Louisiana Morbidity Report

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November-December, 2019 **Volume 30, Number 6**

Gnathostomiasis Associated with Consumption of Ceviche Made from Louisiana Freshwater Fish

Jenna Iberg Johnson, MSPH

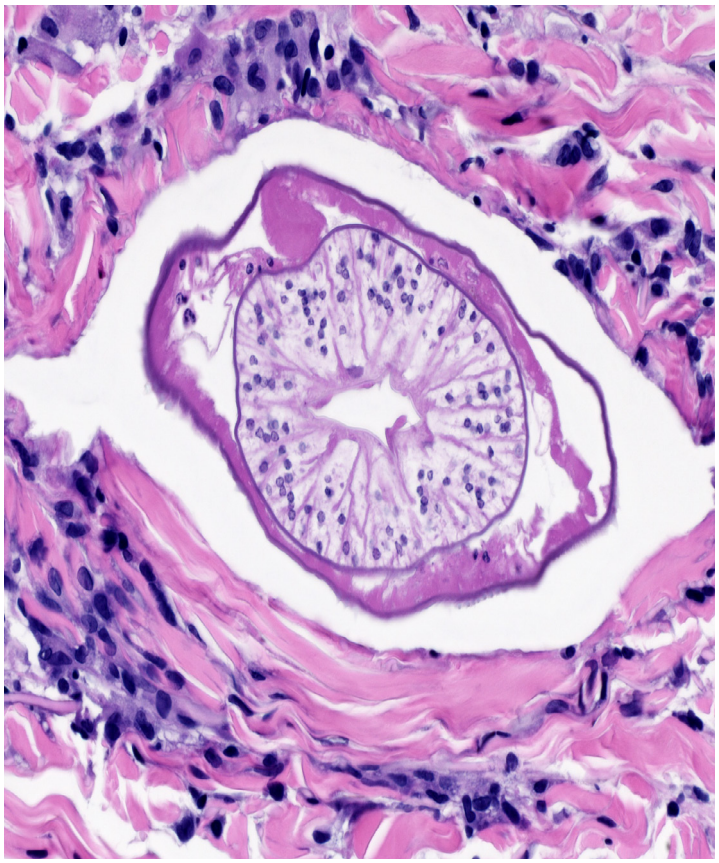
A patient presented to a dermatologist complaining of a painful red streak of swelling on his abdomen and severe itching of his hands, feet, and legs. He also reported feeling very inflamed throughout his body and skin. Additionally, he reported his sense of smell and taste were off, and he had trouble breathing.

His initial symptoms began with larval migrans, which first appeared on one side of the back of his ribs. Two weeks later it appeared on the other side of his ribs. The inflammatory systemic symptoms developed a couple of weeks after the rash.

The dermatologist suspected a migratory nematode larva. A biopsy was taken of the swelling and it was morphologically identified by the Centers for Disease Control and Prevention (CDC) Infectious Disease Pathology Branch (IDPB) as *Gnathostoma* species based on the spines on the organism, intestinal cell morphology, and the musculature.

Gnathostomiasis is an infection caused by several species of parasitic worms of the genus Gnathostoma. The disease is most commonly diagnosed in Southeast Asia, but has also been found in other areas of Asia, South and Central America, and some areas of Africa. Human disease results from consumption of undercooked or raw freshwater fish, eels, frogs, birds, and reptiles. Symptoms include migratory swellings under the skin and eosinophilia. The parasite can enter other tissues including the liver, eye, nerves, spinal cord, or brain, resulting in vision loss or blindness, nerve pain, paralysis, coma and death, however this rarely occurs. Ivermectin and albendazole are used to treat gnathostomiasis.

Photo: Gnathostoma infection, identified by hematoxylin and eosin (H&E) stain of skin. Courtesy of CDC



The patient reported frequent fishing of freshwater bream and largemouth bass, in southeast Louisiana, and consuming ceviche which he prepared at home a couple weeks prior to symptom onset. The patient reported no international travel in over twenty years prior to onset and had no recollection of consuming fish during any international travel.

Gnathostomiasis is not a reportable condition in Louisiana, nor is it nationally notifiable. In fact, this is the first reported case of Gnathostomiasis in Louisiana associated with local fish. The CDC reports that various species of Gnathostoma have been identified

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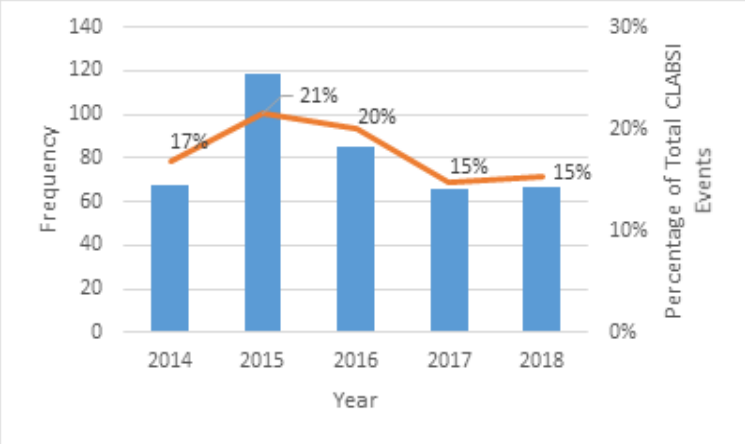
Recent Trends in Central Line-Associated Candidemia

