Summary of Selected Reportable Diseases

2007-2016

Bureau of Assessment, Statistics & Epidemiology

Allegheny County Health Department

542 Fourth Avenue, Pittsburgh, PA, 15219

412-687-2243

www.achd.net

Contributors

Bureau of Assessment, Statistics, and Epidemiology
LuAnn Brink, Chief
Jennifer Fiddner
Stephen Forest
Kristen Mertz
Lauren Torso Orkis
Kathy Reveille
Ena Seltzer

Immunization Program
Lauren Brungo, Supervisor
Janet Benderstahlman
Denise Heintz

TB Program
Kwesi Willacy, Administrator
Sally Chlebowski, Supervisor

Public Health Laboratory
Robert Wadowsky, Director

Table of Contents

Introduction

This summary describes infectious conditions reported to the Allegheny County Health Department (ACHD) from 2007 through 2016. The diseases highlighted here are those most commonly reported and those of greatest public health importance, with the exception of HIV and other sexually transmitted diseases, which are described in a separate report.

Communicable diseases must be reported to the local health department as specified in Pennsylvania's Disease Control and Prevention Act of 1955. The Allegheny County Board of Health periodically revises the list of notifiable diseases, which now includes approximately 70 infectious conditions. Public health officials use reports to identify disease clusters, determine at-risk populations, assess burden of disease, monitor trends, and recommend measures to stop disease transmission.

Cases are reported electronically through Pennsylvania's version of the National Electronic Disease Surveillance System (PA-NEDSS) to ACHD by health care providers and laboratory staff. We gratefully acknowledge their contribution to identifying, treating, and preventing infectious diseases in Allegheny County.

It is important to realize that reported cases do not reflect the true burden for many conditions, given that laboratory results are often needed for reporting and many people may not seek care or get tested. Health care providers may test for or report some conditions more often than others. Nonetheless, disease reports are helpful for monitoring trends over time and identifying groups at risk.

Detailed information on disease characteristics or prevention measures is not provided in this report. Instead, a hyperlink to a fact sheet on the website of either ACHD or the Centers for Disease Control and Prevention (CDC) is provided so that with one click the reader will be able to access pertinent clinical, risk factor, and prevention information.

Methodology

Cases of reportable conditions in Allegheny County residents were investigated by the Infectious Diseases Program and by the Bureau of Assessment, Statistics, and Epidemiology. After clinical and laboratory findings were verified, cases were classified as "confirmed," "probable," "suspected," or "not a case" using case definitions provided by the Centers for Disease Control and Prevention (CDC) and the Council of State and Territorial Epidemiologists (CSTE). Surveillance case definitions do not always match the criteria for clinical diagnosis. Case definitions can be found on the CDC's National Notifiable Diseases Surveillance System website at http://wwwn.cdc.gov/nndss/script/casedefDefault.aspx.

Case counts and age-specific rates for Allegheny County residents are presented. Age-specific rates for the 10-year period (2007-2016) were calculated using reported case counts for the numerator and the US Census 2010 population for Allegheny County times 10 for the denominator. Crude overall incidence rates for 2016 were calculated using the 2016 case count as the numerator and the 2016 US Census population estimate for Allegheny County as the denominator.

Data from 2007 through 2016 are presented for most diseases. For influenza, data pertain to reported cases from October 2, 2016, through September 30, 2017, and represent the 2016-2017 influenza season.

Data sources include PA-NEDSS for case reports, Health Monitoring Systems' EpiCenter data for influenza-like illness in Emergency Departments, the Pennsylvania Department of Health's EDDIE website for incidence rate of selected disease in Pennsylvania, and the CDC's NNDSS 2016 Annual Tables of Infectious Disease Data for US incidence rates of selected diseases.

Vaccine preventable diseases

Influenza

Influenza, a contagious respiratory illness, was the second most commonly reported infectious disease in the county after chlamydial infection in 2016. The annual number of reported influenza cases varies dramatically from year to year, depending on the type of circulating virus, the vaccine efficacy and vaccine coverage (Figure 1). During the 2016-2017 influenza season, cases peaked at the beginning of January and again in mid-February (Figures 1 and 2). The majority (65%) of the 5,025 lab-confirmed cases reported were type A (Figure 2)).

During the 2016-17 season, 428 persons were hospitalized with influenza and 9 persons died, most of whom had underlying illness.

Because many persons with influenza are not tested and are not reported, ACHD also monitors influenza activity using emergency room data for "influenza-like illness" (ILI), defined as fever ≥ 100F plus cough or sore throat. Figure 3 shows the percentage of persons seen in Allegheny County hospital emergency rooms with chief complaint of symptoms consistent with ILI from October 2016 through September 2017.

CDC recommends annual influenza vaccination for all persons ≥6 months. According to the Allegheny County Health Survey conducted in 2015-2016, 48% of adults ≥18 years reported having a flu vaccination within the past 12 months. No local surveys assess vaccination coverage in children.

Figure 1

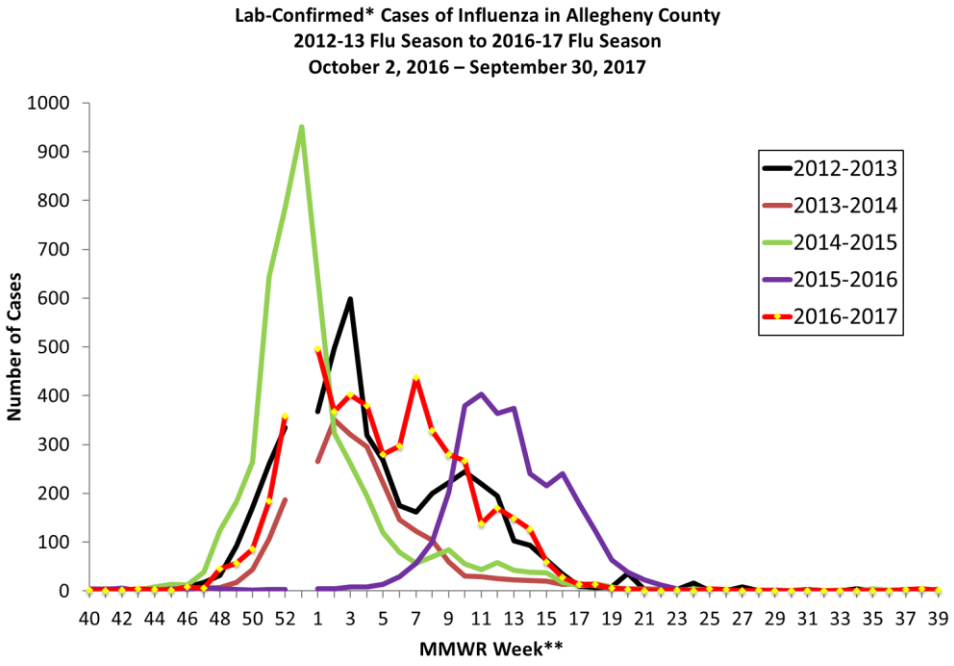


Figure 2

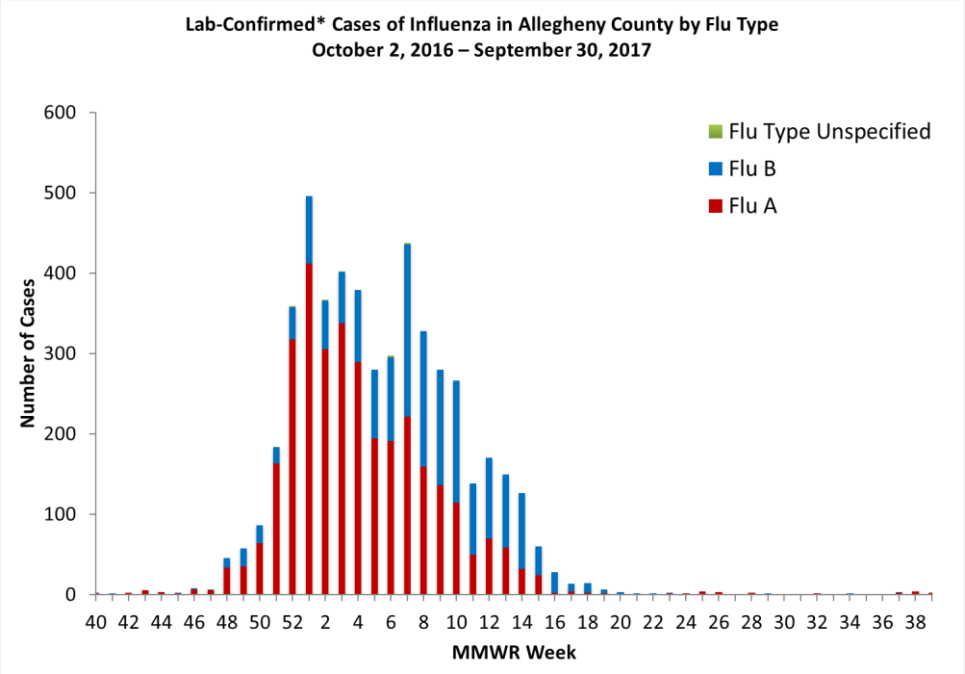
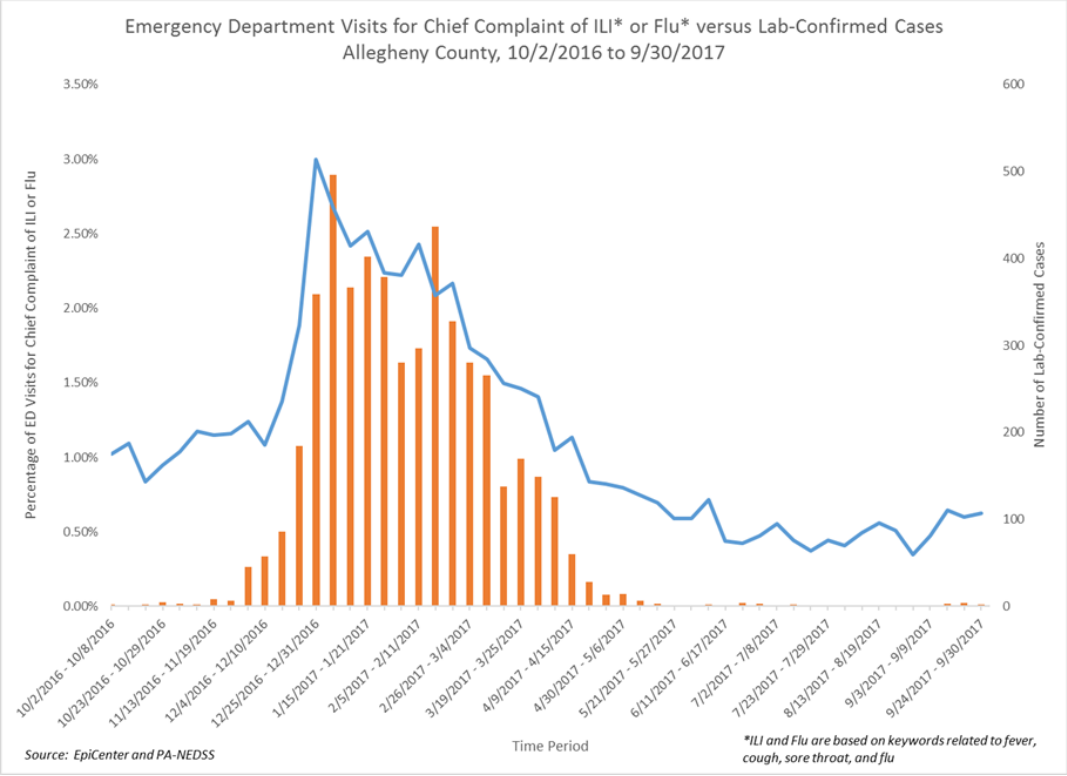


Figure 3



Source: EpiCenter

Measles, Mumps, Rubella

Measles, a highly infectious respiratory illness characterized by high fever and rash, was eliminated from the US in 2000. Since then, clusters stemming from imported cases have appeared from time to time. From 2007 through 2016, six confirmed cases of measles were reported to ACHD, including two in 2014, three in 2009, and one in 2008.

Mumps, also now a rare respiratory illness, is characterized by swelling of the salivary glands. Seventeen cases of confirmed or probable mumps were reported from 2007 through 2016, including two in 2016 which were unrelated. Nine cases were reported in 2014, all associated with a sports team outbreak.

No cases of rubella have been reported in the past 10 years. Rubella was eliminated in the US in 2004.

Pertussis (whooping cough)

Pertussis, a bacterial infection commonly known as whooping cough, is characterized by violent or prolonged coughing. A resurgence of pertussis occurred locally and nationally in 2012. Among Allegheny County residents, 226 cases were reported that year (Figure 4). Allegheny County saw another resurgence in 2014, with 155 cases reported. The case count decreased in 2015 to 105 and again in 2016 to 76, but these counts are still higher than in the years before 2012.

The incidence of pertussis was highest in infants < 12 months of age (Figure 5). Pertussis is most serious for this age group, given their lack of full protection from vaccination. During the 10-year period, 91 cases in infants <1 year were reported, of whom one (1%) died; in 2016, 9 infants < 12 months were reported, the highest number of infants since 2012.

