



Indiana State  
Department of  
Health Laboratories  
2008 Annual  
Report



Indiana State  
Department of Health

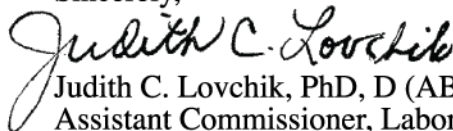


Dear Partners,

My tenure as director of the Indiana State Department of Health Laboratories appropriately began on Valentine's Day, 2008. My heart and mind were captured by the lab when I came to Indiana as Deputy Lab Director in 2007, and discovered the lab was an under-appreciated but valuable resource vital to Hoosier health. To communicate the value of the laboratory to partners and clients, we are presenting our first Annual Report.

The laboratory moved to a beautiful and functional new location in the spring of 2007, just before I arrived. We invite anyone who has not had an opportunity to visit our new building to contact us for a visit and tour. But more impressive than the physical facility and state-of-the-art equipment is our staff. I am continually amazed and gratified by their intelligence, enthusiasm, wisdom, and dedication to the promotion and maintenance of public health in Indiana. I frequently receive notes of appreciation for important public health support provided by the lab as well as praise from federal partners. I am grateful for the opportunity to work with these dedicated public servants.

Sincerely,



Judith C. Lovchik, PhD, D (ABMM)  
Assistant Commissioner, Laboratory Services  
Indiana State Department of Health

## Mission and Vision

**Our Mission:** The Indiana State Department of Health (ISDH) 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.

**Our Vision:** The vision of the ISDH Laboratories is to emerge as a leader among state public health laboratories. Through effective use of leading edge technology and a highly skilled and motivated workforce, the ISDH Laboratories provide comprehensive quality data to address public health concerns in Indiana and the nation.

Hoosiers in the 19th century were suffering and dying of conditions that are uncommonly associated with morbidity and mortality in our day and age. Even then, the Indiana State Board of Health (ISBH, which is what ISDH was formerly called) recognized the need to establish a cohesive service for Hoosiers that could monitor the dynamic health status of the citizenry. They understood that important interface between the health of individuals and the population at-large.

The 1897 ISBH Annual Report announced that "Legislature has passed a laboratory bill which enabled the State Board of Health to establish two laboratories - one for chemical examinations and the other for bacteriological exams. The State Board of Health is now prepared to make, free of charge, sanitary water analyses, food analyses, bacteriological examinations for the diagnosis of diphtheria, phthisis (tuberculosis), and typhoid fever..."

## Then and Now: ISDH Laboratories



In 1897, the ISBH Labs embarked on a noble mission. Thanks to the tireless efforts of many in public health and medicine, diseases such as diphtheria, tuberculosis, and typhoid fever are not nearly as widespread as they once were, however, they have given way to other more current and emerging threats to the health that require vigilant attention. Continual advances in laboratory and information technology have allowed the current ISDH Labs to broaden and enhance testing capabilities while maintaining the basic mission established by the ISBH to be carried out through time.

While nurses and doctors are largely responsible for assessing the health of individuals, public health labs are charged with helping assess the health of the population. The ISDH Labs, like other state public health laboratories, are uniquely prepared to monitor and respond to myriad acute and chronic public health concerns. In the case of infectious disease outbreaks, the ISDH Labs and the ISDH Epidemiology Resource Center (ERC) collaborates to discover outbreak linkages in order to help break chains of transmission. On the other end of the spectrum, the ISDH Labs work on a continual basis with various ISDH program areas and other state agencies to conduct surveillance on environmental and clinical patient samples to get an overall picture of Hoosier health and to evaluate effectiveness of ongoing health-promoting efforts.



So just how do scientists know which strains of influenza virus to include in each year's flu vaccine? How is the source of an outbreak traced? How will you know when your private well water is safe to drink following a flood? The ISDH Laboratories and public health laboratories throughout our nation and world are instrumental in addressing these and countless other questions.

## Feature Stories from 2008

### 2008 Flood Response

The Midwest flooding of 2008 is still fresh in the minds of the thousands affected. Governor Mitch Daniels declared a state of emergency in 23 counties and three deaths were reported. But the flood damage went even beyond that, affecting approximately 31 Indiana counties.

The State of Indiana teamed-up with the Federal Emergency Management Administration (FEMA) to set up Super Sites in select locations throughout the state to provide assistance to the affected citizens of Indiana. These locations included the counties that sustained the most damage and were deemed eligible for FEMA assistance. These counties were Bartholomew, Johnson, Knox, Morgan, Owen and Shelby.

Even before the flood waters receded it was apparent that many citizens' private wells had been inundated and possibly contaminated by flood waters. The ISDH Laboratories staff was an important part of the ISDH contribution to protect the health and safety of the people whose homes and property were severely damaged by the flood waters. Staff from all areas of the laboratory pitched in to assemble drinking water sample collection kits to be distributed to the Super Sites via the Local Health

Departments. Over 2,000 sample collection kits were assembled and distributed during the peak weeks of the response. Some lab staff also volunteered to work at some of the Super Sites to answer questions and distribute ISDH literature containing flood damage response guidance and contact information.

Analysts put in extra hours checking the drinking water despite the time constraints of the U.S. Environmental Protection Agency (EPA) regulations. Other staff also put in the extra effort to get the results of the tests to

the submitters and the appropriate health departments. For some of the affected citizens, it was the first time they had ever had their private well tested. Consequently, when these people were called with results their water was unsafe to drink, a basic explanation of what the results meant and the suggested remedial action was readily offered. Some lab staff, in addition to the analysts, came in after regular business hours to expedite the reporting process by calling the submitters. A lot was learned about how much was unknown about the location and condition of the private wells in most of the affected counties.



