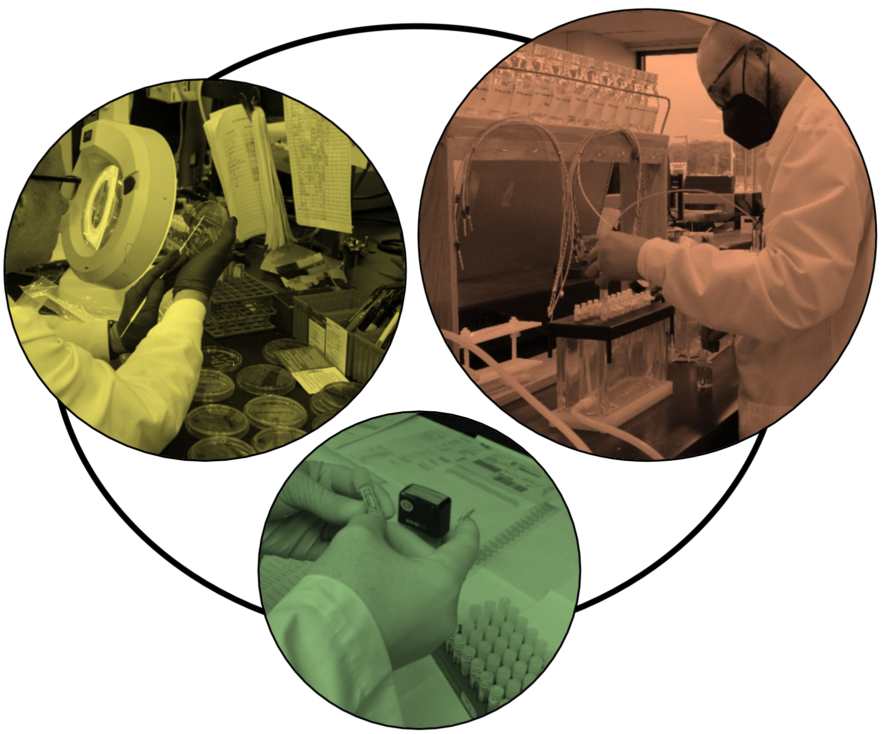
MDHHS

Bureau of Laboratories



Annual Report
Fiscal Year 2021

Sandip Shah, PhD., HCLD(ABB)
Laboratory Director

Our Vision:

The Bureau of Laboratories is a stronger, more diverse team within an integrated public health system. We utilize advanced technology and innovative leadership to provide comprehensive public health services in our dynamic global community.

Our Mission:

The Bureau of Laboratories is dedicated to continuing leadership in providing quality laboratory science for healthier people and communities through partnerships, communication, and technical innovation.

Our Values:

Professionalism
Integrity
Teamwork
Excellence
Communication

The Bureau of Laboratories was established under provisions of the revised Public Health Code – Act 368 of 1978, Part 96 (333.9601)

CONTENTS

INTRODUCTION

The first state laboratory in Michigan was established in 1907 and was the precursor to what is now known as the Michigan Department of Health and Human Services (MDHHS) Bureau of Laboratories (BOL). The BOL has a long, rich history of improving the health and wellness of the citizens of Michigan as well as leading and supporting national and global public health initiatives.

Today, the BOL continues its tradition of service and excellence. With two divisions, Chemistry & Toxicology and Infectious Disease, along with the sections of Quality Assurance, Laboratory Systems, and Health & Safety, the BOL provides testing services, surveillance, and support for all citizens of the State of Michigan through state, county, and city public health programs and through coordination with private healthcare and laboratory facilities. It lends additional support through outreach and training programs and works closely with federal agencies such as the Centers for Disease Control and Prevention (CDC) and the Federal Select Agent Program, as well as many other state and public health organizations.

Shannon Sharp

The BOL faced many challenges in 2021, including the loss of the Bioterrorism Training Coordinator, Shannon Sharp, who passed away suddenly in the early part of the year. She was knowledgeable, kind, generous, and well-respected by both her colleagues and external partners; she is sorely missed. As the SARS-CoV-2 pandemic continued this year, the BOL remained instrumental to the public health response in Michigan with testing and identification of variants. BOL provided clinical laboratory training, healthcare partner support, and offered testing and surveillance data to protect the health and welfare of Michigan residents. Employees actively represented the State of Michigan Public Health Laboratory in the national Association for Public Health Laboratories (APHL) committees and subcommittees, along with participation in speaking engagements, authorship of scientific articles, and poster presentation sessions during national conferences. They kept busy hiring and training 39 new employees as well as validating and verifying 28 tests. The BOL also formed a diversity, equity, and inclusion (DEI) committee to educate and celebrate the rich multicultural backgrounds of our communities and colleagues with monthly events.

