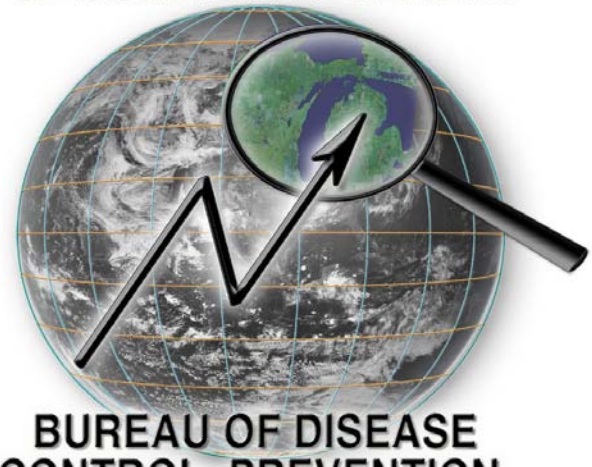
MICHIGAN DEPARTMENT OF COMMUNITY HEALTH



BUREAU OF DISEASE CONTROL, PREVENTION, AND EPIDEMIOLOGY

Reportable Infectious Diseases in Michigan, 2007–2011

Division of Communicable Disease

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Notice

As a cost-cutting measure, this document is only available in an electronic form on the Michigan Department of Community Health; Bureau of Disease Control, Prevention and Epidemiology; Division of Communicable Disease website. The *"Reportable Infectious Diseases in Michigan 2007–2011"* summary can be found at:

www.michigan.gov/cdinfo

The Michigan Department of Community Health would like to acknowledge Jennifer Beggs, Joel Blostein, Ed Hartwick, Jennifer Mills, Noreen Mollon, Susan Peters, and the Divisions of Communicable Disease and Immunization staff for their contributions to this summary.

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Introduction

Purpose

The purpose of this report is to provide trend information for over 80 reportable diseases and pathogens in the State of Michigan between 2007 and 2011. This report includes:

⇒ Table of reportable conditions 2007–2011 (counts and rates of yearly change)

⇒ Select reportable condition summaries

Surveillance of Communicable Diseases in Michigan

Health care providers, laboratories, and hospitals are required by the Michigan Complied Laws (Communicable Disease Rule, R 325.171–325.199) to report select infectious diseases and pathogens to health authorities. All Michigan local health departments are required to investigate cases of notifiable diseases and pathogens. Patient demographics, laboratory results, and other relevant data are reported to the Michigan Department of Community Health (MDCH) through the Michigan Disease Surveillance System (MDSS). MDSS is a centralized, statewide, web-based database utilized for reporting diseases in Michigan. It can be accessed internally and on-line by authorized public health officials. Internal security measures are in place to protect patient confidentiality. MDSS allows immediate communication among public health authorities regarding communicable disease investigations. Statistical summaries and reports can be generated to assist users with evaluating public health prevention and control measures. The list of reportable diseases in Michigan is regularly revised to include emerging and reemerging conditions that require monitoring and investigation. Please refer to (http://www.michigan.gov/documents/Reportable_Disease_Chart_2005_122678_7.pdf) for a current list of reportable diseases in Michigan.

Technical Notes

Prompt reporting by physicians, laboratories, and other health care professionals allows for timely and comprehensive investigations by local and state public health officials.

Select Reportable Condition Summaries

Diseases summaries are provided for select conditions based upon frequency of occurrence and public health importance. Please refer to (http://www.cdc.gov/osels/ph_surveillance/nndss/casedef/index.htm) for current case definitions.

Summaries of selected diseases include the following:

⇒ Causative agent

⇒ Clinical features

⇒ Mode of transmission

⇒ Period of communicability

⇒ Incubation period

⇒ Prevention

⇒ Demographic characteristics of reported cases between 2007 and 2011

⇒ Graphs of case counts reported by year

⇒ Map of disease incidence by county

Disease rates were calculated with population estimates (from year 2010) provided by the US Bureau of Census (http://factfinder2.census.gov). Michigan population size declined slightly from 2000 to 2010 with an estimated change in population (all ages) of -0.55%.

Unless otherwise noted, only confirmed and probable cases of disease were included in the demographic statistics. Therefore, the total number of cases reported during the 5-year period in the *''Table of Reportable Conditions 2007–2011"* may not match the total number of cases reported during the same period within the select reportable disease summaries. Demographic data tables include age, sex, race, and ethnicity. Presentation may vary slightly for each disease depending on the format of the information collected. For additional information, please contact the Michigan Department of Community Health; Bureau of Disease Control, Prevention, and Epidemiology; Division of Communicable Disease at (517) 335-8165.

Table of Reportable Conditions 2007-2011

Diseases	2011		2010		2009		2008		2007		Total	Mean 5 year	
	Cases	% Δ*	Cases	% Δ	Cases	% Δ	Cases	% Δ	Cases	% Δ	5 year cases	Cases	% Δ
Amebiasis	17	-0.41	29	0.12	26	-0.48	50	0.16	43	-0.26	165	33	-0.17
Anthrax	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0	0.00
Blastomycosis	15	0.36	11	-0.31	16	-0.38	26	0.63	16	-0.20	84	17	0.02
Botulism	0	-1.00	2	1.00	1	0.00	0	0.00	0	0.00	3	1	0.00
Brucellosis	2	-0.50	4	-0.60	10	9.00	1	-0.80	5	0.67	22	4	1.55
Campylobacter	1255	-0.04	1302	0.39	935	-0.09	1,032	0.16	890	-0.02	5,414	1,083	0.08
Chancroid	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0	0.00
Chickenpox (Varicella)[1]	1,036	-0.29	1,450	-0.23	1,889	-0.38	3,048	-0.27	4,191	-0.19	11,614	2,323	-0.27
Chlamydia (Genital)	50,063	-0.01	50,430	0.04	48,264	0.04	46,555	0.13	41,291	0.08	236,603	47,321	0.06
Cholera	1	0.00	0	-1.00	1	0.00	0	-1.00	1	0.00	3	1	-0.40
Coccidioidomycosis	38	0.73	22	-0.19	27	-0.33	40	0.54	26	-0.43	153	31	0.06
Creutzfeldt-Jakob Disease	16	-0.06	17	0.31	13	-0.13	15	0.07	14	1.00	75	15	0.24
Cryptosporidiosis	359	0.14	316	0.09	291	0.04	281	0.33	211	0.41	1,458	292	0.20
Cyclosporiasis	7	0.17	6	1.00	3	2.00	1	0.00	1	0.00	18	4	0.63
Dengue Fever	7	-0.22	9	0.50	6	-0.45	11	-0.15	13	0.44	46	9	0.02
Diphtheria	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0	0.00
Ehrlichiosis species	8	0.14	7	0.17	6	0.00	0	0.00	0	0.00	21	4	0.06
Encephalitis, Primary	24	0.20	20	1.00	10	-0.60	25	-0.19	31	-0.03	110	22	0.08
Encephalitis, California	1	-0.50	2	0.00	0	0.00	0	0.00	0	0.00	3	1	-0.10
Encephalitis, Eastern Equine	0	-1.00	3	0.00	0	0.00	0	0.00	0	0.00	3	1	-0.20
Encephalitis, Powassan	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0	0.00
Encephalitis, St. Louis	0	-1.00	2	0.00	0	0.00	0	0.00	0	0.00	2	0	-0.20
Encephalitis, Western Equine	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0	0.00
Encephalitis others	25	1.27	11	-0.15	13	0.30	10	0.00	16	0.00	75	15	0.28
Escherichia coli 0157:H7[2]	0	0.00	0	-1.00	59	-0.61	153	1.19	70	-0.08	282	56	-0.10
Giardiasis	552	-0.20	690	0.03	673	0.13	594	-0.04	619	-0.13	3,128	626	-0.04
Gonorrhea	13,070	-0.06	13,919	-0.10	15,539	-0.13	17,905	0.03	17,327	0.04	77,760	15,552	-0.04
Granuloma Inguinale	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0	0.00
Guillain-Barre Syndrome	77	0.31	59	-0.21	75	0.39	54	0.02	53	-0.02	318	64	0.10

*%Δ = Percent change from the number of cases reported during the previous year or period

Table of Reportable Conditions 2007 - 2011 cont.

Diseases	2011		2010		2009		2008		2007		Total	Mean 5 year	
	Cases	% Δ*	Cases	% Δ	Cases	% Δ	Cases	% Δ	Cases	% Δ	5 year cases	Cases	% Δ
H. influenzae Disease - Inv.[3]	14	1.33	6	-0.14	7	-0.13	8	-0.38	13	1.17	48	10	0.37
Hantavirus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0	0.00
Hemolytic Uremic Syndrome	9	-0.31	13	0.63	8	0.33	6	0.00	6	0.20	42	8	0.17
Hemorrhagic Fever	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0	0.00
Hepatitis A	80	-0.09	88	-0.03	91	-0.32	134	0.14	118	-0.13	511	102	-0.09
Hepatitis B (acute)[4]	90	-0.26	122	-0.08	132	-0.09	145	0.28	113	-0.33	602	120	-0.09
Hepatitis C (acute)[4]	30	-0.43	53	0.43	37	-0.72	131	0.38	95	-1.96	346	69	-0.46
Histoplasmosis	136	0.53	89	0.53	58	-0.38	93	-0.26	126	0.09	502	100	0.10
HIV Infection Stage 1-3	725	-0.06	768	-0.06	817	0.03	791	-0.01	799	-0.10	3,900	780	-0.04
HIV Infection Stage 3	423	-0.17	511	0.07	477	-0.13	546	-0.07	590	0.25	2,547	509	-0.01
Kawasaki	74	-0.04	77	0.05	73	0.01	72	0.00	70	-0.29	366	73	-0.05
Legionellosis	191	-0.02	195	0.10	178	-0.02	181	-0.04	189	0.09	934	187	0.02
Leprosy	0	0.00	0	-1.00	1	0.00	0	-1.00	2	0.00	3	1	-0.40
Leptospirosis	1	0.00	0	0.00	0	-1.00	1	-0.67	3	2.00	5	1	0.07
Listeriosis	37	0.12	33	0.18	28	0.40	20	-0.13	23	0.15	141	28	0.14
Lyme Disease	104	0.08	96	-0.07	103	0.12	92	0.35	68	0.21	463	93	0.14
Lymphogranuloma venereum	0	-1.00	1	0.00	0	0.00	0	0.00	0	0.00	1	0	-0.20
Malaria	35	0.03	34	0.06	32	0.88	17	-0.26	23	0.05	141	28	0.15
Measles	2	0.00	0	0.00	0	-1.00	4	0.33	3	2.00	9	2	0.27
Meningitis - Aseptic	908	0.00	908	0.09	832	-0.14	971	0.00	975	-0.14	4,594	919	-0.04
Meningitis - Bacterial Other	122	-0.16	146	-0.57	343	0.25	274	0.84	149	0.24	1,034	207	0.12
Meningococcal Disease	12	-0.45	22	0.05	21	-0.46	39	0.30	30	0.03	124	25	-0.11
Mumps[5]	21	-0.55	47	1.14	22	-0.44	39	0.34	29	-0.66	158	32	-0.03
Pertussis	691	-0.56	1,564	0.73	902	1.86	315	0.08	292	-0.54	3,764	753	0.32
Plague	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0	0.00
Polio	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0	0.00
Psittacosis	0	-1.00	1	0.00	0	0.00	0	0.00	2	0.00	3	1	-0.20
Q Fever	8	0.14	7	6.00	1	-0.50	2	0.00	2	-0.33	20	4	1.06
Rabies Animal	65	-0.10	72	0.09	66	-0.16	79	-0.61	202	3.12	484	97	0.47
Rabies Human	0	0.00	0	-1.00	1	0.00	0	0.00	0	0.00	1	0	-0.20

*%Δ = Percent change from the number of cases reported during the previous year or period

Table of Reportable Conditions 2007 - 2011 cont.

Diseases	2011		2010		2009		2008		2007		Total	Mean 5 year	
	Cases	% Δ*	Cases	% Δ	Cases	% Δ	Cases	% Δ	Cases	% Δ	5 year cases	Cases	% Δ
Reye Syndrome	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0	0.00
Rheumatic Fever	1	-0.80	5	1.50	2	-0.50	4	1.00	2	1.00	14	3	0.44
Rocky Mt Spotted Fever	4	1.00	2	-0.60	5	0.67	3	0.00	3	-0.40	17	3	0.13
Rubella	0	0.00	0	0.00	0	0.00	0	-1.00	3	2.00	3	1	0.20
Salmonellosis	852	-0.09	936	-0.02	951	0.01	945	-0.03	973	-0.02	4,657	931	-0.03
Shiga toxin, E. coli, Non O157[2]	0	0.00	0	-1.00	32	0.10	29	0.12	26	3.33	87	17	0.51
Shiga toxin, E. coli, Unspecified[2]	0	0.00	0	-1.00	43	0.26	34	-0.03	35	1.50	112	22	0.15
Shiga toxin-producing E. coli (STEC)[2]	156	0.12	139	138.00	1	0.00	0	0.00	0	0.00	296	59	27.62
Shigellosis	193	-0.27	263	0.22	216	-0.17	260	2.17	82	-0.45	1,014	203	0.30
Streptococcal Toxic Shock	6	5.00	1	0.00	0	-1.00	1	-0.50	2	0.00	10	2	0.70
Streptococcus pneumoniae, Drug Resistant	55	0.10	50	0.85	27	0.17	23	6.67	3	-0.84	158	32	1.39
Streptococcus pneumoniae, Inv[6]	668	-0.04	696	0.05	660	0.10	602	-0.07	649	0.09	3,275	655	0.03
Streptococcal Group A	294	0.63	180	0.13	160	-0.17	192	-0.08	209	0.05	1,035	207	0.11
Syphilis (Primary and Second-ary)	274	0.22	225	0.00	224	0.04	216	0.58	137	0.10	1,076	215	0.19
Tetanus	4	1.00	2	0.00	0	-1.00	1	0.00	0	-1.00	7	1	-0.20
Toxic Shock	5	-0.55	11	0.83	6	-0.40	10	0.25	8	0.00	40	8	0.03
Trachoma	1	-0.67	3	2.00	1	-0.50	2	-0.33	3	-0.25	10	2	0.05
Trichinosis	1	0.00	0	-1.00	1	0.00	0	0.00	0	0.00	2	0	-0.20
Tuberculosis[7]	170	-0.08	184	0.28	144	-0.23	188	-0.17	226	0.02	912	182	-0.04
Tularemia	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0	0.00
Typhoid Fever	6	0.00	6	-0.45	11	0.22	9	0.29	7	0.00	39	8	0.01
Typhus	0	-1.00	1	0.00	0	0.00	0	0.00	0	0.00	1	0	-0.20
Vancomycin Intermediate Staphylococcus Aureus (VISA)[8]	5	0.00	5	0.25	4	-0.33	6	2.00	2	-0.33	22	4	0.32

*%Δ = Percent change from the number of cases reported during the previous year or period

Table of Reportable Conditions 2007 - 2011 cont.

Diseases	2011		2010		2009		2008		2007		Total	Mean 5 year	
	Cases	% Δ*	Cases	% Δ	Cases	% Δ	Cases	% Δ	Cases	% Δ	5 year cases	Cases	% Δ
Vancomycin Resistant Staphylococcus Aureus (VRSA)[9]	0	0.00	0	-1.00	1	0.00	0	0.00	2	0.00	3	1	-0.20
Vibriosis (non-cholera)	10	0.11	9	3.50	2	-0.33	3	0.00	0	0.00	24	5	0.66
West Nile Virus	34	0.17	29	28.00	1	-0.95	20	0.00	20	-0.64	104	21	5.32
Yellow Fever	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0	0.00
Yersinia enteritis	26	0.73	15	-0.32	22	-0.04	23	0.00	23	-0.04	109	22	0.07

*%Δ = Percent change from the number of cases reported during the previous year or period

[1] Varicella case counts are mostly based on an aggregate number of cases reported weekly by schools.

[2] Beginning in 2010, three reportable conditions (Escherichia coli 0157:H7*; Shiga toxin, E. Coli, Non O157*; Shiga toxin, E. Coli, Unsp*) were consolidated into the single reportable condition: Shiga toxin-producing Escherichia coli (STEC).

[3] Only confirmed cases of invasive Haemophilus influenzae in children less than the age of 5 years were analyzed.

[4] Only confirmed acute cases of hepatitis B and C were analyzed.

[5] Confirmed, probable, and suspect cases of mumps were analyzed. "Suspect" is a new classification for mumps in the 2009 revision of the Council for State and Territorial Epidemiologists (CSTE) and Centers for Disease Control and Prevention (CDC) case definition.

[6] In 2007, the case definition of invasive Streptococcus pneumoniae was modified. Only confirmed cases in children less than the age of 5 are required to be reported to the CDC.

[7] Only confirmed cases of tuberculosis were analyzed.

[8] Only confirmed cases of VISA were analyzed.

[9] Only confirmed cases of VRSA were analyzed.

Select Reportable Disease Summaries

Amebiasis (Amoebiasis)

Causative agent: Amebiasis is caused by a one-celled protozoan parasite, *Entamoeba histolytica.*

Clinical features: About 10–20% of individuals infected with *E. histolytica* become sick and develop disease symptoms, which are often mild. Symptoms include loose stools, abdominal pain, and cramping. Amebic dysentery is a severe form of amebiasis associated with abdominal pain, bloody or mucoid stool, diarrhea, and fever. Rarely, *E. histolytica* may invade the liver, lungs or brain.

Mode of transmission: Infection is acquired via the fecal-oral route either by person-to-person contact or by eating or drinking contaminated food or water. Amebiasis is commonly reported in people who live in poor sanitary conditions.

Period of communicability: Disease transmission can occur as long as amebic cysts are present in the stool. Fecal shedding of amebic cysts may continue for years.

Incubation period: Incubation can last from days to months or years; however, the average period is 2–4 weeks.

High-risk groups: In the U.S., a higher rate of infection has been observed in immigrants from developing countries and in people who have traveled to endemic areas. Institutionalized individuals with poor sanitary conditions and men who have sex with men are also at increased risk.

Prevention of amebiasis: The risk of infection is low if the affected person is treated with antibiotics. Transmission can be reduced via good personal hygiene practices. Hygiene practices include thorough hand washing after using restrooms, changing diapers, before preparing food, and/or eating food. High-risk groups, such as men who have sex with men, should be educated in methods to prevent fecal-oral transmission. Travelers to countries where sanitary standards are poor can reduce their chances of acquiring amebiasis by:

⇒ Drinking only bottled or boiled (at lease one minute) water or carbonated beverages in cans or bottles. Do not drink fountain drinks or any drinks that contain ice cubes.

⇒ Dissolving iodine tablets in filtered water (1 tablet per Liter, allow water to stand for 10 minutes). Water should be filtered with an "absolute 1 micron" pore filter.

⇒ Do not eat fresh fruit and vegetables that you don't peel yourself.

⇒ Do not consume unpasteurized milk, cheese, or dairy products.

⇒ Do not eat anything sold by street vendors.

References: http://www.cdc.gov/parasites/amebiasis/index.html

American Public Health Association. Amebiasis. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 11–15.

Amebiasis (Amoebiasis)

Table 1. Demographic characteristics of amebiasis cases, Michigan 2007–2011

*N= 165	Number of Cases	Percent Total
Sex		
Male	96	58%
Female	69	42%
Race		
African American	20	12%
American Indian or Alaska Native	0	0%
Asian	31	19%
Caucasian	48	29%
Hawaiian or Pacific Islander	0	0%
Other	23	14%
Ethnicity		
Hispanic or Latino	21	13%
Age groups (years)		
1-9	27	16%
10-19	29	18%
20-29	31	19%
30-39	26	16%
40-49	22	13%
50-59	13	8%
60-69	12	7%
≥70	6	4%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

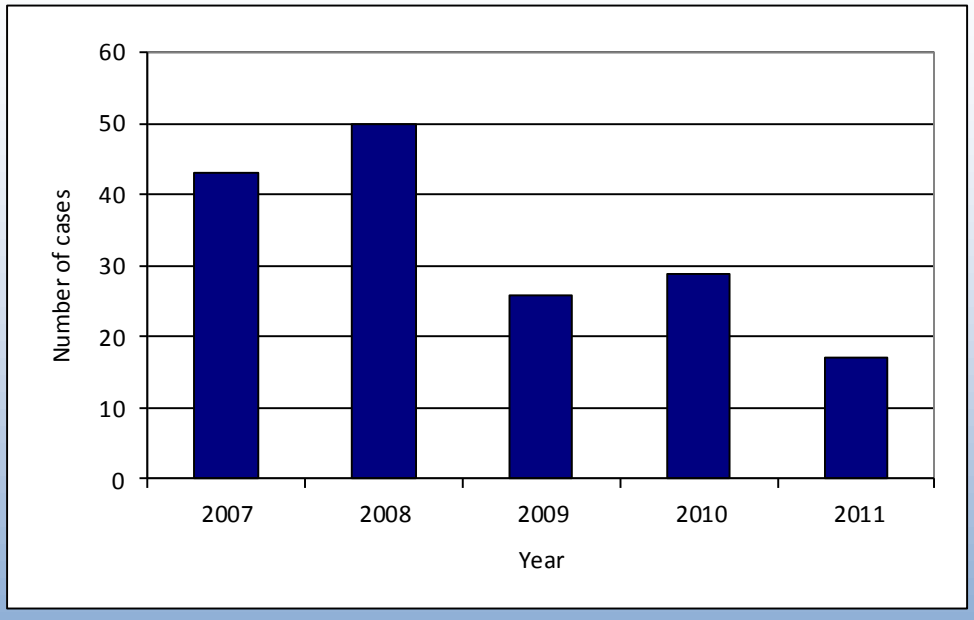


Figure 1. Number of amebiasis cases in Michigan, 2007–2011

Amebiasis (Amoebiasis)

Michigan statistics: Reported amebiasis during 2007–2011 totaled 165 cases. Cases were primarily men (58%). Age analysis of amebiasis showed that over three-fourths of reported cases were found to be in persons 1–49 years of age (16% age 1–9 years, 18% age 10–19, 19% age 20–29, 16% age 30–39, and 13% age 40–49). Caucasians (29%) and Asians (19%) had the highest incidence of disease. Thirteen percent of reported cases were Hispanic or Latino. The majority of cases were in Southern Michigan.

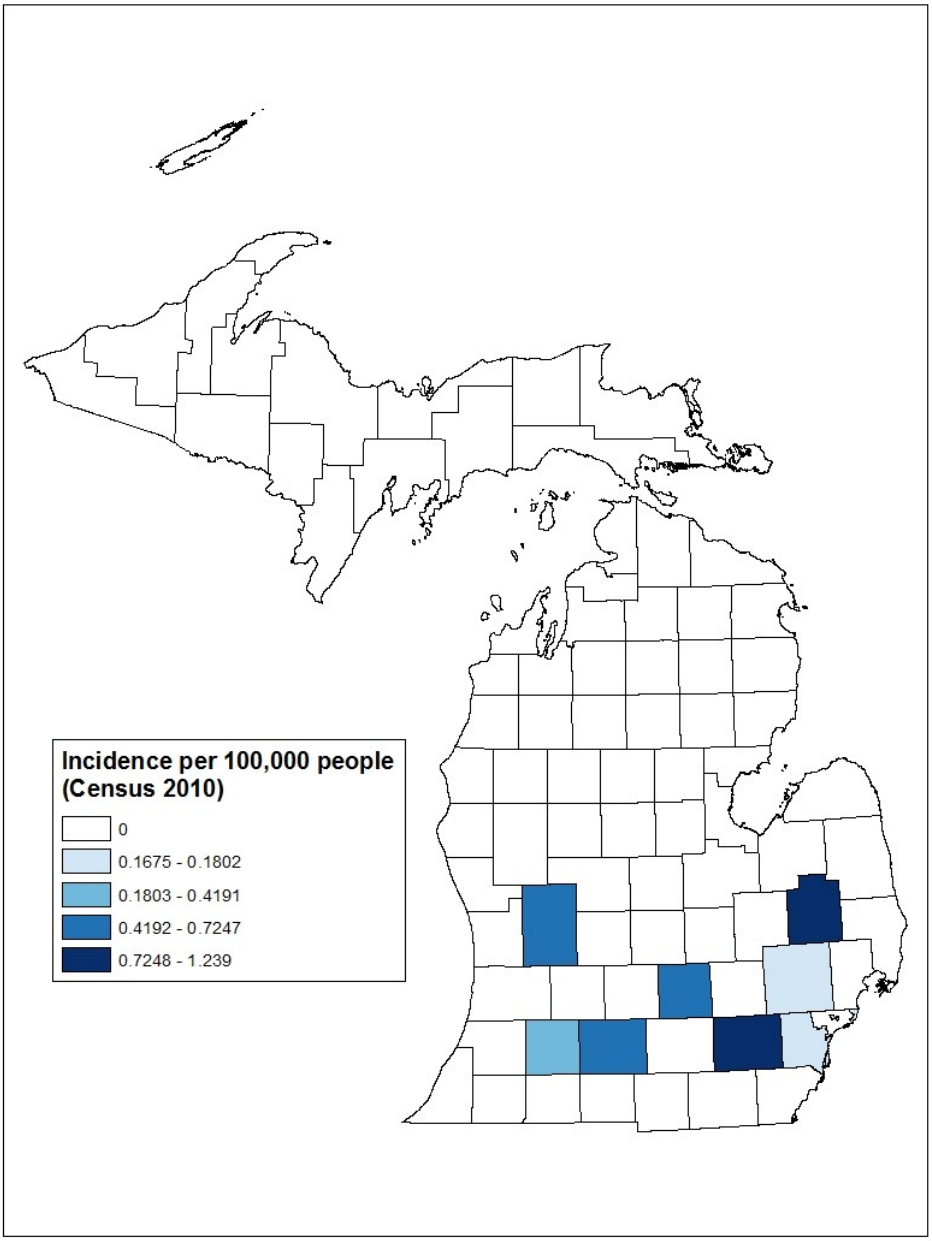


Figure 2. Incidence of amebiasis by county, Michigan 2011

Brucellosis

Causative agent: Brucellosis is an infectious disease caused by bacteria of the genus *Brucella*. These bacteria primarily cause disease among animals, however, humans can also become infected. Various *Brucella* species affect sheep, goats, cattle, deer, elk, pigs, dogs, and other animals.

Clinical features: Brucellosis is characterized by a continuous, intermittent or irregular fever. Other symptoms may include headache, weakness, sweating, chills, joint pain, depression, weight loss, and generalized aching. Infection may last for days to years if left untreated.

Mode of transmission: Brucellosis is spread to humans through contact or handling tissues (including placenta) and body fluids from infected animals. Person-to-person transmission is rare. Breast-feeding and sexual transmission has been reported. In the United States, consumption of unpasteurized milk or dairy products is a frequent means of transmission. The bacteria are highly infectious via aerosolization. Therefore, specialized handling in the laboratory is necessary. Brucellosis may be transmitted to humans if exposed to live brucellosis vaccine

Period of communicability: Period of communicability is uncertain due to rarity of human-to-human transmission.

Incubation period: Incubation is typically 5–60 days, however, symptoms may take months to develop once exposure has occurred. For both sexual and breast-feeding transmission, if the infant or person exposed is treated for brucellosis, their risk of becoming infected will probably be eliminated within 3 days.

High-risk groups: Persons at highest risk for brucellosis are those who work with infected animals such as veterinarians, farmers, butchers, and ranchers. Persons who consume raw dairy products made with unpasteurized milk are also at high-risk.

Prevention of brucellosis: The most successful way of preventing brucellosis in humans is to control disease in animals. The Brucellosis Eradication Program was established to eradicate the disease from cattle in the United States. From 1956 to 1998, the number of known brucellosis-affected herds decreased from 124,000 to 15. Individuals should avoid consuming raw milk or dairy products. Hunters and herdsman should wear gloves when handling viscera of animals. Risk of infection will be reduced if exposed persons or infants are immediately treated with antibiotics.

References: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/brucellosis_g.htm#faqgeneral

American Public Health Association. Brucellosis. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 87–90.

Brucellosis

Table 1. Demographic characteristics of brucellosis cases, Michigan 2007–2011

*N= 22	Number of Cases	Percent Total
Sex		
Male	15	68%
Female	7	32%
Race		
African American	0	0%
American Indian or Alaska Native	0	0%
Asian	1	5%
Caucasian	9	41%
Hawaiian or Pacific Islander	0	0%
Other	5	23%
Unknown	4	18%
Ethnicity		
Hispanic or Latino	12	55%
Age groups (years)		
1-9	2	9%
10-19	5	23%
20-29	2	9%
30-39	2	9%
40-49	1	5%
50-59	2	9%
60-69	4	18%
≥70	4	18%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

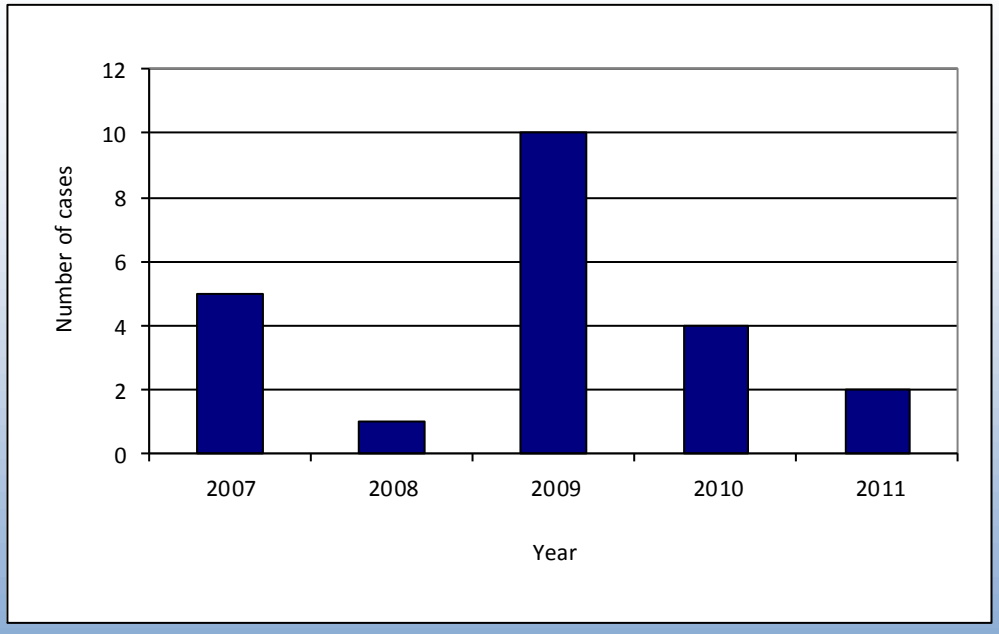


Figure 1. Number of brucellosis cases in Michigan, 2007–2011

Brucellosis

Michigan statistics: Reported brucellosis during 2007–2011 totaled 22 cases. Cases were primarily men (68%). Age analysis of brucellosis showed that over half of reported cases were found to be in children under 19 and persons 60 years and older (32% age 0 –19, 36% age 60+). Caucasians (41%) and Asians (5%) had the highest incidence of disease. Over one-half of reported cases were Hispanic or Latino (55%).

