DIVISION OF ACUTE DISEASE PREVENTION AND EMERGENCY RESPONSE
& ENVIRONMENTAL HEALTH
DIVISION OF BEHAVIORAL HEALTH

Iowa Surveillance of Notifiable and Other Diseases

Annual Report 2014

Iowa Department of Public Health
Promoting and Protecting the Health of Iowans

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Executive Summary

Promoting and protecting the health of Iowans is the mission of the Iowa Department of Public Health (IDPH). Surveillance of notifiable health conditions is essential in establishing what, how, and when events impact the public's health. Once this information is gathered, public health and health care providers around the state are able to use this data to take steps to prevent illnesses from occurring. Multiple divisions and bureaus are dedicated to accomplishing the goals of surveillance. In 2014, there were more than 86,000 laboratory results of infectious diseases and conditions submitted to IDPH disease surveillance programs. IDPH also investigates non-infectious conditions related to lead, occupational, and environmental hazards like carbon monoxide. In 2014, approximately 71,000 children's and more than 7,000 adults' blood tests results were reported to IDPH.

Among vaccine-preventable diseases, pertussis cases decreased significantly in 2014, down over 70 percent from the previous three-year average. Reported mumps cases increased, however. No measles cases were reported. Two cases of meningococcal invasive disease were reported, with one case caused by serogroup B, which is not covered by vaccines in the United States. The number of Hepatitis A cases decreased compared to 2013, but remained slightly higher than the previous three-year average.

Several enteric diseases decreased to varying degrees compared to the previous three-year average, including campylobacter, cryptosporidiosis, giardia, and salmonellosis. *E. coli* and listeriosis both increased versus their three-year averages. Shigellosis decreased from 2013, but remained higher than the three-year average due to the exceptionally high number of cases reported in 2013. There were no cyclosporiasis cases reported in 2014, one year following a multi-state outbreak that infected 136 Iowans. A total of 71 outbreaks were investigated, affecting nearly 1,500 Iowans, the largest of which was a norovirus outbreak that sickened 148 employees in a workplace. Among these outbreaks, 28 were influenza, most of which occurred in long-term care settings. The most common implicated pathogen was norovirus, and outbreaks occurred most frequently in restaurants, long-term care/assisted living facilities, schools/child care facilities, and homes.

A range of vector-borne diseases affect Iowans each year. Some, such as Dengue fever, chikungunya, and malaria are only reported among those who have traveled. Among tick-borne diseases endemic to Iowa, Rocky Mountain spotted fever and ehrlichiosis/anaplasmosis increased slightly from 2013. Lyme disease decreased from 2013, though remained above the previous three-year average. West Nile virus, spread via mosquitos, decreased nearly 50 percent from the previous three-year average.

Over the last decade in Iowa, chlamydia cases have increased while gonorrhea cases have remained relatively stable. This trend continued in 2014. Syphilis cases continued to increase, as they have each of the last three years, with over three times as many syphilis cases reported in 2014 than 2011.

New diagnoses of HIV among Iowans numbered 99 in 2014, a 19 percent drop from the 122 diagnoses reported in 2013, and the fewest since 88 diagnoses were recorded in 2003. Continued surveillance will be necessary to determine if this is a temporary decrease or the start of a sustained downward trend.

In addition to an overall decrease in new HIV diagnoses, the proportion of diagnoses among females declined from a high of 28 percent in 2013 to the long-term average of 20 percent in 2014. From 2005 through 2014, there have been about four males diagnosed for every one female diagnosed. Although racial and ethnic minorities continue to be over-represented in HIV diagnoses, the disparity dropped markedly in 2014. Blacks/African-Americans represent 3 percent of Iowa's population, but accounted for 12 percent of HIV diagnoses in 2014. This percentage dropped from 21 percent in 2013. Such disparities aside, white non-Hispanic Iowans accounted for over 65 percent of new HIV diagnoses and persons

living with HIV disease. For the third year in a row, the proportion of "late testers" (those people who were diagnosed with AIDS within a year of their HIV diagnoses) increased. Nearly 50 percent of people diagnosed in 2013 had a late diagnosis. Because this measure requires a year to complete, the data for 2014 is incomplete; however, early projections suggest late diagnoses will be less than 40 percent.

The number of HIV-infected persons residing in Iowa at the end of 2014 was 2,369, a prevalence of 77 per 100,000 people. As of December 31, 2014, 96 of Iowa's 99 counties had at least one person living with HIV disease. HIV care continuum analysis found that of 2,295 persons diagnosed with HIV disease on or before December 31, 2013, and living in Iowa as of December 31, 2014, 1,655 (72 percent) had been retained in HIV care. Of the 1,655 retained in care, 1,552 (94 percent) had an HIV viral load less than 200 copies per milliliter of blood (viral suppression). Of the 2,295 persons (both in and out of care), 1,552 (68 percent) were virally-suppressed. Studies have shown viral suppression optimizes individual health outcomes and may reduce the likelihood of transmitting HIV by 96 percent.

Crucial partners contributing to the surveillance and reduction of these diseases include the State Hygienic Laboratory (SHL) at the University of Iowa, clinical laboratories, hospitals, city and county public health agencies, long-term health care facilities, schools, as well as health care providers, infection preventionists, and other health professionals. The Iowa Department of Public Health would like to take this opportunity to thank all of its partners for their continued support of disease surveillance in Iowa.

Table 1. Summary of select reportable diseases and percent change in number of cases reported compared to three-year average - Iowa, 2011-2014‡

	2011	2012	2013	3-yr average 2011-2013	2014	Percent change†
Campylobacteriosis	747	534	610	630	571	-9.37%
Chlamydia	10928	11139	11006	11024	11807	7.10%
Cryptosporidiosis	364	328	1505	732	264	-63.93%
***E. coli* and other shiga-toxin producing**	189	181	171	180	224	24.44%
Giardiasis	271	251	275	266	205	-22.93%
Gonorrhea	1966	1982	1473	1807	1641	-9.19%
Hepatitis A	8	7	17	11	12	9.09%
Hepatitis B, acute	15	12	11	13	9	-30.77%
HIV (new diagnoses)	119	117	122	119	99	-16.81%
Lead poisoning (child)	*	*	321	*	521	*
Lead poisoning (adult)	832	818	856	835	759	-9.10%
Legionellosis	11	13	11	12	33	175.00%
Listeriosis	5	3	2	3	7	133.33%
Lyme disease	100	165	247	171	194	13.45%
Meningococcal invasive disease	14	2	1	6	2	-66.67%
Mumps	8	6	3	6	10	66.67%
Pertussis (whooping cough)	232	1736	308	759	222	-70.75%
Salmonellosis	448	622	575	548	527	-3.83%
Shigellosis	18	91	342	150	208	38.67%
Syphilis	70	138	226	145	239	64.83%
West Nile virus	9	31	44	28	15	-46.4%

‡ Table includes confirmed and probable cases

†Percent change calculated by subtracting the 3-year average from the total cases for 2014 and dividing by the absolute value of the 3-year average

*** Due to current changes in determining cases of lead poisoned children, case counts prior to 2013 are being revised and were not available at the time this report was published.**

Introduction

The purpose of this report is to provide a snapshot of the types and trends of notifiable and other diseases that occur in Iowa. When possible, details specific to the disease are provided, including information on which serotypes, strains, or groups were prevalent, and which caused outbreaks. Comparisons to national rates are also provided whenever possible. Aggregated county-level data are provided in a table at the end of the report. The report is intended for use by the public, media, public health, and health care.

The report is divided into the following sections: respiratory and vaccine-preventable diseases; sexually-transmitted diseases; human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS); hepatitis C; enteric diseases; zoonotic diseases; rare and unusual diseases; and environmental health conditions.

The Iowa Department of Public Health (IDPH) has five divisions and of those, two contributed disease data to this report, including Behavioral Health (BH) and Acute Disease Prevention and Emergency Response and Environmental Health (ADPER & EH). The Division of Behavioral Health includes the Bureau of HIV, Sexually Transmitted Disease (STD), and Hepatitis which identifies, monitors, and supports persons with HIV/AIDS, STDs, and viral hepatitis. Disease reporting and tracking are a large component of the work accomplished by this bureau, as well as locating, counseling, and testing partners of persons with sexually transmitted diseases.

The Division of Acute Disease Prevention and Emergency Response and Environmental Health (ADPER & EH) has six bureaus and of those, three bureaus contributed data to this report. Two bureaus are responsible for infectious disease investigation: the Center for Acute Disease Epidemiology (CADE) and the Bureau of Immunization and Tuberculosis (BIT). CADE conducts surveillance for common and emerging infectious diseases, agents of bioterrorism, disease outbreaks, and occurrence of rare and unusual acute diseases. BIT conducts surveillance for tuberculosis (TB) and perinatal hepatitis B, as well as coordinates the immunization program for the state. Specific disease conditions are reportable to the department per Iowa Administrative Code 641, Chapter 1. The urgency tied to reporting varies by disease[1].

The third ADPER & EH reporting bureau is the Bureau of Environmental Health Services (EHS), which is responsible for environmental health conditions investigation. Certain health conditions of environmental origin are required to be reported to IDPH per Iowa Administrative Code 641, Chapter 1. This report includes disease/outbreak surveillance, carbon monoxide poisoning, methemoglobinemia, child and adult blood lead levels, reports of other heavy metal poisonings, and fatal work-related traumatic injuries.

Public health emergency response planning plays a major role in preparing IDPH to respond to events of public health significance. In the past several years, the department used the incident management system in response to several events, including severe weather in 2008 and the 2009 H1N1 pandemic. Preparedness planning at both the state and local levels has greatly improved the ability of public health to respond to large-scale disease outbreaks as well as natural disasters.

This report provides an overview of disease investigations and represents only a fraction of work accomplished by IDPH staff each year. The time invested in each disease report varies greatly by disease and nature of the report. Some reports require a quick database query and update of an electronic file. Others require hours of staff time in contact tracing, mentoring and assisting other health investigators, and communication, education, and implementation of interventions.

Support for the initiatives of the ADPER & EH division comes from a variety of federal and state allocations and grants. The TB, STD, and HIV/AIDS surveillance programs are funded under separate cooperative agreements with the Centers for Disease Control and Prevention (CDC) and the National Center for HIV/AIDS, Viral Hepatitis, STD and TB Prevention.

Methods

Disease reports are submitted to IDPH via phone, fax, mail, or a secure electronic reporting system. Reporters include health care providers, hospitals, local public health agencies, laboratories, and the public. Reports of diseases or exposures occurring outside of Iowa can be reported by other states or CDC to IDPH via the Epi-X system. CADE tracks reports of disease in Iowa residents; however, acquisition or exposure to some illnesses may have occurred in Iowa, another state, or outside of the United States.

Reports received by CADE are tracked in the secure web-based Iowa Disease Surveillance System (IDSS). De-identified data is electronically exchanged between IDSS and CDC.

The Iowa Department of Public Health is in the midst of implementing statewide electronic laboratory reporting (ELR). ELR from the State Hygienic Laboratory (SHL) has been in place since March 2010. The national reference lab ARUP began sending ELR in July 2014. Since that time, 19 additional ELR connections have been established, all of which represent 68 different laboratory or hospital locations. Ongoing implementation plans include establishing 29 more ELR connections representing 57 different laboratories or hospitals. In addition, IDPH efforts are underway to implement ELR with other state public health jurisdictions for more efficient laboratory reporting.

Cases of acute infectious disease are typically referred to local public health agencies for patient investigations and interviews. Agencies primarily use IDSS to report information back to IDPH. Local public health agencies are also critical in conducting outbreak investigations. These agencies work to identify, investigate, and contain outbreaks at the city and county level.

A few diseases require a unique reporting system used by IDPH for transmitting de-identified data to program-specific staff at CDC. These diseases include influenza and West Nile virus. The National Outbreak Reporting System (NORS) is a CDC-sponsored system used by IDPH to report outbreaks.

Rates were calculated using the 2010 census population for the State of Iowa or the appropriate estimated census year. The enteric disease five-year averages were calculated by taking the average of the previous five years' case counts for each disease. This is in contrast to previous methods utilized in this report, which included adding the five-year average to two times the standard deviation (5-year average + 2(SD)). All case counts include cases that were and were not considered to be part of an outbreak investigation. This also differs from previous methods utilized in this report. Calculations were performed with SAS® 9.4, and Microsoft® Excel. Maps were generated using ARC GIS ® 10.0.

CADE uses the most recent Council of State and Territorial Epidemiologists (CSTE)/CDC case definitions found at wwwn.cdc.gov/nndss/conditions/notifiable/2015/. CSTE/CDC definitions are used to classify each case as confirmed, probable, suspect, not a case, or awaiting more information. Only confirmed and probable cases meeting the CSTE/CDC definitions are included in this report.

Disease case counts and Iowa-specific case demographics were retrieved from IDSS, which is maintained within CADE. The specific file used for this report was created in April 2015. Case reports and additional information received after this date that may have altered the disease counts were not included in this report. In addition, the data file was generated using MMWR (Morbidity Mortality Weekly Report) year

2014. Therefore, case counts in this report may vary slightly from counts generated using the calendar year of 2014.

Influenza surveillance data was collected from multiple sources, including sentinel outpatient health care providers, sentinel hospitals, public health, clinical laboratories, and schools. Laboratory-confirmed influenza cases were based on real-time polymerase chain reaction (RT-PCR) test results sent from SHL. SHL also surveyed clinical and reference labs throughout the state for the weekly number of rapid influenza tests performed and number of positives. Influenza-associated hospitalizations were reported from the sentinel hospitals that participated in the Iowa Influenza Surveillance Network (IISN).

Respiratory syncytial virus (RSV) rapid antigen test data are used to determine the weekly positive predictive value of the rapid antigen tests in Iowa. SHL surveyed clinical and reference labs throughout the state for the number of rapid-antigen tests performed and number positive weekly, and sent the survey results to IDPH.

The surveillance case definitions for HIV, AIDS, STDs, and TB are those developed through the collaboration of the Council of State and Territorial Epidemiologists (CSTE) and the Centers for Disease Control and Prevention (CDC). Surveillance is conducted according to detailed guidelines developed by CDC. Several programs enter data into CDC-developed software programs. Programs transfer de-identified data via a secure data network on a weekly or monthly basis. HIV/AIDS data are collected in a CDC-developed software program called the enhanced HIV and AIDS Reporting System (eHARS).

For accuracy of analysis, and because jurisdiction for HIV and AIDS cases is determined by the person's residence at the time of diagnosis, great care is taken both within and between states to maintain unduplicated databases for HIV and AIDS.

HIV/AIDS surveillance reports are generated annually and as needed. An integrated epidemiological profile for HIV, STD, and Hepatitis is produced every three years. HIV/AIDS data analysis for this report used a combination of CDC's eHARS software, Microsoft® Excel, SAS®, and SAS® Enterprise Guide.

In 2010, the STD program began using IDSS for surveillance of syphilis, chlamydia, and gonorrhea. Prior to 2010, the STD program entered data in a CDC database called STD*MIS or the STD Management Information System.

Environmental Health Services began using IDSS in 2010 for surveillance of heavy metals (except lead), carbon monoxide, and methemoglobinemia. The results of all blood lead testing done on Iowa residents are required to be reported to IDPH utilizing electronic laboratory reporting. Reports are collected in a web-based database called the Healthy Homes and Lead Poisoning Surveillance System (HHLPSS), which went online in 2014. Data analysis is performed periodically for reporting to state and national partners.

Most disease-specific data are transmitted to CDC electronically on a routine basis after being de-identified. Some disease information is communicated at the request of CDC. The statistics reported by ADPER & EH programs to CDC are used to develop a composite picture of disease burden in the US.

Summary of respiratory and vaccine-preventable diseases

HAEMOPHILUS INFLUENZAE B, INVASIVE DISEASE

Cases of *Haemophilus influenzae* type B (Hib), invasive disease are rare in Iowa and the US today. In 1991, Hib vaccine was recommended for all infants after age two months. Since then, the incidence of Hib in children less than five years of age has declined by more than 99 percent; in 2013, four cases of Hib were reported to IDPH.

HEPATITIS A

See Summary Enteric Disease Section.

HEPATITIS B (ACUTE AND CHRONIC)

Hepatitis B is caused by infection with the Hepatitis B virus. Hepatitis B is usually spread when blood, semen, or another body fluid from a person infected with the Hepatitis B virus enters the body of someone who is not infected. This can happen through sexual contact with an infected person or sharing needles, syringes, or other drug-injection equipment. Household contacts of a case may also be exposed. Hepatitis B can also be passed from an infected mother to her baby at birth.

Hepatitis B can be either acute or chronic. Acute hepatitis B virus infection is a short-term illness that occurs within the first six months after someone is exposed to the virus. Chronic hepatitis B virus infection is a long-term illness that occurs when the virus remains in a person's body. Chronic hepatitis B is a serious disease that can result in long-term health problems and even death.

A total of nine cases, or 0.3 cases for every 100,000 persons, of acute hepatitis B were reported to CADE in 2014. Females accounted for 56 percent of the cases. Nationally, acute hepatitis B infections occur 1.8 times more often in men than in women.

The Centers for Disease Control and Prevention (CDC) estimates there were 19,764 new hepatitis B infections in the US in 2013, and between 700,000 and 1.4 million people living with chronic hepatitis B disease in the US.

There were 283 confirmed or probable chronic hepatitis B cases reported in 2014 in Iowa. Of these, 57 percent were male and 43 percent were female.

INFLUENZA

The Iowa Influenza Surveillance Network (IISN) tracks influenza activity, age groups impacted, outbreaks, virus type and strain, and severity of seasonal influenza. During the 2013-2014 season, more than 300 surveillance sites reported to IISN, including medical clinics, hospitals, laboratories, schools, and local public health departments. IDPH analyzed the data reported from the surveillance sites and published the influenza weekly report during the season. To see the weekly report, visit www.idph.state.ia.us/IdphArchive/Archive.aspx?channel=FluReports.

The 2014-2015 influenza season in Iowa started late and was more severe than in 2013-2014. The first case of seasonal influenza was confirmed by the State Hygienic Laboratory (SHL) in October, 2014. Influenza activity increased in November and peaked in the middle of December, 2014 (Figures 1-4). SHL

identified three seasonal influenza viruses circulating in Iowa for the season: influenza A (H3N2), influenza A (2009 H1N1) and influenza B (both Yamagata and Victoria Lineage). Influenza A (H3N2) viruses were predominant in Iowa, accounting for 78 percent of all positive influenza specimens tested (Figure 1). During the 2014-2015 season, 1,201 influenza-associated hospitalizations were reported from 23 sentinel hospitals and 61 percent of the hospitalizations were among people 64 years-of-age and older (Figure 3). This is a 59 percent increase from the 491 influenza-associated hospitalizations reported during the 2013-2014 season (Figure 4).

Figure 1. Laboratory-confirmed cases of influenza reported - Iowa, 2014-2015

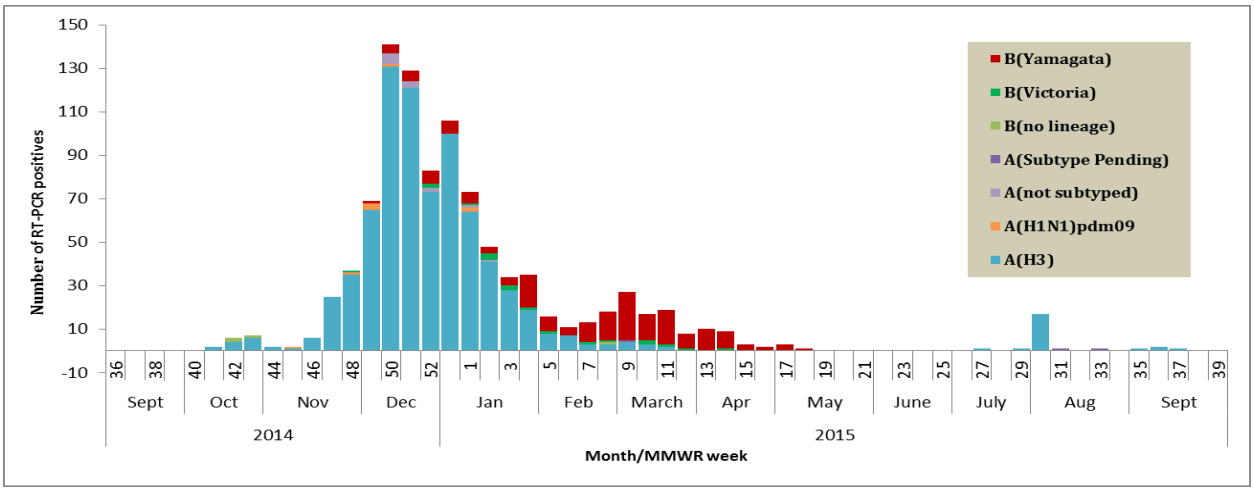


Figure 2. Percent of rapid influenza tests positive and number performed - Iowa, 2014-2015

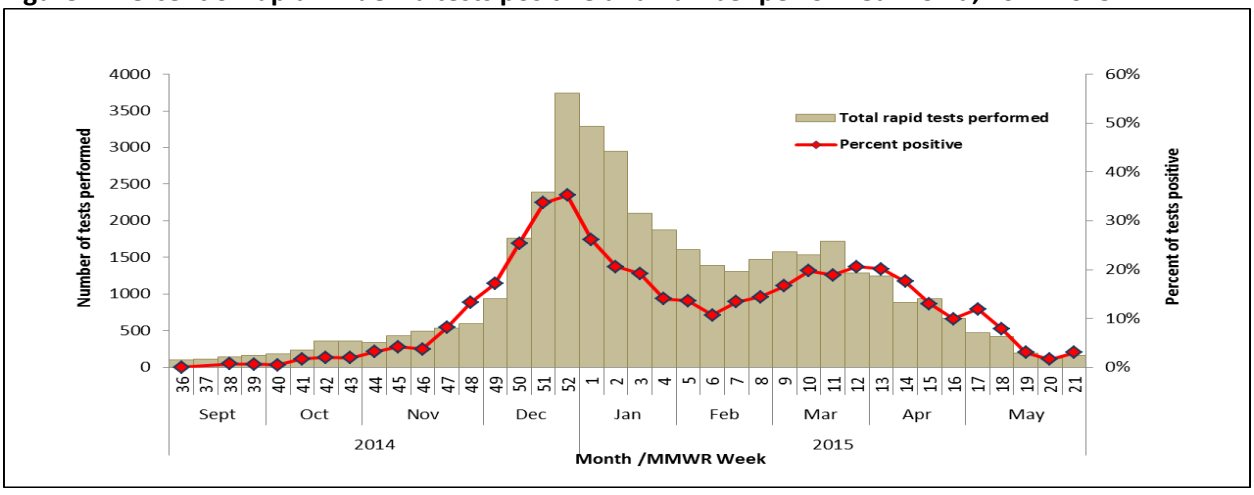


Figure 3. Influenza-associated hospitalizations at sentinel hospitals by age - Iowa, 2014-2015

