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DIVISION OF ACUTE DISEASE PREVENTION AND EMERGENCY RESPONSE

**Center for Acute Disease Epidemiology &
Bureau of Disease Prevention and Immunization**

Iowa Surveillance of Notifiable and Other Diseases

Annual Report 2007



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

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PURPOSE

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

This report is divided into the following sections: vaccine-preventable diseases, sexually-transmitted diseases, HIV/AIDS, hepatitis C, zoonotic diseases, and rare and unusual diseases.

INTRODUCTION

In 2007, the Division of Acute Disease Prevention and Emergency Response (ADPER), part of the Iowa Department of Public Health (IDPH) processed nearly **33,000 reports** of infectious disease. Specific disease conditions are reportable to the department per the Iowa Administrative Code 641, Chapter 1. The urgency tied to reporting varies by disease¹.

Two bureaus within ADPER are responsible for infectious disease investigation- the Center for Acute Disease Epidemiology (CADE) and the Bureau of Disease Prevention and Immunization (DPI). CADE conducts surveillance for emergent infectious disease, agents of bioterrorism, disease outbreaks, and occurrence of rare and unusual disease. DPI conducts the Sexually-Transmitted Diseases (STD) Program, Tuberculosis (TB) Program, and HIV/AIDS Program. In addition to surveillance functions, DPI programs often provide and coordinate prevention measures to reduce the spread of disease.

The goals of ADPER surveillance programs are to monitor disease incidence and prevalence, detect and manage outbreaks, and develop prevention methods in an effort to reduce illness in Iowa.

Both bureaus spend significant time working outbreaks of infectious disease. Localized outbreaks are typically managed by county health agencies, and state involvement varies in

every situation. Statewide outbreaks are coordinated by IDPH, but may also be managed by several local health agencies simultaneously.

Public health emergency response planning plays a major role in preparing IDPH to respond to emergencies such as outbreaks. For example, the department has used incident command structures to better utilize staff during an infectious disease incidents. Preparedness planning at both the state and local levels has greatly improved the way public health responds to large-scale disease outbreaks. Summaries of outbreaks worked in 2007 are found throughout the report.

This report provides a summary of disease investigations and represents only a fraction of work accomplished by ADPER 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 other health investigators, and communication, education, and intervention implementation.

Support for the initiatives of CADE stem from collaboration within the Division of Acute Disease Prevention and Emergency Response. Funding for ADPER programs stem from Federal and State allocations and grants.

The TB, STD, and HIV/AIDS surveillance programs are funded under a cooperative agreement with the Centers for Disease Control (CDC), National Center for HIV, Viral Hepatitis, STDs and TB Prevention.

SUMMARY AND HIGHLIGHTS

Last year, Iowa saw the largest number of cryptosporidiosis cases ever reported. An outbreak began in eastern Iowa and quickly spread across the state via swimming pools (Table 1, Figure 1). More than 1,000 confirmed and probable cases were tracked by CADE. Child care centers were also significant sources of infection. The chlorine-resistant nature of crypto makes outbreaks challenging, but not impossible to control. And as a result of the 2007 crypto outbreak, statewide pool maintenance practices have been changed to encourage faster hyper-chlorination of

TABLE 1. SUMMARY OF COMMON, NOTIFIABLE DISEASES, 2004-2007 AND PERCENT CHANGE IN NUMBER OF CASES REPORTED COMPARED TO 3-YEAR AVERAGE‡

	2004	2005	2006	3-yr average 2004-2006	2007	Percent change‡
	Number of cases			Cases		
Campylobacter	558	534	449	514	524	1.9%
Chlamydia	6858	7390	8399	7549	8643	14.5%
Cryptosporidiosis	90	122	230	147	610	315.0%
<i>E. coli</i> and other shiga-toxin producing	119	100	161	127	175	37.8%
Giardia	305	280	302	296	301	1.7%
Gonorrhea	1249	1606	1981	1612	1928	19.6%
Hepatitis A	50	22	13	28	48	71.4%
Hepatitis B, acute	17	33	21	24	27	12.5%
*Hepatitis B, chronic	0	0	35	12	269	N/A**
HIV (new infections)	107	117	113	112	127	13.4%
Legionellosis	8	8	13	10	12	20.0%
Listeriosis	4	7	6	6	8	33.3%
Lyme disease	53	91	97	80	124	55.0%
Meningococcal invasive disease	17	19	20	19	15	-21.1%
Mumps	2	6	1963	657	27	-95.9%
Pertussis (whooping cough)	481	968	342	597	150	-74.9%
Salmonellosis	442	410	475	442	477	7.9%
Shigellosis	69	103	134	102	109	6.9%
Syphilis	36	28	88	51	64	26.3%

*Hepatitis B, chronic disease was not reported separately from hepatitis B acute disease until 2007.

**Decrease/Increase is beyond interpretable levels.

‡The percent change is calculated by subtracting the 3-year average from the total cases for 2007 and dividing by the absolute value of the 3-year average.

‡Table includes all confirmed and probable cases.

implicated swimming pools. IDPH also changed its reporting requirements to include full case investigation of every cryptosporidiosis case.

The number of newly diagnosed HIV cases and rates rose to the highest number since reporting began in 1998. The largest increase was among men who have sex with men.

Rates of Chlamydia and gonorrhea continue to increase, a portion of the increase may be attributed to better screening availability at STD clinics and routine testing at annual gynecological exams. A disturbing trend both nationally and in Iowa is that most cases occur in young adults ages 15-24.

METHODS

Disease reports are submitted to IDPH via phone, fax, e-mail, or an electronic reporting system. Reporters include health care providers,

hospitals, local public health agencies, and laboratories.

Reports received by CADE are tracked in a DOS-based surveillance system called NETSS (National Electronic Telecommunication System for Surveillance) that enables direct transfer of de-identified disease activity information to CDC. Some diseases within CADE are reported using ArboNET and include diseases like West Nile virus.

CADE surveillance reports are generated daily, weekly, annually and on an as needed basis.

Rates were calculated using the 2007 estimated census population for the State of Iowa or the appropriate estimated census year. Threshold values used in the graphs in the summary of enteric disease were calculating by taking the three-year moving average and adding two standard deviations to the average. Outbreak

cases were removed when calculating the three-year averages and outbreak cases were kept in 2007 case counts.

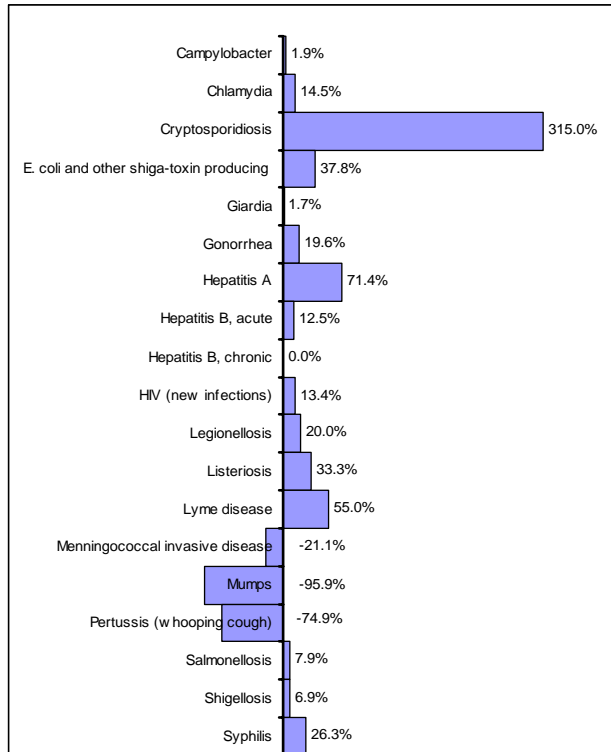


Figure 2. Percent change in the number of cases reported in 2007 compared to 3-year average

Calculations were performed with SPSS 15® and Microsoft® Excel. Maps were generated using ARC GIS®.

CADE uses the most recent Council of State and Territorial Epidemiologists (CSTE) and Centers for Disease Control and Prevention (CDC) case definitions found at http://www.cdc.gov/epo/dphsi/casedef/case_definitions.htm. The outbreak definition was used to classify cases of pertussis in 2006. Case status assigned by using the CSTE/CDC definitions is used to classify the case as confirmed, probable, suspect, not a case, awaiting more information, or chronic hepatitis B reported in a past year. Confirmed and probable cases meet the CSTE/CDC definition and are reported to CDC weekly. All other case classifications are for CADE use, and reports other than confirmed and probable are not reported to CDC.

All case counts and Iowa-specific case demographics were attained from the National

Electronic Telecommunications System for Surveillance (NETSS) maintained within CADE. The specific file used for this report was created in May 2008. Case reports or additional case information that was received after this date was excluded from this report.

The surveillance case definitions for HIV, AIDS, STD, and TB are those developed by CDC, and surveillance is conducted in adherence to detailed guidelines developed by that agency. Several programs enter data into CDC-developed software programs. Programs transfer data via a secure data network weekly to monthly.

For accuracy of analysis, and since 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.

With regard to HIV/AIDS surveillance, reports are generated quarterly, and at other times as needed. An epidemiological profile is produced every three years with annual interim updates².

HIV/AIDS data analysis for this report utilized a combination of CDC’s HARS and eHARS software, Microsoft® Excel, SAS® and SAS® Enterprise Guide. Maps were generated using ArcGIS®.

STD and TB reports are generated annually and as needed. Programs used include Microsoft® Excel and PowerPoint.

Most disease-specific data is transmitted to CDC electronically and on a routine basis. Some disease information is communicated at the request of CDC. The statistics reported by ADPER programs to CDC are used to composite the picture of disease burden in the U.S.

SUMMARY OF VACCINE-PREVENTABLE DISEASES

HAEMOPHILUS INFLUENZAE B

Cases of *Haemophilus influenzae* type B (Hib) are rare in Iowa and the U.S. In 1991, Hib vaccine was recommended for all infants after age 2 months. Since then, the incidence of Hib in children <5 years of age has declined >99%. In 2007, one case occurred in a 48 year old female.

HEPATITIS A

See Summary Enteric Disease Section.

HEPATITIS B (ACUTE AND CHRONIC)

A total of 0.9 cases of acute hepatitis B for every 100,000 persons was reported to CADE in 2007. Sixty-nine percent of these 27 cases were males. Nationally, acute hepatitis B infections occur 1.8 times more often in men than women.

The Centers for Disease Control and Prevention (CDC) estimated there were 46,000 new hepatitis B infections in the U.S. in 2006. National case incidence for acute disease is approximately 1.6 for every 100,000 persons, which is a decline of 81 percent since 1990³.

In 2007, the CSTE chronic hepatitis B case definition was changed to allow for a “probable” case. CADE began using the probable case classification in 2007 which allowed for better tracking on chronic hepatitis B cases⁴.

The addition of a probable case classification for chronic hepatitis B cases resulted in a significant increase in the number of cases reported by CADE for 2007. There were 269 confirmed or probable chronic hepatitis B cases reported in 2007. Cases diagnosed outside of 2007 were not counted in this year’s total. With time, tracking these cases will help determine the true prevalence of chronic hepatitis B disease in Iowa.

INFLUENZA

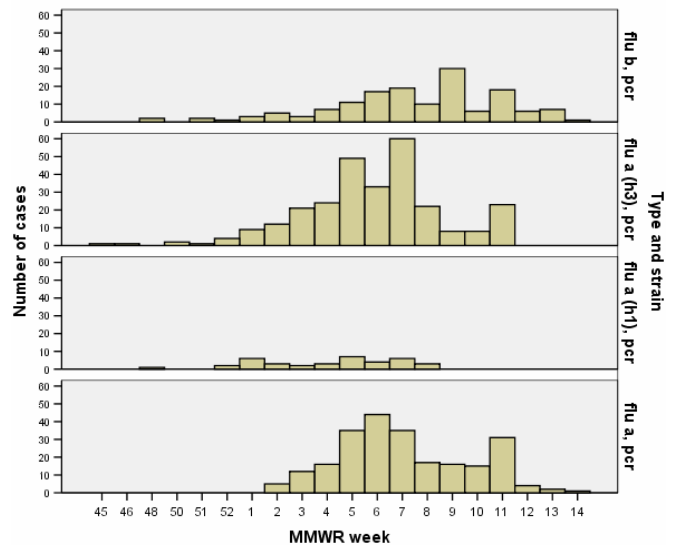
The Iowa Influenza Surveillance Network (IISN) tracks influenza activity, age groups impacted, outbreaks, virus type and strain, and severity of seasonal influenza. In the 2007-2008 season, the network had more than 90 reporting sites that included physicians, clinics, hospitals,

schools, long-term care facilities, and sentinel laboratories. Other non-network reporters who contributed influenza data included medical clinics, hospitals, laboratories, local public health departments and neighboring state health departments.