Figure 4

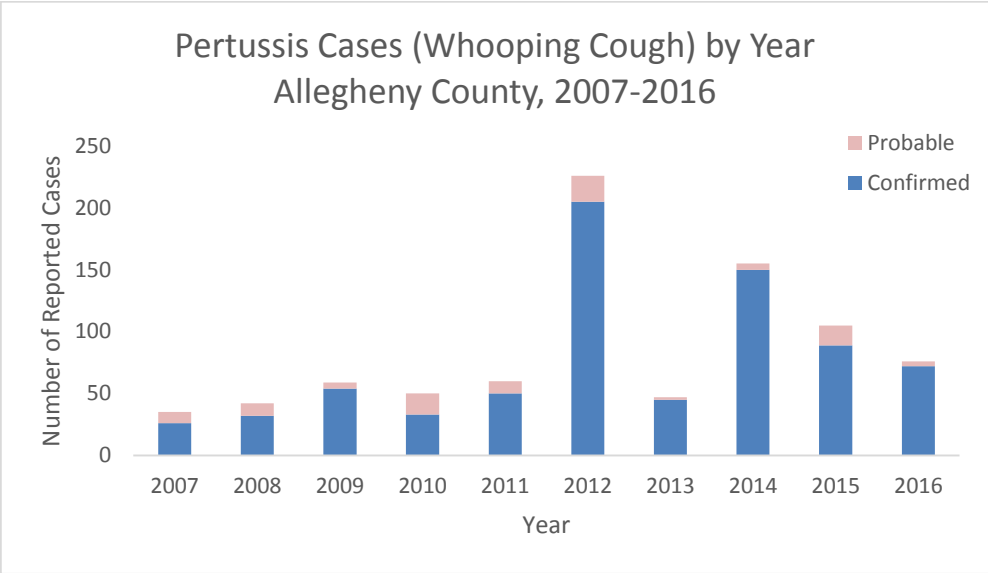
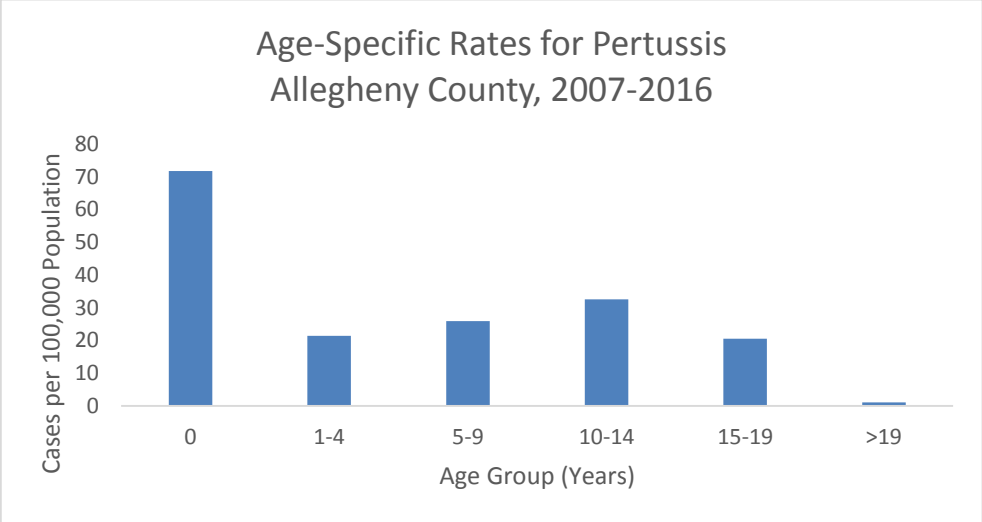


Figure 5

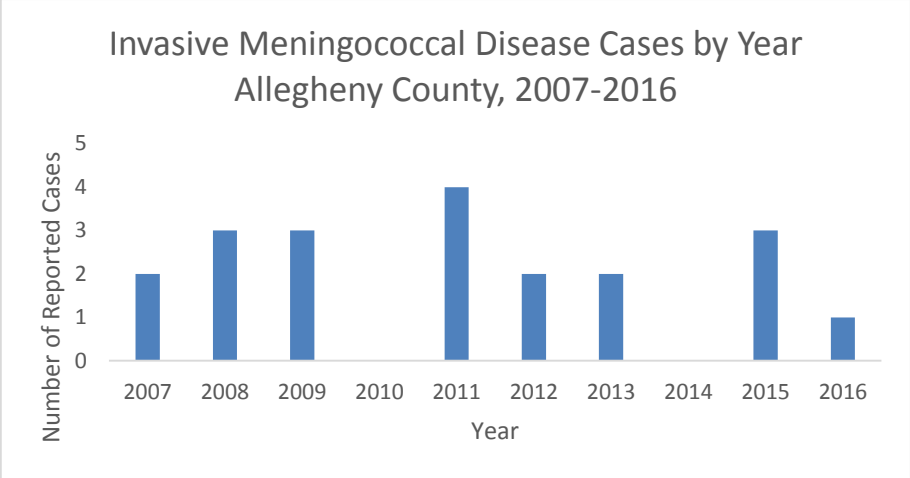


Invasive meningococcal disease

Neisseria meningitidis, also called meningococcus, can cause meningitis and bloodstream infections. During 2007-2016, 20 cases of invasive meningococcal disease were reported in Allegheny County (Figure 6). All age groups have been affected. Nineteen (95%) cases were hospitalized and 5 (25%) died. Serogroup information was available for 10 (50%) of the reported cases; documented serogroups included B (4), Y (3), C (2), and W135 (1). The vaccine routinely given to adolescents and certain high risk groups protects against serogroups A, Y, C, and W135

but not B. Two newly licensed vaccines protect against serogroup B but routine vaccination for all adolescents is not currently recommended.

Figure 6



Invasive pneumococcal disease

Invasive pneumococcal disease includes meningitis and bacteremia caused by the bacterium *Streptococcus pneumoniae*. *S. pneumoniae* also causes pneumonia, but pneumonia alone is not considered invasive for the purposes of public health surveillance. The incidence of invasive pneumococcal disease declined after a peak of 76 cases in 2012 (Figure 7). In 2016, 47 cases were reported. Most (90%) cases were diagnosed by positive blood culture. Of the 493 cases reported in 2007-2016, 347 (68%) were hospitalized and 36 (7%) died.

The incidence rate for invasive disease was highest in the elderly in 2007-2016 (Figure 8). Pneumococcal vaccination is recommended for all persons ≥65 years of age. Data from the Allegheny County Health Survey in 2015-2016 indicate that 81% of county residents ≥65 years reported ever having had a pneumonia vaccination. Since 2015, two different pneumococcal vaccines have been recommended for all adults ≥65 years but it is unknown how many persons in this age group in Allegheny County have received both.

Figure 7

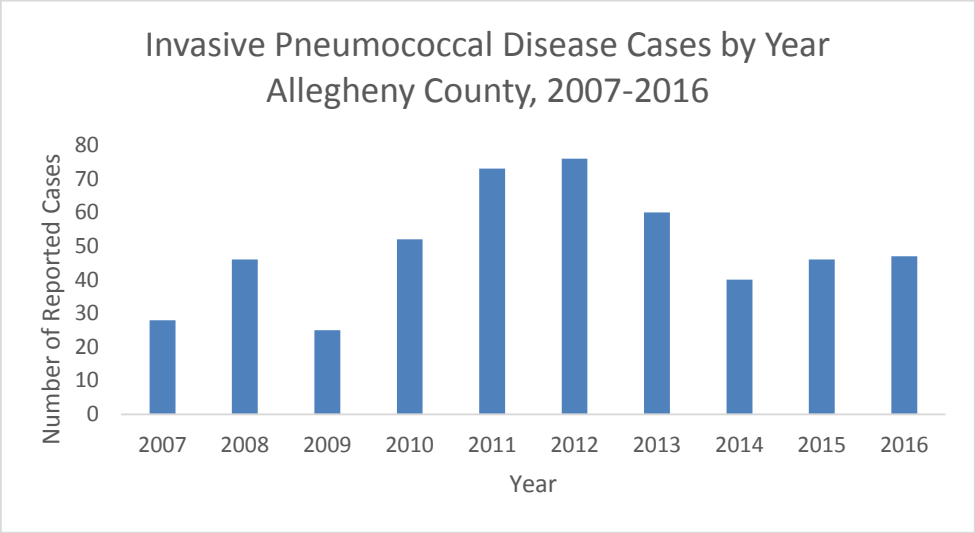
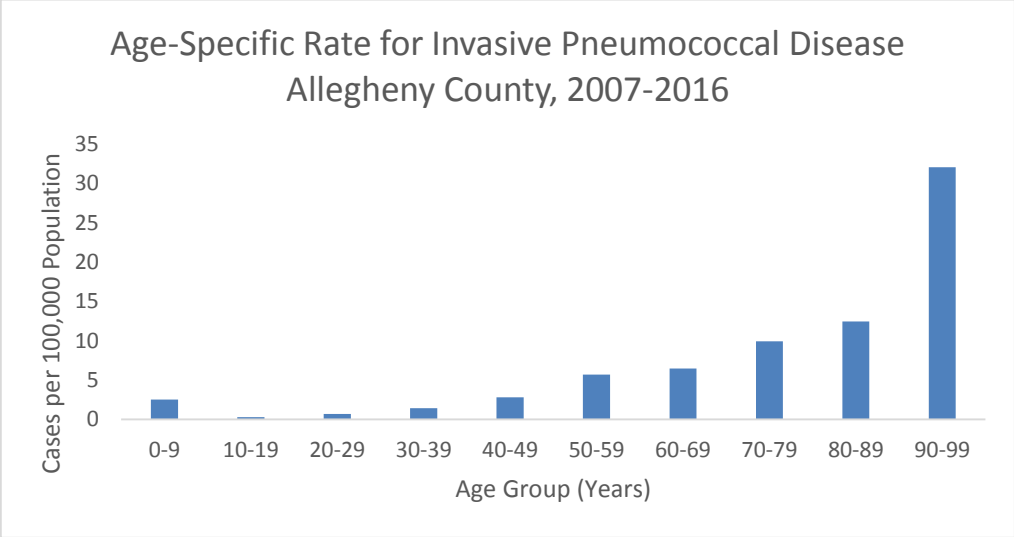


Figure 8



Invasive Haemophilus influenzae

Haemophilus influenzae is a bacterium that may cause pneumonia, bacteremia, meningitis, epiglottitis, or other conditions. A confirmed case of invasive disease requires isolation of the organism from a normally sterile site such as blood or spinal fluid. A total of 148 cases, 15 cases per year on average, were reported in Allegheny County in 2007-2016 (Figure 9). More females (73% of cases) than males were affected. Approximately 55% of reported cases were hospitalized; 9% died. Age groups most affected were those ≥65 years and <5 years (Figure 10). About a third (32%) were nontypable; of the rest, 10 were serotype f, 2 (3%) were e, 1 (2%) was b, and 87 were type unknown or unable to type.

The *Haemophilus influenza* b (Hib) vaccine series has been recommended for routine use in children 2 months and older since 1991. Since then, the number of reported Hib cases in children has plummeted nationwide.

Figure 9

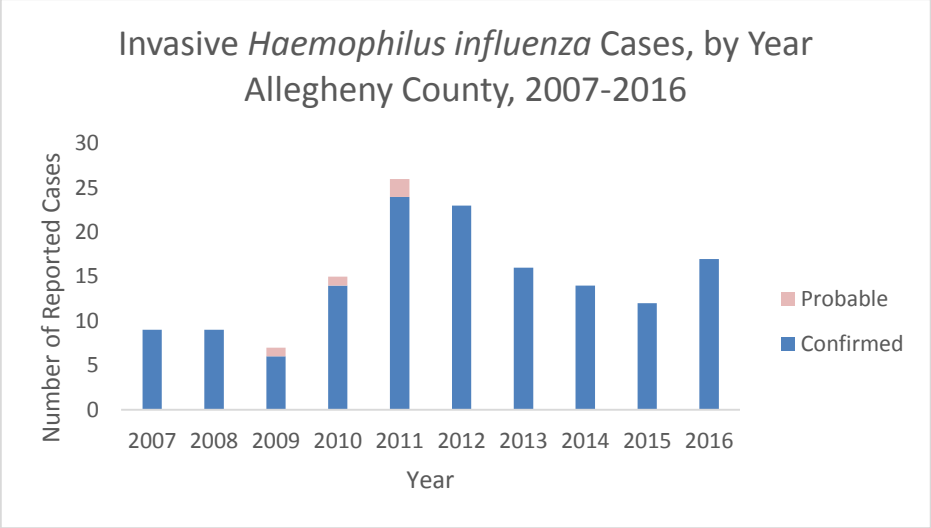
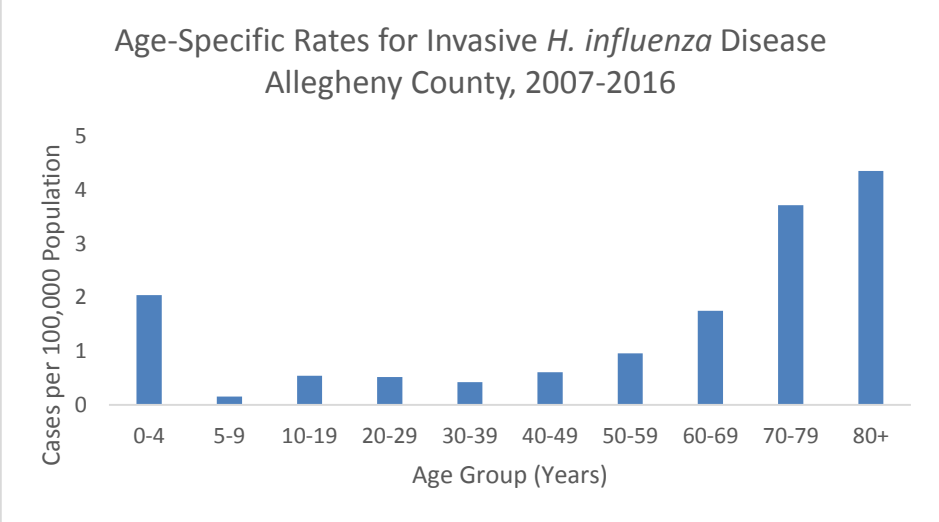


Figure 10



Varicella (chickenpox)

The varicella vaccine was introduced into the routine pediatric vaccine schedule in 1995, causing the number of cases of varicella, more commonly known as chickenpox, to decrease dramatically. When a second dose of vaccine was added to the schedule in 2006, cases decreased further, both nationally and locally (Figure 11).

In Allegheny County, the incidence rate of reported cases was highest in children 5 to 9 years of age (Figure 12); approximately 39% of reported cases in 2007-2016 were in this age group, and 23% were in the 0-4 year age group. Of the 1,033 reported cases, 22 (2%) were hospitalized. Over two thirds (68%) had a known history of vaccination.

Figure 11

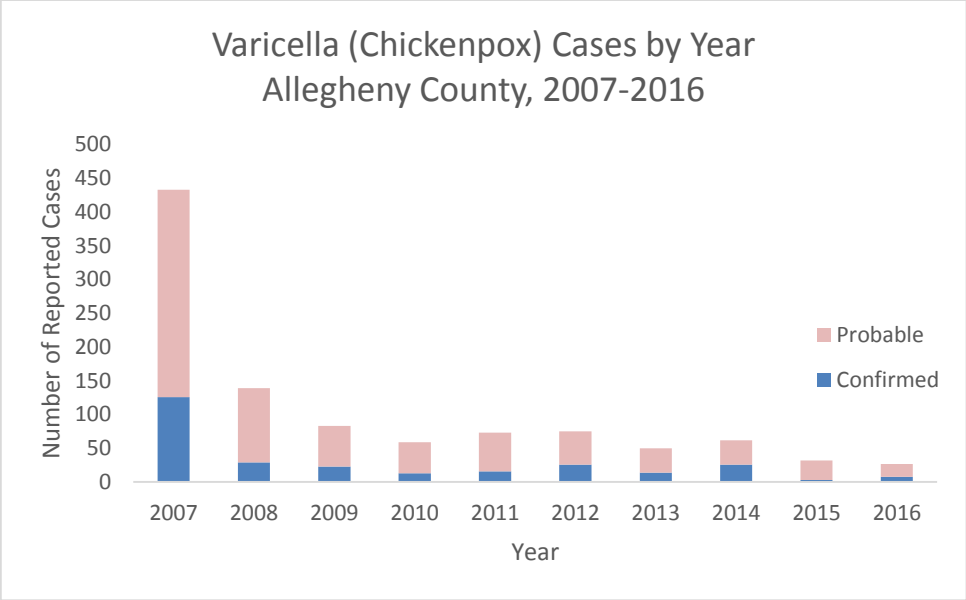
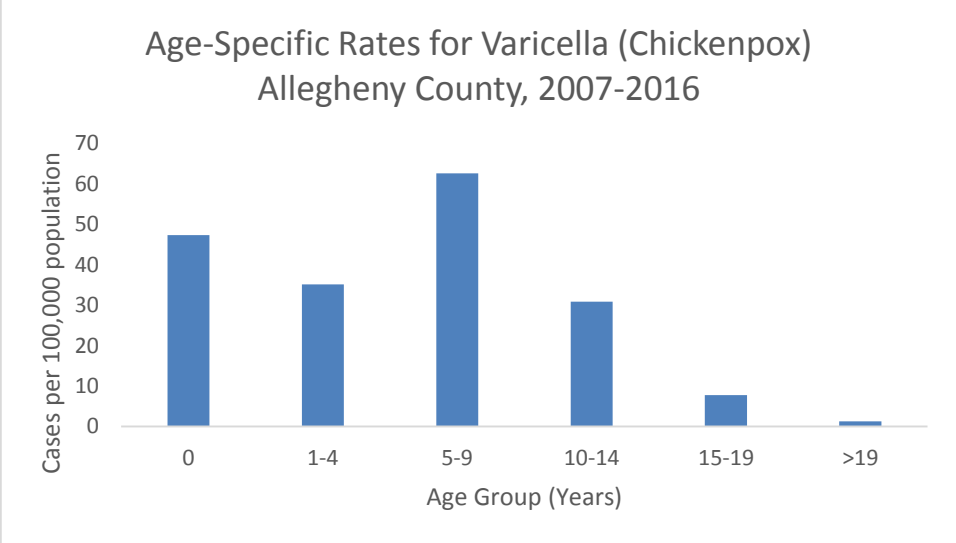


Figure 12



Hepatitis A

The hepatitis A virus is transmitted via the fecal-oral route and causes inflammation of the liver. The number of reported cases of hepatitis A was fewer than 10 per year in Allegheny County in 2007-2016, with the exception of 2007 (Figure 13). Eight cases were reported in 2016. Of the 72 cases reported in 2007-2016, 25 (35%) were hospitalized.