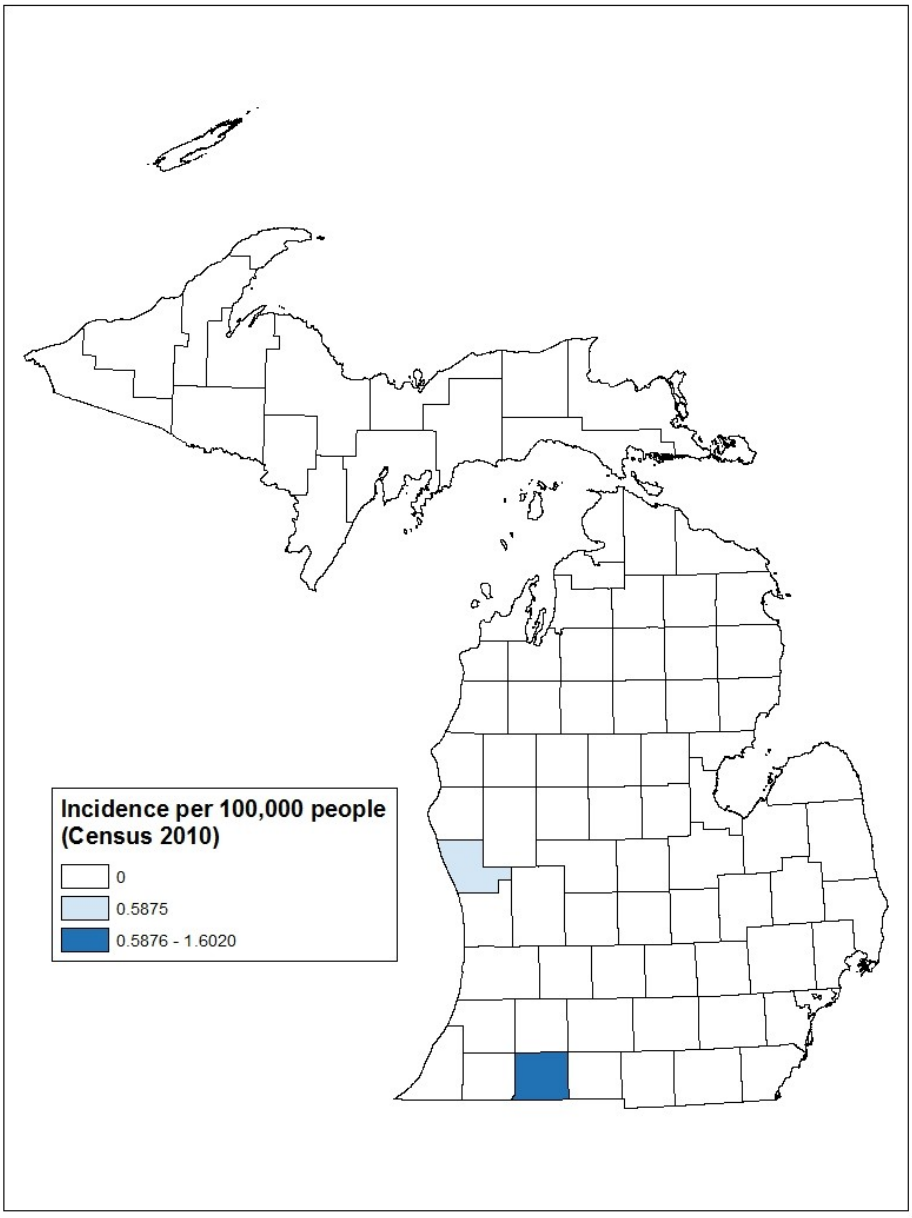


Figure 2. Incidence of brucellosis by county, Michigan 2011

Campylobacteriosis

Causative agent: Campylobacteriosis is caused by bacteria of the genus *Campylobacter.* Most human infections are caused by the species *Campylobacter jejuni.*

Clinical features: Most people with campylobacteriosis experience diarrhea (blood is often present), cramping, abdominal pain, nausea, vomiting, and fever. Illness typically lasts 1 week but relapse can occur. Some individuals infected with *Campylobacter* do not develop any signs or symptoms of the disease.

Mode of transmission: Consuming food or water that is contaminated by the feces of an infected person or animal spreads the bacteria. Most cases of campylobacteriosis are associated with eating raw or undercooked poultry meat or from cross-contamination of other foods by these items. Infants may get the infection by contact with poultry packages in shopping carts. Untreated water, unpasteurized dairy products, and contaminated poultry items are the main sources of infection.

Period of communicability: Infected persons can spread *Campylobacter* throughout their infection. Typical periods of communicability can range from 2 –7 weeks.

Incubation period: Symptoms typically develop in 2 to 5 days after exposure.

High-risk groups: Infants and young adults are diagnosed more frequently than any other age groups. Males are more likely to have identified infections than females. Travelers to endemic areas are at high-risk for exposure, as well as, persons who are immunocompromised.

Prevention of campylobacteriosis: All poultry product should be cooked to an internal temperature of 165°F. Meat thermometers should be used since meat color isn't a reliable indicator of "doneness". Separate cutting boards for meat preparation should be utilized while cooking. All cutting boards, utensils and countertops should be washed with soap and hot water after use. Thorough hand washing before and after handling raw meat products, dirty diapers, and pet waste is essential to prevention. Persons with diarrhea should wash their hands thoroughly and frequently with hot water and soap. Avoid consuming unpasteurized milk and untreated surface water.

References: http://www.cdc.gov/nczved/divisions/dfbmd/diseases/campylobacter/

American Public Health Association. Campylobacter enteritis. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 94–98.

Campylobacteriosis

Table 1. Demographic characteristics of campylobacteriosis cases, Michigan 2007–2011

*N= 5,414	Number of Cases	Percent Total
Sex		
Male	2648	49%
Female	2333	43%
Race		
African American	191	4%
American Indian or Alaska Native	21	0%
Asian	83	2%
Caucasian	3522	65%
Hawaiian or Pacific Islander	2	0%
Other	224	4%
Unknown	831	15%
Ethnicity		
Hispanic or Latino	139	3%
Age groups (years)		
<1	179	3%
1-9	713	13%
10-19	628	12%
20-29	563	10%
30-39	489	9%
40-49	683	13%
50-59	793	15%
60-69	568	10%
≥70	559	10%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

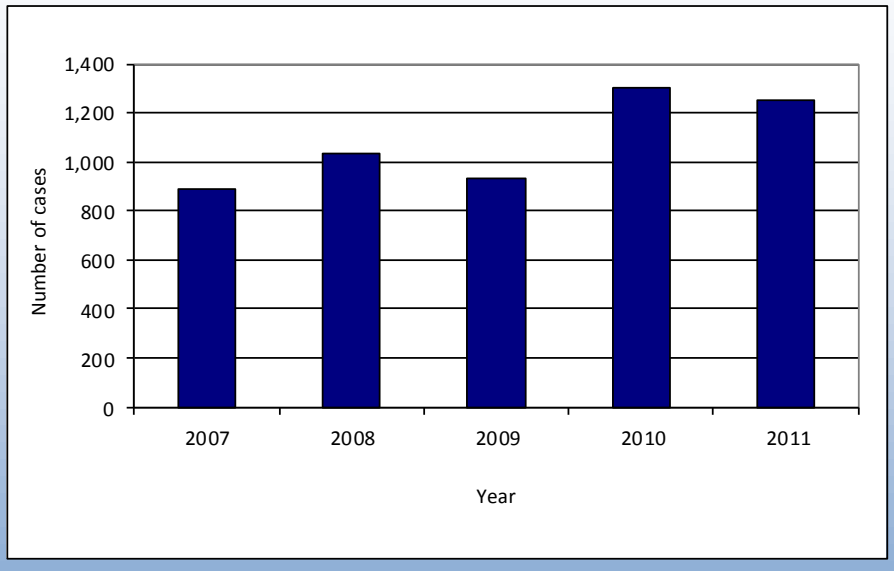


Figure 1. Number of campylobacteriosis cases in Michigan, 2007–2011

Campylobacteriosis

Michigan statistics: Campylobacteriosis was isolated in many counties throughout Michigan in 2011. For the past five years, 5,414 cases were detected. The majority of cases were male (49%). Almost two-thirds of Michigan cases were Caucasian (65%). Three percent of cases were Hispanic or Latino. Persons age 50–59 make up the majority of cases (15%). The second and third largest age groups infected were children 1 year to 9 years of age (13%) and persons 40–49 years of age (13%).

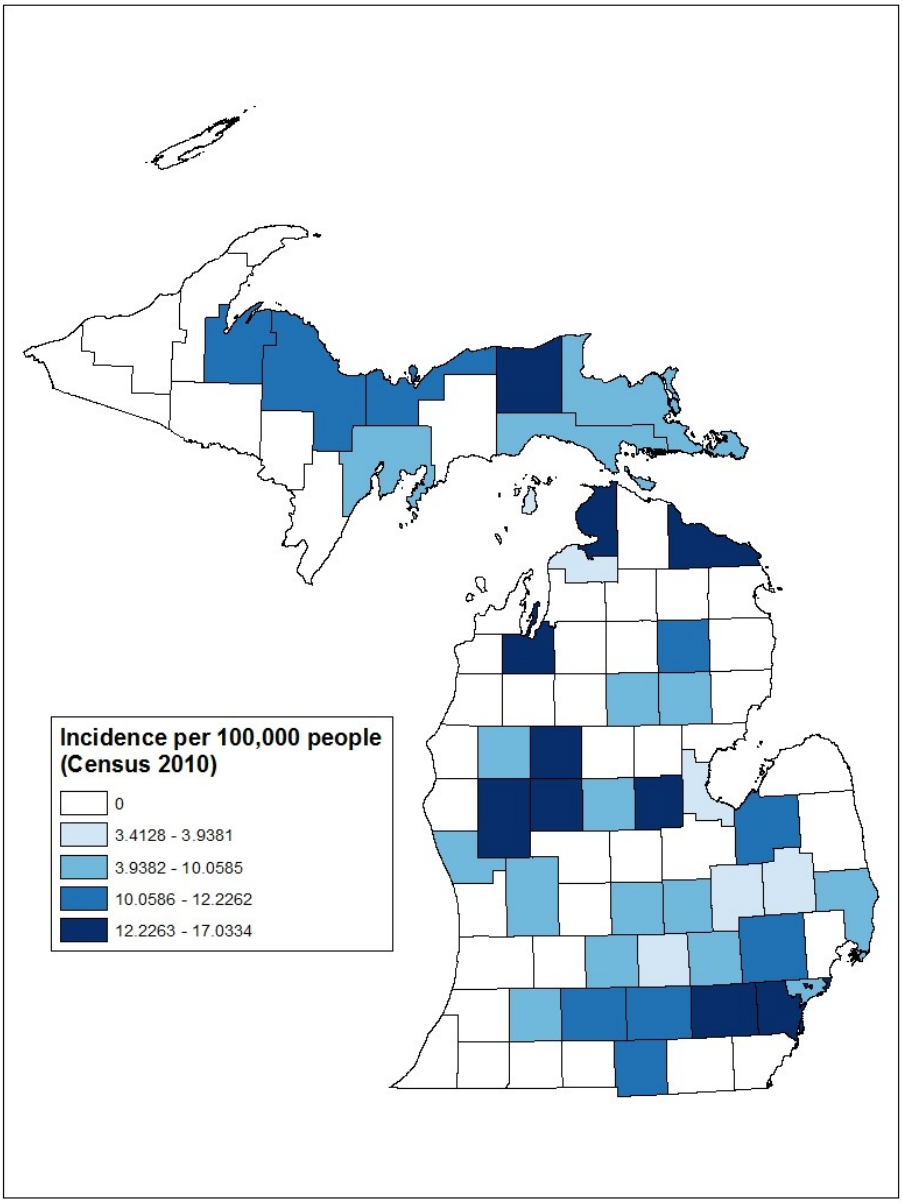


Figure 2. Incidence of campylobacteriosis by county, Michigan 2011

Chickenpox (Varicella)

Causative agent: Chickenpox is caused by the varicella-zoster virus (VZV), which is part of the herpes virus family.

Clinical features: Chickenpox is a viral infection that causes a red, itchy rash on the skin. The chickenpox rash usually appears first on the abdomen, back and/or face. The rash then spreads to the rest of the body, including the scalp, mouth, nose, ears, and genitals. Multiple small, red bumps that look like pimples or insect bites appear first. Thin-walled blisters filled with clear fluid arise from the bumps. The clear fluid can become cloudy. The blister wall breaks, leaving open sores, which finally crust over to become dry, brown scabs. One of the most characteristic features of the chickenpox rash is that all stages of the lesions can be present at the same time. Some children have a fever, abdominal pain or a vague sick feeling a day or two before the rash appears. The duration of illness usually lasts 7 to 10 days in children, but typically lasts longer in adults.

Mode of transmission: Chickenpox is spread by direct contact. The virus may be transmitted through airborne spread of secretions from the respiratory tract of an infected person. Also, indirect contact with articles freshly soiled with the discharges from blisters or vesicles of an infected person can transmit disease.

Period of communicability: The contagious period for chickenpox begins approximately 2 days before the rash appears and lasts until all the blisters are crusted over.

Incubation period: The incubation period for chickenpox is 10–21 days. Most symptoms appear in 14–17 days.

High-risk groups: Although it's more common in children under the age of 15, anyone can get chickenpox. Adults, infants, adolescents, and those with a weakened immune system are more likely to have complications or serious illness if infected with VZV. A person usually has only one episode of chickenpox in his or her lifetime.

Prevention of chickenpox: All children should receive 2 doses of varicella (chickenpox) vaccine, the first at dose at age 12–15 months and the second dose at 4–6 years of age. Vaccination is a requirement for school entry. Persons 13 years of age and older who have never had chickenpox or received varicella (chickenpox) vaccine should also receive 2 doses.

References: http://www.cdc.gov/vaccines/vpd-vac/varicella/default.htm

http://www.michigan.gov/documents/_1Chickenpox_153512_7.pdf

American Public Health Association. Chickenpox/herpes zoster. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 109–116.

Chickenpox (Varicella)

Michigan statistics: A total of 1,036 varicella cases were reported in 2011, representing a 29% decline from the 1,450 cases reported in 2010. Reported cases were evenly split between males and females. Age was reported for 1,029 (99.3%) of cases, and ranged from 1 month to 88 years, with a median of 8 years (mean 9.7 years). The largest proportion of cases was reported in the 5–9 year age group (35.9%), followed by the 10–19 year age group (32.4%). Overall, 930 (89.7%) of case reports included information about varicella vaccine history, of which 552 (59.3%) indicated prior receipt of at least 1 dose of varicella vaccine.

A total of 1,450 varicella cases were reported to MDCH in 2010, which represented a 23% decline from the 1,889 cases reported in 2010. Gender was reported for 1,413 (97.4%), with a slight preponderance of males (51%). Age was reported for 1,442 (99.4%); the median age was 9 years (mean age 10.7 years), and ranged from 1 month to 88 years. The largest proportion of cases was reported among the 10–19 years age group (589, 41%), followed by the 5–9 years age group (541, 38%). Overall 1,265 case reports (87.2%) included information about vaccine history, of which 876 (69.2%) indicated prior receipt of at least 1 dose of vaccine.

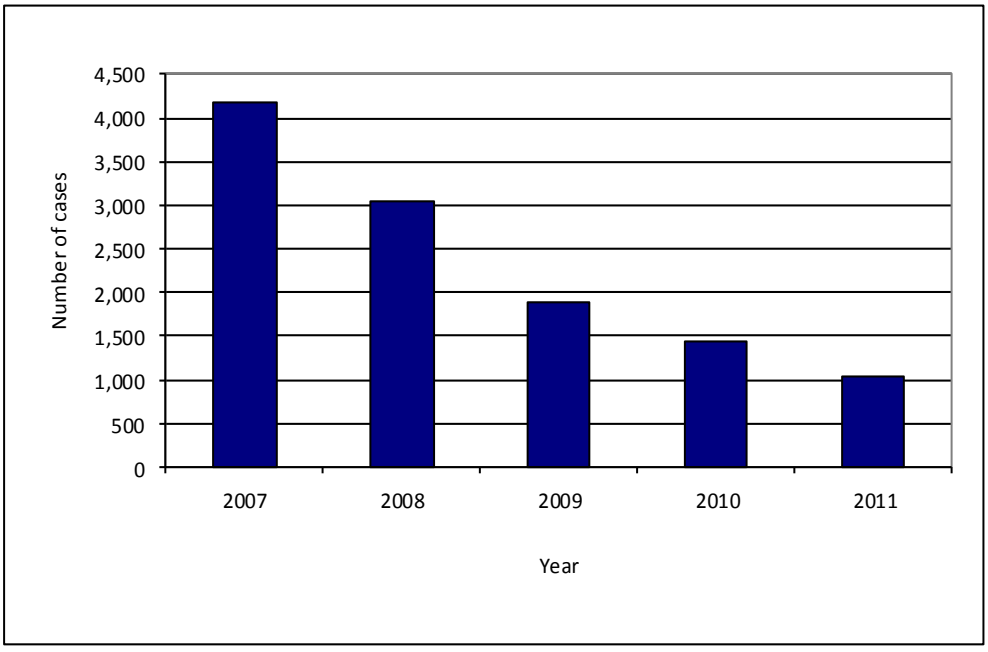


Figure 1. Number of chickenpox cases in Michigan, 2007–2011*

* Surveillance for chickenpox in Michigan depends mostly on school-based reporting. Schools report an aggregate number of cases on a weekly basis. Actual chickenpox incidence is believed to be substantially greater than reflected in reported figures due to under-reporting. MDCH estimates that approximately 26% of cases are reported.

Chlamydia

Causative agent: Chlamydia is a sexually transmitted infection caused by the bacteria *Chlamydia trachomatis*. The bacteria target the cells of the mucous membranes in the genital tract. In the United States, chlamydia is the most common bacterial sexually transmitted disease (STD), particularly among sexually active adolescents and young adults.

Clinical features: About 75% of women and 50% of men with chlamydia do not experience signs or symptoms of infection. In women, symptoms of chlamydia may include:

⇒ Unusual vaginal discharge

⇒ Bleeding after intercourse

⇒ Bleeding between menstrual periods

⇒ Abdominal or pelvic pain

In men, symptoms of chlamydia may include:

⇒ Discharge from the penis

⇒ Burning with urination

⇒ Swollen or painful testicles

Mode of transmission: Chlamydia can be transmitted during vaginal, anal, or oral sex. Chlamydia can also be passed from an infected mother to her baby during vaginal childbirth. Transmission occurs when the mucous membrane of an uninfected individual comes into contact with secretions of an infected person.

Period of communicability: The period of communicability is not known and re-infection frequently occurs.

Incubation period: If symptoms do occur, they usually appear within 1 to 3 weeks after exposure.

High-risk groups: Individuals who have unprotected sex, multiple sex partners, and sexual intercourse with an infected person are at high-risk for infection.

Prevention of chlamydia: High-risk sexual behavior should be avoided. Protected sex with the use of latex condoms during sexual intercourse can prevent infection. Regular screenings for sexually transmitted diseases are advised when unprotected sex is practiced, especially for those under the age of 25.

References: http://www.cdc.gov/std/chlamydia/default.htm

American Public Health Association. Chlamydial infections. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 116–119.

Chlamydia

Table 1. Demographic characteristics of chlamydia cases, Michigan 2011

*N= 50,063	Number of Cases	Percent Total
Sex		
Male	13,221	26%
Female	36,732	73%
Race		
African American	17,912	36%
Caucasian	10,866	22%
Other/ Multi	894	2%
Unknown	19,922	40%
Ethnicity		
Hispanic or Latino	1,069	2%
Age groups (years)		
0-4 years	11	0%
5-9 years	10	0%
10-14 years	662	1%
15-19 years	19,426	39%
20-24 years	18,877	38%
25-29 years	6,026	12%
30-34 years	2,556	5%
35-39 years	1,185	2%
40-44 years	583	1%
45-54 years	450	1%
55-64 years	107	0%
65 and over	31	0%
Unknown Age	139	0%
≥70	26	0%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

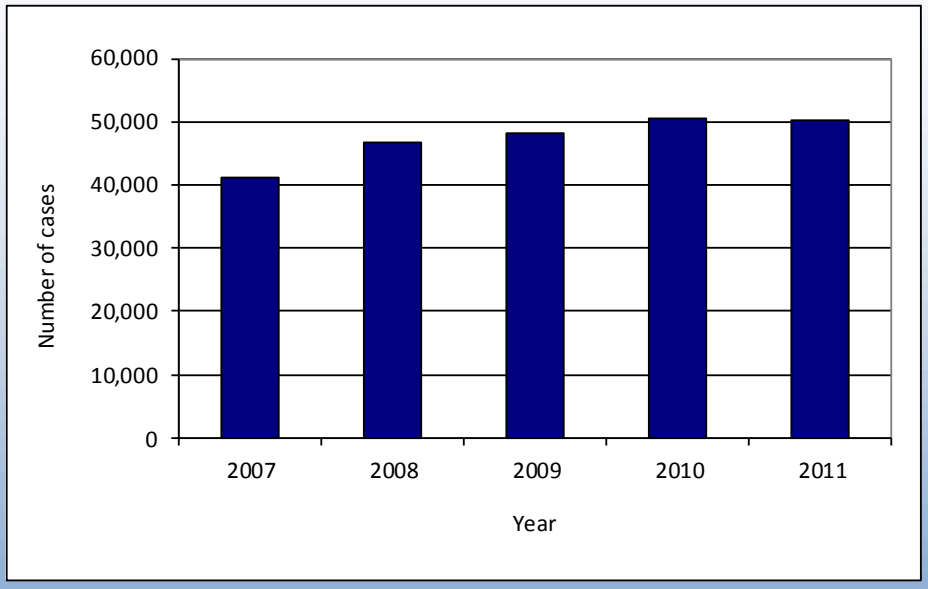


Figure 1. Number of chlamydia cases in Michigan, 2007–2011

Chlamydia

Michigan statistics: Chlamydial infections during 2011 totaled 50,063 cases. Cases were primarily female (73%). Age analysis of chlamydia demonstrated that 77% of reported cases were found to be in persons 15–19 years of age (39%) and 20–24 years (38%). African Americans (36%) and Caucasians (22%) had the highest incidence of disease. Two percent of cases were Hispanic or Latino. In 2011, the majority of chlamydial infections were found in the southern part of Michigan, concentrated in highly populated areas. The geographical distribution of chlamydia was similar to the pattern of gonorrhea, however, chlamydia infections were more evenly distributed statewide, even in rural counties.

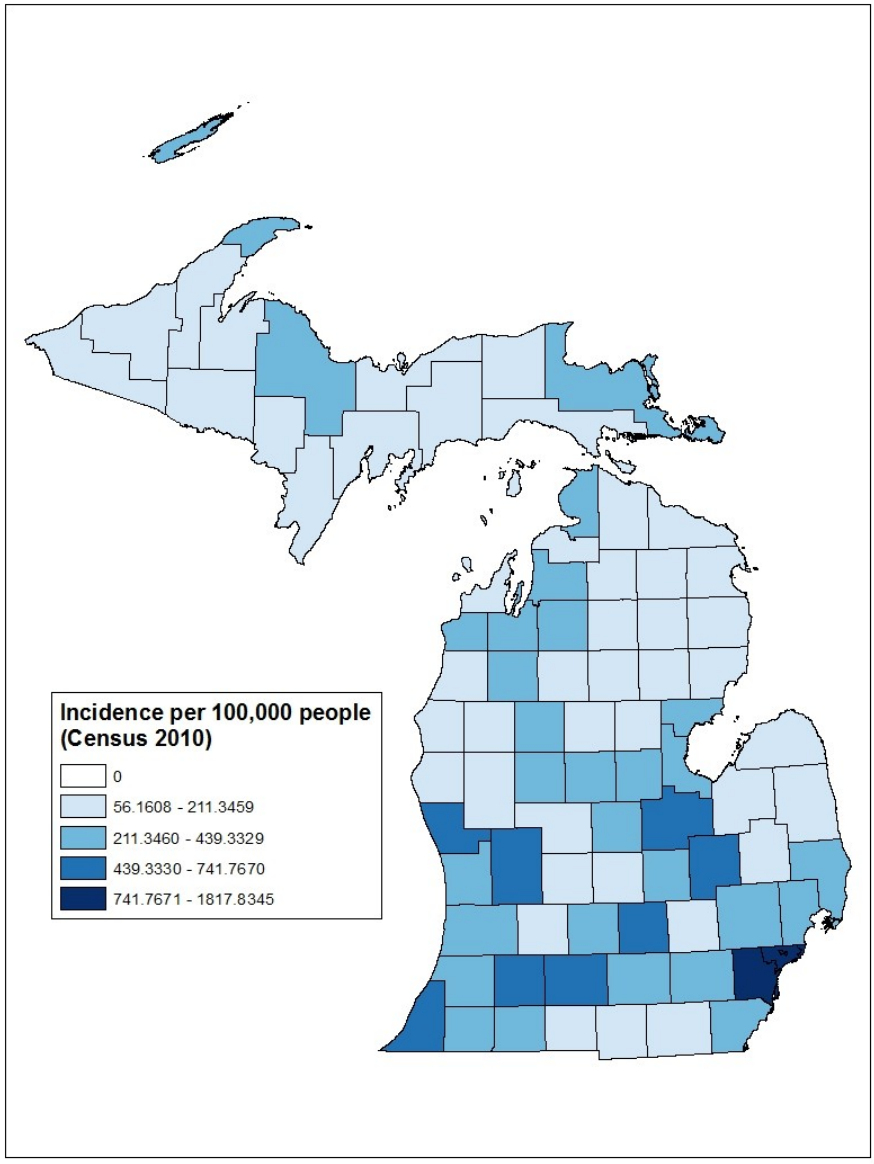


Figure 2. Incidence of chlamydia by county, Michigan 2011

Cryptosporidiosis

Causative agent: Cryptosporidiosis is a diarrheal illness caused by a single-cell parasite called *Cryptosporidium.* The parasite has a protective outer shell that enables it to persist in the environment and be resistant to chlorine bleach.

Clinical features: The usual symptoms of cryptosporidiosis are diarrhea, abdominal cramps, headache, nausea, vomiting, and a low-grade fever. Symptoms can last for days to four or more weeks and can be intermittent. Weight loss and dehydration is a common side effect of infection.

Mode of transmission: *Cryptosporidia* have been found in humans, cattle and other domestic mammals. In addition, *Cryptosporidia* may be found in soil, food, water, or surfaces that have been contaminated with the feces from infected humans or animals. Spreading occurs by:

⇒ Putting something in your mouth or accidentally swallowing something that has come in contact with the stool of an infected person or animal.

⇒ Swallowing recreational water contaminated with *Cryptosporidia*. Recreational water can be contaminated with sewage or feces from humans or animals.

⇒ Swallowing water or beverages contaminated by stool from infected humans or animals.

⇒ Eating uncooked food contaminated with *Cryptosporidia*. All fruits and vegetables should be thoroughly washed with uncontaminated water.

Period of communicability: Communicability lasts throughout an acute infection and as long as the organism persists in the stool, which may be as long as weeks after symptoms have ceased. *Cryptosporidia* can survive in a moist environment for 2 – 6 months.

Incubation period: Incubation period varies from 1 to 12 days with an average of 7 days.

High-risk groups: Anyone can get cryptosporidiosis. Persons more likely to become infected include children who attend daycare centers (especially diaper-aged children), childcare workers, parents of infected children, international travelers, backpackers, hikers, campers who drink unfiltered/ untreated water, swimmers who swallow water while swimming in lakes/ rivers/ ponds/ streams, and people who drink from shallow wells.

Prevention of cryptosporidiosis: Hands should be thoroughly washed with soap and water after using the toilet or after changing diapers and before handling or eating food (especially important for persons with diarrhea). Persons with diarrhea should not swim until two weeks after diarrhea has stopped (especially important for children wearing diapers). Do not drink or swallow untreated water from shallow wells, lakes, rivers, springs, ponds, or streams. Do not drink water or use ice cubes made during community-wide outbreaks of disease caused by contaminated drinking water.

References: http://www.cdc.gov/parasites/crypto/

American Public Health Association. Cryptosporidiosis. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 157–160.

Cryptosporidiosis

Table 1. Demographic characteristics of cryptosporidiosis cases, Michigan 2007–2011

*N= 1,458	Number of Cases	Percent Total
Sex		
Male	695	48%
Female	762	52%
Race		
African American	108	7%
American Indian or Alaska Native	11	<1%
Asian	11	1%
Caucasian	1,087	75%
Hawaiian or Pacific Islander	0	0%
Other	32	2%
Ethnicity		
Hispanic or Latino	35	2%
Age groups (years)		
<1	26	2%
1-9	292	20%
10-19	207	14%
20-29	209	14%
30-39	194	13%
40-49	160	11%
50-59	137	9%
60-69	124	9%
≥70	130	9%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

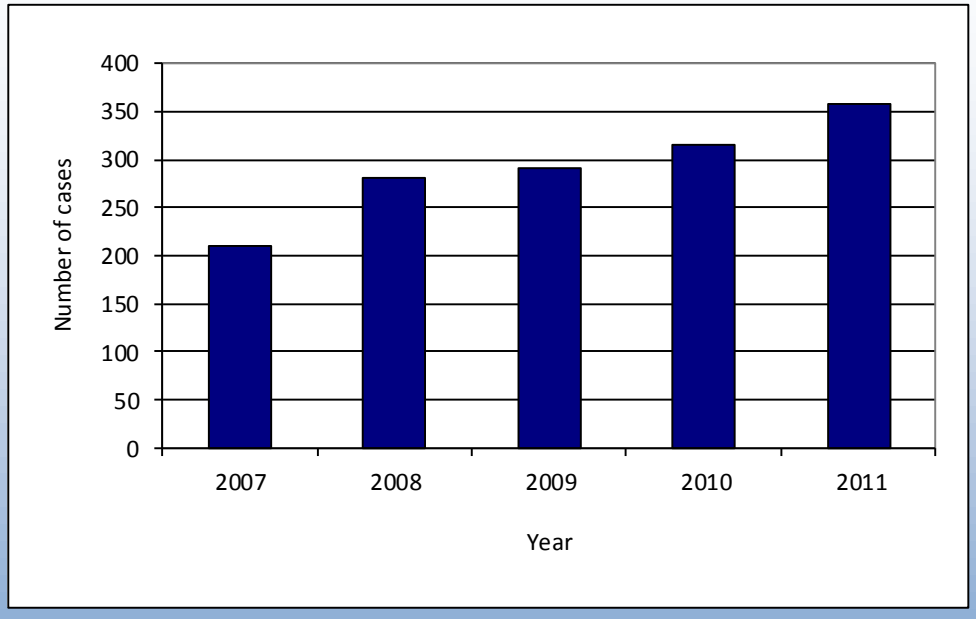


Figure 1. Number of cryptosporidiosis cases in Michigan, 2007–2011

Cryptosporidiosis

Michigan statistics: Cryptosporidiosis has been isolated in many counties throughout Michigan. A total of 1,458 cases were reported during 2007–2011. Males and females were similarly infected (48%, 52% respectively). Three-fourths of the cases were Caucasian (75%). Children between the ages of 1 to 9 years were reported most often (20%). Two percent of the cases were Hispanic or Latino.