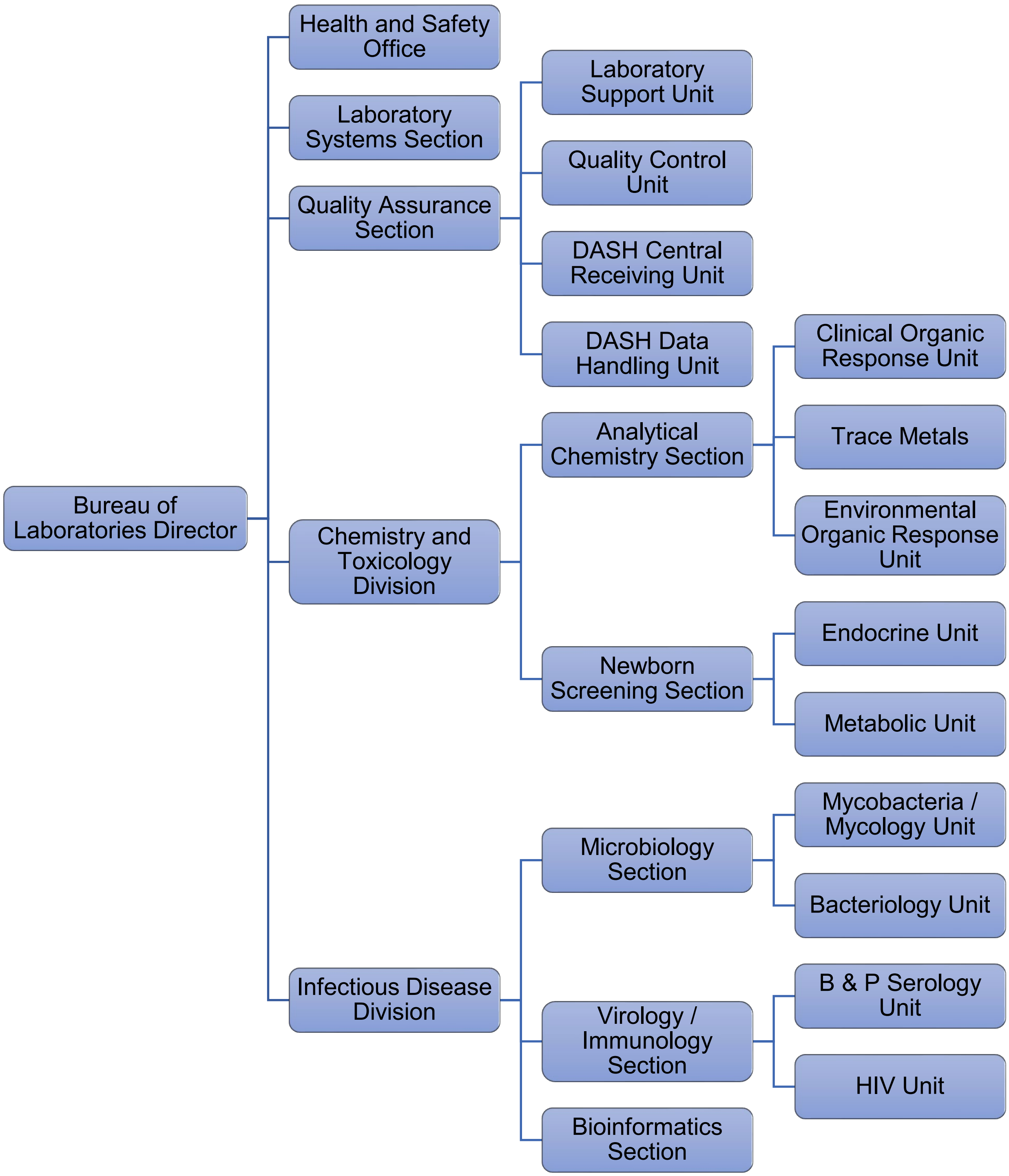
The most exciting news of the year, however, was the approval and planning of an addition to the laboratory that will feature an on-site laboratory training facility and provide more space for the Data and Specimen Handling Unit. Groundbreaking began at the turn of the fiscal year and is scheduled to be completed by December 2022.

Architect's rendering of completed addition

In the interim, the existing building has undergone minor renovations to update the facility and accommodate an ever-growing number of personnel and equipment. Renovations include new cold rooms and fume hoods, an ante room for a sensitive laboratory testing area, an update to the ventilation controls, and the renovation of existing space to provide more office space for the growing molecular and bioinformatics section.

Besides these highlighted developments and accomplishments from 2021, this BOL annual report includes information on testing numbers, funding, and a detailed description of each section of the laboratory along with a more comprehensive list of accomplishments and activities.

ORGANIZATIONAL CHART



FY 2021 TESTING BY THE NUMBERS

Total tests for State of Michigan residents:

7.3 million

Infectious Disease

160,012 specimens and 430,516 tests for 81,931 individuals

Newborn Screening

6,422,254 tests for 101,923 newborns

Blood / Environmental Lead

13,316 tests for 9,968 individuals and households

Harmful Algal Blooms (HAB)

19,785 tests of drinking and recreational water

Per & Polyfluoroalkyl Substances (PFAS)

361,536 tests from 8,608 samples of water, serum, and fish tissue

Fish Monitoring Program

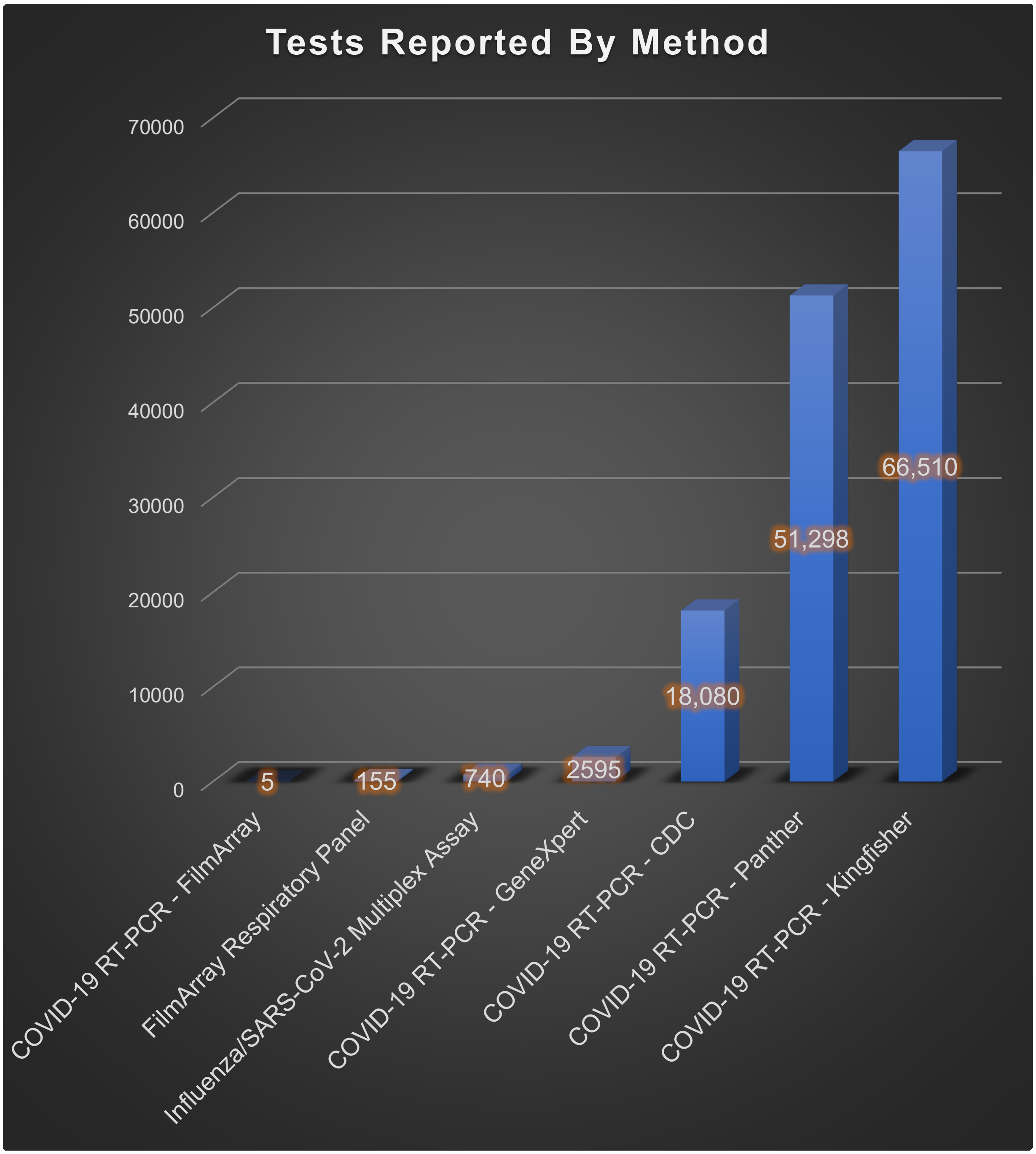
94,406 tests for PCB and pesticides and 1,348 tests for heavy metals from 2,415 fish