No cases were reported in children ≤9 years of age (Figure 14). Infections in children are often asymptomatic. In addition, a vaccine for hepatitis A has been part of the routine childhood vaccination schedule since 2006.

Of the 72 cases reported in 2007-2016, 17 (24%) reported foreign travel, 7 (10%) reported eating raw shellfish, and 5 (7%) reported contact with a hepatitis A case.

Figure 13

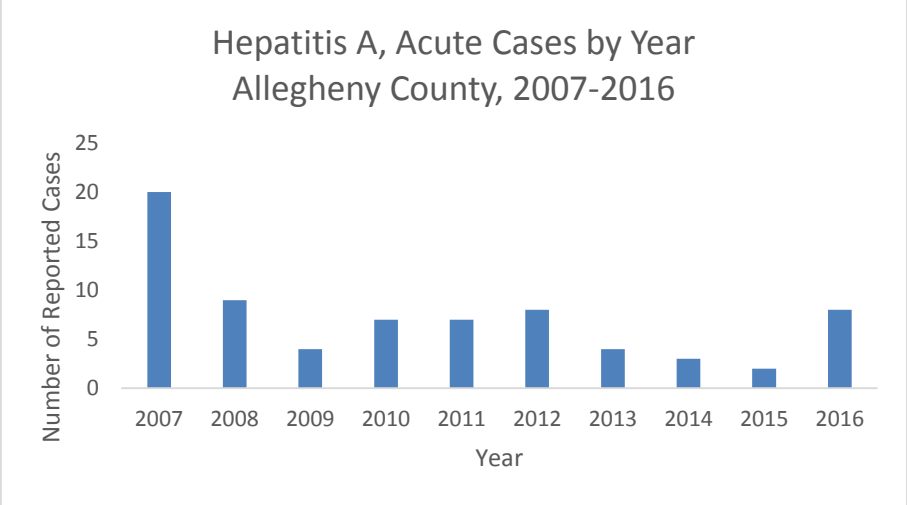
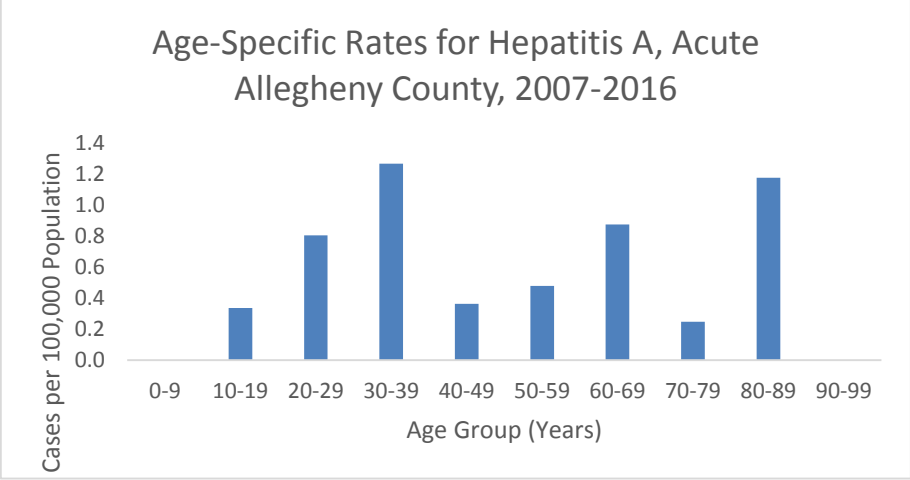


Figure 14



Acute hepatitis B infections

The hepatitis B virus is found in blood and other body fluids. The number of acute hepatitis B infections decreased over the past 10 years with only three cases reported in 2016 (Figure 15). During 2007-2016, rates of acute infection were highest among those 30 through 49 years of age (Figure 16). A higher percentage of cases were male (56%) than female. Over one quarter (29%) of cases were hospitalized and one (1%) died.

Risk factors reported by acute hepatitis B cases include injection drug use (11%), dental work or oral surgery (11%), contact with a hepatitis B case (10%), needle stick (4%), tattoos (3%), and blood transfusion (3%). Of the 156 cases reported in 2007-2016, 103 reported on their number of sex partners; of these, 28 (27%) reported multiple partners.

Figure 15

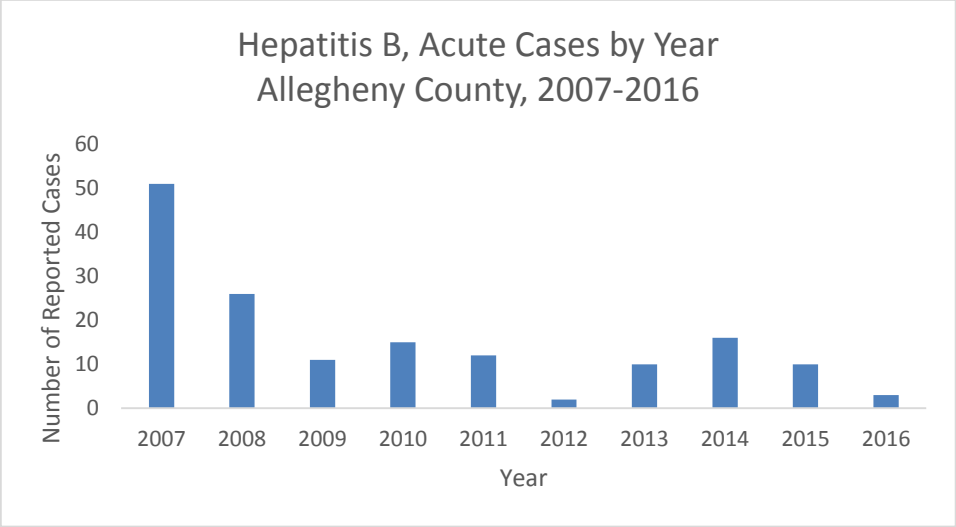
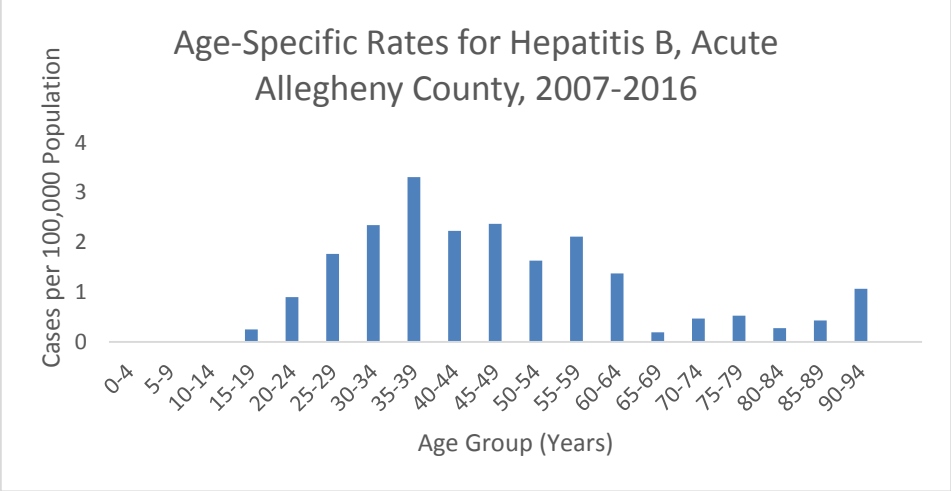


Figure 16



Chronic hepatitis B infections

In 2016, 181 cases of newly diagnosed chronic hepatitis B were reported to ACHD, much higher than the average of 127 per year reported during the previous 9 years (Table 17). Of the 1,323 cases reported during 2007-2016, 56% were male and 79% were 25-59 years, with highest incidence in the 30-34 year age group (Figure 18). Of 916 with known race, 35% were white, 29% Asian, and 27% black. Of 552 females reported in 2007-2016, 124 (22%) were known to be pregnant. No behavioral risk factor information is available for cases of chronic hepatitis B.

Figure 17

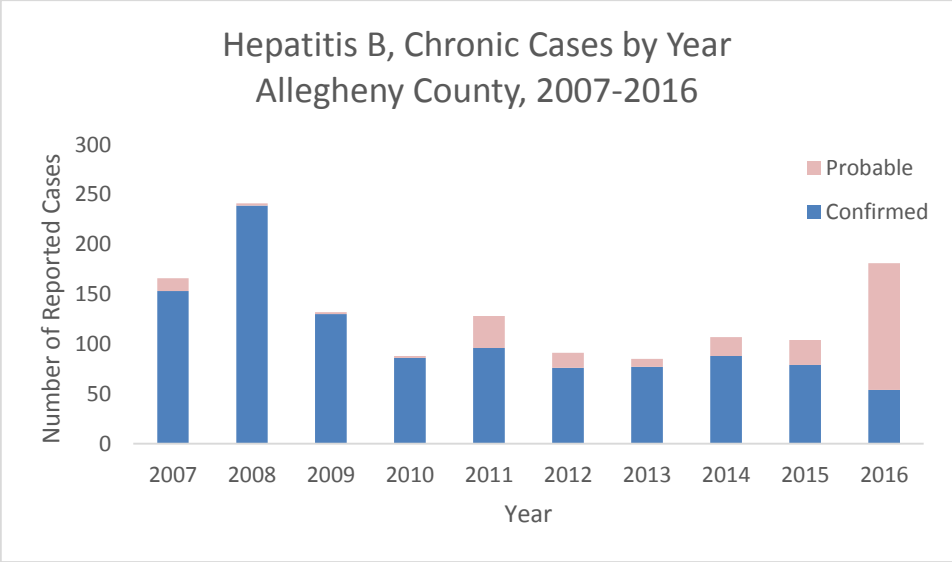
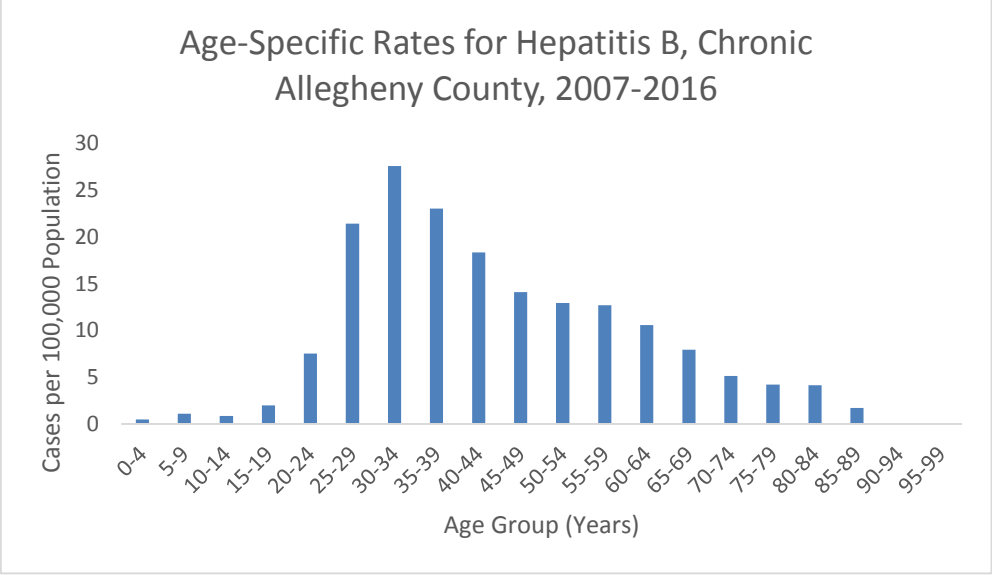


Figure 18



Perinatal hepatitis B

In 2016, 27 infants born to women with chronic hepatitis B virus were followed by ACHD. All received a dose of hepatitis B vaccine and hepatitis B immune globulin (HBIG) within 24 hours of birth. The complete vaccine series was known to be completed by 24 (89%) infants by 10 months of age; three moved out of jurisdiction. Of the 24 infants remaining in the county, 20 (83%) had serologic evidence of immunity; four failed to respond to follow-up requests for serologic testing.

Enteric diseases

Salmonellosis

Salmonellosis is a diarrheal disease transmitted via contaminated food or by contact with animal feces. On average, 132 salmonellosis cases per year were reported to ACHD in 2007-2016 (Figure 19). In 2016, 158 cases were reported for a crude incidence rate of 12.9 per 100,000, above the Healthy People 2020 target of 11.4 per 100,000. All ages were affected but children <5 years of age had the highest incidence rate (Figure 20). More specifically, infants < 1 year of age were at highest risk (39 per 100,000). Slightly more females than males were affected (56% vs 44%). More cases were reported during the summer months (Figure 21). Of 1,149 reported cases with available data, 455 (40%) were hospitalized; four persons died.

In 2016, species was known for 70 (44%) of the 158 reported cases. Of these, the most common serotypes were S. Enteritidis (30%), S. Typhimurium (21%), S. Newport (14%), with 22 other species identified (1 or 2 cases of each).