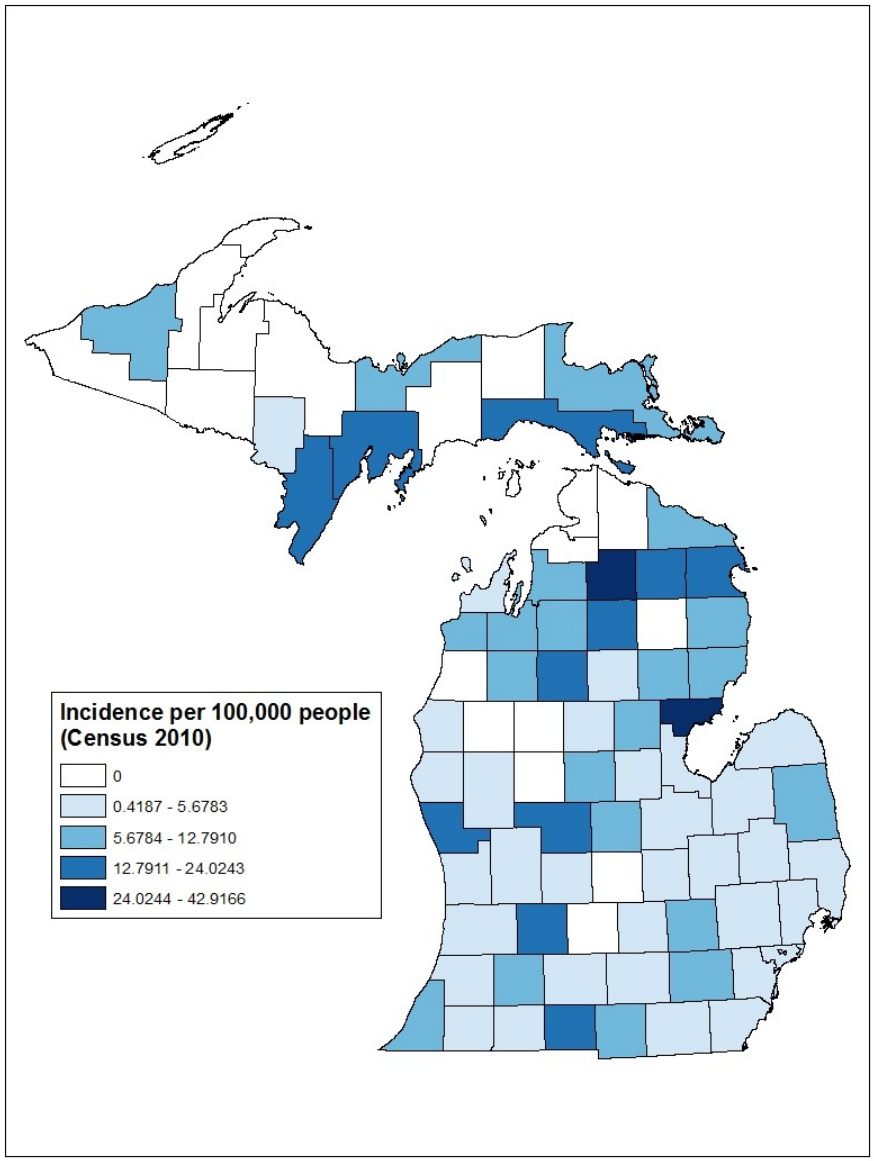


Figure 2. Incidence of cryptosporidiosis by county, Michigan 2011

Dengue Fever

Causative agent: Dengue is a mosquito-borne infection caused by four distinct but closely related viruses: DEN-1, DEN-2, DEN-3, DEN-4.

Clinical features: Dengue fever is a severe, flu-like illness that affects individuals of all age groups. The clinical features of dengue fever vary according to the age of the patient. Infants and young children may have a non-specific febrile illness with rash. Older children and adults may have either a mild febrile syndrome or the classical incapacitating disease with abrupt onset and high fever, severe headache, pain behind the eyes, muscle and joint pains, and rash. Dengue hemorrhagic fever is a potentially deadly complication that is characterized by high fever which lasts 2 to 7 days, often liver enlargement, hemorrhagic phenomena (such as bruising easily, bleeding from the nose or gums, and blood in vomit or feces), and in severe cases, circulatory failure. The illness commonly begins with a sudden rise in temperature accompanied by facial flush and other non-specific symptoms of dengue fever.

Mode of transmission: Dengue viruses are transmitted to humans through the bites of infective female *Aedes* mosquitoes. Mosquitoes generally acquire the virus while feeding on the blood of an infected person. After virus incubation for 8–10 days, an infected mosquito is capable, during probing and blood feeding, of transmitting the virus to susceptible individuals for the rest of its life. Infected female mosquitoes may also transmit the virus to their offspring by transovarial (via the eggs) transmission. However, the role of this in sustaining transmission of virus to humans has not yet been explained.

Period of communicability: No person-to-person transmission has been documented. Patients are infective for mosquitoes from shortly before the febrile period to the end of symptoms, usually 3–5 days. The mosquito becomes infective 8–12 days after the viremic blood meal and remains so for life.

Incubation period: Incubation last from 3–14 days, with an average of 4–7 days.

High-risk groups: Anyone who is bitten by an infected *Aedes* mosquito can get dengue fever. Risk factors for dengue hemorrhagic fever include a person's age and immune status, as well as the type of infecting virus. Persons who were previously infected with one type of dengue virus will have immunity to that specific type for life. However, they will have no immunity to the 3 other types of virus. Therefore, a person can be infected up to 4 times (once with each serotype).

Prevention of dengue fever: There is no vaccine to prevent dengue. Avoiding mosquito bites by using mosquito repellent and protective clothes when traveling to areas where dengue occurs may decrease the likelihood of transmission.

References: http://www.cdc.gov/Dengue/

American Public Health Association. Dengue fever. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 164–171.

Dengue Fever

Table 1. Demographic characteristics of dengue fever cases, Michigan 2007–2011

*N= 46	Number of Cases	Percent Total
Sex		
Male	24	52%
Female	22	48%
Race		
African American	1	2%
American Indian or Alaska Native	0	0%
Asian	6	13%
Caucasian	24	52%
Hawaiian or Pacific Islander	0	0%
Other	4	9%
Ethnicity		
Hispanic or Latino	4	9%
Age groups (years)		
0-9	2	4%
10-19	4	9%
20-29	9	20%
30-39	12	26%
40-49	6	13%
50-59	8	17%
60-69	4	9%
≥70	1	2%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

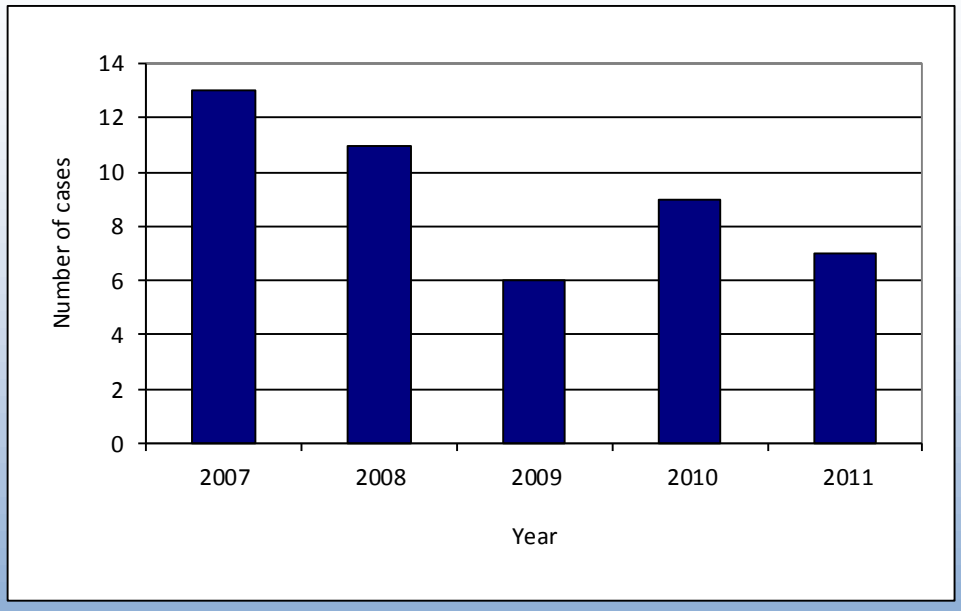


Figure 1. Number of dengue fever cases in Michigan, 2007–2011

Dengue Fever

Michigan statistics: Forty-six cases of dengue fever were reported during 2007–2011. None of the cases were acquired domestically. The majority of cases occurred in Caucasians (52%) and Asians (13%). Four cases were Hispanic or Latino. Over one-fourth of cases were persons between the ages of 30–39 years (26%).

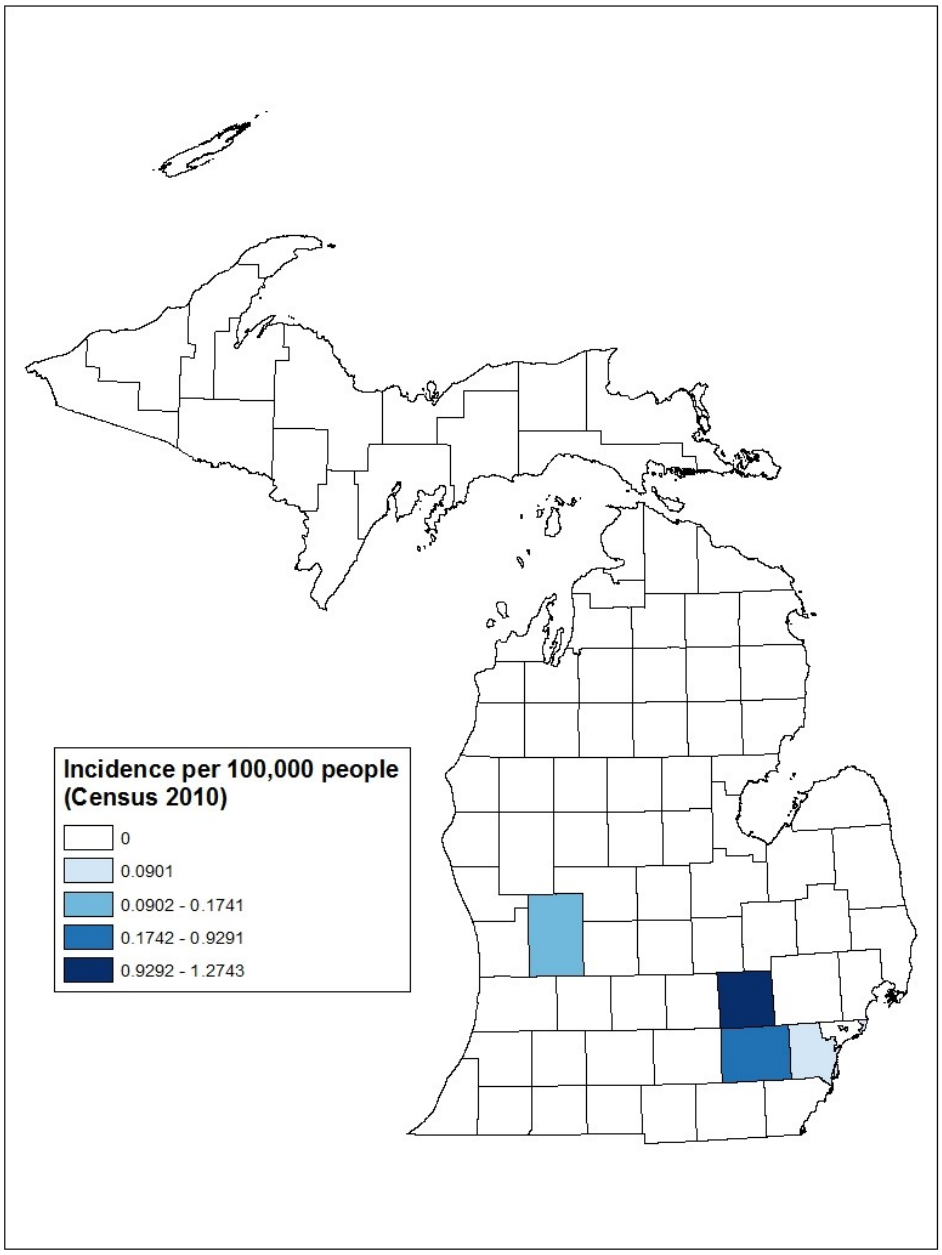


Figure 2. Incidence of dengue fever by county, Michigan 2011

Escherichia coli 0157:H7

Causative agent: *Escherichia coli* (*E. coli)* O157:H7 is one of hundreds of strains of *E.coli*. Although most strains do not cause disease and may live in the intestines of healthy humans and animals, the *E. coli* O157:H7 strain produces a powerful toxin and can cause severe gastrointestinal illness.

Clinical features: *E. coli* O157:H7 infection often results in severe bloody diarrhea and abdominal cramps. However, some *E. coli* infections will have no symptoms. In some cases, particularly children under 5 years of age and the elderly, the infection can cause a complication called hemolytic uremic syndrome (HUS), where severe anemia and kidney failure can occur. About 5%–10% of infections lead to HUS. In the United States, HUS is the principal cause of acute kidney failure in children and most cases are due to *E. coli* O157:H7 infection.

Mode of transmission: The organism may be found in the intestines of healthy cattle and meat can become contaminated during slaughter. Consumption of undercooked meat (especially ground beef), unpasteurized milk, unpasteurized apple cider, soft cheeses made from raw milk, or other contaminated food or water can cause infection. Other known sources of infection are contact with cattle or coming into contact with the feces of infected people. Swallowing contaminated lake water while swimming, touching the environment in petting zoos and other animal exhibits, and by eating food prepared by people who did not thoroughly wash their hands after using the toilet have been documented.

Period of communicability: The duration of excretion of the pathogen is typically one week or less in adults. One-third of children may excrete the pathogen for up to 3 weeks. Prolonged carriage is uncommon, although young children can shed the bacteria longer than adults.

Incubation period: The incubation period is usually 3–4 days but can be as short as 12 hours or as long as 10 days.

High-risk groups: Anyone can become infected. Elderly, children under the age of 5, and the immunocompromised are more susceptible.

Prevention of *E. coli* O157:H7

⇒ Hand washing thoroughly after using the bathroom, changing diapers or after contact with animals or their environment (e.g., farms, petting zoos ,and your backyard), before preparing food, or eating is critical to prevention.

⇒ Cook meats thoroughly. Ground beef and meat that has been needle tenderized should be cooked to an internal temperature of 160°F/70°C. Meat thermometers should be used since meat color isn't a reliable indicator of "doneness".

⇒ Avoid raw milk, unpasteurized dairy products, and unpasteurized juices (e.g., fresh apple cider).

⇒ Avoid swallowing water when swimming or playing in lakes, ponds, streams, swimming pools, and backyard "kiddie" pools.

⇒ Prevent cross contamination in food preparation areas by thoroughly washing hands, counters, cutting boards, and utensils after they touch raw meat.

References: http://www.cdc.gov/ecoli/

American Public Health Association. Diarrhea caused by *Escherichia coli*. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 181–195.

Escherichia coli

Table 1. Demographic characteristics Shiga toxin-producing E. coli (STEC) cases, Michigan 2011

[1]N= 156	Number of Cases	Percent Total
Sex		
Male	66	42%
Female	90	58%
Race		
African American	7	4%
American Indian or Alaska Native	0	<1%
Asian	1	1%
Caucasian	116	74%
Hawaiian or Pacific Islander	0	0%
Other	3	2%
Ethnicity		
Hispanic or Latino	3	2%
Age groups (years)		
<1	2	1%
1-9	32	21%
10-19	37	24%
20-29	21	13%
30-39	13	8%
40-49	14	9%
50-59	12	8%
60-69	16	10%
≥70	10	6%

[1] totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

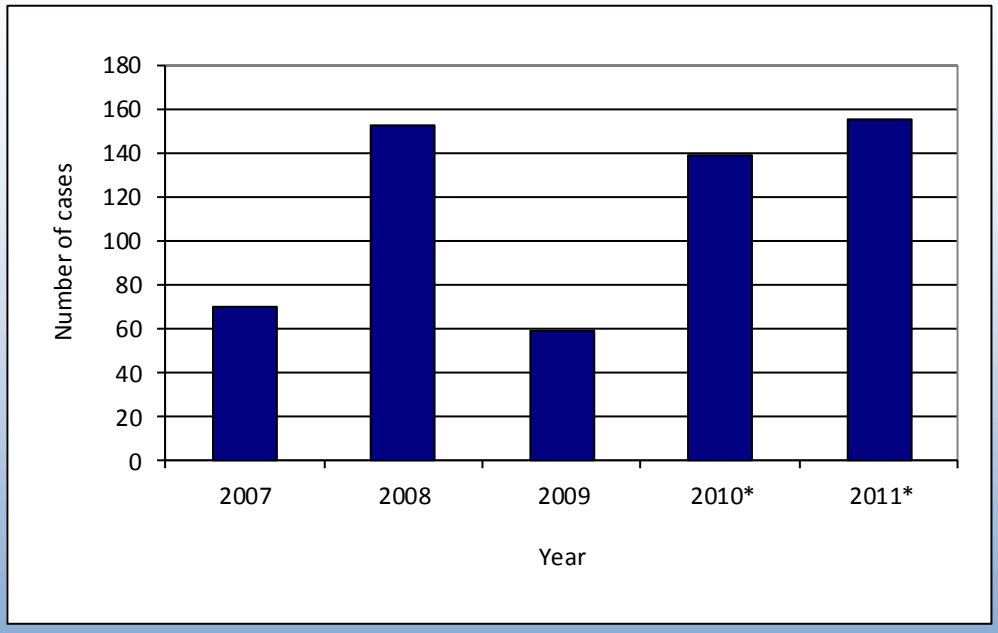


Figure 1. Number of E. coli cases in Michigan, 2007–2011

Beginning in 2010, 3 Reportable Conditions (Escherichia coli 0157:H7; Shiga toxin, E. Coli, Non O157*; Shiga toxin, E. Coli, Unsp*) were consolidated into the single Reportable Condition Shiga toxin-producing Escherichia coli --(STEC).

Escherichia coli

Michigan statistics: Beginning in 2010, three reportable conditions (Escherichia coli 0157:H7*; Shiga toxin, E. Coli, Non O157*; Shiga toxin, E. Coli, Unsp*) were consolidated into the single reportable condition: Shiga toxin-producing Escherichia coli (STEC). There was no change in the overall case definition for STEC, only a collapsing of serotype-based subcategories of STEC.

Reported *E. coli* infection totaled 156 cases during 2011. Cases were primarily female (58%). Age analysis of *E. coli* showed that almost one-half of reported cases were found to be in persons 1–19 years old (24% age 10–19, 21% age 1–9). Caucasians (74%) had the highest incidence of disease. Two percent of cases were Hispanic.

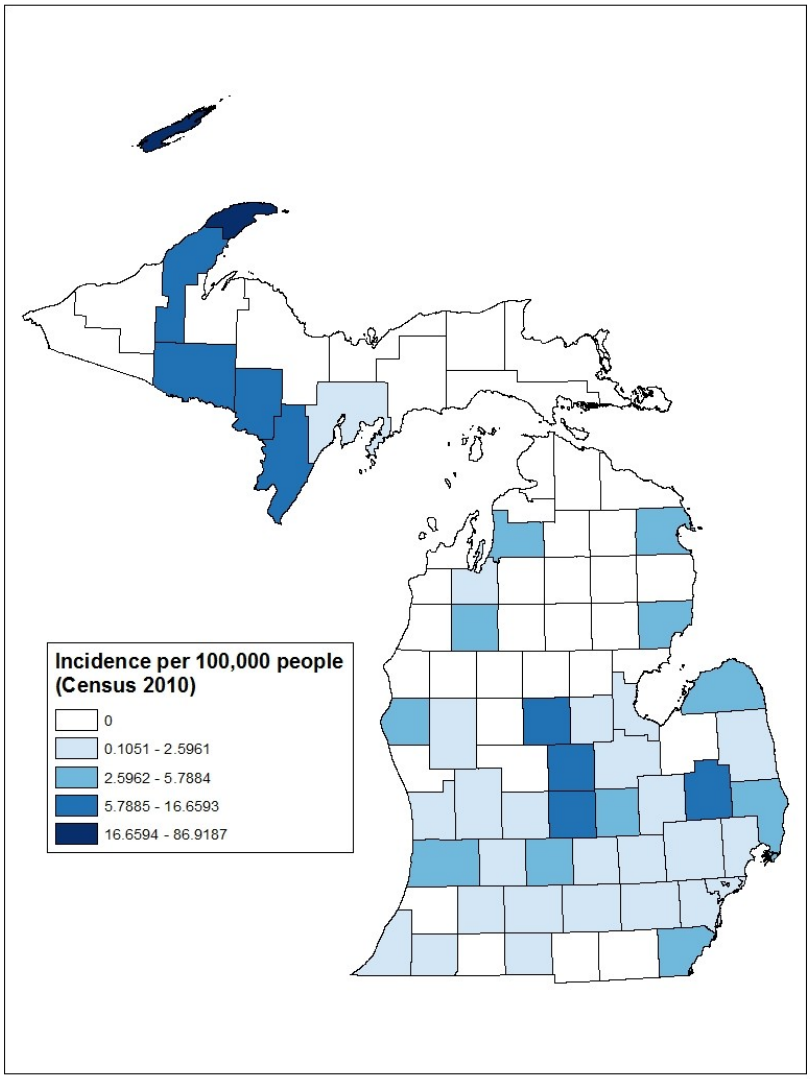


Figure 2. Incidence of *E. coli* by county, Michigan 2011

Giardiasis

Causative agent: Giardiasis is a diarrheal illness caused by a microscopic parasite called *Giardia*. Humans are the main host of *Giardia.* *Giardia* cysts can be found in domestic and wild animals including dogs and beavers.

Clinical features: *Giardia* infection can cause a variety of intestinal symptoms including diarrhea, gas or flatulence, greasy stools that tend to float, stomach cramps, upset stomach, and nausea. These symptoms may lead to weight loss and dehydration. Some people with giardiasis do not develop any symptoms.

Mode of transmission: *Giardia* is passed in the feces of an infected person or animal. The disease can spread by either the ingestion of contaminated food or water from an infected person by the fecal-oral route or from the accidental swallowing of giardia picked up from surfaces (e.g., changing tables, diaper pails, or toys) contaminated with feces from an infected person.

Period of communicability: The infection can be transmitted for as long as the person is shedding the organism in the feces.

Incubation period: Incubation is usually 1 to 2 weeks (average 7 days) after becoming infected.

High-risk groups: Anyone can get giardiasis. Persons more likely to become infected include:

⇒ Children who attend daycare centers, especially diaper-aged children

⇒ Child care workers or parents of infected children

⇒ International travelers

⇒ Backpackers, hikers, and campers who drink unfiltered or untreated water

⇒ Swimmers who swallow water while swimming in lakes, rivers, ponds, and streams

⇒ People who drink from shallow wells

Prevention of giardiasis: Practice good hygiene:

⇒ Hand washing after using the toilet and after every diaper change and before handling or eating food is critical to prevention.

⇒ Persons with diarrhea should not swim (essential for children).

⇒ Do not drink untreated water from shallow wells, lakes, rivers, springs, ponds, or streams.

⇒ Do not drink untreated water or use ice cubes when traveling in countries where the water supply might be unsafe or if there is a community-wide outbreak of disease caused by contaminated drinking water.

⇒ Wash all raw vegetables and fruits with uncontaminated water before consuming.

⇒ Avoid fecal exposure during sexual activity.

References: http://www.cdc.gov/ncidod/dpd/parasites/giardiasis/factsht_giardia.htm

American Public Health Association. Giardiasis. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 258–260.

Giardiasis

Table 1. Demographic characteristics of giardiasis cases by year, Michigan 2007–2011

*N= 3,128	Number of Cases	Percent Total
Sex		
Male	1,766	56%
Female	1,358	43%
Race		
African American	306	10%
American Indian or Alaska Native	12	0%
Asian	219	7%
Caucasian	1625	52%
Hawaiian or Pacific Islander	1	0%
Other	271	9%
Ethnicity		
Hispanic or Latino	114	4%
Age groups (years)		
<1	55	2%
1-9	873	28%
10-19	395	13%
20-29	354	11%
30-39	363	12%
40-49	397	13%
50-59	351	11%
60-69	215	7%
≥70	181	6%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

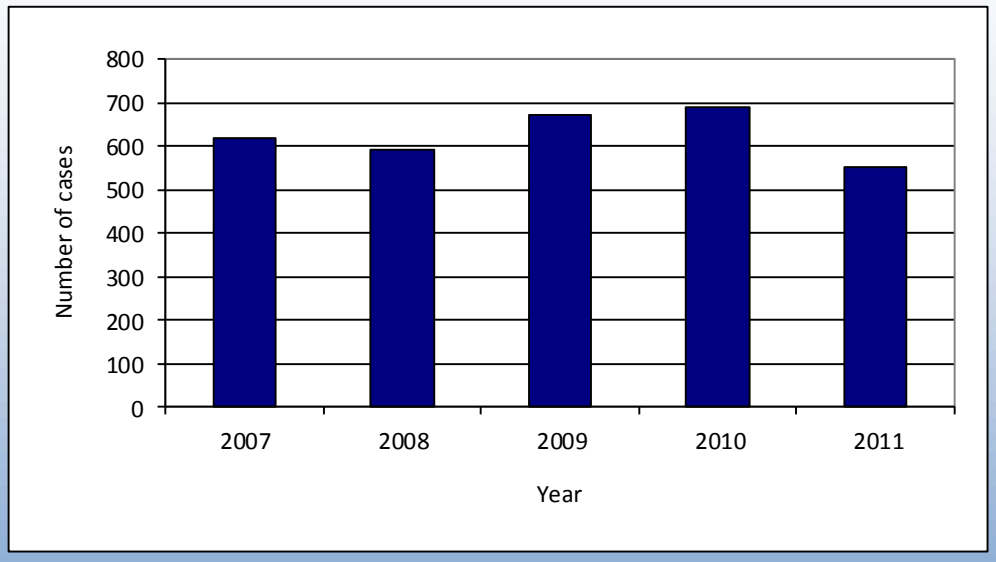


Figure 1. Number of giardiasis cases in Michigan, 2007–2011

Giardiasis

Michigan statistics: A total of 3,128 cases were reported during 2007–2011. Nearly one-third (28%) of all giardiasis cases were reported in persons aged 1 to 9 years of age. Fifty-six percent of cases were male while 43% were female. Four percent of cases were Hispanic or Latino.

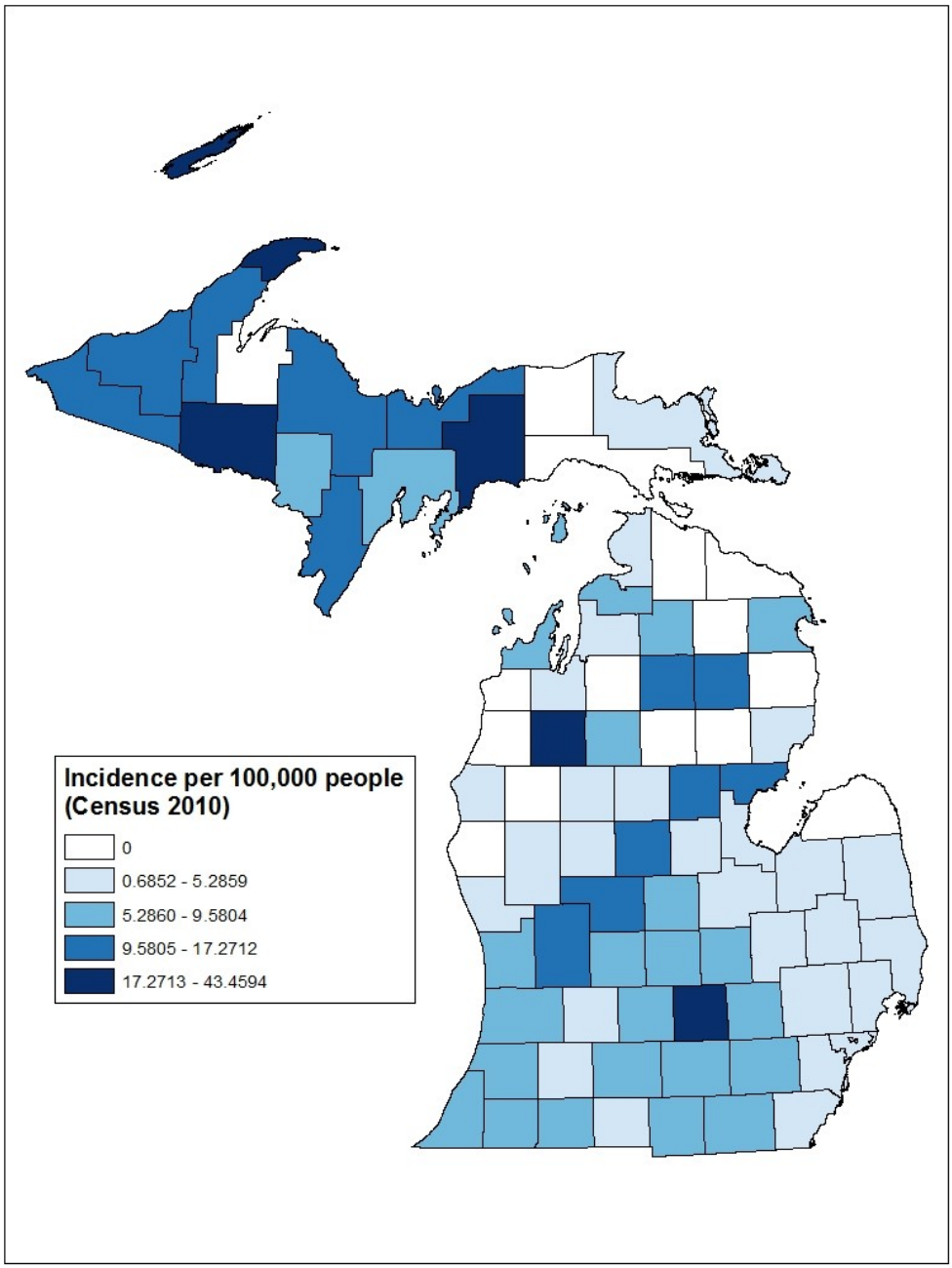


Figure 2. Incidence of giardiasis by county, Michigan 2011

Gonorrhea

Causative agent: Gonorrhea is a sexually transmitted disease caused by the bacteria *Neisseria gonorrhoeae.*

Clinical features: Most women have no symptoms or mild symptoms that can be mistaken for a bladder or vaginal infection. The most common manifestations include increased vaginal discharge, dysuria (pain or burning upon urination), and vaginal bleeding between periods. Women with gonorrhea are at risk for developing serious complications regardless of the severity of the symptoms. Coexisting infections with chlamydia, trichomoniasis, candidiasis, or other organisms are common. Some men may have no symptoms while some may have a profuse penile discharge and painful, frequent urination. The head of the penis may become swollen and sore. Rectal infections in both men and women are characterized by discharge, anal itching, bleeding, painful bowel movements, or no symptoms at all. Infections in the throat may cause a mild sore throat but often will cause no symptoms.

