

The LAByrinth

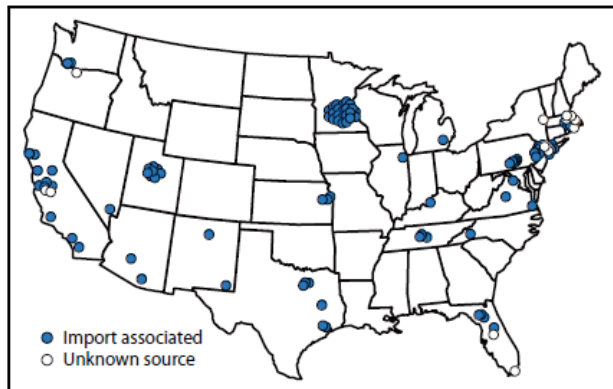
Indiana State Department of Health Laboratories Newsletter

Indiana Measles Outbreak 2011 by Katie Masterson, Jessica Gentry, & Mark Glazier

This summer, Indiana joined the long list of states with reported measles cases. Measles, also known as rubeola, is a highly contagious viral illness that is easily transmitted from person-to-person. Following exposure to the virus, up to 90 percent of susceptible (non-immune) persons develop measles. Characteristic signs and symptoms of measles include runny nose, cough, conjunctivitis and a febrile rash illness. Measles virus infection can be prevented by the use of the highly effective MMR (measles, mumps and rubella) vaccine. According to the Centers for Disease Control & Prevention (CDC), measles vaccine usage has led to a greater than 99 percent reduction in measles cases in the United States.

However, because measles is endemic in other parts of the world, measles transmission in the U.S. still occurs. According to the CDC, between January 1 and May 20, 2011, a total of 118 measles cases were reported from 23 states and New York City (Figure 1), marking the highest number of reports for this time period since 1996.

**FIGURE 1. Distribution and origin of reported measles cases (N = 118)
— United States, January 1–May 20, 2011**



On June 3, a non-immunized Indiana resident was returning to the United States after spending a year overseas living in a measles endemic area. This individual, who was infected with the measles virus, was initially misdiagnosed and therefore continued to have social contact with family members and others within the community, many of whom were not fully immunized or not vaccinated at all. It wasn't until June 20 that five family members of the index patient visited an ER and were correctly diagnosed with having measles. Upon diagnosis, all infected persons were instructed by ISDH to self-quarantine in order to stop the spread of disease.

On June 21, the ISDH Laboratories were alerted by ISDH Epidemiologists about the potential measles outbreak in Indiana. Serum and a nasopharyngeal (NP) swab were collected and immediately submitted to the ISDH Labs for testing. Confirmation of measles was

(continued on page 2)



Indiana State Department of Health Laboratories

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State Health Commissioner

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Laboratory Services

Our Mission:

The Indiana State Department of Health Laboratories partners with other public health agencies to provide timely and accurate information needed for surveillance and outbreak investigations to protect and improve Hoosier health.

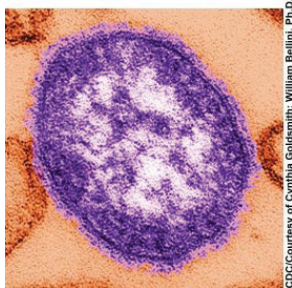
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reported by both the serology and virology laboratories. The serology lab used antibody testing to detect the presence of both IgM and IgG antibodies to the measles virus. Using this method, the serology lab was able to test hundreds of specimens very rapidly, thus allowing results to be reported in a fast and efficient manner. This testing was especially critical following a potential massive workplace exposure in the affected region. The virology lab used both virus isolation and molecular methods to identify and confirm the positive measles result. At the time of the outbreak, the virology lab was beginning work to validate and implement a measles PCR assay. The Labs' ability to test specimens by PCR was especially beneficial to the epidemiologists as it produced faster results than current virus isolation techniques. In addition to PCR, the virology lab cultured the specimen and was able to obtain a viral isolate which was forwarded to the CDC for further characterization.