Figure 19

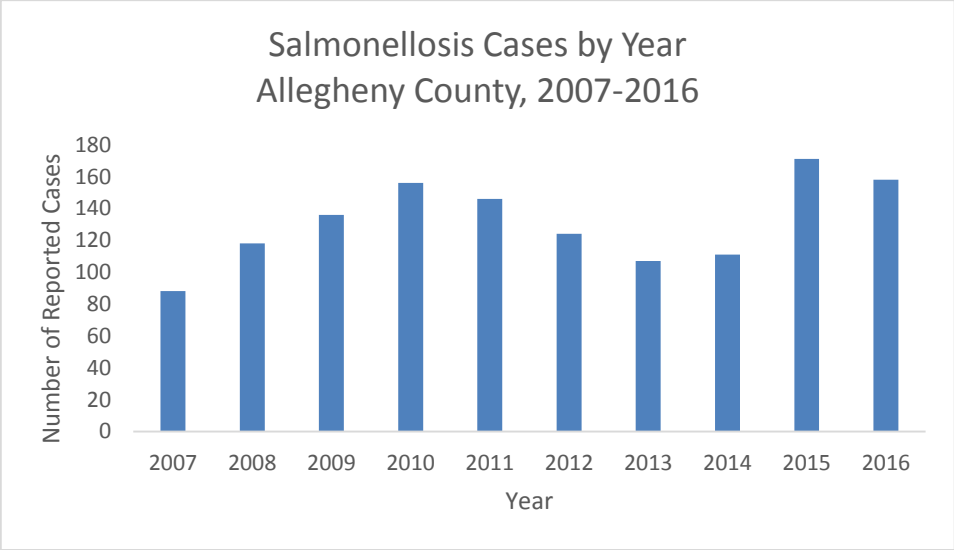


Figure 20

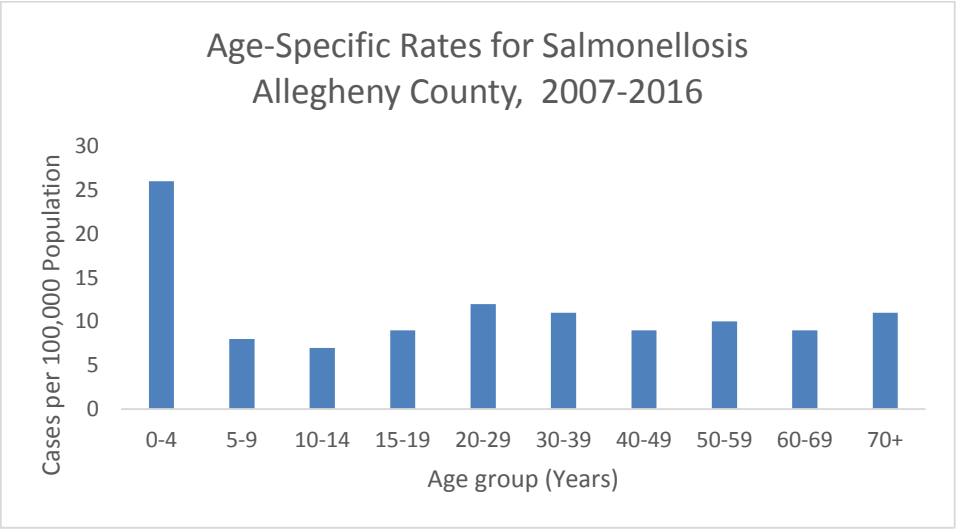
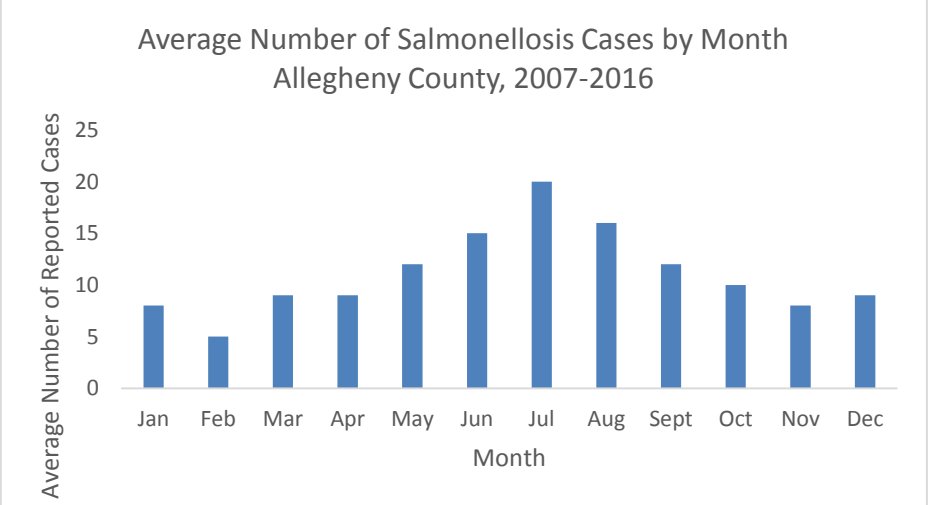


Figure 21



Typhoid fever

In 2007-2016, 28 cases of typhoid fever, caused by *Salmonella* typhi, were reported to ACHD. Of 26 with available risk factor information, 22 (85%) reported travel outside of the US and Canada. Twenty-four (86%) cases were hospitalized, but no deaths were reported. In 2016, two cases were reported; one had traveled outside the US without receiving vaccine and one was visiting the US from overseas.

Shigellosis

Shigellosis is a diarrheal disease with outbreaks common at childcare facilities and among men who have sex with men (MSM). Fewer than 10 cases per year of shigellosis were reported, except in 2009-2010 and 2014-2016 when several childcare facilities experienced outbreaks (Figure 22). A total of 442 cases were reported in 2007-2016. The incidence was highest in children 0-4 years of age (Figure 23). Of 372 cases with available data, 107 (29%) were hospitalized. No associated deaths were reported.

During 2014-2016, 184 cases were reported with median age of 18 years. Of these, species infection was available for 175 cases, of which 145 (83%) were *S. sonnei* and 30 (17%) were *S. flexneri.* Of 164 cases with known risk factors, 47 (29%) reported association with day care facilities. Ten cases reported travel outside the US or Canada and eight were known to be MSM.

Figure 22

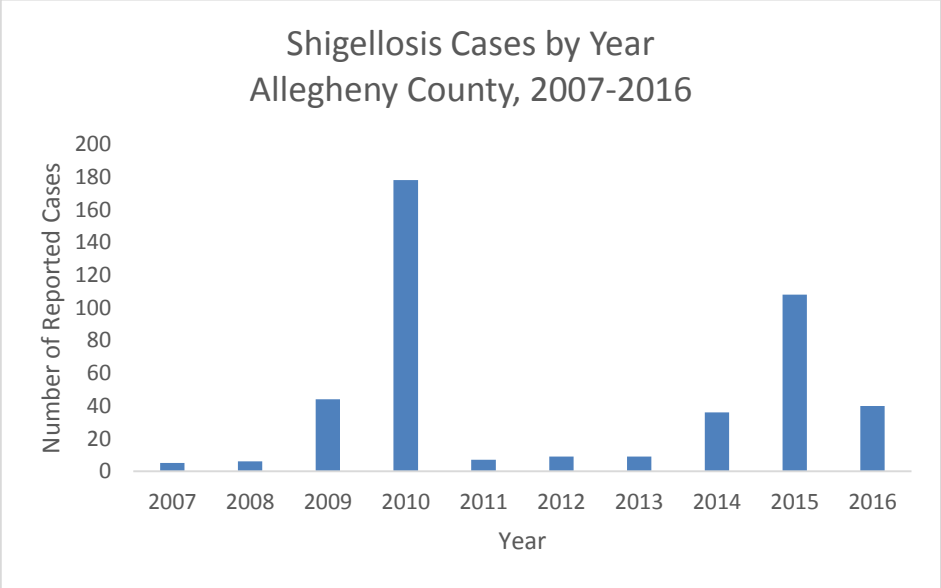
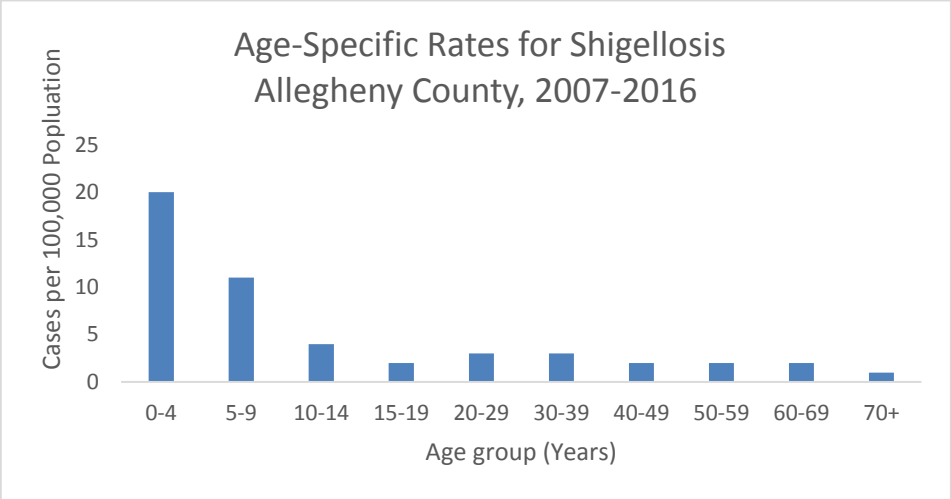


Figure 23



Campylobacteriosis

Campylobacteriosis was the second most commonly reported enteric disease after salmonellosis with an average of 111 cases reported per year (Figure 24). In 2016, 111 cases were reported. The reported incidence rate in 2016 for Allegheny County was 9.1 per 100,000, higher than the Healthy People 2020 target of 8.5 per 100,000.

Campylobacter infection was more common among adults than among school-aged children (Figure 25) and slightly more common among males (55%). More cases were reported during the summer months (Figure 26). Of 977 cases with available data, 260 (27%) were hospitalized; one died.

Common risk factors for campylobacteriosis include eating undercooked poultry or cross contaminated foods or contact with the stool of an ill dog or cat. Among cases reported in 2016 with known risk factors, 57% of cases reported exposure to animals, 18% reported eating raw or undercooked meat, and 5% reported eating raw or undercooked eggs.

Figure 24

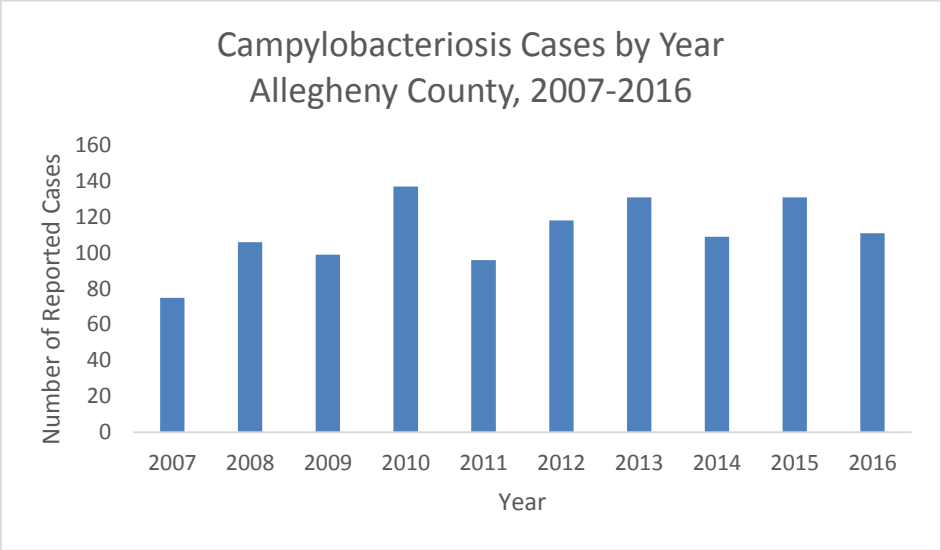


Figure 25

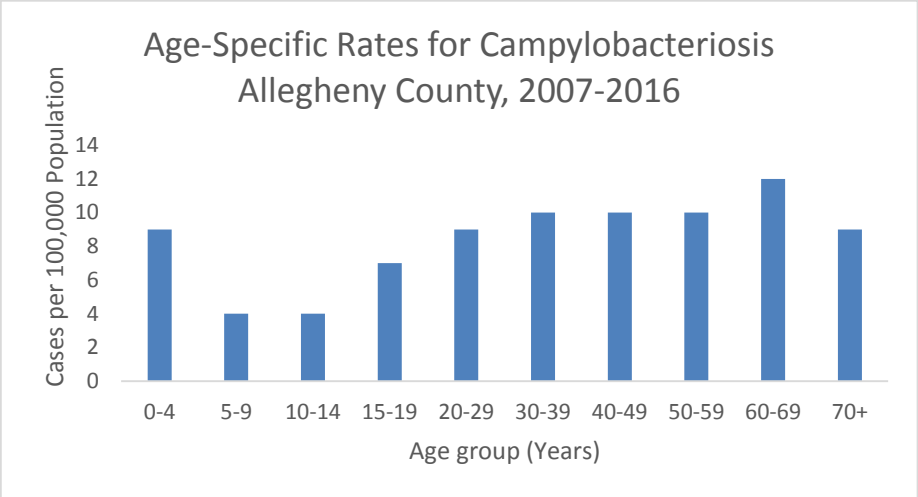
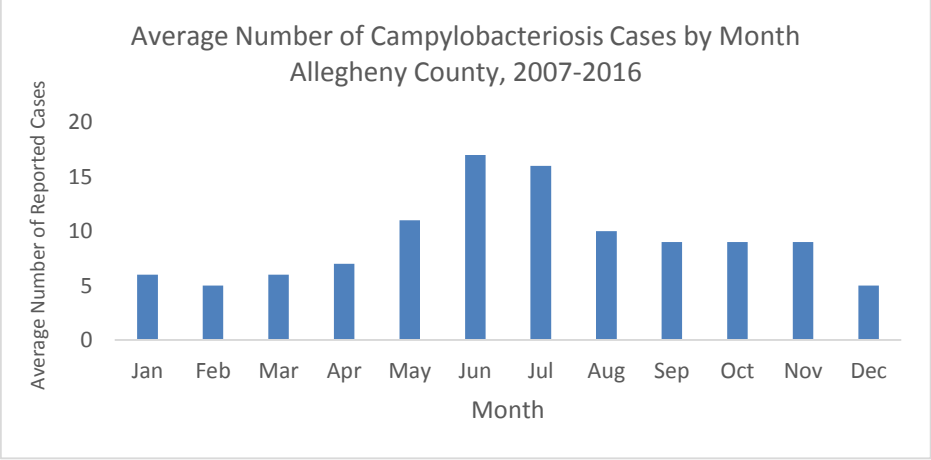


Figure 26

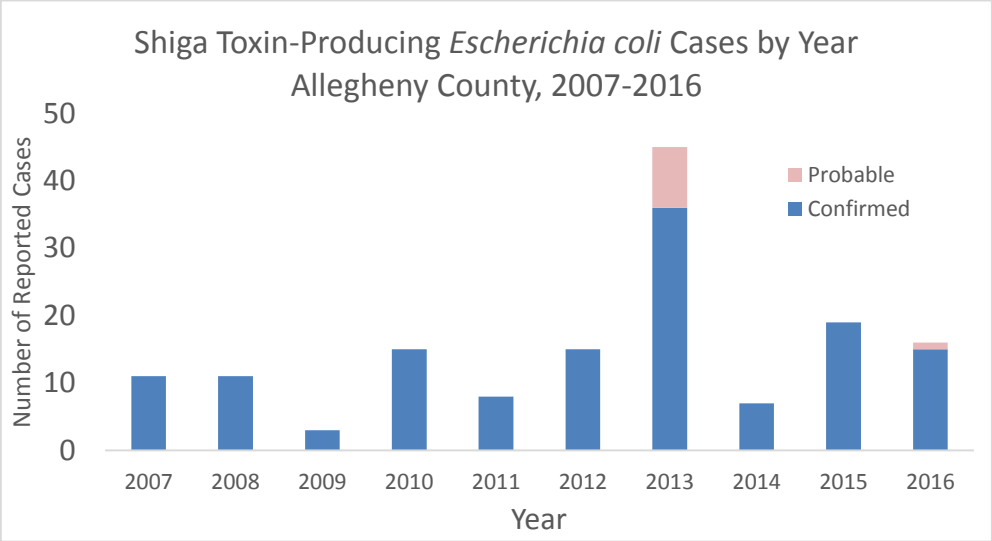


Shiga-toxin producing *E.coli*

Some types of *Escherichia coli* bacteria cause disease by making a toxin called Shiga toxin. *E. coli* 0157:H7 is the most commonly identified Shiga-toxin producing *E.coli* (STEC) in North America. In 2007-2016, 150 cases of STEC were reported to ACHD (Figure 27). Cases spiked in 2013 with 45 reported cases, 24 (56%) of which were associated with an outbreak at a particular restaurant. In 2016, 16 cases were reported for a crude incidence rate of 1.3 per 100,000, about twice the Healthy People 2020 target of 0.6 per 100,000.