There were two known influenza-associated pediatric deaths in Iowa in 2007-2008. One death due to influenza AH1 occurred in a five-month old who was too young to be vaccinated for influenza. The infant was also infected with RSV at the time of death. The second death occurred in a three-year-old child infected with influenza B. This child had been vaccinated though it is known that the vaccine provided no protection against the dominant influenza B strain.

IDPH also investigated a case of AH1N1 swine influenza. Iowa has periodic human cases of this type of influenza that typically infects swine. The case was a young child who had direct contact with swine.

Figure 3. Laboratory-confirmed cases by MMWR week and influenza type and strain



The 2007-2008 influenza season was the most severe in the past three years. Activity started slowly with the first case confirmed in November. All surveillance indicators rose slowly as in past years, and most were elevated above threshold values at MMWR week 6, or the middle of February. This season was unusual

in that peak activity levels lasted approximately 10 weeks. There are two factors that may have contributed to the unusual duration of this influenza season. First, Iowa experienced a long, cold winter with near-record amounts of precipitation⁵. Harsh winter conditions force people to remain indoors and in close proximity to each other thereby facilitating spread of influenza and other viruses. Additionally, the flu virus survives well in cooler, low humid conditions⁶. A second highly contributory factor is that the influenza vaccine did not match the circulating strains well. Overall vaccine efficacy was believed to be 44 percent, and only 58 percent for the most common strain- AH3. Vaccine effectiveness in sub-optimal years ranges from 74-79 percent. The majority of Iowa laboratory-confirmed cases were influenza AH3 (Figure 3). The vaccine had no efficacy against the influenza B strain circulating in the U.S. in 2007-2008⁷.

MEASLES

No cases of measles were reported in Iowa in 2007. Outbreaks were reported in Europe, India, and Israel have resulted in U.S. cases in 2008.

MENINGOCOCCAL INVASIVE DISEASE

In 2007, there were 15 confirmed cases or 0.5 cases for every 100,000 persons. The age of case patients ranged from 5 to 91 years old with the median age of 25 years. Nationally, there are 0.36 cases for every 100,000 persons.

Of the confirmed cases, four were group B, six were group C, one was group Y, and four were undetermined (Table 2).

Table 2. Meningococcal serogroups

Meningococcal Serogroups reported, 2007					
A	B*	C	W135	Y	Unk
0	4	6	0	1	4

*Serogroup B is not covered by the meningococcal vaccine

CDC defines a community-based outbreak as the occurrence of three or more confirmed or probable cases during a period of ≤3 months among persons residing in the same area who are not close contacts of each other and who do not share a common affiliation, with a primary attack rate of at least 10 cases per 100,000

population⁸. There were no instances of this within any area in Iowa in 2007.

Meningococcal invasive disease is fatal in 10-14 percent of cases. There are two vaccines currently licensed for use in the U.S.; one vaccine is commonly used for people 11-55 years old. The other is used in people aged 2-11 and over 55 years⁹.

MUMPS

There were only 16 confirmed and 11 probable cases of mumps reported to IDPH this year. In 2006, Iowa was the center of the largest mumps outbreak in 20 years with 1,963 confirmed and probable cases. Prior to 2006, most cases were typically imported from countries with endemic disease. Case ages in 2007 ranged from <1 to 76 years with a median of 31 years old.

PERTUSSIS (WHOOPIING COUGH)

Pertussis is caused by *Bordetella pertussis* and causes epidemics every three to four years. The last significant state-wide increase in pertussis occurred in 2005. In non-epidemic years, annual incidence in Iowa ranged from 168-481 cases. There were 150 confirmed and probable cases reported to IDPH in 2006 or 5.1 cases for every 100,000 persons.

The highest numbers of cases were reported in Black Hawk, Lee, Scott, and Polk counties with 13 cases in Black Hawk and five in all other counties named.

The incidence is an approximate 80 percent decrease compared to the previous three years.

TETANUS

No cases of tetanus were reported in Iowa in 2006.

TUBERCULOSIS

In 2007, a total of 43 tuberculosis (TB) cases were reported in Iowa compared to 26 in 2006 (Figure 4). Case ages ranged from 10 to more than 80 years.

A cluster of eight cases was reported in a group of non-U.S. born temporary visitors to Jefferson County, skewing that county's incidence rate for the year. A contact investigation of this cluster demonstrated unprecedented infection and case

rates within the defined group. However, all eight cases had unique genotyping and were not related to one another.

State law requires active cases of TB to be reported to the Iowa Department of Public Health. Iowa has one of the lowest TB case rates in the country, thanks in part to contact investigations, strict, directly observed therapy for active disease cases, and the provision of

reported in 1999.

Local health departments are to be commended for their vigilance in controlling tuberculosis in Iowa.

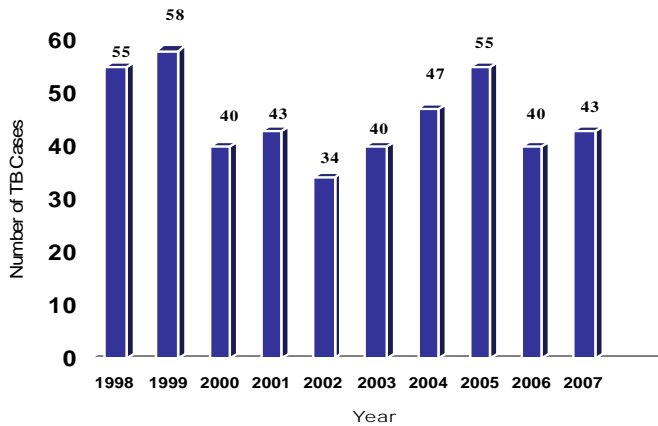


Figure 4. Tuberculosis cases by year, 1998-2007

medication for latent-Tuberculosis infection (LTBI) to thousands of Iowans annually (Figure 5). By completing 6 – 9 months of therapy, patients reduce their risk of developing TB disease by 70 – 90%. Approximately 87% of patients with LTBI have completed therapy in both 2006 and 2007.

In 2007, there was one case of multi-drug resistant TB (MDR-TB). Prior to 2007, there has only been one other known case of MDR-TB

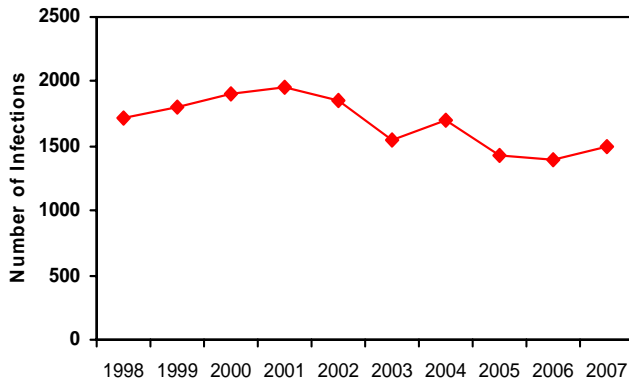


Figure 5. Latent TB cases by year, 1998-2007

SUMMARY OF SEXUALLY-TRANSMITTED DISEASES, HEPATITIS C, HIV AND AIDS

HIV AND AIDS

On December 31, 2007, there were 1,546 persons living with HIV or AIDS who were Iowa residents at the time of diagnosis, a prevalence of 51.7 per 100,000 population. Taking into account the Centers for Disease Control estimate that at least 25% of persons infected with HIV nationwide are as yet undiagnosed and applying a slight correction for under-reporting, there may have been as many as 2,125 Iowans living with HIV or AIDS at the end of 2007 (Figure 6).

The number of Iowans diagnosed with HIV infection last year rose to its highest level since HIV reporting began in 1998. In 2007, there were 127 HIV diagnoses, up from 113 in 2006

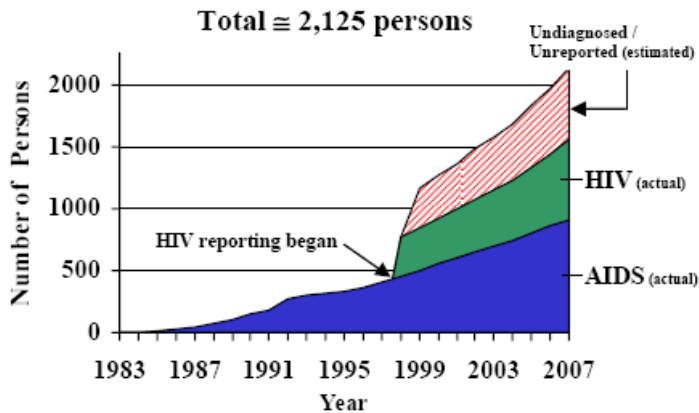


Figure 8. Number of HIV cases diagnosed by year, 1997-2007

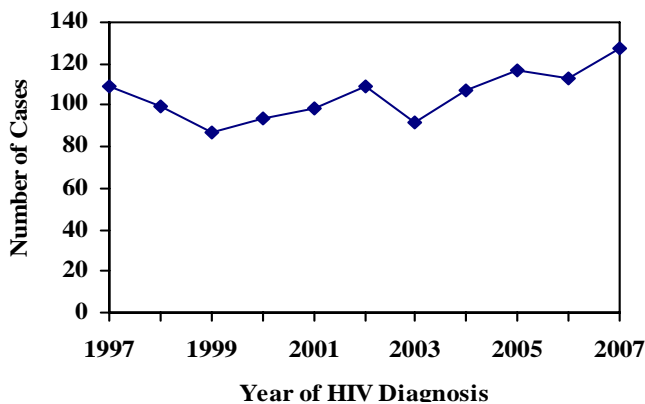


Figure 6. Iowans living with HIV/AIDS as of December 31st, 2007

and the previous high of 117 in 2005. The 127 diagnoses equate to 4.3 HIV diagnoses per 100,000 population (Figure 8).

Males accounted for 83 percent of the new HIV diagnoses in 2007. The increase in diagnoses since 2002 has been almost exclusively among males. The increase among females through 2003 was among foreign-born females only.

Trends vary among the three major exposure groups, Men having sex with men (MSM) remains the number one risk factor for the transmission of the HIV infection in Iowa. Over the last five years the number of diagnoses in the “all MSM” group has almost doubled from 39 cases in 2003 to 74 cases in 2007. “All MSM” combines males reporting a risk of MSM only and males reporting a risk of both MSM and injection drug use (IDU) into one group. Diagnoses among heterosexuals have averaged 25 per year from 2004 to 2007.

The largest proportion of HIV diagnoses remains among those 25-44 years of age, but since 2002 the number of diagnoses among those 45 years and older has increased markedly. The median age at diagnosis in 2007 was 40 years of age – slightly higher for males and a bit lower for females. There were no pediatric HIV diagnoses in 2007.

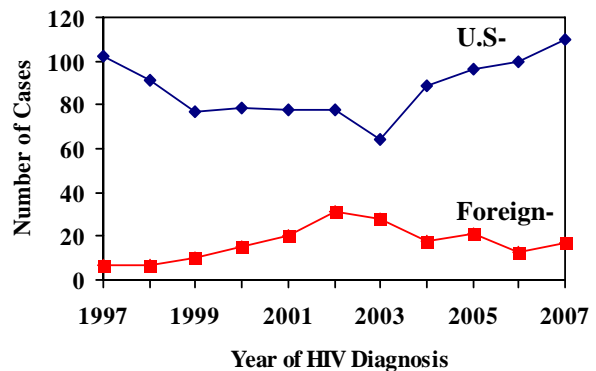


Figure 7. Number of U.S. versus Foreign-born cases of HIV diagnosed in Iowa, 1997-2007

In 2002, it seemed that the focus of the epidemic in Iowa was shifting to foreign-born persons

(Figure 7). Since that time however, Iowa diagnoses have increased substantially among U.S.-born persons while dissipating among the foreign-born. In 2007, 87 percent of HIV diagnoses were among U.S.-born persons compared to 72 percent in 2002 and 70 percent in 2003.