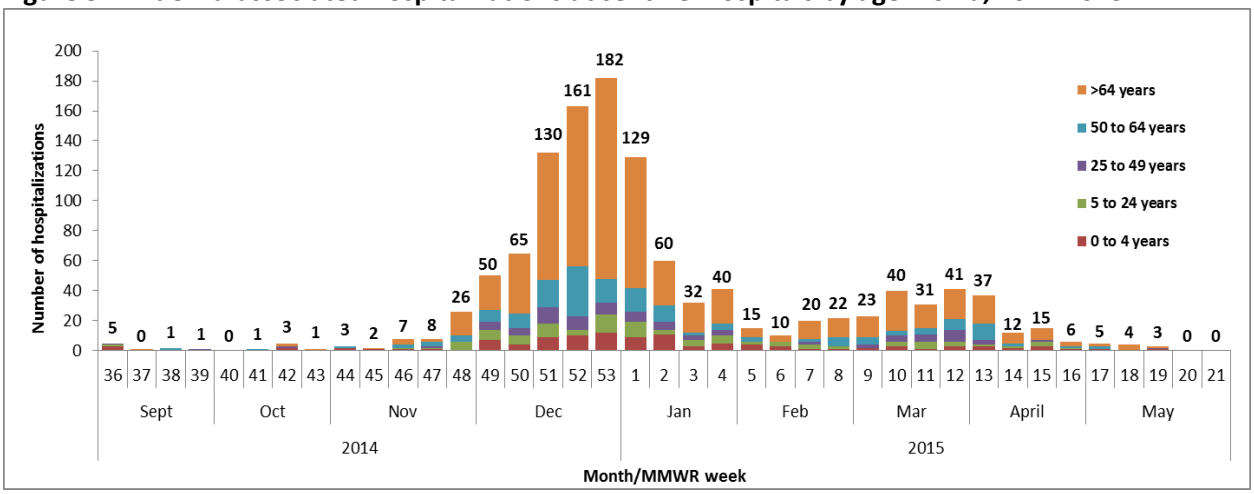
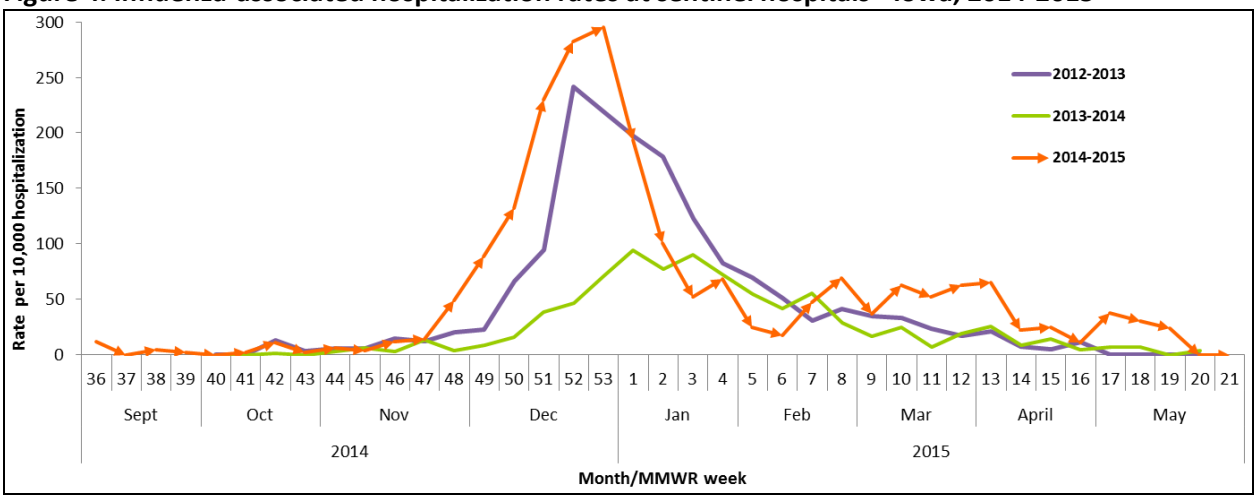


Figure 4. Influenza-associated hospitalization rates at sentinel hospitals - Iowa, 2014-2015



LEGIONELLOSIS

The average number of *Legionella* cases reported to IDPH annually from 2011 to 2013 was 12 cases. There were 33 cases of legionellosis reported to IDPH in 2014. Cases ranged from ages 20 to 95 years with a median age of 55 years. All of the cases that occurred in 2014 were hospitalized. No outbreaks of legionellosis were identified in 2014. No deaths due to legionellosis were reported.

MEASLES

There were no cases of measles reported to IDPH in 2014. The last confirmed case in Iowa was in 2011

MENINGOCOCCAL INVASIVE DISEASE

There were two confirmed cases of meningococcal invasive disease reported to IDPH in 2014 (Table 2). The first case was in a child age 0-17 and was group B. The second case was in an adult 41-60 years of age and was group Y. Nationally, there were 556 cases reported in 2013.

Table 2. Cases of meningococcal disease by serogroup - Iowa, 2014

A	B*	C	W135	Y	Unk
0	1	0	0	1	0

***Serogroup B is not covered by the meningococcal vaccine**

CDC defines a community-based outbreak of meningitis as the occurrence of three or more confirmed or probable cases during a period of less than or equal to three months among persons residing in the same area, are not close contacts of each other, and do not share a common affiliation, with a primary attack rate of at least 10 cases per 100,000 persons[2]. There were no outbreaks in Iowa in 2014.

Meningococcal invasive disease is fatal in 10-14 percent of cases; however, no Iowa case was fatal in 2014. There are two types of meningococcal vaccines currently licensed for use in the US: a polysaccharide vaccine and a conjugated vaccine that cover strains A, C, W135, and Y.

MUMPS

In 2014, there were 10 cases of mumps, or 0.3 cases per 100,000 persons. Case ages in 2014 ranged from 0 to 71 years, with a median age of 21 years. There were no outbreaks in Iowa in 2014.

In 2006, Iowa was the center of the largest mumps outbreak in 20 years in the US with 1,963 confirmed and probable cases. Prior to 2006, most cases were typically imported from countries with endemic disease.

PERTUSSIS (WHOOPING COUGH)

Pertussis is caused by *Bordetella pertussis* and before the vaccine era, typically caused epidemics every three to five years. In 2014, there were 222 confirmed and probable cases reported to IDPH, or 7.3 cases for every 100,000 persons in Iowa, as compared to 308 cases or 10.1 cases for every 100,000 persons in Iowa in 2013 (Figure 5).

Children ages 0 to 14 accounted for 60 percent of cases in 2014. Of reported pertussis cases, 5 percent were hospitalized, and no deaths were reported. The year's highest rates occurred in Decatur, Wayne, Winneshiek, Lucas, and Muscatine counties (Figure 6).

The most common symptoms were paroxysms (fits of coughing, 84 percent) followed by post-tussive vomiting (51 percent), apnea (46 percent), and whooping (31 percent). Rare, but serious secondary conditions reported include pneumonia, seizures, and encephalopathy.

Figure 5. Pertussis cases reported by month and year - Iowa, 2005-2014

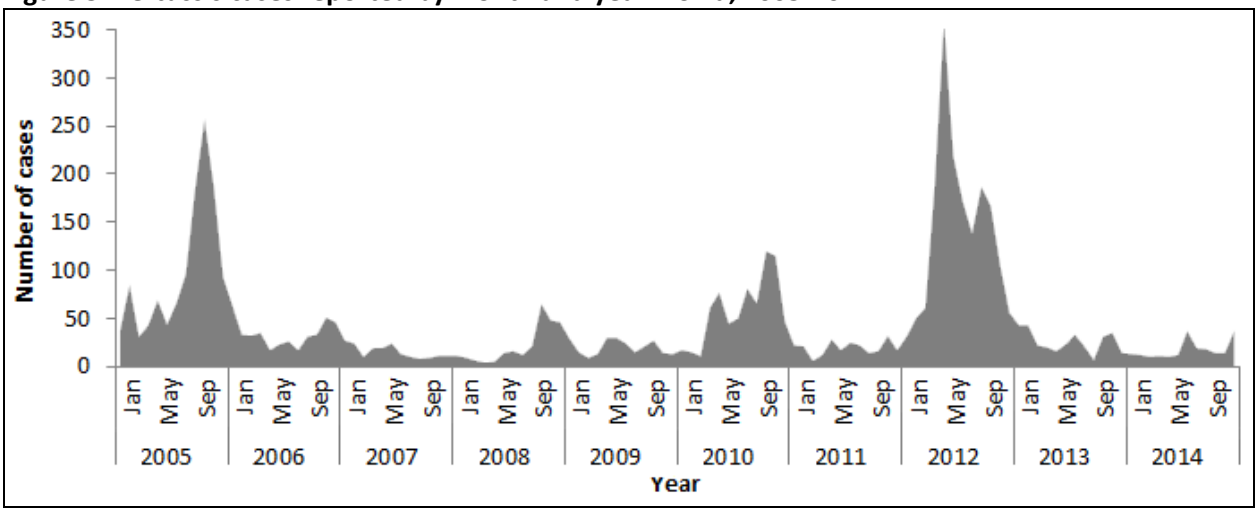
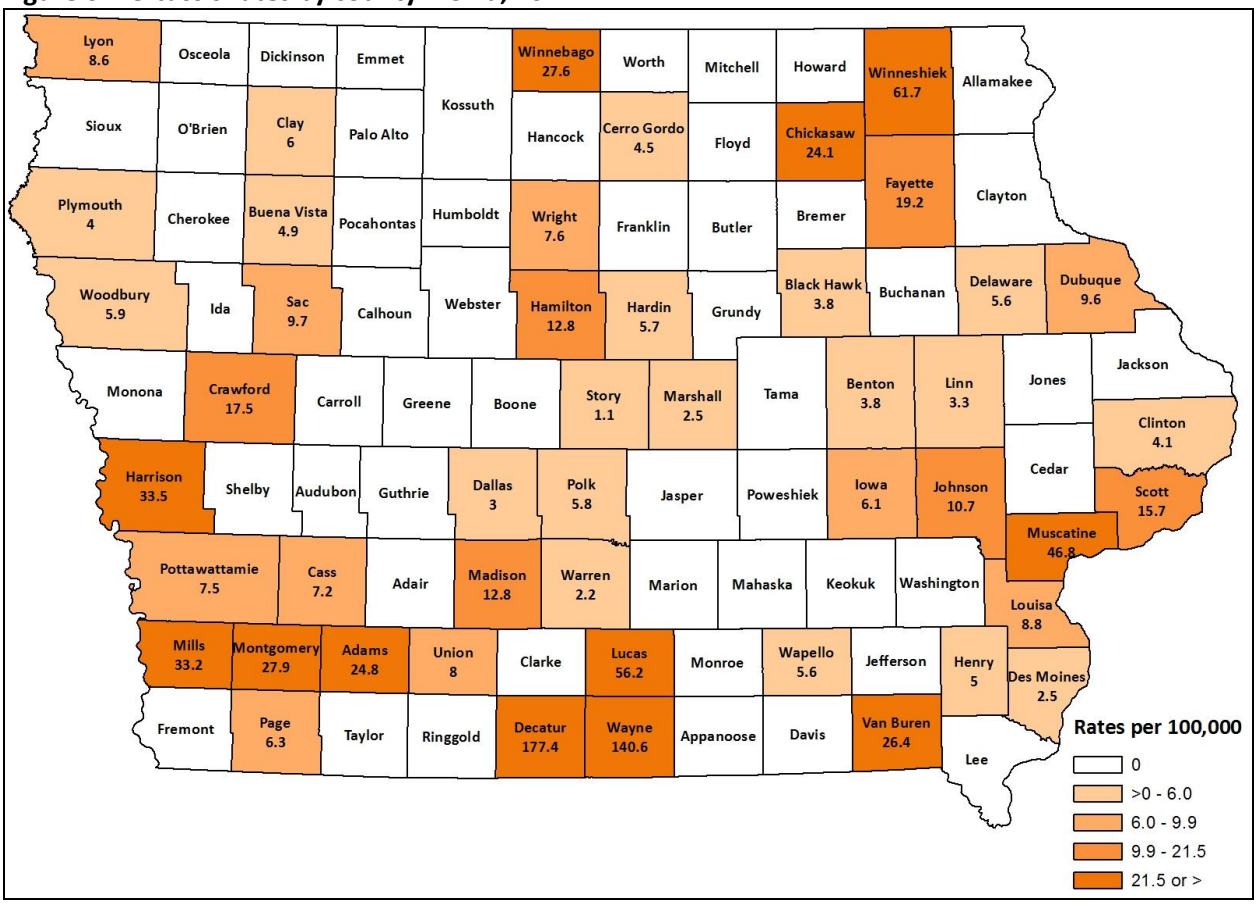


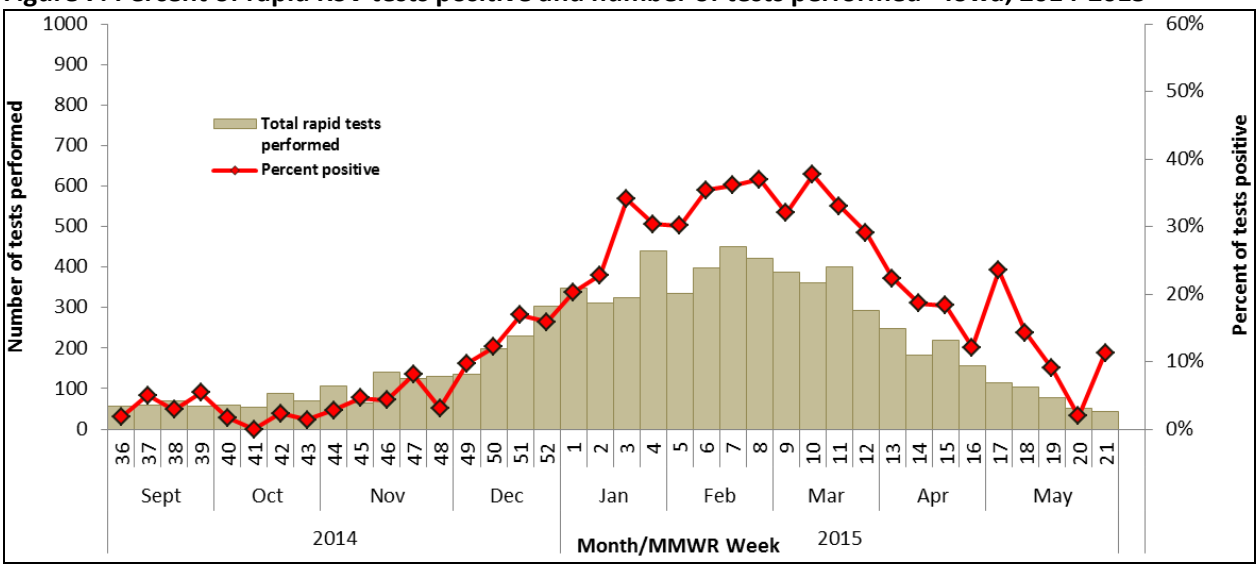
Figure 6. Pertussis rates by county - Iowa, 2014



RESPIRATORY SYNCYTIAL VIRUS (RSV)

Sentinel surveillance for respiratory syncytial virus (RSV) began in 2008. IDPH and SHL solicit rapid RSV test results from clinical and reference labs throughout the state to determine the percentage of positive test results of those performed (Figure 7). In addition, various labs, including SHL, report polymerase chain reaction (PCR) or culture confirmation of RSV as a means to verify the presence of RSV in Iowa. The CDC considers RSV widespread in the population when the percent of rapid antigen tests that are positive exceeds 10 percent. During the 2014-2015 season in Iowa, this occurred in early December (week 50), and the activity peaked in Week 10 ending March 14, 2015.

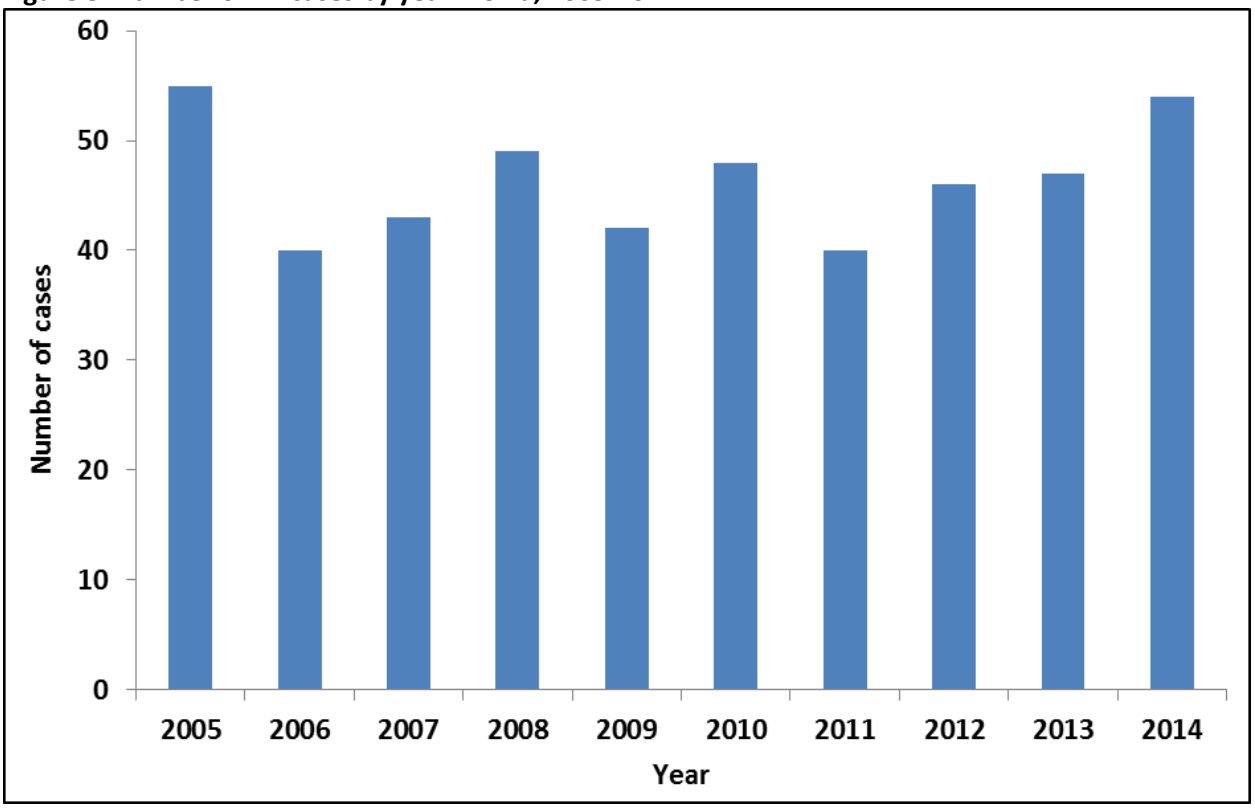
Figure 7. Percent of rapid RSV tests positive and number of tests performed - Iowa, 2014-2015



TUBERCULOSIS (TB)

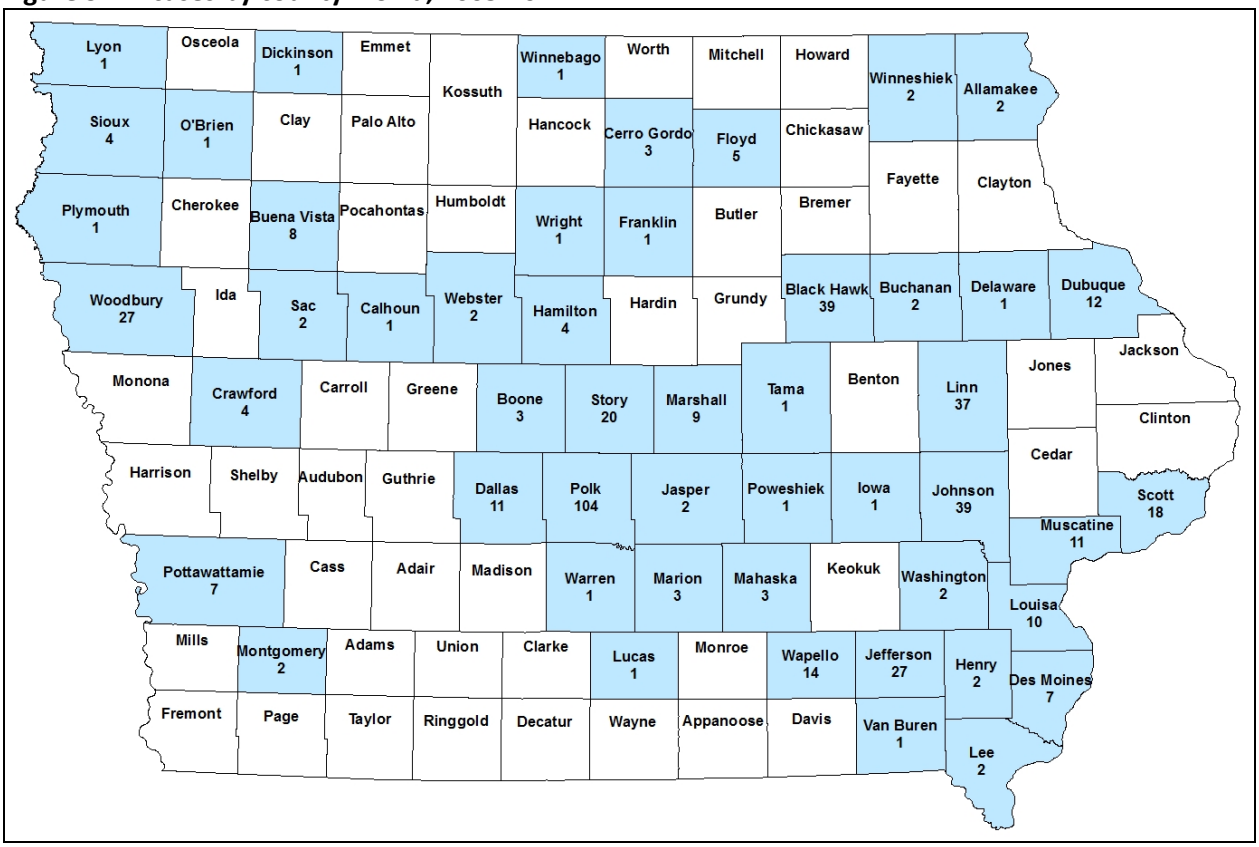
In 2014, Iowa reported 54 cases of active TB disease. Since 2004, Iowa has averaged 46 cases of TB each year (Figure 8). Many cases have existing co-morbidities that make TB treatment considerably more complex and require extensive care, including the use of second-line drugs. Treatment with second-line drugs is complicated and expensive, requiring expert consultation and extended treatment durations.

Figure 8. Number of TB cases by year - Iowa, 2005-2014



Counties with larger population centers such as Polk, Johnson, and Black Hawk, report the majority of TB cases. However, many (52/99) Iowa counties reported TB cases during calendar years 2005-2014 (Figure 9).