The median age of cases in 2007-2016 was 17 years, with a range of 1 to 81 years; 55% were female. Of the 149 STEC cases with available data, 39% were hospitalized, 4% developed hemolytic uremic syndrome, and one (1%) died. About one fifth (19%) of cases reported eating raw or undercooked meat, 19% reported swimming before illness onset, 8% reported international travel, and 5% consumed raw milk or juice.

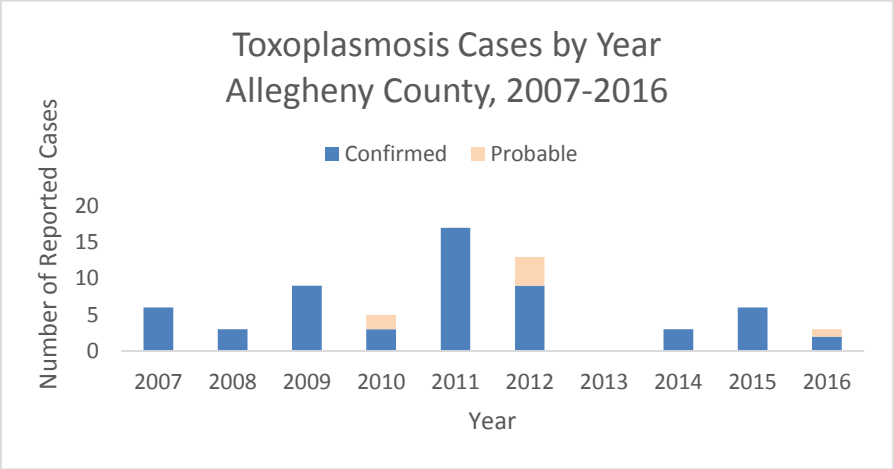
Figure 27



Toxoplasmosis

Approximately 60 million Americans are infected with the *Toxoplasma* parasite, but most infected persons are asymptomatic. Newly infected pregnant women and immunocompromised persons are at risk for complications. In 2007-2016, 58 confirmed and 7 probable cases were reported to ACHD (Figure 28). Of these, 15 were known to be pregnant and 9 were known to be immunocompromised. Reliable information on exposure to cats was not available.

Figure 28



Listeriosis

Listeriosis is a rare but serious foodborne illness which most often affects the elderly, those with compromised immune systems, and pregnant women and their newborns. Infections may be mild but those diagnosed are often more serious, involving blood infection or meningitis. In Allegheny County, an average of 5 cases per year was reported in 2007-2016 (Figure 29). In 2016, only one case was reported for a rate of 0.1 per 100,000, below the Healthy People 2020 goal of 0.2 per 100,000. Infants and the elderly had the highest incidence rates (Figure 30). Thirty one (66%) cases were ≥60 years, including 13 (28%) ≥80 years; two (4%) cases were infants < 12 months. Only one case was known to be pregnant.

Of 43 cases in 2007-2016 with available data, 41 (95%) were hospitalized; 9 deaths were reported with median age of 78? years (range 20 to 95 years?).

Figure 29

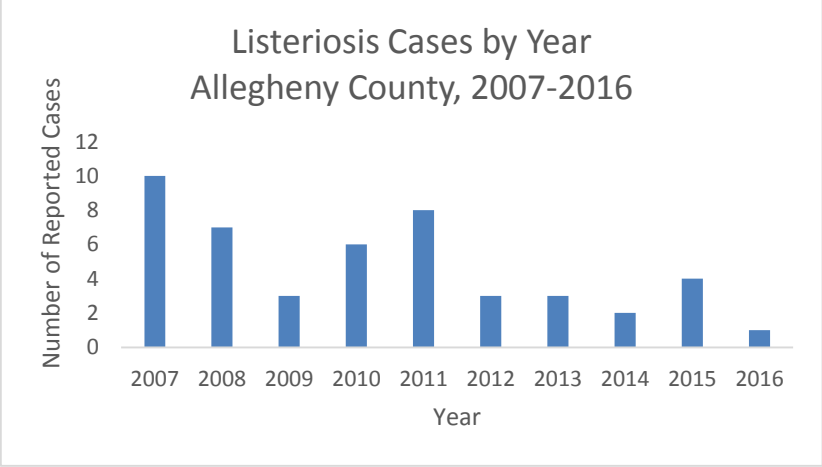
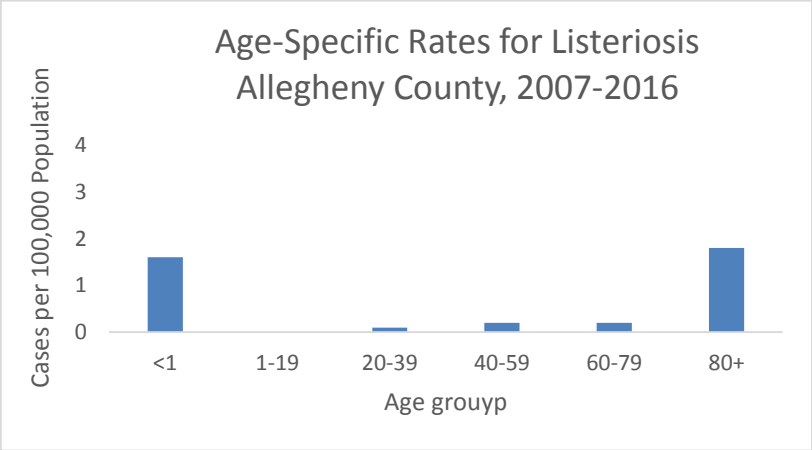


Figure 30



Cryptosporidiosis

Cryptosporidiosis is a diarrheal disease caused by a parasite most commonly transmitted through drinking water or recreational water. Humans and domestic and wild animals may be infected with the parasite. An average of 28 cases per year were reported to ACHD in 2007-2016 (Figure 31). The majority (57%) of reported cases were female; all age groups were affected (Figure 32). Of those with available data, 33% were hospitalized and three died.

About half (47%) of the cases reported having been around an animal, 21% had been swimming, and 9% had traveled outside of the US and Canada. Cryptosporidiosis causes more severe disease in immunocompromised persons, but no information on HIV status or other immunodeficiencies was available for reported cases in Allegheny County.

Figure 31

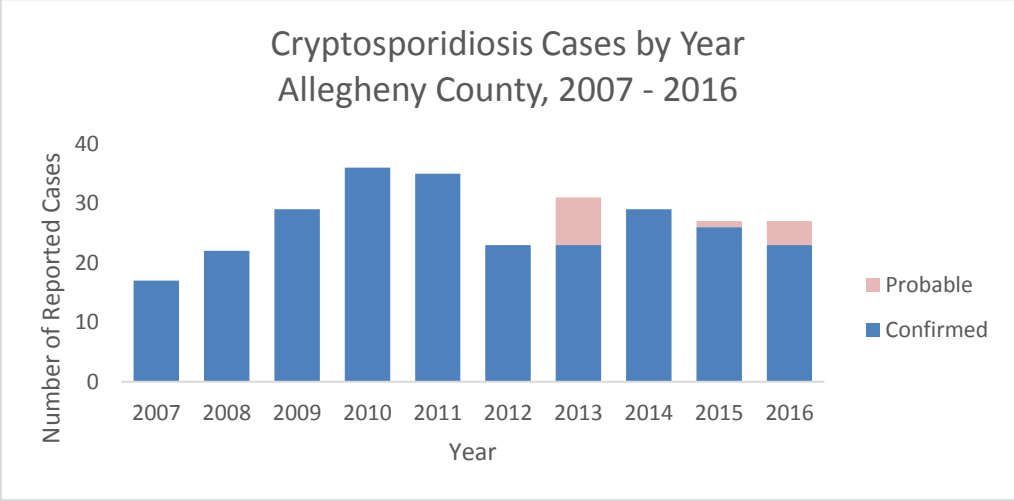
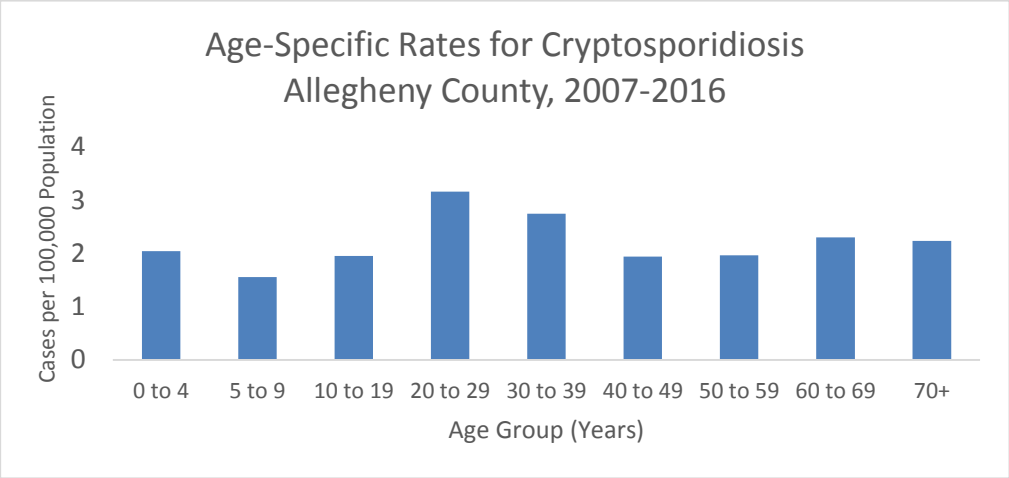


Figure 32



Giardiasis

Giardiasis is an intestinal disease caused by ingestion of Giardia cysts in fecally contaminated water or by person-to-person transmission. An average of 71 cases of giardiasis per year was reported to ACHD in 2007-2016 (Figure 33). More cases were reported during late summer and early fall than in other seasons (Figure 34). The median age of reported cases was 33 years with a range of 0 to 93 years. The incidence rate was highest among children 0-4 years of age (Figure 35). Of cases with available data, 15% (90/599) were hospitalized. Only about one out of six (16%) reported possible exposure outside of the US, and 19% reported having gone swimming in 14 days prior to illness.

Figure 33

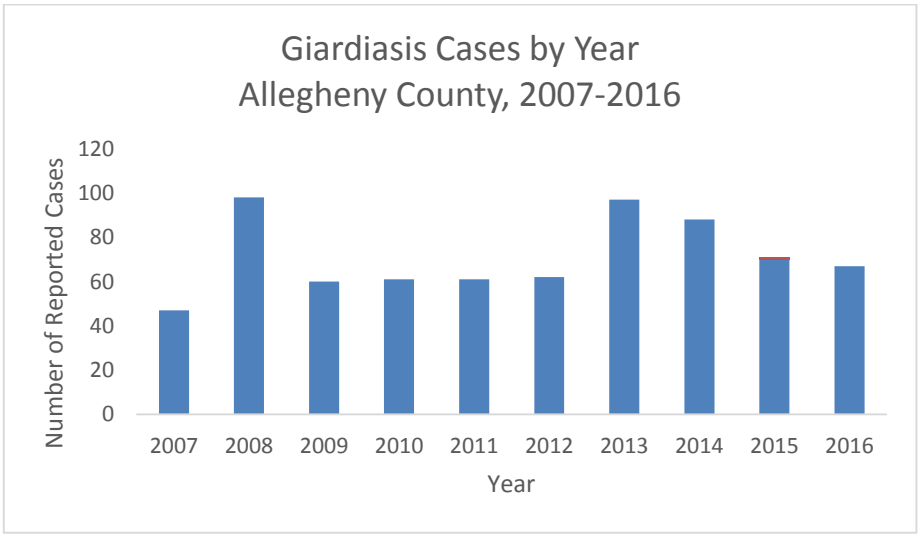


Figure 34

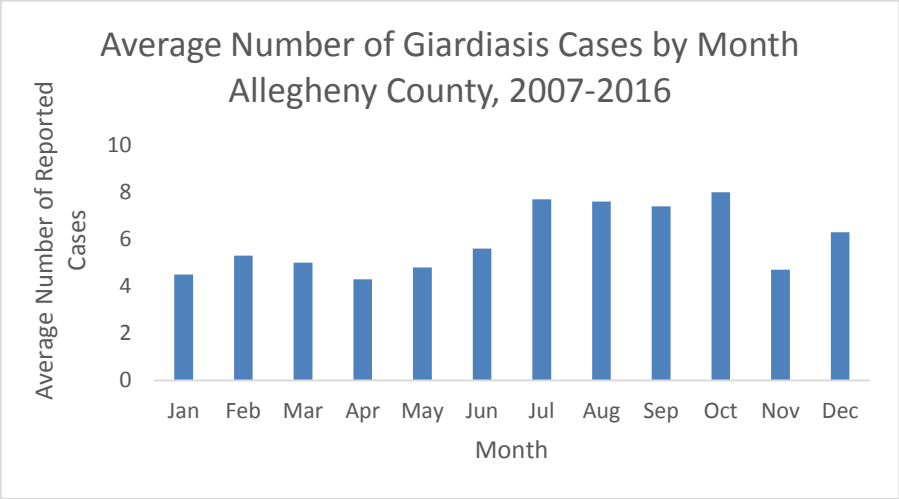
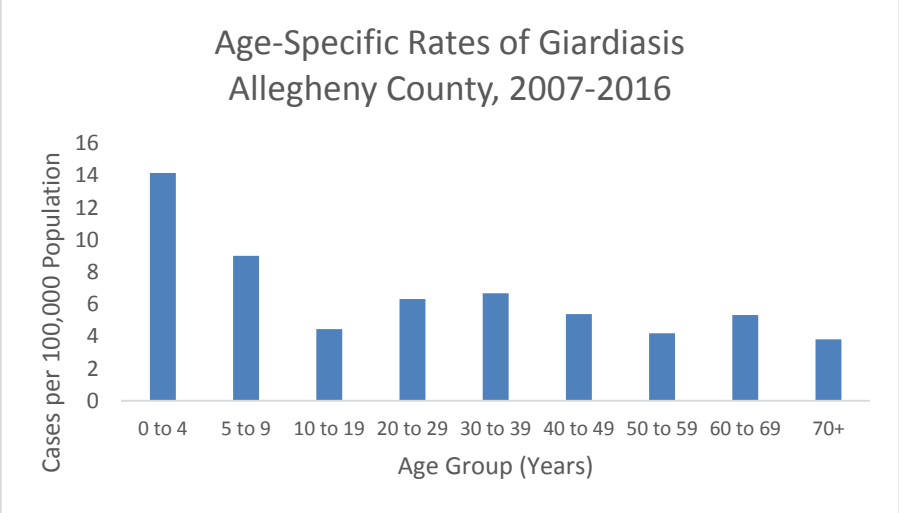


Figure 35



Amebiasis

Amebiasis is caused by ingestion of the parasite *Entamoeba histolytica*. During 2007-2016, 26 cases of amebiasis were reported, including 5 in 2016. Of those with risk factor data, 26% (5/19) were recently adopted, 22% (4/18) had been swimming, and 11% (2/19) had traveled outside the US or Canada. Three cases were known to be hospitalized. No deaths were reported.