Diagnoses among black, non-Hispanic persons continue to be markedly disproportionate to the size of the population. African Americans make up 2.5 percent of Iowa’s population, but accounted for 20 percent of the new HIV diagnoses in 2007. Hispanic persons make up 3.8 percent of Iowa’s population, but accounted for 8 percent of new HIV diagnoses. Despite these disparities, white, non-Hispanic, U.S.-born persons accounted for 70 percent of diagnosed cases.

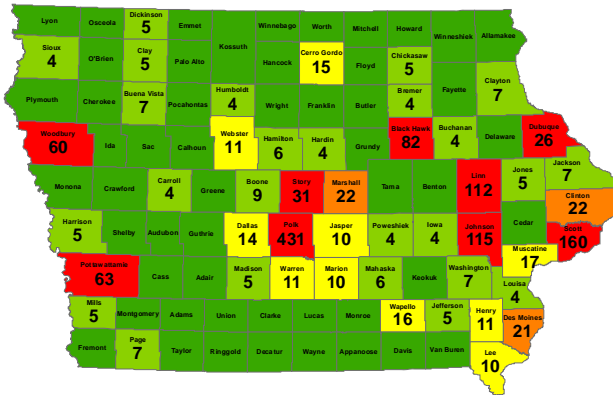


Figure 9. Persons living with HIV/AIDS by county of diagnosis (N=1,546)

AIDS diagnoses declined by 18 percent in 2007 compared to 2006. There were 66 reports of AIDS cases in 2007.

The number of persons living with HIV/AIDS by county is proportional to the total population of the county (Figure 9).

HEPATITIS C

There were an estimated 4.1 million cases of hepatitis C in the United States; up to 85 percent of these cases are chronic. According to the 2007 census population estimate for Iowa, there were 2,988,046 people residing in the state. The Centers for Disease Control and Prevention (CDC) estimate that 1.8 percent of the state’s population, or 53,784 Iowans, have potentially been infected with the hepatitis C virus. To date,

approximately 10,630 cases of hepatitis C have been identified by IDPH.

Hepatitis C data is collected using Evaluation Web, 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.

Due to a lack of funding, surveillance activities are not performed at the state level. The Centers for Disease Control and Prevention provides funding for the adult viral hepatitis program coordinator.

SEXUALLY-TRANSMITTED DISEASES

The Bureau of Disease Prevention and Immunization is responsible for tracking the incidence of sexually-transmitted diseases including Chlamydia, syphilis, and gonorrhea.

In addition to surveillance, IDPH supports targeted voluntary screening at 70 public sites throughout Iowa. IDPH also works with private health care providers to increase screening rates in those clinics.

IDPH provides prophylaxis to cases examined and testing positive at one of the 70 public screening sites. Medication is also provided to contacts of confirmed cases.

Partner-delivered therapy was added to Iowa legislation in 2008. This program allows for a health care practitioner or public health professional to deliver medication or prescriptions to exposed partners of STD cases.

CDC estimates that about 40% of Chlamydia infections and 50 percent of gonorrhea infections remain undiagnosed and untreated each year which means that in 2006, an estimated 21,285 infections went undiagnosed and untreated in Iowa.

Chlamydia and gonorrhea infections are more often diagnosed in women likely due to routine STD screening tests performed at annual gynecological exams.

CHLAMYDIA

There were 8,643 cases of Chlamydia reported to IDPH in 2007, which equates to 290 cases for

every 100,000 people. Rates have been steadily increasing for the past three decades, but were on target in 2007 (Figure 10). Due to underlying prevalence of disease, outbreaks are rarely reported. Iowa is below the national average of 360 cases for every 100,000 people.

Of all infections 74% were reported in persons aged 15-24. Though African Americans comprise only 2% of Iowa's population, 19% of all Chlamydia cases are African American.

GONORRHEA

In 2007, 1,928 cases of gonorrhea were reported to IDPH. This is a rate of 65 for every 100,000 people. Age groups affected by gonorrhea are the same as Chlamydia, though rates in the African American population are higher at 47%. This race represents the highest percentage affected of all races. The state has about half as many cases for every 100,000 people as the national average of 120 cases.

Similar to Chlamydia, 60% of all cases are ages 15-24.

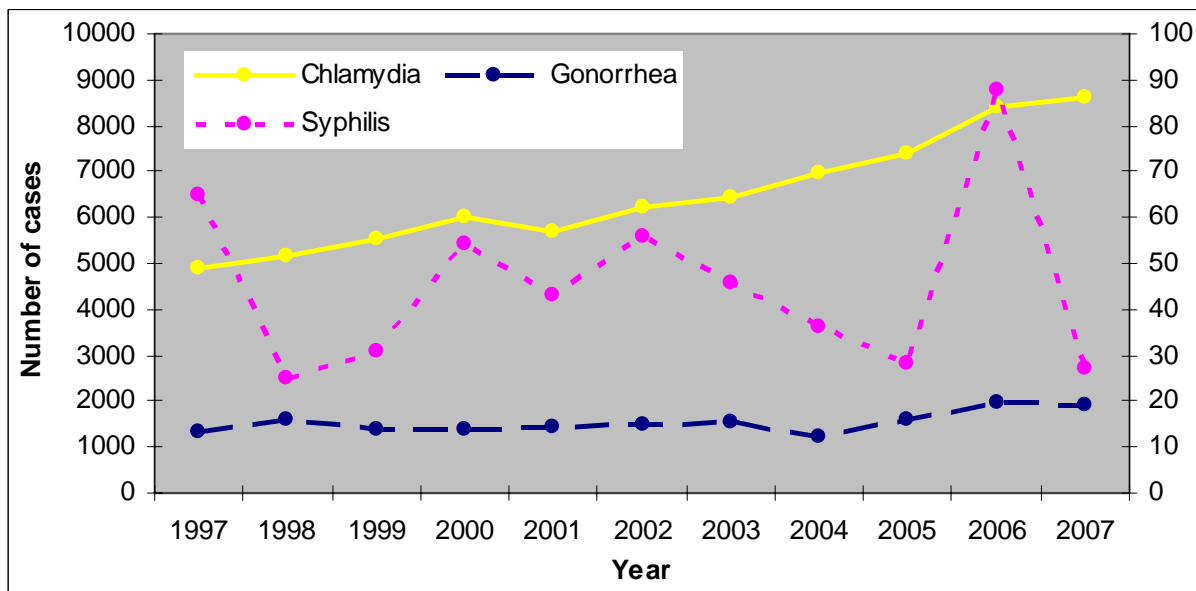
SYPHILIS

There were 64 total cases of syphilis or 2 for every 100,000 people reported in 2007. Cases of syphilis have remained steady for more than 20 years; however, low numbers of cases make it challenging to assess true disease burden in Iowa. The state rate is similar to the national rate

of 3 cases for every 100,000 people.

Syphilis cases were primary males, ages 35-55, and men who have sex with men. The rate of infection was highest among African Americans. Clusters of syphilis are common, especially in early stages of infection and urban areas.

Figure 10. Number of cases of sexually-transmitted diseases, 1997-2007

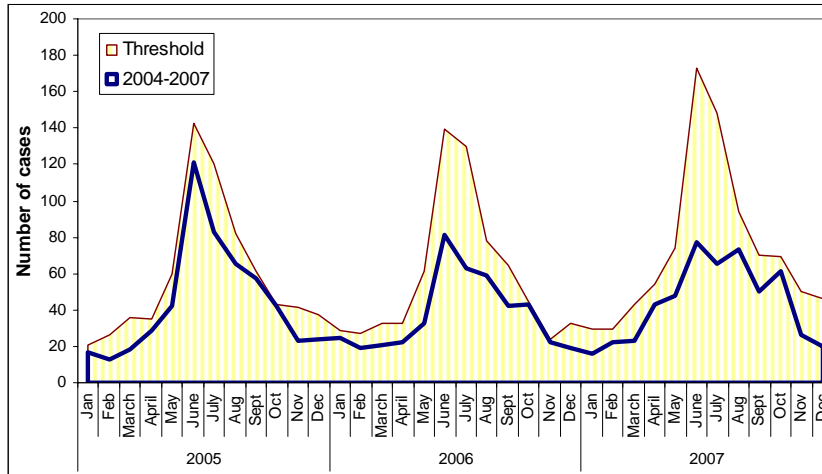


SUMMARY OF ENTERIC DISEASES

CAMPYLOBACTERIOSIS

The total number of campylobacteriosis cases reported in 2007 was slightly higher than last year (Figure 11). The average number of cases reported for 2004-2006 was 516; 524 cases were reported in 2007. Campylobacteriosis incidence was 17.9 cases for every 100,000 people in 2007.

Figure 11. Campylobacteriosis cases versus threshold by month, 2005-2007



Campylobacteriosis activity typically peaks in early summer. Consumption of raw, undercooked meat, raw milk, contact with infected animals, and contaminated water are common sources of campylobacter infection.

CRYPTOSPORIDIOSIS

An outbreak of cryptosporidiosis began in eastern Iowa in early July 2007. Additional outbreaks appeared across Iowa for several weeks. By the end of the summer, cases were widespread, and several other states including Colorado, Florida, Idaho, Ohio, Oregon, Pennsylvania, and Utah were experiencing significant outbreaks as well.

Table 3. Demographics of Iowa Confirmed Crypto Cases, 2007 (n=610)

Gender	Males	262	43%	
	Females	346	57%	
	Unknown	2	<1%	
Age	Female	Male	Unk	%
0-4	92	102	2	32%
5-9	48	46	0	15%
10-19	32	44	0	12%
20-29	58	21	0	13%
30-39	55	24	0	13%
40-49	21	12	0	5%
50-59	17	6	0	4%
60+	21	7	0	5%
Unknown	2	0	0	<1%

Median Age: 11 Age Range: 0-88
100%

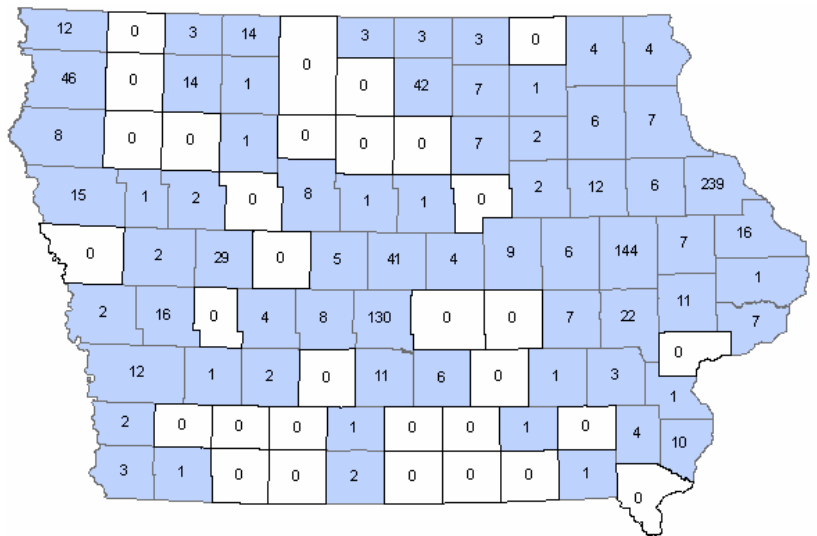


Figure 12. Map of cryptosporidiosis confirmed and epi-linked cases by county

Case report forms were available on 515 of the 610 cases confirmed in Iowa. Follow-up was not requested for cryptosporidiosis until the outbreak was identified in late summer; follow-up will now continue at least through 2008.

There were 20.8 cases for every 100,000 Iowans in 2007 compared to 7.7 in 2006. Cases had similar clinical presentations and most reported either child care or recreational water exposure (Table 4). Epidemiologically-linked cases were counted by IDPH but were not reported to the CDC since they had not been reported prior to the outbreak in 2007 (Figure 13). Cases began to rise above threshold values in 2006 and continued with the statewide outbreak in 2007 (Figure 14).