Grace Lee MD, MPH

Candida are yeast that normally live on the skin, mucous membranes, and in the intestinal tract, and are also a common cause of bloodstream infections. Rates of candidemia in the United States (US) decreased from 2009-2013 due to improved infection control practices, but rates have since stabilized and *Candida spp.* continue to remain important pathogens in healthcare-associated infections, especially in critically ill patients. Risk factors for developing invasive candidiasis include having a central venous catheter, time spent in the intensive care unit, being immunocompromised, recent surgery, receiving total parenteral nutrition, and having kidney failure or being on hemodialysis. Understandably, increased importance is being placed on novel multi-drug resistant organisms (MDROs) in the setting of healthcare-associated infections (HAIs), but a better understanding of common causes of HAIs is warranted. This report aims to characterize central-line associated blood-stream infections (CLABSI) due to Candida species in Louisiana, based on data from the Centers for Disease Control and Prevention (CDC) National Healthcare Safety Network (NHSN).

From January, 2014 to December, 2018, there were 405 reported events of CLABSI due to *Candida spp.*, an average of 81±22.6 events per year (range 66-119 events). There was no significant difference in the percentage of CLABSI due to *Candida spp.* by year.

Figure 1: Frequency and Percentage of CLABSI due to *Candida spp.* in Louisiana, 2014-2018



There was an even distribution of events by gender (50.6% female, 49.4% male), and the mean age of patients was 57.5 ± 20.5 years. The majority (72%) of events occurred after 50 years of age. The distribution pattern of *Candida spp.* reflects published patterns of increasing non-*Candida albicans* infections in the US, with 61% of isolates identified as non-*C. albicans* species. Of note, *C. albicans* and *C. parapsilosis* were the predominant species in the pediatric population, while *C. glabrata* was increasingly more prevalent in older populations.

(continued on page 5)

Web Announcements & Updates

Infectious Disease Epidemiology (IDEpi) Webpages
http://infectiousdisease.ldh.la.gov

Annual Updates: Lyme Disease

Arboviral Updates: Arbovirus Surveillance Summary, Zika Testing Guidelines, Zika Public Information Sheet

HAI/AR: Emerging Infectious Diseases Workshops 2020

Disease Summary Updates: Meningococcal Disease (PowerPoint)

Veterinary-Rabies Updates: Louisiana Hospitals that Carry the Rabies Vaccine, Ordering Rabies Vaccine and HRIG, Toxoplasmosis

Viral Respiratory/Influenza Updates: Weekly Surveillance Reports

Louisiana Morbidity Report
Volume 30, Number 6 November-December, 2019

The Louisiana Morbidity Report is published bimonthly by the LDH, OPH Infectious Disease Epidemiology Section to inform physicians, nurses, and public health professionals about disease trends and patterns in Louisiana. Address correspondence to Louisiana Morbidity Report, Infectious Disease Epidemiology Section, Louisiana Department of Health, P.O. Box 60630, New Orleans, LA 70160.

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Low Risk of Lyme Disease in Louisiana

Sean Simonson, MPH

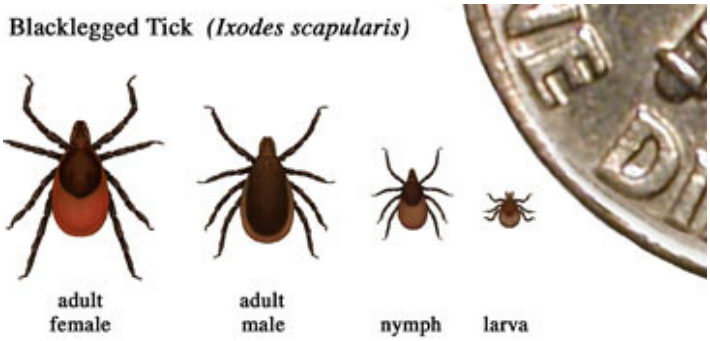

Photo: Life stages of the *Ixodes scapularis* tick which is commonly known as the black-legged tick. Courtesy of CDC

Tickborne diseases are on the rise in the United States, with the number of cases reported more than doubling from 2004 to 2016. In fact, according to CDC, tickborne diseases make up more than 75% of all vectorborne disease cases reported, which includes mosquito and flea-borne diseases. Of these tickborne diseases, Lyme disease is by far the most commonly reported, accounting for 82% of all tickborne disease cases.

The total number of Lyme disease cases reported in the United States has steadily risen over the years, reaching over 40,000 cases in 2017. However, less than 5% of cases came from outside of the upper Midwest and Northeast. In the rest of the country, rates remain relatively low and stable year to year. There are many reasons for this difference, but there are **three key** reasons the South has so many fewer cases.

-**Tick Behavior** – When ticks are seeking hosts, they find an ideal spot and spread out their arms in what is known as "questing." Typically they do this along paths on top of sticks and foliage. However, the southern heat can be deadly to ticks, who run the risk of drying out. To avoid this, southern blacklegged tick nymphs more commonly quest away from the sun, typically under the leaf litter, where they are less likely to encounter a human host. Researchers have shown this difference in behavior between northern and southern ticks from several states.