Infant botulism

Botulism is a muscle paralyzing disease caused by the ingestion of the toxin of the bacterium *Clostridium botulinum* or by colonization of the intestinal tract in infants. *C. botulinum*is an

anaerobic bacteria sometimes found in the environment. In 2007-2016, 7 confirmed cases of infant botulism were reported to ACHD, including one in 2016. All were < 1 year of age. Of 5 with known status, all were hospitalized, received antitoxin and survived. None reported having consumed honey. Four were reported to have had construction around their house.

Respiratory diseases

Tuberculosis

Tuberculosis is a highly contagious respiratory disease that is endemic in many countries outside the US. Approximately 17 cases per year of active tuberculosis (TB) were reported to ACHD in 2007-2016 (Figure 36). In 2016, 8 cases were reported for a crude incidence rate of 0.7 per 100,000, lower than the national rate of 3.0 per 100,000. All eight were confirmed by culture; seven were susceptible to all drugs tested, and one was resistant to pyrazinamide.

The median age of cases in 2007-2016 was 46 years with range of 0 to 98 years. Persons ≥60 years had the highest incidence rate (Figure 37). A higher percentage (58%) of cases was male; 37% were white, 25% black, and 38% Asian. Of 158 cases with information on country of birth, 89 (56%) were foreign born.

HIV test results indicate that of 58 tuberculosis cases reported in 2013-2016, 4 (7%) were HIV-infected, 41 were negative within the past year, 6 were not offered testing, 6 refused testing, and results on one were unknown.

Figure 36

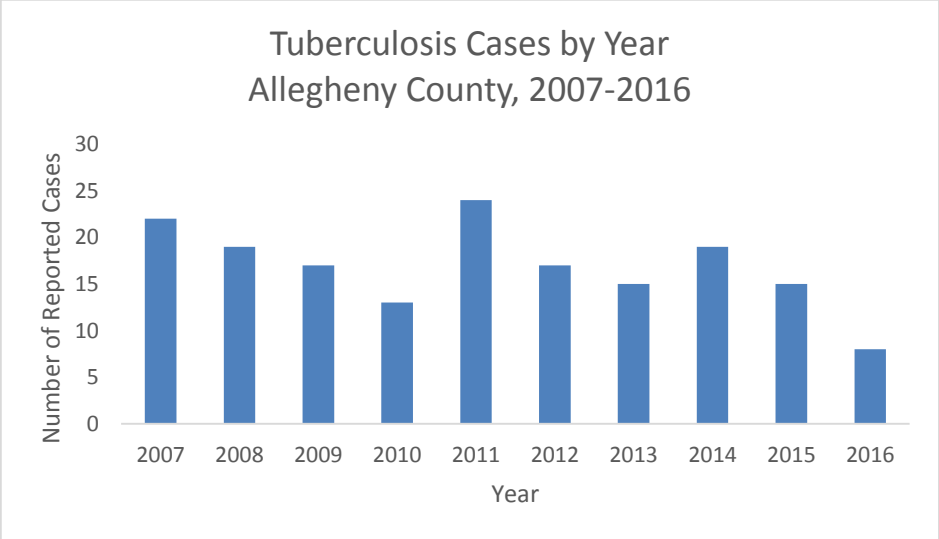
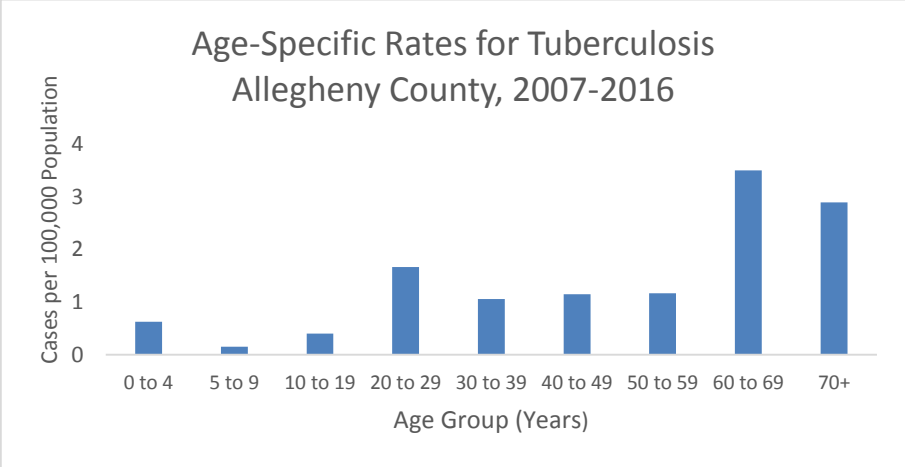


Figure 37



Legionellosis

Legionnaires' disease is a severe pneumonia which may affect persons with weak immune systems who breathe in aerosolized water containing Legionella bacteria. An average of 83 cases of legionellosis per year was reported (range 54 to 118) to ACHD in 2007-2016 (Figure 38). The crude incidence rate varied from 4.4 to 9.7 during the 10-year period, much higher than the national rate which varied from 0.9 to 1.9 per 100,000 in 2007 through 2016. The Mid-Atlantic region, which includes Pennsylvania, has the highest rates of legionellosis in the US.

Of cases with available data, almost all (98%) were hospitalized and 10% died. The rates of reported infection were highest persons ≥70 years (Figure 39). More males (62%) than females were reported. The incidence was highest during the summer months (Figure 40).

In 2016, 69% infections were community acquired, 6% were definitely acquired at a health care facility, and 26% reported having some health care facility exposure. Only 7% reported overnight travel during the incubation period of 2 to 10 days before illness onset.

Figure 38

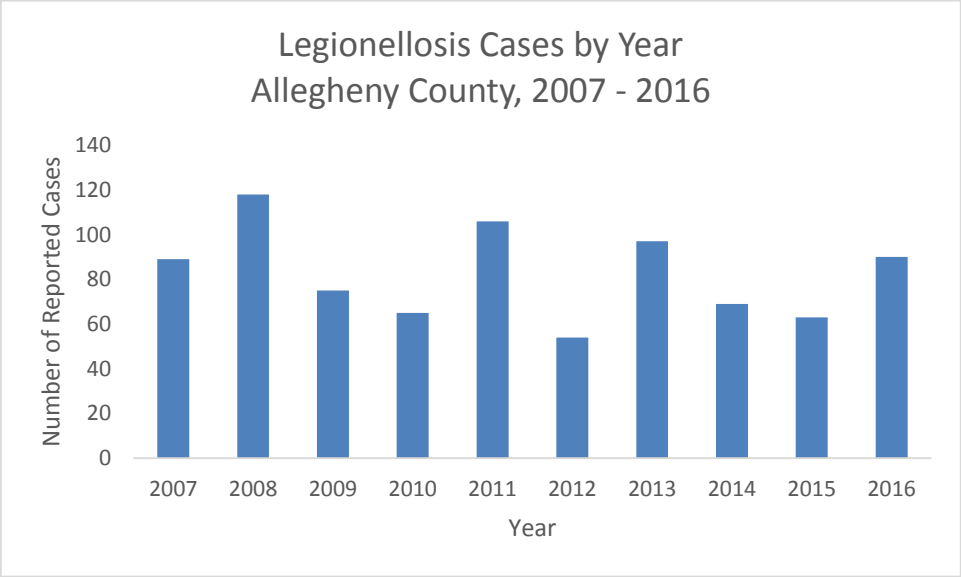


Figure 39

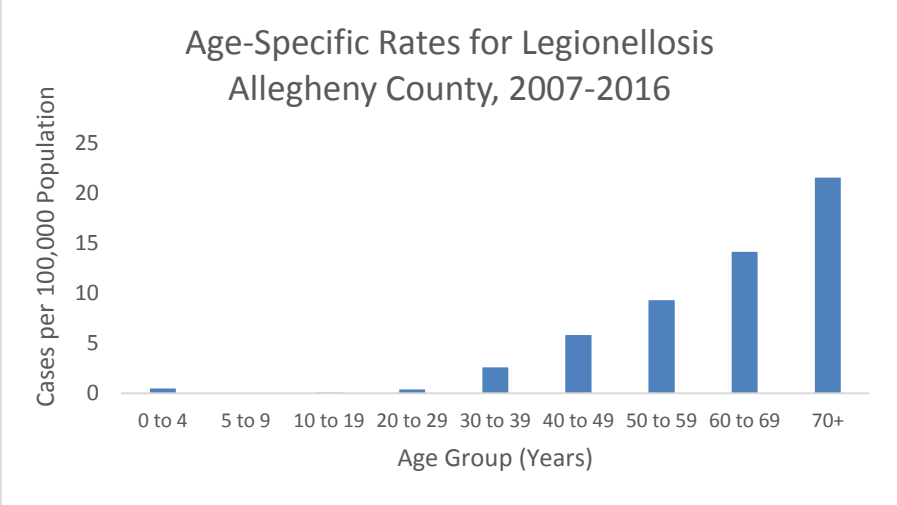
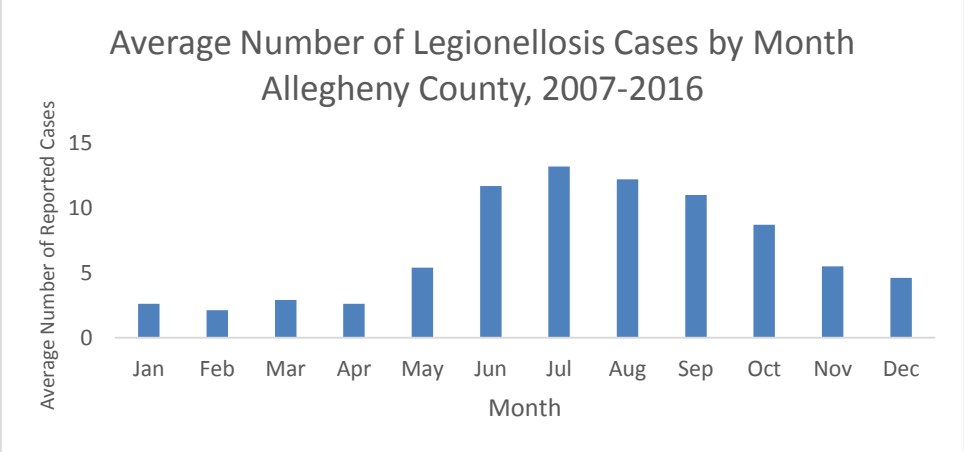


Figure 40



Vectorborne

Lyme disease

Lyme disease, caused by the spirochete *Borrelia burgdorferi*, is transmitted by the blacklegged tick *Ixodes scapularis* in the Eastern and Midwestern parts of the United States. Transmission of *B. burgdorferi* generally occurs once an infected tick has been attached for more than 36 hours.

From 2007 to 2013, the number of positive laboratory tests reported to ACHD began to rise (Figure 41), but ACHD stopped investigating cases because of the increased workload and competing priorities. Fewer than 30 cases were confirmed per year during this time period. In 2014, ACHD received 1,455 reports of Lyme disease and attempted to investigate all reports. After investigation, 822 cases were classified as confirmed or probable (Figure 42).

In 2015, ACHD adopted a case count estimation procedure based on sampling that was developed and utilized in New York, Massachusetts and Minnesota. A 20% sample of laboratory reports were selected for investigation during each quarter of 2015. Based on results of these investigations and on the number of provider-reported cases, ACHD estimated that the reports received by ACHD represented 971 cases (Figure 42). In 2016, ACHD again used the 20% sampling methodology to obtain an estimate of 1,285 cases for the year (Figure 42). The number of estimated cases in 2016 by age group and sex is shown in Figure 43, indicating that more males than females are infected and children 5 to 14 years and adults 55 to 64 years have the highest incidence.

The CDC does not currently accept estimated case counts for official use. Therefore, the official number of cases reported to CDC, 278 in 2015 and 403 in 2016, vastly differ from the estimated case count (Figure 42).