Mode of transmission: Gonorrhea is usually transmitted by direct contact with an infected person during vaginal, anal, or oral sex. Infected pregnant women can pass the disease to newborns where it can cause conjunctivitis and blindness due to corneal scarring.

Period of communicability: Infectious period may last for months in untreated individuals. Effective treatment ends communicability within hours.

Incubation period: The average incubation period is 2 to 7 days but may range from 0 –30 days.

High-risk groups: Any sexually active person can be infected with gonorrhea. In the United States, the highest reported rates of infection are among sexually active teenagers, young adults, and African Americans.

Prevention of gonorrhea: Avoid high-risk sexual behavior by practicing protected sex with the use of latex condoms. Regular screenings for sexually transmitted diseases are advised when unprotected sex is practiced, especially for those under the age of 25.

References: http://www.cdc.gov/std/Gonorrhea/

American Public Health Association. Gonococcal infections. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 261–265.

Gonorrhea

Table 1. Demographic characteristics of gonorrhea cases, Michigan 2011

*N= 13,070	Number of Cases	Percent Total
Sex		
Male	5,343	41%
Female	7,706	59%
Race		
African American	6,382	49%
Caucasian	1,399	11%
Other/ Multi	155	<1%
Unknown	4,988	38%
Ethnicity		
Hispanic or Latino	146	1%
Age groups (years)		
0-4 years	10	0%
5-9 years	3	0%
10-14 years	148	1%
15-19 years	4,249	33%
20-24 years	4,473	34%
25-29 years	1,806	14%
30-34 years	925	7%
35-39 years	550	4%
40-44 years	348	3%
45-54 years	368	3%
55-64 years	113	1%
65 and over	27	0%
Unknown Age	50	0%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

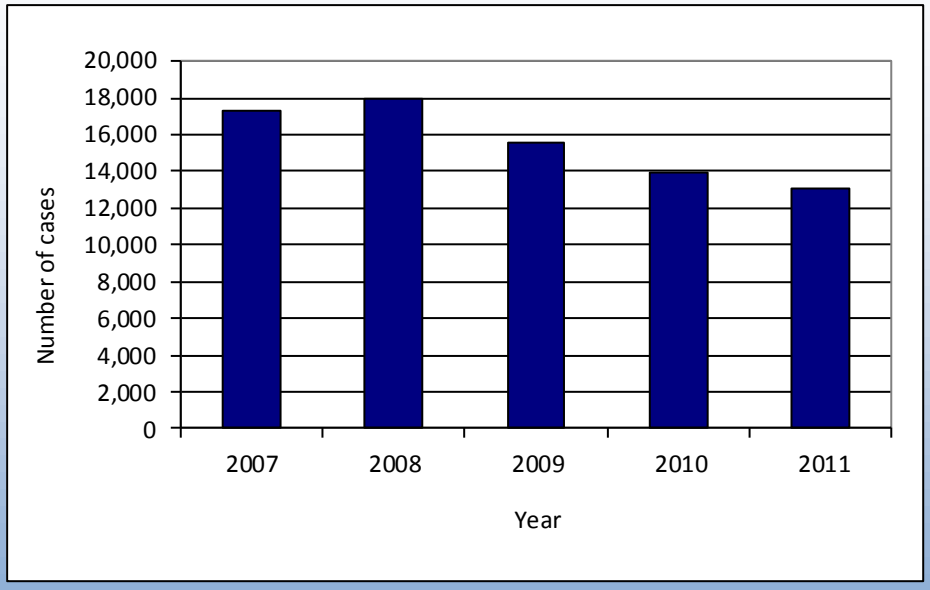


Figure 1. Number of gonorrhea cases in Michigan, 2007–2011

Gonorrhea

Michigan statistics: Michigan reported 13,070 cases of gonorrhea in 2011. The majority of cases were in women (59%) and young adults (age 15–19 years 33%; age 20–24 years 34%). Almost one-half of cases were African American (49%). The majority of gonococcal infections were found in the southern part of Michigan, concentrated in highly populated areas.

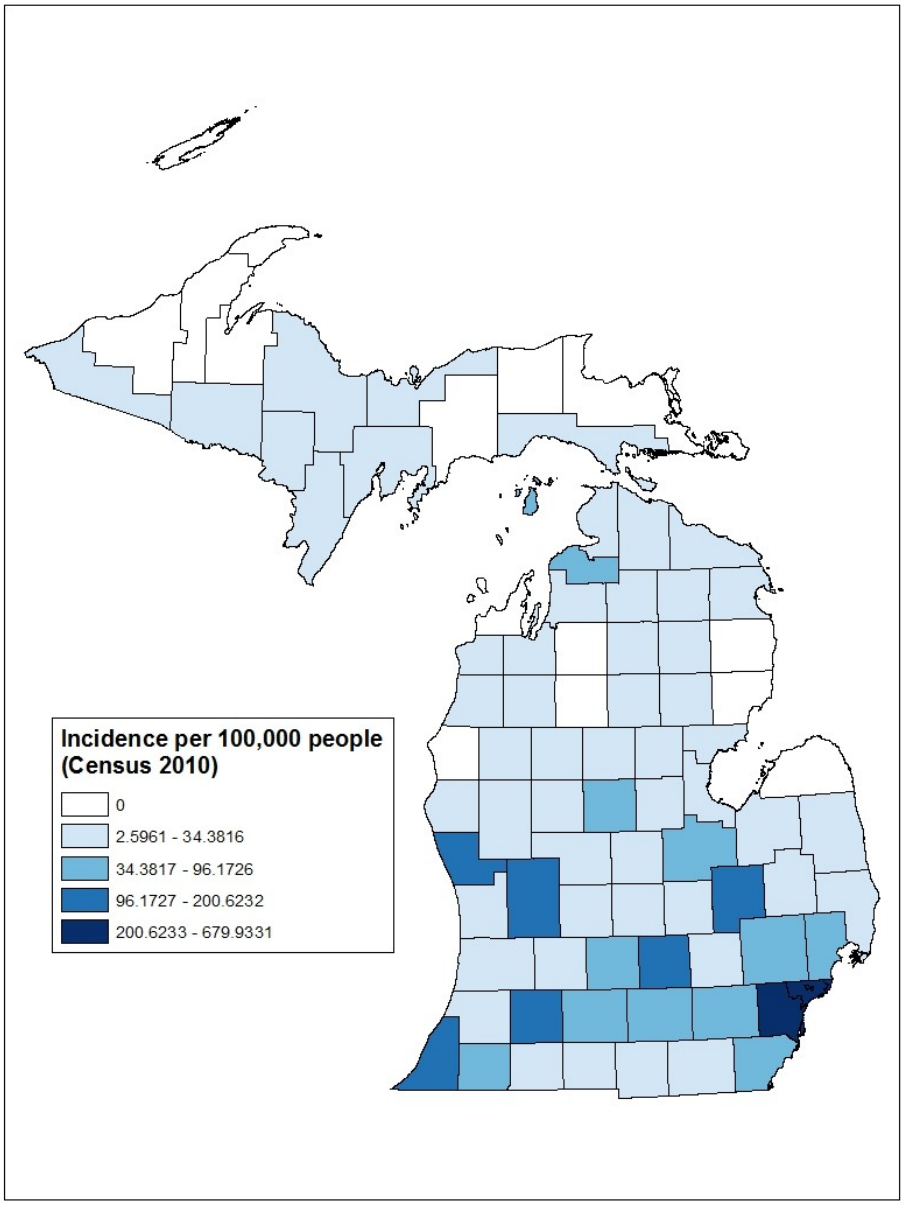


Figure 2. Incidence of gonorrhea by county, Michigan 2011

Hepatitis A

Causative agent: Hepatitis A is an infection caused by the hepatitis A virus that leads to inflammation of the liver.

Clinical features: The initial symptoms are usually fever, loss of appetite, nausea, vomiting, and malaise. This is usually followed by dark-colored urine and jaundice (yellow coloration of skin). Symptoms typically resolve after one to two weeks, however, fatigue may continue.

Mode of transmission: The hepatitis A virus is found in the feces of infected persons and is usually spread person-to-person through the fecal-oral route. Hepatitis A may also be transmitted through food or water contaminated with human feces.

Period of communicability: People are most infectious in the two weeks before their symptoms appear and remain somewhat infectious about one week after jaundice.

Incubation period: The incubation period is usually 28–30 days with a range of 15–50 days.

High-risk groups: Anyone can contract hepatitis A. Children are typically more affected by infection.

Prevention of hepatitis A: Hand washing after bathroom use, changing of diapers, and before food preparation and consumption is critical to prevention. Vaccines are also available for long-term prevention. Immune globulin (Ig) may be used for short-term prevention of hepatitis A virus infection in individuals of all ages. Ig can be given before or within 2 weeks of exposure to hepatitis A.

References: http://www.cdc.gov/hepatitis/index.htm

American Public Health Association. Viral hepatitis A. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 278–284.

Hepatitis A

Table 1. Demographic characteristics of hepatitis A cases by year, Michigan 2007–2011

*N= 511	Number of Cases	Percent Total
Sex		
Male	249	49%
Female	260	51%
Race		
African American	66	13%
American Indian or Alaska Native	1	0%
Asian	12	2%
Caucasian	268	52%
Hawaiian or Pacific Islander	2	0%
Other	30	6%
Ethnicity		
Hispanic or Latino	19	4%
Age groups (years)		
<1	4	1%
1-9	27	5%
10-19	42	8%
20-29	49	10%
30-39	62	12%
40-49	70	14%
50-59	89	17%
60-69	65	13%
≥70	106	21%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

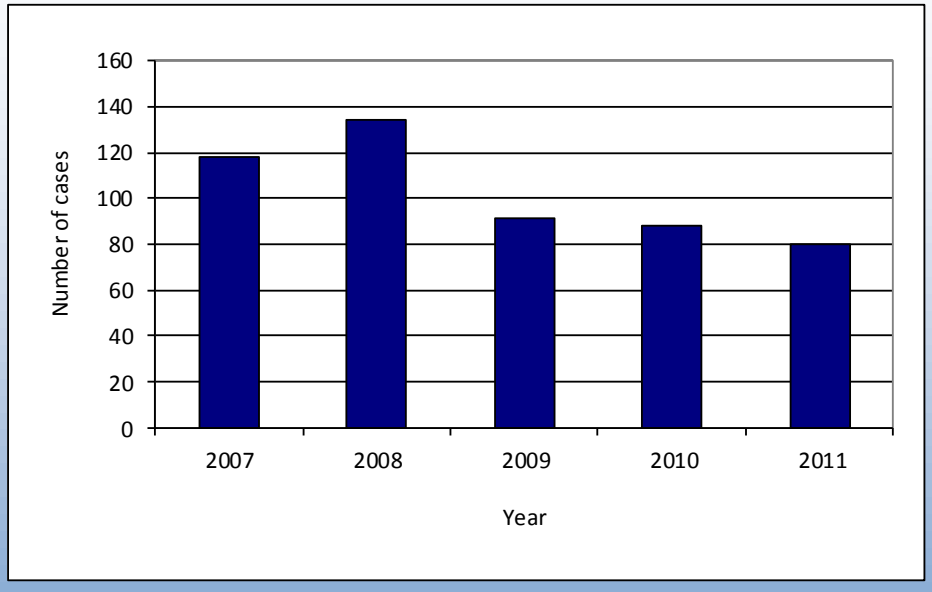


Figure 1. Number of hepatitis A cases in Michigan, 2007–2011

Hepatitis A

Michigan statistics: Hepatitis A cases reported during 2007 to 2011 totaled 511 cases. Fifty-one percent of cases were female. Over half of the cases were Caucasian (52%). Persons greater than 70 years of age equaled the majority of cases (21%). Four percent of cases were Hispanic or Latino.

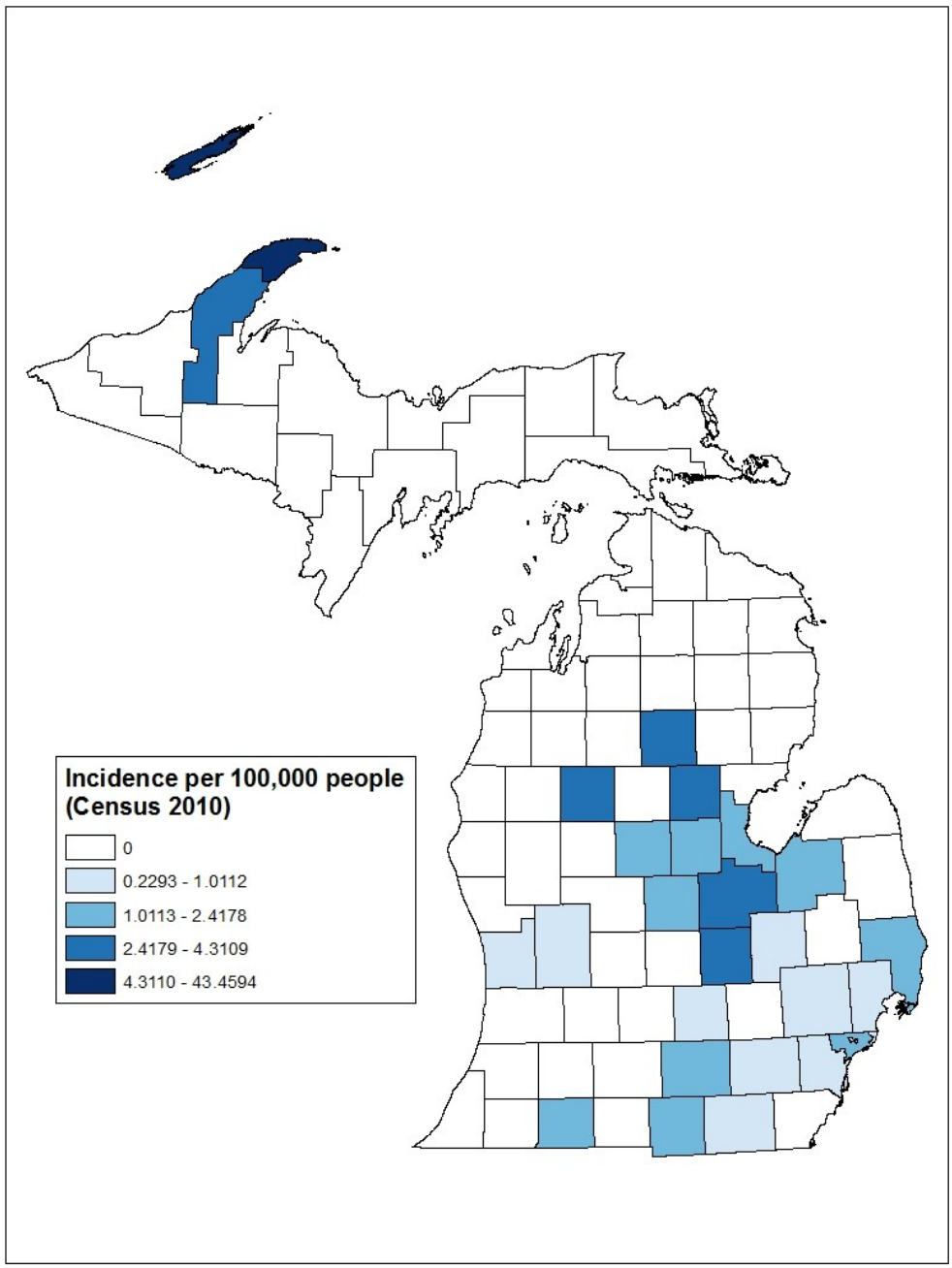


Figure 2. Incidence of hepatitis A by county, Michigan 2011

Hepatitis C

Causative agent: Hepatitis C is a disease caused by the hepatitis C virus (HCV) that results in infection of the liver.

Clinical features: Persons with HCV infection typically are either asymptomatic or have a mild clinical illness. Eighty percent of infected persons have no discernible symptoms. In individuals who are symptomatic, signs and symptoms may include jaundice, fatigue, dark urine, abdominal pain, loss of appetite, and nausea. Fifteen to 25 percent of people infected with the hepatitis C virus will clear the virus from their body. Seventy five to 85 percent will go on to develop chronic infection.

Mode of transmission: The hepatitis C virus is mainly spread by direct contact with HCV-infected blood/blood products, injury with HCV-contaminated needles or syringes, or from an infected mother to her baby during birth. Hepatitis C virus is not spread through casual contact or in typical school, office, or food service settings. It is not spread by coughing or sneezing.

Period of communicability: Infected people may spread the virus indefinitely.

Incubation period: Incubation can be as short as 2 weeks to as long as 6 months. The average incubation period is 6 –9 weeks. Chronic infection may persist for up to 20 years before onset of liver cirrhosis.

High-risk groups: The following groups of people are at higher risk of infection than the general population due to their greater likelihood of exposure: injecting drug users, recipients of clotting factors made before 1987, recipients of blood and/or solid organs before 1992, health care professionals (e.g., physicians, nurses, and lab personnel), infants born to HCV infected mothers, hemodialysis patients, persons that use razors or toothbrushes that were used by a person with HCV, and persons that have sex with a person infected with HCV.

Prevention of hepatitis C:

⇒ There is no vaccine to prevent hepatitis C.

⇒ Do not inject drugs; get into a treatment program and stop. If you cannot stop never share needles, syringes, water, or 'works' with others and get vaccinated for hepatitis A and B.

⇒ Do not share personal care items that might have blood on them (e.g., razors, toothbrushes).

⇒ Health care workers must always follow routine precautions and safely handle needles and other sharps. Get vaccinated against hepatitis B.

⇒ HCV can be spread by sex, but this is rare. If you are having sex with more than one steady sex partner, use latex condoms correctly and every time to prevent the spread of sexually transmitted diseases. You should also get vaccinated against hepatitis B.

⇒ Do not donate blood, organs, or tissue if you are HCV positive.

⇒ The efficacy of latex condoms in preventing infection with HCV is unknown, but their proper use may reduce transmission.

References:

http://www.cdc.gov/ncidod/diseases/hepatitis/c/faq.htm

American Public Health Association. Viral hepatitis C. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 293–295.

Hepatitis C

Table 1. Demographic characteristics of hepatitis C cases by year, Michigan 2011

*N= 30	Number of Cases	Percent Total
Sex		
Male	15	50%
Female	15	50%
Race		
African American	3	10%
American Indian or Alaska Native	0	0%
Asian	1	3%
Caucasian	20	67%
Hawaiian or Pacific Islander	0	0%
Other	6	20%
Ethnicity		
Hispanic or Latino	1	3%
Age groups (years)		
0-9	1	3%
10-19	1	3%
20-29	11	37%
30-39	8	27%
40-49	3	10%
50-59	4	13%
60-69	1	3%
≥70	1	3%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

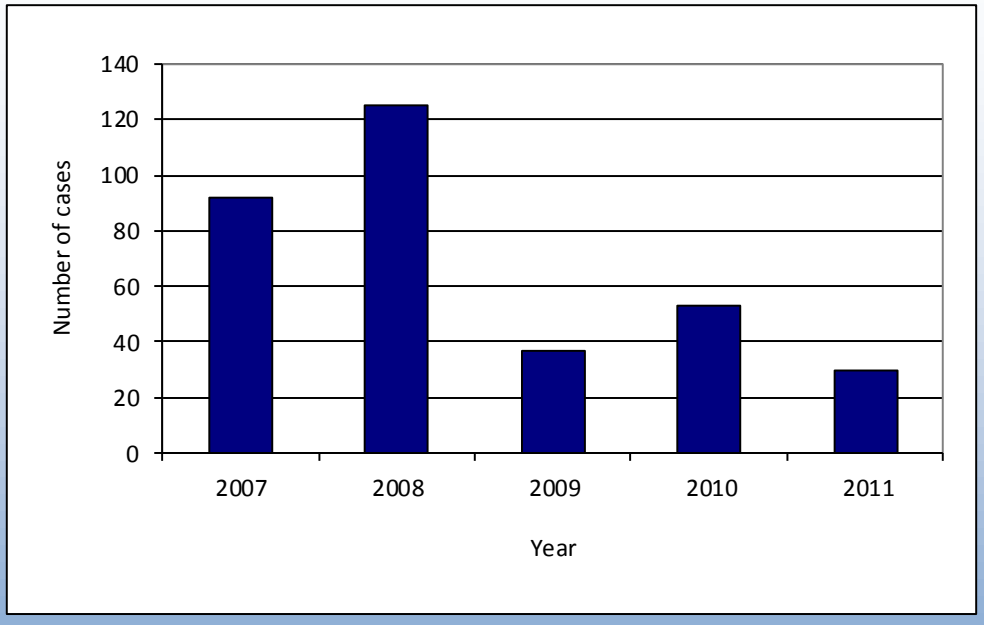


Figure 1. Number of acute hepatitis C cases in Michigan, 2007–2011

Hepatitis C

Michigan statistics: Persons with acute, confirmed hepatitis C infections totaled 30 cases during 2011. Cases were equally distributed amongst sex (50% male, 50% female). Over one-half of cases were Caucasians (67%) followed by African American (10%). Approximately half of the reported acute cases were between the ages of 20–39 years (37% age 20–29 years, 27% age 30–39 years). Three percent of cases were Hispanic or Latino.

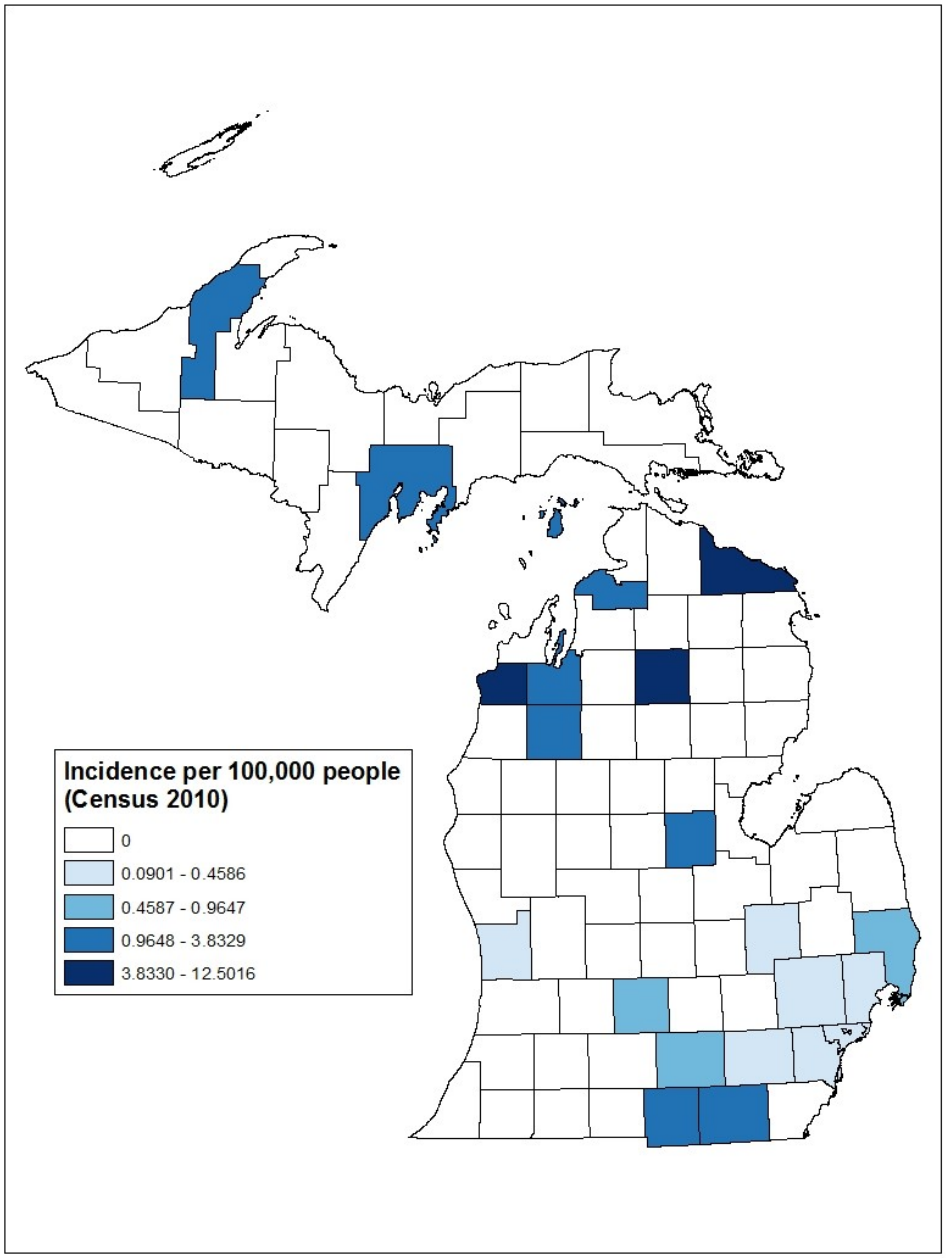


Figure 2. Incidence of hepatitis C by county, Michigan 2011

HIV

Causative agent: Two types of human immunodeficiency virus (HIV) have been identified: HIV-1 and HIV–2. These viruses have different serologic, geographic and epidemiological characteristics. HIV-1 is the predominant strain in the U.S..

Clinical Features:

HIV infections are categorized into three stages. Each subsequent stage represents increased damage to the body's immune system. Stages 1 and 2 do not have any of the conditions associated with severe HIV infection. However, HIV stage 3, formerly known as Acquired Immunodeficiency Syndrome (AIDS), is a severe, life-threatening condition. In this weakened state, the immune system cannot effectively protect the body from invading pathogens, and opportunistic illnesses (OIs) develop. Clinical presentation of HIV Stages 1–3 may include lymphadenopathy (swollen lymph nodes), chronic diarrhea, weight loss, fever, and fatigue. The severity of HIV-related illness is associated with the degree of immune dysfunction.

Mode of Transmission:

HIV is found in blood, semen, and vaginal fluid of a HIV-positive person. HIV transmission occurs via sexual contact (e.g., anal, vaginal, or oral sex) with an HIV-positive person, sharing needles or syringes contaminated with HIV, being exposed to the virus before or during birth, or through breastfeeding. The main risk behaviors associated with HIV infection are males having sex with males (MSM), injection drug use (IDU), and heterosexual sex. Transfusion of infected blood or its components and transplantation of HIV-infected tissues or organs can also transmit the infection, although this is rare since screening of the blood supply began in 1985. HIV does not spread through casual day-to-day contact, such as shaking hands, hugging, touching door knobs, sitting on toilet seats, using drinking fountains, sharing dishes, having pets, or eating food. Mosquitoes do not transmit the virus.

Period of communicability:

Communicability is not known precisely. It begins early after onset of HIV infection and presumably extends throughout life. Infectivity during the first months is considered to be high, increasing with viral load, worsening clinical status, or having concurrent sexually transmitted infections.

Incubation period:

The time from initial HIV infection to diagnosis of stage 3 HIV infection has been observed to range from less than one year to 15 years or longer.

High-risk groups:

Persons at higher risk for infection include those who have:

⇒ Injected drugs or steroids, during which equipment (such as needles, syringes, cotton, water) and blood were shared with others

⇒ Had unprotected (sex without using condoms) vaginal, anal, or oral sex with men who have sex with men, persons with multiple partners, or anonymous partners

⇒ Exchanged sex for drugs or money

⇒ Been given a diagnosis of, or been treated for, hepatitis, tuberculosis (TB), or a sexually transmitted disease (STD) such as syphilis

⇒ Received a blood transfusion or clotting factor during 1978–1985

⇒ Had unprotected sex with someone who has any of the risk factors listed above

HIV

Prevention of HIV:

High-risk sexual behavior should be avoided at all times. Latex condoms used consistently and correctly are highly effective in preventing transmission of HIV. Cessation of injection drug use or not sharing needles, syringes, or other works is important in preventing HIV. High-risk individuals should be tested for HIV once yearly.

References:

http://www.cdc.gov/hiv/topics/basic/index.htm

American Public Health Association. Acquired immunodeficiency syndrome. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 1–9.

Michigan statistics: Compared to the entire U.S., Michigan has moderate HIV morbidity, with approximately 36% of infections occurring in residents of the City of Detroit. Nationally racial and ethnic minorities have been disproportionately affected by HIV since the beginning of the epidemic. In Michigan in 2011, 62% of new HIV diagnoses occurred in African Americans, who make up only 14% of Michigan's population. Five percent of new diagnoses were Hispanic or Latino. The prevalence of HIV in Michigan has increased as those with HIV are living longer, largely due to improved treatment. Over three quarters of diagnoses occurred in persons between the ages of 20–49 years (38% ages 20–29 years, 21% ages 30–39 years, 19% ages 40–49 years).

