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WISCONSIN EPI EXPRESS

IN THIS ISSUE

PROGRAM UPDATES

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NEW ANTIMICROBIAL STEWARDSHIP WEBSITE:

A new website has been created on the topic of Antimicrobial Stewardship and One Health. Find the new website here.

ONGOING OUTBREAK INVESTIGATIONS:

Check out the DHS website for up-to-date information: *Salmonella* Heidelberg, Seoul Hantavirus, and Zika virus.

NEW EDUCATIONAL MATERIALS:

Please see our new flyers and posters that have recently been developed: Wash Your Hands!, Handwashing After Animal Contact, Safety Guidelines for Rodent Owners, Staying Healthy While Working on a Farm, and Harmful Algal Bloom poster.

COMMUNICABLE DISEASE UPDATE WEBINAR SERIES:

The Communicable Disease Update Webinar Series continues to be held on the second Friday of every month from 1 to 2 p.m. The link to join the webinar is the same every month: https://connect.wisconsin.gov/monthly-webinar-series/. No registration is necessary. Upcoming topics include: Perinatal Hepatitis B, HIV Lab and Case Reporting in WEDSS, Tickborne illness, Arboviral diseases, and HPV Guideline Updates.

CHILDHOOD COMMUNICABLE DISEASE CHART

Printable PDF's are now available for each disease state of the Childhood Communicable Disease Chart.

Tick Season Returns to Wisconsin

By: Rebecca Osborn, MPH; Christine Muganda, PhD; and Christy Vogt, MPH

Spring is returning to Wisconsin and with the warmer temperatures, people are getting outside to enjoy all that Wisconsin has to offer. The opportunity for many outdoor activities combined with the lifecycle of the black-legged tick (the tick species that transmits Lyme disease in Wisconsin) makes the late spring and summer months the riskiest for human Lyme disease infection. Educating Wisconsin residents about tickborne disease prevention can help to reduce the risk of Lyme disease infection. For this purpose, Wisconsin-specific outreach and educational materials are available for order and distribution, including a tickborne disease safety guide card available in both English and Spanish.

Introducing Lyme disease data on the Wisconsin Environmental Public Health Tracking Portal:

The Wisconsin Environmental Public Health Tracking (EPHT) and Vectorborne Disease programs have partnered to bring Lyme disease data to the EPHT data portal! EPHT is an interactive source for environmental public health data and now includes a Lyme disease section allowing users to create charts, maps, and tables to visualize and summarize the data.

Anyone can access the free, easy-to-use data portal, which has over a dozen data topics including air and water quality, asthma, and childhood lead poisoning.

New portal users might be interested in our short web tutorials. These tutorials walk through portal features such as bookmarking a query, exporting data, and zooming in and out of maps.

If spending time in a data portal doesn't sound fun for you, take a look at the County Environmental Health Profiles. The profiles, which last came out in 2015, give readers a snapshot of what is available on the portal. The 2017 profiles, scheduled to come out this spring, will include Lyme disease as a topic in the Climate section.

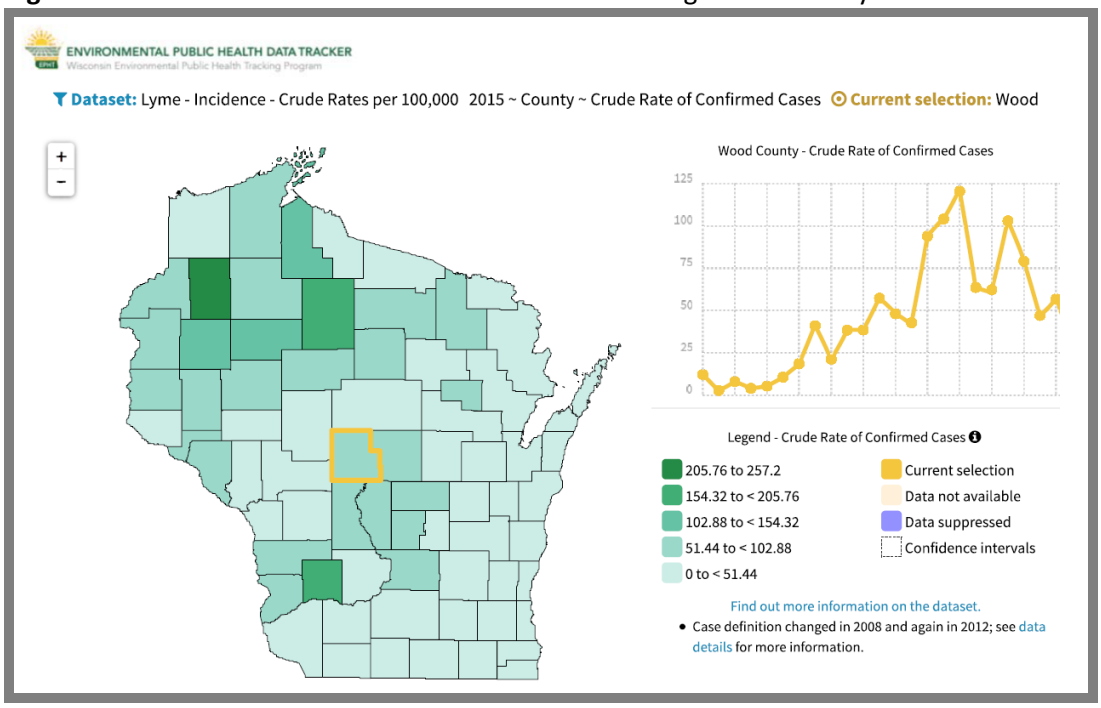
You can stay up-to-date on the latest Tracking news by joining the quarterly newsletter.

