School of Public Health

Daniel Kurtycz, *Adjunct Faculty*

University of Wisconsin-Whitewater

College of Business and Economics-Department of Occupational and Environmental Safety and Health

George Gruetzmacher, *Adjunct Faculty*

University of Wisconsin-La Crosse

Alana Sterkel, *Adjunct Faculty*

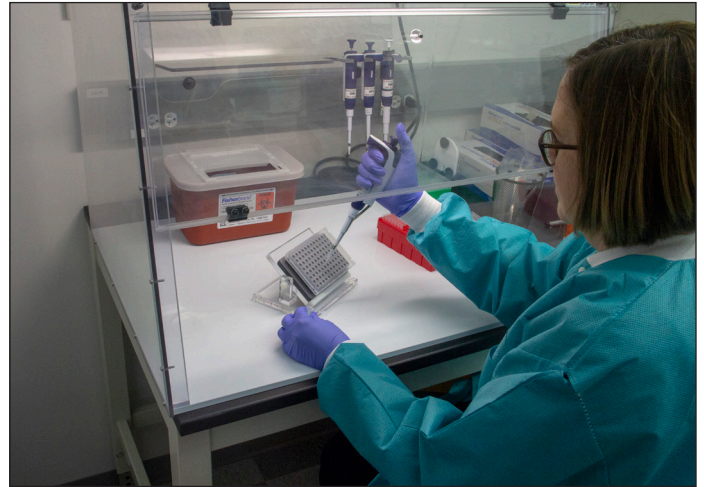
Communicable Disease Division and WSLH Proficiency Testing

Communicable Disease Division

The Communicable Disease Division (CDD) provides reference and specialized testing services in support of local, state, and national public health agencies and ensures access to laboratory expertise and capabilities in the disciplines of bacteriology, mycobacteriology, virology, parasitology, molecular microbiology, and serology.

CDD staff also coordinate a network of clinical laboratories in Wisconsin for emergency and public health response.

The Centers for Disease Control and Prevention (CDC) has designated the WSLH as a regional reference center for influenza and respiratory viruses, vaccine-preventable diseases, caliciviruses, antibiotic resistant organisms and advanced molecular diagnostics.



The testing CDD scientists perform enables us to provide detailed information to public health agencies about viruses and bacteria circulating in communities, as well as identify emerging pathogens that could cause severe illness and/or outbreaks.

WSLH Proficiency Testing - Laboratory Improvement Division

WSLH Proficiency Testing (WSLH PT) provides proficiency testing services to help more than 3,000 clinical laboratories in all 50 states and internationally provide quality patient care and meet their laboratory accreditation and quality assurance requirements.

WSLH PT offers more than 150 different products in Bacteriology, Blood Bank, Chemistry, Coagulation, Hematology, Immunology, Mycobacteriology, Mycology, Parasitology, Point of Care Testing, Urinalysis/Microscopy, Virology, and Waived Testing.

Proficiency testing (PT) is the practice of testing samples of unknown values sent from an external PT program. These samples are shipped to a laboratory

at various times throughout the year. The samples are analyzed within a specified time frame by testing personnel who must treat them like a patient sample. Once the samples have been tested, results are sent to the PT program for evaluation. The evaluated results are sent back to the laboratory in a report that both compares the results obtained with the actual results and rates the laboratory against other laboratories using identical or similar methodology.

Participation in PT allows a laboratory to identify procedural problems and take corrective action before patient results are affected.

Successful completion of proficiency testing can serve as a benchmark for quality.