COVID-19 PANDEMIC

Total tests reported since the pandemic began:

(February 2020 - September 2021)

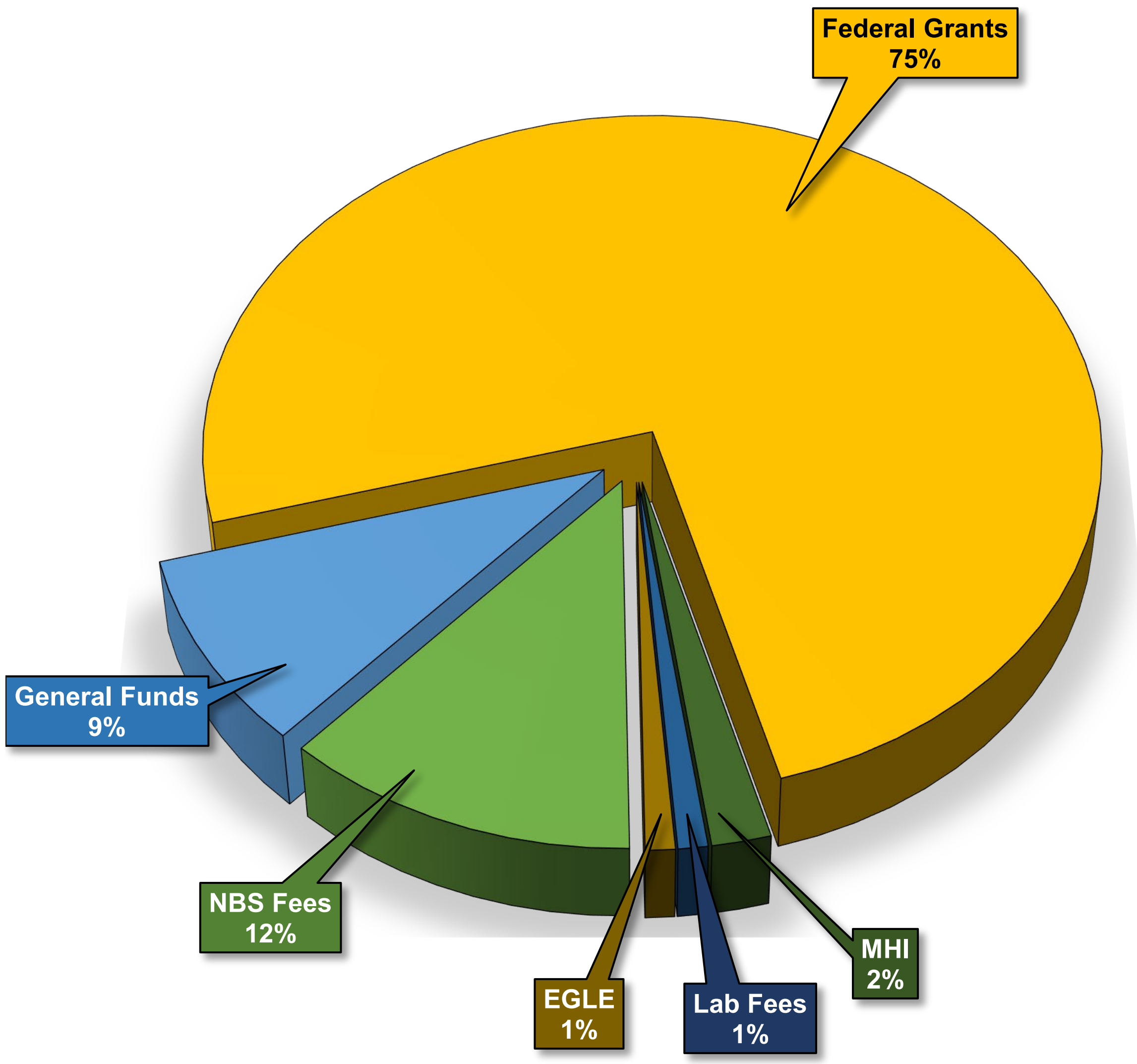
139,383



FY 2021 FUNDING SOURCES

Federal grants comprise the largest amount of funding for the BOL at around 75%. BOL federal partners include the Centers for Disease Control and Prevention (CDC), Federal Drug Administration (FDA), Department of Homeland Security (DHS) and Department of Health and Human Services (HHS).

The remaining 25% of funding derives from BOL newborn screening and lead testing laboratory fees, State of Michigan general funds, Michigan Department of Environment, Great Lakes, and Energy (EGLE), and the Michigan Health Initiative (MHI).



ACCOMPLISHMENTS

Chemistry and Toxicology Division

Analytical Chemistry and Newborn Screening Sections

The Chemistry and Toxicology Division is designated as a CDC Laboratory Response Network-Chemical (LRN-C) Level 1 laboratory that tests clinical samples in the event of a regional chemical exposure. The Analytical Chemistry Section of this division provides expertise in testing clinical specimens for human exposures and environmental samples for contamination of chemical agents such as lead and mercury. The Newborn Screening Section performs tests including over 50 congenital and metabolic disorders such as cystic fibrosis and sickle cell anemia for every infant born in Michigan. This laboratory testing program is part of a comprehensive state program for newborns including referral to specialty clinics and follow up care to prevent and treat serious health problems.

Highlights from FY 2021 include:

- Fifty-nine spices, teas, and supplement samples were analyzed for a panel of metals.
- One hundred and eighty Food Emergency Response Network (FERN) surveillance samples were analyzed for a panel of metals and organic compounds.
- Experienced two CDC LRN-C surge exercises with 110 urine specimens analyzed for abrine and ricinine.
- Completed the Lead Isotope Ratio method validation that will be used for sourcing of lead in homes of children with elevated blood lead levels.
- Developed tissue method for the analysis of PFAS compounds on a newer technology, LC-MSMS and expanded the analyte panel to 42 analytes.