Coming soon from the Vectorborne program:

The monthly Communicable Disease Update Webinar Series will feature tickborne disease and surveillance updates on June 9. Please stay tuned!

The Vectorborne program is developing new outreach materials on the topics of Lyme and tickborne diseases. Be on the lookout for these new materials.

Figure 1. Wisconsin Environmental Public Health Tracking Data Portal Lyme disease data



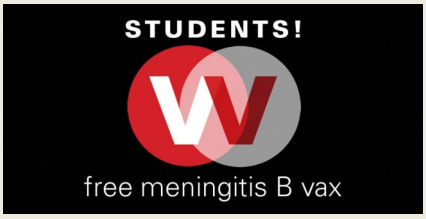
2016 Meningococcal Disease Outbreak at University of Wisconsin-Madison

By: Susann Ahrabi-Fard, MS

From October 3-25, 2016, three confirmed cases of meningococcal disease were identified in students attending the University of Wisconsin-Madison (UW-Madison). All three cases were determined to be caused by serogroup B, which was not contained in vaccines prior to 2014. The students ranged in age from 18-19 years and contact investigations identified an average of 5-10 people per case who required antibiotic prophylaxis. Two of the cases lived on campus in different residence halls. After thorough investigations, no epidemiologic links were found between the patients. None had received either of the recently licensed serogroup B vaccines (Bexsoro or Trumenba). All three patients survived.

Meningococcal disease is caused by the bacterium *Neisseria meningitidis* and can cause meningitis (inflammation of the meninges, the protective membranes covering the brain and spinal cord), sepsis (blood infection), pneumonia, or septic arthritis. The bacteria spread through direct contact with respiratory and oral secretions (saliva or spit) of an infected person or an asymptomatic carrier. Common ways it can spread are through kissing, sharing eating utensils, or drinking from the same container. Symptoms may include sudden onset of fever, headache, stiff neck, nausea, vomiting, photophobia (sensitivity to light), or altered mental status (confusion). Symptoms of meningococcal disease can appear quickly and progress rapidly. Typically they develop within three to seven days after exposure. Prompt medical attention and treatment are crucial for survival.

Following the first two cases, the UW-Madison University Health Services (UHS), Wisconsin Division of Public Health (DPH), and Centers for Disease Control and Prevention (CDC) collaborated to provide free vaccine to undergraduate students up to age 25 and older students that lived with or had intimate relationships with an undergraduate student.



Snapchat filter and image used on UW-UHS Twitter to promote UW's vaccination campaign "I got the VAX."

One of the seven UW-Madison mass vaccination clinics held during October and November 2017.

Over a two-week period, seven vaccine clinics were held on the UW-Madison campus through the massive coordination efforts of UHS. During the vaccine campaign, the third case was identified. In total, 20,608 students were vaccinated.

Thousands of staff and volunteers worked at the clinics, provided IT and data support, developed educational materials (e.g, stickers, magnets, bookmarks), and launched social media campaigns. DPH staff were on site to provide assistance to students in need of vaccination records through the Wisconsin Immunization Registry (WIR).