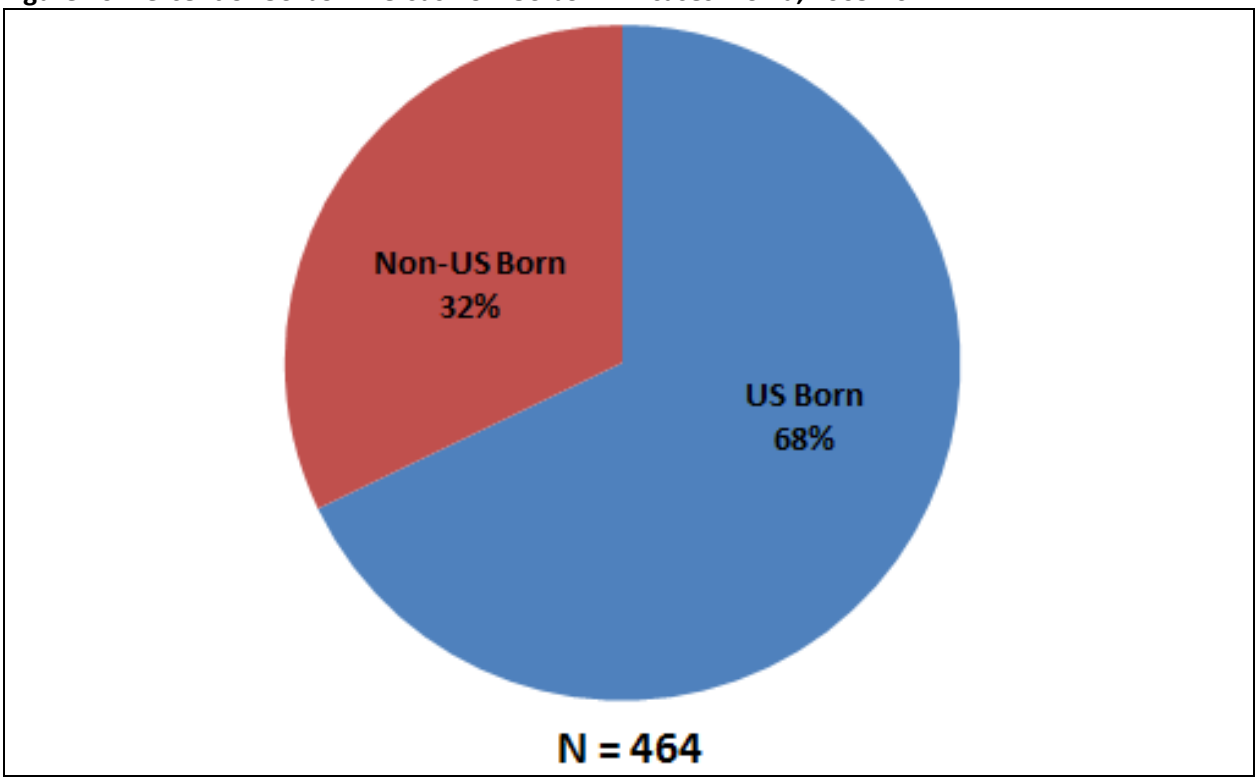
Figure 9. TB cases by county - Iowa, 2005-2014



The 2014 TB case rate for Iowa was 1.75 cases per 100,000 persons, significantly lower than the 2014 national average of 3.0 cases per 100,000 persons. Iowa owes its low TB case rate in part to proficient contact investigations, health care providers' observance of treatment guidelines, adherence to directly observed therapy (DOT) for active disease cases, and the provision of medication for active TB disease and latent TB infection (LTBI) to approximately one thousand Iowans annually.

The proportion of reported TB cases in non-US born persons has increased significantly in the past two decades. For example, in 1995 non-US born persons accounted for only 38 percent of reported TB cases in Iowa. From 2005 to 2014, non-US born persons accounted for 68 percent of reported TB cases in Iowa (Figure 10). Non-US born persons account for only four percent of the Iowa population, highlighting the disparity. The decreasing numbers of US born cases are due in part to effective TB control practices in this country.

Figure 10. Percent of US-born versus non-US born TB cases - Iowa, 2005-2014

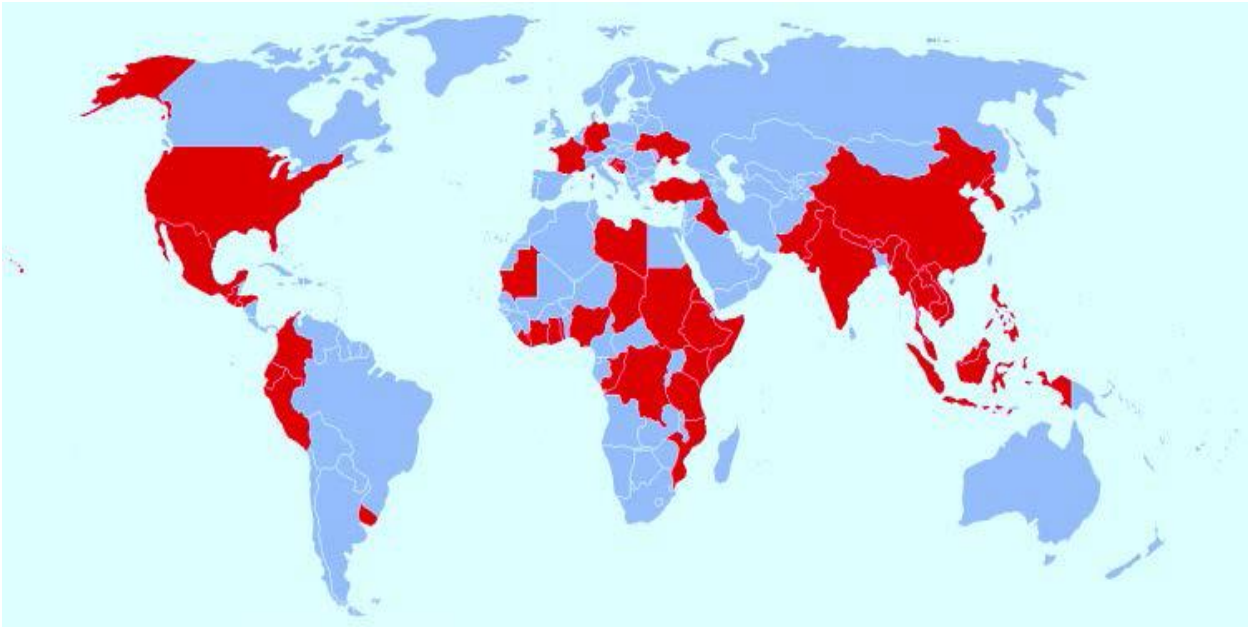


In many parts of the developing world, TB is still widespread and remains a leading cause of death. Immigration of people from these countries to the US illustrates how diseases in one part of the world can directly impact other parts of the world. Effective targeted testing programs for newly-arriving refugees, immigrants, and students play a major role in identifying and treating these populations and stopping the spread of TB in Iowa.

In 2014, 38 individuals emigrating from 18 countries (excluding the US) developed TB in Iowa. A total of 314 individuals, emigrating from 48 countries (excluding the US) developed TB disease after their arrival to Iowa during 2005 to 2014 (Figure 11). Approximately 95 percent of all patients with active TB disease live in the developing world, where 99 percent of all TB deaths occur. TB is a good example of the global nature of public health. It is important to implement consistent and aggressive public health measures everywhere to halt TB disease, which left untreated kills half of its victims.

For a detailed overview of TB, see www.idph.state.ia.us/ImmTB/TB.aspx?prog=Tb&pg=TbHome.

Figure 11. TB cases by country of origin - Iowa, 2005-2014

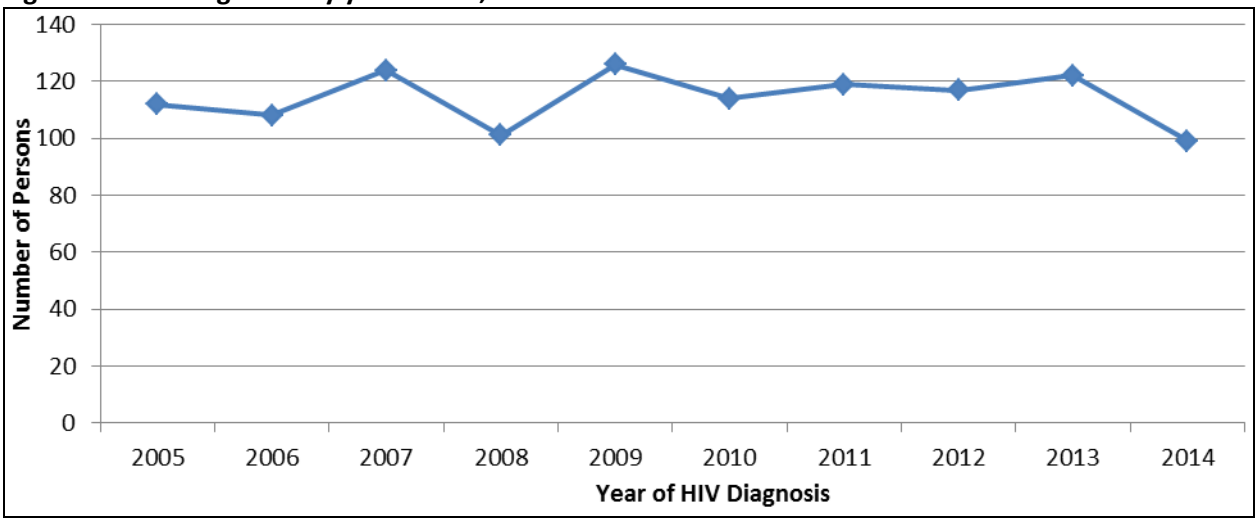


Summary of HIV and AIDS and hepatitis C

HUMAN IMMUNODEFICIENCY VIRUS (HIV) AND ACQUIRED IMMUNODEFICIENCY SYNDROME (AIDS)

There were 99 HIV diagnoses in 2014, down 23 (19 percent) from 122 diagnoses in 2013, and 21 (18 percent) below the average of 120 for the previous five years (2009-2013). Nonetheless, this fits the 10-year pattern of variability seen since 2005 (Figure 12). During that 10-year period, annual diagnoses ranged from a low of 99 to a high of 126, with an average of 114.2 and median of 115.5. In 2014 there were 3.2 HIV diagnoses per 100,000 persons, compared to 4.0 HIV diagnoses per 100,000 persons in 2013 and 3.8 HIV diagnoses per 100,000 persons in 2012.

Figure 12. HIV diagnoses by year - Iowa, 2005-2014



A person who is diagnosed with AIDS within 12 months of initial HIV diagnosis is termed a "late tester." Given this definition (it takes a year to determine), 2013 is the most recent year for which complete late tester analysis is available. After peaking at 61 percent in 2001, late testers as a proportion of all HIV diagnoses for a given year declined over time to 35 percent in 2011, only to climb again to 39 percent in 2012 and 48 percent in 2013. Late testers have typically been infected for many years and during that time have had the opportunity to unknowingly infect others with the virus. They generally have higher HIV viral loads and are more infectious than are persons who have been diagnosed early, are in care, and have a very low viral load as the result of successful treatment with antiretroviral medications.

Diagnoses of HIV among the foreign born reached a 10-year high in 2010, when 28 (24 percent) of the 119 persons diagnosed with HIV in Iowa were born outside the U.S. Foreign-born persons accounted for 19 percent of total HIV diagnoses in the last five years (2009-2013) and 18 percent in 2014. Diagnoses among foreign-born persons in Iowa may not necessarily indicate new diagnoses. By CDC rules, foreign-born HIV-infected persons who initially immigrated to Iowa (refugees, spouses, or other types of immigrants) are counted as Iowa diagnoses even if they had an initial diagnosis in their country of origin. While IDPH does not monitor the immigration status of persons diagnosed with HIV, resettlement of refugees in Iowa and secondary migration of immigrants from areas of the world with higher prevalence of HIV may be contributing to diagnoses among the population of foreign-born. US-born persons have accounted for 88 percent of total HIV diagnoses in Iowa, on average, since the beginning of the epidemic.

Males have accounted for 82 percent of HIV diagnoses among Iowans since the beginning of the epidemic. This disparity has remained constant in the short term, with 81 percent of HIV diagnoses among males during the five years from 2009 through 2013 and 80 percent (79 diagnoses) in 2014. Diagnoses among females fell to 20 in 2014 after spiking at 34 and accounting for 28 percent of diagnoses in 2013. The 20 cases in 2014 are consistent with the average of 20 from 2006 through 2012. Thus, year-to-year variations notwithstanding, there continues to be about four diagnoses among males for every one diagnosis among females.

Over half of all HIV diagnoses annually were among persons 25 to 44 years of age, except in 2013 and 2014, when diagnoses in this group fell to 44 percent and 45 percent of diagnoses, respectively. Persons 25 to 44 years of age have accounted for 64 percent of all HIV diagnoses in Iowa since the beginning of the epidemic; however, they accounted for only 51 percent of diagnoses in the last five years (2009-2013). HIV diagnoses among persons aged 45 years and older reached a peak of 50 (41 percent) of the 122 total diagnoses in 2013, but fell to 34 (34 percent) of 99 diagnoses in 2014. While persons aged 45 years and older have accounted for 22 percent of total HIV diagnoses, on average, since the beginning of the epidemic, they accounted for 29 percent of diagnoses in the last five years (2009-2013). Diagnoses among persons aged 15 to 24 years peaked at 27 (23 percent) in 2011, averaged 22 (18 percent) for the five years 2009 through 2013, and numbered 18 (18 percent) in 2014. There were two pediatric HIV diagnoses in 2014. One was a foreign-born child initially diagnosed and treated outside the US.

For persons 13 years of age and older (adults and adolescents), mean and median ages at diagnosis in 2014 were 38.6 and 37.0 years respectively, slightly higher than the five-year (2009-2013) mean of 37.5 years and median of 36.7 years. In 2014, the ages for adult/adolescent males, 38.7 (mean) and 37.0 years (median), were almost the same as those for adult/adolescent females, 38.4 (mean) and 37.5 years (median).

Racial and ethnic minorities continue to be over-represented in HIV diagnoses (Figure 13). HIV diagnoses among non-Hispanic black/African-American persons decreased from 26 (21 percent) in 2013 to 12 (12

percent) in 2014, half the five-year (2009-2013) average of 24. Of the 12 black/African-American persons diagnosed in 2014, three (25 percent) were foreign born, compared to 12 (46 percent) of the 26 black/African-American persons diagnosed in 2013. Black/African-American persons make up almost three percent of Iowa's population, but have account for 20 percent of HIV diagnoses over the last five years (2009-2013) and 15 percent of HIV diagnoses in Iowa since the beginning of the epidemic. The 12 non-Hispanic black/African-American diagnoses in 2014 equate to 12.4 diagnoses per 100,000 non-Hispanic black/African-American persons.

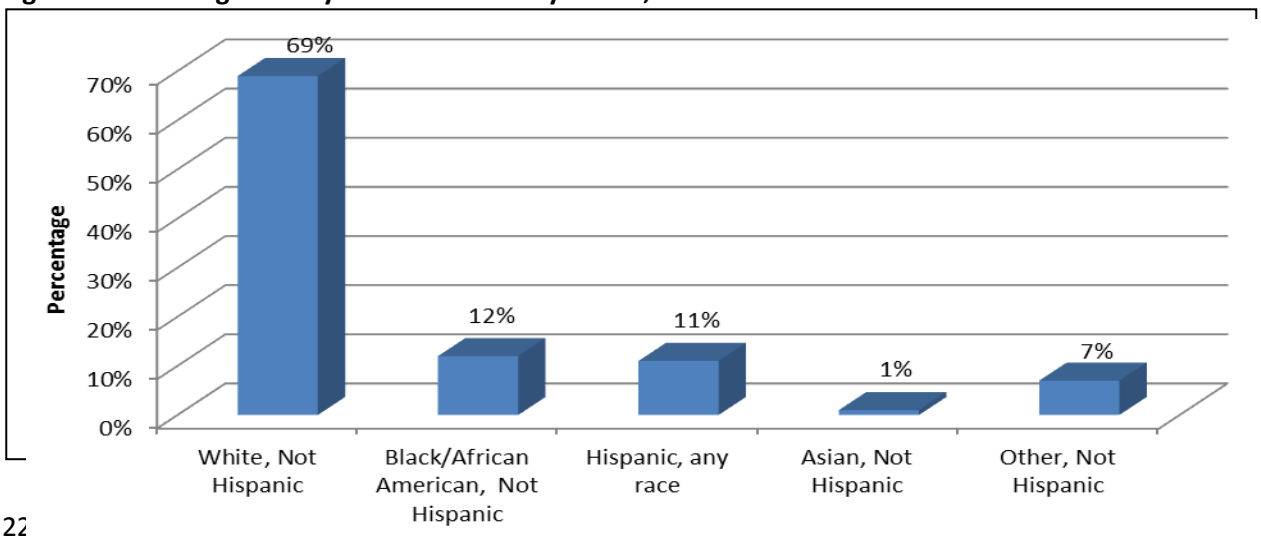
HIV diagnoses among Hispanic persons increased from nine (7 percent) in 2013 to 11 (11 percent) in 2014. Of the 11 Hispanic persons diagnosed in 2014, nine (82 percent) were foreign-born, compared to six (67 percent) of the nine Hispanic persons diagnosed in 2013. Hispanic persons make up about 5 percent of Iowa's population, but have accounted for 8 percent of total HIV diagnoses over the five years 2009 through 2013, and 7 percent of all HIV diagnoses in Iowa since the beginning of the epidemic. The 11 Hispanic diagnoses in 2014 equate to 6.5 per 100,000 Hispanic persons.

Numbers of HIV diagnoses among non-Hispanic Asians in Iowa are small and primarily influenced by immigration. All non-Hispanic Asian HIV diagnoses since 2005 have been among foreign-born people, except in 2009 when two of the seven diagnoses were among U.S.-born Asian people. Diagnoses among non-Hispanic Asians reached a peak in 2013 at eight (7 percent) of the 122 diagnoses. Only one non-Hispanic Asian was diagnosed with HIV in 2014, equating to 1.6 diagnoses per 100,000 non-Hispanic Asian persons. Non-Hispanic Asian persons make up two percent of Iowa's population, but have accounted for five percent of HIV diagnoses in the last five years (2009-2013) and two percent of all HIV diagnoses in Iowa since the beginning of the epidemic.

Despite the racial and ethnic disparities noted above, the largest proportion of HIV diagnoses in Iowa continued to be among non-Hispanic, white persons. Of the 99 HIV diagnoses in 2014, 68 (69 percent) were among non-Hispanic, white persons compared to a five-year (2009-2013) average of 63 percent. Since the beginning of the epidemic, non-Hispanic, white persons have accounted for 74 percent of all new HIV diagnoses in Iowa. The 68 non-Hispanic, white persons diagnosed in 2014 equate to 2.5 per 100,000 non-Hispanic, white persons.

When the numbers of persons diagnosed per 100,000 persons are compared, non-Hispanic blacks/African Americans were five times more likely to have been diagnosed with HIV in 2014 than non-Hispanic whites. Hispanic persons were 2.6 times more likely to have been diagnosed with HIV in 2014 than non-Hispanic, white persons.

Figure 13. HIV diagnoses by race and ethnicity - Iowa, 2014



Men who have sex with men (MSM) remained the leading exposure category for HIV infection in Iowa. Of the 99 HIV diagnoses in 2014, 55 (56 percent) were among MSM, less than the five-year (2009-2013) average of 67. MSM accounted for 56 percent of five-year (2009-2013) HIV diagnoses and 56 percent of all HIV diagnoses since the beginning of the epidemic.

Numbers (and proportions) of other HIV exposure categories in 2014 were as follows: injection drug use (IDU), six (6 percent); men who have sex with men and inject drugs (MSM/IDU), two (2 percent); heterosexual contact, 20 (20 percent); and no identified risk (NIR), 14 (14 percent). Experience has shown that while newly-diagnosed persons may initially be reluctant to disclose their mode of HIV exposure to their health care provider or to health department staff, they become less reticent as they come to trust their providers. Some exposures will be ascertained over time through follow-up calls to care providers. By the end of 2015, exposure category will have been ascertained for most of the remaining persons diagnosed in 2014. As noted above, there were two pediatric HIV diagnoses in 2014. One of these was born and first diagnosed and treated in a foreign country.

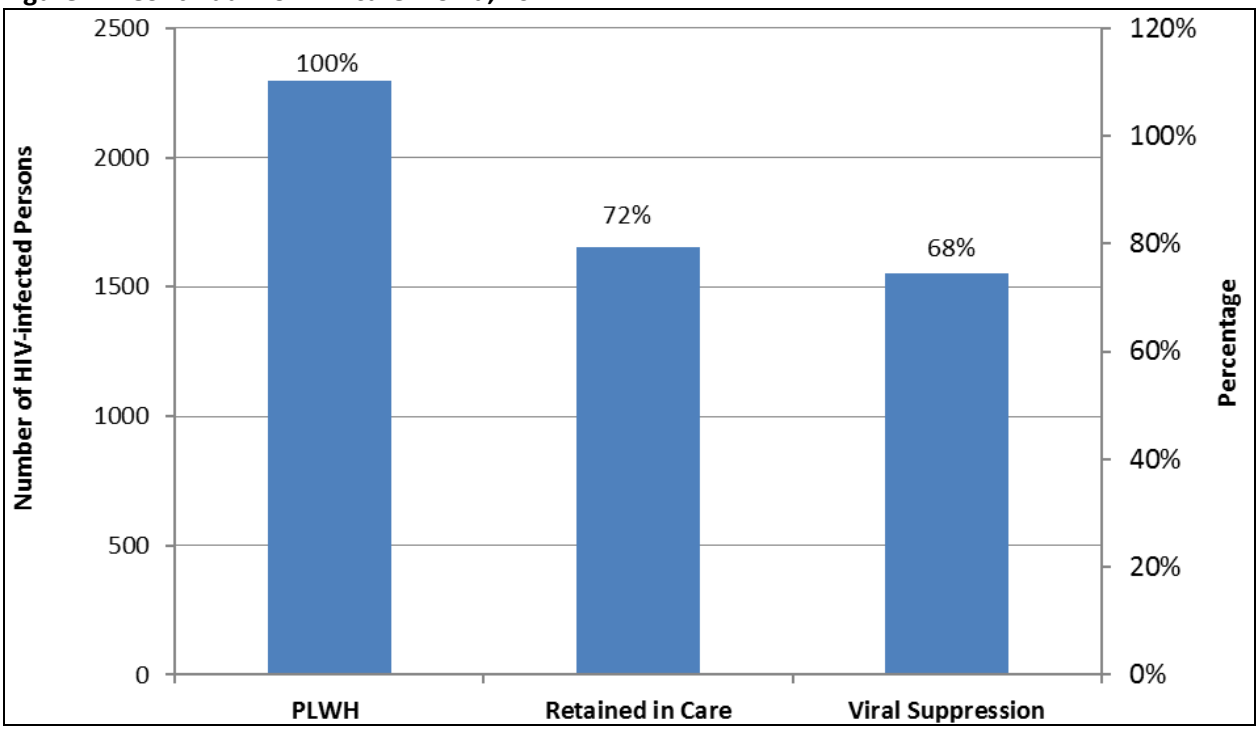
A total of 60 persons were diagnosed with AIDS in 2014, down from 82 in 2013 and 91 (the highest number since 1996) in 2009. The 60 AIDS diagnoses in 2014 are lower than the average of 78 for the five years 2009 through 2013.