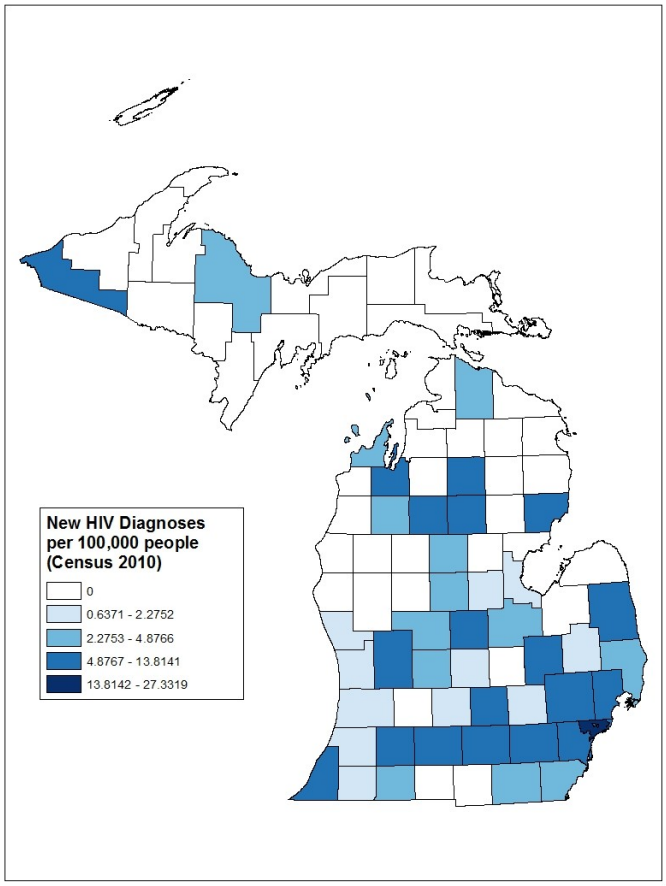


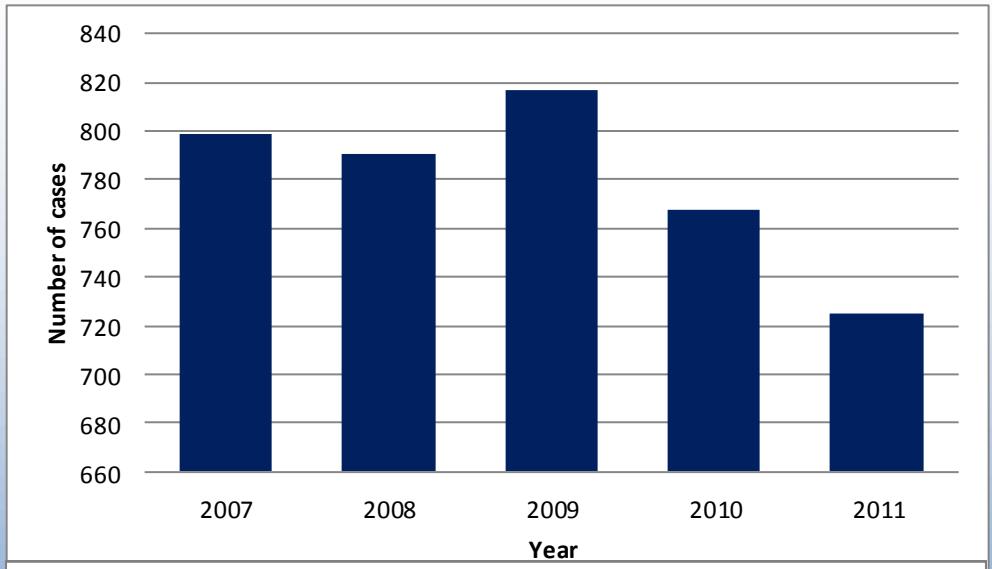
Figure 2. Rate of new HIV infection diagnoses (stage 1–3) by county (as of April 2012), Michigan 2011

HIV

Table 1. Demographic characteristics of persons diagnosed with HIV infection (stages 1–3) and living in Michigan at the time of diagnosis, 2011[1]

N= 725	Number of Cases	Percent Total
Sex		
Male	581	80%
Female	144	20%
Race[2]		
African American	448	62%
American Indian or Alaska Native	1	<1%
Asian, Hawaiian or Pacific Islander	15	2%
Caucasian	210	29%
Other/Multi/Unknown	12	2%
Ethnicity		
Hispanic or Latino	39	5%
Age groups at HIV diagnosis (years)		
0-9	3	<1%
10-19	59	8%
20-29	276	38%
30-39	153	21%
40-49	136	19%
50-59	70	10%
60-69	23	3%
≥70	5	1%

[1]Data include HIV infection cases in eHARS, diagnosed as of April, 2012.
[2]In this report, persons described as African American, American Indian/Alaska Native, Asian/ Hawaiian/Pacific Islander, Caucasian, or Other/Multi/Unknown are all non-Hispanic; persons described as Hispanic or Latino may be of any race.



Data include HIV infection cases in eHARS, diagnosed as of April, 2012.
The decline in new HIV infections in recent years is likely due to reporting delay.

Figure 1. Number of persons diagnosed with HIV infection (stages 1–3) and living in Michigan at the time of diagnosis, 2007–2011

Influenza

Causative agent: Influenza is an acute viral infection of the respiratory tract. Three types of influenza viruses are recognized: A, B, and C.

Clinical features: Typical symptoms of influenza include fever, chills, muscle aches, headache, stuffy or runny nose, cough, sore throat, and general weakness. Stomach symptoms such as nausea, vomiting, and diarrhea can also occur. Children are more likely than adults to display gastrointestinal symptoms.

Mode of transmission: Influenza is spread through contact with droplets from the nose and throat of an infected person during coughing and sneezing. People may become infected after touching something with the flu virus on it and then touching their mouth or nose.

Period of communicability: The contagious period varies. It usually begins the day before symptoms appear and lasts approximately one week.

Incubation period: Symptoms usually appear 1–3 days after a person is exposed to the virus.

High-risks groups: Some people are more susceptible to influenza complications. Young children, the elderly, those with certain health conditions (e.g., asthma, heart disease, diabetes, or immune-compromised) have higher susceptibility to complications.

Prevention of influenza: The mouth and nose should be covered with a disposable tissue during coughing or sneezing. Frequent hand washing with soap and water for at least 20 seconds is critical to prevention. In addition, getting a flu shot is an excellent way to prevent influenza. Because the types and strains of viruses that cause influenza change often, an influenza vaccination should be received every year. Some people who have been exposed to influenza may be prescribed an anti-viral medication to prevent or reduce the severity of illness.

References: http://www.flu.gov

www.michigan.gov/flu

American Public Health Association. Influenza. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 315-331.

Influenza

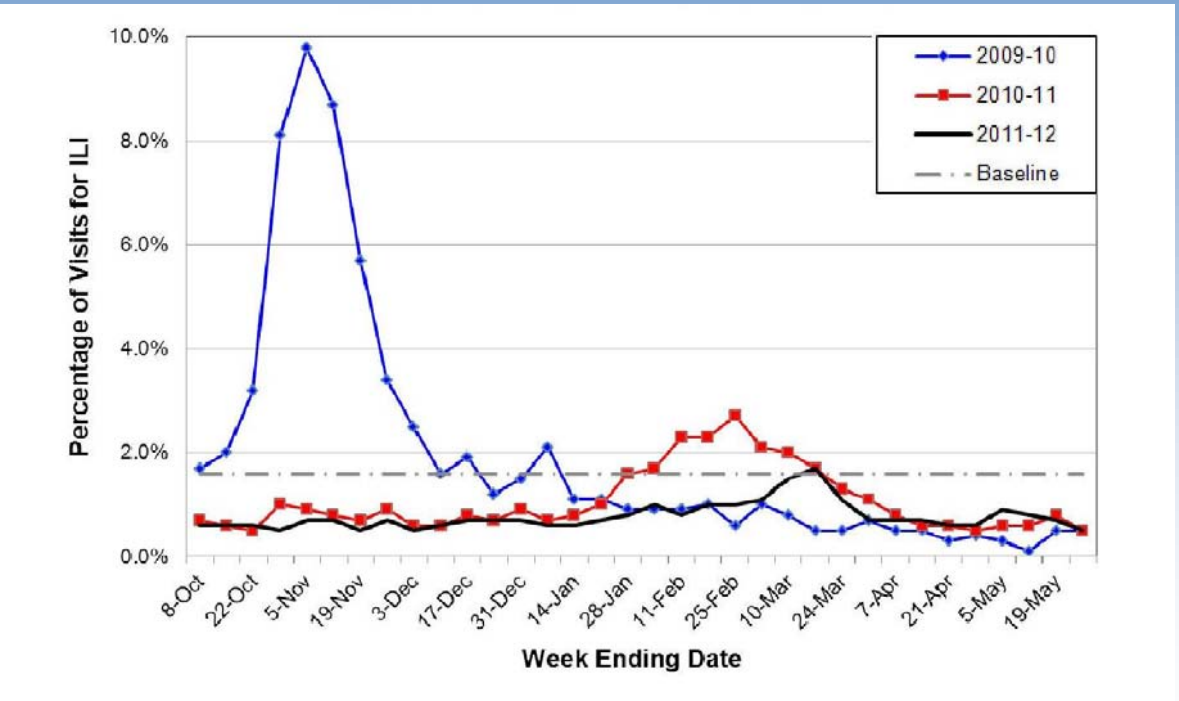


Figure 1. Percentage of ILI visits reported by Michigan sentinel physicians, 2009–2012

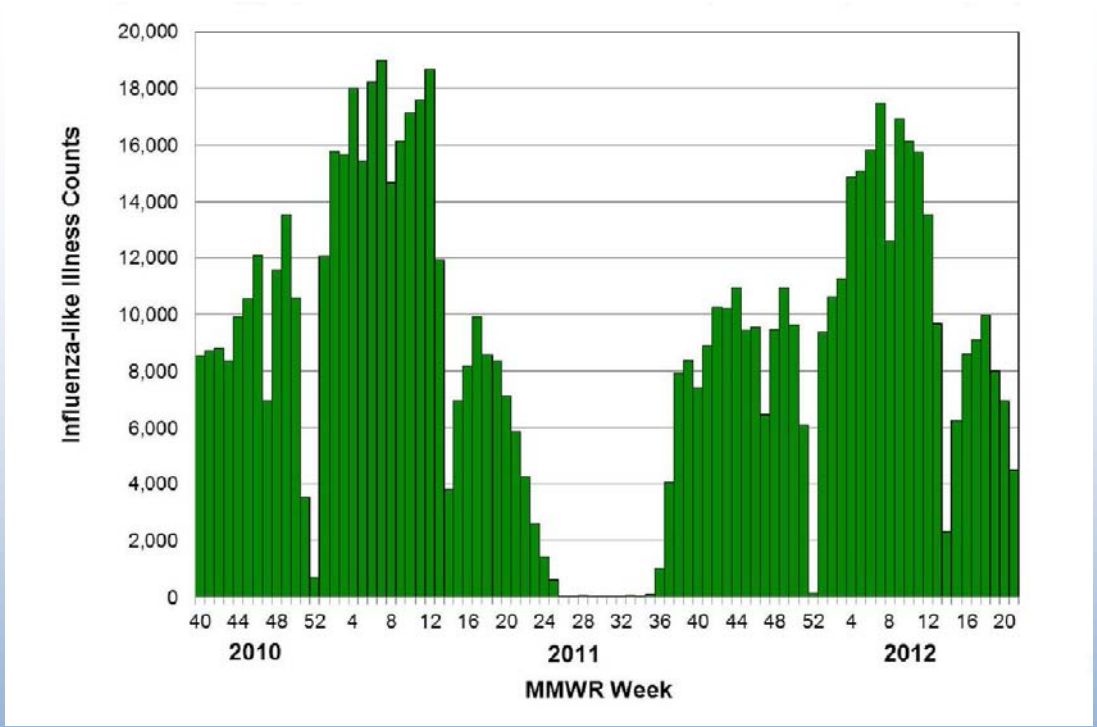


Figure 2. Aggregate and individual counts of influenza-like illness, by MMWR week, October 3, 2010–May 26, 2012

Influenza

Michigan statistics: Surveillance for influenza in Michigan depends mostly on sentinel physician reporting and weekly aggregate reporting from schools and extended care facilities. Actual incidence of influenza like illness is believed to be substantially greater than reflected in reported figures due to under-reporting. For the most current information regarding influenza, please visit www.michigan.gov/flu.

Compared to the previous two flu seasons, the 2011–2012 season was a mild season with a late peak in activity (Figure 1). The percentage of visits due to ILI peaked at 1.7% this season, compared to 2.7% during the 2010–2011 season and 9.8% in 2009–2010. During the pandemic 2009–2010 influenza season, ILI activity peaked in late October at an activity level above historic norms.

During the 2011–2012 season, peak aggregate activity occurred during the week ending February 18, 2012 (MMWR Week 7) at 17,478 reports. The noticeable decreases during MMWR Weeks 14, 24–36 and 52 correspond to school breaks. In comparison, during the 2010–2011 season, peak aggregate activity occurred in mid-February with 18,919 reports (Figure 2). The timing of activity during this season was similar to the previous season, although the number of reports was slightly lower during 2011-2012.

Healthcare providers participating in the Michigan component of the CDC U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet) report weekly the percentage of healthcare visits due to influenza-like illness (ILI) (Figure 3). Eighty-nine sentinel sites are enrolled in Michigan's ILINet program; an average of 49 sites regularly reported data on over 14,500 weekly patient visits. By surveillance region, the average number of ILINet providers that regularly submitted reports was: Central (22), Southeast (12), North (8) and Southwest (7). The percentage of visits due to ILI peaked statewide at 1.7% during the week ending March 17, 2012 (MMWR Week 11). Influenza activity in the Central, Southwest and Southeast surveillance regions was mild overall with a peak in mid-March, similar to activity statewide. Activity in the North region stayed mild throughout the influenza season without a defined peak. Because sentinel practices in each region vary by type, size, and number, these data should not be used to make direct comparisons of intensity among regions.

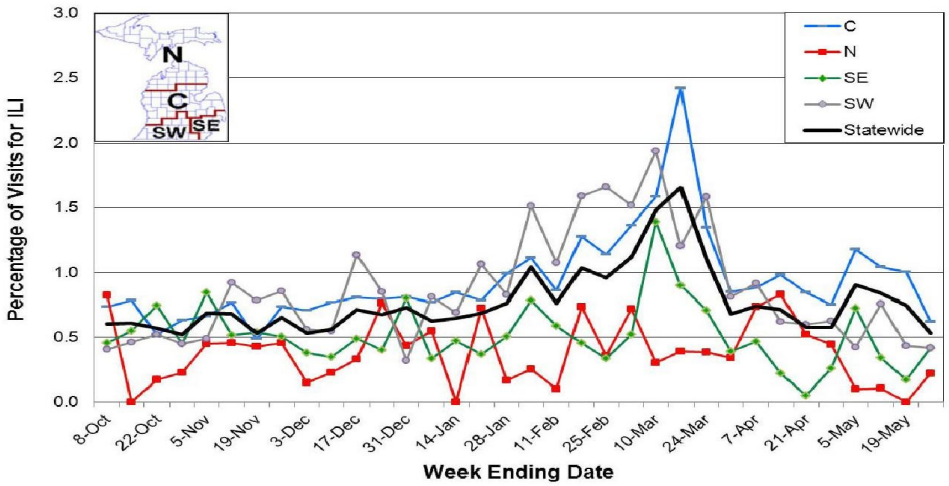


Figure 3. Percentage of influenza-like illness visits reported by Michigan Sentinel Providers, by influenza surveillance region, October 2, 2011–May 26, 2012

Legionellosis

Causative agent: Legionellosis is a bacterial infection caused by the bacterium *Legionella pneumophila*. Legionellosis is associated with 2 distinct illnesses: Legionnaires' disease and Pontiac fever. Both Pontiac fever and Legionnaires' disease may include influenza-like illness followed by high fever, chills, muscle aches, and headache. Legionnaires' disease is a more severe illness because it causes mild to severe pneumonia

Clinical features: The early symptoms of legionellosis may be influenza-like with muscle aches, headache, tiredness, dry cough, high fever, chills, and occasionally diarrhea. Body temperatures usually reach 102-105 degrees Fahrenheit and chest X-rays often show pneumonia.

Mode of transmission: People get legionellosis when they inhale aerosols (water mist) that carry *Legionella* bacteria. People can be exposed to aerosols from mist-producing devices (e.g., water heaters and air-conditioning systems) in their homes, workplaces, hospitals, or other public places. *Legionella* bacteria live in the environment. Therefore, groups of persons who are exposed to a common source of water mist can be exposed to the bacteria at the same time. A legionella outbreak can occur when several group members become sick from exposure to the same source. Legionellosis outbreaks have been traced to whirlpools, showers, room humidifiers, decorative spraying fountains, and large air-conditioning cooling towers. For most cases not associated with outbreaks, the water source responsible for infection is not known.

Period of communicability: Person-to-person transmission has not been documented.

Incubation period: The incubation period for Legionnaires' disease is usually 2 to 14 days. The incubation period for Pontiac fever is typically less than 2 days.

High-risk groups: People of any age can get legionellosis but the disease most often affects elderly persons, as well as, those who smoke or who have chronic lung disease (e.g., emphysema). Those with underlying illnesses such as cancer, diabetes, kidney failure, or lowered immune system are also at higher risk.

Prevention of legionellosis: Cooling towers should be drained when not in use and should have regular maintenance and cleaning to remove scale and sediment. Appropriate biocides should be used to limit the growth of slime forming organisms. Tap water should not be used in respiratory therapy devices. Maintaining hot water system temperatures at 50ºC (122ºF) or higher may reduce the risk of transmission. Do not swim in pools or fountains that appear unclean.

References: http://www.cdc.gov/legionella/index.htm

American Public Health Association. Legionellosis. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 337-340.

Legionellosis

Table 1. Demographic characteristics of legionellosis cases by year, Michigan 2007–2011

*N= 934	Number of Cases	Percent Total
Sex		
Male	571	61%
Female	358	38%
Race		
African American	206	22%
American Indian or Alaska Native	3	0%
Asian	1	0%
Caucasian	561	60%
Hawaiian or Pacific Islander	0	0%
Other	10	1%
Ethnicity		
Hispanic or Latino	4	0%
Age groups (years)		
0-9	2	0%
10-19	6	1%
20-29	31	3%
30-39	61	7%
40-49	171	18%
50-59	249	27%
60-69	207	22%
≥70	206	22%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

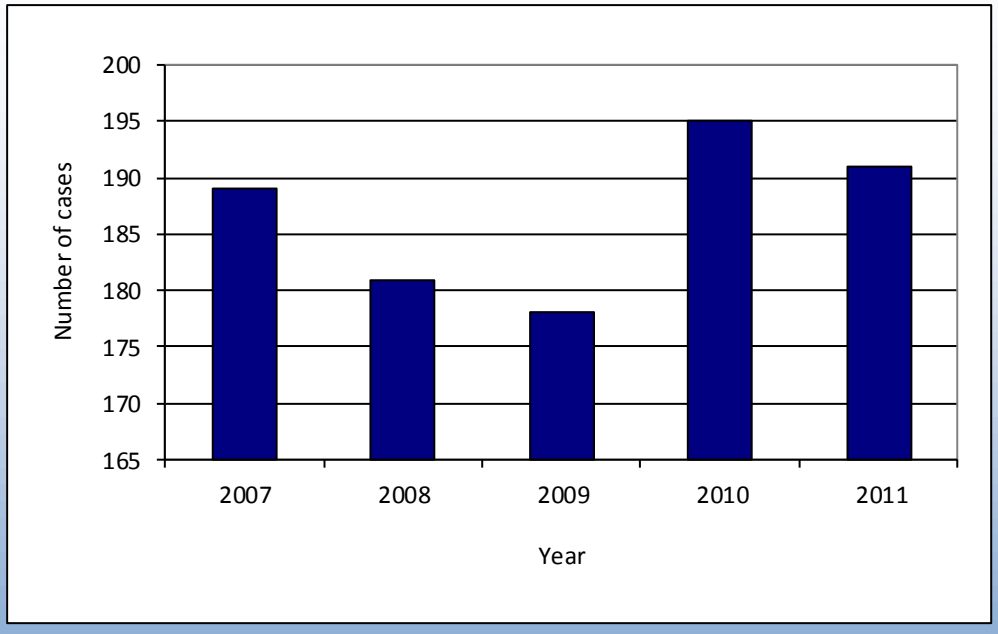


Figure 1. Number of legionellosis cases in Michigan, 2007–2011

Legionellosis

Michigan statistics: Reported legionellosis during 2007–2011 totaled 934 cases. Cases were primarily men (61%). Age analysis of legionellosis showed that almost three-fourths of reported cases were found to be in persons 50 years and older (27% age 50–59, 22% age 60–69, and 22% age 70 and older). Caucasians (60%) and African Americans (22%) had the highest incidence of disease. Less than 1 percent of cases were Hispanic or Latino.

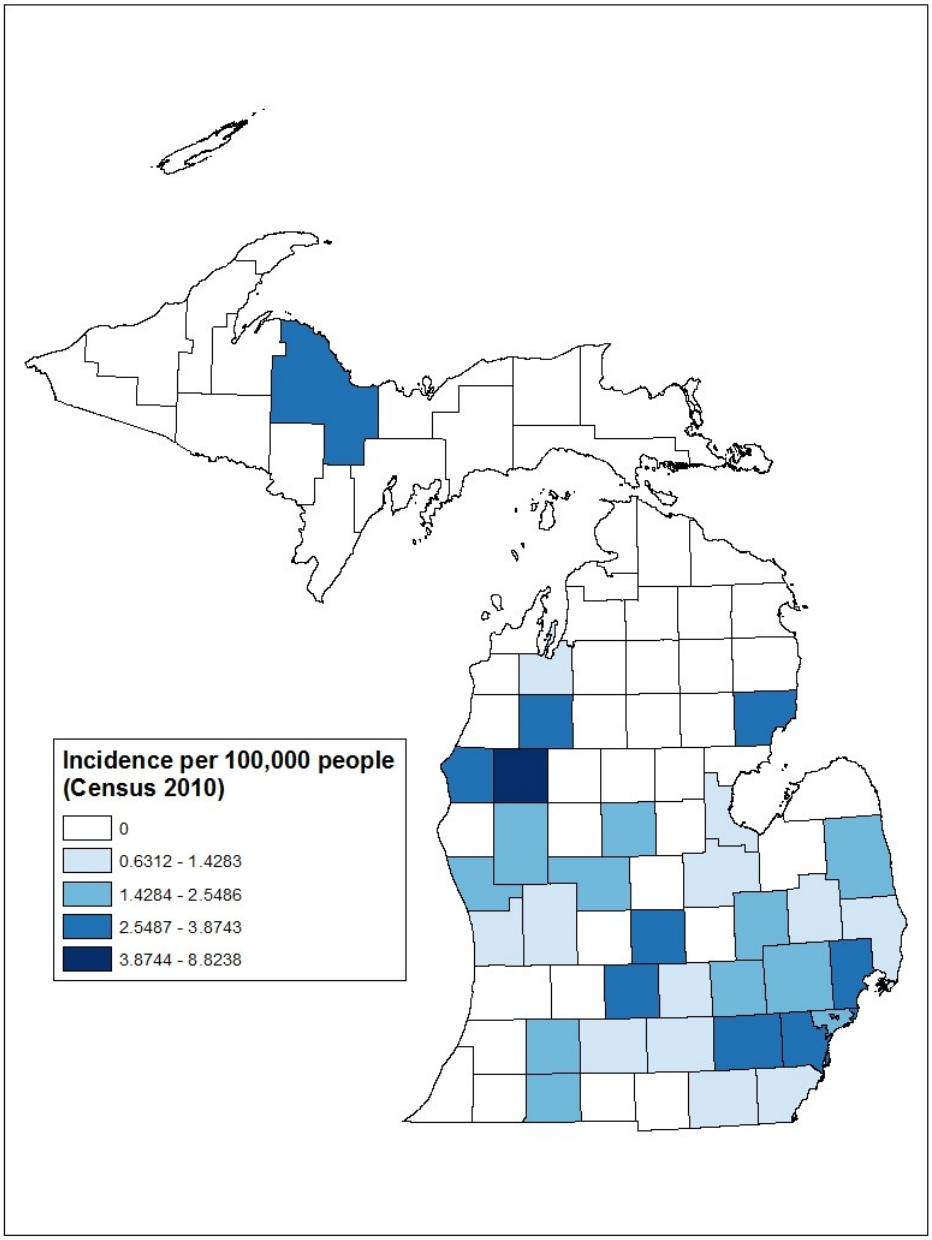


Figure 2. Incidence of legionellosis by county, Michigan 2011

Listeriosis

Causative agent: Listeria is caused by the bacteria known as *Listeria monocytogenes*.

Clinical features: Listeriosis causes fever and flu-like symptoms such as fever, muscle aches, nausea, vomiting, and diarrhea. Symptoms of headache, stiff neck, confusion, loss of balance, or convulsions can occur if the infection has spread to the brain or spinal column (meningitis). *Listeria* can cause infection of the uterus and cervix. Infected pregnant women may only experience mild flu-like symptoms. However, infections during pregnancy can result in miscarriage, stillbirth, premature delivery, or illness in the newborn.

Mode of transmission: The main route of transmission is oral by ingestion of contaminated food. Other routes include vertical transmission from infected mother to newborns. *Listeria monocytogenes* is found in soil and water. Vegetables can become contaminated from soil or manure used as fertilizer. The bacterium has been found in a variety of raw foods (e.g., uncooked meats and vegetables) and processed foods that become contaminated after handling (e.g., soft cheeses and cold cuts at the deli counter). Unpasteurized (raw) milk or foods made from unpasteurized milk may contain the bacterium. *Listeria* is killed by pasteurization and cooking. Certain ready-to-eat foods such as hot dogs and deli meats may be contaminated after cooking but before packaging.

Period of communicability: Infected individuals can shed the organisms in stools for several months. Mothers of infected newborns may shed the infectious agent in vaginal discharges and urine for seven to 10 days.

Incubation period: Symptoms have been noted to occur within as few as 3 to as many as 70 days after consumption of a contaminated food. The average incubation period is 3 weeks.

High-risk groups: Pregnant women, newborns, and persons with weakened immune systems are more likely to be vulnerable.

Prevention of listeriosis: The risk of listeriosis can be reduced by thoroughly cooking all raw animal products. Vegetables and fruits should be washed before eating. Uncooked meats should be kept separate from vegetables, cooked foods, and ready-to-eat foods. Avoid raw (unpasteurized) milk or foods made from raw milk. Wash hands, knives, and cutting boards after handling uncooked foods.

In addition to the above recommendations, pregnant women, the elderly and those with weakened immune systems should also:

⇒ Not eat hot dogs, luncheon meats, or deli meats unless they are reheated until steaming hot.

⇒ Avoid getting fluid from hot dog packages on other foods, utensils, and food preparation surfaces; and wash hands after handling hot dogs, luncheon meats, and deli meats.

⇒ Do not eat soft cheeses such as feta, Brie, Camembert, blue-veined cheeses, or Mexican-style cheeses such as queso blanco, queso fresco, and Panela, unless they have labels that clearly state they are made from pastuerized milk.

⇒ Do not eat refrigerated pâtés or meat spreads. Canned or shelf-stable pâtés and meat spreads may be eaten.

⇒ Do not eat refrigerated smoked seafood unless it is contained in a cooked dish, such as a casserole. Canned or shelf-stable smoked seafood may be eaten.

References: http://www.cdc.gov/listeria/index.html

American Public Health Association. Listeriosis. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 357–361.

Listeriosis

Table 1. Demographic characteristics of listeriosis cases by year, Michigan 2007–2011

*N= 141	Number of Cases	Percent Total
Sex		
Male	66	47%
Female	74	52%
Race		
African American	15	11%
American Indian or Alaska Native	0	0%
Asian	0	0%
Caucasian	108	77%
Hawaiian or Pacific Islander	0	0%
Other	4	3%
Ethnicity		
Hispanic or Latino	3	2%
Age groups (years)		
<1	9	6%
1-9	1	1%
10-19	13	9%
20-29	5	4%
30-39	3	2%
40-49	6	4%
50-59	21	15%
60-69	18	13%
≥70	73	52%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

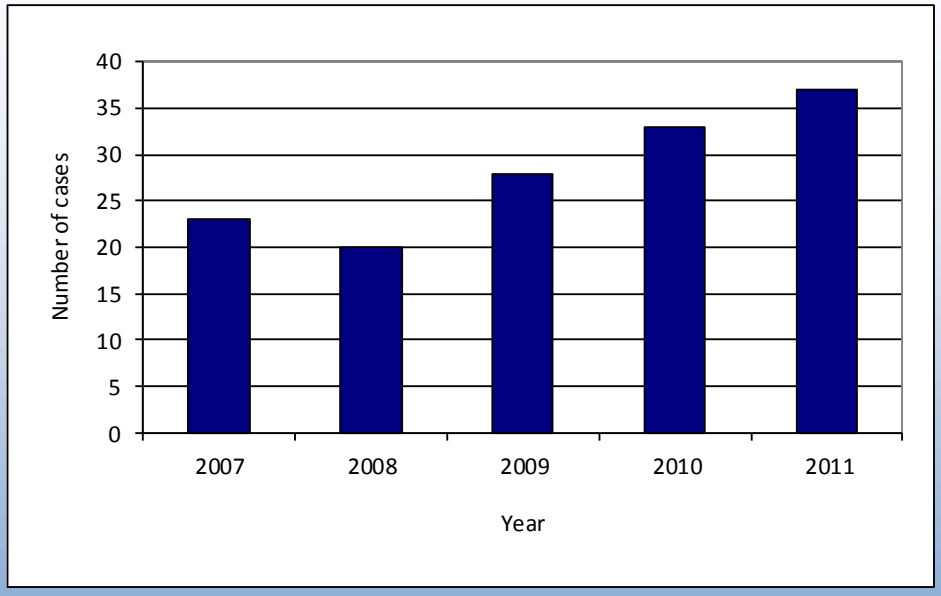


Figure 1. Number of acute listeriosis cases in Michigan, 2007–2011

Listeriosis

Michigan statistics: For the 2007–2011 time period, a total of 141 cases of listeria were reported in Michigan. Fifty-two percent of the cases were female. The majority (52%) of cases were in persons age 70 and older. Caucasians (77%) and African Americans (11%) had the highest incidence of disease. Two percent of reported cases were Hispanic or Latino.