A GLANCE

Environmental Health Division and Forensic Toxicology

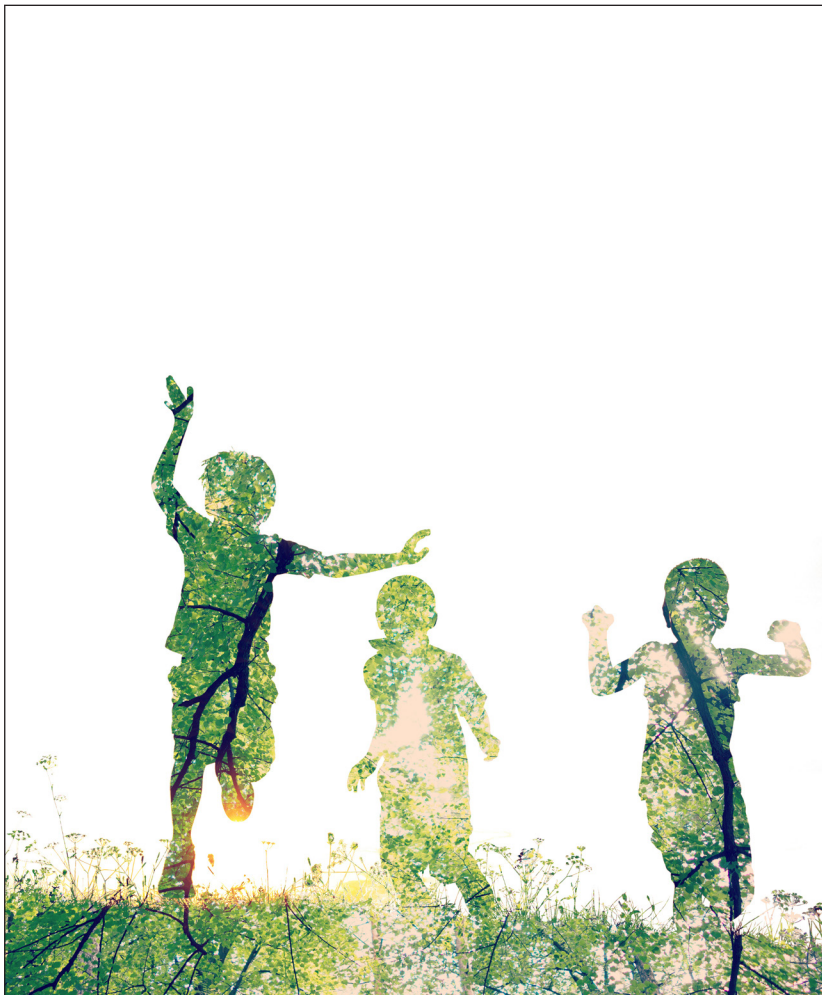
Environmental Health Division

The Environmental Health Division (EHD) serves as the testing laboratory for the Wisconsin Department of Natural Resources and other agencies.

Scientists test for many substances and organisms such as pathogenic microbes, pesticides, nutrients, metals, radionuclides, industrial chemicals, and air pollutants. Many types of samples are tested such as water, wastewater, groundwater, air, sediment, solid wastes, and clinical specimens.

Although most testing is done only for government agencies, a few tests of public health significance are available to Wisconsin residents.

EHD scientists also engage in research in Wisconsin and worldwide on the effects of environmental contamination on human health.



Forensic Toxicology

The WSLH Forensic Toxicology section provides alcohol and drug testing, interpretation of test results, and court testimony to law enforcement agencies and coroners/medical examiners in Wisconsin.

Testing for law enforcement agencies is for traffic safety and other motor vehicle matters (boats, ATVs and snowmobiles) in support of Wisconsin's impaired driving (Operating While Intoxicated - OWI) laws.

Testing provided to coroners/medical examiners assists these county officials in routine death investigations.

Toxicology staff also provide training for law enforcement, members of the judicial system and coroners/medical examiners.



Newborn Screening

The Wisconsin Newborn Screening (NBS) Program is a collaborative partnership between the WSLH, the Wisconsin Department of Health Services, hospitals, midwives, physician consultants, genetic counselors and nutrition professionals from around the state.

The WSLH NBS Laboratory screens the more than 66,000 babies born in Wisconsin annually for 44 rare, serious disorders that, left untreated, can lead to severe health issues and sometimes death. Nearly all these disorders are unrecognizable at birth by routine physical examination and require specialized testing to detect.