### 2008 *Salmonella saintpaul* outbreak

It seems as if there is always some sort of foodborne disease outbreak or food item recall occurring somewhere in the U.S. During the national 2008 *Salmonella saintpaul* outbreak, the source of the bacteria that resulted in sickening thousands of Americans was a true moving target. Fresh tomatoes were implicated first and continued to be the focus of the nationwide investigation beginning in May 2008 until July 2008 when the U.S. Food and Drug Administration (FDA) revealed microbiological evidence which linked the outbreak to contaminated jalapeño and serrano peppers. At the height of the FDA's revised focus, the Food Emergency Response Network (FERN) Microbiology group was activated nationally. The ISDH

Laboratories are members of the Food Emergency Response Network in all three areas of expertise represented: chemistry, microbiology and radiochemistry. Since the ISDH Labs had previously demonstrated proficiency and capacity for testing fresh produce for *Salmonella*, the ISDH Labs were offered the opportunity to participate in nationwide surveillance. ISDH Labs tested samples collected and submitted from FDA investigators in other parts of the country as well as some collected in Indiana. Extra hours and effort were used to complete the testing and report the results through the FERN electronic network, eLEXNET. Although the ISDH Labs were not among the FERN Labs that eventually discovered the contaminated peppers, the labs played a critical role in the national investigation of the outbreak. The *Salmonella saintpaul* outbreak was reported to have affected over 1,400 persons from May 2008 to August 2008 and cost the tomato industry, growers and processors, millions of dollars as well as the eroded consumer confidence in fresh produce in general and specifically in fresh tomatoes and peppers.

### Increased Surveillance 2007-2008 Influenza Season

Life in public health and healthcare tends to ebb and flow in a seasonal pattern along with the various seasonal diseases. In the winter months, this is especially true when respiratory diseases climb to their peak in mid-winter and eventually wind down through the spring months. Illness due to seasonal influenza is of particular concern because of the potential morbidity and mortality associated with it.



In 1995, the ISDH began recruiting healthcare providers as sentinels for surveillance of influenza throughout Indiana. These influenza sentinel providers agree to submit respiratory samples from patients with influenza-like-illness (ILI).

The Indiana network for influenza surveillance has since grown to 52 sites - and continues to grow! In exchange, these sentinel sites are provided with sample collection kits, postage for sample shipment to the ISDH labs, rapid influenza test kits and regular communication from the ISDH respiratory epidemiologist regarding the status of the season's influenza activity.

The samples received from the sentinel influenza providers have molecular testing performed on them and are cultured for influenza and other respiratory viruses. An abundance of important data is generated from the isolates of influenza cultured in the ISDH Virology Laboratory. In Indiana, providers are alerted to the influenza strains circulating within the state at several intervals during the influenza season. Along with similar data collected nationwide by other states, healthcare providers can use this information to more accurately treat the patients that come into their offices with ILI. Additionally, influenza isolates are submitted by ISDH Labs to the CDC laboratories throughout the season for more detailed antigenic analysis and antiviral resistance testing. These data obtained from Indiana isolates, coupled with the data obtained worldwide, enables the CDC to determine which strains of influenza are circulating in the United State. It is this data that also contributes significantly to the yearly influenza vaccine recommendations made to the World Health Organization (WHO).

The 2007-2008 influenza season mirrored that of the rest of the country and throughout the world in that the season saw significantly more cases of influenza. In the 2006-2007 season the ISDH Labs tested a total of 217

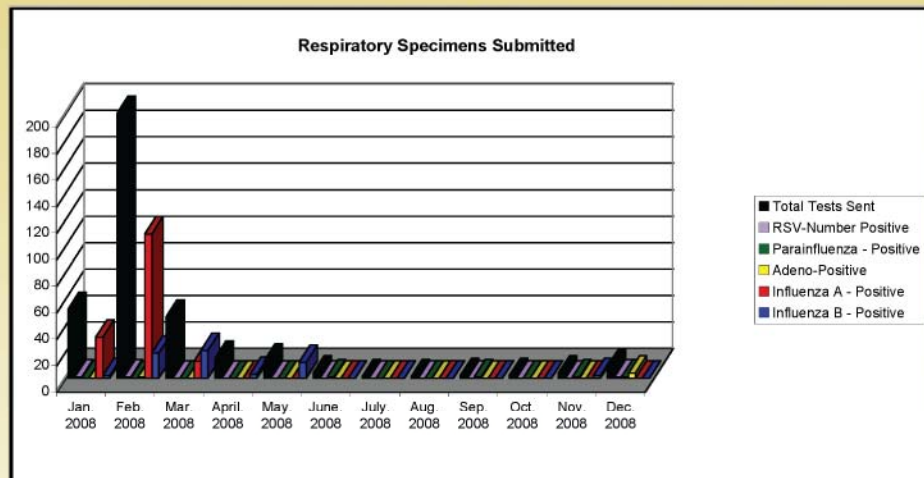
## Clinical Laboratory Areas

samples which resulted in 136 positive influenza results (62.6%). In the 2007-2008 season, 346 samples were tested, a 62.7% increase from the previous year. Of those samples, 229 tested positive for influenza (66.2%), a 59.4% increase from the 2006-2007 season.

### Clinical Virology Laboratory

The ISDH Virology Laboratory conducts testing to detect and identify viral diseases that are of public health importance. The main role of the laboratory is to aid in the diagnosis of viral pathogens as well as to participate in surveillance testing programs for influenza and other viral diseases of public health interest. The virology lab accepts clinical specimens and isolates for virus isolation and nucleic acid amplification testing. The viral agents which can be isolated and identified in cell culture by either rapid shell vial technique or viral antigen detection (FA) are respiratory viruses, herpes viruses, enteroviruses, mumps, measles and varicella-zoster virus (the virus that causes chicken pox). Nucleic acid amplification testing (also known as polymerase chain reaction, PCR) is used to identify viral infections caused by mumps and influenza virus as well as to subtype influenza isolates.