Nationwide, widespread vaccination against meningococcal disease serogroups C, Y, and W have reduced overall meningococcal disease rates. However, no vaccines against serogroup B were available until 2014. Since 2008, there have been at least nine outbreaks on U.S. college campuses caused by serogroup B meningococcal disease. Over 40 students have become ill and there have been several fatalities. Some survivors have had lasting consequences, including neurologic problems and amputation. Two recently approved vaccines, Bexsoro and Trumenba, are now available to prevent serogroup B meningococcal disease. It is recommended that teens and young adults, 16 through 23 years old, receive the vaccine, with 16-18 years of age being the optimum age for vaccination. More than one dose is necessary for maximum protection, and while either vaccine can be used, the vaccines are not interchangeable. The same brand should be used for the entire series.

The Return of Avian Influenza: If or When?

By: Tom Haupt, MS

Experts postulate the United States could see H5N2 or another strain of avian flu in poultry again in 2017. Since March 5, 2017, two instances of avian influenza have been identified in the U.S. Highly pathogenic avian influenza (HPAI) A/H7N9 was found in a chicken flock in Tennessee and a low pathogenic avian influenza (LPAI), A/H5N2, in a commercial turkey flock in Barron County, Wisconsin.

The LPAI strain identified in Barron County is not related to the highly pathogenic strain found in Tennessee, nor is it related to the highly pathogenic strain identified in the U.S. in 2015.

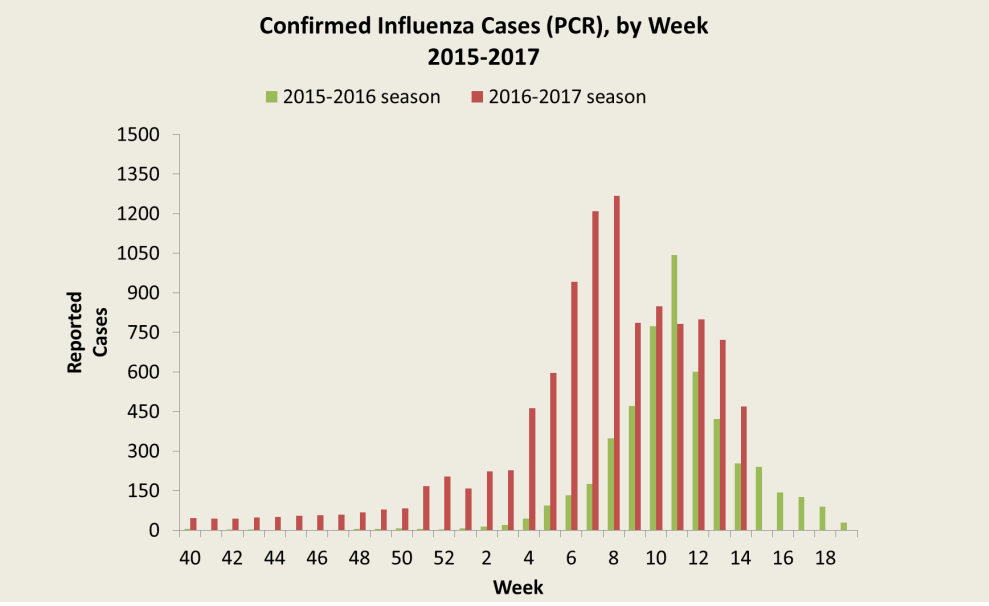
While response to HPAI is more extensive and requires the monitoring of staff who depopulated and disposed of sick birds, the common denominator in the response to LPAI is the need for public health intervention. This includes interviewing and monitoring the health of those workers and other staff exposed to the infected birds. Should those exposed become ill, it is important for them to seek medical attention at a facility willing and able to use the proper personal protection equipment to protect their staff. Arrangement for immediate transport and testing at the Wisconsin State Laboratory of Hygiene is essential.

This situation is what we prepare for, and have likely practiced many times. While we hope we will not need to use this training, we should be assured of a timely response to the threat of avian influenza in Wisconsin. Acting quickly in order to avoid a bottleneck is necessary when facing a highly pathogenic avian influenza outbreak.

2016-2017 Influenza Season Update:

Although the 2016-17 influenza season reached peak activity in mid-February and the incidence of flu is declining, hospitalizations due to influenza continue to be reported statewide. For the season, influenza A/H3N2 remains the predominant virus adversely affecting mainly the older population. However, in recent weeks Influenza B cases have been the predominant influenza virus in the state, primarily the Yamagata lineage of influenza B that is a component of 2016-17 quadrivalent vaccine. Influenza B viruses tend to adversely affect the younger population, but like influenza A viruses, they can cause complications in the older population as well.