-**Tick Predators** – Probably more familiar to residents of Louisiana than the blacklegged tick is another small nuisance – the red fire ant. Red fire ants were introduced to the United States in 1930 and have gradually spread throughout the Southeast, halted in their expansion by cold weather further north. In terms of Lyme disease, these fire ants perform two important functions. First, they reduce the number of tick hosts such as mice and secondly, they eat ticks themselves. In addition, a 2015 study by Castellanos, et al showed that areas with red fire ants had significantly fewer ticks in a given area, meaning that the potential for human exposure is reduced even further.

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(Gnathostomiasis ... continued from page 1)

in Louisiana vertebrates, including *G. procyonis,* in raccoons, and *G. turgidum*. While *G. turgidum* has mostly been studied in coastal Gulf regions of Mexico, it has also been reported historically in Louisiana and Texas. Although the presence of the parasite in Louisiana fish has not been very well studied, it would be expected that the parasite would be present in the cold-blooded intermediate hosts (fish, frogs, snakes, etc.) in areas where the parasite is common in the mammalian definitive hosts.

Photo: *Gnathostoma spinigerum* parasite, head of third-stage larva. Courtesy of CDC

According to information published by seafoodhealthfacts.org, preparing fish as ceviche by marinating the fish in lime juice does not kill parasites that may be present. Raw or undercooked freshwater fish, eels, frogs, birds, and reptiles should not be eaten. Parasites that are the most common concern in seafood include nematodes or roundworms *(Anisakis spp., Pseudoterranova spp., Eustrongylides spp., and Gnathostoma spp.)*, cestodes or tapeworms *(Diphyllobothrium spp.)* and trematodes or flukes *(Chlonorchis sinensis, Opisthorchis spp., Heterophyes spp., Metagonimus spp., Nanophyetes salminicola and Paragonimus spp.).* Some products that have been implicated in human infection include: ceviche (fish and spices marinated in lime juice); lomi (salmon marinated in lemon juice, onion and tomato); poisson cru (fish marinated in citrus juice, onion, tomato and coconut milk); herring roe; sashimi (slices of raw fish); sushi (pieces of raw fish with rice and other ingredients); green herring (lightly brined herring); drunken crabs (crabs marinated in wine and pepper); cold-smoked fish (lox); and undercooked grilled fish.

The Food and Drug Administration (FDA) recommends the following methods for fish preparation, or storage, to kill parasites:

-Freezing and storing at -4°F (-20°C) or below for 7 days (total time), or

-Freezing at -31°F (-35°C) or below until solid and storing at -31°F (-35°C) or below for 15

-Freezing at -31°F (-35°C) or below until solid and storing at -4°F (-20°C) or below for 24 hours

More information about seafood preparation for consumption can be found at https://www.seafoodhealthfacts.org/seafood-safety/general-information-healthcare-professionals/seafood-safety-topics/parasites. If you have questions about this article, contact Jenna Iberg Johnson at jenna.ibergjohnson@la.gov.

Is Powdered Infant Formula Sterile?

In a previous letter to healthcare professionals, the Food and Drug Administration (FDA) said that powdered infant formulas are not "commercially sterile products" because, unlike liquid formula products, they are not heated long enough to achieve sterility. Most powdered infant formula are prepared from pasteurized milk, not sterilized milk. Accordingly, pasteurized milk is free from enteric pathogens such as *Escherichia Coli (E.coli)*, Salmonella, and Shigella.

Photos: Powdered infant formula products, Courtesy of United States Department of Agriculture (left) and CDC (center and right)

Therfore, if you are dealing with an infant diagnosed with salmonella, shigella or *E. coli,* who consumed infant formula prepared from a powdered product and good drinking water (preferably boiled), you can assure the parents that the infection does not come from the powdered formula.

However, for those infants in a neonatal intensive care unit (NICU), who may be immuno-compromised, it is best to use a milk based on STERILIZED MILK instead of pasteurized milk. The Food and Drug Administration, citing a risk of serious infections with *Enterobacter sakazakii*, recommended that milk-based powdered infant formulas not be used in neonatal intensive care units (NICUs) unless there is no alternative. The recommendation was issued in conjunction with a CDC report of a case in which the death of a newborn infant in Tennessee was linked with *E. sakazakii* in powdered formula in 2002. Powdered formulas are widely used in NICUs, and several outbreaks of *E sakazakii* infection in NICUs have been associated with powdered formulas.

E. sabazakii is an emerging foodborne pathogen that can cause sepsis, meningitis, or necrotizing enterocolitis in newborn infants, particularly premature infants or other infants with weakened immune systems. The agency said that if powdered formula is the only option, the following precautions will reduce the risk of infection:

-Reconstituting powdered formula with boiling water and refrigerating it before feeding. Conversly, this option will cause some loss of water-soluble vitamins;

-Preparing only a small amount of formula for each feeding;

-Minimizing the holding time before reconstituted formula, either chilled or at room temperature, is used.