The number of deaths among HIV-infected persons diagnosed in Iowa continues to decrease since peaking at 103 deaths in 1995. Death numbers have fluctuated from a low of 23 to a high of 37 since 2000. As of December 31, 2014, a total of 1,177 deaths have been reported among HIV-infected persons in Iowa. Of those deaths, 67 percent were caused in some part by the underlying HIV disease, 29 percent of deaths were not HIV-related, and the cause of 4 percent is unknown. Death data for 2014 are incomplete. The underlying cause for the 23 deaths already reported for 2014 has yet to be officially certified. Matching eHARS to the State Death Registry and the National Death Index in late summer of 2015 will provide more complete data.

The number of HIV-infected persons residing in Iowa at the end of 2014 was 2,369, a prevalence of 77 per 100,000 people. This number includes persons initially diagnosed in Iowa (and still living in Iowa), plus people who were initially diagnosed while living in another state but who now reside in Iowa. As of December 31, 2014, 96 of Iowa's 99 counties had at least one person living with HIV disease. Prevalence in four counties was greater than 100 per 100,000 persons. Polk County, with 149 per 100,000 topped the list, followed by Pottawattamie County with 146 per 100,000, Scott County with 113 per 100,000, and Johnson County with 109 per 100,000.

In Figure 14 (below), Persons Living With HIV (PLWH) is defined as persons diagnosed with HIV disease as of December 31, 2013, and living in Iowa at the end of 2014. "Retained in Care" is defined as PLWH having two or more CD4 or viral load lab results at least three months apart or having one CD4 or viral load lab result and virally suppressed during 2014. "Viral Suppression" is defined as persons retained in care and virally suppressed (viral load < 200 copies/mL) at the end of 2014. At the end of 2014, 1,655 (72 percent) of the 2,295 PLWH in Iowa were retained in care, and 1,552 (94 percent) of them were virally-suppressed. Viral suppression for all PLWH (in care and out of care) was 68 percent. Studies have shown viral suppression optimizes individual health outcomes, and may reduce the likelihood of transmitting HIV by 96 percent.

Figure 14. Continuum of HIV care - Iowa, 2014



HEPATITIS C

Hepatitis C is the most common chronic blood-borne pathogen in the United States. According to the Centers for Disease Control and Prevention (CDC) there are an estimated 2.7 to 3.9 million people living with chronic hepatitis C in the United States. According to the 2014 census population estimate for Iowa, there were 3,107,126 people residing in the state. CDC estimates that 1.3 percent to 1.9 percent of the state's population, or 40,392 to 59,035 Iowans, have potentially been infected with the Hepatitis C virus.

Hepatitis C data are collected using IDSS, the state's web-based reporting system, to allow for collection of risk information, test results, referral information, and data on whether immunizations were offered.

Summary of sexually transmitted diseases

The Bureau of HIV, STD, and Hepatitis is responsible for tracking the incidence of sexually transmitted diseases, including chlamydia, gonorrhea, and syphilis. In addition to disease surveillance, IDPH supports targeted voluntary screening at 65 public sites throughout Iowa. IDPH also works with private health care providers to increase screening.

IDPH provides free treatment to eligible individuals at public testing sites who test positive for chlamydia, gonorrhea, syphilis, or trichomoniasis. Sexual partners can be treated as well. In 2008, *Iowa Code 139A* was updated to allow for expedited partner therapy (EPT). This statute allows health care practitioners to give medications or prescriptions for the treatment of chlamydia or gonorrhea to their patients to give to exposed partners, particularly when the partner is unable or unwilling to come in to a clinic for examination. These medications may also be distributed to exposed partners via public health professionals.

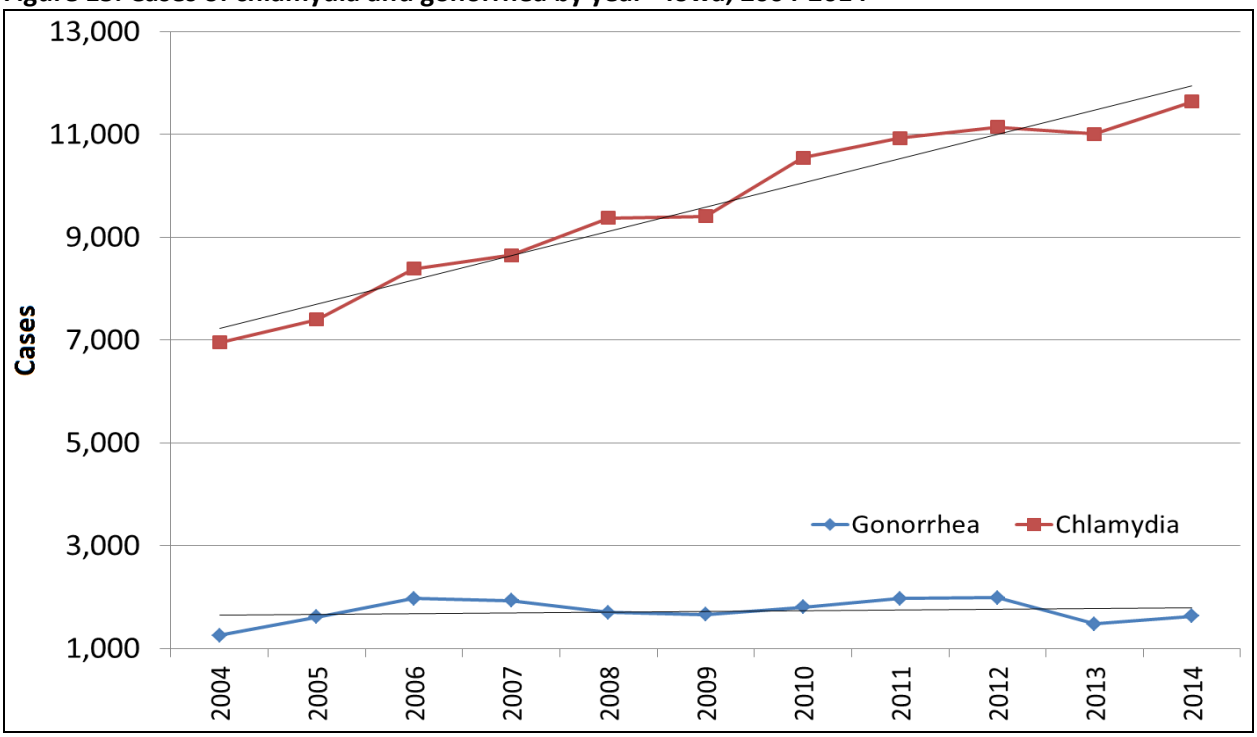
CHLAMYDIA

Urogenital infections caused by *Chlamydia trachomatis* are extremely common in some populations. In fact, chlamydial infections account for the greatest number of cases of any reportable disease in the United States and in Iowa. Diagnoses of chlamydia have increased steadily during the past couple decades. The reasons for this increase are varied. One important reason is that testing technology has improved, allowing for more sensitive tests and more convenient ways to test. The use of nucleic acid amplification tests (NAATs) for the detection of *Chlamydia trachomatis* became widespread in Iowa in the mid-2000s. This method of detection is much more sensitive than the previously used method of cell culture. NAATs also permit the use of a greater variety of specimen types. Urine and vaginal specimens (which can be collected much less invasively than the traditional specimen types of cervical and urethral) can be used for NAATs. Because most chlamydial infections cause no symptoms, there is a large pool of undiagnosed chlamydia in certain populations. As testing methodology has improved and as screening has increased, the number of cases reported has also increased.

In 2014, 11,807 cases of chlamydia were reported to IDPH (Figure 15). This corresponds to a rate of 388 cases per 100,000 persons. Iowa is lower than the US average of 447 cases per 100,000 persons. Both nationally and in Iowa, adolescents and young adults are the most impacted populations. In Iowa, 67 percent of reported infections occurred in persons 15 to 24 years of age.

There are racial and ethnic disparities among those infected with chlamydia. Although black, non-Hispanic persons accounted for 3 percent of the population in Iowa, 18 percent of chlamydial infections were diagnosed in this population. According to national data from CDC[3], Iowa ranks number one in the nation for the rate of chlamydia among black, non-Hispanic populations in the US.

Figure 15. Cases of chlamydia and gonorrhea by year - Iowa, 2004-2014



GONORRHEA

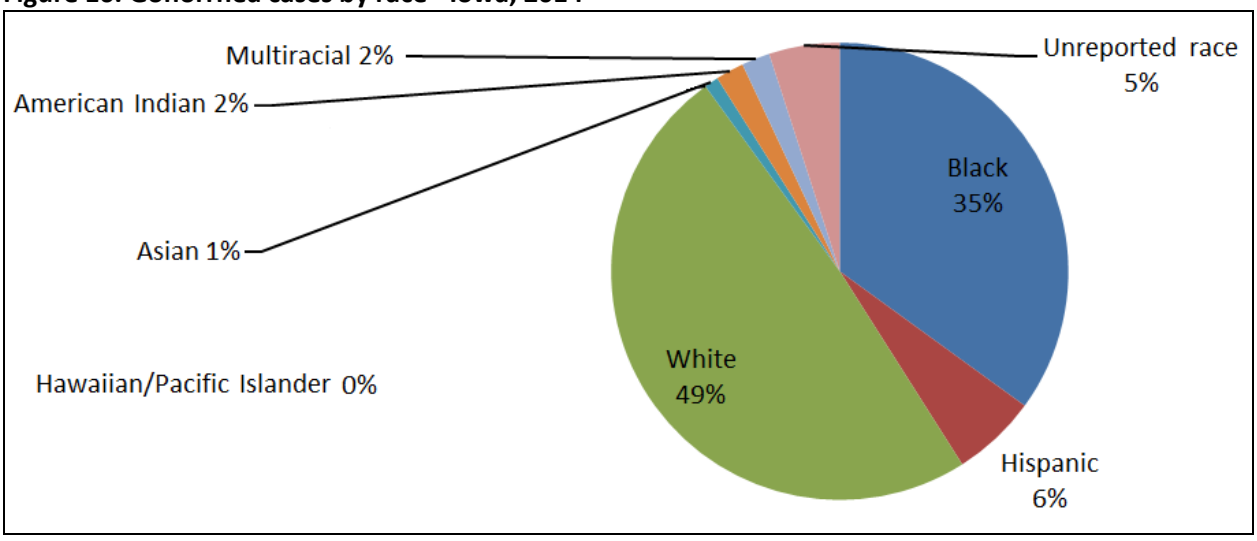
Nationally, the number of reported cases of gonorrhea has been fairly steady over the past several years. On average, the trends in Iowa have mirrored this, although 2014 data indicate an increase. NAATs have been utilized for gonorrhea as they have been for chlamydia. The most widely used tests incorporate gonorrhea and chlamydia testing into a single specimen collection. Thus, patients are typically tested for both infections simultaneously.

In 2014, 1,641 cases of gonorrhea were reported to IDPH (Figure 15), which corresponds to 54 cases per 100,000 persons. This is well below the national average of 106 cases per 100,000 persons. Gonorrhea has many similarities with chlamydia, chief of which is the population (i.e., adolescents/young adults) that it predominately affects. Those aged 15 to 24 years of age accounted for 54 percent of reported cases in Iowa. Black, non-Hispanic persons are even more disproportionately affected by gonorrhea than they are by chlamydia in Iowa. Black persons accounted for 35 percent of reported cases (Figure 16).

Antimicrobial resistance is of continuing concern with *Neisseria gonorrhoeae*. The only class of antimicrobials still effective in the treatment of gonococcal infection is the cephalosporins. Antimicrobials in other classes possess insufficient efficacy to cure the infection on their own. Current guidelines recommend dual therapy of ceftriaxone with azithromycin[4]. Dual therapy is recommended because individuals infected with gonorrhea are often co-infected with chlamydia. Furthermore, dual therapy likely slows the development of resistance to cephalosporins. Treatment failures with the last remaining effective oral cephalosporin have been confirmed in North America[5]. It is anticipated that *N. gonorrhoeae* will develop resistance to all cephalosporins, at which time treatment will become much more difficult. Currently, no new antimicrobials are available to treat gonorrhea. Researchers are investigating the use of other drug combinations to cure gonococcal infections but it is unknown if and when new options will be available for population-wide clinical use.

The significant disparities among black populations, the likelihood of further antimicrobial resistance by *N. gonorrhoeae*, and the steady number of cases make improving gonorrhea prevention a priority for IDPH and CDC.

Figure 16. Gonorrhea cases by race - Iowa, 2014

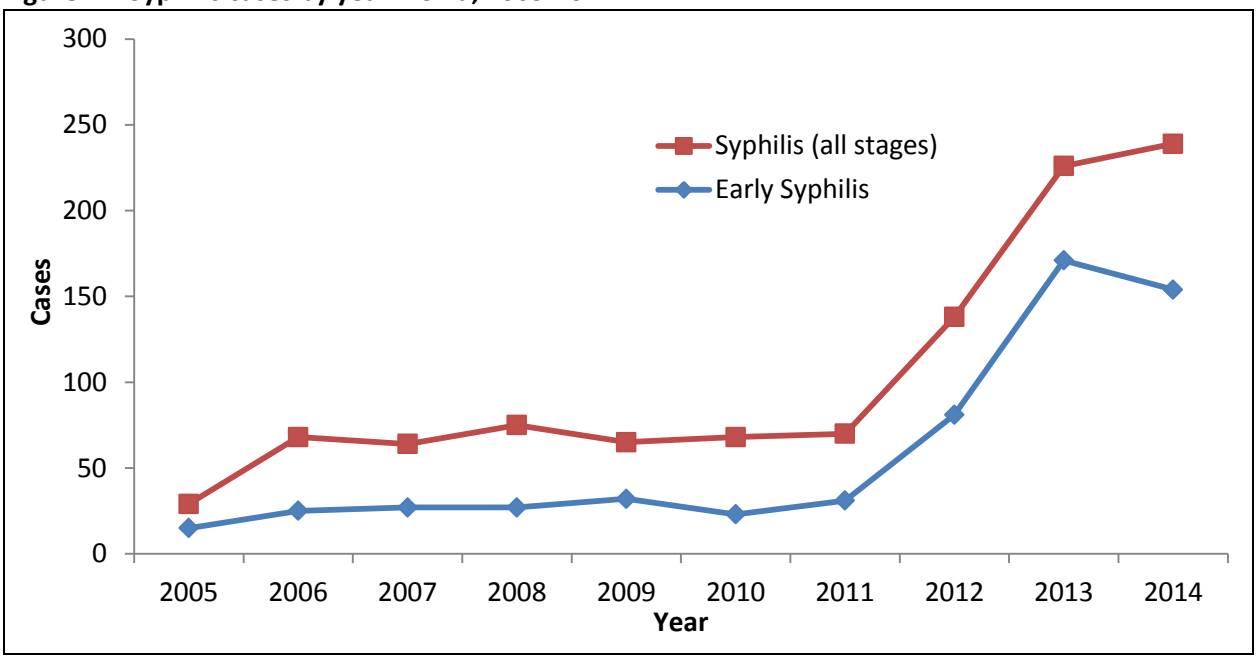


SYPHILIS

Iowa is considered a low-morbidity state for syphilis; however, the number of reported cases has significantly increased over the last three years (Figure 17). In 2014, 239 cases of syphilis were reported to IDPH. Of these, 154 were cases of early syphilis (primary, secondary, or early latent), which are of greatest concern to the public's health because these are the infectious stages of the disease. In 2014, the rate of early syphilis in Iowa was 5.1 per 100,000 persons, which is less than the US average of 10.9 per 100,000 persons. The preponderance of syphilis cases occurred in men. In terms of early syphilis, 89 percent of cases were among men. Of these, the majority were men who have sex with men (MSM). Co-infection with HIV is a concern with this population, so concurrent testing for HIV is recommended for persons at risk for syphilis.

Elimination of syphilis from Iowa has proven difficult due to sporadic clusters of cases and the spread from other states. The more recent outbreak among Iowa's MSM populations have complicated elimination efforts further, with challenging investigations and inadequate resources being significant contributing factors. IDPH follows up on every case of syphilis in Iowa and ensures that partner services and treatment are offered whenever they are appropriate and possible.

Figure 17. Syphilis cases by year - Iowa, 2005-2014



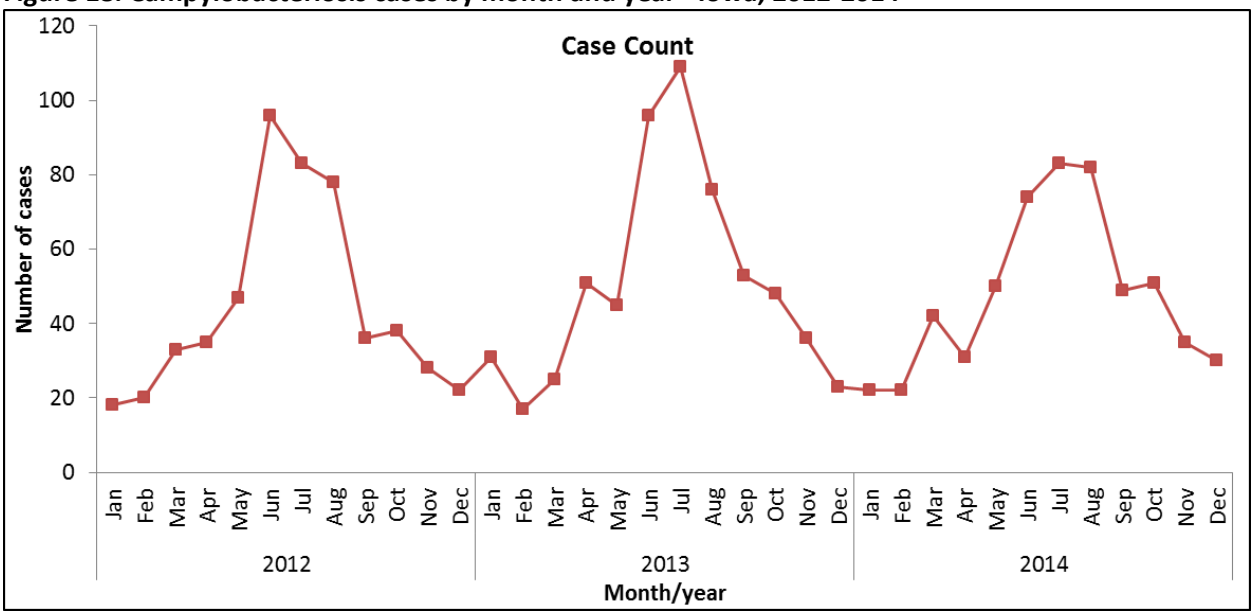
Summary of enteric diseases

CAMPYLOBACTERIOSIS

The total number of *Campylobacter* cases reported in 2014 was 571. Campylobacteriosis incidence was 18.7 cases for every 100,000 people in 2014.

Campylobacteriosis activity typically peaks in early summer (Figure 18). Consumption of raw or undercooked meat, raw milk, contaminated water, and contact with infected animals are common sources of *Campylobacter* infection.

Figure 18. Campylobacteriosis cases by month and year - Iowa, 2012-2014

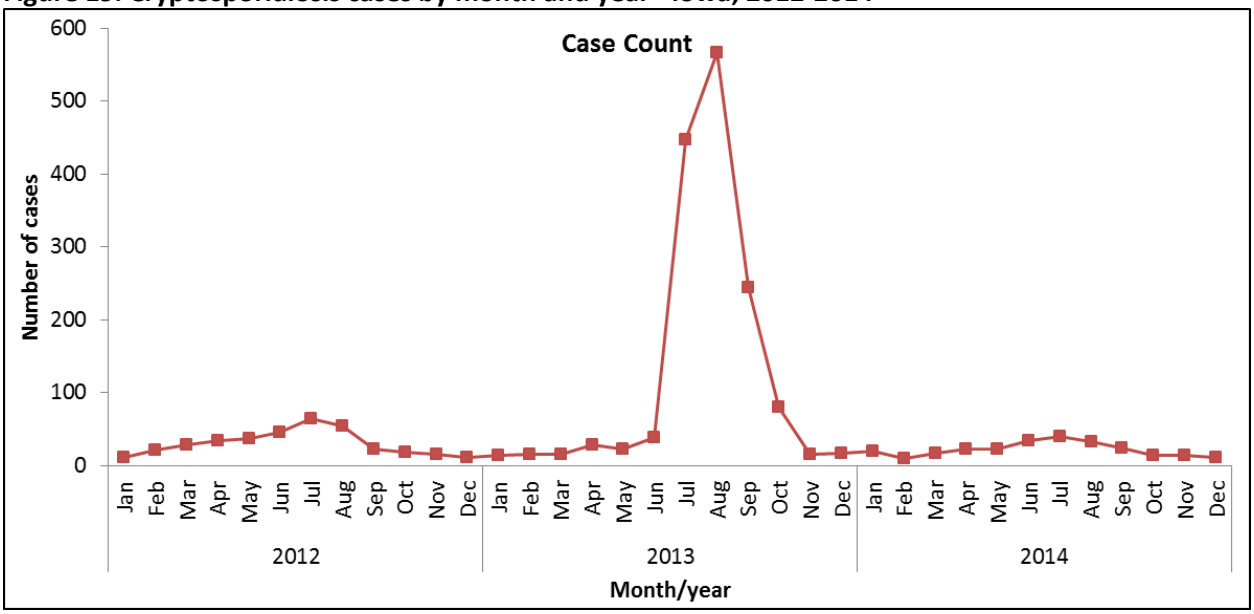


CRYPTOSPORIDIOSIS

There were 264 cases of cryptosporidiosis reported in Iowa in 2014, or 8.7 cases per 100,000 people (Figure 19). This is a decrease from 2013, when there were 1,505 cases reported in Iowa (49.4 cases per 100,000 people). No outbreaks of cryptosporidiosis were identified in 2014.

Cryptosporidiosis (often called crypto) is a diarrheal disease caused by a protozoan called *Cryptosporidium parvum*. The parasite can cause disease in both animals and humans. People usually catch cryptosporidiosis by coming in contact with persons or animals shedding the parasite, or drinking contaminated water.