Table 4. Cryptosporidiosis clinical and exposure summaries (N=515)

Clinical Information			Exposure Information*		
Symptoms	# of Cases	%	Yes	No	
Diarrhea	507	98%	279	235	
Vomiting	270	52%	Of 137 childcare centers named, 40 centers (29%) had more than one confirmed case associated with it.		
Abdominal Cramps	354	69%	257	225	
Fever	222	43%	Between July 1 and September 29, 61% of cases interviewed had a recreational water exposure listed.		
Weight Loss	159	31%	64	451	
<i>Median duration of illness: 9 days; Range (0-90 days)</i>			68	447	
Treatment	# of Cases	%	Since Oct 1, 30% of new cases had contact with an ill individual		
Hospitalized	62	12%			
<i>Median duration of hospital stay: 3 days; Range (1-9 days)</i>					
Treated w/ Antiparasitic Drug:	186	36%			
<i>(Alinia®/Nitazoxanide)</i>					

* Many cases had multiple exposures listed
 ** (either case or case's child attended)
 *** (includes swimming pools both indoor and outdoor, lakes, rivers, & water parks)

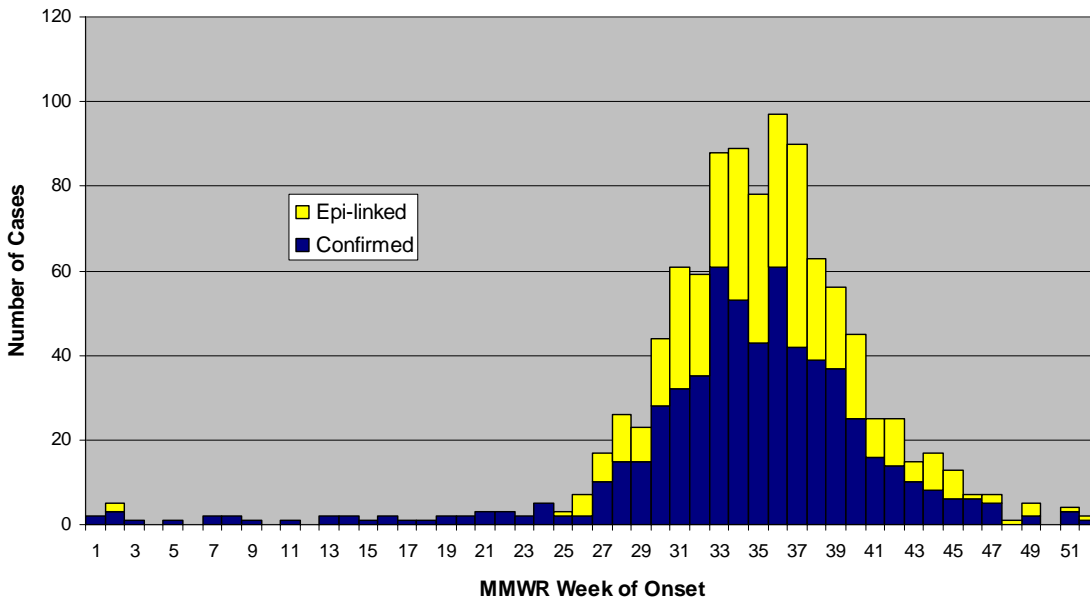
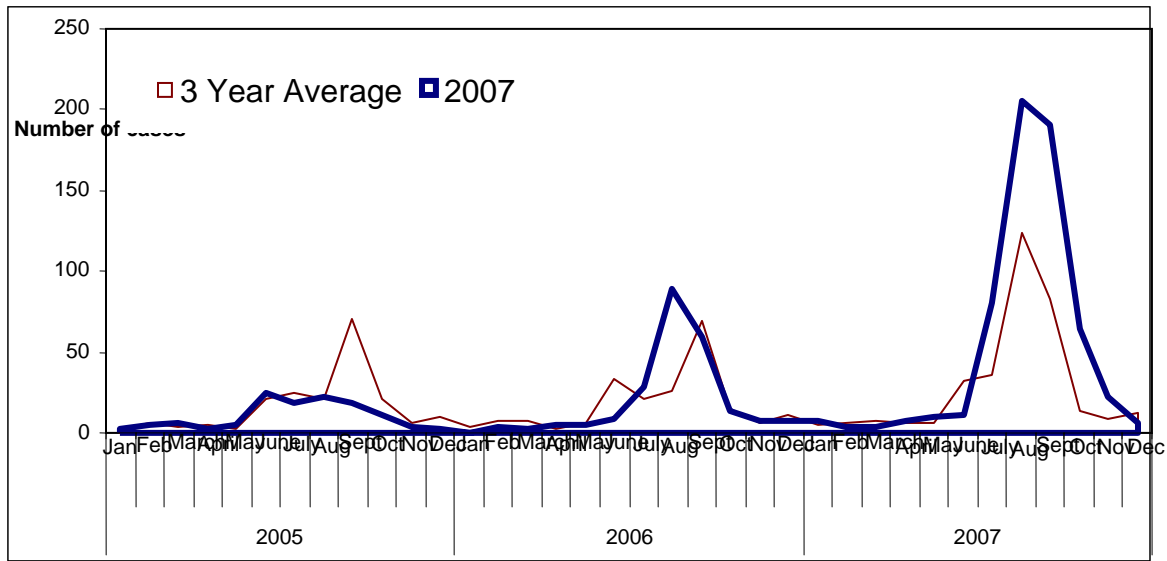


Figure 13. Cryptosporidiosis confirmed and epidemiologically-linked cases (N=1008)

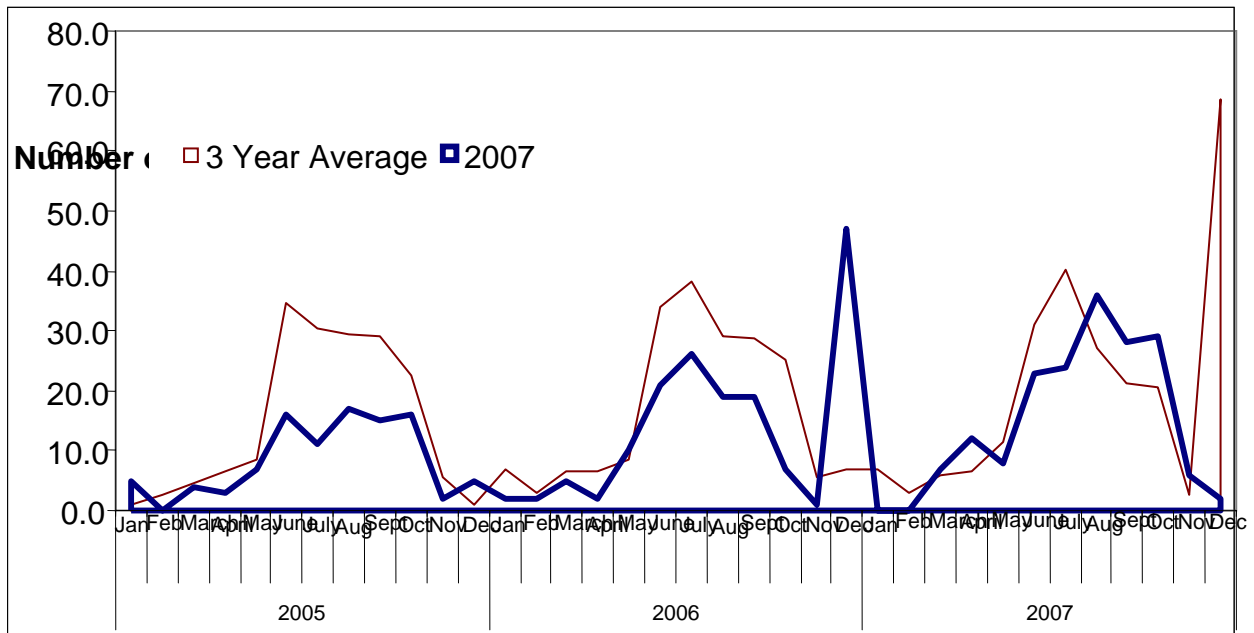
Figure 14. Cryptosporidiosis cases versus threshold by month, 2005-2007



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

The incidence of *E. coli* shiga-toxin cases in Iowa rose to 6.0 cases/100,000 persons in 2007 from 5.4 cases/100,000 persons in 2006. One outbreak that involved several child care centers resulted in high case counts the months of September and October. Figure 15 shows the increase in cases in December 2006 and the yearly seasonal cyclic trend of cases which peaks in the summer months. There were a total of 175 cases reported in 2007.

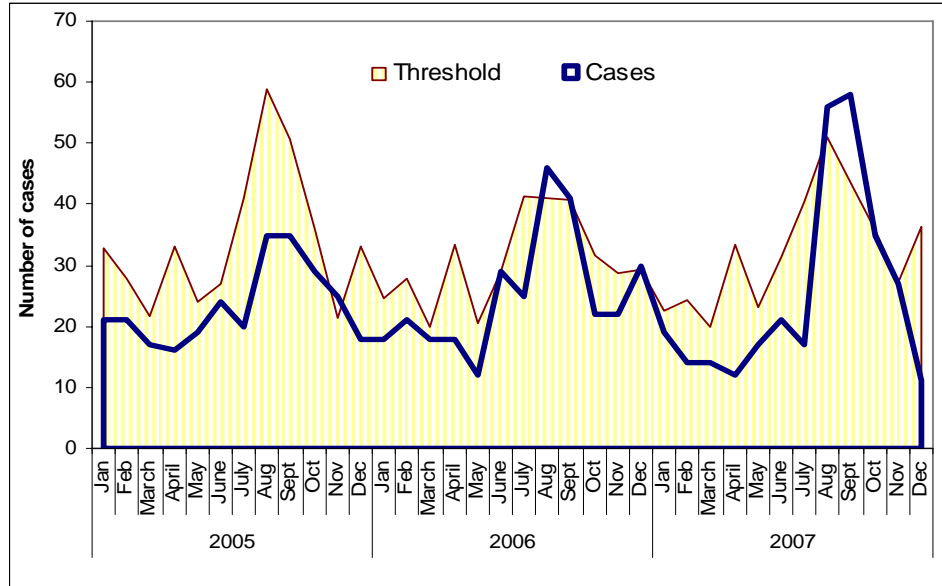
Figure 15. *E. coli* O157:H7 and other STX-producing strains cases versus threshold by month, 2005-2007



GIARDIASIS

Giardiasis is one of the leading waterborne diseases that typically peaks in late summer or early fall (Figure 16). There were 10.3 cases for every 100,000 Iowans, or 301 cases total, compared to 9.6/100,000 in the previous year.

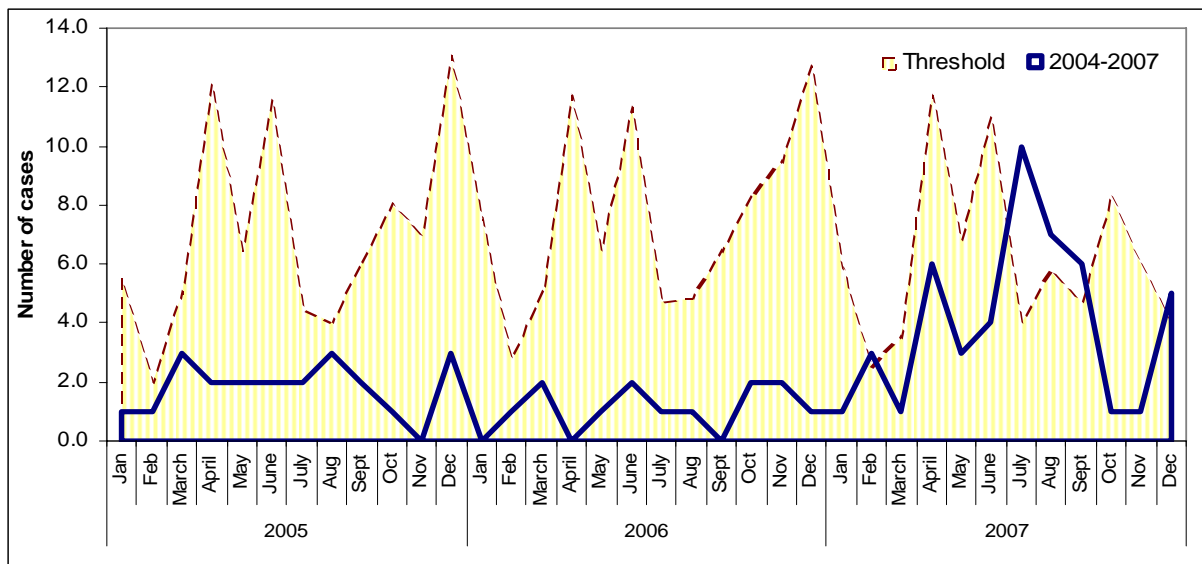
Figure 16. Giardiasis cases versus threshold by month, 2005-2007



HEPATITIS A

During the years of 1995 through 1998, Iowa had ongoing outbreaks/clusters of hepatitis A, with significantly higher numbers in Polk and Woodbury counties. During this outbreak those at highest risk were methamphetamine users, but other routes of transmission included transmission from infected food handlers. Outbreaks in the western part of the state peaked in February of 1996 but gained ground in central Iowa through 1997 to 1998. At the end of the 1990s, hepatitis A vaccine was more widely used and the number of cases reached historic lows¹⁰. It is estimated that one-third of Americans have evidence

Figure 17. Hepatitis A cases versus threshold by month, 2005-2007



of past infection (immunity). In 2006, Iowa had only 13 cases of hepatitis A reported with an incidence of 0.4 cases per 100,000 Iowans. This is the lowest incidence of hepatitis A that Iowa has reported in 15 years. In 2007, cases began to rise again with only 7 of the 48 reported cases occurring in persons less than 18 years of age. The median age of 2007 cases is 39 years. Cases were slight more often male than female and predominantly Caucasian.