More information about infection risk and powdered infant formulas is available at *http://www.cidrap.umn.edu/news-perspective/2002/04/fda-warns-infection-risk-powdered-infant-formulas*. To view the full text on *Enterobacter sabazakii* infections associated with powdered infant formula go to *https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5114a1.htm*.

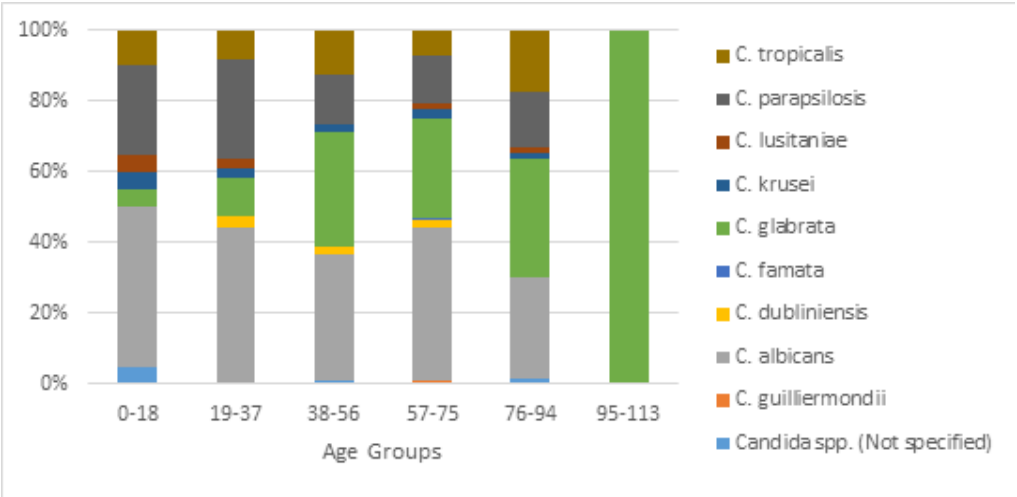
Call for Antibiograms

The Healthcare Associated Infections and Antibiotic Resistance (HAI/AR) Program is collecting 2018 Louisiana hospital antibiograms. Contact Ashley Terry, MPH, CPH, CIC at *ashley.terry@la.gov* with inquiries or for guidance with submissions. General questions and answers about this report can be found at *http://ldh.la.gov/assets/oph/Center-PHCH/Center-CH/infectious-epi/AntibioticSensitivity/LaAntibiogramQA1.pdf.*

The latest statewide Antibiogram Report is available for viewing at *http://ldh.la.gov/assets/oph/Center-PHCH/Center-CH/infectious-epi/AntibioticSensitivity/LAAntibiogram/LouisianaAntibioticResistance2016_FINAL.pdf*

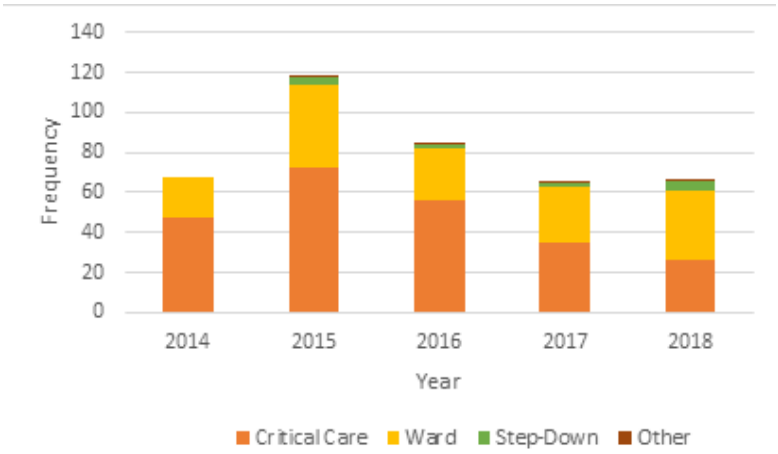
Recent Trends...continued from page 2

Figure 2: Distribution Pattern of *Candida spp.* in CLABSI by Age Group in Louisiana, 2014-2018



As shown below, a slight majority (58%) of the events occurred in critical care units, with 38% of events occurring in the general ward, and this was consistent by year. This is not unexpected, as invasive candidiasis typically develops in more critically ill patients. Of the events, 26.4% resulted in death, though death attributable to candidemia was low (9%). Events occurring in critical care units had a higher mortality rate (36%) compared to the general ward (11.8%).

Figure 3: Location of Acute Care CLABSI events due to *Candida spp.* in Louisiana, 2014-2018



Longer time from admission to event was associated with CLABSI due to *Candida spp.* (median 17 days, range 3-1114 days), compared to CLABSI not due to *Candida spp.* (median 15 days, range 3-648 days). Only a minority (3%) of events had documented neutropenia, which may be a reflection of antifungal prophylaxis in this patient population. Co-infection with a MDRO was not common and only occurred in 3% of cases.

Multi-drug resistant *C. auris* has not been reported in Louisiana. None the less, with the persistence of *Candida* as a healthcare-associated pathogen, especially in the context of increasing non-*C. albicans* species, infection control and prevention practices must continue to take *Candida spp.* into consideration.