- Developed a dried blood spot method for the analysis of PFAS compounds on an LC-MSMS with an analyte panel to 42 analytes.
- Developed PCB, pesticides, and other organic method on GC-QQQ using a GPC extraction.
- Established the Harmful Algal Blooms Drinking Water Microcystins LC-MSMS method on a second instrument to better meet customer needs and turnaround times.
- Characterized new lots of material for cyanide, tetramine, and volatile organic compounds in serum and/or urine for the PHEP program.
- Implemented a clinical chemistry analyzer to analyze biomarkers, developed method for POPs in serum, and started developing a method for FreeT4, FreeT3, and other thyroid hormones in serum as part of the Organic Biomonitoring Testing Program.
- Hired new Environmental Organic Response Unit Manager Nicole Sanchez.
- Filled eight additional open positions in the Analytical Chemistry Section after a hiring freeze was lifted.
- Expanded testing capabilities on an integrated chemistry analyzer to better support the HIV and STI programs in Michigan by performing creatinine clearance testing every six months on PrEP patients.

Chemistry and Toxicology Test Validations and Verifications

- ✓Analysis of Environmental Samples for Perfluoroalkyl Substances (PFAS) by High Performance Liquid Chromatography Tandem Mass Spectrometry (HPLC-MS/MS)
- ✓Anaylsis of Fish Tissue for Toxaphene Parlars by GC-MS/MS
- ✓Analysis of Microcystins in Drinking Water via LC-MS/MS
- ✓Analysis of Microcystins in Recreational Water
- ✓Analysis of Sulfur Mustard Metabolite SBMSE in Urine and Serum by Automated 96-Well Solid Phase Extraction Ultra High-Performance Liquid Chromatography Tandem Mass Spectrometry (SPE-UHPLC-MS/MS)
- ✓Analysis of Water Samples for Perfluoroalkyl Substances (PFAS) by Automated 96-well Solid Phase Extraction High Performance Liquid Chromatography Tandem Mass Spectrometry (SPE-HPLC-MS/MS)
- ✓Bio-Monitoring Blood Metals by ICP-MS
- ✓Bio-Monitoring Metals in Urine by ICP-MS/MS
- ✓HABS, Anatoxin-Cylindrospermopsin - Drinking Water Method
- ✓HABS, Anatoxin-Cylindrospermopsin - Recreational Water Method
- ✓Lead Isotope Ratio Analysis of Biological and Environmental Samples by ICP-QQQ-MS
- ✓Quantitation of Lysophosphatidylcholines in Dried Blood Spots by Liquid Chromatographic QSight Mass Spectrometry
- ✓Urine arsenic speciation determination via anion exchange HPLC-ICP Reaction Cell-MS/MS for biomonitoring

Infectious Disease Division

Microbiology, Virology, and Bioinformatics Sections

The Infectious Disease Division is designated as a CDC Laboratory Response Network-Biological (LRN-B) Advanced Tier laboratory that tests biological samples for the CDC, the Federal Select Agent program, and the Food Emergency Response Network (FERN). It also provides quality reference and specialized testing services for rapid and effective detection and surveillance of emerging and existing communicable diseases. The Microbiology Section performs testing for a variety of threats such as foodborne illness, sexually transmitted infections, fungal disease as well as respiratory diseases like tuberculosis and pertussis. The Virology Section handles viral public health threats such as SARS CoV-19, Jamestown Canyon virus, rabies, and Eastern Equine Encephalitis virus. The Bioinformatics Section was organized this year to assist epidemiologic efforts to trace and monitor emerging infectious diseases and their variants via genetic sequencing and data analysis.

Highlights from FY 2021 include:

- TB Unit Manager, Angie Schooley, was presented with the National Tuberculosis Controller's Association's Ed Desmond Award.
- Hired new Bioinformatics Section Manager Dr. Heather Blankenship.
- Hired new Microbiology Section Manager Dr. Kimberly McCullor.
- Featured in a Lansing State Journal newspaper article: "How Michigan tracks coronavirus variants" on February 23, 2021.
- Completed multi-lab validation for Cyclospora testing for foods.
- Performed triage exercise for food testing even during COVID-19 testing surges.
- Involved with strengthening the regional laboratory system with onboarding BD MAX platforms for COVID-19 testing.
- Infectious Disease staff was appointed to the following APHL committees:
    - Vector-borne Disease Subcommittee

- National Laboratory Coordination SIG
- HIV Subcommittee
- Workforce Development Committee
- Vice-Chair of the Infectious Disease Committee
- Chair of NGS Subcommittee
- TB Subcommittee

- Additional committee appointments: Knowledge Management Committee and AMP Public Relations Committee.

Infectious Disease Test Validations and Verifications

- ✓Addition of Moxifloxacin to the AP Secondary Drug Susceptibility Panel for Mycobacterium tuberculosis complex
- ✓Arbovirus Molecular Mosquito Pool Surveillance
- ✓BioFire Film Array 2.0 to 2.1 verification
- ✓CDC Influenza SARS-CoV-2 (Flu SC2) Multiplex Assay for Emergency Use Authorization (EUA) Only
- ✓Eswab Collection and Transportation System for rectal colonization screening
- ✓EUA Validation of Aptima SARS-CoV-2 Assay (Panther System)
- ✓HIV and Molecular Bridging Study-ABI 3130 vs SeqStudio
- ✓Internal Standard in FSIS FERN LC-MS Screening of Food Matrices TOX2 Method
- ✓Multiplex Real-Time PCR Assay for the detection of Legionella species, Legionella pneumophila, and Legionella pneumophila serogroup 1 from respiratory specimens
- ✓Mumps RNA Detection (VM,14) Update
- ✓Panther Fusion Instrument Verification
- ✓ThermoFisher Scientific TaqPath COVID-19 Combo Kit Using the Kingfisher for Emergency Use Authorization (EUA) Only
- ✓Validation of the Hepatitis C Antibody Assay on the ADVIA Centaur XPT
- ✓Verification of the Modified Two-Tier Testing (MTTT) for Lyme
- ✓Verifying the Navios Flow Cytometer for CD4/CD8 Enumeration Using the EX tetra System

Quality Assurance Section

The Quality Assurance (QA) Section supports all quality system essentials and external proficiency testing with the Laboratory Support Unit and Quality Control Unit. The QA Section also includes the Data and Specimen Handling Unit (DASH), which was divided into two units this year, the DASH Central Receiving Unit and the DASH Data Handling Unit. The DASH Central Receiving Unit receives all samples for laboratory testing and is proficient in Division 6.2 Packaging and Shipping. The DASH Data Coding Unit is responsible for patient requisition entry.