The ISDH Virology and Molecular Virology Laboratories actively participate in the U.S. WHO influenza virus surveillance program. The virology laboratory also works closely with ISDH Epidemiology Resource Center during peak influenza season allowing the respiratory epidemiologist to activity peaked in late January-early February and continued until late



	Total Tests	RSV - pos.	Para - pos.	Adeno - pos.	Flu A - pos.	Flu B - pos.
Jan. 2008	52	1	0	0	31	2
Feb. 2008	200	1	0	1	109	19
Mar. 2008	46	0	0	0	13	21
Apr. 2008	15	0	0	0	0	3
May 2008	13	0	0	0	0	12
June.2008	4	0	1	0	0	0
July 2008	1	0	0	0	0	0
Aug. 2008	1	0	0	0	0	0
Sep. 2008	2	0	1	0	0	0
Oct. 2008	2	0	0	0	0	0
Nov. 2008	4	0	1	0	0	2
Dec. 2008	9	1	1	4	0	0
<b>YEAR 2008</b>	<b>349</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>153</b>	<b>59</b>

April-early May. In Indiana, as in the rest of the United States, the predominating virus circulating and causing infection was Influenza A, specifically Influenza A/H3. Of the 349 specimens submitted to the ISDH Virology Laboratory in 2008, 44% were positive for Influenza A (95% Flu A/H3, 5% Flu A/H1); 17% were positive for Influenza B (93% Flu B/Shanghai strain, 3% Flu B/Florida strain, 2% Flu B/Malaysia strain, 2% Flu B/unable to subtype); 1.4% were positive for Adenovirus; 1.1% were positive for Parainfluenza (75% Parainfluenza 2, 25% Parainfluenza 3); and less than 1% were positive for Respiratory Syncytial Virus (RSV).

### Serology Laboratory

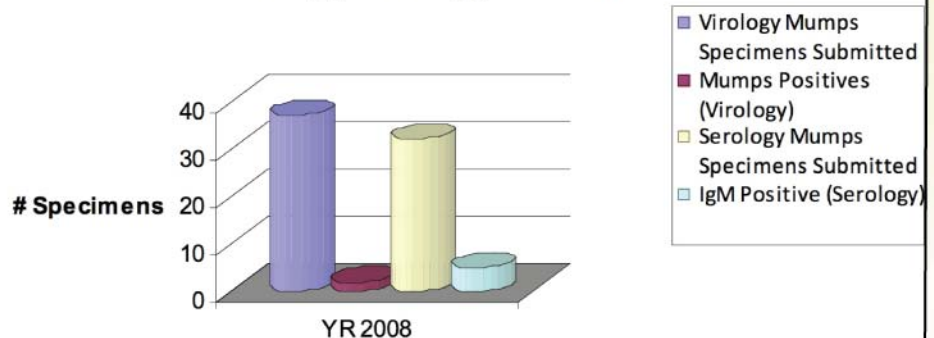
In 2008, the ISDH Serology Lab tested an average of 30,000 samples each for Syphilis, HIV and Hepatitis B and C. The specimens were submitted by local health departments, community health clinics, and the Indiana Department of Corrections. This lab is instrumental in identifying recently infected patients in the community, as well as monitoring the overall positivity rates for these diseases. The testing done in the ISDH Serology Lab provides vital support for the ISDH HIV Prevention Program as well as the ISDH STD Program.



In addition, the ISDH Serology Lab tests human serum and cerebrospinal fluid specimens for West Nile Virus as well as other associated Arboviruses. In 2008, nine specimens were tested, but only one of these was positive for West Nile Virus. The lab also performs confirmatory testing for this virus on specimens which screened positive at other labs. In 2008, ISDH labs received 10 specimens which screened positive at other labs.

Contributing to vaccine preventable disease detection is another function of the ISDH Serology Lab by working closely with the ISDH Virology Lab. Serum samples from patients are submitted to the ISDH Serology Lab to test for antibodies associated with pathogens of public health

**Mumps Specimens Submitted to Virology/Serology Laboratories**



importance such as rubella, mumps, varicella and rubeola. The ISDH Virology Lab offers both virus isolation and PCR testing for vaccine-preventable diseases like mumps and varicella. Test results generated by both labs are utilized by the ISDH ERC to confirm the clinical diagnosis and aid in case investigations of possible vaccine-preventable disease outbreaks.

The ISDH Serology Laboratory tested 32 mumps specimens for IgM antibodies, five of which tested positive. Nine specimens submitted for suspected rubella cases were also tested for IgM antibodies. Three of the specimens were rubella reactive and one was equivocal. Of the 37 specimens submitted to the ISDH Virology Laboratory for mumps testing in 2008, two were positive for mumps virus. Both isolates were sent to the CDC for sequencing analysis to determine their respective genotypes; one isolate was genotype B and the other genotype G. The B and G genotypes are not unusual or rare genotypes and, like the rest of known genotypes of mumps, both have been circulating globally for decades or longer.

### Reference and Special Bacteriology Laboratory

The Reference and Special Bacteriology Laboratory provides vital data to the ISDH ERC and Immunization Program as well as Indiana hospitals and other medical facilities within the state through lab testing of pathogenic and communicable disease causing bacteria.

There are several organisms of public health importance that are required to be submitted to the ISDH Labs if cultured in a clinical laboratory; *Neisseria meningitidis*, *Haemophilus influenzae*, and *Streptococcus pneumoniae* are a few of them that the ISDH Reference Laboratory commonly receives to perform additional testing to assess vaccine efficacy and if the patients are involved in an outbreak. Some of the other organisms that are often submitted for further confirmation/identification testing and typing are *Bordetella pertussis* and *Legionella* species. Various other bacterial isolates are received originating from sterile sites that are rarely or poorly identified and/or have unusual characteristics. Identification of these organisms provides important feedback to the submitting clinic or hospital lab and the patient's physician.

During 2008, nearly 115 cases of invasive bacterial meningitis were confirmed and typed. In addition, over 80 isolates of invasive *Streptococcus pneumoniae* from children 6 years of age or less were also identified and typed. Nearly 150 suspected cases of whooping cough (*Bordetella pertussis*) were also received and tested during this time. This data provided support tracking of these infectious diseases, and monitor related cases of infection. Additionally, several suspected cases of diphtheria, botulism and toxin producing *Staphylococcus* were received and the laboratory often provided the first notification to the ISDH epidemiologists for further investigation.