To date, over 300 specimens related to the IN measles outbreak have been tested by the virology and serology labs. Of those 300 specimens, 14 were laboratory confirmed cases. Thanks to a very dedicated laboratory staff for all of their efforts during this outbreak!

For more information regarding measles: <http://www.cdc.gov/measles/index.html>



CDC/Courtesy of Cynthia Goldsmith, William Bellini, Ph.D

Measles virus, as viewed under transmission electron micrograph.



Infection with measles usually manifest as a rash over entire body after 2-4 days of initial symptoms, which are cough, coryza (runny nose), and conjunctivitis (red eyes). The symptoms are called the "three C's" .

Toxigenic *Vibrio cholerae* O75 Outbreak

By Brent Barrett



Vibrio cholerae

In late March to early April 2011, an outbreak occurred in northern Florida with 11 reported cases and 10 confirmed cases due to cholera toxin producing *Vibrio cholerae* serotype O75. Seven cases were Florida residents, and three were from Georgia, Louisiana and Indiana, all with travel history to Florida. After consuming raw or lightly cooked oysters harvested from Florida's Apalachicola Bay, they presented with gastrointestinal symptoms of diarrhea, nausea, vomiting, cramps, chills, and/or fever. None were hospitalized or died in the first reported outbreak of this rare strain of *Vibrio cholerae*.

A trace back of the oysters performed by the Florida Department of Agriculture found the affected oysters were harvested from Area 1642 in Apalachicola Bay, Gulf of Mexico between March 21 and April 6, 2011. The harvesting area was closed and re-opened for harvesting after 15 oyster samples from 10 different sections of the implicated harvest area tested negative for *V. cholerae* O75.

Vibrio spp. bacteria are common in coastal waters and also found in local shell fish. *Vibrio vulnificus* is an important cause of gastrointestinal illness and wound infections in Florida. *Vibrio cholerae* has over 180 serogroups and most are non-toxigenic. Infections caused by toxigenic *V. cholerae* strains, especially serotype O1 and O139, can cause sporadic cases, outbreaks and pandemics but rarely occur in the United States. Most of the reported cases are related to travel outside the United States.



Raw oysters are a common source of cholera outbreaks in USA.

are being investigated. These include dredging operations near Area 1642 harvesting area that may have stirred up organisms on the sea floor and a sewer break in Eastpoint, FL. Toxigenic *V. cholera* O75 strains have the cholera toxin gene and can cause severe diarrhea but are infrequently seen in the United States. Clinicians and public health officials should be aware of new and emerging toxigenic *V. cholerae* serogroups.

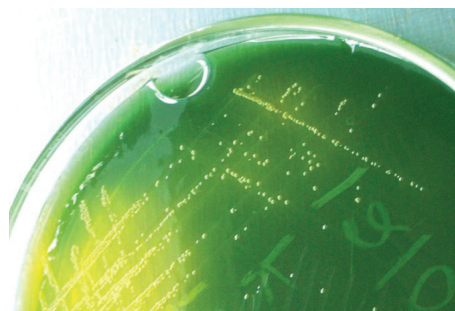
To test for *V. cholerae*, isolates or stools from ill persons, which have been previously screened by a clinical laboratory and suspected as *V. cholera*, are referred to the Indiana State Department of Health for confirmation. Stools are planted to Thiosulfate Citrate Bile Sucrose (TCBS) agar and alkaline peptone water enrichment broth, then subcultured to TCBS, and isolates are planted to TCBS. Suspect colonies are checked biochemically and then serology is performed using serotype O1 and O139 antisera. *V. cholerae* isolates are forwarded to the Center for Disease Control for additional characterization, cholera toxin and serology testing.

This is the first reported outbreak due to toxigenic *V. cholerae* O75 and oyster consumption. The identification of this outbreak may be due to increased testing of stool samples for *Vibrio* species in states along coastal waters, thus providing a better detection method. Two events that may have caused the oyster beds' contamination



Left: *Vibrio cholerae* colonies growing on TCBS agar.