Highlights from FY 2021 include:

- Results from the 2021 external American Industrial Hygiene Association Laboratory Accreditation Program (AIHA LAP, LLC) inspection returned no deficiencies for the BOL.
- BOL successfully completed 198 proficiency test events from nine different proficiency test providers.
- BOL allowed hospitals in the state to link up to their continuous monitoring system, Vaisala, to help monitor vaccine storage.
- QA Section put a new Storekeeper Supervisor, Jeffery Thalison, in place at the BOL warehouse.
- BOL, through a joint effort with the Bureau of EMS, Trauma and Preparedness (BETP), continued with the dissemination of clinical sample collection supplies for COVID-19 testing. As of 2021, the BOL warehouse personnel shipped over 17.9 million swabs and transport media kits to health agency partners positioned throughout the State of Michigan. These supplies are federal relief supplies provided through FEMA and HHS.
- Twenty-eight test validations and verifications were approved and implemented. A list of validations and verifications is included for each division on their respective pages of this report.

Safety Office

The Bureau of Laboratories is actively committed to preserving the health and safety of its laboratory staff and to protecting the community and the environment. The Health & Safety Office provides several required annual employee training programs. Below are the 2021 safety statistics and activities:

Laboratory Building Upgrades

- Walk-in cold rooms 202 and 229 were replaced.
- Room 113 was remodeled to add an ante room.
- New fume hoods were installed in room 04 and 204.
- Laboratory Ventilation Controls project began.
- Quality Assurance cubicles and Genotyping and Bioinformatics Section offices were remodeled.
- Laboratory Expansion Project architecture planning began.

Laboratory Safety Actions

- Seventeen accident/injury/incidents were reported for the fiscal year.
- Two biological exposure incidents.
- Five Safety Committee meetings.
- Eleven Tenants Committee meetings.
- On-site influenza immunization, rabies titer draws, and TB skin test clinic.
- Laboratory Expansion Phase 1.

Safety Training

- One hundred twenty-eight laboratory staff received annual refresher training for bloodborne pathogens and chemical safety.
- Thirty-nine new laboratory employees were trained.
- Fourteen laboratory staff trained in Hazardous Chemical Waste Transportation and Storage.
- Four individuals were trained in the HAZWOPER eight-hour refresher training.
- Thirty-seven Select Agent program employees were trained in Agent Biosafety, Biosecurity, Incident Response, and Insider Threat Awareness.
- Respiratory training and fit testing for all staff who wear respirators:
    - Forty-four staff were fit tested for N-95 respirators.
    - Thirty-nine staff received CAPR training.

Laboratory Systems Section

The Laboratory Systems Section (LSS) administers two laboratory information management systems (LIMS) ensuring real-time reporting of laboratory results to hospital laboratories, veterinary clinics, physician offices, clinical laboratories, environmental agencies, as well as local, state, and federal health officials to track outbreaks, and prevent illness, disease, and deaths. LSS also provides outreach for Biological and Chemical Threat Package and Shipping training, Laboratory Biosafety training, and K-12 Explore Lab Science educational opportunities across the state.

The following is a list of statistics and activities from FY 2021:

LIMS

- Hired Newborn Screening LIMS Administrator Brian Hefferan.
- Began implementation of STARLIMS v12 business upgrade.
- Continuous administration of Newborn Screening - PerkinElmer Specimen Gate LIMS.
- Implemented many new tests into the PROD STARLIMS system for two divisions, including harmful algal blooms (HABs) and multiple BT agents.
- Implemented COVID-19 sequencing into the STARLIMS system.
- Added two new Regional Lab sites to the STARLIMS system to expand COVID-19 testing in the Upper Peninsula.

Laboratory Tours

- Laboratory tours were limited to State of Michigan staff due to safety issues surrounding the COVID-19 pandemic. This year included legislators and MDHHS employees.

COVID-19 Training

- The training program for the Abbott BinaxNOW antigen test received over 19,000 views on YouTube.
- Twenty-one point of care (POC) testing trainings were held via Microsoft TEAMS.
- Two POC testing trainings were created for distribution.

Biological Threat (BT) Training

- Hired new Bioterrorism Training Coordinator Jason Wholehan.
- A total of 211 participants were trained in packaging and shipping of infectious materials.
- A total of 12 classes were held:
  - Seven virtual classes
  - Five classes when in-person instruction returned in September 2021
- New on-demand training was uploaded to MI-TRAIN on November 9, 2020, to allow students to take the class on their own schedule.

Chemical Threat (CT) Training

- Ten training sessions were scheduled but unfortunately cancelled due to the pandemic.
- Maintained Level 3 capabilities for the Public Health Emergency Preparedness (PHEP) cooperative agreement:
  - Chemical threat response kits and supplies were maintained and available as needed for trained healthcare facilities.
  - Earned a 100% rating on the CDC's Laboratory Response Network-Chemical (LRN-C) Specimen Packaging and Shipping Exercise for the seventeenth consecutive year.
  - BOL LRN-C administrative duties were maintained with staff confidentiality agreements and member registrations.
  - LRN-C communication was maintained through regular conference calls, communication drills and written protocols for partner coordination.
  - Maintained certification for Division 6.2 packaging and shipping.
- Represented BOL at APHL Environmental Health Committee meetings.
- Provided a proposal for the opening session of the APHL national meeting.
- Acted as a liaison to the Chemical Threat Collaborative Workgroup.
- Led the Chemical Threat Collaborative Workgroup.
- Organized a speaker from the StayWell group.

Explore Lab Science Outreach

- A total of six events were attended reaching close to three thousand students across the state:
  - One virtual career fair
  - One virtual science fair
  - One summer camp
  - Three demonstrations, with a first-place award earned for the virtual MDHHS Kids Day
- Seven university student interns volunteered to assist with K-12 outreach.
- Eighteen science experiment videos were produced by the K-12 science education program for the Explore Lab Science website.

PUBLICATIONS

- Koralur M, Chen CY, Pillay A, White B, Pettus K, Chi KH, Stringer J, Aroh C, Dasu T, Bhattacharyya S, Perkins K, Chen J, **Riner D, Soehnlen M**, Cao W, Gaynor AM, Kersh EN. Evaluation of a laboratory-developed multiplex real-time PCR assay for diagnosis of syphilis, herpes and chancroid genital ulcers in four public health laboratories in the USA. Sex Transm Infect. 2021 Dec 6: sextrans-2021-055081. doi: 10.1136/sextrans-2021-055081. Epub ahead of print. PMID: 34873027.