Figure 41

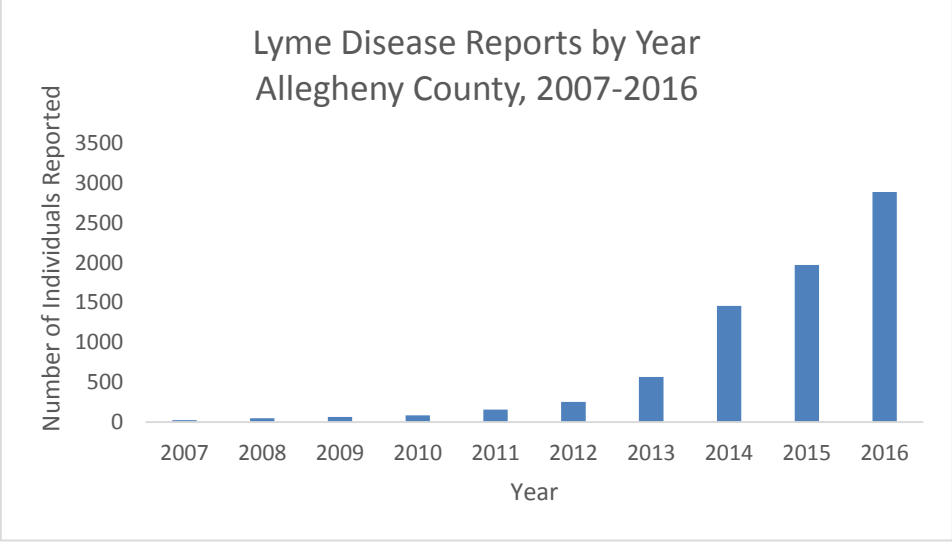


Figure 42

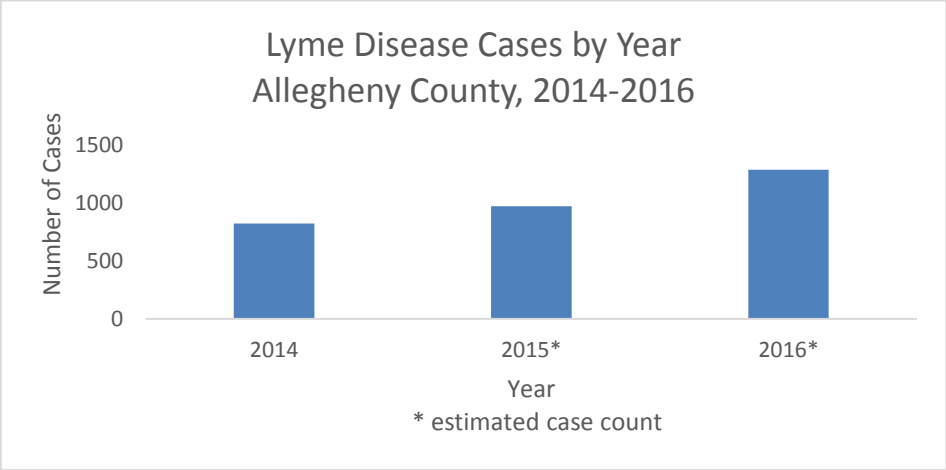
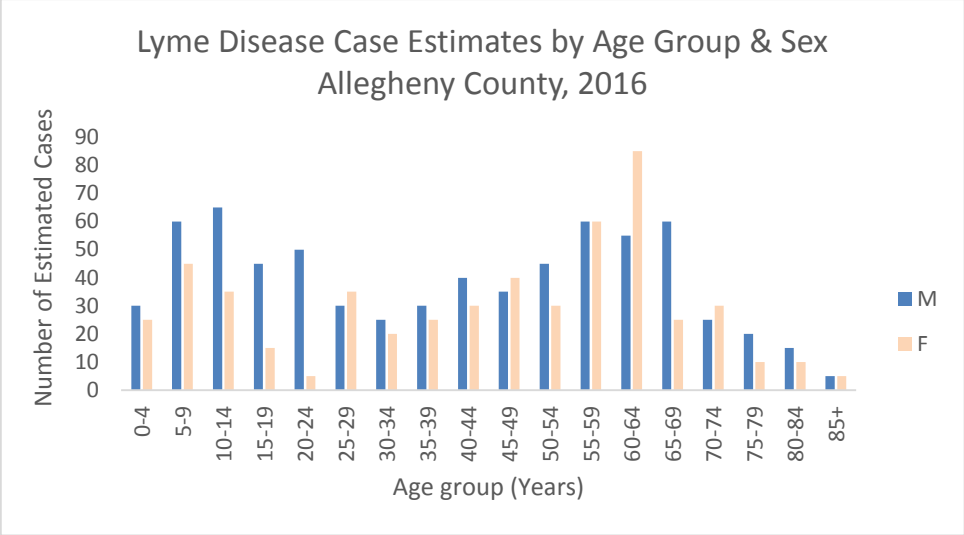


Figure 43



Zika virus disease

Zika virus was first detected in the Western Hemisphere in Brazil in 2014 and quickly spread to most countries in the Americas. It is spread by mainly by mosquitos but sexual transmission has also been documented. It is the first arbovirus known to cause birth defects in humans. Twelve Allegheny County residents tested positive for the virus in 2015-2016, including 11 who were symptomatic after traveling to Zika-affected areas and one who developed symptoms after a laboratory exposure. Cases ranged in age from 19 to 70 years with median of 36 years. Three persons had traveled to Puerto Rico, and the other cases had traveled to Haiti, the Dominican Republic, the Virgin Islands, Bonaire, Costa Rica, Honduras and Nicaragua.

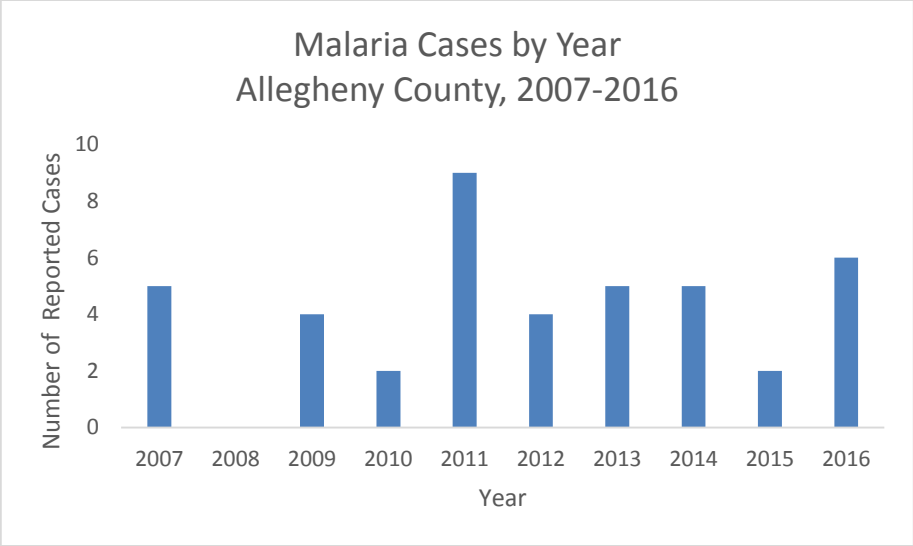
West Nile virus disease

The West Nile virus is transmitted by mosquito and can cause a febrile illness and occasionally encephalitis. Seven confirmed cases of West Nile virus disease were reported in 2007-2016, including one in 2014, three in 2015, but none in 2016.

Malaria

In 2007-2016, 42 cases of malaria, a mosquito-borne infection caused by the *Plasmodium* parasite, were reported to ACHD (Figure 44). All reported cases had traveled outside the US and Canada. Cases ranged in age from 5 to 81 years with a median age of 34 years. Twenty one (50%) cases were had possible exposure in West Africa, 11 (26%) in India, 5 (12%) in East and Southern Africa, 2 (5%) in unspecified country in Africa, 3 (7%) in Central America/Caribbean, and one (2%) in Afghanistan. More than half of the cases did not take any prophylactic antimalarial medication while traveling. One Allegheny County resident with malaria died in 2013.

Figure 44



Dengue

In 2007-2016, 17 cases of dengue fever, a mosquito-borne viral disease common in warm climates, were reported to ACHD with an age range of 16 to 72 years and a median age of 49 years. All cases had traveled outside of the US and Canada. Infections were most likely acquired in India (35%), the Caribbean (29%), Central or South America (18%), Sri Lanka (6%), Thailand (6%) and China (6%).

Chikungunya

Chikungunya, a mosquito-borne disease introduced into the Americas in 2013, was first diagnosed in Allegheny County residents in 2014, when 9 travel-related cases were reported. Another case was reported in 2015, and two in 2016. The age range of the 12 total cases was 14 to 63 years, with a median of 46 years. Three cases had traveled to Haiti, two to India, and one each to the Dominican Republic, Jamaica, Puerto Rico, Trinidad, Nicaragua, Venezuela, Indonesia, respectively.

Other diseases

Hepatitis C

Hepatitis C is a liver disease that results from infection with the hepatitis C virus (HCV), which is spread primarily through contact with the blood of an infected person. In 2016, ACHD received positive hepatitis C reports for 3,856 Allegheny County residents, whereas during the previous nine years (2007-2015), ACHD received new positive hepatitis C laboratory results on an average of 1,837 residents per year (Figure 45).

Prior to 2015, hepatitis C reports were not investigated due to the large volume of reports and lack of available staff; cases were classified on the basis of reported laboratory tests only. In 2015, ACHD attempted to collect clinical and additional laboratory information on all patients reported. The enhanced surveillance efforts in 2015 led to the identification of 23 acute cases of hepatitis C, whereas only two acute cases had been identified in the previous 9 years (2006-2014). In 2016, ACHD investigated reports for individuals < 34 years old, >75 years old, tested by dialysis centers or reported to have acute infections; 11 acute infections were confirmed. The median age of the 34 acute cases identified in 2015-2016 was 34 years (range 18 to 85 years); 65% were male. Of 29 persons interviewed, 19 (66%) reported a history of intravenous drug use.

Chronic hepatitis C is associated with liver damage and sometimes liver failure or liver cancer. In 2016, of 3,856 new reports for Allegheny County residents, 1,628 (42%) were classified as confirmed chronic cases (positive HCV NAT, HCV antigen, or genotype results without clinical information consistent with acute infection) and 1,196 (31%) were classified as probable chronic cases (HCV antibody without clinical information consistent with acute infection) (Figure 46). Prior to 2016, the probable case definition did not include individuals with only a positive anti-HCV test and thus the number of cases classified as probable was much lower.

Of the 2,824 confirmed and probable cases of chronic hepatitis C cases reported in 2016, 60% were males. The age distribution was bimodal with peaks in the 25-39 year and 50-64 year old age groups (Figure 47). Injection drug use was the most common risk factor reported by providers.

Only 86 chronically infected persons aged 18-34 years were reached for interview in 2016; of these, 61 (74%) reported a history of injection drug use, 57 (70%) reported having a tattoo, 54 (66%) reported a history of dental work or oral surgery and 35 (43%) reported contact with an HCV case. Of those interviewed, 8 (9%) reported receiving medication or treatment for their infection and 14 additional persons reported receiving medical care specifically for their hepatitis C infection.

Figure 45

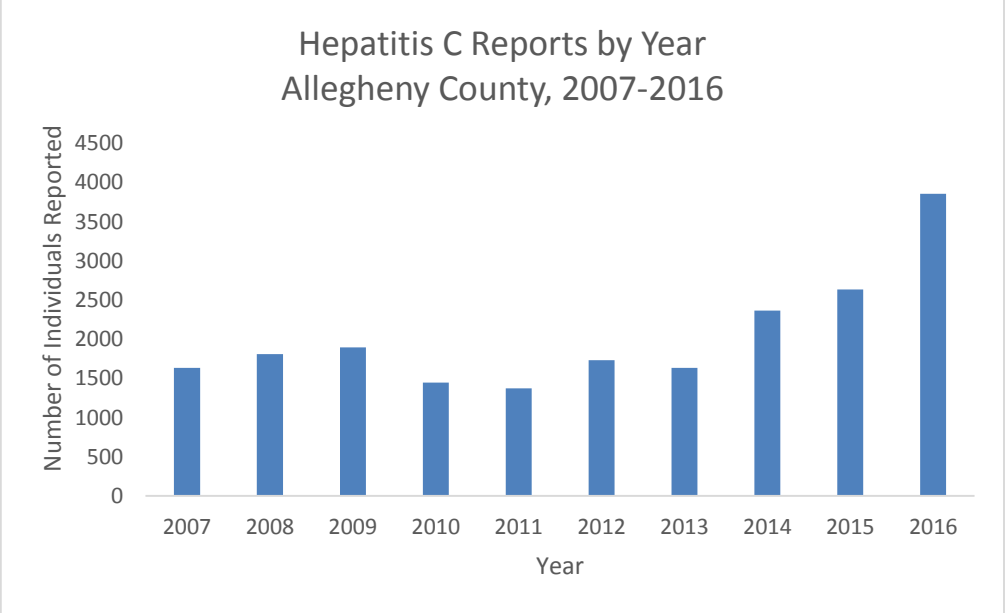


Figure 46

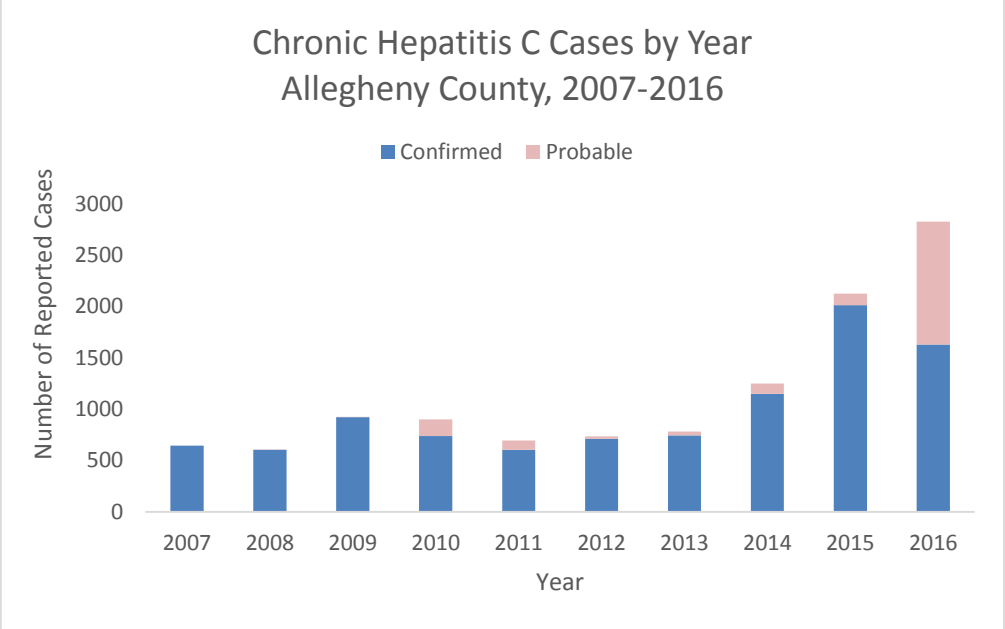
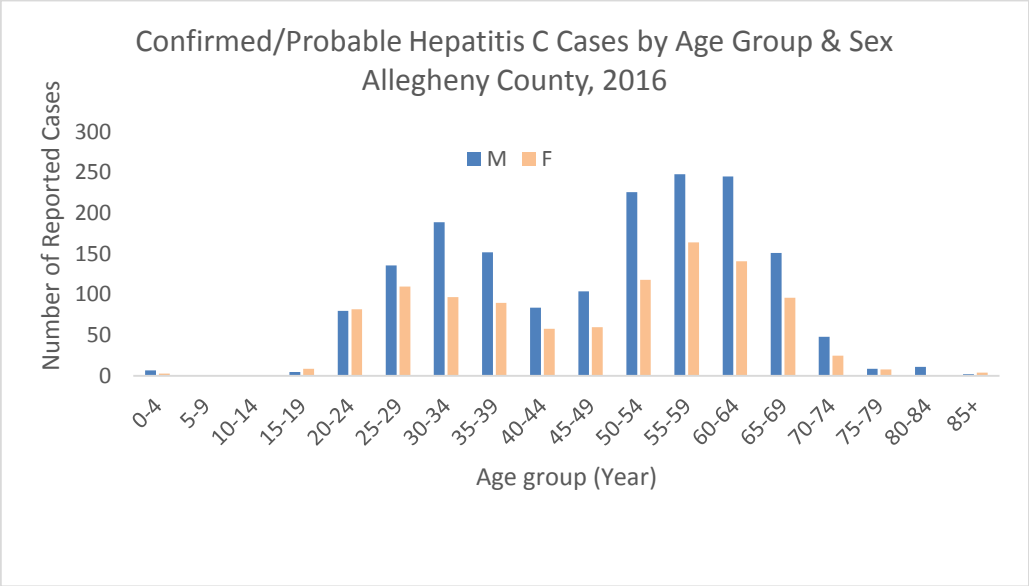


Figure 47



Invasive Group A Streptococcus infection

Group A streptococci cause infections of the throat and skin. If the bacteria invade the blood, fascia, or organs, they cause more severe infections including necrotizing fasciitis, toxic shock syndrome, pneumonia, and septicemia. An average of 30 cases per year of invasive Group A streptococcus cases was reported to ACHD in 2007-2016 (Figure 48). Persons ≥60 years were at greatest risk (Figure 49). Of cases with known status, 93% (187/202) were hospitalized and 15% (23/155) died.