Right: Closeup of the *Vibrio cholerae* colonies on TCBS agar.



Blood Lead Lab Begins New Screening Technique

By Mary Hagerman



The Blood Lead Lab now accepts dried blood spots for lead screening. Blood from a finger stick is dropped into circles imprinted on special Whatman filter paper cards, then allowed to dry and mailed to the laboratory in a regular business envelope via United States mail.

The Lab requests that the clinic or health department fill at least two blood circles per child. We use one for the initial analysis and reserve the other for confirmation of abnormal results. We make three small punches from one blood circle using a PerkinElmer Dried Blood Spot Puncher. The three punches fall into a well on a 48-place well plate. After all samples are punched, diluent is added and the well plate is shaken. The plates are placed on the Inductively Coupled Plasma/Mass Spectrometer autosampler and analyzed. Lead is detected by its atomic mass, which is 208.

The Blood Lead Lab screens thousands of children and scores of pregnant women per year for lead poisoning, which continues to be a problem in Indiana because of the number of older homes with lead-based paint. "Abnormal" levels of Blood Lead are considered concentrations equal to or greater than 10 µg/dL and require follow-up by a case worker.

Our new method of testing for lead poisoning is an improvement for both us and for our clients. By accepting dried blood spots on filter paper, we not only save money on postage (since it dispenses with the need for costly UN 3373, Biological Substance Category B packaging), but also makes collecting the specimens easier for the nurses around the state. Before filter paper, the nurses had to transfer blood from a finger stick into very small, 100 to 300 µL, capillary blood tubes. The new sampling method already has elicited kudos from Clay County. The nurse there wrote a note to us saying: "I think the filter sheets are wonderful. A lot less stress on the child & myself. Trying to get the drops of blood into the little vial when the kids were stiff & screaming was very stressful! Thanks!"

Promoting Safety of Indiana’s Private Wells

By Dianna Zamani



The record-setting 2008 flood that affected 23 Indiana counties brought to light the problem of questionable water quality in our private wells. Many people across the state had never had their water tested and found that repeated rounds of sanitizing their well did not resolve their problems. Hoosiers are not alone in this--nearly 37 million people across the country depend on unmonitored private water supplies. This has been recognized as a national concern, and the National Center for Environmental Health (NCEH) at the Centers for Disease Control and Prevention (CDC) is collaborating with federal, state, tribal, and local partners to develop the Unregulated Drinking Water Initiative for Environmental Surveillance and Public Health (UDWI). In addition to pathogenic bacteria, well water may contain unacceptable levels of arsenic, other heavy metals, and nitrates. To ensure clean drinking water for all Americans relying on private water supplies, a workgroup was initiated in 2009 with four goals to promote this vision¹:

- develop and organize data, information, and knowledge about current status and conditions of UDWS
- develop means to inform public health practitioners and the public on issues associated with UDWS
- identify and recommend interventions to address public health issues associated with UDWS
- explore opportunities and approaches to continue to track UDWS safety and implement the identified interventions.

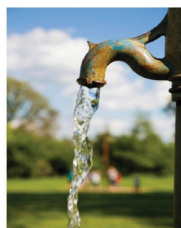
The Environmental Health Division at the ISDH is currently seeking a grant to further these goals. One of their activities has been the development of a brochure to promote testing of private water supplies. The Water Microbiology lab actively supports these activities by assisting with the development of the brochure and being available to assist the public in performing analyses to assure potability of private water supplies. See the contents of the brochure below.

Knowing your water is safe for the whole family is as simple as...

1, 2, 3



Know YOUR Source!