Out of the 66,000 babies screened annually, about 135-140 babies will have one of the 44 disorders.

Babies also have their hearing and hearts tested at the hospital or home (if a home birth) as part of the Wisconsin newborn screening program.

Biochemical Genetics

The WSLH Biochemical Genetics Laboratory specializes in the diagnosis and monitoring of inborn errors of metabolism, including disorders such as propionic acidemia, phenylketonuria (PKU), maple syrup urine disease and many others.

Laboratory tests include amino acid analysis, quantitative organic acid analysis, carnitine and enzymology for biotinidase deficiency.

Most of the patients for whom our laboratory performs testing had their disorder identified in infancy, either through newborn screening or other testing.

Scientists at the WSLH Biochemical Genetics Laboratory and the metabolic specialist physicians who treat these patients will monitor their health and conditions throughout the patients' lifetimes, including transitioning into adulthood.

A GLANCE

Disease Prevention Division

Cytogenetics / Molecular Genetics

Scientists in UW Cytogenetics Services/ Molecular Genetics at the WSLH look for genetic abnormalities in patient specimens using microscopic and molecular testing methods.

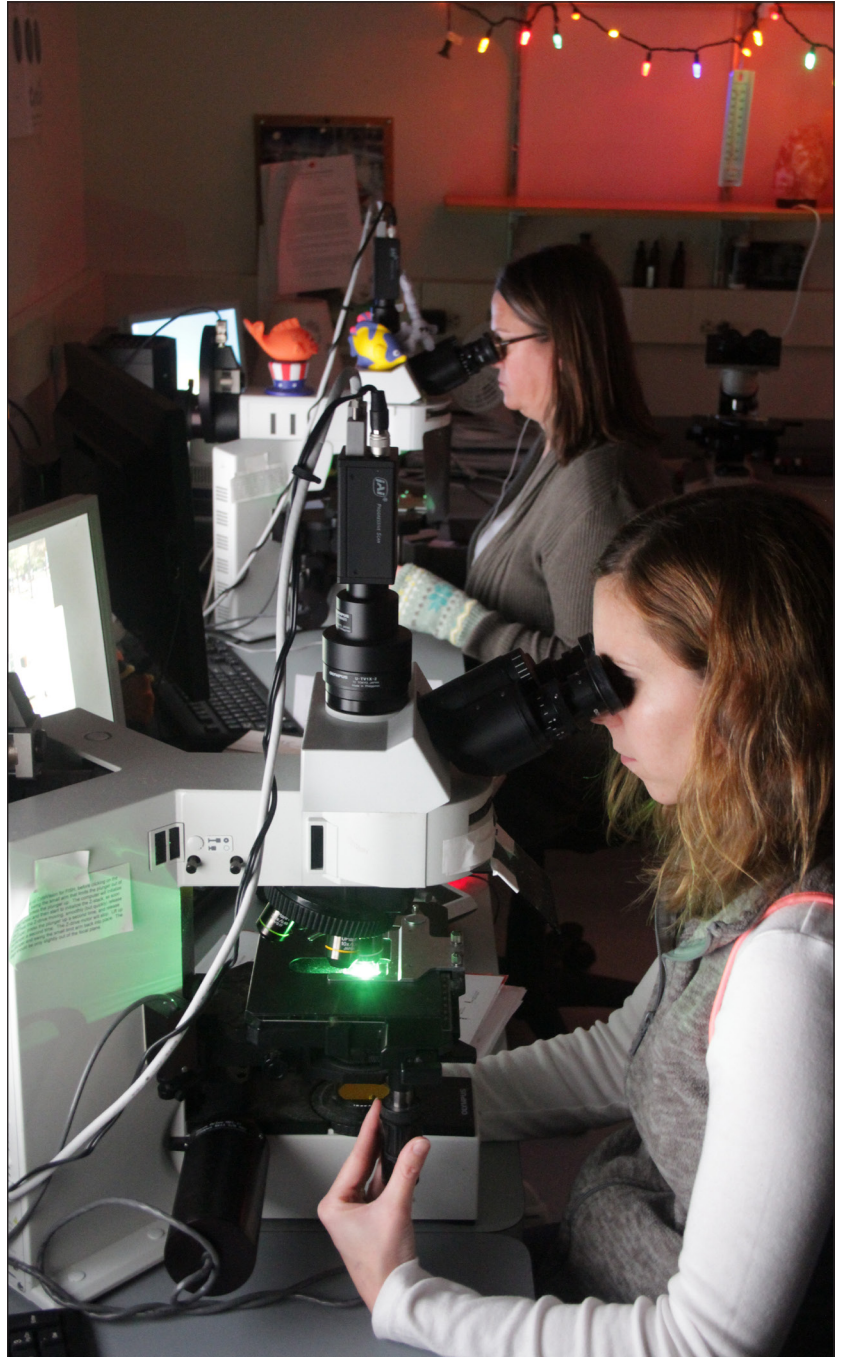
Genetic analysis is an important laboratory diagnostic procedure in the diagnosis and treatment of patients with cancer (oncological), in prenatal diagnosis, in determining possible causes of some cases of infertility or multiple miscarriages, and in the diagnosis of certain patients with developmental disabilities and/or multiple birth defects (postnatal).