Figure 1. Reported Influenza cases in 2017 compared to 2016



Brucellosis in Wisconsin, 2000-2015

By: Lynn Roberts, senior veterinary student at UW-Madison completing her clinical year of training

Brucellosis is caused by facultative intracellular Gram-negative coccobacilli in the genus *Brucella*. The disease is an important cause of reproductive losses and abortions in domestic animal species including cattle, sheep, goats, swine, and dogs. Brucellosis constitutes a significant zoonosis, particularly for persons who consume raw milk or milk products or are occupationally exposed to the pathogen. While the disease is rare in the United States (U.S.), it is endemic in many developing countries and consequently remains the most common bacterial zoonosis in the world, with an estimated 500,000 new human cases worldwide each year.[1]

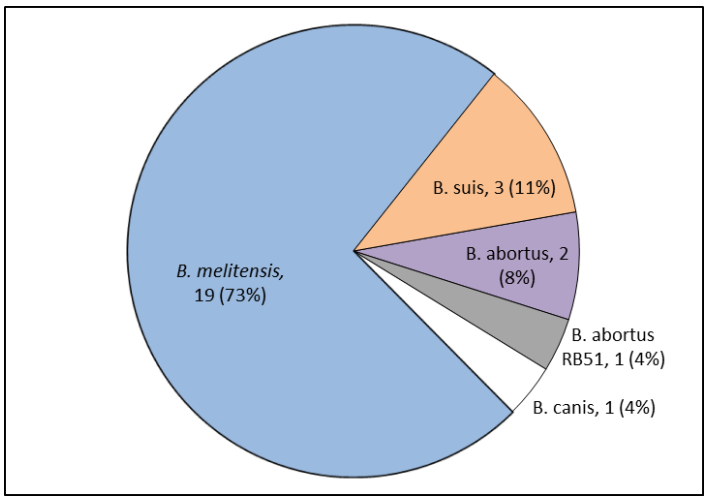
Listed in descending order of pathogenicity and invasiveness, *B. melitensis* (sheep and goats), *B. abortus* (cattle), *B. suis* (wild and feral swine), and *B. canis* (dogs) are common causes of human brucellosis. Annual incidence of human brucellosis is highest in the Middle East, Central Asia, most countries surrounding the Mediterranean Sea, parts of Latin America (including Mexico), and parts of Africa.[1] Those at highest risk of infection are persons who consume unpasteurized milk or milk products (e.g., cheese) from endemic regions.[2] The other most likely route of infection is contact with infected animals or animal tissues (particularly aborted fetuses and associated fluids and tissues), putting laboratory staff, farmers, feral swine hunters, slaughterhouse workers, kennel workers, dog breeders, and veterinary medical personnel at highest risk.[3] Local health departments should use the brucellosis case report form (https://www.cdc.gov/brucellosis/pdf/case-report-form.pdf) to ascertain risk factors when investigating a case of brucellosis.

Due to the non-specific nature of its symptoms and its ability to mimic other diseases, human brucellosis has been called "the great imitator."[4] The disease usually presents as an acute or insidious febrile flu-like illness, with undulant fevers, malaise, headache, anorexia, weight loss, myalgia, arthralgia, arthritis/spondylitis, orchitis/epididymitis, or night sweats.[2, 3, 4, 7]

Up to about one-third of patients will have hepatomegaly or splenomegaly.[2, 4] Patients will occasionally have more severe disease manifestations, such as osteomyelitis, meningitis, pleural effusion, pneumonia, or endocarditis. The mortality rate for untreated brucellosis is 2% – 5%, and most deaths occur due to endocarditis.[3, 4]

The rarity of brucellosis and consequent low index of suspicion, variable clinical presentation, and difficulties associated with laboratory testing make the disease a challenge for western practitioners. The gold standard for diagnosis is isolation of *Brucella* from blood, cerebrospinal fluid, lymph nodes, or synovial fluid, but due to low levels of intermittent bacteremia in infected persons (particularly in chronic cases), and the organism's fastidiousness and slow growth *in vitro*, false negative cultures are likely common.[8] Serologic testing is another option for most *Brucella* species, but no validated human assay for *B. canis* antibody detection exists in the U.S., making diagnosis exceptionally difficult and likely causing human cases of *B. canis* to be missed and consequently underreported.[9] A genus-specific PCR assay performed on blood is also available for diagnostic purposes.