- Brito AF, Semenova E, Dudas G, Hassler GW, Kalinich CC, Kraemer MUG, Ho J, Tegally H, Githinji G, Agoti CN, Matkin LE, Whittaker C; Danish COVID-19 Genome Consortium; COVID-19 Impact Project; Network for Genomic Surveillance in South Africa (NGS-SA); GISAID core curation team, Howden BP, Sintchenko V, Zuckerman NS, Mor O, **Blankenship HM**, de Oliveira T, Lin RTP, Siqueira MM, Resende PC, Vasconcelos ATR, Spilki FR, Aguiar RS, Alexiev I, Ivanov IN, Philipova I, Carrington CVF, Sahadeo NSD, Gurry C, Maurer-Stroh S, Naidoo D, von Eije KJ, Perkins MD, van Kerkhove M, Hill SC, Sabino EC, Pybus OG, Dye C, Bhatt S, Flaxman S, Suchard MA, Grubaugh ND, Baele G, Faria NR. Global disparities in SARS-CoV-2 genomic surveillance. medRxiv [Preprint]. 2021 Dec 9:2021.08.21.21262393. doi: 10.1101/2021.08.21.21262393. PMID: 34462754; PMCID: PMC8404891.

- Biomonitoring Fact Sheet (Teresa Miller, Chemical Threat Response Coordinator).

- Environment Health Laboratories Fact Sheet (Teresa Miller, Chemical Threat Response Coordinator).

PRESENTATIONS

- Association of Public Health Laboratories (APHL) fellow from Infectious Disease Division assisted with BinaxNOW training.
- Several BOL employees gave presentations for the following organizations and events throughout the year:
  - American Society for Clinical Laboratory Science (ASCLS)
  - Michigan Medical Society
  - Michigan Pathology Society
  - Association of Public Health Laboratories (APHL)
  - State of Michigan In-Service
- Teresa Miller, Chemical Threat Response Coordinator:
  - Level 3 presentation and poster for the LRN-C technical meeting.
  - Co-hosted a webinar for LRN-C Level 3 laboratories with Robert Nickla from Oregon.
  - Co-authored a poster presentation for Chemical Threat Collaborative Workgroup.

FEATURED ARTICLES

Bureau of Laboratories is a National Leader in an Effort to Identify COVID-19 Variants

Since COVID-19 was first detected in Michigan 13 months ago, Bureau of Laboratories' staff members have genome sequenced thousands of samples of the virus with the goal of protecting Michiganders from new variants.

Viruses, including the one that causes COVID-19, are constantly changing and can lead to the emergence of new variants with different characteristics. Some variant viruses are of particular concern because they spread more easily, cause even more severe disease or may escape the body's immune response.

To date, BOL staff has sequenced more than 10,000 COVID-19 samples to identify these new variants.

"Our lab is a national leader in genome sequencing and our efforts have allowed us to implement rapid public health responses to slow the spread of outbreaks involving more easily transmitted variants," said Dr. Joneigh Khaldun, chief medical executive and chief deputy for health. "We will continue to work to identify these variants in Michigan as an important tool in fighting this pandemic back in Michigan."

The SARS-CoV-2 genome encodes instructions organized into sections, called genes, to build the virus. Scientists use a process called genomic sequencing to decode the genes and learn more about the virus. Genomic sequencing allows scientists to identify SARS-CoV-2 and monitor how it changes over time into new variants, understand how these changes affect the characteristics of the virus, and use this information to predict how it might impact health.

The genome sequencing process takes about a week after the lab receives the positive test results. The state lab is one of two labs in Michigan now conducting sequencing and can process from 500 to 600 samples a week.

As of April 10, 2,640 B.1.1.7 (U.K.) cases have been identified, nine cases of the B.1.351 (South African) variant, nine cases of P.1 (Brazilian) variant and 31 cases of the B.1.427 and B.1.429 (California) variant.

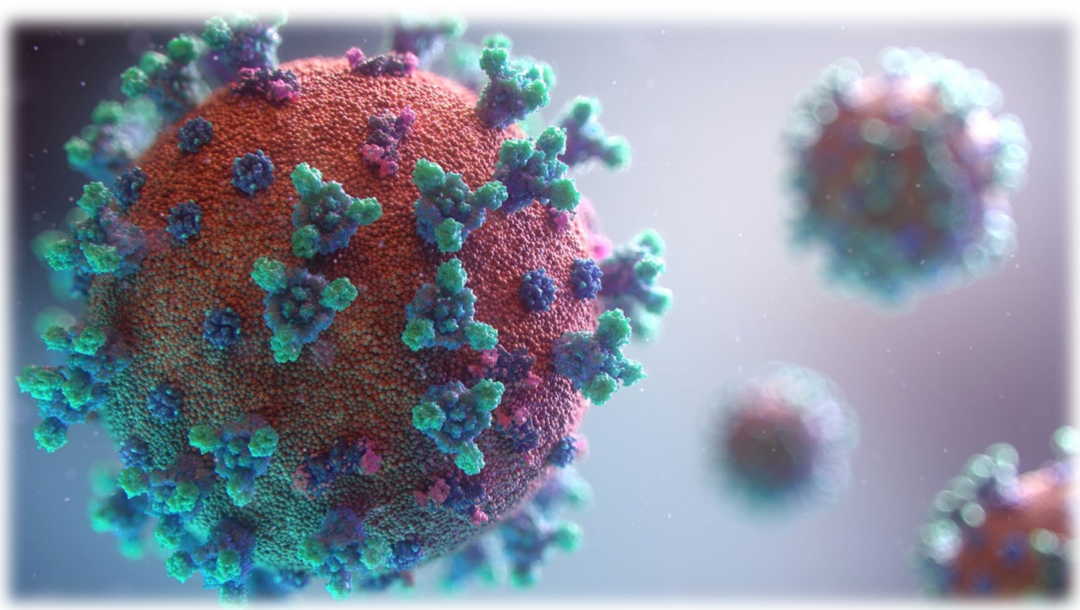
“The presence of more infectious variants, such as the B 1.1.7 variant, threatens our progress in control of the epidemic and is likely contributing to our current increase in cases,” Dr. Khaldun said. “It is critical that we not let up now, and I urge Michiganders to continue to mask up, wash their hands, social distance, get tested and get vaccinated as soon as possible.”

Genome sequencing is a small part of the state lab's mission. Each day, the lab’s scientists test for hundreds of microbes, diseases and chemical substances in human, animal, and environmental sources, and it completes screening for more than 120,000 newborns each year to check for dozens of potentially life-threatening diseases.

The lab is also responsible for testing fish in the state’s lakes, rivers and streams for mercury, PCBs, dioxins and PFAS.

Pictured above is BOL staff member Steve Dietrich doing sample preparation for genome sequencing.