WSLH geneticists also teach at the UW School of Medicine and Public Health and engage in research in Wisconsin and nationally.

Cytology

The WSLH Cytology Laboratory was started in the 1940s after a WSLH medical technologist was sent to study with Dr. George Papanicolaou — the founder of clinical pathology and the creator of the Pap smear test to diagnose cervical cancer.

Today the WSLH Cytology Laboratory provides conventional and liquid-based cervical cancer screening (Pap tests), Human Papillomavirus (HPV) testing, and surgical biopsy testing (histology).



Occupational Safety and Health Division

Wisconsin Occupational Health Laboratory

The Wisconsin Occupational Health Laboratory (WOHL) has been actively involved in industrial hygiene chemical analysis since the mid-1930s.

WOHL is a full-service industrial hygiene chemistry and environmental microbiology laboratory, and has served as the central laboratory for OSHA's voluntary health and safety consultation program since 1977. In addition, WOHL provides laboratory services to a wide spectrum of public agencies and private sector clients.

WOHL supplies customers with an extensive list of analytical capabilities and industrial hygiene expertise.

Bureau of Labor / Occupational Safety & Health Statistics

BLS/OSH holds a cooperative agreement with the U.S. Department of Labor's Bureau of Labor Statistics (BLS) to collect occupational injury, illness and fatality data for the State of Wisconsin.

BLS/OSH analysts conduct the Survey of Occupational Injuries and Illnesses (SOII) and the Census of Fatal Occupational Injuries (CFOI) annually. Staff publish the data collected and disseminate educational materials.

They also fulfill specific data requests for public and private stakeholders.



Work Safe Bucky was created by Danica Harrier, a WisCon health consultant, for the Bucky on Parade exhibition.

WisCon Onsite Safety and Health Consultation Program

The WisCon program, in conjunction with the U.S. Department of Labor, provides free safety and health consultations to small businesses in Wisconsin.

WisCon industrial hygienists, safety specialists, engineers and ergonomic specialists help business owners provide their employees with safe and healthy workplaces and meet their obligations and responsibilities under the federal Occupational Safety and Health Act (OSHA).

WisCon services about 300 Wisconsin businesses annually.