Figure 1. Confirmed cases of brucellosis in Wisconsin by species, 2000 – 2015 (n=26)



Cases are classified as confirmed if the patient has a clinically compatible illness with either culture and identification of *Brucella* spp. from clinical specimens, or at least a fourfold increase in *Brucella* antibody titers between paired serum samples.[7] Among Wisconsin residents, there were 26 confirmed cases of human brucellosis between 2000 and 2015 (Figure 1).

Brucellosis in Wisconsin, 2000-2015 (cont.)

The majority of these patients were infected with *B. melitensis* (n=19, 73%), followed by *B. suis* (n=3, 11%), *B. abortus* (n=2, 8%), *B. abortus* RB51 (n=1, 4%), and *B. canis* (n=1, 4%). Three of the *B. melitensis* infections (11% of all Wisconsin cases) were laboratory-acquired, with the remainder of those cases (16, 62% of all Wisconsin cases) associated with exposure to animals or animal products from endemic regions or travel to endemic regions.

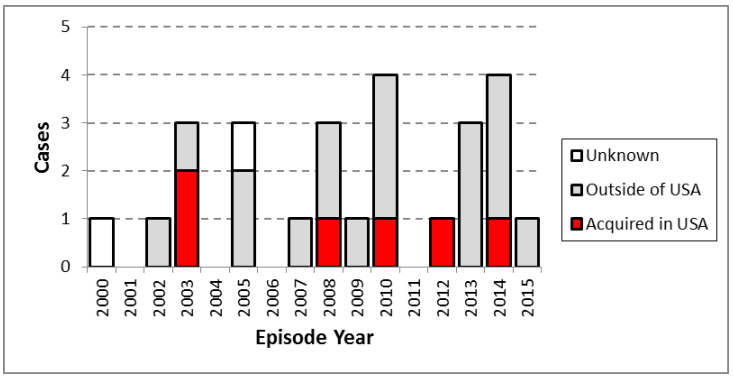
Two of the Wisconsin residents with *B. suis* infections had farmed in endemic countries; one had consumed raw milk in Eastern Europe and the other had butchered pigs and cattle in Southeast Asia. The circumstances of the third case of *B. suis* are unknown. One of the *B. abortus* patients was originally from a country in South America and the other was from the U.S., but the sources of neither of their infections were found. The patient positive for *B. abortus* RB51 was a veterinarian with a history of using the *Brucella* RB51 cattle vaccine. The *B. canis*-positive patient was a breeder with a *Brucella*-positive dog.

The introduction of pasteurization processes and disease eradication efforts in livestock during the 20th century had a profound impact on the incidence of brucellosis in the U.S. Congressional funds for the Cooperative State – Federal Brucellosis Eradication Program were first approved in 1954. There were 156,000 affected cattle herds in the U.S. in 1956; this number had dropped to 700 by the early 1990s.[5] The program expanded to include commercial swine herds in 1972. As of November 10, 2016, USDA-APHIS has declared all 50 states as Class Free for both cattle and swine brucellosis—i.e., no known cases of brucellosis had been found in domesticated cattle or swine during the previous 12 months.[6] Per the CDC, brucellosis in goats and sheep has been considered eradicated in the U.S. since the 1970s. However, infected elk and bison in the greater Yellowstone Park area, and infected feral swine and wild boar populations throughout the southern U.S. threaten to reintroduce brucellosis to domestic cattle and swine, and pose a direct zoonotic risk to hunters.[10,11]

Regardless of these threats, the *Brucella* eradication effort continues to be successful. Figure 2 shows cases among Wisconsin residents by location of exposure. Only 23% (n=6) of persons in Wisconsin with brucellosis were exposed to *Brucella* in the U.S., and half of those exposures (n=3) occurred in research or medical laboratories.

Of the three domestic cases not acquired in a lab, two were occupational exposures (the aforementioned dog breeder and veterinarian) and one had no known risk factors other than exposure to livestock and raw milk in Wisconsin decades ago and a brief trip to Mexico. The remainder of brucellosis cases (n=18, 69%) were acquired outside of the U.S., most commonly in Mexico (n=11, 42%). The other regions of exposure were in Eastern Europe (n=2), the Middle East (n=2), South America (n=1), Eastern Africa (n = 1), and Southeast Asia (n=1).