The ISDH Reference Lab also partners with the CDC and ISDH epidemiologists in a special nation-wide program to assess antibiotic resistance in *Nocardia* species cultured from hospital patients. The ISDH lab identifies or confirms suspected *Nocardia* isolates submitted and an ISDH epidemiologist follows up with the patients' clinicians to obtain information on infection and antibiotic therapy history. The CDC will use this data to determine if there is an increasing level of antibiotic resistance with *Nocardia* infections in the U.S.



## Molecular Test Development Laboratory

The Molecular Test Development Laboratory develops and implements cutting edge methods for detection and DNA subtyping of various gastrointestinal and respiratory pathogens. In addition, the laboratory conducts routine testing for selected pathogenic viruses and bacteria which are of public health interest. PCR amplification and detection of nucleic acids is used to identify Shiga Toxin-Producing (STEC) *E. coli* in clinical specimens as well as STEC *E. coli* and *Shigella* species in contaminated food samples. A PCR method is also being validated to detect *Bordetella pertussis* in clinical specimens. In 2008, the Molecular Test Development Laboratory typed 78 *E. coli*, 606 *Salmonella*, 48 *Shigella*, and three (3) *Listeria* bacterial isolates.

Pulsed-field gel electrophoresis (PFGE) is performed to DNA subtype isolates of foodborne pathogens such as *Salmonella* sp., STEC *E. coli*, *Shigella* sp. and *Listeria monocytogenes*. Through PFGE, unique bacterial DNA fingerprints are obtained, analyzed, and matched against PulseNet National DNA fingerprint Database at the CDC to track in real-time emerging local and national outbreak patterns. Active, real-time surveillance through the PulseNet network helps detect, investigate and contain outbreaks in early stages of development, significantly reducing the number of ill and hospitalized individuals in both our state and nationwide. DNA fingerprinting technology also assists ISDH epidemiologists in rapid identification of common source outbreaks and separation of outbreak-associated cases from other unrelated, sporadic infections. Currently being



evaluated by the laboratory is a novel, nucleic acid amplification based bacterial DNA fingerprinting technology, MLVA (Multiple Loci VNTR Analysis) which will further increase the laboratory's capacity to detect indistinguishable bacterial DNA patterns associated with foodborne illness outbreaks. In 2008, the Molecular Test Development Laboratory helped to identify and rule-out clusters of related clinical infections at the regional and national level which involved individuals from Indiana: 10 clusters of *E. coli*, 33 clusters of *Salmonella*, three (3) clusters of *Shigella*, and no clusters of *Listeria* infections.

## Enteric Microbiology Laboratory

During 2008, the ISDH Labs Enterics and Parasitology Laboratory received over 1,800 specimens for examination. Most specimens were sent to the laboratory for isolation and/or identification of major foodborne bacterial pathogens such as *Salmonella* sp., *Shigella* sp., *Campylobacter* sp., *Vibrio cholerae* and *E. coli* O157:H7. These foodborne pathogens have been linked to infections with symptoms of fever, diarrhea, and abdominal cramping. Specimens sent to the laboratory that are believed to be foodborne pathogens receive a full work up that includes isolation of the bacteria, set up and reading of biochemical testing series, and eight tests that use normal biological processes to help determine the type of bacteria, and in the cases of *Salmonella* sp. and *Shigella* sp., the appropriate serotyping is performed.

The ISDH Enterics and Parasitology Lab works closely with Refugee Health programs offered through ISDH, Marion County, and Allen County. These programs allow refugees arriving in Indiana to receive a full medical

evaluation. Of the over 1,800 specimens submitted 670 were submitted for examination and reporting of intestinal parasites. Our participation in these evaluations helps ensure that refugees receive comprehensive medical care and that the transmission of these reported parasites will not be a source of an outbreak in our state.

### **Tuberculosis Laboratory**

Many people believe that Tuberculosis (TB) is a disease of the past in the U.S. and is only circulating within less developed countries. Unfortunately, TB continues to infect many Americans in the U.S. The ISDH TB program works diligently to control TB by seeking out cases of TB, conducting patient contact evaluations and following up on treatment of patients to assure that spread of the disease can be contained.

The ISDH TB lab supports this function by testing patient samples that are thought to be of public health importance. From patient samples, TB can be isolated, identified, and tested for which drugs the isolates are susceptible to. These results guide patient therapy used to control the disease.

The ISDH TB Lab receives diagnostic specimens and culture isolates from suspected cases, in order confirm the presence of the TB bacterium. In 2008, 2,790 samples for testing were processed by the ISDH TB lab. Once the organism is isolated and identified, antimicrobial susceptibility tests are performed and the ISDH TB Lab can submit these isolates to other specialized TB labs for further characterization through genotyping. Genotyping of TB isolates helps ISDH and local health department epidemiologists determine if patients are epidemiologically linked with other patients in the state or the rest of the country.

### **Chlamydia and Gonorrhea Laboratory**

The ISDH works in conjunction with The Indiana Family Health Council for the testing of Chlamydia and Gonorrhea specimens from around the State of Indiana. The ISDH Chlamydia and Gonorrhea Laboratory tested 40,843 specimens in 2008 that came from family planning clinics, county and local health departments. Of these specimens we reported 4,248 positives for Chlamydia and 1,539 positives for Gonorrhea. Chlamydia and Gonorrhea (CT/GC) are tested simultaneously from just one sample which is submitted by both male and female patients. Testing for CT/GC is not just targeted to individuals who are showing symptoms or have had sex with those at risk, but is offered to individuals seeking contraception as well as for pre-natal screening. These last two categories are important because Chlamydia and Gonorrhea disease can be asymptomatic in over half the females who are infected. Untreated, ongoing infection could lead to complications that could cause infertility or susceptibility to contracting other diseases like HIV from the virus that causes AIDS. In women who are pregnant, untreated infection could cause complications such as premature birth and respiratory, blood and eye infections, possibly resulting in blindness, in the baby. Although, infection of either organism is treatable with antibiotics, antibiotic resistance is on the rise so detection and early treatment for all target groups is important. ISDH CT/GC Lab is committed to accurate and prompt CT/GC testing and reporting to meet this public health need.