With the increase continuing at the time of publication, IDPH has implemented several epidemiologic efforts to assess the increase.

LISTERIOSIS

There were eight cases of *Listeria montocytogenes* infection reported in 2007. Of these, two were male and six were female with ages ranging from 2 to 86. None of the cases was associated with any known *Listeria* outbreaks. All appear to be sporadic cases, and the specific exposure that caused illness was not identified.

SALMONELLOSIS

Salmonellosis incidence in 2007 rose slightly to 16.2 cases per 100,000 persons from 15.9 cases per 100,000 persons in 2006. The total number of cases reported was 477. The graph below shows the number of salmonellosis cases reported for the past three years along with the calculated threshold for each month. The expected number of cases was exceeded two times in 2006, and both times *Salmonella* outbreaks were identified. In September, a *Salmonella* I 4,[5],12:i:- outbreak associated with a wedding in southern Iowa occurred. Epidemiological evidence suggested a pasta salad as the cause. This same *Salmonella* serotype was involved in a Johnson County outbreak in December 2006, but no food vehicle was identified. Iowa *Salmonella* cases were also linked to several multi-state clusters/outbreaks including *Salmonella* Enteritidis and raw stuffed chicken products, *Salmonella* Montevideo, contact with baby chicks, and the start of the outbreak of *Salmonella* Tennessee linked to contaminated peanut butter.

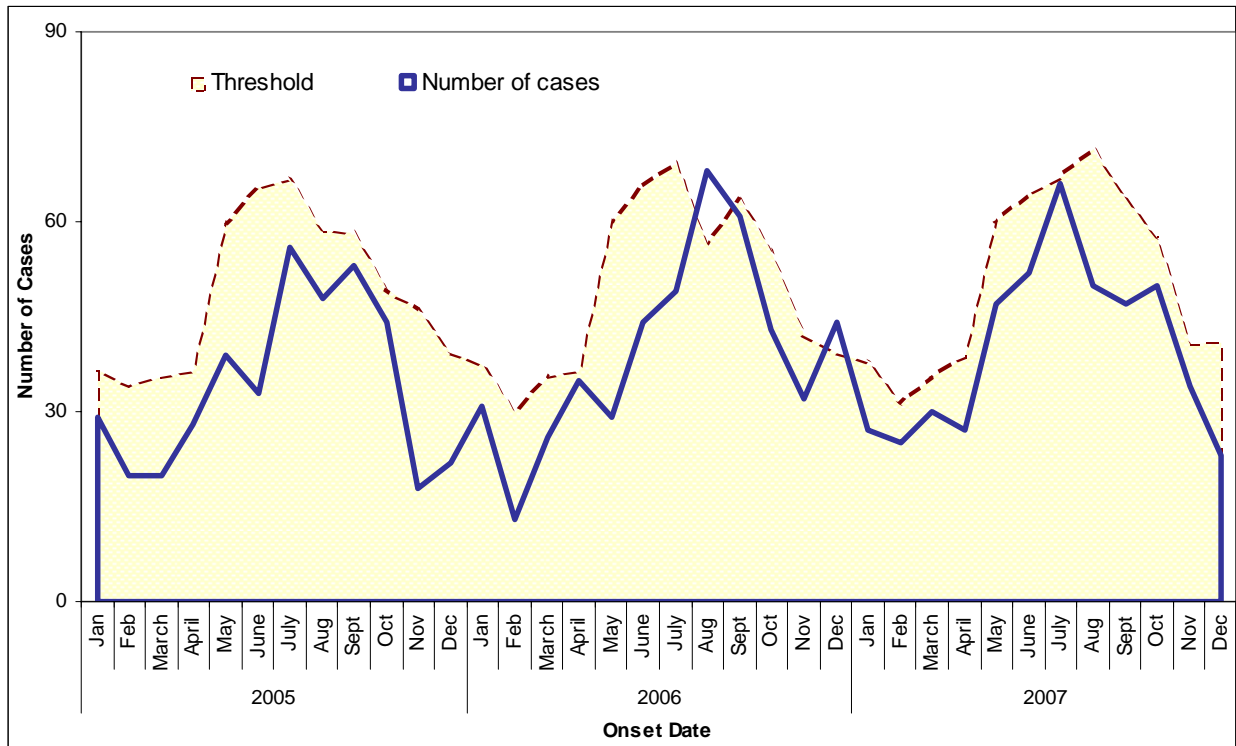


Figure 18. Salmonellosis cases versus threshold by month, 2005-2007

SHIGELLOSIS

Figure 19. Shigellosis cases versus threshold by month, 2005-2007

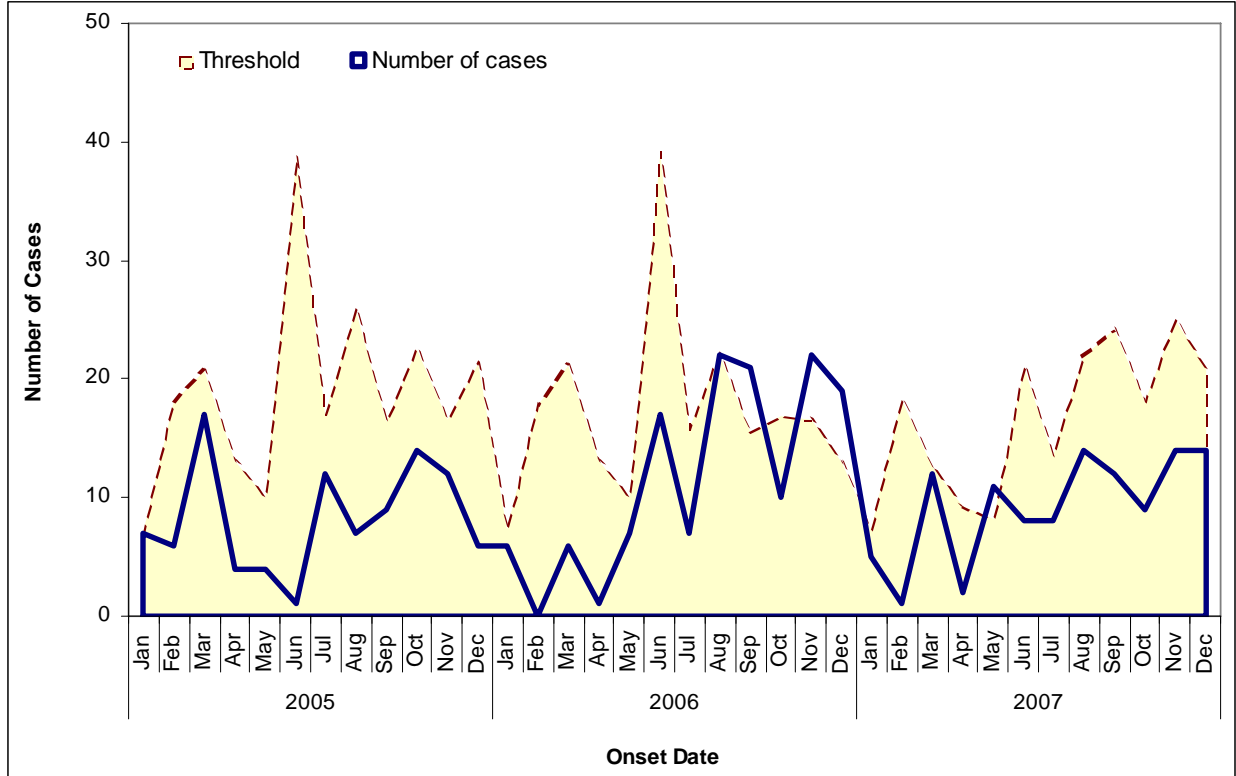


Figure 18 shows the shigellosis trend in Iowa for the past three years. Both times the number of cases exceeded the expected threshold. Outbreaks were identified. In August 2006, 15 shigellosis cases were associated with a school trip to Mexico. In December 2006, when the number of cases exceeded the threshold for the second time of the year, a community wide outbreak resulting in 20 reported *Shigella* cases was identified in northeast Iowa. The 2006 Iowa incidence of *Shigella* was 4.5 cases/100,000 persons which was a slight increase from 2005. In sum, there were 109 cases of *Shigella* in Iowa in 2007.

SUMMARY OF ZOO NOTIC DISEASES

DENGUE FEVER

There were six cases of Dengue fever reported in 2007. All were considered probable cases. All cases had reportedly spent time in areas with endemic disease activity including India, Central America, and Africa.

EHRlichIOSIS

Ehrlichiosis is a disease transmitted to humans by ticks. Human ehrlichioses in the U.S., Europe and Asia are caused by three distinct organisms: *Ehrlichia chaffeensis* known as human monocytic ehrlichiosis (HME), *Ehrlichia muris* (detected in Japan and Russia), and *Anaplasma phagocytophilum* known as human granulocytotropic ehrlichiosis (HGE).

There were seven cases of ehrlichiosis reported in Iowa in 2006. Of those, all were reported as HME.

HANTAVIRUS

There were no cases of hantavirus reported in Iowa in 2006.

LYME DISEASE

The 2007 Iowa case rate for Lyme disease is 4.2 cases/100,000 persons or 124 cases total. Cases ranged from age 1 to 79 with a median age of 27 years. The total number of Lyme disease cases has steadily increased in the past 10 years (Figure 20).

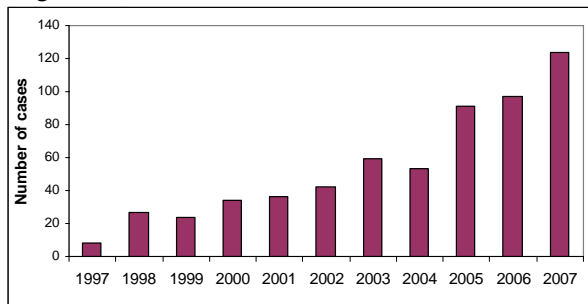


Figure 20. Confirmed and probable cases of Lyme disease reported to IDPH, 1997-2007

MALARIA

Three cases of malaria were identified in Iowa in 2007. Two cases had recently immigrated to the

United States. The third had recently traveled to Brazil. Two cases were determined to have *Plasmodium vivax* infection and the other had *Plasmodium falciparum*.

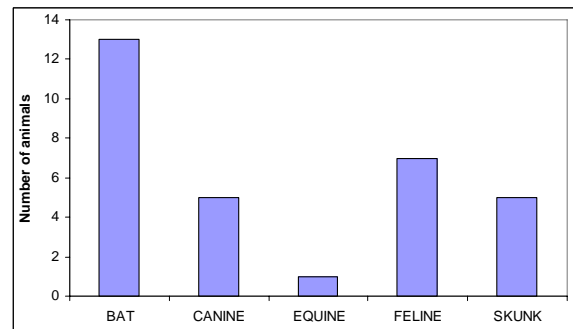
OTHER ARBOVIRAL DISEASES

In addition to West Nile virus, one other mosquito-borne virus was detected in Iowa in 2007. As part of the state’s arboviral surveillance program, a human case of LaCrosse encephalitis virus was identified in Winneshiek County.

RABIES, ANIMAL

A total of 31 cases of animal rabies were reported in Iowa during 2007. Forty-one reported animal cases were wildlife species including 13 bats and 5 skunks. The remaining 13 were domestic animal species including cats, dogs, and horses. These data reflect tested animals that might have exposed humans or other domestic animals to rabies, and do not represent all rabid animals in Iowa.