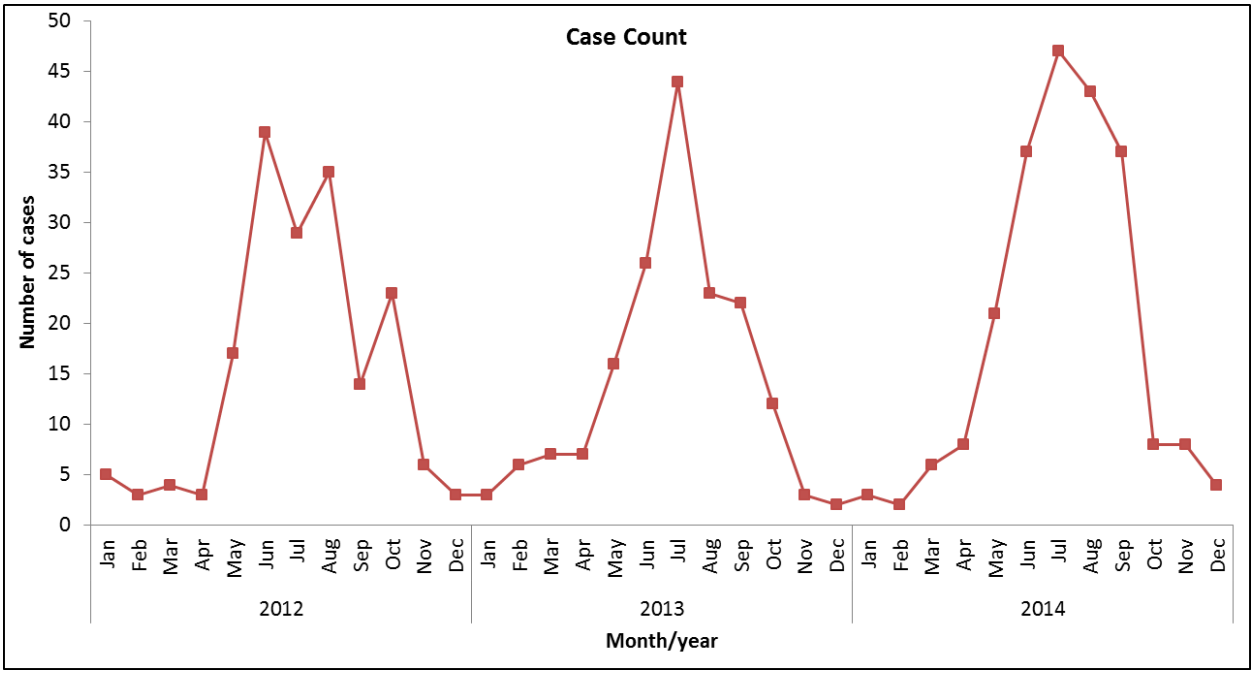
Figure 19. Cryptosporidiosis cases by month and year - Iowa, 2012-2014



E. COLI O157:H7 AND OTHER SHIGA-TOXIN PRODUCING STRAINS

The incidence of *E. coli* shiga-toxin cases in Iowa increased slightly from 5.6 cases per 100,000 persons in 2013 to 7.4 cases per 100,000 persons in 2014 (Figure 20). There were 224 total cases reported in 2014. Most types of *E. coli* are harmless and live in the gut, but some *E. coli*, including O157:H7, can cause illness. *E. coli* is spread by a person eating or drinking food or water that was contaminated with feces from infected people or animals. Other sources of *E. coli* include consumption of raw milk, unpasteurized cider or other juices, or poorly cooked meat.

Figure 20. *E. coli* O157:H7 and other shiga-toxin producing strain cases by month and year - Iowa, 2012-2014

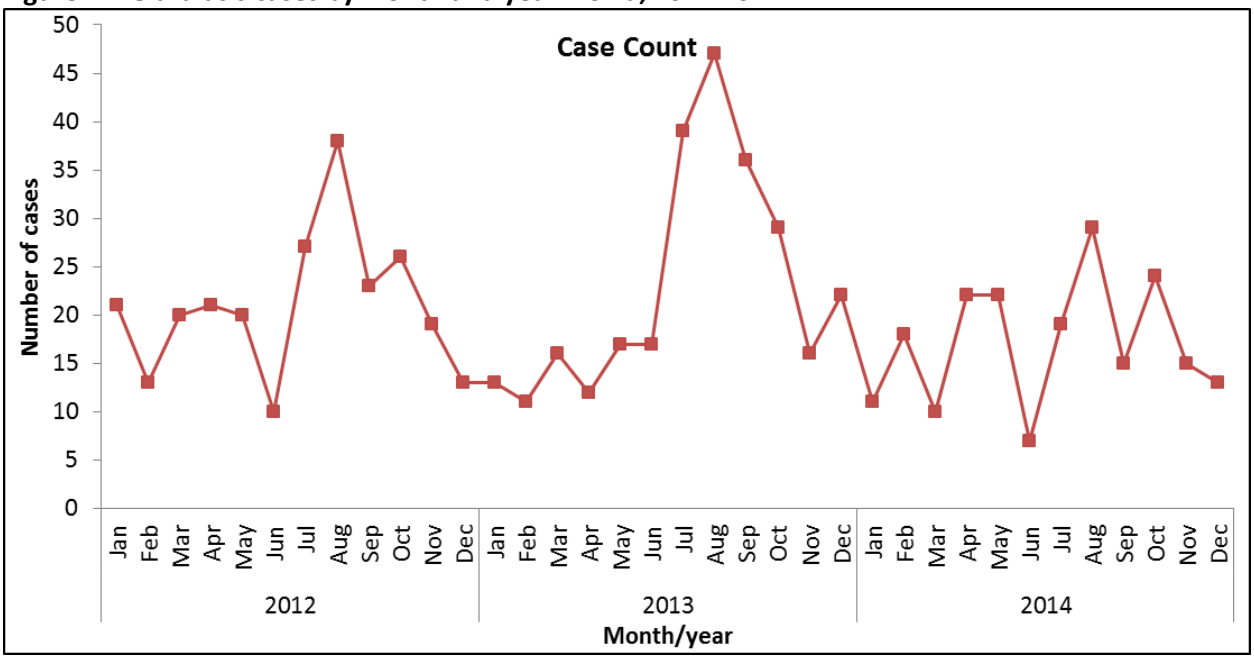


GIARDIASIS

Giardiasis activity typically peaks in late summer or early fall (Figure 21). In 2014, there were 205 cases reported in Iowa. There were 6.7 cases for every 100,000 persons in 2014 compared to 9.0 cases for every 100,000 persons the previous year.

Giardiasis is a diarrheal disease caused by the microscopic parasite Giardia, a parasite that lives in the intestines of people and animals. Giardia is one of the most common causes of waterborne disease in the United States. The parasite can be found in streams, lakes, wells, and recreational waters.

Figure 21. Giardiasis cases by month and year - Iowa, 2012-2014

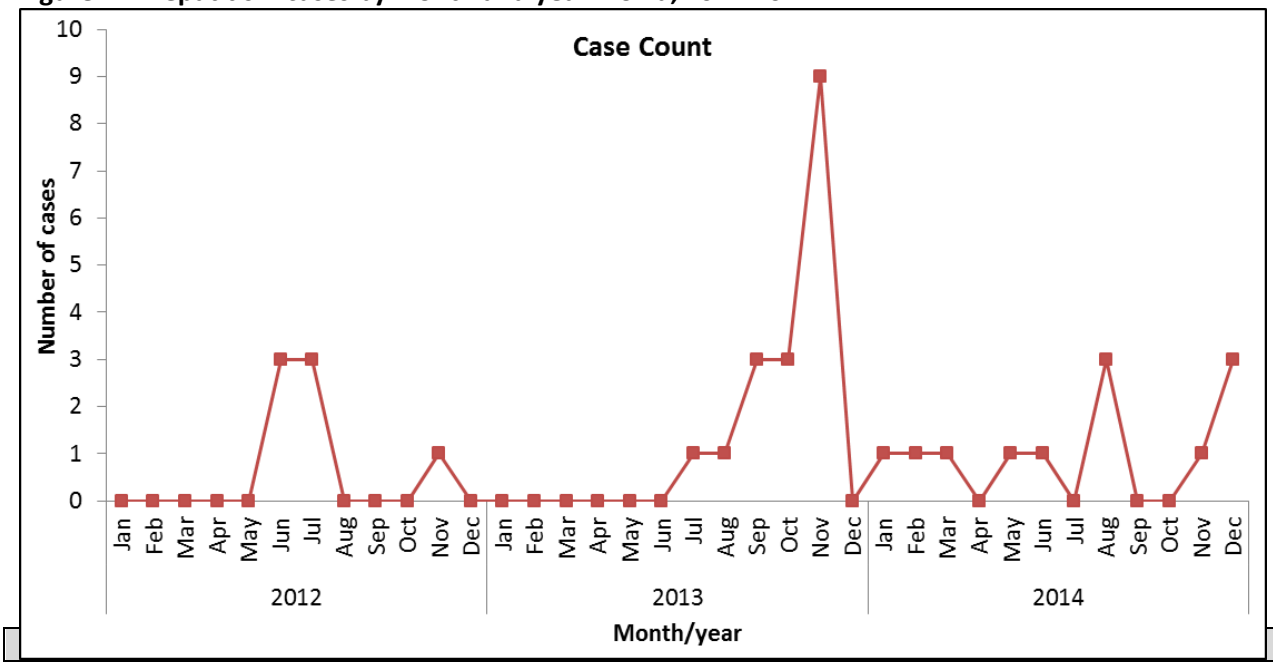


HEPATITIS A

In 2014, 12 cases of hepatitis A were reported in Iowa (Figure 22). The three-year average from 2011-2013 was 11 cases. Cases ranged in age from 20 to 62 years of age. None of the cases were associated with outbreaks.

Hepatitis A is a highly contagious liver disease caused by the hepatitis A virus. It is usually transmitted by the fecal-oral route, either through person-to-person contact or consumption of contaminated food or water.

Figure 22. Hepatitis A cases by month and year - Iowa, 2012-2014



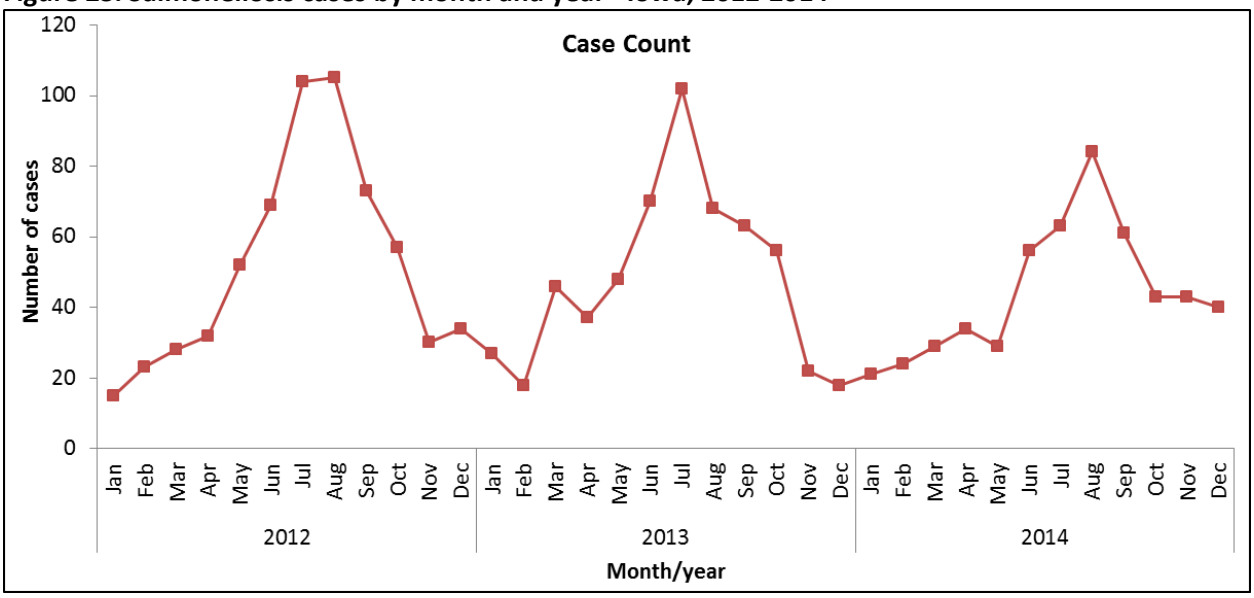
There were seven cases of *Listeria monocytogenes* reported in 2014. None were associated with a national outbreak.

Listeriosis is an uncommon bacterial infection caused by the bacteria *Listeria monocytogenes*. This bacterium is widespread in nature and most cases are sporadic, although foodborne outbreaks and person-to-person spread have been documented. *L. monocytogenes* is most commonly found in the soil, water, mud, cattle forage, and silage. Infected humans and animals can also shed the bacteria.

SALMONELLOSIS

Salmonellosis incidence in 2014 decreased to 17.3 cases per 100,000 persons from 18.9 cases per 100,000 persons in 2013 (Figure 23). The total number of cases reported was 527. Local public health departments and IDPH investigated one Iowa-specific outbreak, which was associated with a restaurant. IDPH also interviewed several Iowans involved in national *Salmonella* investigations.

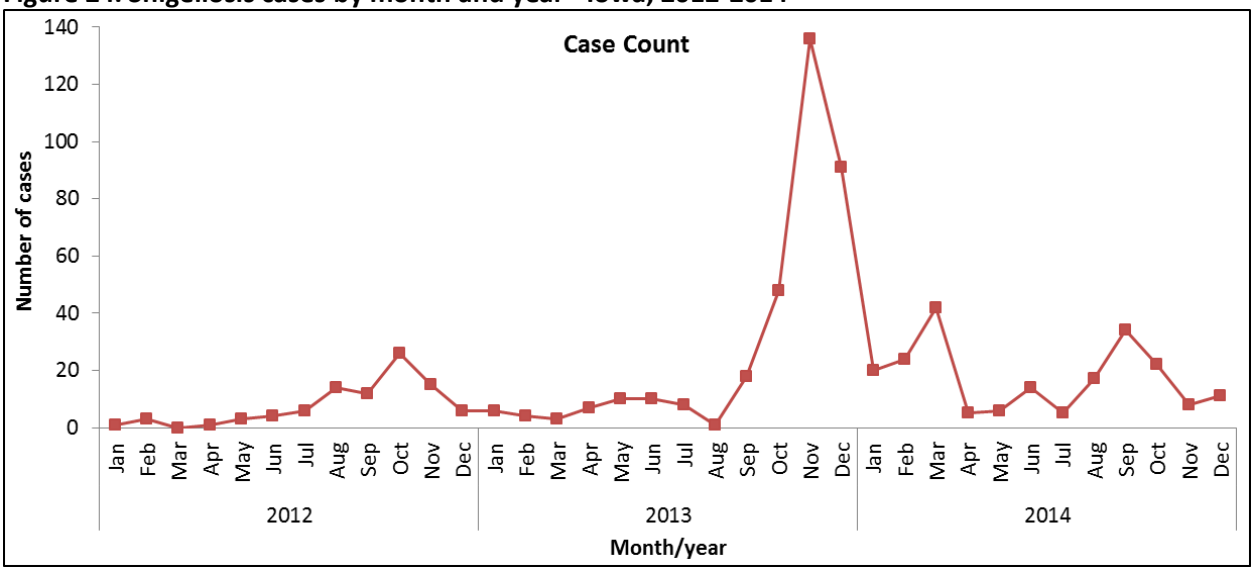
Figure 23. Salmonellosis cases by month and year - Iowa, 2012-2014



SHIGELLOSIS

In 2014, 208 cases of *Shigella* were reported in Iowa, down from 342 cases reported in 2013 (Figure 24). There were no newly identified outbreaks of *Shigella* in 2014, though the beginning of the year saw increased numbers of cases likely associated with the large community-wide outbreak in western Iowa that occurred towards the end of 2013.

Figure 24. Shigellosis cases by month and year - Iowa, 2012-2014



Summary of zoonotic and vectorborne diseases

DENGUE FEVER

In 2014, four cases of Dengue fever were reported to IDPH. Cases ranged from age 19 to 52 with a median age of 23 years. All infections were acquired outside of the United States.

CHIKUNGUNYA

In 2014, four cases of chikungunya virus disease were reported in Iowa. Chikungunya is not found in Iowa. All infections were acquired outside of the continental United States.

EHRLICHIOSIS/ANAPLASMOSIS

There are at least three species of bacteria responsible for ehrlichiosis/anaplasmosis in the United States: *Ehrlichia chaffeensis, Anaplasma phagocytophilum*, and *Ehrlichia ewingii*. They are transmitted by the bite of an infected lone star tick (*Amblyomma americanum*), which is found in Iowa. The clinical signs and symptoms of these infections are similar.

In 2014, there were 17 cases of ehrlichiosis/anaplasmosis reported to IDPH, an increase from the eight cases reported in 2013.

HANTAVIRUS

There were two reports of hantavirus pulmonary syndrome (HPS) in Iowa in 2014. There have been 11 cases of HPS reported in Iowa since the disease was first identified in 1993. Substantial rodent exposure has been identified in most of these cases.

LYME DISEASE

Lyme disease is caused by *Borrelia burgdorferi* and is transmitted to humans by the bite of an infected tick, primarily the blacklegged tick. Symptoms of Lyme disease can include fever, headache, fatigue, and a "bull's-eye" skin rash also known as erythema migrans. In 2014, 194 cases of Lyme disease were reported to IDPH, a decrease from 2013 but a 13 percent increase over the previous three-year average (Figure 25). The 2014 Iowa case rate for Lyme disease was 6.2 cases per 100,000 persons. Most cases occurred in the eastern half of the state (Figure 26).

Figure 25. Confirmed and probable Lyme disease cases by year - Iowa, 2005-2014

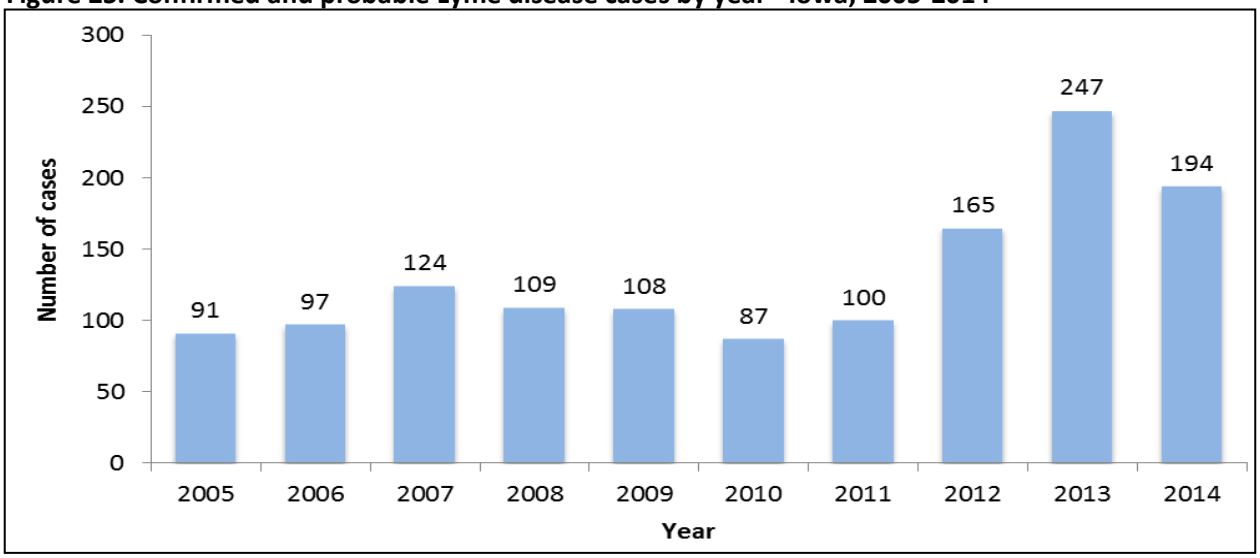
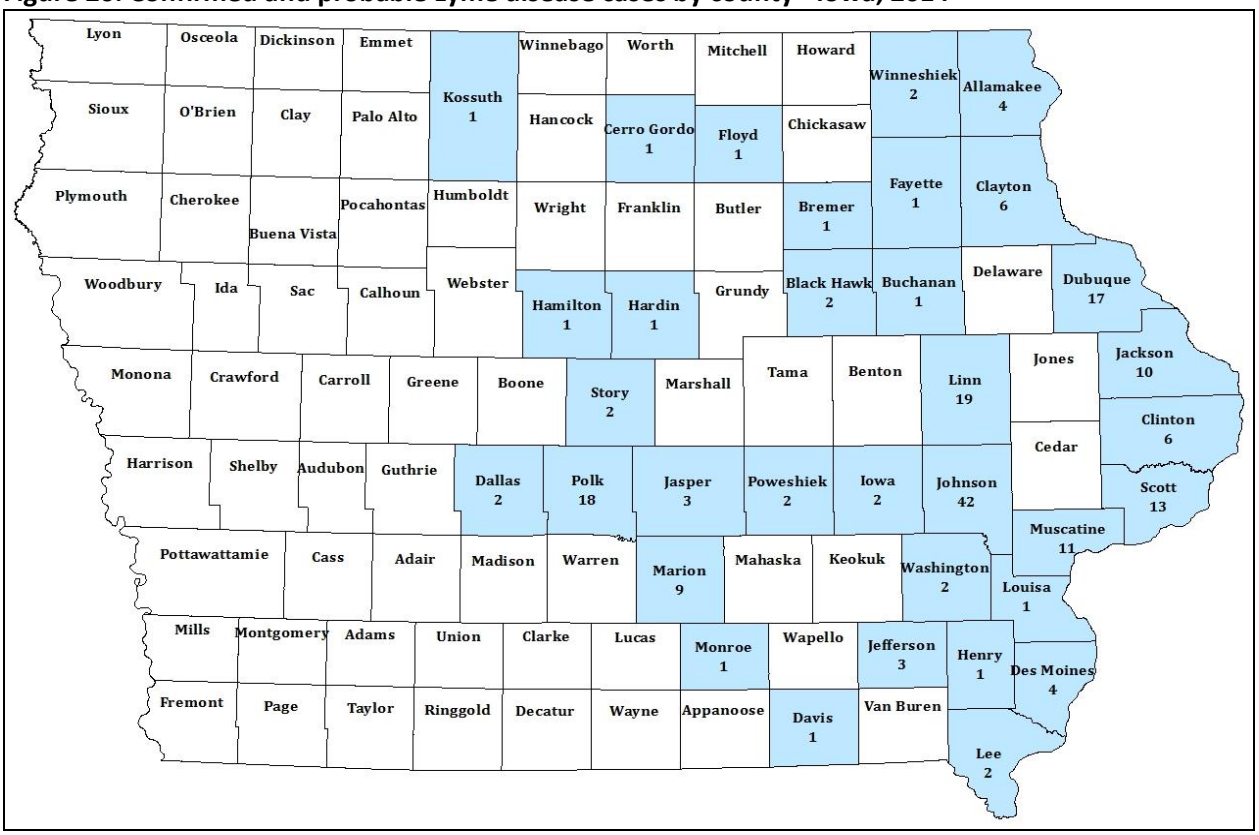


Figure 26: Confirmed and probable Lyme disease cases by county - Iowa, 2014



MALARIA

In 2014, 17 cases of malaria were identified in Iowa, an increase from the 12 cases reported in 2013. Cases ranged from ages two to 56, with a median age of 26 years. All infections were acquired outside of the United States.