Figure 2. Confirmed cases of brucellosis reported in Wisconsin by domestic vs. foreign exposure, 2000 – 2015 (n=26)



Related links:

Brucellosis disease fact sheet: https://www.dhs.wisconsin.gov/publications/p4/p42033.pdf

CDC brucellosis case report form: https://www.cdc.gov/brucellosis/pdf/case-report-form.pdf

Canine brucellosis Q&A for dog owners: https://www.dhs.wisconsin.gov/publications/p0/p00614.pdf

Canine brucellosis and human health Q&A for veterinarians: https://www.dhs.wisconsin.gov/publications/p0/p00614a.pdf

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6. U.S. Department of Agriculture – Animal and Plant Health Inspection Service. Status of current eradication programs. https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/ct_status_of_eradication_programs. Accessed December 5, 2016.
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8. Seleem MN, Boyle SM, Sriranganathan N. Brucellosis: a re-emerging zoonosis. Vet Microbiol. 2010;140(3),392-398.
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11. U.S. Department of Agriculture – Animal and Plant Health Inspection Service, Veterinary Services. Brucellosis regionalization risk assessment model: an epidemiologic model to evaluate the risk of *B. abortus* infected undetected breeding cattle moving out of the designated surveillance areas in Idaho, Montana, and Wyoming. https://www.aphis.usda.gov/animal_health/animal_ diseases/brucellosis/downloads/risk_assessment_model.pdf. Accessed December 7, 2016.

Communicable Disease Case Counts

This report contains a selection of reportable conditions with inclusion based on public health significance and frequency of occurrence. The case counts reflect confirmed cases only. These numbers are not final and are subject to change as confirmatory testing and case follow-up are completed.

Disease	2016 Case Counts	2017 Case Counts				
	Total	Q1	Q2	Q3	Q4	2017 YTD
Enteric/ Gastrointestinal						
Campylobacteriosis	1647	243				262
Cryptosporidiosis	857	76				80
Cyclosporiasis	1	0				0
Giardiasis	816	66				68
E. coli, Shiga toxin-producing (STEC)	266	1				1
Hemolytic uremic syndrome	7	0				0
Listeriosis	15	0				0
Salmonellosis	904	32				32
Shigellosis	735	99				100
Typhoid fever	8	0				0
Vibriosis (non-Cholera)	10	2				2
Yersiniosis	31	0				0
Invasive Bacteria						
Haemophilus influenzae invasive disease	126	7				7
Meningococcal disease	6	0				0
Meningitis, other	8	0				0
Streptococcus pneumoniae invasive disease	420	174				188
Group A Streptococci	208	91				98
Group B Streptococci	545	104				120
Mycotic						
Coccidioidomycosis	13	0				0
Blastomycosis	12	0				0
Histoplasmosis	1	0				0
Respiratory						
Please refer to the weekly respiratory virus surveillance report: https://www.dhs.wisconsin.gov/influenza/weekly-influenza-report.pdf						
Vectorborne						
Babesiosis	68	2				2
Ehrlichiosis/ Anaplasmosis	692	6				6
Jamestown Canyon virus infection	5	0				0
La Crosse virus infection	4	0				0
Lyme disease	2282	76				78
Malaria[1]	20	1				1
Powassan virus infection	4	0				0
Rocky Mountain spotted fever	19	0				0
Zika virus infection[1, 2]	62	4				4
West Nile virus infection	12	0				0
Yellow fever[1]	0	0				0

[1] Denotes diseases where all cases in Wisconsin residents are travel-associated. No local transmission occurs.
[2] Due to enhanced surveillance, asymptomatic confirmed cases are included.

Communicable Disease Case Counts (cont.)

Disease	2016 Case Counts	2017 Case Counts				
	Total	Q1	Q2	Q3	Q4	2017 YTD
Zoonotic						
Brucellosis	3	0				0
Hantavirus infection	0	0				0
Leptospirosis	1	0				0
Q Fever	7	0				0
Rabies (human)	0	0				0
Toxoplasmosis	2	2				2
Tularemia	1	0				0
Other						
Hepatitis A	7	2				2
Hepatitis E	5	0				0
Legionellosis	106	0				0
Lymphocytic choriomeningitis virus infection	1	0				0
Psittacosis	0	0				0
Transmissible spongiform encephalopathy (human)	7	0				0
Tuberculosis	41	13				14