## Environmental Laboratory Areas

### Food and Dairy Microbiology Laboratory

The focus of this laboratory area is primarily for the microbiological examination of foods (raw and processed), Grade A milk and related dairy products, and meat and meat related products. The majority of the food and dairy products tested support the regulatory surveillance programs administered and conducted by the staff of the Indiana Board of Animal Health (IBAOH). Within the IBAOH are the Dairy Products Division and the Meat and Poultry Division. The Dairy Products Division operates under the authority of the FDA and the Interstate Milk Shippers (IMS) Conference. The efforts of the Meat and Poultry Division are guided by the United States Department of Agriculture-Food Safety and Inspection Service (USDA-FSIS). The sources of the remaining food products, raw and processed, to be tested come from the ISDH Food Protection Program

and the 92 local health departments located statewide in Indiana. Although some of these samples may be submitted in support of a specific surveillance or inspection assignment, the majority of the samples submitted by the local health departments and the ISDH Food Protection program are related to investigations of consumer complaints of alleged food adulteration which resulted in illness or injury. A key element of an investigation of an alleged food related illness is whether it is an isolated incident or a part of a much more extensive outbreak. The recent outbreaks implicating fresh produce such as tomatoes, peppers, spinach, and processed foods such as peanut butter are excellent samples of this. The accurate and timely analyses and reporting of lab results is critical in these investigations.

During 2008, there were 2,967 milk and dairy related products were submitted and tested for regulatory purposes. Meat and meat related products accounted for 1,130 samples submitted. The remaining food and food related product samples accounted for 240 samples which may require multiple tests performed on each of them.

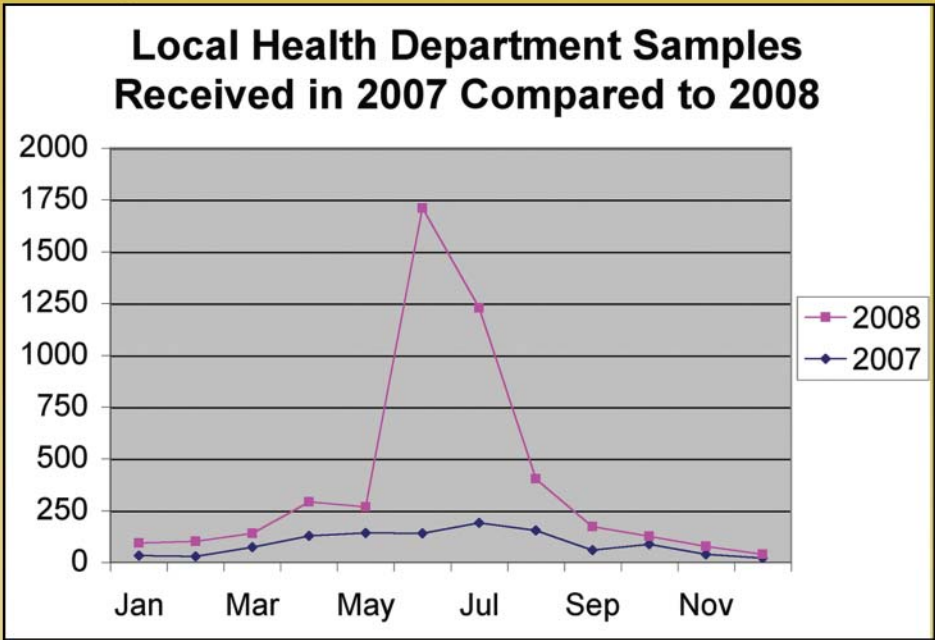


### Water Microbiology Laboratory

The ISDH Water Microbiology lab analyses water and occasionally soil samples to test for microbial contamination as well as drinking water for environmental and fecal contamination. In accordance with the Safe Drinking Water Act, the ISDH Water Microbiology Lab is responsible for a large part of the bacteriological analysis of public water supplies. The laboratory is certified to perform these analyses by the USEPA. An inspection by the USEPA is performed every three years, to insure the lab meets all standards.

Data collected is forwarded to the Indiana Department of Environmental Management (IDEM) for monitoring and enforcement. The ISDH Water Microbiology Lab also supports ISDH program areas such as Environmental Public Health and Food Protection. The Lab also assists county sanitarians in various investigations, checking surface water and some swimming pools when there has been a specific problem that is being investigated. We also support the county health departments and FEMA after flooding, by checking wells for contamination as demonstrated during the 2008

flooding. Other Indiana state agencies that utilize these lab services include the Department of Transportation, Department of Natural Resources, and BOAH. Tests on pools that are state owned are also performed. The lab also assists the general public by analyzing their private well water supplies when requested.



### Rabies Laboratory

The ISDH Rabies Laboratory is the only lab in Indiana that performs rabies testing and has played a vital role in protecting the health of Indiana citizens. In August 2008, the ISDH Rabies Laboratory moved to new laboratory space within the Indiana Health and Forensic Science Laboratory building; this new laboratory space increases the size and overall functionality of the ISDH Rabies Laboratory and allows for future enhancement to the testing protocol.

In 2008, the ISDH Rabies Laboratory received 1,641 specimens from 27 different types of animals. Thirteen specimens tested positive for the rabies virus by the direct fluorescent antibody (DFA) test. All thirteen positive specimens were bats that were submitted from 11 different counties.

The majority of rabies specimens are submitted from veterinary clinics/hospitals, animal control facilities/humane societies and county health departments.

The ISDH Rabies Laboratory performs testing on animals suspected of having rabies to provide information to physicians treating humans for animal bites or non-bite exposures, to provide information to veterinarians and animal owners in determining the cause of death for animals with neurological disease, and conduct rabies surveillance among animal species that may serve as likely rabies vectors in Indiana.