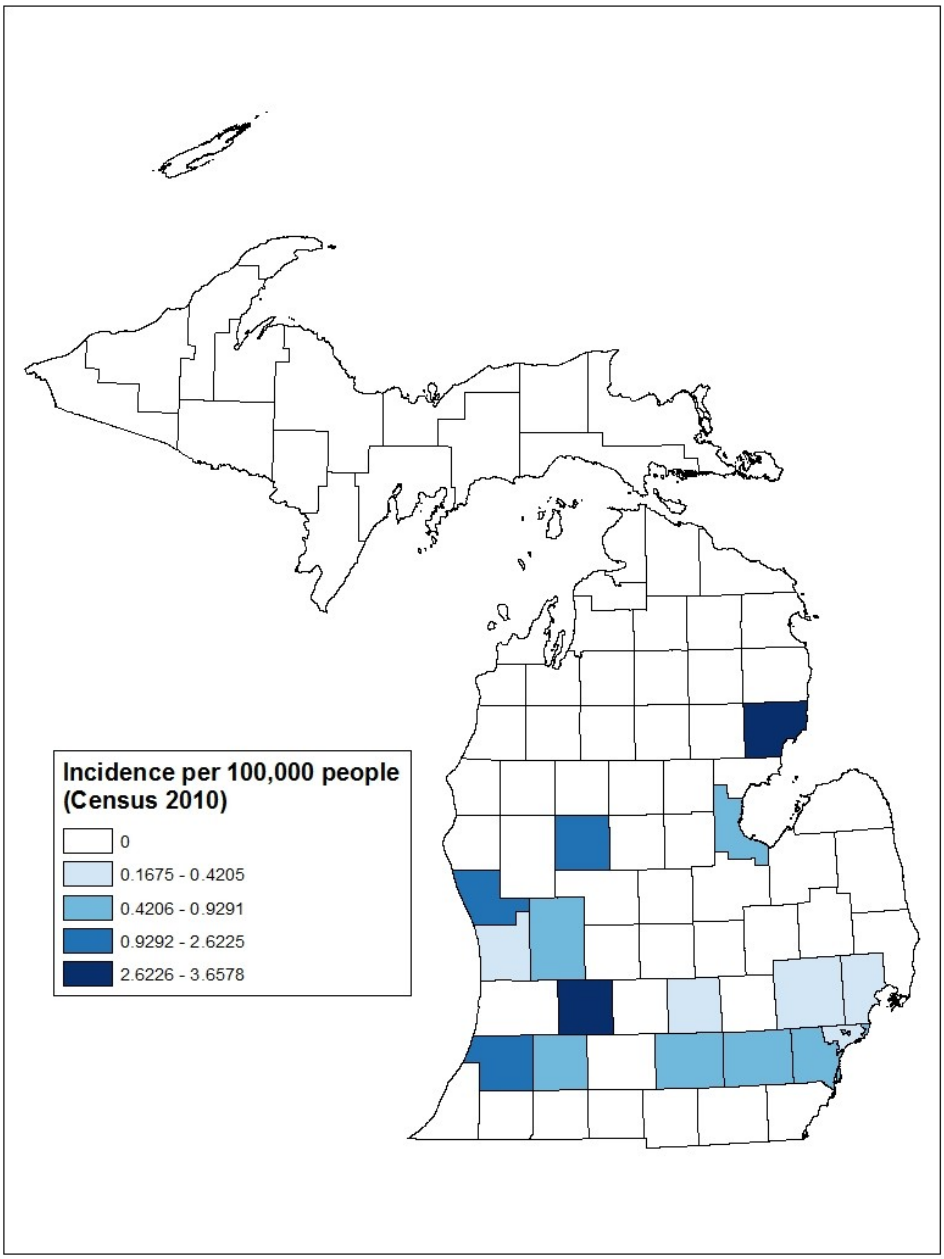


Figure 2. Incidence of listeriosis by county, Michigan 2011

Lyme Disease

Causative agent: Lyme disease is an illness caused by the bacteria, *Borrelia burgdorferi.*

Clinical features: Lyme disease is difficult to recognize because the symptoms mimic those of other diseases. The bacterium can infect several areas of the body resulting in different symptoms at different times. Not all patients with Lyme disease will have all symptoms. The illness starts with a circular red rash in 70–80% of patients at or near the site of the tick bite after a delay of 3–30 days. A distinctive feature of the rash is that it gradually expands in size and may become as large as 12 inches in diameter. It may be warm but usually isn't painful. Often there may be a clearing in the center of the rash resulting in a "bull's-eye" appearance. Along with the rash, other "influenza-like" symptoms may appear such as fever, chills, headache, fatigue, stiff neck, muscle aches, joint pain, and swollen lymph nodes. The joints, nervous system and heart may be affected weeks to months after the initial tick bite. A small number of people with Lyme disease may develop symptoms during later stages of the disease without having had the earlier skin rash.

Untreated Lyme disease If the patient is not treated, the infection may spread to other parts of the body producing some of the following symptoms: loss of muscle tone on one or both sides of the face (called facial or "Bell's palsy), severe headaches and neck stiffness due to meningitis, shooting pains that may interfere with sleep, heart palpitations and dizziness due to changes in heartbeat, and pain that moves from joint to joint. After several months, approximately 60% of patients with untreated infection will begin to have intermittent bouts of arthritis, with severe joint pain and swelling. Large joints are most often affected (particularly the knees). In addition, up to 5% of untreated patients may develop chronic neurological complaints months to years after infection. These include shooting pains, numbness or tingling in the hands or feet, problems with concentration, and short-term memory loss.

Treated Lyme disease Most cases of Lyme disease can be cured with antibiotics, especially if treatment is begun early in the course of illness. However, a small percentage of patients with Lyme disease have symptoms that last months to years after treatment with antibiotics. These symptoms can include muscle and joint pains, arthritis, cognitive defects, sleep disturbance, or fatigue. The cause of these symptoms is not known. There is some evidence that they result from an autoimmune response in which a person's immune system continues to respond even after the infection has been cleared.

Mode of transmission: In the northeastern and north-central United States these bacteria are spread to humans from the bite of an infected black-legged (deer) tick. Usually, the bacteria that cause Lyme disease will only be transferred from an infected tick if it is attached to skin for at least 24 hours. Research has shown that infection is unlikely if the tick is removed within 24 hours and removal within 48 hours greatly reduces the risk of illness. Lyme disease is most common during the spring and summer months when ticks are most active and people are frequently outdoors.

Period of communicability: No evidence of natural transmission from person-to-person has been documented.

Incubation period: The rash or "influenza-like" symptoms usually begin within one month after a tick bite.

High-risk groups: Anyone can get Lyme disease. Campers, hikers, and others who frequent wooded, brushy and grassy places where ticks are found are at higher risk for infection.

Lyme Disease

Prevention of Lyme disease:

⇒ Know where to expect ticks. Ticks like warm, moist environments especially in or near woody or grassy areas. Avoid tick-infested areas, especially during the months of May, June, and July.

⇒ Walk in the center of trails to avoid overhanging grass and brush.

⇒ Wear white colored clothing, which allows you to see ticks crawling on your clothing.

⇒ Wear long sleeves, long pants, socks, and closed toe shoes when outdoors in possible tick-infested areas.

⇒ Check your body for ticks after being outdoors in a potentially tick-infested area. Check your children and pets for ticks after returning from tick-infested areas.

⇒ Use a repellant containing DEET or permethrin (e.g., on clothing, shoes or camping equipment). Always follow product instructions.

⇒ Prevent ticks on pets by contacting your veterinarian for tick prevention advice. There are several topical products available for tick prevention. Read and follow label instructions.

⇒ Immediately remove any attached tick on your body gently with tweezers. Watch for signs of rash or illness and contact your healthcare provider if these develop.

References: http://www.cdc.gov/lyme

http://www.michigan.gov/emergingdiseases/0,1607,7-186-25890---,00.html

http://www.cdc.gov/Features/StopTicks/

Lyme Disease

Table 1. Demographic characteristics of Lyme disease cases by year, Michigan 2007–2011

*N= 463	Number of Cases	Percent Total
Sex		
Male	279	60%
Female	186	40%
Race		
African American	3	1%
American Indian or Alaska Native	2	0%
Asian	1	0%
Caucasian	367	79%
Hawaiian or Pacific Islander	0	0%
Other	4	1%
Ethnicity		
Hispanic or Latino	4	1%
Age groups (years)		
<1	1	0%
1-9	53	11%
10-19	69	15%
20-29	59	13%
30-39	41	9%
40-49	66	14%
50-59	86	19%
60-69	52	11%
≥70	39	8%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

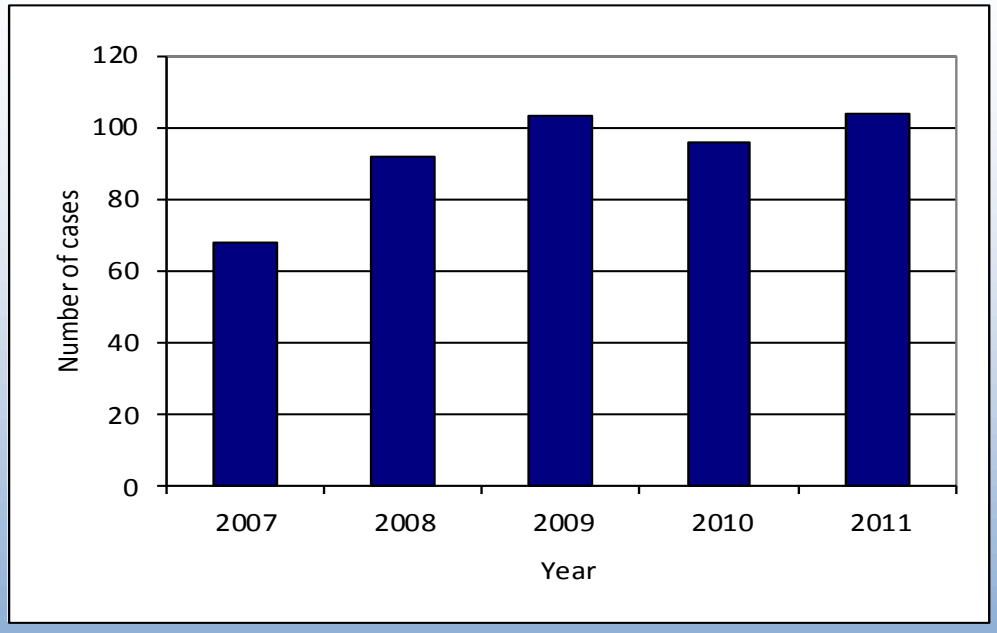


Figure 1. Number of Lyme disease cases in Michigan, 2007–2011

Lyme Disease

Michigan statistics: Lyme disease case incidence by county is based on cases reported in citizens of that county. This does not necessary reflects a local exposure to the vector or disease agent. Approximately half of Lyme disease cases reported to local and state health authorities are from travel exposures.

Michigan has had a total of 463 cases reported during 2007–2011. Over half of the cases were male (60%). Seventy-nine percent of cases were Caucasian. Hispanic or Latino cases totaled one percent.

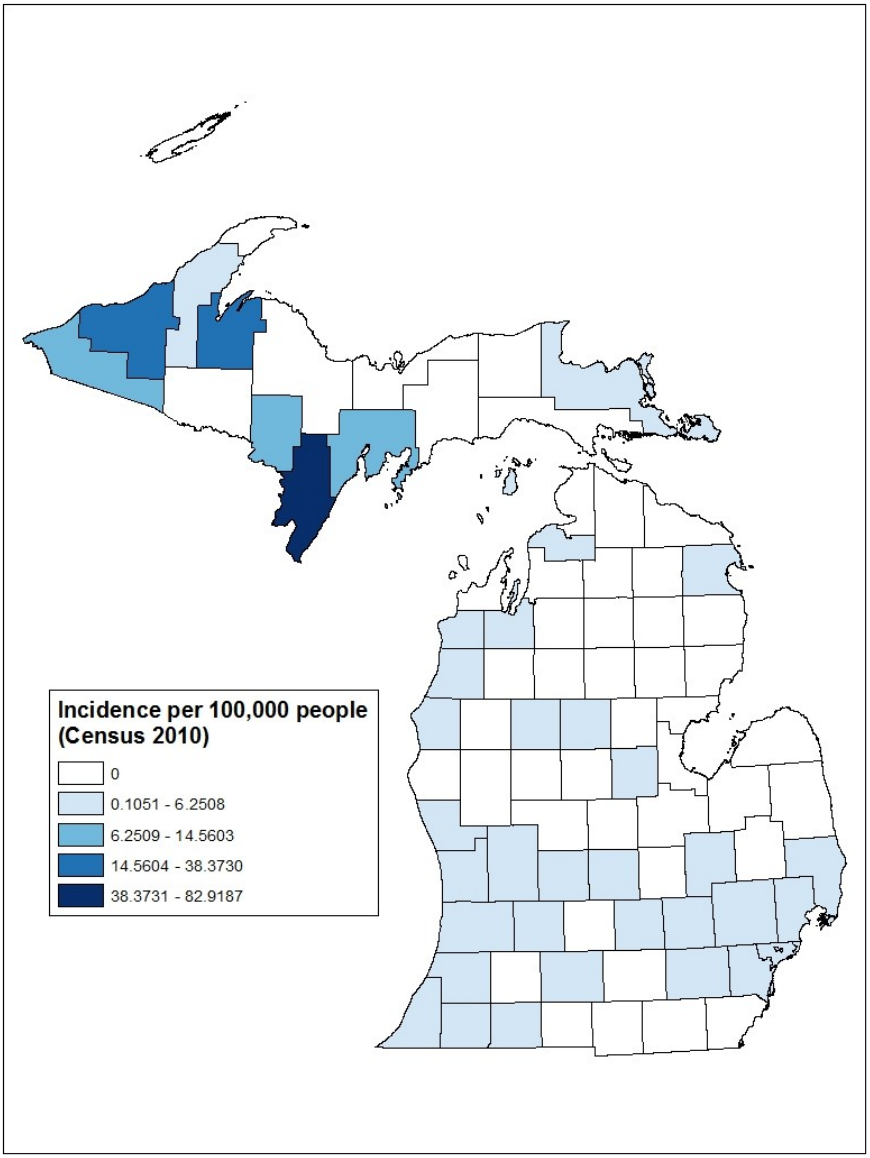


Figure 2. Incidence of Lyme disease by county, Michigan 2011

Malaria

Causative agent: Malaria is a disease caused by a family of parasites called *Plasmodium*. Most United States cases were those who traveled to or lived in areas where malaria is common (e.g., tropics and sub-tropics).

Clinical features: Infection with malaria parasites can result in a wide variety of symptoms ranging from absent to severe or even death. Symptoms of malaria include fever, chills, headache, muscle aches, and malaise. Malaria can cause fluid in the lungs, liver and kidney failure, swelling of the brain, coma, and death. Symptoms can appear months after an infected bite depending on the type of parasite.

Mode of transmission: The female *Anopheles* mosquito acquires the parasite when it bites a person who is infected. The infected mosquito spreads malaria to other humans when it feeds on the blood. Infants born to infected mothers can become infected before or during delivery. Because the parasite lives on the red blood cell it can also be transmitted via blood transfusion, organ donation, and sharing of needles or syringes.

Period of communicability: There is no direct human-to-human transmission and it cannot be transmitted sexually.

Incubation period: The time between the infective bite and the appearance of clinical symptoms is approximately 9–40 days depending on the strain. Some strains (mostly from temperate areas) have an incubation period of 8–10 months and longer. With infection through blood transfusion, incubation period depends upon the number of parasite infused.

Susceptibility: Travelers to endemic zones of malaria (e.g., South America, Southeast Asia, sub-Saharan Africa, the Caribbean, and South Pacific Islands) are at risk for acquiring malaria. Pregnant women are at increased risk of developing severe malaria compared to non-pregnant women. Malaria can increase the risk of serious pregnancy outcomes, including premature birth, miscarriage, and stillbirth.

Prevention of malaria: Malaria is no longer endemic in the U.S. Thus, the risk of acquiring malaria in the U.S. is very low. The risk depends on the destination, activities, and duration of travel. If personal protection measures are utilized (e.g., taking antimalarial drugs, using mosquito netting and insect repellents) the risk is reduced significantly. *Anopheles* mosquitoes feed during the nighttime hours, from dusk to dawn, so caution is especially recommended during these hours. Those that travel to areas known to have malaria cannot donate blood for one year and those who either lived in an endemic area or have been treated for malaria cannot donate for three years.

References: http://www.cdc.gov/malaria/

American Public Health Association. Malaria. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 373–393.

Malaria

Table 1. Demographic characteristics of malaria cases by year, Michigan 2007–2011

*N= 141	Number of Cases	Percent Total
Sex		
Male	89	63%
Female	51	36%
Race		
African American	50	35%
American Indian or Alaska Native	0	0%
Asian	17	12%
Caucasian	28	20%
Hawaiian or Pacific Islander	0	0%
Other	31	22%
Ethnicity		
Hispanic or Latino	2	1%
Age groups (years)		
0-9	7	5%
10-19	15	11%
20-29	43	30%
30-39	24	17%
40-49	17	12%
50-59	19	13%
60-69	8	6%
≥70	7	5%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

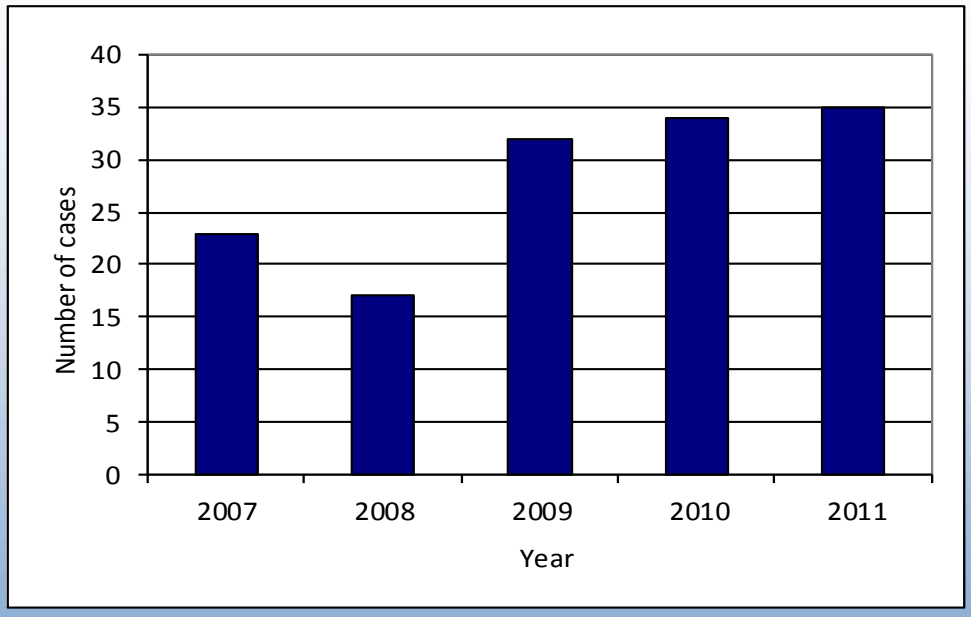


Figure 1. Number of malaria cases in Michigan, 2007–2011

Malaria

Michigan statistics: One hundred and forty-one cases of malaria have been reported during 2007–2011. None of the cases were acquired domestically. The majority of cases occurred in African Americans (35%) and Caucasians (20%). Two cases were Hispanic or Latino. Over one quarter of the cases were between the ages of 20–29 (30%).

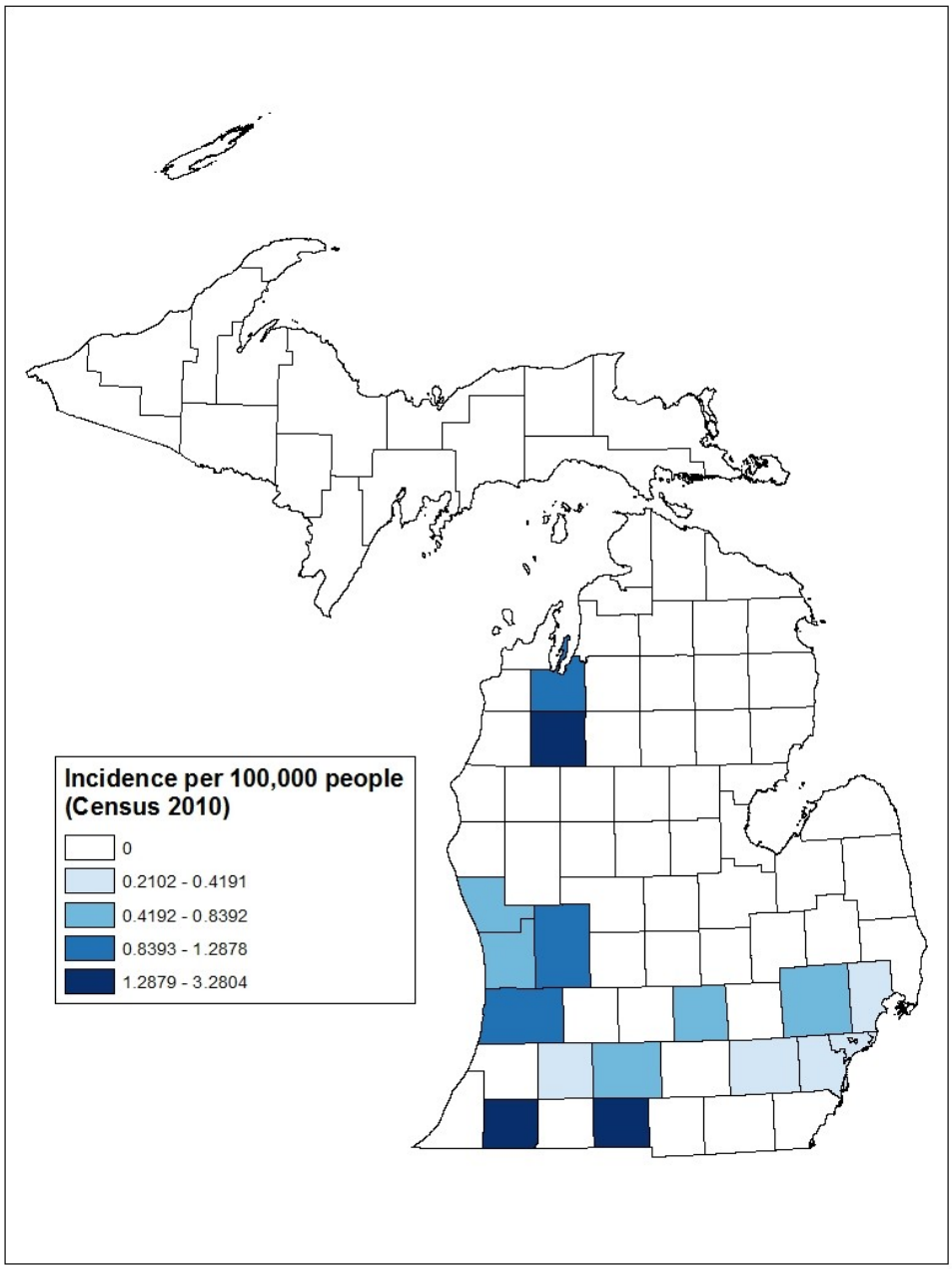


Figure 2. Incidence of malaria by county, Michigan 2011

Pertussis (Whooping Cough)

Causative agent: Pertussis is a contagious respiratory disease caused by the *Bordetella pertussis* bacteria.

Clinical features: The symptoms of pertussis usually occurs in two stages. The first stage begins like a cold with a runny nose, sneezing and possibly a low-grade fever. The second stage of pertussis includes uncontrolled coughing spells. When a child breathes in, they give a whooping noise. The second stage can last for 6–10 weeks. Infants under 6 months sometime exhibit different symptoms. Small infants may not have the "whoop" and may stop breathing for a period of time. Un-immunized or under-immunized infants usually develop severe disease and many will require hospitalization. In adults and older children, pertussis starts like a cold with a runny nose, sneezing, low-grade fever, and cough. The infection may develop into bronchitis with raspy, hoarse coughing. Bronchitis may last for weeks.

Mode of transmission: *Bordetella pertussis* is found in the mouth, nose, and throat of infected persons. The bacteria are spread in the air by droplets produced during sneezing or coughing. Pertussis is highly contagious and most unvaccinated household members living with an infected person will contract the disease.

Period of communicability: Pertussis is highly communicable in the initial stage of infection (first 2 weeks). Thereafter, communicability gradually decreases and becomes negligible in about 3 week, despite persisting spasmodic cough with whoop.

Incubation period: The average incubation period is 7–10 days but may range from 4–24 days.

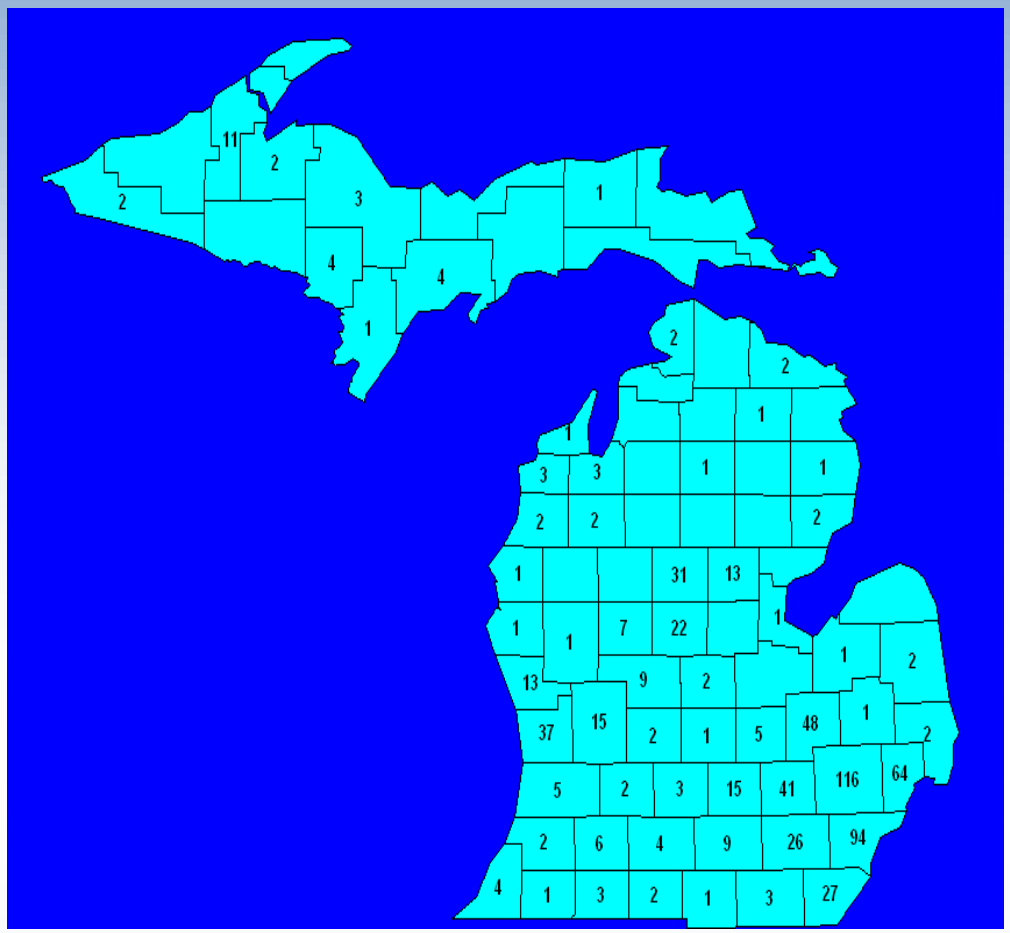
High-risk groups: Anyone can get pertussis. Infants and young children usually get the disease from an infected family member who may have a coughing illness.

Prevention of pertussis: Effective pertussis vaccine is available. Pertussis vaccine is recommended for all children is given in a series of doses at two, four, six, and 15 months of age and again when a child enters school (4–6 years of age). A booster dose of pertussis vaccine (known as Tdap) is recommended for all adolescents at 11–12 years of age, and for all adults 19 years of age and older who didn't previously receive it as a pre-teen or teen. Prompt use of appropriate antibiotics for a case is helpful in limiting other cases. Antibiotic should also be given to household contacts and other close contacts.

References: http://www.cdc.gov/vaccines/vpd-vac/pertussis/default.htm

American Public Health Association. Pertussis. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 455–461.

Pertussis (Whooping Cough)



n = 691

Figure 1. Pertussis cases by county, 2011

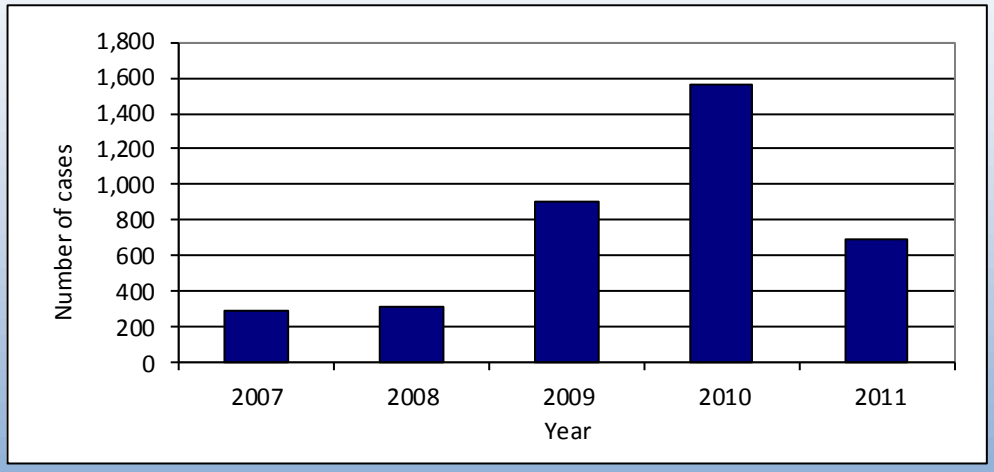


Figure 2. Number of pertussis cases in Michigan, 2007–2011

Pertussis (Whooping Cough)

Michigan statistics: There were 691 cases of pertussis reported in 2011, a decline of 56% from the 1,564 cases reported in 2010. Cases ranged in age from 5 days to 87 years, with a median age of 8 years and a mean age of 18.2 years. Similar to 2010, one-third of reported cases were among adults (age 19 years and older) and this was the largest proportion of cases among the age groups routinely used for pertussis surveillance (see Pertussis Figure 3). The proportion of cases 10–18 years of age declined from 20.5% in 2010 to 12.5% in 2011, which might reflect efforts of targeted Tdap vaccine use in this population. There were 88 cases (12.7%) reported among infants under 6 months of age, of which 29 (33%) were hospitalized. There were no deaths reported. Cases were reported from 60 counties (see Pertussis Figure 1). Among the 375 cases less than 10 years of age, 249 (66.4%) had received an age-appropriate number of pertussis vaccine doses. Among 296 cases 11 years of age or older, 49 (16.6%) reported having received a dose of Tdap.