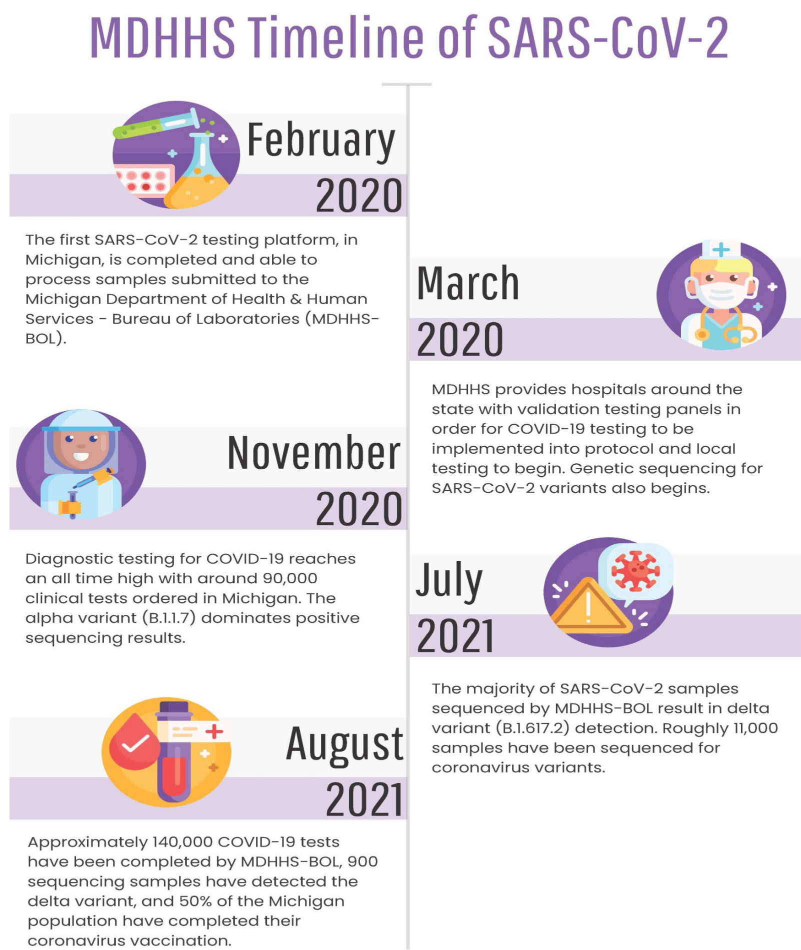
Source: HOPE Weekly, April 12, 2021



MDHHS BOL Timeline of SARS-CoV-2, Delta Variant Emergence

Author: Amy Dedoyard, Virology Fellow

Throughout this pandemic we have seen many changes to our regular day-to-day routine. From mask-wearing to social distancing to vaccines; we have integrated the best practices possible in order to stay healthy. A large part of the COVID-19 pandemic has included testing for SARS-CoV-2 as well as sequencing for coronavirus variants. The Michigan Department of Health and Human Services Bureau of Laboratories (MDHHS BOL) is a primary center for testing and sequencing in Michigan.



When the novel coronavirus emerged and began spreading in the U.S., the Centers for Disease Control and Prevention (CDC) and other public health laboratories, like MDHHS BOL, teamed up to begin testing for this novel virus as no FDA-approved testing methods were available. In February 2020, MDHHS BOL participated in the initial verification studies for the CDC's 2019 Novel Coronavirus (2019-nCOV) Real-Time Reverse Transcriptase (RT)-PCR Diagnostic Panel. MDHHS-BOL began testing for SARS-CoV-2 on February 29, 2020 and identified their first positive case on March

10, 2020. MDHHS-BOL has completed 139,350 COVID-19 tests spanning from February 29, 2020, to August 20, 2021, including testing of the Michigan National Guard, long term care facilities, psychiatric hospitals, and correctional facilities.

In addition to bringing on clinical testing at the beginning of the pandemic, MDHHS BOL scientists also created Whole Genome Sequencing (WGS) protocols and data analysis pipelines early on in the pandemic response. The first Michigan COVID-19 WGS was published on March 20, 2020. Having real-time sequencing capabilities allows for the detection and tracking of COVID variants as they emerge and spread within the state as seen by the emergence of the alpha variant followed by the delta variant.

Of the 11,264 SARS-CoV-2 positive cases sequenced, 892 have already been recorded as the delta variant; specifically, the most prevalent variant B.1.617.2. This switch from the highly contagious alpha variant to the even more contagious delta variant occurred during July of 2021. This data is imperative to public health departments across the nation.
Real-time data is provided by public health laboratories to local and national epidemiologists in order to collaborate with their community; this data includes positive cases, variant prevalence, and surge locations. MDHHS' robust surveillance allows for specific, accurate data that supports public health measures aimed at protecting the health of Michigan residents. Overall, this pandemic has shown us that testing, sequencing, and surveillance are key to implementing safety measures for everyone in our community, especially with emerging variants.

Source: LabLink, Fall 2021, Volume 28, Number 4

BOL Becomes National Hepatitis C Virus NAT Reference Center

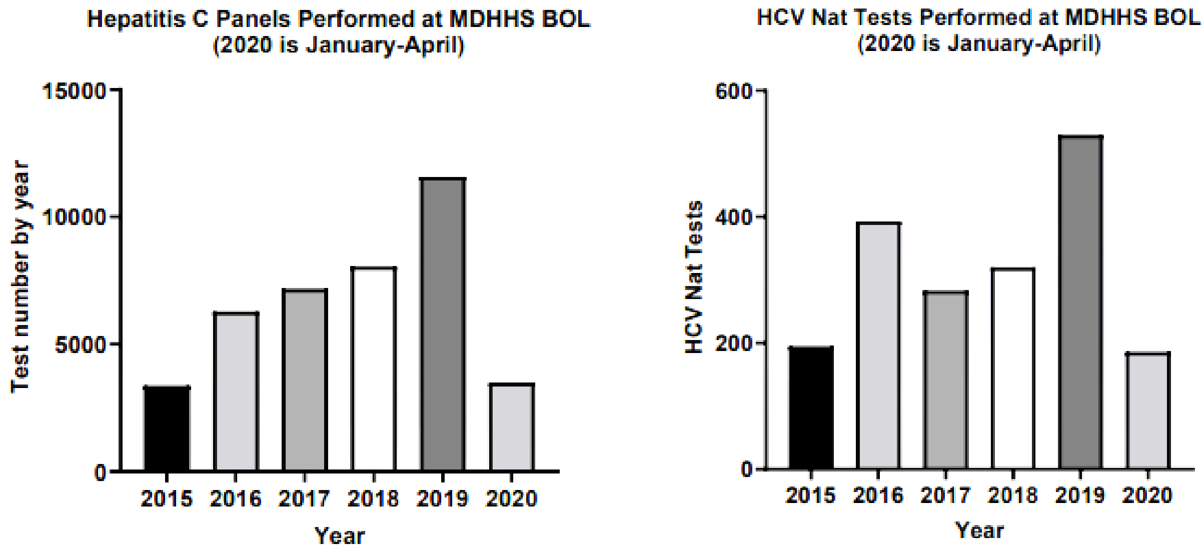
Author: Diana K. Riner, MS, PhD, Virology and Immunology Section Manager