This lab provides a vital link in the protection of Hoosier's health against waterborne disease. The following table gives the number of samples and analyses broken down by our submitter types and the total for the year. Public Water Supplies (PWS) include any business or organization that supplies water to the public. They are further categorized as Community,

## Chemistry Laboratories

Non-community Non-transient (NCNT), and Non-Community Transient (NCT). Communities include Municipalities, Apartment Complexes, Mobile Home Parks and Residential Schools. NCNT include schools, daycares, manufacturing facilities where the same population is served every day. NCT includes Restaurants, Rest Areas, Parks, Churches, Banks, and other business which serve different populations on a daily basis. Not all PWS are open for the complete year, for instance campgrounds are typically open only during the warm months and closed the rest of the year. These facilities are further designated seasonal.

### Blood Lead Monitoring and Environmental Lead Assessment Activities

Lead is a toxic heavy metal that can cause irreversible brain damage when levels are elevated in the blood and young children are especially vulnerable. Lead is often found in our environment as a residual contaminant. Used as a pigment in paint for generations, lead-based paint is often found in homes built before 1978. As the paint film deteriorates, it sheds a chalky lead-containing dust that can contaminate a home's interior and surrounding exterior soil. Lead residues also contaminate soils and play areas exposed to exhaust from leaded gasoline. Ironically, even some traditional folk medicines may contain lead as well as some children's jewelry, toys, and even candies. Both the ISDH Blood Lead Lab and the Indoor Air Lab provide support to the Indiana Healthy Homes Program.

In 2008, the Blood Lead Laboratory screened over 14,000 children for elevated blood lead levels. Approximately 2.5% of the tests showed an elevated blood lead level and those children were referred for follow-up medical treatment, scheduled retesting and environmental assessments. Samples from the subsequent home investigations were sent to the ISDH Indoor Air Laboratory.

During 2008, the Indoor Air lab analyzed 3,200 paint samples and 2,800 dust wipe samples for lead. Of these, 49 percent of the paint samples exceeded the US Department of Housing and Urban Development (HUD) limit and 38 percent of the dust wipe samples exceeded the EPA limit. Dust wipe samples are taken from floors, walls and items such as toys to pinpoint the poisoning source.

Negative and clearance sample data are important, too. They may establish that a previously contaminated area is safe or is not a source of environmental lead. One notable case identified the source of a child's elevated blood lead level from a wipe of the parent's work clothing. Laboratory analysis determined the clothing was heavily contaminated with lead while the home's samples were acceptably lead-free. Working together, the ISDH Blood Lead and Indoor Air Labs protect the health of some of Indiana's most vulnerable citizens.

### Inorganic Chemistry Laboratory

The ISDH Inorganic Chemistry Laboratory functions as a support unit providing analytical laboratory services to IDEM, ISDH programs, and other state agencies and institutions. Laboratory services are also provided to local county health departments to assist in public health or environmental emergencies or investigations. Additionally, a citizen of Indiana may submit a water sample to the laboratory for analysis for a nominal fee. The tests include Fluoride, Sodium, Nitrate, and Nitrite analyses. In 2008, approximately 317,461 determinations were made on 83,406 samples submitted to the Inorganic Laboratory.

The Inorganic Laboratory is certified by the USEPA to analyze drinking water under the Safe Drinking Water Act (SDWA), as well as being certified

by National Lead Laboratory Accreditation Program to analyze soil; paint and dust wipe samples for lead. The laboratory can also analyze various other matrices, for example: waste water, rivers, streams, ditches, lakes, sediments, sludges, and the like. Food and beverage matrices are encountered when samples are submitted by the ISDH Food Chemistry laboratory.

These services are also provided to the ISDH Oral Health Program for their fluoridation program, ISDH Sanitary Engineering for their projects with the Indiana Geological Survey, the ISDH Lead Program of Maternal and Child Health (MCH), and Food Protection for their Bottled Water program as well as responding to consumer complaints. The laboratory also provides support to IDEM on a watershed project that involves the analysis of General, Nutrient, and Metal parameters on 10-15 sites monthly for a year.



The ISDH Laboratories participated in the Regional Laboratory Response Plan (RLRP) for Drinking Water exercise in which an unknown sample was delivered to the laboratory for emergency analysis. The sample was analyzed and results reported

within 24 hours. The sample was analyzed for Cyanide, Ammonia, Nitrates, Chlorides, Sulfates and Phosphorus. A semi-quantitative method on an ICP-MS instrument was used for the analysis of metals.

### Radiochemistry Laboratory

The ISDH Radiochemistry Lab provides analytical services to the ISDH, other Indiana State Agencies and Local Health Department and assists Federal Agencies in emergency situations. In 2008, the Radiochemistry Laboratory analyzed 764 samples for radioactivity.

The ISDH Radiological Emergency Response Program responds to incidents throughout the State involving radioactive materials. These incidents can take place at countless locations: schools, scrap yards, hospitals, or vehicular accidents. Once unknown radioactivity has been found in the

public domain, it must be investigated, secured and identified and proper disposal must be arranged. In 2008, a cesium-137 device and a radium static eliminator bar were found at a scrap yard in Warsaw. A majority of the other incidents involved naturally occurring radioactive materials (radium, thorium, and uranium). The ISDH Radiochemistry Lab assists with the identification and provision analytical of results for disposal.



### Organic Chemistry Laboratory

The ISDH Organic Chemistry Laboratory functions as a support unit providing analytical laboratory services to IDEM, ISDH programs, and other state agencies and institutions. Laboratory services are also provided to local county health departments to assist in public health or environmental emergencies or investigations. The ISDH Organic Laboratory is certified by the USEPA to analyze drinking water under the Safe Drinking Water Act (SDWA). The Organic Laboratory's analytical services include pesticide/herbicide, toxic industrial chemicals (TIC) and volatile organic compounds (VOC) analyses. In 2008, approximately 41,918 determinations were made on 1,879 samples submitted to the Organic Laboratory. An important function of the Organic Chemistry Laboratory is to support

the IDEM Water Quality program which monitors pesticides and other chemicals in the rivers and streams of Indiana. Monitoring pesticide levels at a certain place in a river or stream over time allows historical data to be used in studying the types and amounts of pesticides run-off into a river or stream due to agricultural use. These pesticides can have a harmful effect on fish and other aquatic life. They can also bioaccumulate, causing bans or warnings to be issued for fish consumption. The ISDH Organic Chemistry Laboratory provided data for 33 different pesticides on a total of 263 samples from a variety of locations in the rivers, streams, lakes, and canals of Indiana. Over the years, this data can also be used as a baseline history of a body of water, potentially pointing out spills and improper discharges. The ISDH Organic Chemistry Laboratory protects the health of the citizens of Indiana by providing this important pesticide data to the IDEM - Water Quality Branch.