A total of 1,564 of pertussis were reported in 2010. This is the highest number of cases since 1962, and represents an increase of 73% over the 902 cases reported in 2009. This increase continues a rising trend since the early 1990s, which intensified starting in 2008. Cases in 2010 ranged in age from 1 week to 91 years, with a median age of 11 years and a mean age of 20.2 years. Over one-third of cases were among adults (≥19 years of age), and over 56% of cases were among persons 10 or more years of age. There were 155 cases (9.9%) reported in infants less than 6 months of age; 73 of these (47%) were hospitalized. There was one reported pertussis-related death, a 3 month old child. Among 1,002 cases under 19 years of age, a cohort for whom immunization history information should be readily available, 183 (18.3%) lacked documentation of the recommended number of pertussis vaccine doses for their age. Cases were reported from 69 counties.

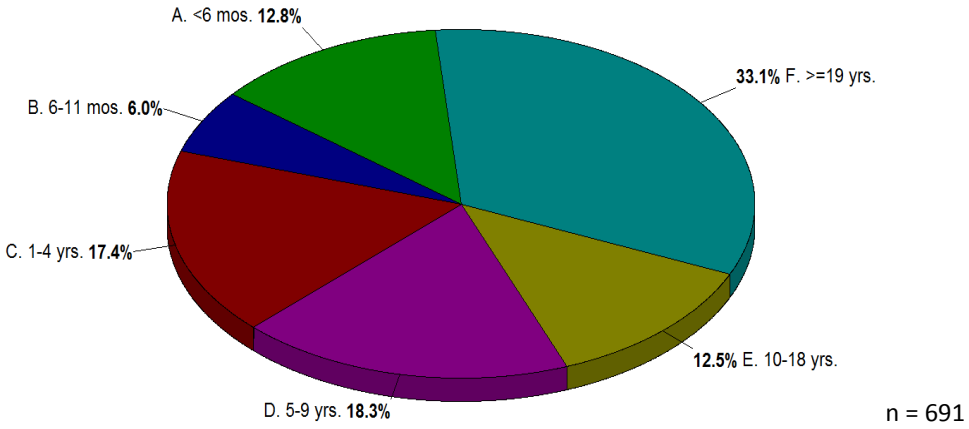


Figure 3. Incidence of pertussis by age, Michigan 2011

Pertussis (Whooping Cough)

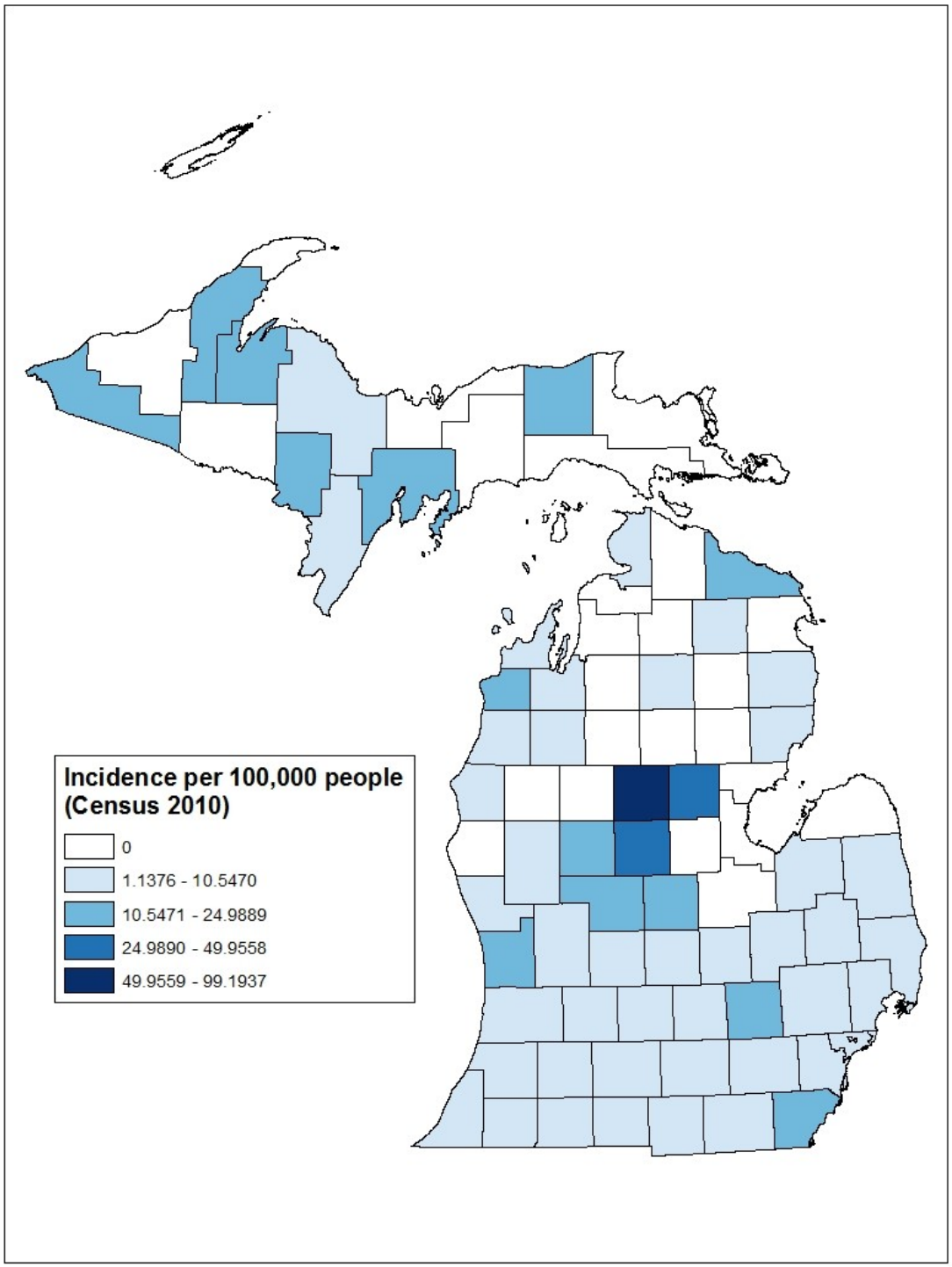


Figure 4. Incidence of pertussis by county, Michigan 2011

Q Fever

Causative agent: Q fever is an infection caused by a bacterium known as *Coxiella burnetii*.

Clinical features: Only about half of those infected with *Coxiella burnetii* show signs of illness. Most acute cases begin with one or more of the following symptoms: a sudden high fever (up to 104–105), severe headache, chills, confusion, weakness, malaise, severe sweats, sore throat, cough, vomiting, diarrhea, abdominal pain, and chest pain. Fever lasts one to two weeks and some patients have weight loss. Thirty to fifty percent of those with symptoms develop pneumonia. Many patients have abnormal liver function tests and some will develop hepatitis. Most patients recover to good health within several months without treatment and mortality is low (1–2%). Chronic Q fever (an infection lasting longer then 6 months) is an uncommon but more serious disease. Patients who have the acute form may develop the chronic form one to twenty years later. Endocarditis (inflammation of the heart valves) is a serious complication. In contrast to the acute form, mortality from the chronic form can be as high as 65%.

Mode of transmission: Q fever is spread to humans primarily through inhalation of dust contaminated by bodily fluids or excreta of infected animals. Transmission via direct contact with infected animals and ingestion of contaminated raw milk has been documented. Direct human-to-human and tick bite transmission are very rare.

Period of communicability: *C. burnetti* is resistant to heat, drying, and many common disinfectants and can survive in the environment for long periods of time.

Incubation period: Incubation period is typically 2–3 weeks after exposure but may vary.

High-risk groups: Q fever is a rare disease, but anyone can get it if they are infected with *C. burnetii* bacteria. Persons at highest risk for Q fever are those who work with animals that are infected. This includes veterinarians, meat workers, sheep and dairy workers, and livestock farmers. *C. burnetii* can be found in a wide variety of livestock and in domestic pets.

Prevention of Q fever: Educate those in high-risk occupations about the signs and symptoms of Q fever, as well as, bio-security measures. A Q fever vaccine is currently not available for general use, but may be available through the Department of Defense for persons who are known to be at high risk of exposure.

References: http://www.cdc.gov/ncidod/dvrd/qfever/index.htm

American Public Health Association. Q fever. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 494–498.

Q Fever

Table 1. Demographic characteristics of Q fever cases by year, Michigan 2007–2011

*N= 20	Number of Cases	Percent Total
Sex		
Male	11	55%
Female	7	35%
Race		
African American	3	15%
American Indian or Alaska Native	0	0%
Asian	0	0%
Caucasian	12	60%
Hawaiian or Pacific Islander	0	0%
Other	0	0%
Ethnicity		
Hispanic or Latino	1	5%
Age groups (years)		
0-9	0	0%
10-19	0	0%
20-29	0	0%
30-39	6	30%
40-49	4	20%
50-59	4	20%
60-69	3	15%
≥70	1	5%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

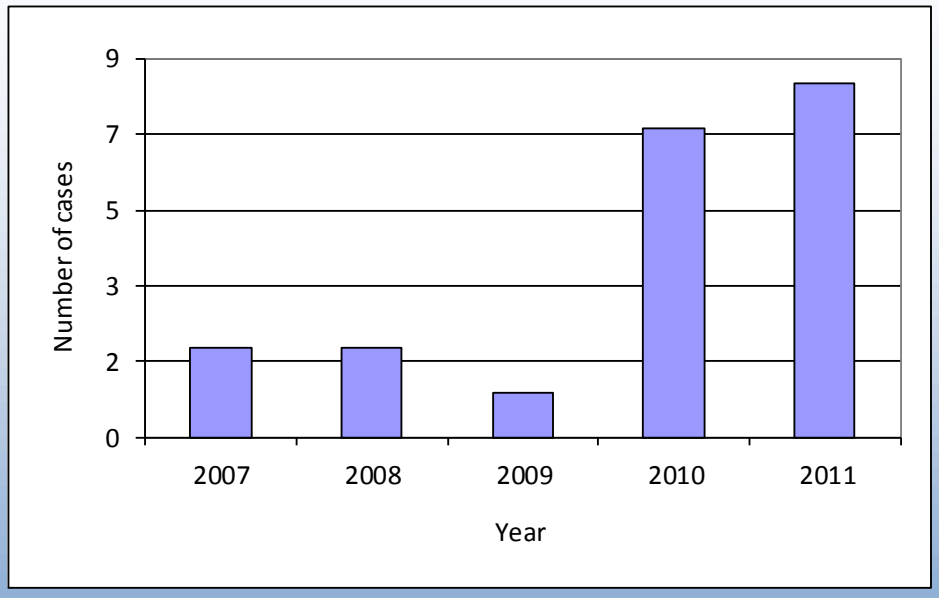


Figure 1. Number of Q fever cases in Michigan, 2007–2011

Q Fever

Michigan statistics: Twenty cases of Q fever were reported in Michigan during 2007–2011. Fifty-five percent of cases were male. Sixty percent of cases were Caucasian. The majority of reported cases were between the ages of 30–39 years (30%).

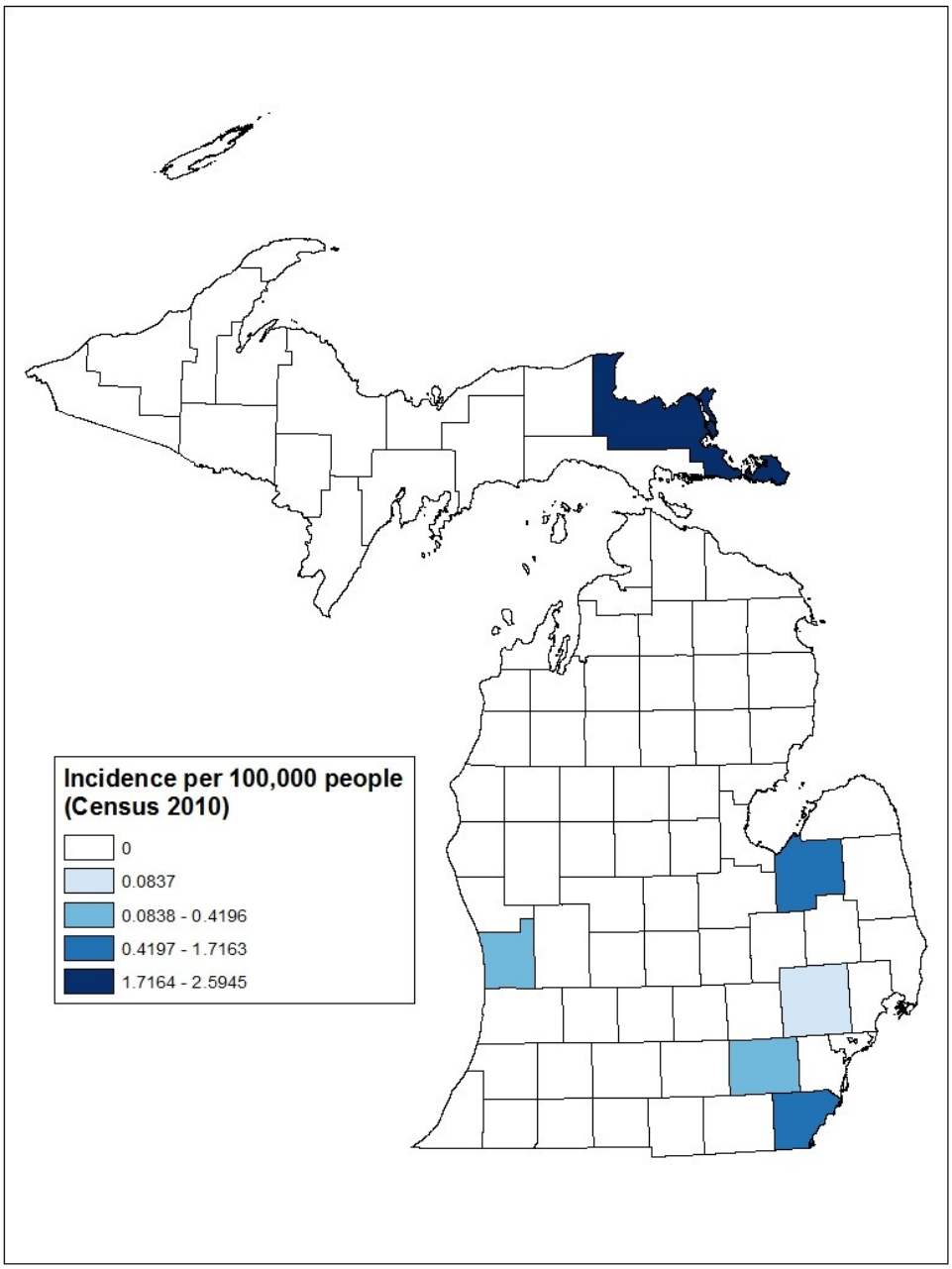


Figure 2. Incidence of Q fever by county, Michigan 2011

Rabies (Animal)

Causative agent: Rabies is viral disease of mammals often transmitted through the bite of a rabid animal.

Clinical features: The rabies virus infects the central nervous system causing encephalopathy (damage to the brain) and ultimately death. Early symptoms in humans are general flu-like symptoms such as fever, headache, and general malaise (not feeling well). Sometimes there is pain at the site of the exposure. As the disease progresses, neurological symptoms appear and may include insomnia, anxiety, confusion, slight or partial paralysis, excitation, hallucinations, agitation, hypersalivation, difficulty swallowing, and hydrophobia (fear of water). Death usually occurs within days of the onset of symptoms.

Mode of transmission: People and animals get rabies primarily from the bite of an infected animal. Although rare, it is possible to get rabies if infectious material (such as saliva or brain tissue) from a rabid animal enters a wound, eyes, nose, or mouth. Rarely, non-bite transmission has been reported such as:

⇒ inhalation of aerosolized rabies virus, most people are unlikely to be exposed to aerosolized virus outside of a laboratory

⇒ human-to-human transmission has been documented in cornea and organ transplant recipients

Period of communicability: The rabies virus enters through a bite wound and travels from the bite location along the nerves to the brain. The person or animal does not appear ill during this time. The virus cannot be transmitted at this point of infection because it is not present in the saliva. Only late in the disease, after the virus has reached the brain and multiplied there, does the virus move from the brain to the salivary glands and saliva. Also at this time, after the virus has multiplied in the brain, almost all animals begin to show the first signs of rabies. Most of these signs are obvious to even an untrained observer, but within a short period of time, usually within 3 to 5 days, the virus has caused enough damage to the brain that the animal begins to show unmistakable signs of rabies and is infectious.

Incubation period: Incubation can be as short as 9 days or as long as 7 years. The average incubation period is 3–8 weeks.

High-risk groups: Persons at high-risk include those who work closely with animals that have the potential to have rabies infection. Veterinarians, wildlife conservation personnel, park rangers, and animal control personnel all have a higher risk for coming in contact with the rabies virus.

Rabies (Animal)

Prevention of rabies: Following rabies prevention measures is critical to preventing infection. The following measures should be taken at all times:

⇒ Never handle wild or unfamilar animals. Teach children never to handle unfamiliar animals, wild or domestic, even if they appear friendly. "Love your own, leave other animals alone" is a good principle for children to learn.

⇒ Wash any wound or bite from an animal thoroughly with soap and water and seek medical attention immediately.

⇒ Have all dead, sick, or easily captured bats tested for rabies if exposure to people or pets occurs.

⇒ If you awaken and find a bat in your room, see a bat in the room of an unattended child, or see a bat near a mentally impaired or intoxicated person, seek medical advice and submit the bat for rabies testing.

⇒ Prevent bats from entering living quarters or occupied spaces in homes, churches, schools, and other similar areas where they might contact people and pets.

⇒ Be a responsible pet owner by keeping vaccinations current for all dogs, cats, and ferrets, keeping your cats and ferrets inside and your dogs under direct supervision, calling animal control to remove stray animals from your neighborhood, and consider having your pets spayed or neutered.

⇒ Many exotic species make poor pets, and no rabies vaccine is licensed for use in these species. It is illegal in Michigan to have wild animals as pets.

Rabies is more common in some Asian, African, and Latin American countries. If you plan travel abroad you should contact your health care provider, travel clinic, or health department about risk for rabies exposure.

References: http://www.cdc.gov/rabies/

http://www.michigan.gov/emergingdiseases/0,1607,7-186-25807---,00.html

American Public Health Association. Rabies. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 498–508.

Rabies (Animal)

Michigan statistics: Rabies in humans is very rare in Michigan and in the United States. One human case of rabies was reported in 2009. Prior to 2009, the last reported case of human rabies in Michigan was during 1983.

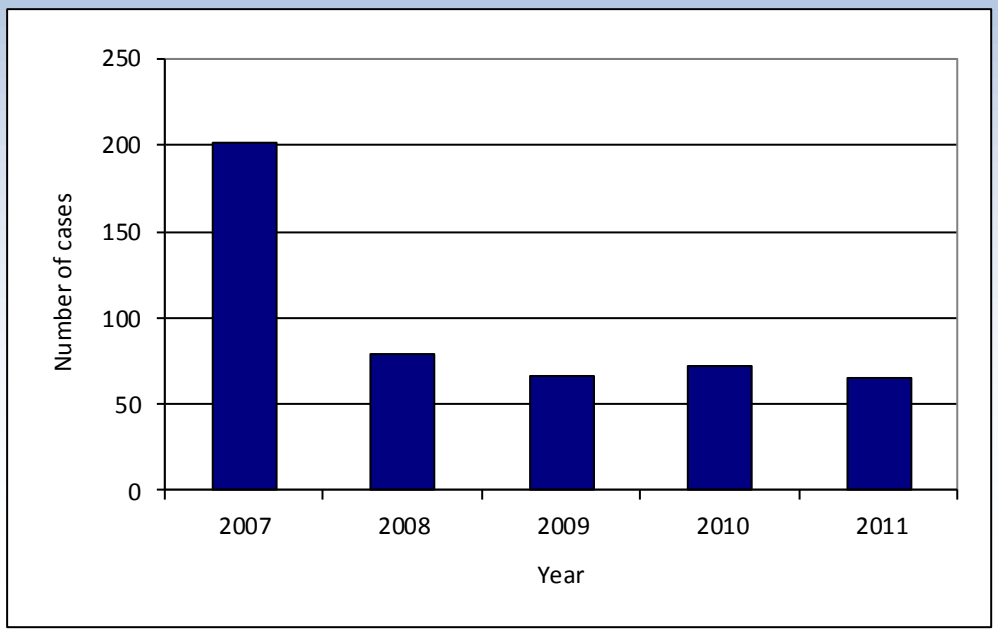


Figure 1. Number of rabies cases in Michigan, 2007–2011

Rabies (Animal)

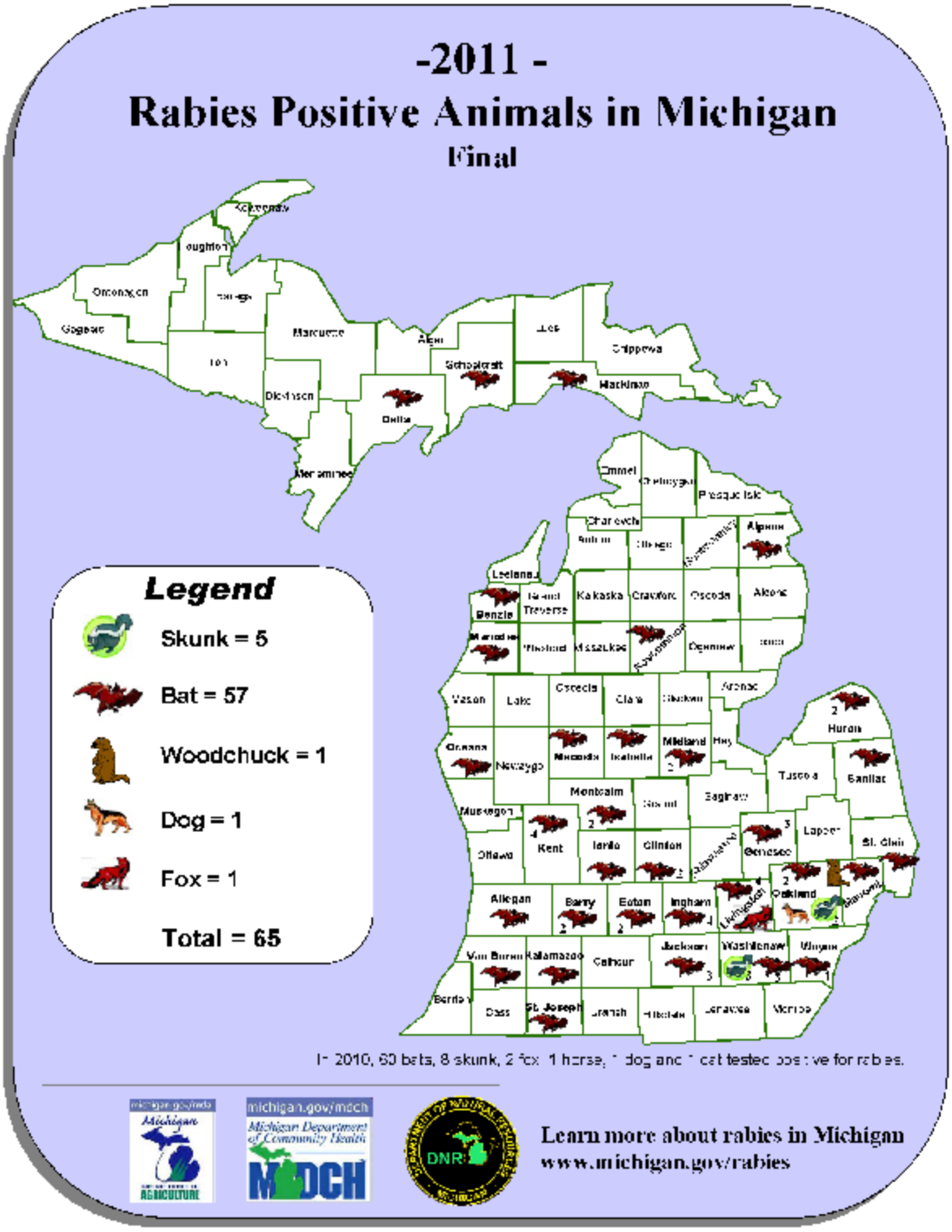


Figure 2. County and species of positive rabies animals, Michigan 2011

Salmonellosis

Causative agent: Salmonellosis is caused by the bacterium *Salmonella*. Over 2,400 *Salmonella* serotypes have been identified. Most human salmonellosis is caused by the typhimurium, enteritidis, Newport, and Heidelberg serotypes.

Clinical features: Individuals infected with *Salmonella* usually develop diarrhea, fever, and abdominal cramps. The illness usually lasts 4 to 7 days and most persons recover without treatment. However, in some cases, severe diarrhea causes the patient to be hospitalized. In these patients, infection may spread from the intestines to the blood stream and then to other body sites. Death can occur from severe infection.

Mode of transmission: *Salmonella* are usually transmitted to humans by eating contaminated foods. Contaminated foods are often of animal origin, such as beef, poultry, milk, or eggs. However, all foods including fruits and vegetables may become contaminated during preparation and handling. *Salmonella* can also be found in the feces of some pets and people. Persons can become infected if they don't wash their hands after contact with infected pets or pet feces. Reptiles (such as turtles, lizards, and snakes) and chicks or young birds are particularly likely to carry *Salmonella.*

Period of communicability: Period of communicability is extremely variable from several days to weeks. Depending on the serotypes, approximately 1% of infected adults and 5% of children under 5 years may excrete the organism for >1 year.

Incubation period: Incubation ranges from 6–72 hours. Average incubation is 12–36 hours.

High-risk groups: The elderly, infants, and those with impaired immune systems have a higher risk of contracting salmonellosis than the general population.

Prevention of salmonellosis: The risk of S*almonella* infection can be reduced if the following preventative measures are taken:

⇒ Cook poultry, ground beef, and eggs thoroughly. Do not eat or drink foods containing raw eggs or raw (unpasteurized) milk.

⇒ Wash hands, kitchen work surfaces, and utensils with soap and water immediately after they have been in contact with raw meat or poultry.

⇒ Wash hands with soap after handling reptiles, birds or baby chicks, and after contact with pet feces.

⇒ Reptiles (e.g., turtles, iguanas, other lizards, and snakes) are not appropriate pets for small children and should not be in the same house as an infant.

⇒ Don't work with raw poultry or meat and an infant (e.g., cooking, feeding and changing diapers) at the same time.

References: http://www.cdc.gov/salmonella/

American Public Health Association. Salmonellosis. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 534–540.

Salmonellosis

Table 1. Demographic characteristics salmonellosis cases by year, Michigan 2007–2011

*N= 4,657	Number of Cases	Percent Total
Sex		
Male	2,022	43%
Female	2,566	55%
Race		
African American	412	9%
American Indian or Alaska Native	24	1%
Asian	91	2%
Caucasian	3046	65%
Hawaiian or Pacific Islander	2	0%
Other	124	3%
Ethnicity		
Hispanic or Latino	135	3%
Age groups (years)		
<1	232	5%
1-9	738	16%
10-19	715	15%
20-29	562	12%
30-39	468	10%
40-49	582	12%
50-59	586	13%
60-69	439	9%
≥70	563	12%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

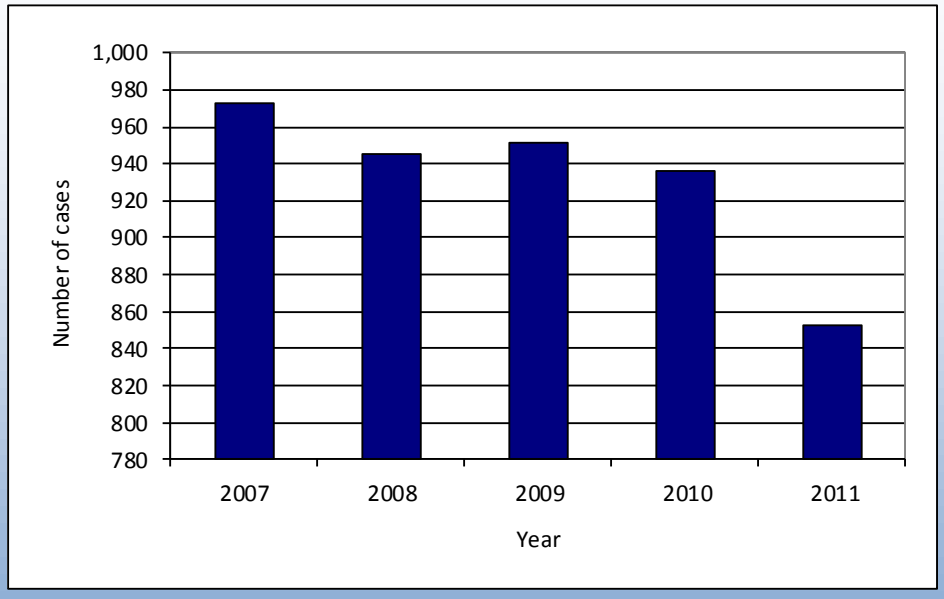


Figure 1. Number of salmonellosis cases in Michigan, 2007–2011

Salmonellosis

Michigan statistics: A total of 4,657 cases of salmonellosis were reported in Michigan during 2007–2011. The majority of the cases were Caucasian (65%) and African American (9%). Almost one quarter of the cases were between the ages of 0–9 years (21%). Three percent of the cases were Hispanic or Latino.