Figure 21. Number of animals with laboratory-confirmed rabies by animal type



ROCKY MOUNTAIN SPOTTED FEVER (RMSF)

In 2007, there were 17 cases of Rocky Mountain Spotted Fever (RMSF) reported in Iowa. American dog ticks are carriers of *Rickettsia rickettsii*, the bacterium that causes RMSF. The American dog tick is the most common species of tick in Iowa and can be found in every county in Iowa. The tick is active late March through August¹¹. Iowa RMSF cases in 2006 had symptom onset dates from March to November. Cases ranged from age 17 to 81 with a median age of 48.

WEST NILE VIRUS

In 2007, 30 human cases of West Nile virus were reported to IDPH (Table 5). Of those 12 were neurologically invasive (meningitis, encephalitis, or meningoencephalitis), 15 were

not neurologically invasive (“West Nile fever”), and three had other clinical manifestations. Cases were surveyed for repellent use and 67% reported they “never” used insect repellent. The age range of cases was 11 to 87 with a median age of 47 years.

Table 5. 2007 Iowa West Nile Virus Final Data

	# positive
Human	30
Sentinel Chickens	18
Mosquito Pools	5
Equine	10
Blood Donors	6
Final data as of December 14, 2007	

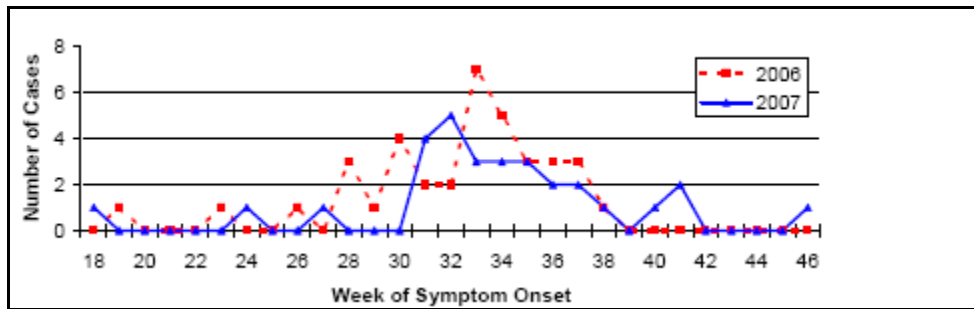


Figure 22. Number of West Nile Virus Human Cases, 2006-2007

SUMMARY OF RARE AND UNUSUAL DISEASES

BOTULISM

There was one case of infant botulism reported in a five month old infant. The toxin type A was confirmed in the infant's stool. The infant was exclusively breastfed but had indirect exposure to honey. The infant also had significant environmental exposure in a state with a higher incidence of cases than Iowa.

LEGIONELLOSIS

There were 12 cases of legionellosis reported to IDPH in 2007. The age range was 25 to 74 with a median of 50 years. The average number of cases for the last five years is 10.6.

VIBRIO PARAHAEMOLYTICUS

One case of *Vibrio parahaemolyticus* was reported to IDPH in 2007. The case had recently traveled to the West Coast where cases of *parahaemolyticus* are more common compared other coasts. The case reported consumption of oysters, mussels, shrimp, and other shellfish during travel to the West Coast.

There were no cases of human illness reported for the following diseases:

BRUCELLOSIS

HANSEN'S DISEASE

HEPATITIS D

PSITTACOSIS

TOXIC SHOCK SYNDROME

OUTBREAK SUMMARIES

TABLE 6. FOODBORNE OUTBREAKS

Type	Nature of Episode	Event	Location of Food Preparation	Location of Food Consumption	Region	Month	Number Affected	Food Vehicle of Transmission	Agent Involved	Reports (internal use only)
Foodborne	Diarrhea	Chinese restaurant	Restaurant	Restaurant	1	April	7	Unknown	Unknown County investigated	FS, I
Foodborne	Vomiting	School lunch	Elementary school	Elementary school	4	April	63	Unknown	Unknown	FS
Foodborne	Diarrhea	Bowling banquet	Banquet facility & private home	Banquet facility	6	May	28	Refried Beans, suspect	Unknown County investigated	FS, I
Foodborne	Diarrhea, cramps	Office lunch	Private home	Office setting	6	May	11	Chicken salad suspect	Norovirus suspect 1 of 2+	FS, NC
Foodborne	Diarrhea, vomiting	Restaurant	Restaurant	Restaurant	1	June	8	Unknown, suspect Food Worker	Norovirus confirmed 3+	FS, I
Foodborne	Diarrhea, cramps	Office lunch	Private home	School	1	June	61	Unknown	<i>Clostridium perfringens</i> confirmed	FS, I
Foodborne	Bloody diarrhea, cramps	Office lunch	Private home & restaurant	Office	1	June	7	Unknown	Unknown	FS, I
Foodborne	Vomiting, cramps	School lunch	School	School	1	November	71	Turkey sandwich, through epi	Norovirus confirmed 4+	FS
Foodborne	Vomiting, diarrhea	Holiday brunch	Country club	Country club	1	November	44	Fruit, through epi	Norovirus confirmed 2+	FS
Foodborne	Vomiting, diarrhea	Christmas party	Banquet facility	Banquet facility	2	December	18	Unknown	Norovirus confirmed 3+	FS, I

TABLE 7. NON-FOODBORNE OR UNKNOWN CAUSE OUTBREAKS

Type	Nature of Episode	Event/Place	Region	Month	Number Affected	Vehicle of Transmission	Agent Involved	Written Report
Waterborne	Rash	Hotel pool & spa	6	January	20/23	Recreational water	Unknown	WBOR
Waterborne	Rash	Hotel spa	1	February	10	Recreational water	<i>Pseudomonas</i> suspect	WBOR
Waterborne	Skin infection	Hotel spa	1	January	4	Recreational water	<i>Staphylococcus</i> suspect	WBOR
Person-to-Person	Diarrhea, vomiting	Long-term care facility	6	January	52/69 pts 13/66 staff	Person-to-Person	Norovirus suspect 1 of 2 +	NC
Person-to-Person	Diarrhea, vomiting	Hospital	4	March	11	Person-to-Person	Norovirus confirmed (4)	NC
Person-to-Person	Diarrhea, vomiting	Elementary school	2	April	52/217	Person	Norovirus suspect 1 of 2 +	NC
Waterborne	Diarrhea, vomiting	Hiking/ state forest	2	May	10/13	Paint Creek suspected	Norovirus suspect	WBOR
Unknown	Diarrhea, vomiting	Birthday party/ restaurant	1	March	8	Unknown	Unknown	FS
Person-to-Person	Vomiting	Childcare center	6	June	30	Person-to-Person	Norovirus suspect	NC
Unknown	Bloody diarrhea, fever, abdominal cramps	Childcare center	6	June	2	Unknown; likely child care related	<i>E. coli</i> O26	
Waterborne	Diarrhea, abdominal cramps	Municipal pools	6	July/August	132	Recreational water	<i>Cryptosporidium</i> confirmed	WBOR, I
Waterborne	Diarrhea, cramps	Municipal pool	2	August	34	Recreational water	<i>Cryptosporidium</i> confirmed	WBOR, I
Person-to-Person	Diarrhea, vomiting	Birthday party/ LTC facility	6	September	18/21	Person-to-Person	Norovirus suspect	NC, FS
Person-to-Person	Diarrhea, vomiting	Preschool/Elementary school	6	October	35/128	Person-to-Person	Norovirus suspect	NC
Unknown	Diarrhea, vomiting	Wedding reception	6	September	25/62	Unknown	Unknown (county investigated)	FS, I
Person-to-Person	Bloody diarrhea, cramps	Daycare	6	August	5	Person-to-Person	<i>E. coli</i> O157:H7 confirmed	FS
Person-to-Person	Bloody diarrhea, abdominal cramps, HUS	Daycare	6	August/September	8	Person-to-Person	<i>E. coli</i> O157:H7 confirmed	FS
Person-to-Person	Diarrhea, vomiting	Elementary school	1	August	24	Person-to-Person	Norovirus suspect 1 of 2+	NC
Person-to-Person	Diarrhea, vomiting	Childcare center	1	September	20	Person-to-Person	Norovirus confirmed 3 of 4 +	NC

DIVISION OF ACUTE DISEASE PREVENTION AND EMERGENCY RESPONSE

Type	Nature of Episode	Event/Place	Region	Month	Number Affected	Vehicle of Transmission	Agent Involved	Written Report
Person-to-Person	Bloody diarrhea	Child care center, Family	1	October	10	Person-to-Person	<i>E. coli</i> O157:H7 confirmed	FS
Person-to-Person	Diarrhea, vomiting	Elementary school	1	December	76	Person-to-Person	Norovirus suspect	NC
Person-to-Person	Diarrhea, vomiting	Data entry workplace	6	December	25/50	Person-to-Person	Norovirus suspect	NC

TABLE 8. PFGE (PULSE-FIELD GEL ELECTROPHORESIS) CLUSTERS

Type	Nature of Episode	Event/Place	Region	Month	Number Affected	Vehicle of Transmission	Agent Involved	Written Report
Foodborne	Diarrhea	Multi-state	6	February 2007	2	Mexico travel w/ same all inclusive hotel	<i>Salmonella</i> Oranienburg	
Foodborne	Diarrhea	Multi-state	Multi-County	Sept 2006- July 2007	11 confirmed	Peanut Butter	<i>Salmonella</i> Tennessee	FS
Foodborne	Diarrhea	Taste of Chicago food festival, IL	1	July 2007	2 confirmed	Hummus	<i>Salmonella</i> Heidelberg	
Unknown	Diarrhea	Unknown	Multi-County	July- August 2007	6 confirmed	Unknown	<i>Salmonella Paratyphi B var Java</i>	
Unknown	Diarrhea	Multi-state	Multi-County	May-June 2007	11 confirmed	Unknown	<i>Salmonella</i> Muenchen	
Foodborne	Diarrhea	Multi-state	Multi-County	Jan 2007- ongoing	6 confirmed	Pot Pie	<i>Salmonella</i> 14,[5], 12:i:-	FS
Non-Foodborne	Diarrhea	Multi-state	5	September 2007	1 confirmed	Dry Pet Food	<i>Salmonella</i> Schwarzengrund	FS
Foodborne	Diarrhea	Distributed by non-profit org	6	October 2007	3 confirmed	IQF chicken leg quarters	<i>Salmonella</i> Typhimurium	FS
Foodborne	Bloody diarrhea	Multi-state	1	October	1 confirmed	Ground Beef	<i>E. coli</i> O157:H7	

TABLE 9. CASES AND RATES PER 100,000 POPULATION IN 2007- ALL DISEASES

Event (Disease)	Cases	Rate
AIDS	66	2.2
Anthrax	0	0.0
Botulism, Infant	1	0.0
Brucellosis (Undulant Fever)	0	0.0
Campylobacteriosis	558	18.7
Chlamydia	8643	289.2
Cholera	0	0.0
Cryptosporidiosis	610	20.4
Cyclospora	0	0.0
Dengue Fever	6	0.2
Diphtheria	0	0.0
Ehrlichiosis	7	0.2
Encephalitis (arboviral except WNV)	0	0.0
Escherichia coli O157:H7 (includes HUS & Shiga-toxin producing)	269	9.0
Giardiasis	301	10.1
Gonorrhea	1928	64.5
Hansen's Disease (Leprosy)	0	0.0
Hantavirus Syndromes	0	0.0
Hepatitis A (Viral, infectious)	48	1.6
Hepatitis B Acute	27	0.9
Hepatitis B Chronic	269	9.0
Hepatitis E	0	0.0
<i>Haemophilus Influenzae</i> Type B Inv Disease	1	0.0
HIV (Diagnosis)	127	4.2
Legionellosis	12	0.4
<i>Listeria Monocytogenes</i> Inv. Dis	8	0.3
Lyme Disease	124	4.1
Malaria	3	0.1
Measles (Rubeola)	0	0.0
Meningococcal Inv. Disease	15	0.5
Mumps	27	0.9
Pertussis (Whooping Cough)	150	5.0
Plague	0	0.0
Poliomyelitis	0	0.0
Psittacosis	0	0.0
Rabies (Animal)	31	1.0
Rabies (Human)	0	0.0
Rocky Mountain Spotted Fever	17	0.6
Rubella (German Measles)	0	0.0
Salmonellosis	477	16.0
Shigellosis	109	3.6
Syphilis	64	2.1
Tetanus	0	0.0
Toxic Shock Syndrome	0	0.0
Trichinosis	0	0.0
Tuberculosis	43	1.4
Typhoid Fever	1	0.0
West Nile Virus	30	1.0
Yellow Fever	0	0.0