A GLANCE

WSLH Finances - Fiscal Year 2018

Revenues

Wisconsin General Program Revenue	\$11,110,054	24%
Wisconsin State and Local Agencies	9,344,675	20%
Newborn Screening	5,401,087	11%
Driver Improvement Surcharge	1,619,200	3%
Grants	5,828,003	12%
Earnings-Investment Income	146,399	0.3%
Laboratory service fees from:		
Clinical	5,174,164	11%
Proficiency Testing	3,154,937	7%
Occupational Health	1,958,502	4%
Environmental (public)	1,860,254	4%
Assoc. of Public Health Laboratories (APHL)	1,414,344	3%
Other	198,376	0.4%

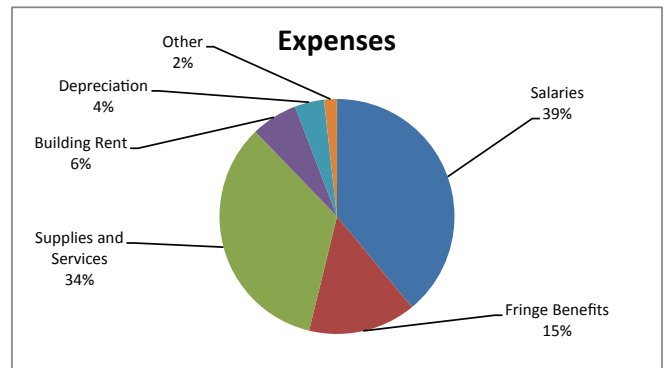
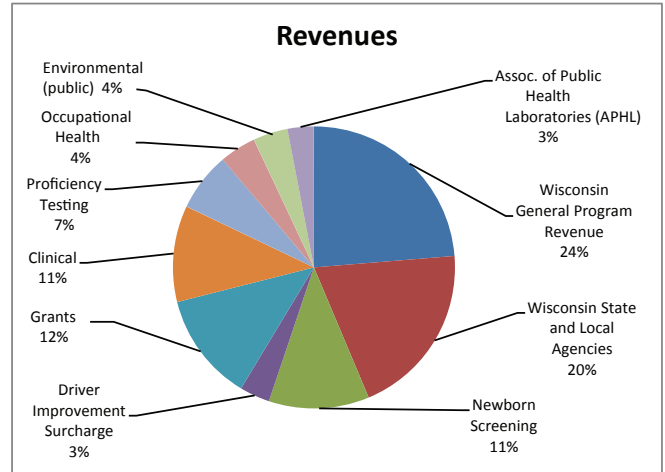
Total Revenues **\$47,209,995** 100%

Expenses

Salaries	\$18,367,555	39%
Fringe Benefits	6,981,748	15%
Supplies and Services	15,999,085	34%
Building Rent	3,007,762	6%
Depreciation	1,905,001	4%
Other	836,106	2%

Total Expenses **\$47,097,257** 100%

Net Increase/(Decrease) in Equity **\$112,738**



WSLH AT A GLANCE

WSLH Leadership

Board of Directors

Appointed by Governor of Wisconsin

Member	Representing
Robert Corliss, MD	Clinical Laboratories
Barry Irmen	Coroners and Medical Examiners
Jeffrey Kindrai	Local Health Departments
James Morrison	Occupational Health
Vacant	Public Member (2)
Vacant	Environmental Laboratories

Appointed by University of Wisconsin-Madison or Wisconsin State Agency

Member	Representing
Richard Moss, PhD	Chancellor, UW-Madison and Dean, School of Medicine and Public Health
Karen McKeown (Alternate - Charles Warzecha)	Secretary, Department of Health Services
Joseph Liebau, Jr. (Alternate - Steven Geis)	Secretary, Department of Natural Resources
Gil Kelley	Secretary, Department of Agriculture, Trade and Consumer Protection

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Madison, WI 53706

**Environmental Health, Occupational Health and Communicable Disease Divisions;
WSLH Proficiency Testing**

2601 Agriculture Drive
Madison, WI 53718

Phone:

Clinical Laboratories: (800) 862-1013

Environmental Laboratories: (800) 442-4618

Wisconsin Occupational Health Laboratory: (800) 446-0403

WSLH Proficiency Testing: (800) 462-5261



**Wisconsin State
Laboratory of Hygiene**
UNIVERSITY OF WISCONSIN-MADISON

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