For more information or if you have questions about this article, contact Grace Lee, MD at glee2@tulane.edu.

World Leprosy Day will be observed on January 26, 2020
to increase public awareness of Leprosy, now referred to as Hansen's Disease.

See http://ldh.la.gov/assets/oph/Center-PHCH/Center-CH/infectious-epi/EpiManual/LeprosySummary.pdf for a summary about Hansen's disease.

Monitoring West Nile Neuro-Invasive Disease

West Nile viral infection causes three different clinical pictures: Asymptomatic infection, Neuro-Invasive disease, and West Nile Fever.

Asymptomatic infection accounts for some 80 percent of infections. However, the only method to confirm the incidence of asymptomatic cases is through population-based surveys. One such survey was conducted in St. Tammany Parish in October, 2002 because of its high West Nile Virus (WNV) activity. St. Tammany was chosen to establish the community-wide prevalence of recently acquired WNV infection. As a result, a household-based serosurvey was carried out in and around Slidell, Louisiana. A two-stage cluster method was utilized to select a representative sample of households. According to census data, the population of Slidell at that time was 45,672. Louisiana residents from at least 10 households, in each of 70 randomly selected clusters, were invited to participate resulting in 758 participating households and 1,226 individuals.

Among 1,226 participants, 21 had serological evidence of recent WNV-infection (seroprevalence = 1.7%) with a (95% confidence interval, [CI] = 0.8%–2.6%). Additionally, seroprevalence ranged from 3.9% among participants aged 15–24 years to 1.0% among those ≥ 65 years. However, differences were not statistically significant (p = 0.31), and no difference in seroprevalence existed between female and male participants (both 1.7%). The 21 seropositive participants lived in 20 different households distributed among 17 clusters in no discernable geographical pattern.

Nine (48%, CI = 22%–74%), of 20 seropositive, reported a febrile illness between June and October 2002, compared to 212 (18%) of 1,191 seronegative participants. WNV seropositivity was thus associated with a febrile illness (p = 0.01) with an estimated 30% of the seropositive participants having febrile illness attributable to a recent WNV infection (95% CI = 7%–53%). In contrast, the percentage of participants reporting symptoms of West Nile Fever (WNF) was similar among seropositive and seronegative participants (4.2% vs. 4.4%, respectively; p = 0.96).

Neuroinvasive disease presents in about 1% to 2% of the population, particularly in those 65 and over. Most of these cases are severe and require the patient to be hospitalized, tested, and reported to the Infectious Disease Epidemiology Section. As a result, less than 1% would be missed, particularly if the patient presented with other deficits in brain function such as a stroke. One concern is the distribution of persons ages 65 and over, since the 2000 census showed the proportion of this population in the 64 Louisiana parishes varied from 14% to 17%. Still, none of these minor variations had statistical influence on endemicity monitoring.

West Nile Fever occurs in some 10% to 20% of infections. Testing for WNF was restricted at the beginning and available only at the CDC laboratory. It later became available in commercial laboratories. A major flaw with this method is that laboratory testing depends on multiple factors including the availability of testing in rural areas, and the variability of seeking testing. For example, some patients seek testing for minor symptoms, while others ignore mild symptoms. In short, using WNF testing to evaluate West Nile endemicity is not reliable. Thus, **West Nile Neuro-Invasive Disease** is the **ONLY** reliable method to monitor WNV disease incidence.

(Lower risk of lyme ... continued from page 3)

-**Disease Reservoir** – For ticks to be able to transmit Lyme disease to humans, they first have to pick up the bacteria *Borrelia burgdorferi* from a previous host. The main reservoir in nature for this bacteria is the mouse. Mice are the main hosts of blacklegged ticks in the northeast, where up to 50% of ticks may carry the pathogen. In southern states, blacklegged ticks in early life stages commonly feed on lizards and snakes, which are not typically carriers of the bacteria. Due to this feeding behavior, ticks are far less likely to be carriers of the pathogen in the first place.

Collectively, these factors help demonstrate why the risk for Lyme disease remains low in Louisiana: humans are less likely to encounter ticks and the ticks they do encounter are less likely to carry the disease. Case counts have remained low in Louisiana. Of those reported, more than 75% traveled to the northeast prior to illness. The latest annual report for Louisiana is available at *http://ldh.la.gov/assets/oph/Center-PHCH/Center-CH/infectious-epi/Annuals/Lyme_LaIDAnnual_2018.pdf*

The best protection to prevent all tickborne diseases is to use insect repellant and wear protective clothing when appropriate. It is also important to check yourself and pets for ticks after outdoor activity. More information on Lyme disease and tick prevention can be found at *https://www.cdc.gov/lyme/.* For questions contact Sean Simonson at *sean.simonson@la.gov.*

Save the Date

Healthcare-associated Infections and Emerging Infectious Diseases (EID) Workshops 2020

Healthcare-associated infections and emerging antimicrobial-resistant threats pose serious threats to the health of Louisianans. This workshop targets infection preventionists, laboratorians, and other infectious disease personnel across the provider spectrum who have roles in infection surveillance and reporting. These are full-day workshops which are free of charge.