TABLE 10. CASES AND RATES PER 100,000 POPULATION FOR 2007 BY AGE GROUP

Disease	Age group															Total	
	<=1		2 to 4		5 to 19		20 to 29		30 to 39		40 to 64		>64		Unk		
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Cases	Rate
AIDS (diagnosis)	0	-	0	-	0	-	11	0.4	13	0.4	40	1.3	2	0.1	0	66	2.2
Campylobacteriosis	22	0.7	46	1.5	119	4.0	76	2.5	62	2.1	150	5.0	49	1.6	0	524.0	17.5
Chlamydia	0	-	12	0.4	3015	100.9	4772	159.7	674	22.6	154	5.2	3	0.1	13	8643	289.2
Cryptosporidiosis	61	2.0	110	3.7	194	6.5	80	2.7	79	2.6	63	2.1	23	0.8	0	610	20.4
E. coli and other shiga-toxin producing	16	0.5	28	0.9	56	1.9	19	0.6	13	0.4	28	0.9	15	0.5	3	175	5.9
Gonorrhea	0	-	2	0.1	557	18.6	949	31.8	292	9.8	123	4.1	4	0.1	1	1928	64.5
Giardiasis	20	0.7	27	0.9	70	2.3	30	1.0	48	1.6	87	2.9	19	0.6	0	301	10.1
Hemolytic uremic syndrome	1	-	5	0.2	3	0.1	0	-	0	-	1	-	0	-	0	10	0.3
Hepatitis A	1	-	0	-	6	0.2	8	0.3	10	0.3	18	0.6	5	0.2	0	48	1.6
Hepatitis B, acute	0	-	0	-	2	0.1	1	-	6	0.2	15	0.5	3	0.1	0	27	0.9
Hepatitis B, chronic	2	0.1	1	-	21	0.7	60	2.0	68	2.3	101	3.4	16	0.5	0	269	9.0
HIV (diagnosis)	-	-	-	-	2	0.1	31	1.0	30	1.0	61	2.0	3	0.1	0	127	4.2
Legionellosis	0	-	0	-	0	-	1	-	0	-	9	0.3	2	0.1	0	12	0.4
Listeriosis	0	-	1	-	0	-	1	-	0	-	0	0.0	6	0.2	0	8	0.3
Lyme disease	3	0.1	5	0.2	41	1.4	18	0.6	10	0.3	34	1.1	13	0.4	0	124	4.1
Menningococcal invasive disease	0	-	0	-	6	0.2	3	0.1	0	-	4	0.1	2	0.1	0	15	0.5
Mumps	1	-	3	0.1	11	0.4	3	0.1	1	-	6	0.2	2	0.1	0	27	0.9
Pertussis (whooping cough)	5	0.2	17	0.6	68	2.3	11	0.4	18	0.6	25	0.8	6	0.2	0	150	5.0
Rocky Mountain Spotted Fever	0	-	0	-	1	-	0	-	6	0.2	9	0.3	1	-	0	17	0.6
Salmonellosis	14	0.5	38	1.3	97	3.2	70	2.3	52	1.7	145	4.9	61	2.0	0	477	16.0
Shigellosis	5	0.2	18	0.6	39	1.3	20	0.7	9	0.3	13	0.4	5	0.2	0	109	3.6
Syphilis	0	-	0	-	2	0.1	16	0.5	17	0.6	26	0.9	3	0.1	0	64	2.1

*Diseases with fewer than 3 cases in 2006 were excluded from this table.

**Rates were not calculated for diseases with fewer than 5 cases in a cell.

TABLE 11. CASES AND RATES PER 100,000 POPULATION FOR 2007 BY SEX

Disease	Sex						
	Female		Male		Unk	Total	
	Cases	Rate	Cases	Rate	Cases	Cases	Rate
AIDS (diagnosis)	7	0.2	59	2.0	0	66	2.2
Campylobacteriosis	220	7.4	263	8.8	1	524	17.5
Chlamydia	6310	211.1	2333	78.1	0	8643	289.2
Cryptosporidiosis	346	11.6	116	3.9	1	610	20.4
E. coli and other shiga-toxin producing	85	2.8	90	3.0	0	175	5.9
Erhlichiosis (HME)	4	0.1	3	0.1	0	7	0.2
Giardia	143	4.8	157	5.3	1	301	10.1
Gonorrhea	1121	37.5	807	27.0	0	1928	64.5
Hemolytic uremic syndrome	7	0.2	3	0.1	0	10	0.3
Hepatitis A	21	0.7	27	0.9	0	48	1.6
Hepatitis B, acute	8	0.3	19	0.6	0	27	0.9
Hepatitis B, chronic	107	3.6	161	5.4	1	269	9.0
HIV (diagnosis)	21	0.7	106	3.5	0	127	4.3
Legionellosis	5	0.2	7	0.2	0	12	0.4
Listeriosis	6	0.2	2	0.1	0	8	0.3
Lyme disease	57	1.9	66	2.2	1	124	4.1
Menningococcal invasive disease	11	0.4	4	0.1	0	15	0.5
Mumps	17	0.6	10	0.3	0	27	0.9
Pertussis (whooping cough)	75	2.5	75	2.5	0	150	5.0
Rocky Mountain Spotted Fever	10	0.3	7	0.2	0	17	0.6
Salmonellosis	260	8.7	215	7.2	2	477	16.0
Shigellosis	65	2.2	44	1.5	0	109	3.6
Syphilis	25	2.0	39	1.3	0	64	2.1

*Diseases with fewer than 3 cases in 2006 were excluded from this table.

**Rates were not calculated for diseases with fewer than 5 cases in a cell.

TABLE 12. NOTIFIABLE DISEASES BY YEAR, 1991-2007*

NOTIFIABLE DISEASES	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
AIDS (diagnosis)	76	117	156	104	110	104	97	75	60	77	80	80	75	75	70	79	80	66
Anthrax																		
Botulism										1					1		1	1
Brucellosis (Undulant Fever)	3	1	1	2	1	2	4	4	1	6		2	1			1	2	0
Campylobacteriosis	388	333	260	292	280	274	339	425	455	467	499	467	427	458	559	537	449	524
Cholera					1					1								
Cryptosporidiosis					71	21	75	71	66	56	77	82	49	122	90	122	230	610
Cyclospora							3	1	3			1						
Dengue Fever																1	1	6
Diphtheria																		
Ehrlichiosis													1	1		4	7	7
Encephalitis (arboviral except WNV)	7	4	3	4	1	13	19	3	3	3	4	3	3		2		1	
Escherichia coli O157:H7 (includes HUS & STX-producing)	0	15	20	27	54	64	123	114	93	114	180	81	122	103	124	108	161	175
Giardiasis	435	422	351	340	339	391	410	358	429	377	420	345	315	277	301	280	302	301
Haemophilus Influenzae B Inv Disease	23	15	7	5	6	3	4	6	5	2					1		2	1
Hansen's Disease (Leprosy)		1							1		2	1				1	1	
Hantavirus Syndromes								2	1	2				1				
Hepatitis A (Viral, infectious)	277	48	53	58	64	106	346	490	400	161	67	41	72	40	50	22	13	48
Hepatitis B (Serum) Acute / Chronic	54	42	33	36	27	46	74	44	54	44	38	24	20	27	17	32	21/35	269
Hepatitis B (Perinatal)																		1
Hepatitis C or unspecified	17	14	12	12	25	1	43						1	1				
Hepatitis E																		1
HIV (diagnosis)									98	87	94	98	109	92	107	117	113	127
Legionellosis	4	12	18	19	34	21	11	12	11	17	15	8	13	12	8	8	13	12
Listeria Monocytogens Inv. Dis	6						1		2	6	2	3	5		3	7	6	8
Lyme Disease	16	22	33	8	17	16	19	8	27	24	34	36	42	58	56	91	97	124
Malaria	2	7	5	5	5	3	3	10	8	11	2	9	4	6	5	9	2	3
Measles (Rubeola)	26	17	1		7		1								3			
Meningococcal Inv. Disease	7	15	18	28	25	31	56	47	46	42	37	32	29	28	17	19	20	15
Mumps	22	23	13	11	16	11	3	10	11	8	8	1	1	2	2	6	1,963	27
Pertussis (Whooping Cough)	20	26	11	38	23	11	32	207	78	111	67	167	230	182	1066	1106	342	150
Plague																		
Poliomyelitis		1																
Psittacosis		3	2	2								3				1		

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Rabies (Animal)	215	155	175	78	90	141	237	160	153	159	81	83	74	105	100	108	57	31
Rabies (Human)													1					
Rocky Mountain Spotted Fever	2	1	3	7	1		1	2	2	1	2	5	7	3	2	7	5	17
Rubella (German Measles)	4	6	3									30	1					
Salmonellosis	314	304	339	242	404	433	335	296	375	260	373	339	509	413	435	410	475	477
Shigellosis	51	33	46	68	338	351	151	90	69	74	569	367	122	93	64	103	134	109
Tetanus			1	1	1			1	1		1		1			1		
Toxic Shock Syndrome	10	7	7	7	8	5	4	3	4	4	4	1	3	5	5	5		
Trichinosis	79	1			1	6						3				1		
Tuberculosis	72	71	49	58	66	67	70	74	55	58	37	42	31	40	47	55	36	
Tularemia																		
Typhoid Fever	1		1				1	1		1				2				1
West Nile Virus													52	147	23	37	37	
Yellow Fever																		

*Table excludes sexually-transmitted diseases.

TABLE 13. SALMONELLA SEROTYPES REPORTED 2007

<i>SALMONELLA</i> SEROTYPES BY FREQUENCY					
	Serotype	Cases	Serotype		Cases
<i>Salmonella</i>	4:l=	1	<i>Salmonella</i>	Montevideo	23
<i>Salmonella</i>	Agbeni	1	<i>Salmonella</i>	Muenchen	15
<i>Salmonella</i>	Agona	6	<i>Salmonella</i>	Muenster	2
<i>Salmonella</i>	Bareilly	1	<i>Salmonella</i>	Newport	35
<i>Salmonella</i>	Bovismorbificans	3	<i>Salmonella</i>	Ohio	1
<i>Salmonella</i>	Bradenburg	1	<i>Salmonella</i>	Oranienburg	5
<i>Salmonella</i>	Braenderup	9	<i>Salmonella</i>	Panama	2
<i>Salmonella</i>	Bredeney	1	<i>Salmonella</i>	Paratyphi A	1
<i>Salmonella</i>	Corvallis	1	<i>Salmonella</i>	Paratyphi B var Java	19
<i>Salmonella</i>	Derby	5	<i>Salmonella</i>	Pensacola	2
<i>Salmonella</i>	Dublin	2	<i>Salmonella</i>	Reading	1
<i>Salmonella</i>	Elmorane	1	<i>Salmonella</i>	Saintpaul	9
<i>Salmonella</i>	Enteritidis	85	<i>Salmonella</i>	Salspe	1
<i>Salmonella</i>	Give	2	<i>Salmonella</i>	Schwarzengrund	2
<i>Salmonella</i>	Hadar	5	<i>Salmonella</i>	Senftenberg	2
<i>Salmonella</i>	Hartford	4	<i>Salmonella</i>	Stanleyville	1
<i>Salmonella</i>	Havana	3	<i>Salmonella</i>	Subspecies I	2
<i>Salmonella</i>	Heidelberg	8	<i>Salmonella</i>	Subspecies IV	1
<i>Salmonella</i>	Hvittingfoss	1	<i>Salmonella</i>	Telelkebir	4
<i>Salmonella</i>	Hyointestinalis	1	<i>Salmonella</i>	Tennessee	6
<i>Salmonella</i>	Infantis	13	<i>Salmonella</i>	Thompson	10
<i>Salmonella</i>	Javiana	7	<i>Salmonella</i>	Typhimurium	66
<i>Salmonella</i>	Kentucky	1	<i>Salmonella</i>	Typhimurium Var Copenhagen	40
<i>Salmonella</i>	Kiambu	1	<i>Salmonella</i>	Upsaliensis	2
<i>Salmonella</i>	Litchfield	3	<i>Salmonella</i>	Virchow	1
<i>Salmonella</i>	London	1	<i>Salmonella</i>	Weltevreden	1
<i>Salmonella</i>	Mbandaka	2	<i>Salmonella</i>	Unknown	22
<i>Salmonella</i>	Monophasic	32	Total		477