Figure 48

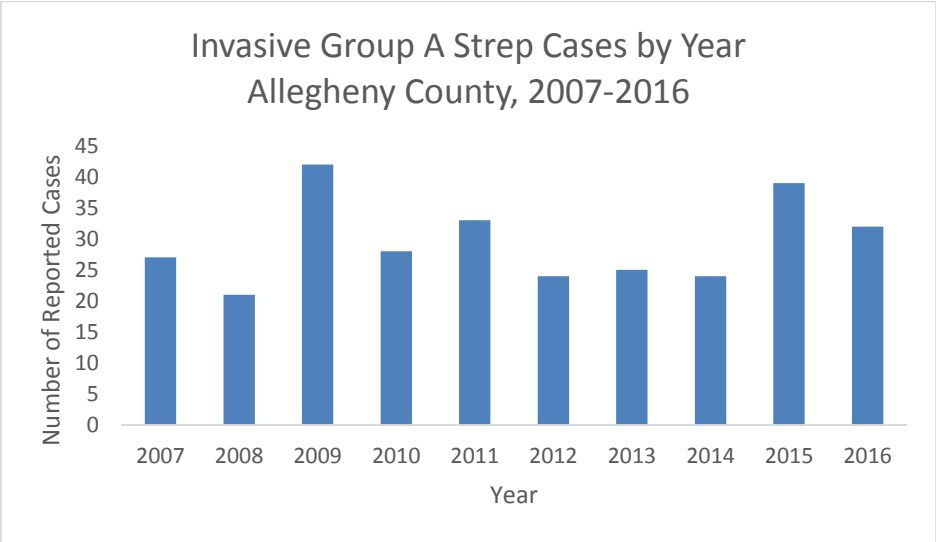
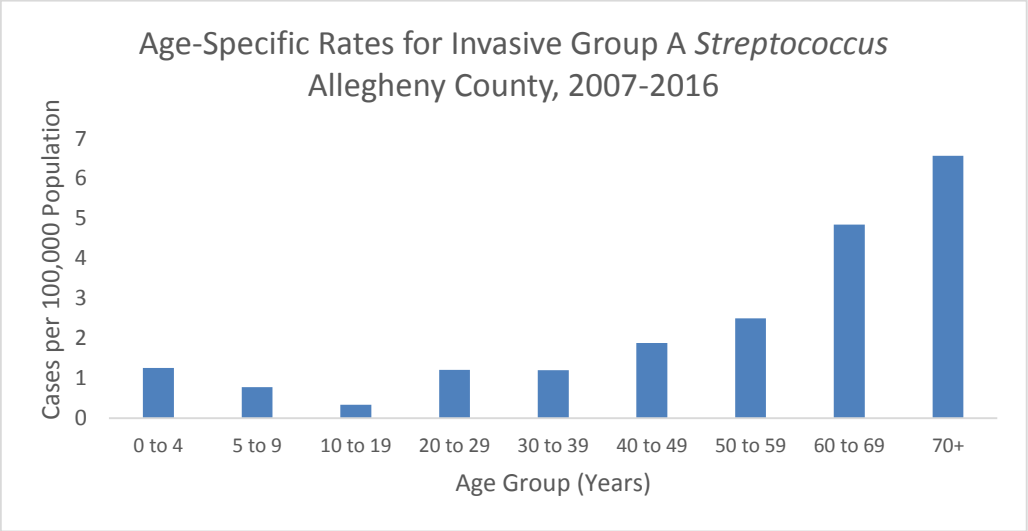


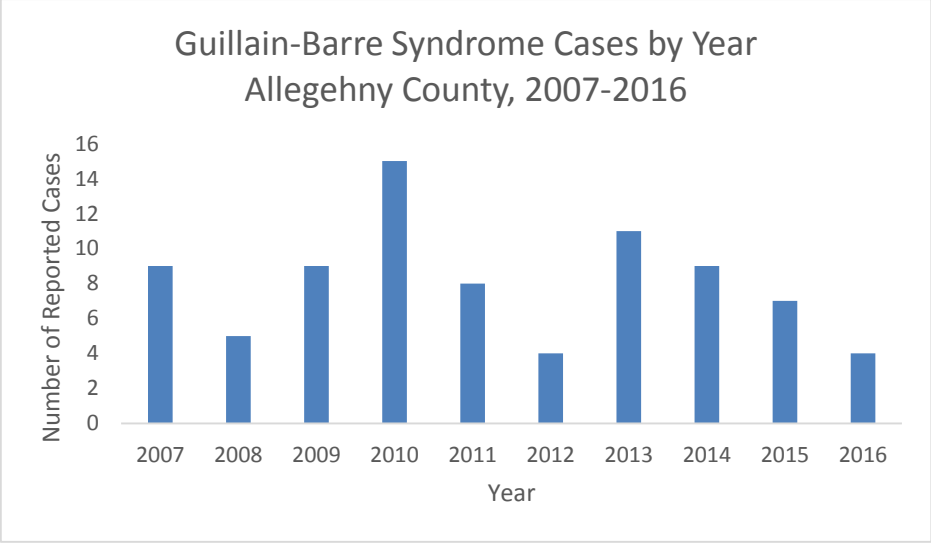
Figure 49



Guillain-Barre Syndrome

Guillain-Barre Syndrome (GBS) is an autoimmune disease characterized by muscle weakness and paralysis, often preceded by diarrheal or respiratory infections. In 2007-2016, 81 confirmed cases of GBS syndrome were reported to ACHD (Figure 50). The median age of cases was 57 years with a range of 18 to 82 years. Information on preceding diarrheal or respiratory illness was incomplete but noted for eight cases. Four cases reported vaccination within a month of symptom onset.

Figure 50



Creutzfeldt-Jakob Disease (CJD)

In 2007-2016, 19 cases of classic Creutzfeldt-Jakob disease, a neurodegenerative prion disease, were reported to ACHD, including 2 cases in 2016. The reported cases include 7 confirmed, 5 probable, and 7 suspect cases. No cases of variant CJD, which is related to "mad cow" disease, were reported. All reported cases of classic CJD were ≥45 years of age (median 61 years). CJD is always fatal.

Outbreaks

In 2016, ACHD was the primary investigator for 18 disease outbreaks in Allegheny County, including 8 norovirus outbreaks, 3 legionellosis outbreaks, and 3 influenza A outbreaks (Table 1).

Table 1: Outbreaks investigated by ACHD by disease and type of facility affected, 2016.

Condition	Norovirus	Salmonella	Invasive Group A Streptococcus	Influenza A	Pertussis	Legionellosis	Total
# outbreaks	8	1	1	3	2	3	18
# people ill	157	3	2	80	6	17	265
# outbreaks by setting							
Restaurant	4	1	0	0	0	0	5
Long-term care facility	3	0	1	2	0	0	6
Hospital	0	0	0	0	0	2	2
Outpatient	0	0	0	1	0	0	1
School	0	0	0	0	2	0	2
Other	1	0	0	0	0	1	2

Appendix A: Number of cases reported by disease, Allegheny County, 2007-2016

Disease	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Amebiasis	0	1	3	1	2	1	2	4	7	5	26
Infant Botulism	1	0	0	2	0	1	1	0	1	1	7
Campylobacteriosis	75	106	99	137	96	118	131	109	131	111	1,113
Chikungunya	0	0	0	0	0	0	0	9	1	2	12
Creutzfeldt–Jakob disease	0	1	5	0	1	3	3	2	2	2	19
Cryptosporidiosis	17	22	29	38	35	23	31	29	27	27	278
Dengue	1	1	0	1	0	4	2	1	2	5	17
Giardiasis	47	98	60	61	61	62	97	88	71	67	712
Guillain-Barre	9	5	9	15	8	4	11	9	7	4	81
Haemophilus influenzae, invasive	9	9	7	15	26	23	16	14	12	17	148
Hepatitis A	20	9	4	7	7	8	4	3	2	8	72
Hepatitis B, Acute	51	26	11	15	12	2	10	16	10	3	156
Hepatitis B, Chronic	166	241	132	88	128	91	85	107	104	181	1,323
Hepatitis C, Acute	1	0	0	0	0	0	0	1	23	11	36
Hepatitis C, Past/Present	643	606	925	899	693	734	780	1,248	2,123	2,824	11,475
Legionellosis	89	118	75	65	106	54	97	68	63	90	825
Listerosis	10	7	3	6	8	3	3	2	4	1	47
Lyme	24	16	29	18	1	10	32	822	278	403	1,230
Malaria	5	0	4	2	9	4	5	5	2	6	42
Measles	0	1	3	0	0	0	0	2	0	0	6
Meningococcal Disease	2	3	3	0	4	2	2	0	3	1	20
Mumps	0	0	1	0	0	0	2	9	3	2	17
Pertussis	35	42	59	50	60	226	47	155	105	76	855
Salmonellosis	88	118	136	156	146	124	107	111	171	158	1,315
Shigellosis	5	6	44	178	7	9	9	36	108	40	442
Shiga toxin-producing E. coli	12	13	3	15	8	15	45	7	19	15	152
Invasive Group A Streptococcus	32	25	51	31	35	24	35	26	39	32	330
Invasive Streptococcus pneumoniae	28	46	25	52	73	76	60	40	46	47	493
Tuberculosis	23	19	18	11	24	17	15	20	15	8	170
Toxoplasmosis	6	3	9	5	17	13	0	3	6	3	65
Typhoid Fever	2	5	3	4	6	1	2	0	3	2	28
Varicella	433	139	83	59	73	75	50	62	32	27	1,033
West Nile	2	0	0	0	1	0	0	1	3	0	7
Zika	0	0	0	0	0	0	0	0	1	11	12

Appendix B. Comparison of reported incidence rates per 100,000 of selected notifiable diseases - United States, Pennsylvania, and Allegheny County, 2016

Disease	US rate*	PA rate^	Allegheny County rate
Campylobacteriosis	18.6	18.3	9.1
Cryptosporidiosis	4.2	3.7	2.2
Giardiasis	6.4	4.7	5.5
Invasive *Haemophilus influenza*	1.5	2.0	1.4
Hepatitis A	0.6	0.5	0.7
Hepatitis B acute	1.0	0.3	0.2
Pertussis	5.6	12.4	6.2
Salmonellosis	16.7	12.5	12.9
Shiga toxin-producing *E coli*	2.5	1.9	1.2
Shigellosis	6.5	5.2	3.3
Tuberculosis	2.9	1.4	0.7

*Source: CDC, National Notifiable Diseases Surveillance System, 2016 Annual Tables of Infectious Disease Data.

^Source: Pennsylvania Department of Health, Enterprise Data Dissemination Informatics Exchange

Appendix C: List of reportable diseases, Allegheny County

REPORTABLE DISEASES/CONDITIONS IN ALLEGHENY COUNTY

Report the Following Diseases/Conditions via PA-NEDSS* at https://www.nedss.state.pa.us

Report HIV to (412) 578-8358 and Sexually Transmitted Infections to (412) 578-8081

Any unusual diseases/infections/conditions including SARS or MERS-CoV are to be reported IMMEDIATELY as soon as clinically suspected. Reporting is not to await laboratory confirmation.

Outbreaks of any kind are to be reported IMMEDIATELY

ON NIGHTS, WEEKENDS, AND HOLIDAYS REPORT ALL TO (412) 687-ACHD (2243)

Healthcare practitioners and healthcare facilities MUST report the following WITHIN 24 HOURS**

1) Animal bites (*separate form on ACHD website*)
2) Anthrax
3) Arboviruses (*includes chikungunya, dengue, Eastern encephalitis, Japanese encephalitis, Powassan, St. Louis encephalitis West Nile virus infection, Yellow fever, et. al.*)
4) Botulism (all forms)
5) Carbon Monoxide Poisoning
6) Cholera
7) Diphtheria
8) Enterohemorrhagic *E. coli* (shiga toxin-producing *E. coli* or STEC)
9) Food poisoning
10) *Haemophilus Influenzae* invasive disease
11) Hantavirus pulmonary syndrome
12) Hemorrhagic fever (*includes Ebola*) *equine*
13) Lead Poisoning
14) Legionnellosis
15) Measles
16) Meningococcal invasive disease
17) Plague
18) Poliomyelitis
19) Rabies
20) Smallpox
21) Typhoid fever

Healthcare practitioners and healthcare facilities MUST report the following within FIVE WORKING DAYS**

22) Acquired Immunodeficiency Syndrome (AIDS)
23) Anaplasmosis
24) Amebiasis
25) Babesiosis
26) Brucellosis
27) Campylobacteriosis
28) Cancer (report to the Pennsylvania Cancer Registry)
29) CD4 T-Lymphocyte test result <200 or a percentage <14% of total
30) Chancroid
31) Chickenpox (Varicella)
32) Chlamydia trachomatis (Chlamydia) Infections
33) Creutzfeldt-Jakob Disease
34) Cryptosporidiosis
35) Ehrlichiosis
36) Encephalitis (all types)
37) Giardiasis
38) Neisseria gonorrhoeae (Gonorrhea) Infections
39) Granuloma Inguinale
40) Guillain-Barre Syndrome
41) Hepatitis, Viral — Acute and Chronic (A, B, C, D, E)
42) Histoplasmosis
43) Human Immunodeficiency Virus (HIV)
44) Influenza (Lab-confirmed only)
45) Leprosy
46) Leptospirosis
47) Listeriosis
48) Lyme Disease
49) Lymphogranuloma Venereum
50) Malaria
51) Methicillin-Resistant Staphylococcus Aureus (MRSA), invasive disease (separate form on ACHD website)
52) Meningitis (all types—not limited to invasive Haemophilus influenzae or Neisseria meningitidis)
53) Mumps
54) Perinatal exposure of a newborn to Hepatitis B
55) Perinatal exposure of a newborn to HIV
56) Pertussis
57) Psittacosis (Ornithosis)
58) Respiratory Syncytial Virus
59) Rickettsial Diseases
60) Rubella and Congenital Rubella Syndrome
61) Salmonellosis
62) Shigellosis
63) Staphylococcus aureus, Vancomycin-resistant (VRSA) or Intermediate (VISA) invasive disease
64) Streptococcal invasive disease (group A)
65) Streptococcus pneumoniae, invasive disease
66) Syphilis - all stages
67) Tetanus
68) Toxic Shock Syndrome
69) Toxoplasmosis
70) Trichinosis
71) Tuberculosis
72) Tularemia

Reportable only in children <5 years of age to the Pennsylvania Department of Health at (877) 724-3258

73) Congenital Adrenal Hyperplasia (CAH)
74) Congenital Hypothyroidism
75) Galactosemia
76) Maple Syrup Urine Disease
77) Phenylketonuria
78) Sickle Cell Disease

* *PA-NEDSS is Pennsylvania's version of the National Electronic Disease Surveillance System. New Users: To register for PA-NEDSS access please send an e-mail to NEDSS@pa.gov.*

** *Clinical laboratories — all diseases are reportable by next workday*

Updated 09.12.2017