View the complete agenda at *file:///C:/Users/mbwalker/AppData/Local/Microsoft/Windows/INetCache/Content.Outlook/G8G3H01J/Agenda_HAIEID20_Web_Final.pdf*

Locations

January 28, 2020: East Bank Regional Library (Metairie)
February 4, 2020: Willis Knighton Bossier Health Center
February 5, 2020: Lafayette General Hospital
Whitney Bank Building

Registration is required: *http://ldh.la.gov/index.cfm/page/3818*

Table 1. Communicable Disease Surveillance, Incidence by Region and Time Period, September-October, 2019

DISEASE		HEALTH REGION 1	2	3	4	5	6	7	8	9	TIME PERIOD Sept-Oct 2019	Sept-Oct 2018	Jan-Oct Cum 2019	Jan-Oct Cum 2018	Jan-Oct % Chg*
Vaccine-preventable															
Hepatitis B Acute[3]	Cases	2	2	3	0	1	1	0	1	2	12	14	62	45	37.8%
	Rate[1]	0.2	0.4	0.8	0.0	0.4	0.3	0.0	0.3	0.5	0.3	0.3	1.4	1.0	NA*
Measles (rubeola)[4]		0	0	0	0	0	0	0	0	0	0	0	0	2	NA*
Mumps[4]		0	0	0	0	1	5	0	2	0	8	7	206	21	881.0%
Rubella[3]		0	0	0	0	0	0	0	0	0	0	0	0	0	NA*
Pertussis[4]		3	0	0	0	0	0	2	1	1	7	12	72	107	-32.7%
Sexually-transmitted															
HIV/AIDS	Cases[2]	46	31	6	14	11	10	19	15	12	164	151	813	823	1.2%
	Rate[1]	5.1	4.5	1.5	2.3	3.6	3.3	3.5	4.3	2.0	3.5	3.2	17.4	17.7	N/A*
Chlamydia	Cases	1398	911	475	688	190	320	828	544	406	5760	6570	30156	31212	-3.4%
	Rate[1]	156.2	133.7	119.3	113.6	62.4	106.5	154.3	155.8	69.0	123.6	141.0	647.1	669.8	0.0
Gonorrhea	Cases	484	306	153	218	95	121	358	250	142	2127	2220	10500	10118	3.8%
	Rate[1]	54.1	44.9	38.4	36.0	31.2	40.3	66.7	71.6	24.1	45.6	47.6	225.3	217.1	0.0
Syphilis (P&S)	Cases	13	16	3	6	6	10	11	13	7	85	137	528	570	-7.4%
	Rate[1]	1.5	2.3	0.8	1.0	2.0	3.3	2.0	3.7	1.2	1.8	2.9	11.3	12.2	N/A*
Enteric															
Campylobacter[4]		9	19	4	50	6	7	7	14	7	123	155	742	683	8.6%
Hepatitis A[3]	Cases	14	27	1	2	0	2	2	24	20	92	7	576	22	2518.2%
	Rate[1]	1.3	4.8	0.3	0.4	0.0	0.7	0.4	6.8	5.2	2.1	0.2	13.3	0.5	2518.2%
Salmonella[4]	Cases	28	39	19	58	24	32	18	35	32	285	326	1083	1021	6.1%
	Rate[1]	2.7	6.9	5.0	11.2	9.0	10.5	3.6	10.0	8.3	6.6	7.6	25.1	23.7	NA*
Shigella[4]	Cases	10	27	3	38	9	31	1	4	22	145	45	442	193	129.0%
	Rate[1]	1.0	4.8	0.8	7.4	3.4	10.2	0.2	1.1	5.7	3.4	1.0	10.2	4.5	129.0%
Vibrio cholera[3]		0	0	0	0	0	0	0	0	0	0	1	0	2	NA*
Vibrio, other[4]		4	1	2	4	1	1	0	2	3	18	23	95	99	NA*
Other															
H. influenzae (invasive)[4]		3	0	2	1	0	1	1	2	1	11	0	67	71	-5.6%
N. Meningitidis (invasive)[4]		0	1	0	0	0	0	0	0	0	1	8	3	0	NA*

1 = Cases Per 100,000

2=These totals reflect persons with HIV infection whose status was first detected during the specified time period. This includes persons who were diagnosed with AIDS at time HIV was first detected. Due to delays in reporting of HIV/AIDS cases, the number of persons reported is a minimal estimate. Data should be considered provisional.

3=Confirmed cases 4=Confirmed and Probable cases

* Percent Change not calculated for rates or count differences less than 5

Table 2: Diseases of Low Frequency (January-October, 2019)

Disease	Total to Date
Legionellosis[3]	49
Lyme Disease[4]	8
Malaria[3]	6
Rabies, animal	6
Varicella[4]	58

Table 3: Animal Rabies, (November-December, 2019)

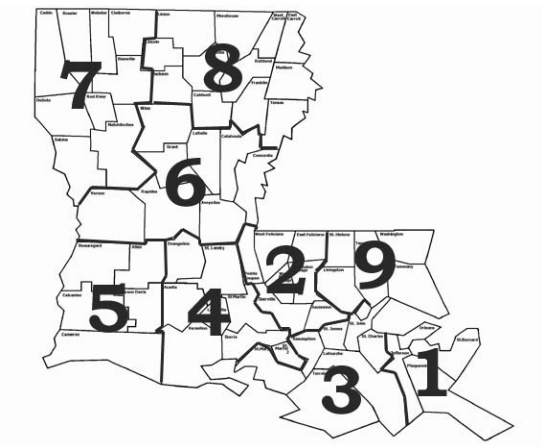
Parish	No. Cases	Species
East Baton Rouge	1	Brazilian Freetail bat