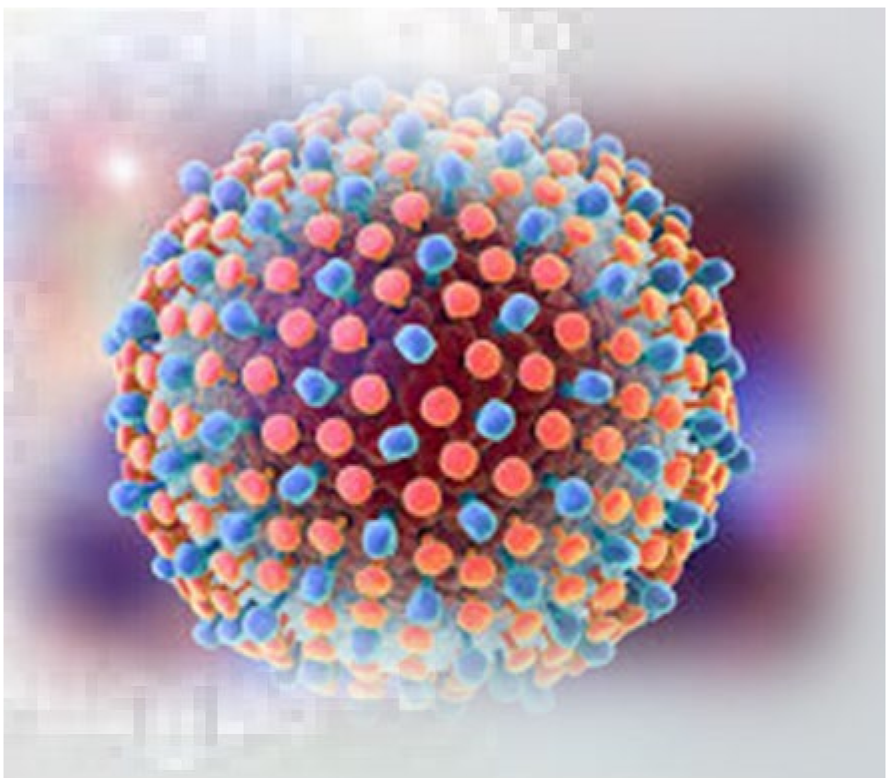
The Bureau of Laboratories (BOL) was awarded a 5-year contract to act as a Hepatitis C Virus (HCV) Nucleic Acid Amplification Testing (NAT) Reference Center by the Association of Public Health Laboratories, in cooperation with the Centers for Disease Control and Prevention. The HCV NAT Reference Center will provide United States public health laboratories access to HCV NAT to identify current HCV infection. The testing algorithm for diagnosis of current HCV infection recommends all persons who test positive for an HCV antibody (anti-HCV) test should receive an HCV NAT to detect HCV RNA. If HCV RNA is detected, the case is considered to have current HCV infection and should be linked to care.

HCV specimens received by the BOL are tested for HCV IgG antibodies. If the specimen is reactive for HCV antibody and there is sufficient specimen quantity (≥ 500 µl) the specimen is run on the Roche COBAS® AmpliPrep/COBAS® TaqMan® HCV test for detection and quantification of HCV viral RNA. This platform allows for quantitative detection of HCV virus from plasma or serum with a quantitative limit of detection of 15 to 100,000,000 IU/ml and a lower limit of detection of < 15 IU/ml HCV. If specimen volume is not sufficient for running on the COBAS® platform BOL has a qualitative HCV NAT laboratory developed real-time PCR assay that was validated for clinical use.

At BOL, the annual testing volume for HCV screening panel has steadily increased over the past five years (Figure 1). This illustrates BOL ability to increase its testing capacity to meet the needs of Michigan’s public health efforts to expand testing and provide treatment for HCV with the goal of eliminating this disease.

Figure 1. HCV testing volumes for 2015 -2019 and the first 5 months of 2020





Courtesy of MDHHS BOL Source: LabLink, Winter 2021, Volume 27, Number 1

BOL Outreach Program Receives Awards

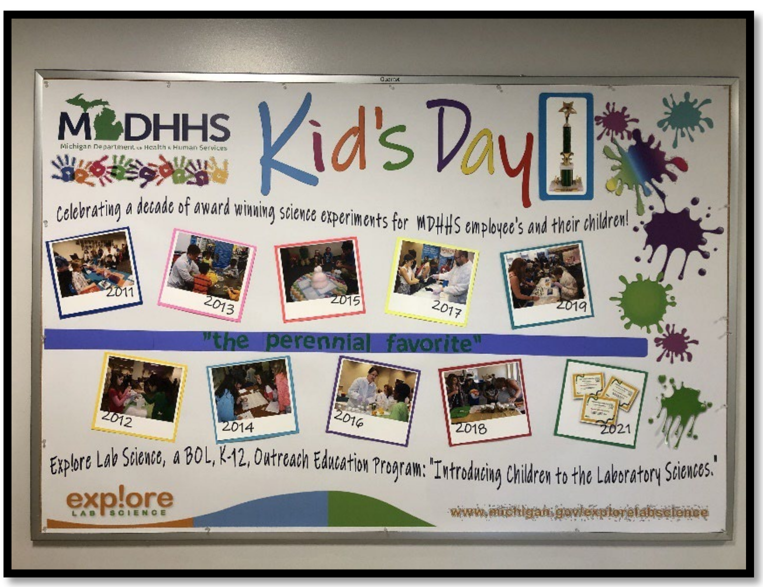
Author: Sandra Lenneman, K-12 Outreach Coordinator

The Bureau of Laboratories has been awarded the “Kid’s Choice” for the best booth activities presented by the K-12 outreach program, “Exp!ore Lab Science.” For the past 10 years, hands-on scientific experiments offered at MDHHS Kid’s Day, or the day officially designated as “Bring Your Child to Work Day,” has become “the perennial favorite” among all participants.

This year, the MDHHS families were introduced to laboratory science activities through a virtual format displaying video demonstrations that also included DIY instructions for safe, at home, replication of the experiments.

In 2021, the children voted the BOL Outreach Program as the “Most Creative’”, “Learned the Most’,” and the “Most Favorite Activity.”

Source: LabLink, Fall 2021, Volume 28, Number 4



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The Michigan Department of Health and Human Services will not exclude from participation in, deny benefits of, or discriminate against any individual or group because of race, sex, religion, age, national origin, color, height, weight, marital status, partisan considerations, or a disability or genetic information that is unrelated to the person's eligibility.