RABIES, ANIMAL

In 2014, 15 cases of animal rabies were reported in Iowa, which is slightly higher than the number identified in 2013. Rabies was identified most frequently in wildlife species, including 10 bats and two skunks. Two cases were diagnosed in cows and one case was diagnosed in a cat; however, only animals that have exposed humans are tested for rabies.

During 2014, 1409 animals in Iowa were tested for rabies and 15 were confirmed positive (1.06 percent). The percent positive varies greatly by species (Table 3). It is important to note that this data is greatly influenced by the number of animals tested. Many animals are tested because they have contact with humans or domestic animals and they exhibit unusual behavior or clinical signs, making them more likely to be infected with the rabies virus. For these reasons, the percentages should not be considered representative of the true distribution of disease within the animal population in Iowa.

Table 3. Animals testing positive for rabies virus by species - Iowa, 2014

Species	Positive	Total Tested	Percent Positive
Bat	10	487	2.05%
Skunk	2	7	28.57%
Cow	2	82	2.44%
Cat	1	366	0.27%

There are two rabies strains that commonly circulate in Iowa (bat and skunk) and many different species can be infected with these strains. In animal samples that are strongly positive for rabies, the State Hygienic Laboratory (SHL) can differentiate the rabies strain that infected the animal (the strain typing procedure is only effective in samples that are strongly positive as opposed to weakly positive) (Table 4). In 2014, SHL was able to identify the rabies strain in seven of the positive rabies cases; four were bat strain and three were skunk strain. Bat strain rabies was identified in four bats. Skunk strain rabies was identified in two skunks and one cow. For more information on rabies, visit www.idph.state.ia.us/Rabies/Resources.aspx.

Table 4. Animals testing positive for rabies virus by species and by year - Iowa, 2005-2014

Species	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Bat	60	28	13	11	11	10	12	17	6	10
Skunk	33	13	5	7	13	13	7	9	4	2
Cat	5	7	7	9	3	1	3	1	0	1
Cow	7	4	0	1	5	1	3	4	2	2
Dog	2	2	5	1	2	1	0	0	0	0
Horse	1	3	1	0	0	0	0	0	0	0
Fox	0	0	0	0	0	1	0	0	0	0
Squirrel	0	0	0	0	1	0	0	0	0	0
Badger	0	0	0	0	0	0	0	0	0	0
Total	**108**	**57**	**31**	**29**	**35**	**27**	**25**	**31**	**12**	**15**

RABIES, HUMAN

Iowa's most recent human rabies case occurred in 2002 and was caused by bat strain rabies. Prior to that, the last reported human case in Iowa occurred in 1951.

While the exact number of people who receive rabies post-exposure prophylaxis each year in the United States is unknown, it is estimated to be about 40,000 people. Based upon Iowa's population, it is estimated that approximately 400 Iowans receive rabies post-exposure prophylaxis each year.

ROCKY MOUNTAIN SPOTTED FEVER (RMSF)

In 2014, 10 cases of Rocky Mountain spotted fever (RMSF) were reported in Iowa. American dog ticks are carriers of *Rickettsia rickettsii*, the bacteria that causes RMSF. The American dog tick is the most common species of tick in Iowa and can be found in every county in the state. The tick is most active late March through August. Iowa RMSF cases in 2014 had symptom onset dates from May to October. Cases ranged from ages 26 to 60, with a median age of 46. Nine out of the 10 cases were male.

WEST NILE VIRUS

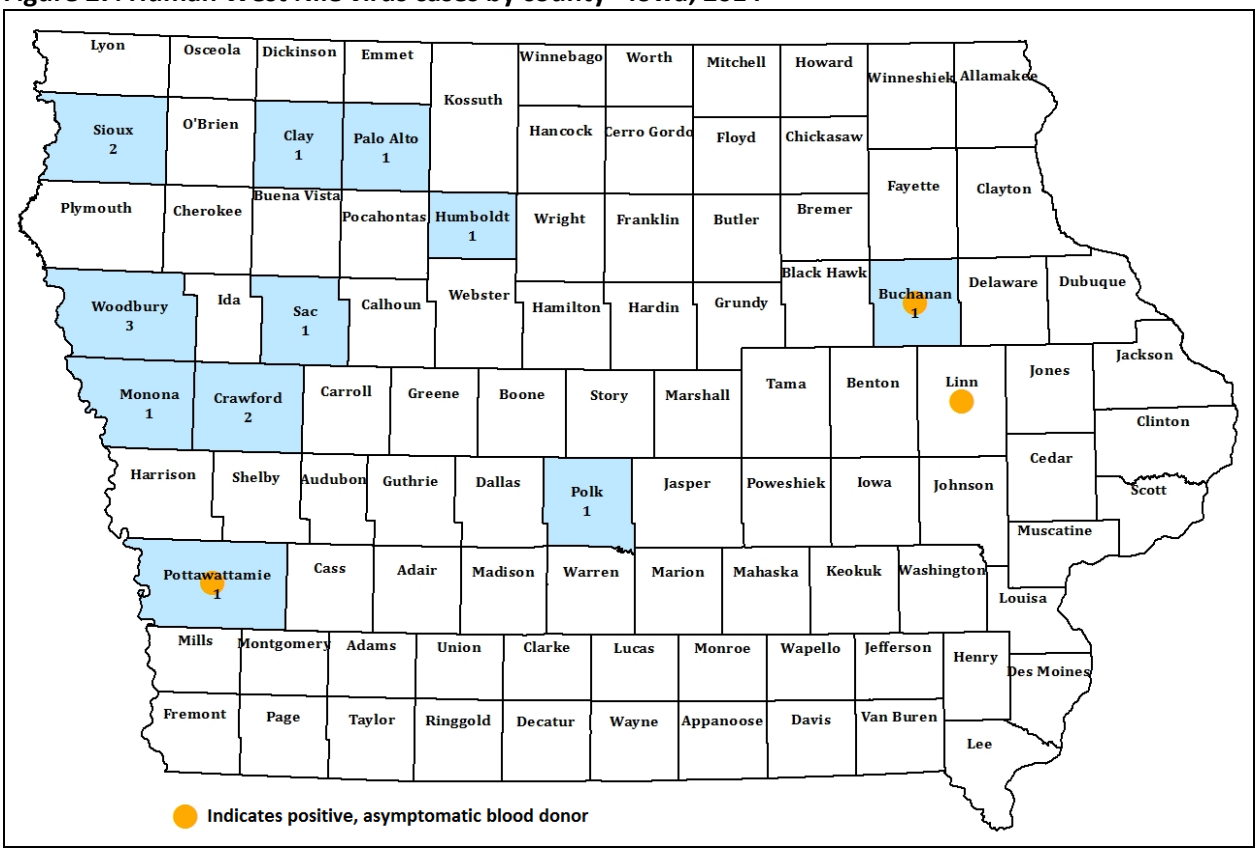
There were 15 human cases of West Nile virus reported to IDPH in 2014, a decrease from the 44 cases reported in 2013 and 31 cases reported in 2012 (Table 5). Eight of the 15 cases reported in 2014 were hospitalized (53 percent), and no deaths were reported. Cases ranged from age two to 76, with a median age of 45. Eight cases were male and seven were female. The highest numbers of cases were reported in the northwest region of the state (Figure 27).

Table 5. West Nile virus activity by species and outcome - Iowa, 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Human cases	37	37	30	5	5	9	9	31	44	15
Human deaths	2	0	3	1	0	2	0	0	0	0
Sentinel chickens	19	18	18	3	6	14	14	17	15	*
Mosquito (pools)	7	15	5	5	9	7	5	14	66	15
Horses	15	12	10	4	3	2	1	35	11	5

***Sentinel chicken testing was not performed**

Figure 27. Human West Nile virus cases by county - Iowa, 2014



Summary of Rare and Unusual Diseases

Toxic Shock Syndrome
There was one case of Toxic Shock Syndrome reported to IDPH in 2014, which occurred in a male child (0-17 years of age).

Tularemia
There was one case of tularemia reported to IDPH in 2014, which occurred in a female (61-80 years of age).

There were no cases of human illness reported for the following diseases:
Hansen's disease (Leprosy)
Hepatitis E
Psittacosis
Tetanus
Yellow Fever

Changes to the reportable disease list are set to take affect January 2016.
The following will be removed from the reportable disease list: *Enterococcus* invasive disease, Group A *Streptococcus* invasive disease, *Streptococcus pneumoniae* invasive disease, Toxic Shock Syndrome, Trichinosis, and *Staphylococcus aureus* invasive disease: Methicillin-resistant invasive disease.

The following will be added to the reportable disease list: Tularemia, Q Fever, exposure to harmful algal blooms.

Clarifications will be made to the reporting language for mosquito-borne diseases, tick-borne diseases, and viral hemorrhagic fevers.

Summary of environmental health conditions

CARBON MONOXIDE (CO) POISONING

Each year, according to the CDC, more than 400 Americans die from unintentional CO poisoning. Additionally, more than 20,000 visit the emergency room and more than 4,000 are hospitalized due to CO poisoning. Fatalities are highest among Americans 65 and older. IDPH collects reports of CO poisoning and CO exposure from health care providers and the Iowa Statewide Poison Control Center (Table 6). CO poisoning is defined in Iowa as:

- A blood carbon monoxide level equal to or greater than 10 percent carboxyhemoglobin or its equivalent with a breath analyzer test; **or**
- A clinical diagnosis of carbon monoxide poisoning regardless of any test result.

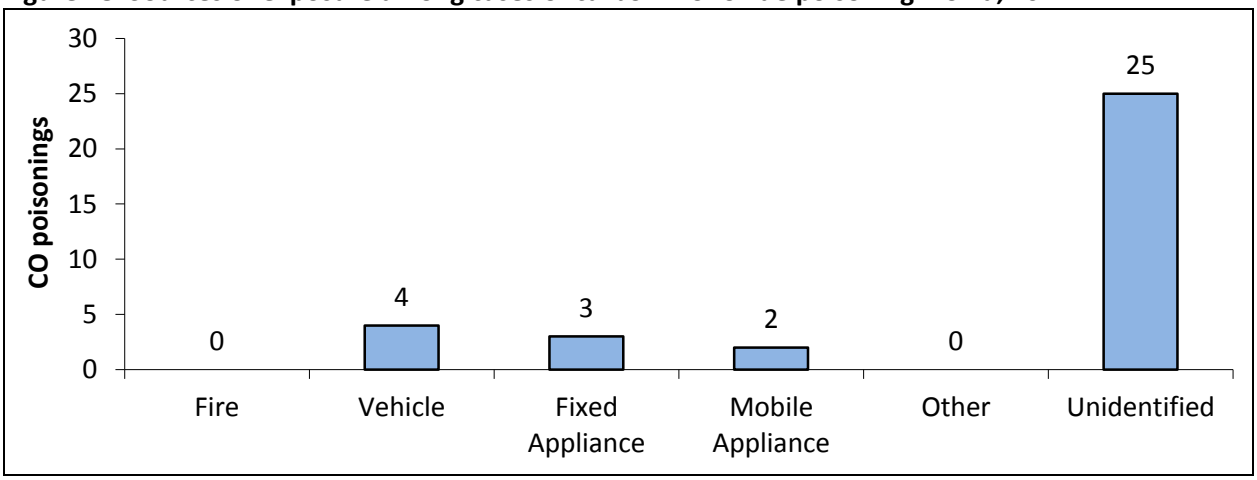
Table 6. Carbon monoxide poisoning cases by gender - Iowa, 2014

Gender	Number of Cases
Male	17
Female	17
Total	34

Information collected includes basic demographics (age, gender, county of residence), diagnosis, blood carboxyhemoglobin test results, exposure (circumstance, source, location) (Figure 28), and severity of health impact (Figure 29). Reports are reviewed to identify clusters and possible occupational exposures for further investigation and intervention.

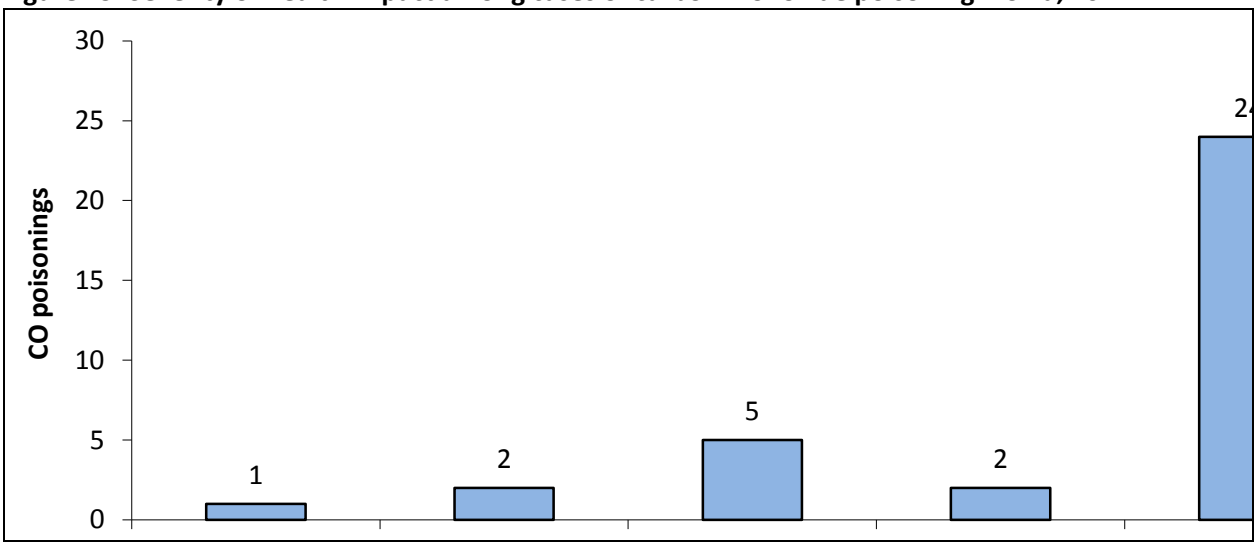
In 2014, there was one reported death from CO exposure in Iowa. Thirty-four individual reports of CO poisoning were received by IDPH.

Figure 28. Sources of exposure among cases of carbon monoxide poisoning - Iowa, 2014



Vehicles include automobiles and other fuel-powered recreational vehicles (e.g. boats, ATVs, Zamboni Ice Resurfacing machines, etc.).
Fixed appliances include fuel-burning equipment that is typically stationary (e.g., furnaces, gas water heaters, gas stoves or fireplaces).
Mobile appliances include generators, space heaters, and other small power equipment (e.g., power washers, lawn mowers, chain saws, etc.)

Figure 29. Severity of health impact among cases of carbon monoxide poisoning - Iowa, 2014



Fatal – Patient died due to carbon monoxide poisoning
Major – Patient experienced major symptoms (loss of consciousness, long-term complications)
Moderate – Patient experienced moderate symptoms such as nausea, vomiting, confusion
Minor – Patient experienced minor symptoms such as headache, dizziness

METHEMOGLOBINEMIA

Methemoglobinemia is a blood disorder caused when nitrite interacts with the hemoglobin in red blood cells, reducing the ability to carry sufficient oxygen to individual body cells. Infants under six months of age are the primary population at risk, and the condition is also known as 'Blue Baby Syndrome.' Sources of nitrite include nitrate in drinking water or from preservatives in food, some drugs, or other sources.

In 2014, there were two cases of methemoglobinemia reported in Iowa. There were no cases reported in an infant.

HEAVY METAL POISONING (NON-LEAD)

IDPH conducts surveillance for three other heavy metals in addition to lead: arsenic, cadmium, and mercury. Cases of poisoning from these three heavy metals are rare in Iowa and many exposures are related to industrial or hobby/small market work in industries that use these metals. Outside of industrial use, the possibility of arsenic contamination of moonshine, herbal preparations, and nutritional supplements also must be considered as a source of exposure. Other potential sources of mercury exposure include consumption of large amounts of contaminated fish and seafood, or from broken thermometers, barometers, fluorescent light bulbs, or electrical switches. In 2014, there were three cases of arsenic poisoning, one case of cadmium poisoning, and three cases of mercury poisoning reported.

CHILDHOOD LEAD POISONING

Lead has adverse effects on nearly all organ systems in the body. It is especially harmful to the developing brains and nervous systems of children under the age of 6. At very high blood lead levels, children can have severe brain damage or even die. Recent research suggests that there is no level of lead exposure at which adverse health and developmental effects do not occur. At blood lead levels as low as 1 microgram per deciliter (µg/dL), children's intelligence, hearing, and growth may be affected. This damage can be minimized if a child's lead exposure is reduced; however, the damage cannot be

reversed. The Centers for Disease Control and Prevention recommends that public health actions be initiated at blood lead levels above 5 µg/dL, and has a goal to eliminate blood lead levels greater than or equal to 10 µg/dL in children.

Iowa's children are most commonly poisoned by lead-based paint found in homes built before 1950. Lead-based paint in a home becomes a lead hazard as it deteriorates and paint chips end up on the floors and in window wells throughout the home, as well as in the soil around the exterior of a home. Since 2008, Iowa law has required that all children have proof of a blood lead test when enrolling in kindergarten. The Iowa Department of Public Health recommends that children receive a blood lead test at least every year, starting when they are one year old, until six years of age. Depending upon the results of the blood lead testing, more frequent testing may be recommended.

There are two types of specimens for blood lead tests completed in Iowa: a finger or heel stick (capillary test) and blood drawn from a vein (venous test). The venous test is more accurate, and is required to confirm the result of an abnormal capillary test result of 10 µg/dL or greater. There were 60,653 blood lead tests completed on children under the age of six in Iowa in 2014. Of these 60,653 tests completed in Iowa, 1,070 (1.7 percent) blood lead tests were at levels at or above the 10 µg/dL level (Table 7). There were 521 confirmatory elevated blood lead level tests in 2014. A confirmed elevated blood lead level is defined as 1) any venous blood level test result greater than or equal to 10 µg/dL, or 2) a set of two capillary blood lead test results greater than or equal to 10 µg/dL conducted less than 12 weeks apart. There were 491 unconfirmed elevated blood lead level tests in 2014. An unconfirmed elevated blood lead level is any capillary blood lead test result greater than or equal to 10 µg/dL that is not confirmed by a follow-up capillary or venous blood lead test within 12 weeks.

Table 7. Children with elevated blood lead levels by highest confirmed level - Iowa, 2014

Blood Lead Level Range	Number of Confirmed Elevated Blood Tests	Percent of Confirmed Elevated Blood Tests in Range (Number of Confirmed Elevated / 521 x 100)
10-14 µg/dL	188	36.08
15-19 µg/dL	122	23.42
20-24 µg/dL	156	29.94
25-44 µg/dL	47	9.02
45-69 µg/dL	8	1.54
>70 µg/dL	0	0.00

ADULT LEAD POISONING

Lead exposure occurs when lead dust or fumes are inhaled, or when lead is ingested via contaminated hands, food, water, cigarettes, or clothing. Lead entering the respiratory and digestive systems is released to the blood and distributed throughout the body. The toxic nature of lead is well-documented. Lead affects all organs and functions of the body to varying degrees. The frequency and severity of symptoms among exposed individuals depends upon the level of exposure. Once it is in the body, lead can be stored in organs and bones where it can cause serious and permanent damage to the kidneys, brain, heart, and reproductive system. Lead can damage the body even when someone is exposed to small amounts over a long period of time. Lead in bones may be released into the blood, re-exposing organs long after the original exposure.

Most adults who do not work with lead as part of their job or during hobby activities have a low risk of exposure and are rarely tested. Persons who work with lead must be periodically tested through their worksite (when there is known high risk of exposure). Others should request testing from their personal medical provider (when there is a sporadic or low risk of exposure not known to meet the Occupational

Safety and Health Administration (OSHA) requirement for testing) to monitor their actual level of exposure. Those with hobbies such as target shooting, hunting, casting or reloading ammunition, or involvement in art projects or other activities that utilize lead should be tested at least yearly. Testing can alert adults to the need for preventive measures to protect their health and reduce the risk of spreading lead to their families.

In 2014, the IDPH lead poisoning prevention program transitioned to a web-based data system to collect all blood lead test reports for Iowa residents from laboratories and medical providers reportable to IDPH under Iowa Administrative Code 641, Chapter 1. The 2014 data should be considered provisional (subject to change) and may not be complete at this time due to this transition.

For 2014, blood lead tests of 10 micrograms per deciliter (µg/dL) or higher were defined as an elevated blood lead level (EBL) for an adult 16 years or older (age as of the date of collection) with residency in Iowa. Blood lead level (BLL) test results for 2,493 Iowa adults were reported to IDPH for calendar year 2014 (data as of May 2015) (Table 8). Based on the highest BLL in 2014 for each of these adults, there was a total of 759 Iowans (30.4 percent of those tested) who had blood lead levels of 10 µg/dL or higher: 611 adults with levels 10-24 µg/dL, 139 adults with levels 25-39 µg/dL, and nine adults with levels 40 µg/dL or higher. The remaining Iowa adults tested (1,729, 69 percent) had results less than 10 µg/dL, with an average BLL less than 3 µg/dL.

Descriptive analysis of the 2014 adult lead test data by gender, county, and source of exposure is not available at this time. Iowa's high risk industries have remained consistent in the past, with about 90 percent of the EBL adults working in manufacturing plants that use lead or metal products that contain lead. These workers are the most likely to be tested for lead exposure because of regulatory oversight or concerns about the risk of exposure in a fixed worksite environment. The second highest industry group is construction at about 3 percent of the adult EBLs. The construction industry includes industrial, commercial, and residential construction, painting, maintenance, and renovation projects. It is known that many workers in construction are not routinely tested for lead exposure. Other work-related cases in Iowa include exposures from electronic and scrap metal recycling, materials wholesalers and retailers, automotive or radiator repair, leaded glass workers and installers, transportation maintenance shops, and a variety of other work types. There are undoubtedly additional workers – especially those working for smaller companies or those who are self-employed – that have lead exposure but were never tested during 2014. About 3 percent of adult EBLs in Iowa are due to non-work-related exposures.