### **Food Chemistry Laboratory**

The ISDH Food Chemistry Laboratory serves an important role in food safety for Federal, State and Local government agencies by performing chemistry analyses on meat, dairy and grocery food items. The lab also supports terrorism preparedness by participating in the FDA's Food Emergency Response Network (FERN). Recently, the laboratory welcomed the Indiana Lead and Healthy Homes Program (ILHHP), a division of the ISDH, as a new customer in 2008.

The ISDH Food Chemistry Laboratory supports USDA programs with the analysis of dairy products for pesticides, PCBs, Protein and Vitamins. The surveillance program is run by USDA and Board of Animal Health and the samples are submitted to the Food Chemistry Laboratory. This lab receives about 300 to 400 samples a year.

The ISDH Food Protection Division and local health departments which serve the individual citizens of Indiana are also supported by the ISDH Food Chemistry Laboratory. This involves sample analysis for the investigation of consumer complaints and surveillance programs. About 350 samples are received in a year.

The ISDH Food Chemistry Laboratory participates in USDA, FDA and FERN proficiency evaluation programs. In 2008, six samples were analyzed for the USDA, three for the FDA and three for FERN. The FERN proficiency samples are a test of the laboratory's abilities to detect toxic compounds that might potentially be used in a terrorism event. The products sent were milk, romaine lettuce and apple juice.

Food samples involved in suspected poison cases can also be processed in this lab area. In 2008, three were submitted by police departments. They were a chili cheese burger sandwich possibly containing arsenic, a submarine sandwich possibly containing drugs and heavy metals and a coffee creamer suspected in a spousal poisoning case. Additionally, an animal control agency submitted food samples that were used to poison a dog.

Two new testing procedures were added in 2008. The detection of percent protein in ice cream is useful for determining if a manufacturer is using inappropriate ingredients to manufacture ice cream. Melamine testing in infant formula was the other test added to the laboratory testing procedures.

### **Biological Emergency Preparedness**

The ISDH Laboratory is a Laboratory Response Network (LRN) Reference Laboratory providing confirmatory testing for potential agents of bioterrorism referred from Indiana LRN Sentinel Clinical Laboratories. Eleven isolates submitted by sentinel laboratories in 2008 for rule-out testing of biothreat agents were negative. The 12 environmental specimens submitted were also negative.

### **Chemical Emergency Preparedness**

The ISDH Laboratory is a Level 2 LRN Laboratory that can detect chemicals and their metabolites in clinical specimens collected from individuals exposed to toxic chemicals.

### **Food Emergency Preparedness for Chemical Contaminants**

The ISDH Laboratories analyzes food samples for chemical contaminants implicated in terrorist events or contamination. The 2008 melamine contamination in milk products is an example of a large-scale food emergency requiring our laboratory participation.

### **Food Emergency Preparedness for Microbiological Agents**

The ISDH Laboratories analyzes food samples for microorganisms implicated in contamination or terrorist events. The ability to rapidly provide laboratory testing assistance, such as in the 2008 multi-state Salmonella contamination of peppers, is an example of our capability to respond to large-scale food emergencies.

### **Food Emergency Preparedness for Radiological Contaminants**

The ISDH Laboratories analyze food samples for radiological contaminants implicated in terrorist events or contamination.

### **Laboratory Information Management Systems**

The ISDH has been working diligently to keep pace with technology to provide our many test submitters with electronic test submission and results tracking. By utilizing the programs STARLIMS and LimsNet, ISDH has begun streamlining the labs' operations, reducing error rates, and saving on labor. Any current test submitter to ISDH is eligible to take advantage of the benefits of this service.

In 2008, the LIMS automation project implemented Hepatitis C, Hepatitis A/B, HIV, and Herpes virus in the LimsNet and STARLIMS applications. Test submitters throughout the state enter patient demographic information and test requests into LimsNet prior to mailing the specimen. Use of the LimsNet system streamlines the test submission process and improves accuracy. For example, during October and November of 2008, 22,033 test requests were submitted to the ISDH Labs via LimsNet for CT/GC, Hepatitis, HIV, and Syphilis tests and had an error rate of 2.02%. From the remaining test submitters still utilizing paper, there was an error rate of 6.46% associated with the 1,084 tests submitted.

Once the specimen is received and accessioned ISDH Labs analysts enter test status and results into the STARLIMS system. Test submitters can track the status of their specimens via LimsNet, as well as view test results. The next assays to be implemented include Influenza, VZV, Tuberculosis and Blood Lead. There will be several other assays added in 2009 and even more beyond that being planned for future implementation.

### **Drinking Water Laboratory Certification**

The ISDH Laboratories operates a program for the certification of other laboratories performing chemical testing and EPA approved bacteriological examinations of drinking water for public water supplies. The program conducts on-site evaluations for laboratories in Indiana every three years, evaluates proficiency testing data from the



on-site evaluations for microbiology in 2008. Laboratories outside Indiana are certified based on their home state certification. There are 25 in-state laboratories and 45 out-of-state laboratories in the chemistry laboratory certification program and 60 in-state and 10 out-of-state laboratories in the microbiology certification program. Certified laboratories can also provide testing for owners of private wells.

### Laboratory Outreach

There are many key players throughout the state of Indiana who contribute to what is known as a State Public Health Laboratory System. The ISDH Labs aim to establish a more formalized relationship with these players that contribute to laboratory functions on a state level. Within the last year the ISDH Labs has focused its outreach efforts on our state's clinical labs (clinic and hospital based as well as independent commercial labs), also known as sentinel laboratories. These sentinel laboratories are those labs that would most likely encounter agents of bioterrorism in an unannounced attack. In addition to being on the front line of disease detection, many of these labs are regular submitters for routine testing to the ISDH Labs.