TABLE 14. SHIGELLA SEROGROUPS 1991-2007

<i>Shigella</i>																	
<i>Serogroups</i>	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<i>Boydii</i>		1			1	1				4	6	2		3	1	1	0
<i>Dysenteriae</i>	1	1				1										1	0
<i>Flexneri</i>	8	8	8		3	13	12	6	7	10	7	11	5	8	7	15	9
Group B						3		1	1						3		2
Group C				1													2
Group D		1		4	3	5		1					1				1
<i>Sonnei</i>	24	33	50	199	119	116	62	44	55	514	306	63	62	41	58	110	97
Unknown										41	46	46	25	12	7	7	0
TOTAL CASES	33	46	68	338	351	151	90	69	74	569	365	122	93	64	78	134	109

TABLE 15. COMMON NOTIFIABLE DISEASES BY COUNTY, 2007*

	AIDS (diagnosis)	HIV (diagnosis)	CAMPY	Chlamydia	CRYPTOSPOR	E.COLI SHGT	EHRlich HME	GIARDIA	Gonorrhea	H UREMIC SY	HEP A	HEP B	HEP B CHRON	LEGION	LIST	LYME	MENINGO.INF	MUMPS	PERTUSSIS	RABIES A	RMSF	SALM	SHIG	Syphilis	TB	Total
ADAIR	0	0	1	14	1	1	0	2	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	8
ADAMS	0	0	0	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
ALLAMAKEE	0	0	12	16	4	1	0	3	0	0	1	0	0	0	0	5	0	0	0	0	0	3	1	0	0	30
APPANOOSE	0	0	0	21	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	4
AUDUBON	0	0	1	7	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	7
BENTON	0	0	8	25	5	6	0	1	1	1	1	0	1	0	0	0	0	0	1	1	0	6	0	0	0	31
BLACK HAWK	0	5	18	740	1	5	0	13	233	0	2	2	16	0	0	0	0	4	3	0	0	25	0	5	2	91
BOONE	4	0	2	49	3	0	0	3	5	0	0	0	1	0	0	0	0	0	0	2	0	5	0	1	0	16
BREMER	0	0	2	27	1	3	0	2	3	0	0	0	2	0	0	1	0	0	0	2	0	1	0	1	0	14
BUCHANAN	0	0	11	21	8	2	0	1	3	0	0	0	1	2	0	0	0	1	0	1	0	2	0	0	0	29
BUENA VISTA	0	0	7	47	0	2	0	2	2	0	0	0	3	0	0	0	0	0	0	0	0	13	0	4	0	27
BUTLER	0	0	2	15	2	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	4	0	0	0	11
CALHOUN	0	0	3	13	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	6	0	0	0	11
CARROLL	0	0	1	17	18	1	0	1	3	0	0	0	2	0	0	0	1	2	10	0	0	7	0	0	0	43
CASS	0	0	0	24	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4
CEDAR	0	0	5	16	7	1	0	0	2	0	0	0	0	0	0	1	0	2	1	0	0	3	0	0	0	20
CERRO GORDO	0	0	10	104	27	1	1	2	12	0	0	0	2	1	1	0	0	0	1	1	0	9	0	0	1	58
CHEROKEE	0	0	2	9	0	0	0	1	2	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	6
CHICKASAW	0	0	6	13	1	1	1	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
CLARKE	0	0	1	18	1	0	0	0	7	0	0	0	1	0	0	1	0	0	1	0	1	1	0	0	0	7
CLAY	0	0	1	28	10	0	0	5	3	0	0	0	0	0	0	0	0	0	2	1	1	3	0	0	0	23
CLAYTON	0	0	5	20	4	6	1	2	0	0	1	0	2	0	0	6	0	0	0	0	0	2	0	1	0	29
CLINTON	0	0	7	160	1	3	0	2	19	0	0	1	3	0	0	2	0	0	0	0	0	7	3	0	0	30
CRAWFORD	0	0	5	48	2	1	0	3	8	1	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	16
DALLAS	0	0	3	70	2	5	0	2	12	0	0	0	4	0	0	1	0	0	0	0	0	9	1	1	0	27
DAVIS	0	0	1	7	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	2	1	0	0	0	7
DECATUR	0	0	1	18	2	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
DELAWARE	0	0	3	12	3	2	0	2	1	0	1	0	0	0	0	1	1	0	0	0	0	1	0	0	0	14
DES MOINES	0	0	13	159	8	4	0	2	64	0	0	0	3	0	0	1	0	0	0	0	0	2	1	0	1	35
DICKINSON	0	0	3	12	2	0	0	1	5	0	0	0	0	0	0	1	0	0	0	0	0	4	0	0	0	11
DUBUQUE	0	0	42	297	132	7	0	10	72	0	0	2	4	0	0	5	0	1	3	1	0	16	0	4	2	225
EMMET	0	0	1	20	9	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	17
FAYETTE	0	0	6	25	4	1	0	2	9	0	0	0	2	0	0	7	0	0	0	0	0	3	0	0	0	25
FLOYD	0	0	3	12	5	2	0	1	9	0	0	0	0	0	0	0	0	0	0	0	0	6	1	0	1	19
FRANKLIN	0	0	0	12	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
FREMONT	0	0	3	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	6
GREENE	0	0	0	12	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
GRUNDY	0	0	3	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4
GUTHRIE	0	0	1	5	1	2	0	0	0	0	0	0	1	0	0	0	1	0	2	0	0	0	0	0	0	8
HAMILTON	0	0	3	21	1	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	7
HANCOCK	0	0	3	9	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	7

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	AIDS (diagnosis)	HIV (diagnosis)	CAMPY	Chlamydia	CRYPTOSPOR	E. COLI SHGT	EHRLICH HME	GIARDIA	Gonorrhea	H UREMIC SY	HEP A	HEP B	HEP B CHRON	LEGION	LIST	LYME	MENINGO. INF	MUMPS	PERTUSSIS	RABIES A	RMSF	SALM	SHIG	Syphilis	TB	Total
HARDIN	0	0	0	20	1	0	0	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4
HARRISON	0	0	5	19	1	0	0	2	0	0	0	1	1	0	0	0	0	0	0	0	0	2	0	1	0	12
HENRY	0	0	2	50	3	0	0	2	14	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	1	11
HOWARD	0	0	3	8	0	1	1	1	1	0	0	0	2	0	0	2	0	0	1	1	0	1	0	0	0	13
HUMBOLDT	0	0	1	17	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
IDA	0	0	3	16	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
IOWA	0	0	4	17	4	7	0	1	1	1	0	0	0	0	0	8	0	0	0	2	0	3	0	0	0	30
JACKSON	0	0	9	41	7	2	0	3	3	0	0	0	2	0	0	3	0	0	0	0	0	3	0	0	0	29
JASPER	0	0	4	51	0	4	0	5	4	1	1	0	0	0	0	2	1	0	2	2	0	2	0	0	0	24
JEFFERSON	0	0	1	16	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	4	0	0	8	15
JOHNSON	0	7	27	493	13	12	0	21	62	0	1	3	19	0	1	28	0	2	8	0	0	12	8	12	2	160
JONES	0	0	8	28	7	2	0	2	4	0	1	0	0	0	0	0	0	0	0	0	0	4	0	0	0	24
KEOKUK	0	0	3	9	1	0	0	1	0	0	0	0	3	0	0	1	0	0	2	0	0	4	0	0	0	15
KOSSUTH	0	0	3	11	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	5
LEE	0	0	4	96	0	0	0	2	18	0	0	1	0	0	0	2	0	4	0	0	1	6	0	0	0	20
LINN	6	16	22	709	88	11	2	25	229	0	3	1	18	1	1	10	2	2	0	1	1	26	7	7	3	226
LOUISA	0	0	2	19	1	0	0	1	0	0	0	0	1	0	0	2	0	0	0	0	0	2	4	0	0	13
LUCAS	0	0	0	9	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
LYON	0	0	3	4	6	5	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	4	0	0	0	20
MADISON	0	0	1	23	0	3	0	2	8	0	0	0	1	0	0	0	0	0	0	0	2	4	0	0	0	13
MAHASKA	0	0	2	50	0	0	0	0	5	0	0	0	2	0	0	0	0	0	0	0	1	1	0	0	0	6
MARION	0	3	7	45	2	1	0	2	8	0	0	0	1	0	0	2	0	1	2	0	0	0	0	0	1	19
MARSHALL	0	0	2	126	3	5	0	4	9	0	1	1	4	1	0	1	1	1	1	1	0	9	0	0	1	36
MILLS	0	0	0	30	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	3	0	1	0	5
MITCHELL	0	0	6	6	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	7	0	0	0	17
MONONA	0	0	3	13	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	7
MONROE	0	0	1	9	0	0	0	1	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	4
MONTGOMERY	0	0	3	21	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	6
MUSCATINE	0	3	5	101	0	1	0	1	6	0	1	0	0	0	0	4	0	0	0	2	0	17	3	2	2	36
O'BRIEN	0	0	13	9	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	5	0	0	0	22
OSCEOLA	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
PAGE	0	0	3	30	1	0	0	0	2	0	0	0	1	1	0	0	0	0	0	0	2	1	0	0	0	9
PALO ALTO	0	0	1	13	1	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	4
PLYMOUTH	0	0	6	32	5	1	0	1	1	0	1	0	0	0	0	1	0	0	0	1	0	5	0	0	0	21
POCAHONTAS	0	0	1	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	4
POLK	25	44	32	1934	79	19	0	82	481	0	18	6	103	3	1	4	2	1	20	3	0	85	7	16	7	475
POTTAWATTAMIE	3	3	18	195	6	4	0	7	42	1	0	3	7	0	1	1	0	0	9	0	0	15	0	1	2	74
POWESHIEK	0	0	4	34	0	0	0	6	0	0	0	0	3	0	0	0	0	0	1	0	0	2	0	1	0	17
RINGGOLD	0	0	1	5	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4
SAC	0	0	8	12	2	4	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	16
SCOTT	10	12	18	864	4	1	0	6	306	1	1	2	10	0	0	2	1	4	62	0	0	17	55	3	1	185
SHELBY	0	0	1	18	10	0	0	1	2	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	14

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	AIDS (diagnosis)	HIV (diagnosis)	CAMPY	CHLAMYDIA	CRYPTOSPOR	E. COLI SHGT	EHRlich HME	GIARDIA	GONORRHEA	H UREMIC SY	HEP A	HEP B	HEP B CHRON	LEGION	LIST	LYME	MENINGO.INF	MUMPS	PERTUSSIS	RABIES A	RMSF	SALM	SHIG	SYPHILLIS	TB	Total
SIoux	0	0	12	24	32	4	0	4	2	0	0	0	1	0	0	0	0	0	0	1	0	14	0	1	2	70
STORY	0	0	8	264	17	3	0	9	30	1	0	0	18	1	1	2	2	0	1	1	0	8	11	1	1	85
TAMA	0	0	3	49	6	0	0	1	5	0	0	1	0	0	0	0	0	0	0	0	0	3	0	0	0	14
TAYLOR	0	0	2	7	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	6
UNION	0	0	1	19	0	0	0	2	1	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	6
VAN BUREN	0	0	0	8	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5
WAPELLO	0	0	2	111	1	0	0	6	5	0	0	0	0	0	0	1	0	0	0	0	0	4	0	0	0	14
WARREN	0	0	3	56	5	1	0	4	9	0	2	0	2	0	0	1	1	0	3	0	0	11	0	0	0	33
WASHINGTON	0	0	13	27	3	2	0	1	1	0	2	0	0	0	0	2	1	0	2	0	0	2	2	0	0	30
WAYNE	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
WEBSTER	0	0	5	175	7	2	0	6	54	0	0	1	3	1	1	2	0	1	0	0	0	4	0	0	0	33
WINNEBAGO	0	0	6	16	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
WINNESHIEK	0	0	11	30	4	2	0	1	2	0	1	0	0	0	0	3	0	0	1	0	0	4	5	0	0	32
WOODBURY	0	3	15	441	10	3	0	5	109	2	0	1	6	0	1	1	0	1	1	2	0	14	0	1	5	67
WORTH	0	0	1	5	2	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	6
WRIGHT	0	0	3	20	0	0	0	0	0	0	1	0	2	0	0	1	0	0	0	0	0	3	0	0	0	10
Total	66	127	524	8643	610	175	7	301	1928	10	48	27	269	12	8	124	15	27	150	31	17	477	109	64	43	2996

*Counties with fewer than three cases of HIV/AIDS were not listed in this table.

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