Table 8: Adult Blood Lead Level (BLL) Test Results - Iowa, 2011-2014

2014 Data is Provisional	Number of Iowa Adults		Tested by Highest BLL for Year				Percent of all Iowa Adults Tested by BLL Range by Year			
IA ABLES DATA	**2014**	**2014 numbers vs. 2013**	**Prior 3-yr Ave**	**2013**	**2012**	**2011**	**2014**	**2013**	**2012**	**2011**
BLL 0-9 µg/dL	1729	-658	2276	2317	2187	2323	69.4%	72.8%	72.8%	73.6%
BLL 10-24 µg/dL	611	-43	623	654	622	592	24.5%	20.6%	20.7%	18.8%
BLL 25-39 µg/dL	139	-44	187	183	174	203	5.6%	5.8%	5.8%	6.5%
BLL 40 µg/dL or higher	9	-10	26	19	22	37	0.4%	0.6%	0.7%	1.1%
All BLL 10+ (Total EBLS)	759	-97	835	856	818	832	30.4%	27.2%	27.2%	26.4%
Total Individuals Tested by Year	2493	-680	3111	3173	3005	3155				

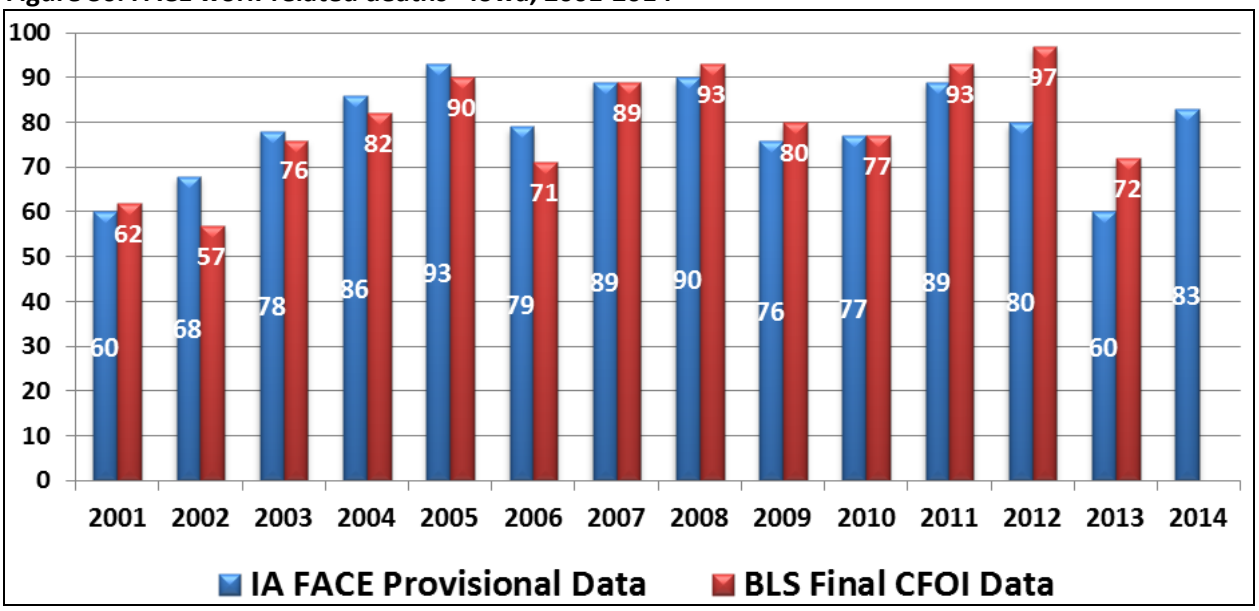
Adults: Persons 16 years of age or older as of date of blood test.
Iowa Adult Data: Test results for adults with an Iowa residential address as of date of blood test. Blood lead test reports received without address data or with a residential address outside of Iowa are not included in this report.
Report reflects data as of May 4, 2015.

TRAUMATIC WORK-RELATED FATALITIES SURVEILLANCE

The IDPH Occupational Health and Safety Surveillance Program (OHSSP) includes the Iowa Fatality Assessment and Control Evaluation (FACE) project, with work subcontracted to the University of Iowa College of Public Health, through funding provided by the National Institute of Occupational Safety and Health (NIOSH). The Iowa Office of the State Medical Examiner assists with this surveillance.

Iowa FACE identified 83 work-related fatalities for 2014 (provisional data) (Figure 30). The victims included 80 males and three females aged 16 to 89 years, with a median age of 54. The workers were predominantly Caucasians, with fewer than 5 percent of the workers identified as Black, Hispanic, or another race or ethnicity.

Figure 30. FACE work-related deaths - Iowa, 2001-2014



Industry sectors with the highest numbers of traumatic worker deaths were agriculture/forestry/fishing/hunting (AFFH) with 22 fatalities (27 percent) and construction with 22 fatalities (27 percent) (Table 9).

Three types of incidents accounted for 70 of all work-related traumatic fatalities (84 percent), regardless of industry: transportation events, fall, slip and trip events, and contact with objects and equipment events.

Transportation incidents accounted for 28 of all fatalities (34 percent), including 17 roadway fatalities and 11 off-roadway fatalities. AFFH sector deaths included 11 incidents involving transportation as a cause, with seven incidents involving off-road work and four involving on-road vehicles. Six of the deaths involved tractors and two deaths involved ATVs or four-wheeled utility vehicles being used for work. Construction sector deaths included six transportation fatalities, with four involving on-road incidents, and two off-road incidents.

Falls, slips, and trips accounted for 22 of all fatalities (27 percent), with half of the deaths occurring in the construction sector. Incidents involving contact with objects and equipment followed with 20 (24 percent) fatalities, 11 in AFFH (55 percent) and four in construction (20 percent).

For fatalities to be included as a FACE "case," the incident causing the work-related death has to occur in Iowa (resident or non-resident), and be traumatic in nature. Deaths that occur while commuting to or from work do not qualify. Deaths involving home or yard maintenance by the occupant or farm activities not related to production farming are also excluded. Deaths from natural causes, chronic disease, or cancer are not included. Iowa workers killed while working out of state are not included.

Some potential cases may not be identified due to lack of surveillance data, especially for individuals killed in motor vehicle crashes when it is unknown that the person was traveling as part of their job duties (other than commuting). Some cases are not identified until months after the incident. Case definition may also vary between agencies involved in worker surveillance. For these reasons, total case numbers may differ between those reported by other programs, such as the US Bureau of Labor Statistics (BLS), Census of Fatal Occupational Injuries (CFOI), or the Iowa Worker Memorial Day observance.

Table 9. Traumatic work-related fatalities by industry sector of employer - Iowa, 2014

NAICS Industry Code Group	Industry Title	2014 IA FACE*	Percent Total*
11	Agriculture, Forestry, Fishing and Hunting	22	27%
21	Mining	1	1%
22	Utilities	0	
23	Construction	22	27%
31-33	Manufacturing	5	6%
42	Wholesale Trade	5	6%
44-45	Retail Trade	3	4%
48-49	Transportation and Warehousing	4	5%
51	Information	1	1%
52	Finance and Insurance	2	2%
53	Real Estate Rental and Leasing	3	4%
54	Professional, Scientific, and Technical Services	0	
55	Management of Companies and Enterprises	0	
56	Administrative and Support and Waste Management and Remediation Services	3	4%
61	Educational Services	0	
62	Health Care and Social Assistance	1	1%
71	Arts, Entertainment, and Recreation	0	
72	Accommodation and Food Services	3	4%
81	Other Services (except Public Administration)	3	4%
92	Public Administration	3	4%
9999	Unknown/not able to classify*	2	2%

2014 Iowa summary of reported outbreak investigations

Table 10. Norovirus/Suspect Norovirus Outbreaks - Iowa, 2014

	Type	Nature of Episode	Event/Place	County	Month	Number Affected / Number Exposed (if known)	Agent Involved, Number of Positive Tests (if known)
1.	Norovirus	Vomiting, Diarrhea	Restaurant	Multi-county	February	8/8	Norovirus
2.	Norovirus	Vomiting, Diarrhea	Private Residence	Story	March	23/35	Norovirus - 3
3.	Norovirus	Vomiting, Diarrhea	Restaurant	Polk/Webster/Dallas	March	5/10	Norovirus - 2
4.	Norovirus	Vomiting, Diarrhea	Restaurant	Polk/Webster/Dallas	March	3/3	Suspect Norovirus
5.	Norovirus	Vomiting, Diarrhea	Workplace	Polk/Webster/Dallas	April	148/700	Norovirus GI - 3
6.	Norovirus	Vomiting, Diarrhea	Restaurant	Polk	May	5/35	Norovirus GII - 1
7.	Norovirus	Vomiting, Diarrhea	Restaurant	Shelby/Crawford/Dallas	October	13/17	Norovirus GII - 2
8.	Norovirus	Vomiting, Diarrhea	Restaurant	Johnson	December	8/9	Norovirus - 5
9.	Norovirus	Vomiting, Diarrhea, Cramping	Long-Term Care	Polk	January	44/100	Norovirus - 3
10.	Norovirus	Vomiting, Diarrhea	Long-Term Care	Poweshiek	January	16	Norovirus GI & G2 - 2
11.	Norovirus	Vomiting, Diarrhea	Assisted Living	Polk	January	12	Norovirus GII
12.	Norovirus	Vomiting, Nausea, Diarrhea	Long-Term Care	Jasper	January	26	Norovirus GII - 1
13.	Norovirus	Vomiting, Diarrhea	Assisted Living	Cass	January	11	Suspect Norovirus
14.	Norovirus	Vomiting, Diarrhea	Assisted Living	Black Hawk	February	48	Norovirus GII - 3
15.	Norovirus	Vomiting, Diarrhea	Workplace	Story	February	32	Norovirus GI - 4

	Type	Nature of Episode	Event/Place	County	Month	Number Affected / Number Exposed (if known)	Agent Involved - Number of Positive Tests (if known)
16.	Norovirus	Vomiting, Diarrhea	Hospital	Buena Vista	February/March	19/45	Norovirus - 2
17.	Norovirus	Vomiting, Diarrhea	Long-Term Care	Scott	February/March	39	Norovirus GII - 2
18.	Norovirus	Vomiting, Diarrhea	Private Residence	Cherokee	March	11	Norovirus - 2
19.	Norovirus	Vomiting, Diarrhea	Long-Term Care	Muscatine	March	34/100	Norovirus - 2
20.	Norovirus	Vomiting, Diarrhea	Long-Term Care	Warren	March	45/92	Norovirus - 2
21.	Norovirus	Diarrhea	Workplace	Linn	March	5	Norovirus GI - 1
22.	Norovirus	Vomiting, Diarrhea	Elementary School	Sioux	March	59/428	Norovirus GII - 1
23.	Norovirus	Vomiting, Nausea, Diarrhea	Elementary School	Henry	May	46/302	Norovirus GI - 1
24.	Norovirus	Vomiting, Diarrhea, Fever	Long-Term Care	Story	April/May	23	Norovirus GII - 1
25.	Norovirus	Vomiting, Diarrhea	Wedding	Dubuque	May	35/250	Norovirus - 3
26.	Norovirus	Diarrhea, Vomiting, Cramping	Hospital	Johnson	May	13	Suspect Norovirus
27.	Norovirus	Vomiting, Diarrhea	Elementary School	Linn	October/November	12/48	Norovirus GII - 3
28.	Norovirus	Vomiting, Diarrhea	Long-Term Care	Clinton	November	16/43 + 1staff	Norovirus GII - 2
29.	Norovirus	Vomiting, Nausea, Fever, Headache	Elementary School	Scott	November	70/642	Suspect Norovirus

Table 11. Foodborne Outbreaks - Iowa, 2014

Type	Nature of Episode	Event/Place	Location of Food Preparation	Location of Food Consumption	County	Month	Number Affected / Number Exposed (if known)	Vehicle of Transmission	Agent Involved - Number of Positive Tests (if known)
1. Foodborne	Vomiting, Diarrhea	Restaurant	Restaurant	Restaurant	Linn	April/May	7/7	Unknown	Unknown
2. Foodborne	Diarrhea	Private Event	Licensed Caterer	Private Event	Dubuque	August	45/70	Unknown	Clostridium perfringens - 4
3. Foodborne	Diarrhea	Private Residence	Private Residence	Private Residence	Linn	September	5/15	Chicken	Campylobacter jejuni - 2
4. Foodborne	Vomiting, Diarrhea	Unknown	Unknown	Workplace	Polk	December	unk/300	Unknown	Unknown
5. Foodborne	Vomiting, Diarrhea	Restaurant	Restaurant	Restaurant	Johnson	December	6	Unknown	Salmonella enteritidis JEGX01.0005 - 5

Table 12. Non-Norovirus, Non-Foodborne or Unknown Cause Outbreaks - Iowa, 2014

Type	Nature of Episode	Event/Place	County	Month	Number Affected / Number Exposed (if known)	Vehicle of Transmission	Agent Involved - Number of Positive Tests (if known)
1. Foodborne	Vomiting, Diarrhea	Restaurant	Linn	January	3	Unknown	Bacillus – 1; Shiga toxin - 1
2. Person-to-Person	Pruritus, Rash, Pustules, Crusts	Hospital	Clinton	January - February	42	Person-to-Person	Crusted Scabies
3. Person-to-Person	Fever, Cough, Pneumonia	Long-term Care	Story	April - May	62	Person-to-Person	Human Metapneumovirus
4. Person-to-Person	Pruritus, Erythema	Hospital	Pottawattamie	April-June	70	Person-to-Person	Suspect Scabies
5. Person-to-Person	Pruritus, Erythema	Long-term Care	Henry	May	4/100	Person-to-Person	Crusted Scabies
6. Environmental	Diarrhea	Long-term Care	Howard	April - May	4	Environmental	Clostridium difficile
7. Person-to-Person	Respiratory	Long-term Care	Poweshiek	November	16/43 + 1 staff	Person-to-Person	Influenza
8. Person-to-Person	Respiratory	Long-term Care	Shelby	November	6	Person-to-Person	Influenza
9. Person-to-Person	Respiratory	Long-term Care	Page	November	3	Person-to-Person	Influenza
10. Person-to-Person	Respiratory	Long-term Care	Carroll	December	10/43	Person-to-Person	Influenza
11. Person-to-Person	Respiratory	Long-term Care	Woodbury	November	3	Person-to-Person	Influenza

	Type	Nature of Episode	Event/Place	County	Month	Number Affected / Number Exposed (if known)	Vehicle of Transmission	Agent Involved - Number of Positive Tests (if known)
12.	Person-to-Person	Dermatologic	Long-term Care	Clinton	December	?	Person-to-Person	Scabies
13.	Person-to-Person	Respiratory	Long-term Care	Cass	December	4	Person-to-Person	Influenza
14.	Person-to-Person	Respiratory	Long-term Care	Mills	December	16/50	Person-to-Person	Influenza
15.	Person-to-Person	Respiratory	Long-term Care	Jasper	November - December	11/25	Person-to-Person	Negative for viral/bacterial pathogens
16.	Person-to-Person	Respiratory	Long-term Care	Marshall	December	33/580	Person-to-Person	Influenza
17.	Person-to-Person	Respiratory	Group Home	Palo Alto	December	2/14	Person-to-Person	Influenza
18.	Person-to-Person	Respiratory	Assisted Living/Long-term Care	Webster	December	5/316	Person-to-Person	Influenza
19.	Person-to-Person	Respiratory	Long-term Care	Harrison	December	10/22	Person-to-Person	Influenza
20.	Person-to-Person	Respiratory	Long-term Care	Emmet	December	35/82	Person-to-Person	Influenza
21.	Person-to-Person	Respiratory	Long-term Care	Sioux	December	8/60	Person-to-Person	Influenza
22.	Person-to-Person	Respiratory	Long-term Care	Story	December	3/180	Person-to-Person	Influenza
23.	Person-to-Person	Respiratory	Long-term Care	Hamilton	December	12	Person-to-Person	Influenza
24.	Person-to-Person	Respiratory	Long-term Care	Polk	December	7	Person-to-Person	Influenza
25.	Person-to-Person	Respiratory	Long-term Care	Emmet	December	8/50	Person-to-Person	Influenza
26.	Person-to-Person	Respiratory	Long-term Care	Dubuque	December	6/75	Person-to-Person	Influenza
27.	Person-to-Person	Respiratory	Long-term Care	Audubon	December	6	Person-to-Person	Influenza
28.	Person-to-Person	Respiratory	Long-term Care	Washington	December	10/100	Person-to-Person	Influenza
29.	Person-to-Person	Cough	Community-wide	Winneshiek	December 2014 - February 2015	24	Person-to-Person	Pertussis
30.	Person-to-Person	Respiratory	Long-term Care	O'Brien	December	3	Person-to-Person	Influenza

	Type	Nature of Episode	Event/Place	County	Month	Number Affected / Number Exposed (if known)	Vehicle of Transmission	Agent Involved - Number of Positive Tests (if known)
31.	Person-to-Person	Respiratory	Long-term Care	Chickasaw	December	8	Person-to-Person	Influenza
32.	Person-to-Person	Respiratory	Long-term Care	Dubuque	December	14/58	Person-to-Person	Influenza
33.	Person-to-Person	Respiratory	Long-term Care	Dubuque	December	9/204	Person-to-Person	Influenza
34.	Person-to-Person	Respiratory	Long-term Care	Hancock	December 2014 - January 2015	4/22	Person-to-Person	Influenza
35.	Person-to-Person	Respiratory	Long-term Care	Boone	December 2014 - January 2015	5/110	Person-to-Person	Influenza
36.	Person-to-Person	Respiratory	Long-term Care	Muscatine	December 2014 - January 2015	5/70	Person-to-Person	Influenza
37.	Person-to-Person	Respiratory	Long-term Care	Carroll	December 2014 - January 2015	9/79	Person-to-Person	Influenza

Table 13. Reportable disease cases and rates per 100,000 population by age group - Iowa, 2014

	0 to 4		5 to 19		20 to 29		30 to 39		40 to 64		>64		Unk	Total	
Disease	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Cases	Rate
AIDS (diagnoses)	0	0.0	4	0.6	7	1.7	10	2.7	40	4.0	3	0.6	0	60	1.9
Botulism	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Campylobacteriosis	66	32.7	95	15.4	89	21.6	91	25.1	169	16.9	61	13.5	0	571	18.7
Chlamydia	6	3.0	3185	515.0	7036	1711.1	1286	355.4	294	29.4	0	0	0	11807	387.6
Cryptosporidiosis	40	19.8	58	9.4	32	7.8	44	12.2	54	5.4	36	7.9	0	264	8.7
Dengue fever	0	0	1	0.2	2	0.5	0	0	1	0.1	0	0	0	4	0.1
E. coli/shiga-toxin producing	49	24.2	60	9.7	42	10.2	25	6.9	33	3.3	15	3.3	0	224	7.4
Ehrlichiosis/anaplasmosis	0	0	1	0.2	3	0.7	1	0.3	9	0.9	3	0.7	0	17	0.6
Giardiasis	35	17.3	41	6.6	30	7.3	30	8.3	57	5.7	12	2.6	0	205	6.7
Gonorrhea	1	0.5	351	56.8	892	216.9	290	80.1	103	10.3	4	0.9	0	1641	53.9
Hemolytic uremic syndrome	3	1.5	2	0.3	0	0	0	0	0	0	1	0.2	0	6	0.2
Hepatitis A	0	0	0	0	6	1.5	1	0.3	5	0.5	0	0	0	12	0.4
Hepatitis B, acute	0	0	0	0	1	0.2	1	0.3	7	0.7	0	0	0	9	0.3
Hepatitis B, chronic	1	0.5	13	2.1	82	19.9	77	21.3	97	9.7	13	2.9	0	283	9.3
HIV (diagnoses)	0	0.0	7	1.1	28	6.7	20	5.3	42	4.2	2	0.4	0	99	3.2
Legionellosis	0	0	0	0	2	0.5	3	0.8	16	1.6	12	2.6	0	33	1.1
Listeriosis	1	0.5	0	0	0	0	0	0	2	0.2	4	0.9	0	7	0.2
Lyme disease	9	4.5	51	8.2	17	4.1	14	3.9	70	7.0	33	7.3	0	194	6.4
Malaria	3	1.5	3	0.5	4	1.0	3	0.8	4	0.4	0	0	0	17	0.6
Meningococcal Inv. Disease	1	0.5	0	0	0	0	0	0	1	0.1	0	0	0	2	0.1
Mumps	2	1.0	3	0.5	1	0.2	2	0.6	1	0.1	1	0.2	0	10	0.3
Pertussis (whooping cough)	54	26.7	122	19.7	10	2.4	15	4.1	19	1.9	2	0.4	0	222	7.3
Q fever	0	0	0	0	0	0	0	0	5	0.5	2	0.4	0	7	0.2
Rocky Mountain spotted fever	0	0	0	0	2	0.5	2	0.6	6	0.6	0	0	0	10	0.3
Salmonellosis	79	39.1	80	12.9	57	13.9	69	19.1	174	17.4	68	15.0	0	527	17.3
Shigellosis	64	31.7	67	10.8	15	3.6	30	8.3	23	2.3	9	2.0	0	208	6.8
Syphilis	0	0	11	1.8	80	19.5	53	14.6	87	8.7	8	1.8	0	239	7.8
Tuberculosis	4	2.0	1	0.2	7	1.7	15	4.1	18	1.8	9	2.0	0	54	1.8
Typhoid fever	0	0	0	0	0	0	0	0	1	0.1	0	0	0	1	0.0
West Nile virus	1	0.5	1	0.2	3	0.2	0	0	8	0.8	2	0.4	0	15	0.5

Table 14. Reportable Disease cases and rates per 100,000 population by sex - Iowa, 2014

	Female		Male		Unk	Total	
Disease	Cases	Rate	Cases	Rate	Cases	Cases	Rate
AIDS (diagnosis)	9	0.6	51	3.3	0	60	1.9
Botulism	0	0.0	0	0.0	0	0	0.0
Campylobacteriosis	248	16.1	323	21.4	0	571	18.7
Chlamydia	8388	545.4	3419	226.7	0	11807	387.6
Cryptosporidiosis	117	7.6	147	9.7	0	264	8.7
Dengue fever	2	0.1	2	0.1	0	4	0.1
E. coli and other shiga-toxin producing	127	8.3	97	6.4	0	224	7.4
Ehrlichiosis/anaplasmosis	8	0.5	9	0.6	0	17	0.6
Giardiasis	84	5.5	121	8.0	0	205	6.7
Gonorrhea	862	56.0	779	51.6	0	1641	53.9
Hemolytic uremic syndrome	5	0.3	1	0.1	0	6	0.2
Hepatitis A	6	0.4	6	0.4	0	12	0.4
Hepatitis B, acute	5	0.3	4	0.3	0	9	0.3
Hepatitis B, chronic	121	7.9	162	10.7	0	283	9.3
HIV (diagnoses)	20	1.3	79	5.2	0	99	3.2
Legionellosis	13	0.8	20	1.3	0	33	1.1
Listeriosis	4	0.3	3	0.2	0	7	0.2
Lyme disease	73	4.7	121	8.0	0	194	6.4
Malaria	8	0.5	9	0.6	0	17	0.6
Meningococcal invasive disease	0	0	2	0.1	0	2	0.1
Mumps	4	0.3	6	0.4	0	10	0.3
Pertussis (whooping cough)	110	7.2	112	7.4	1	222	7.3
Q fever	1	0.1	6	0.4	0	7	0.2
Rocky Mountain spotted fever	1	0.1	9	0.6	0	10	0.3
Salmonellosis	269	17.5	258	17.1	0	527	17.3
Shigellosis	120	7.8	88	5.8	1	208	6.8
Syphilis	43	2.8	196	13.0	0	239	7.8
Tuberculosis	26	1.7	28	1.9	0	54	1.8
Typhoid fever	0	0	1	0.1	0	1	0.0
West Nile virus	7	0.5	8	0.5	0	15	0.5