Errata to the September-October 2019 issue:

Table 2: Rabies, animal total to date, January-October 2019 = 5

Table 3: Animal rabies September-October 2019, No. Cases = 0

Figure: Department of Health Regional Map



Sanitary Code - State of Louisiana
Part II - The Control of Disease

LAC 51:II.105: The following diseases/conditions are hereby declared reportable with reporting requirements by Class:

Class A Diseases/Conditions - Reporting Required Within 24 Hours

Diseases of major public health concern because of the severity of disease and potential for epidemic spread-report by telephone immediately upon recognition that a case, a suspected case, or a positive laboratory result is known; [in addition, all cases of rare or exotic communicable diseases, unexplained death, unusual cluster of disease and all outbreaks shall be reported.

- *Acinetobacter* spp., carbapenem-resistant
- Acute Flaccid Paralysis including Acute Flaccid Myelitis
- Amoeba (free living) infection (including *Acanthamoeba, Naegleria, Balamuthia* & others)
- Anthrax
- Avian or Novel Strain Influenza A (initial detection)
- Botulism
- Brucellosis
- *Candida auris,* as well as common misidentifications of *C. auris* (e.g., *C. haemolunii, C.duobushaemolunii, C. famata, C. lusitaniae, C. sake, C. parapsilosis, C. catenulata, C. guilli-ermondii*, and *Rhodotorula glutinis*)
- Cholera
- *Clostridium perfringens* (foodborne infection)
- Diphtheria
- Enterobacteriaceae, carbapenem-resistant
- Fish/Shellfish Poisoning (domoic acid, neurotoxic shellfish poisoning, ciguatera, paralytic shellfish poisoning, scombroid)
- Foodborne Illness
- *Haemophilus influenzae* (invasive infection)
- Influenza-associated Mortality
- Measles (Rubeola imported or indigenous)
- Melioidosis (*Burkholderia pseudomallei*)
- *Neisseria meningitidis* (invasive infection)
- Outbreaks of Any Infectious Disease
- Pertussis
- Plague (*Yersinia pestis*)
- Poliomyelitis (paralytic & non-paralytic)
- *Pseudomonas aeruginosa*, carbapenem-resistant
- Q Fever (*Coxiella burnetii)*
- Rabies (animal and human)
- Ricin Poisoning
- Rubella (congenital syndrome)
- Rubella (German Measles)
- Severe Acute Respiratory Syndrome-associated Coronavirus (SARS-CoV)
- Smallpox
- *Staphylococcus aureus*, Vancomycin Intermediate or Resistant (VISA/VRSA)
- Staphylococcal Enterotoxin B (SEB) Pulmonary Poisoning
- Tularemia (*Francisella tularensis*)
- Viral Hemorrhagic Fever (Ebola, Lassa, Marburg, Crimean Congo, etc.)
- Yellow Fever

Class B Diseases/Conditions - Reporting Required Within 1 Business Day

Diseases of public health concern needing timely response because of potential of epidemic spread-report by the end of the next business day after the existence of a case, a suspected case, or a positive laboratory result is known.

- Anaplasmosis
- Arthropod-Borne Viral Infections (West Nile, Dengue, St, Louis, California, Eastern Equine, Western Equine, Chikungunya, Usutu, Zika & others)
- Aseptic Meningitis
- Babesiosis
- Chagas Disease
- Chancroid
- Cryptosporidiosis
- Cyclosporiasis
- *Escherichia coli*, Shiga-toxin producing (STEC), including *E. coli* O157:H7
- Granuloma Inguinale
- Hantavirus (infection or Pulmonary Syndrome)
- Hemolytic-Uremic Syndrome
- Hepatitis A (acute illness)
- Hepatitis B (acute illness and carriage in pregnancy)
- Hepatitis B (perinatal infection)
- Hepatitis C (acute illness)
- Hepatitis C (perinatal infection)
- Hepatitis E
- Herpes (neonatal)
- Human Immunodeficiency Virus [(HIV), infection in pregnancy][2,6]
- Human Immunodeficiency Virus[(HIV), perinatal exposure][2,6]
- Legionellosis
- Listeriosis
- Malaria
- Mumps
- Salmonellosis
- Shigellosis
- Syphilis[1]
- Syphilis [(*Treponema pallidum*), infection in pregnancy][1,6]
- Syphilis [(*Treponema pallidum*), perinatal exposure][1,6]
- Tetanus ,
- Tuberculosis[3] (due to *M. tuberculosis*, *M. bovis, or M. africanum*)
- Typhoid Fever
- *Vibrio* infections (other than cholera)
- Zika Virus-associated Birth Defects

Class C Diseases/Conditions - Reporting Required Within 5 Business Days

Diseases of significant public health concern-report by the end of the workweek after the existence of a case, suspected case, or a positive laboratory result is known.