Indiana State Department of Health
Environmental Public Health Division
2 North Meridian Street, 5-E
Indianapolis, IN 46204
(317) 233-7173

1 Test every year!

Know What Can Pollute Your Water:

- Bacteria & Nitrates from human and animal wastes
- Fertilizers & Pesticides
- Industrial Products & Wastes
- Heavy Metals

2 Did you know that young children are the most likely to become ill from contaminated water? Know Where To Go for Help:

- Local health department
- ISDH Test Kit Order Form: www.in.gov/isdh/24550 (See link at bottom.)
- Certified Drinking Water Laboratories in Indiana: www.in.gov/isdh/24859
- Well Disinfection: www.in.gov/isdh/files/Well_Disinfection.pdf

3 Test every year! Know Your Responsibilities:

- Arrange for or collect your own samples.
- Use only containers supplied by the testing laboratory.
- Follow the sample collection instructions provided by the testing laboratory.
- Deliver the samples to the testing lab within the required time limits.

Backer, Lorraine C.; Tosta, Nancy, Journal of Environmental Health, "Unregulated Drinking Water Initiative for Environmental Surveillance and Public Health," March 2011, Vol# 73, No. 7, P 31-32.

State Health Commissioner Award: Dave Dotson

By Dr. Judith Lovchik

We would like to congratulate our Emergency Preparedness and Virology Division Director, Dave Dotson, for receiving the State Health Commissioner Award for Excellence in Public Health. Dr. Larkin was present at our bimonthly laboratory meeting in July to present Dave with this prestigious honor.

Dave's "job area" has been a constantly moving one. Whenever new needs arise in the laboratory, he is likely to be tapped to be the responsible person in charge. His most outstanding contribution within recent years is to prepare the laboratory for its role in preparing and responding to All Hazards emergencies. Using federal grant money, he brought on instrumentation, training, and supplies to perform Laboratory Response Network test methods, cross training, instrumentation, and reagent & supply inventory. He also took a major role in procuring Epidemiology & Laboratory Capacity (ELC) funds for the lab. He regularly represents us at national Preparedness meetings.

Dave has done a great job meeting deadlines and obligations for the Centers for Disease Control & Prevention (CDC) Preparedness Grant and the Select Agent program as Responsible Official. One federal colleague praised his management of our local program, calling it "screamin' green."

Most of the new equipment in the laboratory has been purchased with federal grant funds procured by Dave. He surveyed the equipment needs of all laboratory sections, insuring they obtained what was needed to respond to public health needs.

Dave has worked closely with others in the agency to maximize federal grant dollars to support emergency preparedness. His efforts support those of surveillance/epidemiology and response operations. Under his leadership, West Nile Virus testing and Pandemic Influenza testing were implemented.

Perhaps his greatest achievement was to help obtain funding for the implementation and maintenance of a Laboratory Information Management System. Dave's computer expertise combined with his lab knowledge has made him a valuable participant in the STARLIMS development and implementation, helping to make Indiana a leader nationally. He is also our authority on SNOMED coding.

Dave has consistently risen to the challenge when presented with a laboratory need. He is very organized and thorough, consistent and reliable. Any job assigned to Dave is in good hands. He is passionate and persistent in achieving public health goals. He is motivated to serve without expectation of personal gain or recognition. With personal and professional integrity, he serves for the common good.



Healthy-U News

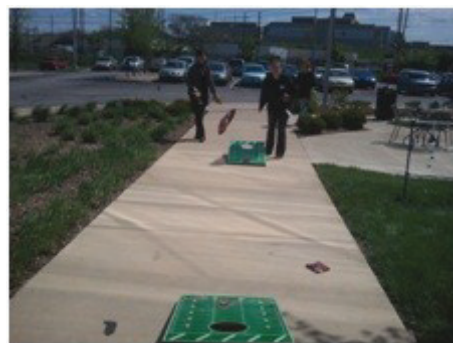
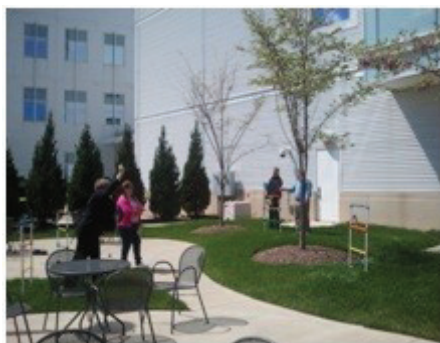
The ISDH Labs Health & Wellness Committee has been busy these last few months! To recap:

In April, over 20 lab staff laced up their sneakers and joined in the fun during National Start Walking Day. The incredible turnout for this initial “kick-off” walk led to the formation of a weekly walking club. Each Tuesday, weather permitting, our group leads a predetermined walking route totaling 1 – 1.5 miles. We hope to see you walking next Tuesday!

In June, we conducted two events; an outdoor game day to celebrate Laboratory Week and an indoor game day in honor of Men’s Health Day. For Laboratory Week, outdoor games such as ladder ball and cornhole were setup. It was a chilly day but thanks to those who came out to play! During Men’s Health Day, staff bonded over pizza (and healthy snacks!) and board games. The turnout was great and the laughter was contagious!

The Labs Health & Wellness Committee is currently working on several events, so be on the lookout for e-mails/flyers in the coming months! Be sure to check out the Wellness bulletin board located by the employee entrance too. The wellness “theme” changes from month to month, so stop by frequently for health tips, recipes and more! Don’t forget that you can play lawn darts during your lunch break; grab a friend and have some fun!

For questions, comments and/or suggestions, email LabsWellness@isdh.IN.gov



Gamma Spectrometry of Radionuclides in Food Matrices Training

By Megan Teachout



Additional Training opportunities for our Laboratorians:

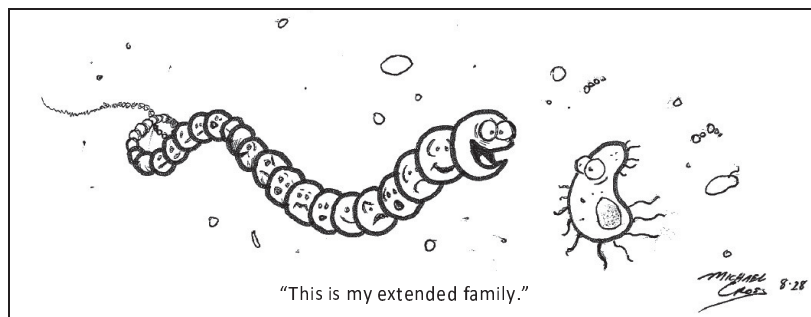
Megan Teachout, a chemist from the Consumer Health section of the ISDH labs, attended the Food and Drug Administration's Food Emergency Response Network (FERN) training course for gamma spectrometry of radionuclides in food matrices from June 21st to 24th at the Washington State Public Health Laboratory in Shoreline, WA. The objective of this training was to provide hands-on experience with advanced analysis of radioactive contamination in food samples using gamma ray spectrometry. The course focused on the principles of radioactive decay as they affect interpretation of spectra.

Samples of tomatoes, carrots, and fish were processed until homogeneous. These samples were later radioactively spiked and counted using a high-purity germanium detector. Participants used the gamma spectrum of the carrots to identify the radionuclides present. This led to discussions about particular peaks on a spectrum accounting for various nuclear decay phenomena and techniques to minimize the presence of unwanted interactions. Instructors stressed the importance of proper energy, shape, and efficiency calibrations. Calibrations using the appropriate sample and standards geometries ensure the accuracy of gamma spectrometry analyses and allow the software's library to assist in identifying radionuclides.

Gamma spectrometry is a useful tool in analyzing samples suspected of being radioactive that are brought to us by the Indiana Department of Homeland Security on a routine basis. Additionally, if FERN is ever activated because of a contamination in the food supply, the Radiochemistry lab will be able to assist FERN in analyzing samples if necessary.

Microtoon

By Mike Cross



The LAByrinth

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