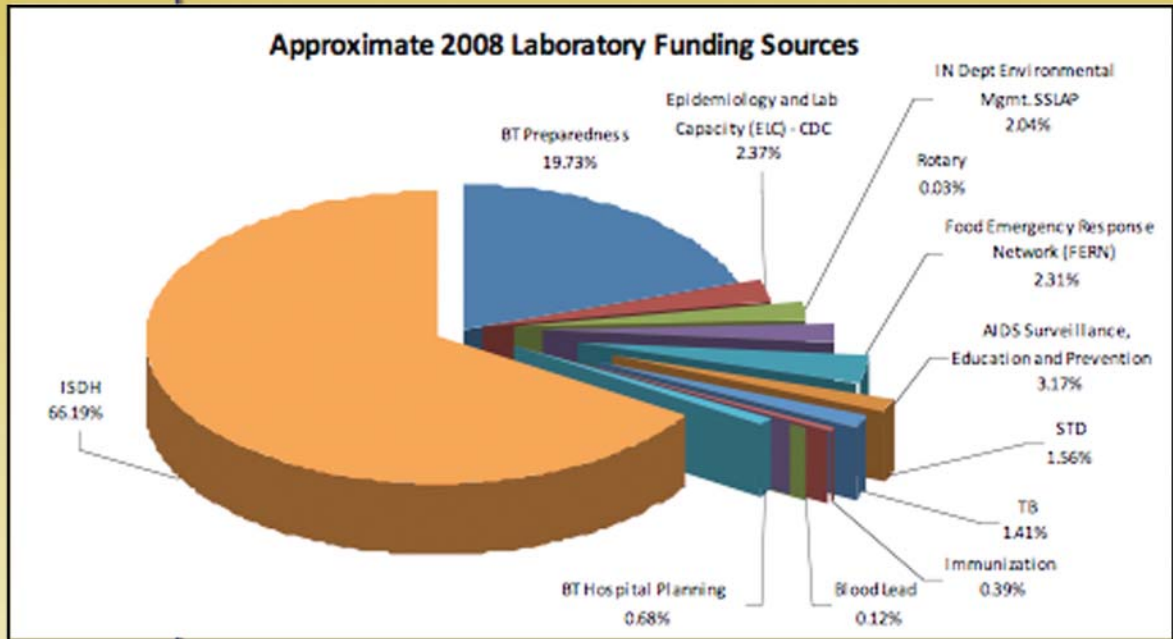


The ISDH Labs have been working to get to know all of the sentinel labs better in order to understand how we can best meet their needs in terms of receiving communication from the ISDH Labs and to offer trainings that will suit their needs as laboratory scientists. Through online surveys, the ISDH Labs have collected an abundance of information from sentinel labs including personnel contact information, available test methodologies, and readiness for emergency situations. The ISDH Labs have also begun offering trainings for sentinel labs including: a clinical microbiology seminar, packaging and shipping workshops and hands-on bioterrorism workshops. The ISDH Labs will

continue to broaden the scope of outreach with the goal of positively affecting various aspects of our state's Public Health Laboratory System.

# Financial Profile

Funding Source	Dollar Amount	Percentage
BT Preparedness	\$1,935,501.00	19.73%
Epidemiology and Lab Capacity (ELC) - CDC	\$ 232,103.00	2.37%
IN Dept Environmental Mgmt. SSLAP	\$ 200,000.00	2.04%
Food Emergency Response Network (FERN)	\$ 226,200.00	2.31%
Aids Surveillance, Education and Prevention	\$ 310,563.23	3.17%
STD	\$ 153,115.00	1.56%
TB	\$ 138,357.42	.41%
Immunization	\$ 38,716.00	0.39%
Blood Lead	\$ 12,000.00	0.12%
Rotary	\$ 3,322.55	0.03%
BT Hospital Planning	\$ 66,882.63	0.68%
ISDH	\$6,493,868.51	66.19%
<b>Total</b>	<b>\$9,810,630.29</b>	<b>100.00%</b>



# ISDH Laboratory Contacts

## ISDH Laboratory Contacts

ISDH Laboratory  
CLIA 15D0662599

Mailing and Physical address:  
ISDH Laboratories  
550 W 16th St, Suite B  
Indianapolis, IN 46202

### Contact Us

#### Telephone Numbers

Operator.....317.921.5500  
After Hours Emergency.....317.233.1325 or 317.921.5500  
State Emergency Operations Center.....800.669.7362

#### Laboratory Senior Staff

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Thomas C. Cronau – Environmental Microbiology Division  
Director.....317.921.5850  
Robin Bruner - Chemistry Division Director.....317.921.5559  
David Dotson - Emergency Preparedness and Virology Division  
Director.....317.921.5545  
Lixia Liu, PhD, MP (ASCP)- Clinical Microbiology and Emergency  
Preparedness Division Chief.....317.921-5832

#### Phone Numbers for Lab Services

##### Shipping containers:

Clinical .....317.921.5875  
Water .....317.921.5874

State Laboratory Training Coordinator: Shelley Matheson.....317.921.5890  
Laboratory Program Advisor: Ellie Carter.....317.921-5556  
Hospital Laboratory Training: Jim Hogan.....317.921.5519

##### Information Technology - StarLIMS Help

Desk.....888.535.0011 & 888.535.0012

##### Drinking Water Microbiology Certification:

Mary Robinson.....317.921.5523  
Drinking Water Chemistry Certification: Phil Zillinger.....317.921.5571

#### MICROBIOLOGY

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Food and Dairy Microbiology: Elgaali Hesham, Supervisor.....317.921.5813  
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Rabies and Molecular Virology: Mark Glazier, Supervisor.....317.921.5842  
Reference Microbiology: Jon Radosevic, Supervisor.....317.921.5860  
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#### CHEMISTRY

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Visit us on the ISDH Website: <http://www.in.gov/isdh/22421.htm>