Table 15. Reportable diseases by year - Iowa, 1994-2014

Notifiable Disease	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
AIDS (diagnosis)	110	104	97	75	60	77	81	80	74	76	70	78	79	68	66	91	73	73	71	82	60
Anthrax																					
Botulism						1					1		1	1	1						
Brucellosis	1	2	4	4	1	6		2	1			1	2		2	2		1		2	
Campylobacteriosis	280	274	339	425	455	467	499	467	427	458	559	537	449	524	591	552	751	747	534	610	571
Chlamydia	5412	5088	4165	4906	5173	5511	5989	5716	6241	6462	6958	7390	8399	8643	9372	9406	10542	10928	11139	11006	11807
Cholera	1					1														1	
Cryptosporidiosis	71	21	75	71	66	56	77	82	49	122	90	122	230	610	284	232	397	364	328	1505	264
Cyclosporiasis			3	1	3			1								1		1		148	
Dengue Fever												1	1	6	5	2	2	5	2	3	4
Diphtheria																					
Ehrlichiosis / Anaplasmosis									1	1		4	7	7	7	8	2	8	6	8	17
Encephalitis (arboviral, except WNV)	1	13	19	3	3	3	4	3	3		2		1	1							
E. coli	54	64	123	114	93	114	180	81	122	103	124	108	161	185	208	163	173	189	181	171	224
Hemolytic uremic syndrome*																		13	10	6	6
Giardiasis	339	391	410	358	429	377	420	345	315	277	301	280	302	301	326	291	284	270	251	275	205
Gonorrhea	1645	1723	1144	1309	1615	1365	1394	1424	1496	1544	1249	1606	1981	1928	1700	1658	1804	1966	1982	1473	1641
Haemophilus influenzae Type B	6	3	4	6	5	2					1		2	1	2	1	1	3		1	
Hansen's disease (Leprosy)					1		2	1				1	1		1		1			1	
Hantavirus				2	1	2				1					1			1	1		
Hepatitis A	64	106	346	490	400	161	67	41	72	40	50	22	13	48	109	38	11	8	7	17	12
Hepatitis B acute /chronic **	27/X	46/X	74/X	44/X	54/X	44/X	38/X	24/X	20/X	27/X	17/X	32/X	21/ 35	26/ 269	24/ 226	37/ 293	15/ 183	15/ 182	13/ 227	11/ 276	9/ 283
Hepatitis B (perinatal)													1		1		1				
Hepatitis C**	25	1	43						1	1						262	156	48	297	3	

Notifiable Disease	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
HIV (diagnosis)			102	109	97	83	91	95	104	88	105	112	108	124	101	126	1114	119	117	122	99
Legionellosis	34	21	11	12	11	17	15	8	13	12	8	8	13	12	21	24	16	11	13	11	33
Listeriosis			1		2	6	2	3	5		3	7	6	8	1	4	3	5	3	2	7
Lyme disease	17	16	19	8	27	24	34	36	42	58	56	91	97	124	109	108	87	100	165	247	194
Malaria	5	3	3	10	8	11	2	9	4	6	5	9	2	3	12	10	14	22	6	12	17
Measles (Rubeola)	7		1								3					1		1			
Meningococcal invasive disease	25	31	56	47	46	42	37	32	29	28	17	19	20	15	19	16	10	14	2	1	2
Mumps	16	11	3	10	11	8	8	1	1	2	2	6	1.963	27	24	15	38	8	6	3	10
Pertussis	23	11	32	207	78	111	67	167	230	182	1066	1106	342	150	257	235	705	232	1736	308	222
Plague																					
Poliomyelitis																					
Psittacosis								3				1									
Rabies, animal	90	141	237	160	153	159	81	83	74	105	100	108	57	31	29	35	27	25	31	12	15
Rabies, human										1											
Rocky Mountain Spotted Fever	1		1	2	2	1	2	5	7	3	2	7	5	17	8	5	5	7	8	8	10
Rubella (German Measles)						30		1													
Salmonellosis	404	433	335	296	375	260	373	339	509	413	435	410	475	477	425	408	530	448	622	575	527
Shigellosis	338	351	151	90	69	74	569	367	122	93	64	103	134	109	214	53	57	18	91	342	208
Syphilis	235	171	91	65	25	31	55	45	56	43	36	29	68	64	75	65	68	70	138	226	239
Tetanus	1			1	1		1		1			1					1			1	
Toxic Shock Syndrome	8	5	4	3	4	4	4	1	3	5	5	5			1	2	1	1	1	1	
Trichinosis	1	6						3				1									
Tuberculosis	66	67	70	74	55	58	37	42	31	40	47	55	36		46	42	48	40	46	47	54
Tularemia																1		3	1	4	
Typhoid fever			1	1		1				2				1	6		3	4	3	1	1
West Nile virus									52	147	23	37	37	30	5	5	9	9	31	44	15
Yellow Fever																2					

*** includes cases starting 2011** ****includes cases starting 2006** ***** Hep C cases are not all entered due to limited staffing**

Table 16. *Salmonella* serotypes reported - Iowa, 2014

Subtype	Serotype	Cases		Serotype	Cases
Salmonella	Abony	1	*Salmonella*	Mbandaka	4
Salmonella	Agbeni	2	*Salmonella*	Monschaui	1
Salmonella	Agona	6	*Salmonella*	Montevideo	10
Salmonella	Altona	2	*Salmonella*	Muenchen	11
Salmonella	Anatum	2	*Salmonella*	Napoli	1
Salmonella	Baildon	1	*Salmonella*	Newport	33
Salmonella	Bareilly	4	*Salmonella*	Oranienburg	9
Salmonella	Berta	5	*Salmonella*	Oslo	1
Salmonella	Bovismorbificans	2	*Salmonella*	Othmarschen	2
Salmonella	Braenderup	9	*Salmonella*	Paratyphi B	1
Salmonella	Brandenburg	1	*Salmonella*	Poona	2
Salmonella	Chiredzi	1	*Salmonella*	Reading	6
Salmonella	Corvallis	1	*Salmonella*	Roodepoort	1
Salmonella	Cotham	4	*Salmonella*	Saintpaul	14
Salmonella	Dublin	2	*Salmonella*	Sandiego	2
Salmonella	Enteritidis	93	*Salmonella*	Schwarzengrund	1
Salmonella	Hadar	2	*Salmonella*	Stanley	2
Salmonella	Hartford	3	*Salmonella*	Tennessee	1
Salmonella	Heidelberg	10	*Salmonella*	Thompson	12
Salmonella	Indiana	1	*Salmonella*	Typhimurium	92
Salmonella	Infantis	21	*Salmonella*	Urbana	1
Salmonella	Java	1	*Salmonella*	Telelkebir	1
Salmonella	Javiana	8	*Salmonella*	Species	13
Salmonella	Kentucky	1	*Salmonella*	Subspecies I	71
Salmonella	Kiambu	2	*Salmonella*	Subspecies IIIb	2
Salmonella	Kottbus	1	*Salmonella*	Subspecies IV	1
Salmonella	Kuntair	1		Unknown	46
Salmonella	Litchfield	2	**Total**		**530**

Table 17. *Shigella* serogroups reported - Iowa, 2005-2014

Shigella Serogroup	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Boydii	1	1	0	1	1	2	1	0	0	0
Dysenteriae		1	0	0	0	0	0	0	2	0
Flexneri	7	15	9	11	7	6	4	5	3	6
Group B	3		2	0	0	0	0	0	0	0
Group C			2	0	0	0	0	0	0	0
Group D			1	1	0	0	0	10	0	0
Sonnei	58	110	97	136	45	49	10	73	184	149
Unknown	7	7	0	0	0	0	3	3	153	53
Total	78	134	109	214	53	57	18	91	342	208

Table 18. Adult blood testing summary by county - Iowa, 2014

COUNTY	# tested	# BLL result ≥ 10 µg/dL	COUNTY	# tested	# BLL result ≥ 10 µg/dL	COUNTY	# tested	# BLL result ≥ 10 µg/dL
Adair	1	0	Floyd	3	0	Monona	2	0
Adams	4	0	Franklin	3	0	Monroe	9	6
Allamakee	7	2	Fremont	5	4	Montgomery	17	5
Appanoose	39	32	Greene	4	0	Muscatine	37	1
Audubon	7	6	Grundy	6	2	O'Brien	1	0
Benton	10	1	Guthrie	5	0	Osceola	1	0
Black Hawk	67	19	Hamilton	22	0	Page	5	1
Boone	13	2	Hancock	1	0	Palo Alto	1	0
Bremer	13	0	Hardin	10	0	Plymouth	9	0
Buchanan	222	172	Harrison	2	0	Pocahontas	2	0
Buena Vista	2	0	Henry	7	0	Polk	219	4
Butler	2	0	Howard	3	0	Pottawattamie	23	1
Calhoun	5	0	Humboldt	9	0	Poweshiek	15	0
Carroll	11	0	Ida	1	0	Ringgold	5	2
Cass	30	19	Iowa	5	0	Sac	5	0
Cedar	11	0	Jackson	52	36	Scott	216	7
Cerro Gordo	22	0	Jasper	13	2	Shelby	2	2
Cherokee	2	0	Jefferson	42	11	Sioux	6	1
Chickasaw	1	0	Johnson	46	0	Story	37	0
Clarke	3	2	Jones	27	5	Tama	16	0
Clay	9	3	Keokuk	14	2	Taylor	3	0
Clayton	213	184	Kossuth	3	1	Union	3	0
Clinton	72	21	Lee	29	1	Van Buren	6	1
Crawford	2	0	Linn	187	72	Wapello	58	12
Dallas	21	1	Louisa	9	0	Warren	27	5
Davis	4	1	Lucas	37	24	Washington	11	0
Decatur	8	4	Lyon	2	2	Wayne	136	115
Delaware	1238	1025	Madison	5	1	Webster	25	0
Des Moines	12	0	Mahaska	61	11	Winnebago	4	0
Dickinson	8	0	Marion	12	5	Winneshiek	5	0
Dubuque	369	226	Marshall	20	7	Woodbury	41	4
Emmet	3	1	Mills	6	2	Worth	1	0
Fayette	98	68	Mitchell	3	0	Wright	3	0
Based on highest test result in 2013 per adult (16 yo at time of test) residing in Iowa.1An elevated blood lead level (EBL) is considered a venous result greater than or equal to 10 micrograms per deciliter (µg/dL).						Total (incl. suppressed data)	4134	2143

Table 19. Common reportable diseases by county - Iowa, 2014

	AIDS (diagnosis)	HIV (diagnosis)	CAMPY	CHLAMYDIA	CRYPTO	*E.COLI* SHGT	EHRLICH (HME)	GIARDIA	GONORRHEA	HUS	HEP A	HEP B, ACUTE	HEP B, CHRON	LEGIONELLA	LISTERIA	LYME	MENINGO. IINF	MUMPS	PERTUSSIS	RABIES (animal)	RMSF	SALM	SHIGELLA	SYPHILIS	TB	WEST NILE
ADAIR	1	0	0	7	1	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
ADAMS	0	0	0	12	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
ALLAMAKEE	0	0	8	33	2	1	4	0	2	0	0	0	1	0	0	4	0	1	0	0	0	3	0	0	1	0
APPANOOSE	0	1	1	41	0	0	0	1	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
AUDUBON	0	0	0	13	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
BENTON	0	1	15	66	7	4	0	2	4	0	1	0	2	2	0	0	0	0	1	0	1	3	0	1	0	0
BLACK HAWK	3	6	17	816	1	3	0	5	198	0	0	0	20	3	0	2	0	1	5	0	0	21	8	7	4	0
BOONE	0	0	4	65	4	0	0	2	4	0	0	1	0	1	1	0	0	0	0	0	0	2	0	3	1	0
BREMER	1	0	7	51	0	2	0	1	3	0	0	0	1	0	0	0	0	0	0	0	0	5	0	1	0	0
BUCHANAN	2	1	9	51	0	5	0	2	8	0	0	0	0	0	0	1	0	0	0	0	0	4	1	1	2	1
BUENA VISTA	0	0	11	72	1	1	0	1	4	0	0	0	5	0	0	0	0	0	1	0	0	2	0	2	0	0
BUTLER	0	0	8	24	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
CALHOUN	1	0	1	18	1	3	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
CARROLL	0	0	3	44	4	2	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0	0
CASS	0	1	6	36	2	0	0	1	1	0	0	0	1	0	0	0	0	0	1	0	0	9	0	1	0	0
CEDAR	2	1	5	32	2	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
CERRO GORDO	0	0	3	85	0	1	0	1	6	0	0	1	2	0	0	1	0	1	2	0	0	2	3	1	0	0
CHEROKEE	0	0	1	23	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
CHICKASAW	0	0	3	25	0	1	0	1	1	0	0	0	0	0	0	0	0	0	3	0	0	2	0	0	0	0
CLARKE	0	0	0	31	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
CLAY	0	0	4	53	1	2	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	3	0	0	0	1
CLAYTON	4	0	3	31	10	1	0	0	2	0	0	0	0	0	0	6	0	0	0	0	0	3	0	0	0	0
CLINTON	0	0	3	176	3	4	0	3	47	0	0	0	3	1	0	6	0	0	2	0	0	4	0	2	0	0
CRAWFORD	0	0	11	78	0	1	0	0	3	0	0	0	1	0	0	0	0	0	3	0	0	3	0	0	1	2
DALLAS	2	4	15	187	2	3	1	4	19	0	0	0	8	0	0	2	0	0	2	0	0	11	3	2	2	0

	AIDS (diagnosis)	HIV (diagnosis)	CAMPY	CHLAMYDIA	CRYPTO	*E.COLI* SHGT	EHRLICH (HME)	GIARDIA	GONORRHEA	HUS	HEP A	HEP B, ACUTE	HEP B, CHRON	LEGIONELLA	LISTERIA	LYME	MENINGO. IINF	MUMPS	PERTUSSIS	RABIES (animal)	RMSF	SALM	SHIGELLA	SYPHILIS	TB	WEST NILE
DAVIS	0	0	0	12	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0
DECATUR	0	0	2	36	0	0	0	0	1	0	0	0	0	0	0	0	0	0	15	0	0	1	0	0	0	0
DELAWARE	0	0	9	42	11	6	0	3	2	0	0	0	0	0	0	0	0	0	1	0	0	4	15	0	0	0
DES MOINES	0	0	11	182	5	0	0	3	14	0	0	0	0	2	0	4	0	0	1	0	0	9	1	5	2	0
DICKINSON	0	1	2	34	1	4	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	10	0	1	0	0
DUBUQUE	0	0	32	395	22	17	0	10	84	0	0	0	4	1	0	17	0	0	9	0	0	8	43	5	0	0
EMMET	1	1	1	28	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
FAYETTE	0	0	3	40	2	2	0	1	2	0	1	0	0	0	0	1	0	0	4	0	0	2	0	1	0	0
FLOYD	0	0	3	37	2	4	0	2	2	0	0	0	1	0	0	1	0	0	0	0	0	4	0	1	0	0
FRANKLIN	0	2	0	34	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
FREMONT	0	0	2	20	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
GREENE	0	0	1	29	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
GRUNDY	0	0	2	22	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
GUTHRIE	0	0	2	22	1	1	0	0	3	0	0	0	1	0	0	0	0	0	1	0	0	3	0	0	0	0
HAMILTON	1	0	2	27	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	4	0	3	1	0
HANCOCK	0	0	0	18	1	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	3	0	2	0	0
HARDIN	0	0	2	32	0	1	0	3	4	0	0	0	0	0	0	1	0	0	1	0	0	3	0	0	0	0
HARRISON	1	1	2	48	1	1	0	0	4	0	0	0	0	0	0	0	0	0	5	0	0	1	2	0	0	0
HENRY	0	0	1	45	0	0	0	1	6	0	0	0	1	0	0	1	0	0	1	0	0	4	0	1	0	0
HOWARD	0	0	0	24	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
HUMBOLDT	0	0	1	16	2	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1
IDA	0	0	0	16	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0
IOWA	0	0	4	30	1	2	0	0	1	0	1	0	0	0	0	2	0	0	1	0	0	6	0	1	1	0
JACKSON	0	0	7	38	7	7	0	1	5	0	0	0	0	0	0	10	0	0	0	0	0	3	0	0	0	0
JASPER	0	0	4	93	12	6	0	2	11	0	0	0	2	0	0	3	0	0	0	0	0	5	0	0	0	0

	AIDS (diagnosis)	HIV (diagnosis)	CAMPY	CHLAMYDIA	CRYPTO	*E.COLI* SHGT	EHRLICH (HME)	GIARDIA	GONORRHEA	HUS	HEP A	HEP B, ACUTE	HEP B, CHRON	LEGIONELLA	LISTERIA	LYME	MENINGO. IINF	MUMPS	PERTUSSIS	RABIES (animal)	RMSF	SALM	SHIGELLA	SYPHILIS	TB	WEST NILE
JEFFERSON	0	0	1	33	1	0	0	2	1	0	0	0	2	0	0	3	0	0	0	0	1	0	0	1	0	0
JOHNSON	2	6	24	727	4	12	6	8	82	0	0	0	19	0	0	42	0	0	14	0	2	26	15	24	7	0
JONES	0	0	10	41	3	3	0	1	4	0	0	0	1	0	0	0	0	0	0	0	0	3	0	0	0	0
KEOKUK	0	0	3	19	2	1	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
KOSSUTH	0	0	1	27	1	1	2	0	1	0	0	0	0	0	0	1	0	0	0	0	0	7	4	0	0	0
LEE	0	0	2	114	1	0	0	2	9	0	0	0	0	0	0	2	0	1	0	0	1	7	0	2	0	0
LINN	7	15	53	1065	24	11	1	14	108	0	0	1	18	1	1	19	0	1	7	0	0	36	4	21	5	0
LOUISA	0	0	2	25	1	0	0	1	0	0	0	0	4	0	0	1	0	0	1	0	0	0	2	0	1	0
LUCAS	0	0	2	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	1	0	0	0	0
LYON	0	0	10	10	2	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	6	0	0	0	0
MADISON	0	0	2	16	1	0	0	0	4	0	1	0	1	0	0	0	0	0	2	0	0	1	1	0	0	0
MAHASKA	0	0	5	77	3	3	0	2	13	0	0	0	0	0	0	0	0	0	0	0	1	3	0	2	1	0
MARION	0	1	4	83	7	4	0	0	8	0	1	0	2	0	0	9	0	0	0	0	0	5	1	1	0	0
MARSHALL	1	0	9	146	0	2	0	0	14	0	0	0	5	0	0	0	0	0	1	0	0	7	0	1	0	0
MILLS	0	0	1	34	2	0	0	1	5	0	0	0	1	1	0	0	0	0	5	0	0	6	0	1	0	0
MITCHELL	0	0	4	22	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	0	0
MONONA	0	0	5	26	1	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1
MONROE	0	0	0	14	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
MONTGOMERY	0	0	0	19	0	0	0	0	3	0	0	0	0	1	0	0	0	0	3	0	0	3	0	0	0	0
MUSCATINE	1	0	3	156	6	3	0	1	12	1	0	0	3	1	0	11	0	1	20	0	0	6	0	4	4	0
O'BRIEN	0	0	9	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	0	1	0
OSCEOLA	0	0	3	10	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0
PAGE	0	0	0	58	1	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0
PALO ALTO	0	0	1	13	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
PLYMOUTH	0	0	5	54	7	1	0	3	3	0	0	0	0	0	0	0	0	0	1	0	0	6	0	2	0	1
POCAHONTAS	0	0	2	8	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0

	AIDS (diagnosis)	HIV (diagnosis)	CAMPY	CHLAMYDIA	CRYPTO	*E.COLI* SHGT	EHRLICH (HME)	GIARDIA	GONORRHEA	HUS	HEP A	HEP B, ACUTE	HEP B, CHRON	LEGIONELLA	LISTERIA	LYME	MENINGO. IINF	MUMPS	PERTUSSIS	RABIES (animal)	RMSF	SALM	SHIGELLA	SYPHILIS	TB	WEST NILE
POLK	16	29	54	2,302	23	16	1	66	392	0	1	4	98	6	1	18	1	0	25	0	1	76	6	69	9	1
POTTAWATTAMIE	4	8	10	427	5	11	0	2	89	0	0	0	9	0	1	0	1	0	7	0	0	14	3	7	0	1
POWESHIEK	0	0	3	56	0	0	0	0	2	1	0	0	0	0	0	2	0	0	0	0	0	6	0	1	0	0
RINGGOLD	0	0	0	11	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SAC	0	0	2	14	1	1	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	4	0	0	0	1
SCOTT	7	9	20	918	4	16	0	9	115	3	2	2	19	8	0	13	0	2	26	0	0	14	6	39	3	0
SHELBY	0	0	1	20	7	4	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	8	0	2	0	0
SIOUX	0	1	10	46	3	2	0	9	4	0	0	0	1	0	0	0	0	0	0	0	0	16	1	0	0	2
STORY	0	2	14	418	6	3	0	6	31	0	1	0	17	0	0	2	0	0	1	0	0	8	1	4	1	0
TAMA	0	1	5	57	1	5	0	1	11	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0
TAYLOR	0	0	1	10	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UNION	0	1	0	43	0	1	0	1	4	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
VAN BUREN	0	0	2	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	1	0	0	1	0
WAPELLO	0	0	7	230	9	0	1	3	25	0	0	0	7	1	0	0	0	1	2	0	0	1	1	0	3	0
WARREN	0	1	1	112	7	2	0	2	3	0	0	0	3	1	0	0	0	0	1	0	0	8	0	1	1	0
WASHINGTON	0	0	12	39	1	0	0	0	3	0	0	0	1	0	0	2	0	0	0	0	0	4	0	0	1	0
WAYNE	0	0	0	6	0	0	0	1	0	0	0	0	0	0	0	0	0	0	9	0	1	0	0	0	0	0
WEBSTER	0	0	3	185	3	1	0	2	45	0	1	0	3	1	1	0	0	0	0	0	0	4	2	1	0	0
WINNEBAGO	0	0	2	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	0	0
WINNESHIEK	0	0	10	33	3	7	0	0	2	0	0	0	1	0	0	4	0	0	13	0	0	4	1	0	0	0
WOODBURY	1	3	19	576	4	9	0	6	160	0	0	0	10	1	1	0	0	0	6	0	0	22	77	7	1	3
WORTH	0	0	0	6	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
WRIGHT	2	2	3	28	2	1	0	0	4	0	0	0	0	0	0	0	0	0	1	0	0	2	0	1	0	0
Total	60	99	571	11807	264	224	17	205	1641	6	12	9	283	33	7	194	2	10	222	0	10	527	208	239	54	15

References

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