- Acquired Immune Deficiency Syndrome[3] (AIDS)
- *Anaplasma Phagocytophilum*
- Aspergillosis
- Blastomycosis
- Campylobacteriosis
- Chlamydial infection[1]
- Coccidioidomycosis
- Cryptococcosis (*C. neoformans* and *C. gattii*)
- Ehrlichiosis (human granulocytic, human monocytic, *E. chaffeensis* and *E. ewingii)*
- *Enterococcus*, Vancomycin Resistant [(VRE), invasive disease]
- Giardiasis
- Gonorrhea[1] (genital, oral, ophthalmic, pelvic inflammatory disease, rectal)
- Guillain-Barré Syndrome
- Hansen's Disease (leprosy)
- Hepatitis C ((infection, other than as in Class B)
- Histoplasmosis
- Human Immunodeficiency Virus[2] (HIV (infection other than as in Class B)
- Human T Lymphocyte Virus (HTLV I and II infection)
- Leptospirosis
- Lyme Disease
- Lymphogranuloma Venereum[1]
- Meningitis, Eosinophilic (including those due to *Angiostrongylus* infection)
- Nontuberculous Mycobacteria
- Nipah Virus Infection
- Non-gonococcal Urethritis
- Ophthalmia neonatorum
- Psittacosis
- Spotted Fevers [*Rickettsia* species including Rocky Mountain Spotted Fever (RMSF)]
- *Staphylococcus aureus* (MRSA), Invasive Infection
- Staphylococcal Toxic Shock Syndrome
- Streptococcal Disease, Group A (invasive disease)
- Streptococcal Disease, Group B (invasive disease)
- Streptococcal Toxic Shock Syndrome
- *Streptococcus pneumoniae*, invasive disease
- Transmissible Spongiform Encephalopathies (Creutzfeldt-Jacob Disease & variants)
- Trichinosis
- Varicella (chickenpox)
- Yersiniosis

Class D Diseases/Conditions - Reporting Required Within 5 Business Days

- Cancer
- Carbon Monoxide Exposure and/or Poisoning[5]
- Complications of Abortion
- Congenital Hypothyroidism[4]
- Galactosemia[4]
- Heavy Metal (arsenic, cadmium, mercury) Exposure and/or Poisoning (all ages)[5]
- Hemophilia[4]
- Lead Exposure and/or Poisoning (all ages)[4, 5]
- Pesticide-Related Illness or Injury (all ages)[5]
- Phenylketonuria[4]
- Pneumoconiosis (asbestosis, berylliosis, silicosis, byssinosis, etc.)[5]
- Radiation Exposure, Over Normal Limits[5]
- Reye's Syndrome
- Severe Traumatic Head Injury
- Severe Undernutrition (severe anemia, failure to thrive)
- Sickle Cell Disease[4] (newborns)
- Spinal Cord Injury
- Sudden Infant Death Syndrome (SIDS)

Class E Diseases/Conditions - Reporting Required Within 10 Business Days[5]

Any disease/condition where the work environment is suspected to be the cause of an illness or injury or where the work environment is thought to be the cause of an illness exacerbation.

Case reports not requiring special reporting instructions (see below) can be reported by mail or fax on Confidential Disease Report forms (2430), fax (504) 568-8290, telephone (504) 568-8313 or call (800) 256-2748 .

[1]Report on STD-43 form. Report cases of syphilis with active lesions by telephone, within one business day, to (504) 568-8374.

[2]Report to the Louisiana STD/HIV Program: Visit www.hiv.dhh.louisiana.gov or call 504-568-7474 for regional contact information.

[3]Report on form TB 2431 (8/94). Mail form to TB Control Program, DHH-OPH, P.O. Box 60630, New Orleans, LA. 70160-0630 or fax both sides of the form to (504) 568-5016

[4]Report to the Louisiana Genetic Diseases Program and Louisiana Childhood Lead Poisoning Prevention Programs: www.genetics.dhh.louisiana.gov or fascimile (504) 568-8253, telephone (504) 568-8254, or (800) 242-3112

[5]Report to the Section of Environmental Epidemiology and Toxicology, Occupational Health and Injury Surveillance Program: www.seet.dhh.louisiana.gov or call (504) 568-8150 or (888) 293-7020 or fax (504) 568-8149

[6]Report to the Louisiana STD/HIV Program on HIV/Syphilis during Pregnancy Reporting Form: Visit www.hiv.dhh.louisiana.gov or call 504-568-7474

Reference Cultures/Specimens to State Laboratory: Visit http://ldh.la.gov/assets/oph/Center-PHCH/Center-CH/infectious-epi/IsolatesToSendToStateLab_2019.pdf.

All **laboratory facilities** shall, in addition to reporting tests indicative of conditions found in §105, report positive or suggestive results for additional conditions of public health interest. The following findings shall be reported as detected by laboratory facilities: 1. adenoviruses; 2. coronaviruses; 3 .enteroviruses; 4. hepatitis B (carriage other than in pregnancy); 5. hepatitis C (past or present infection); 6. human metapneumovirus; 7. parainfluenza viruses; 8. respiratory syncytial virus; and 9. rhinoviruses.