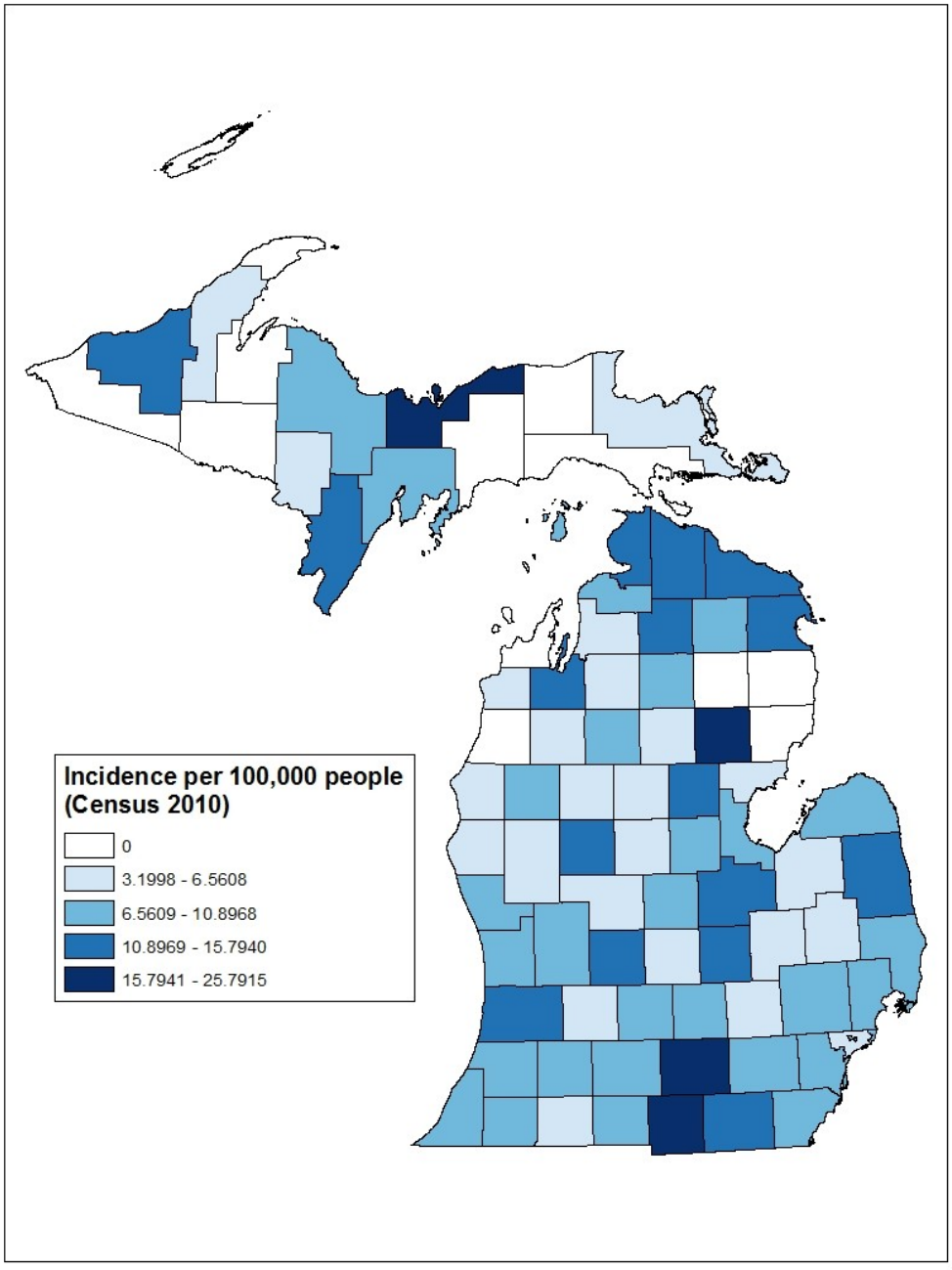


Figure 2. Incidence of salmonellosis by county, Michigan 2011

Shigellosis

Causative agent: Shigellosis is a bacterial infection of the large and small intestines caused by the bacterium *Shigella*.

Clinical features: Diarrhea, fever, nausea, vomiting, and abdominal cramps characterize shigellosis. Stools usually contain blood, mucus, and pus. Some cases may present with watery diarrhea. Asymptomatic infections can also occur. The illness is usually self-limited and lasts from several days to weeks with an average of four to seven days. The severity of the infection depends on the age and state of nutrition of the patient and the serotype of *Shigella*.

Mode of transmission: Shigellosis is transmitted through direct or indirect fecal-oral routes. *Shigella* can be transmitted through food or water contaminated with human feces. Contaminated food, water, and milk have all been identified as sources of infection.

Period of communicability: Shigellosis is communicable during acute infection and while the infectious agent is present in feces (usually no longer than four weeks). Asymptomatic carriers may transmit infection for months or years.

Incubation period: The average incubation period is 1–3 days but can range from 12 hours to one week.

High-risk groups: The elderly, children, and individuals who are immunocompromised are at higher risk.

Prevention of shigellosis: The following prevention measures may limit the risk of acquiring infection:

⇒ Wash hands with soap carefully and frequently; especially after going to the bathroom, after changing diapers, and before preparing foods or beverages.

⇒ Dispose of soiled diapers properly in a closed lid garbage can.

⇒ Disinfect diaper-changing areas after use.

⇒ Keep children with diarrhea out of child care settings.

⇒ Supervise hand washing of toddlers and small children after they use the toilet.

⇒ Do not prepare food for others while ill with diarrhea.

⇒ Avoid swallowing water from ponds, lakes or untreated pools.

References: http://www.cdc.gov/nczved/divisions/dfbmd/diseases/shigellosis/

American Public Health Association. Shigellosis. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 556–560.

Shigellosis

Table 1. Demographic characteristics of shigellosis cases by year, Michigan 2007–2011

*N= 1,014	Number of Cases	Percent Total
Sex		
Male	495	49%
Female	506	50%
Race		
African American	380	37%
American Indian or Alaska Native	0	0%
Asian	17	2%
Caucasian	355	35%
Hawaiian or Pacific Islander	0	0%
Other	53	5%
Ethnicity		
Hispanic or Latino	76	7%
Age groups (years)		
<1	20	2%
1-9	418	41%
10-19	112	11%
20-29	159	16%
30-39	107	11%
40-49	84	8%
50-59	61	6%
60-69	40	4%
≥70	31	3%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

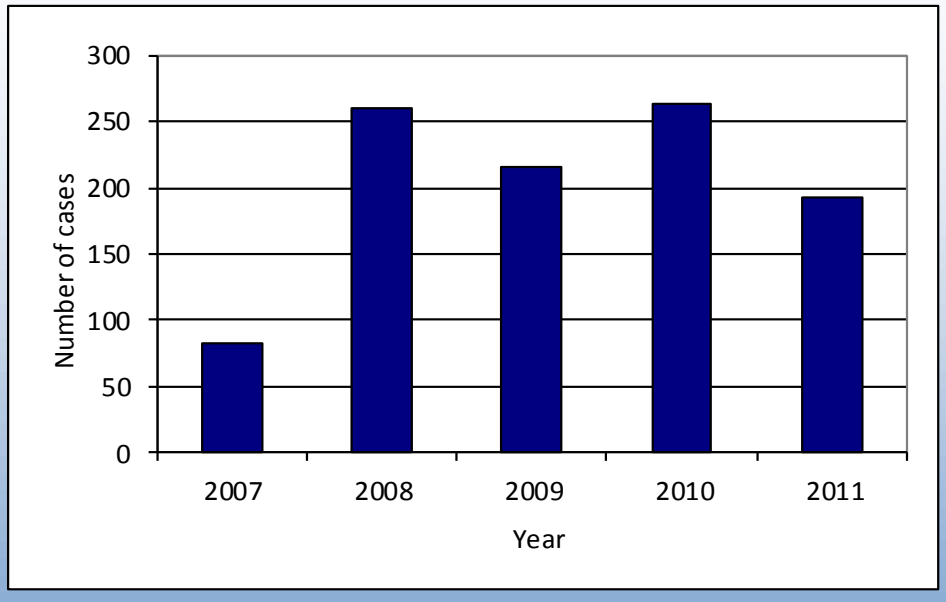


Figure 1. Number of acute shigellosis cases in Michigan, 2007–2011

Shigellosis

Michigan statistics: A total of 1,014 shigellosis cases were reported during 2007–2011. Fifty percent of cases were female. Thirty-five percent of cases were Caucasian and 37% were African American. Seven percent of cases were Hispanic or Latino. The majority of cases were found in children age 1 to 9 years of age (41%).

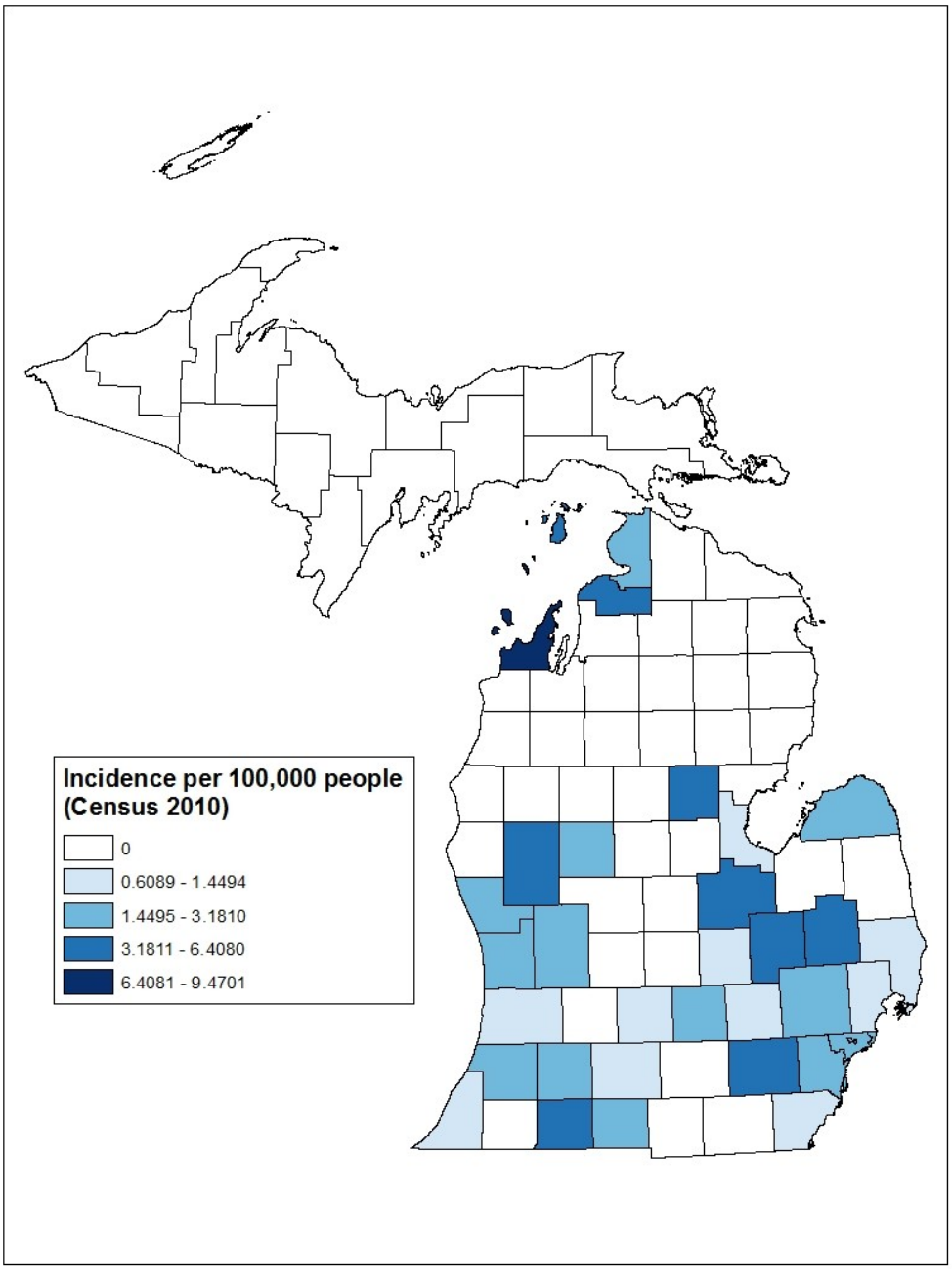


Figure 2. Incidence of shigellosis by county, Michigan 2011

Streptococcus, Group A (GAS)

Causative agent: Streptococcal disease is caused by the bacterium, *Streptococcus pyogenes*. This bacterium is commonly found in the throat and on the skin. "Group A" refers to the classification of the bacteria's cell wall in the genus *Streptococcus.*

Clinical features: Most GAS infections are relatively mild such as "Strep throat" and impetigo. Strep throat causes fever, sore throat, and swollen lymph glands. Impetigo is a skin infection that displays red, weeping skin sores. Scarlet fever causes all the symptoms of strep throat plus a characteristic rash on the neck, chest, skin folds, and inner thighs. Severe and sometimes life-threatening, GAS disease may occur when bacteria get into parts of the body where bacteria usually are not found, such as blood, muscle, or lungs. These infections are termed "invasive GAS disease." Two of the most severe, but least common, forms of invasive GAS disease are necrotizing fasciitis and streptococcal toxic shock syndrome. Necrotizing fasciitis (occasionally described by the media as "flesh-eating bacteria") is a rapidly progressive disease that destroys muscles, fat, and skin tissue. Streptococcal toxic shock syndrome (STSS) results in a rapid drop in blood pressure and organ (e.g., kidney, liver, lungs) failure. STSS is not the same as "toxic shock syndrome" caused by the bacteria *Staphylococcus aureus* that has been associated with tampon usage.

Mode of transmission: Group A streptococcal bacteria are spread by direct person-to-person contact. The bacteria are carried in discharge from the nose or throat of an infected person and in infected wounds or sores on the skin. The bacteria are usually spread when infected secretions come in contact with the mouth, nose, or eyes of an uninfected person. They can also enter the body through a cut or scrape.

Period of communicability: The risk of spreading the infection is highest when an infected person has symptoms or has an infected wound. Infected persons who have no symptoms are much less contagious. With adequate penicillin therapy, it is communicable for 24–48 hours. Untreated cases can be communicable for 10–21 days. Patients with untreated streptococcal infection with purulent discharges may spread the infection for weeks or months. Household objects like plates, cups, and toys do not play a major role in the spread of group A strep.

Incubation period: Symptoms appear quickly after infection, usually within 1–3 days.

High-risk groups: Anyone can become infected with group A strep. However, people with long-term illnesses like cancer, diabetes, kidney disease, and those who use medications such as steroids, are at higher risk for invasive disease. Breaks in the skin (e.g., cuts, surgical wounds or chickenpox blisters) can provide an opportunity for the bacteria to enter the body.

Prevention of streptococcal group A disease: The spread of all types of *Streptococcus* infection can be reduced by good hand washing, especially after coughing and sneezing and before preparing foods or eating. Persons with sore throats should be seen by a doctor who can perform tests to find out whether the illness is strep throat. If the test results are positive for strep throat, the person should stay home from work, school, or daycare until 24 hours after taking an antibiotic. All wounds should be kept clean and watched for possible signs of infection such as redness, swelling, drainage, and pain at the wound site. A person with signs of an infected wound, especially if fever occurs, should seek medical care.

References: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/groupastreptococcal_g.htm

American Public Health Association. Streptococcal diseases. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 577–585.

Streptococcus, Group A (GAS)

Table 1. Demographic characteristics of streptococcus group A cases by year, Michigan 2007–2011

*N= 1,035		Number of Cases	Percent Total
Sex			
	Male	511	49%
	Female	523	51%
Race			
	African American	233	23%
	American Indian or Alaska Native	1	0%
	Asian	9	1%
	Caucasian	606	59%
	Hawaiian or Pacific Islander	3	0%
	Other	23	2%
Ethnicity			
	Hispanic or Latino	29	3%
Age groups (years)			
	<1	14	1%
	1-9	100	10%
	10-19	55	5%
	20-29	59	6%
	30-39	90	9%
	40-49	147	14%
	50-59	153	15%
	60-69	177	17%
	≥70	254	25%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

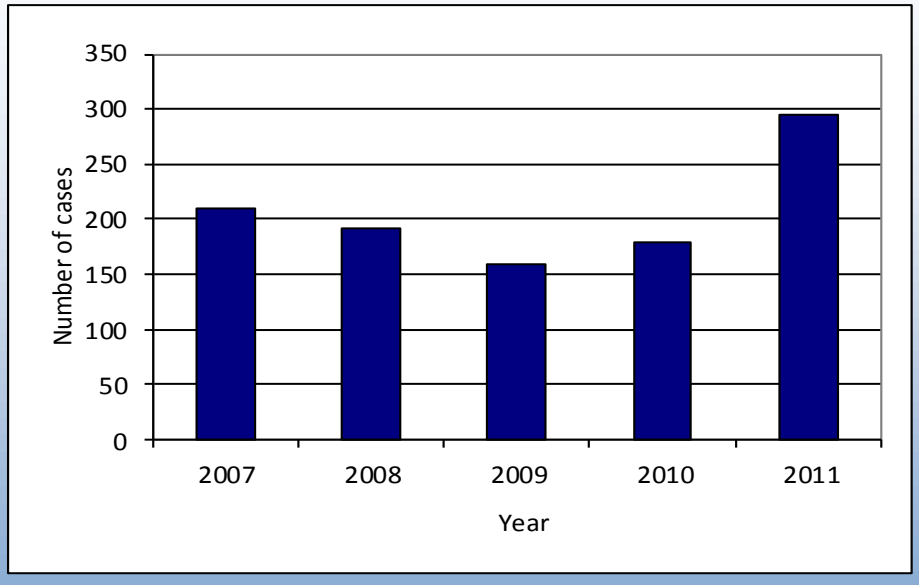


Figure 1. Number of invasive group A streptococcus cases in Michigan, 2007–2011

Streptococcus, Group A (GAS)

Michigan statistics: Reported GAS cases during 2007–2011 totaled 1,035 cases. Cases were primarily female (51%). Age analysis of GAS showed that over one-fourth of reported cases were found to be in persons 70 years and older (25%). Caucasians (59%) and African Americans (23%) had the highest incidence of disease. Three percent of reported cases were Hispanic or Latino.

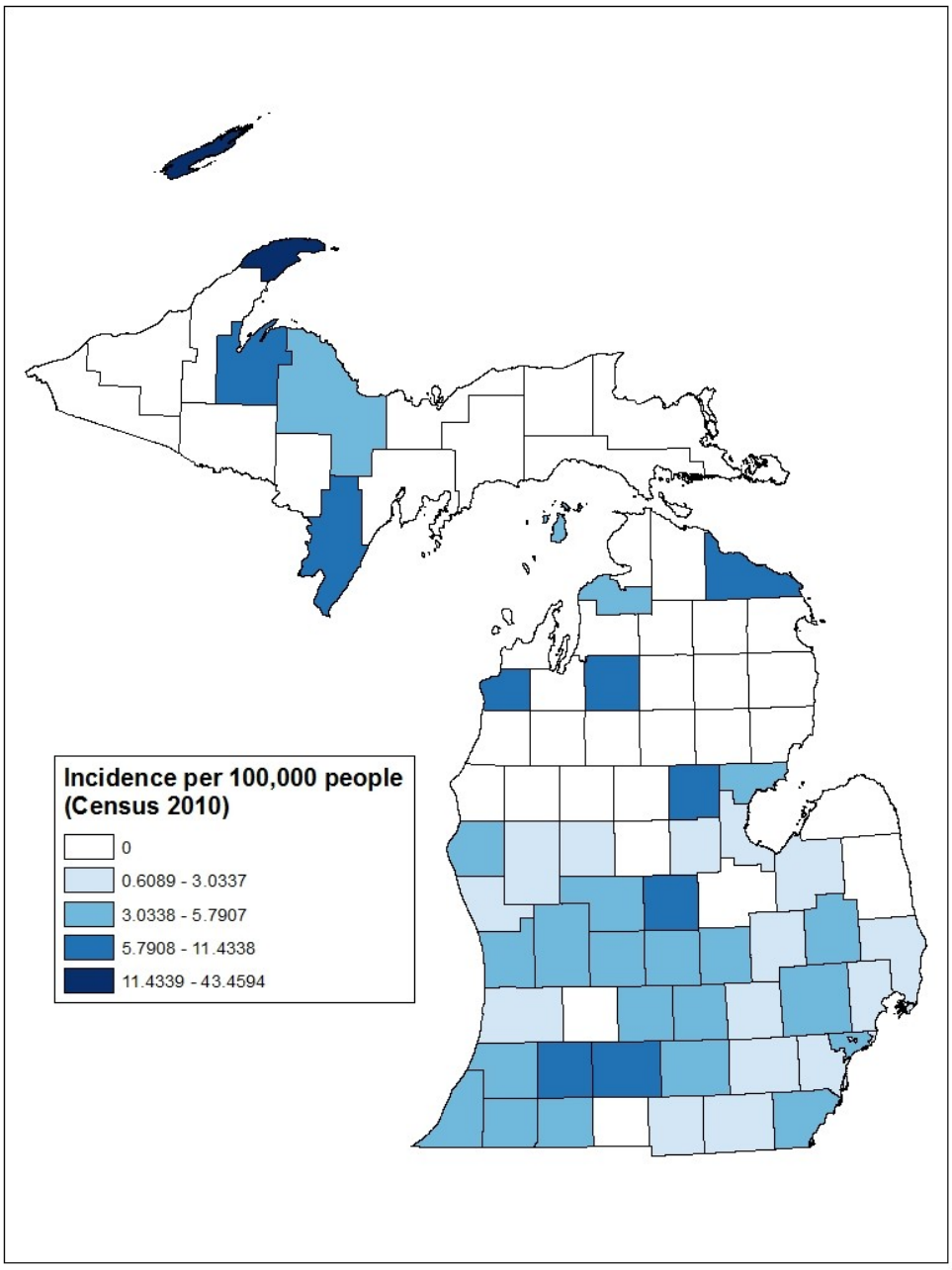


Figure 2. Incidence of invasive group A streptococcus by county, Michigan 2011

Syphilis

Causative agent: Syphilis is a sexually transmitted disease caused by the bacterium *Treponema pallidum*.

Clinical features: Many of the symptoms of syphilis are indistinguishable from other diseases and are characterized by progressive stages. If people with syphilis are treated early they do not progress to the later stages.

Primary Syphilis: The typical sore (chancre) of primary syphilis is solitary, almost always painless and covered by a scab. It may also look like an area of erosion, blister or an ulcer with a raised border. It disappears in three to five weeks, but if the disease is untreated, the person is still infected and contagious.

Secondary Syphilis: Individuals who progress to secondary syphilis may have a painless rash anywhere on the body, especially the palms of the hands or the soles of the feet. This type of rash is almost diagnostic as very few other conditions cause rashes on the palms and soles. Hair loss from the scalp, eyebrows or pubic area may occur. Other symptoms include headache, nausea, weight loss, mild fever, and general malaise. Syphilis can still be spread at this stage.

Latent Syphilis: This stage of syphilis has been divided into early latency and late latency. An individual who has had syphilis for a year or less is considered to have early latent syphilis. An individual who has had syphilis for one year or more is considered to have late latent syphilis. Although no symptoms occur in the latent stages, the organism is still present in the body.

Tertiary (Late) Syphilis: The late stage of syphilis can develop in 15% of those who are infected but have not been treated and can occur 10-20 years after the infection was first. The disease may damage internal organs including the brain, nerves, eyes, heart, blood vessels, liver, bones, and joints. Symptoms of the late stage include difficulty coordinating muscle movements, paralysis, numbness, gradual blindness, and dementia. The disease may lead to death. Many people infected with syphilis do not have any symptoms for years, yet remain at risk for complications that are associated with tertiary disease if they are not treated.

Mode of transmission: Syphilis is spread from person to person through direct contact with a syphilis sore. Syphilis sores occur mainly on the genitals, vagina, anus, or in the rectum and can appear on the lips and in the mouth. Transmission of the organism often occurs during vaginal, anal, or oral sex. Pregnant women with the disease can pass infection to their babies. Syphilis cannot be spread through contact with toilet seats, door knobs, swimming pools, hot tubs, bathtubs, shared clothing, or eating utensils.

Period of communicability: Transmission is most likely to occur during the first year of infection. An infection that has persisted for more than four years is rarely communicable. The exception is an untreated pregnant woman who may transmit syphilis to the fetus regardless of the duration of her disease.

Incubation period: The incubation period varies from 9 to 90 days but usually last 2–4 weeks.

Syphilis

High-risk groups: The following groups of people are at higher risk of contracting syphilis than the general population due to higher likelihood of exposure:

⇒ Commercial sex workers

⇒ Men who have sex with men

⇒ Individuals having unprotected sex with people infected with syphilis

⇒ Fetus of an infected pregnant mother

Prevention of syphilis: The following measures can prevent syphilis infection if followed carefully:

⇒ Avoid unprotected sexual intercourse with persons infected with syphilis.

⇒ Regular screenings for sexually transmitted diseases are advised when unprotected sex is practiced.

⇒ Infected individuals should avoid sexual intercourse until therapy is completed by both themselves and their sexual partners to minimize the risk of re-infection.

References: http://www.cdc.gov/std/syphilis/default.htm

American Public Health Association. Syphilis. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 591–596.

Syphilis

Table 1. Demographic characteristics of primary and secondary syphilis cases, Michigan 2011

*N= 274	Number of Cases	Percent Total
Sex		
Male	247	90%
Female	26	9%
Race		
African American	169	62%
Caucasian	93	34%
Other/ Multi	3	<1%
Unknown	4	<1%
Ethnicity		
Hispanic or Latino	4	1%
Age groups (years)		
0-4 years	0	0%
5-9 years	0	0%
10-14 years	0	0%
15-19 years	14	5%
20-24 years	63	23%
25-29 years	44	16%
30-34 years	35	13%
35-39 years	40	15%
40-44 years	28	10%
45-54 years	36	13%
55-64 years	13	5%
65 and over	1	0%
Unknown Age	0	0%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

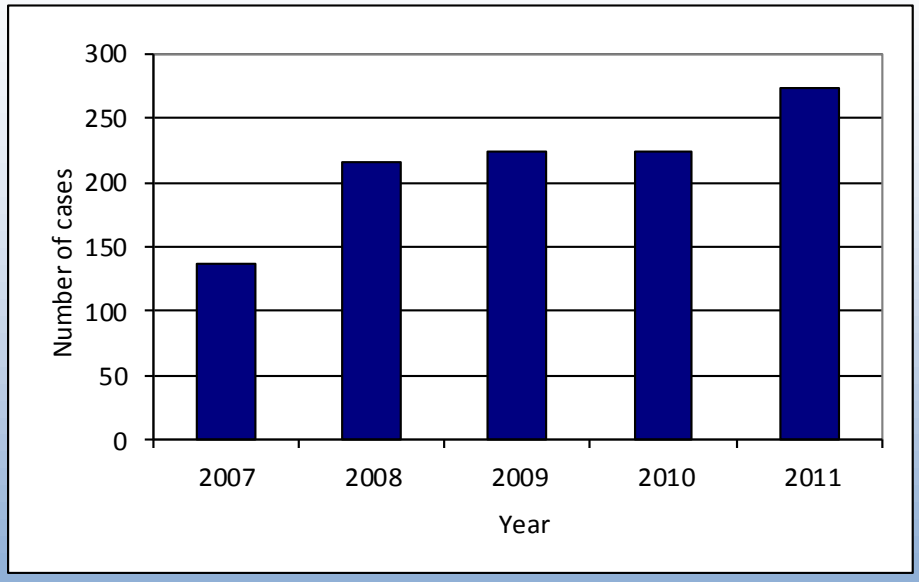


Figure 1. Number of syphilis cases in Michigan, 2007–2011

Syphilis

Michigan statistics: Since 2007, reporting of primary and secondary cases of syphilis has increased. From 2011, 274 cases were reported. The majority of the cases were male (90%). Almost two-thirds of the cases were African American (62%). One percent of cases were identified to be Hispanic or Latino. Almost one quarter of the cases were between the ages of 20–24 years of age (23%).

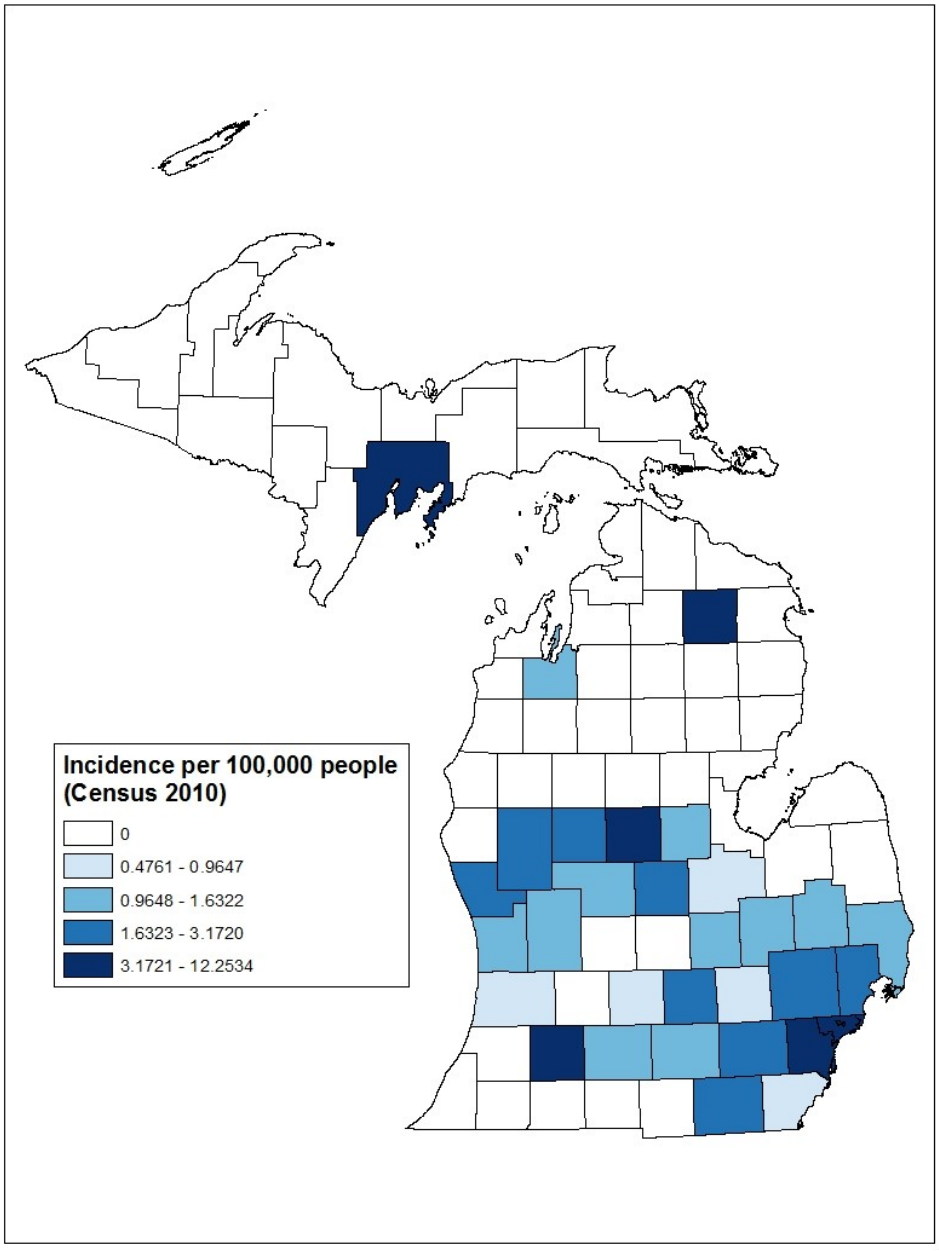


Figure 2. Incidence of syphilis by county, Michigan 2011

Tuberculosis

Causative agent: Tuberculosis (TB) is an infectious disease caused by the bacteria *Mycobacterium tuberculosis*. It generally affects the lungs but can sometimes cause infections in the lymph nodes, kidneys, brain, or spine.

Clinical features: Not everyone who is infected with *M. tuberculosis* becomes sick. Those that have infection but have no symptoms and do not feel sick are said to have latent TB. They cannot spread the infection to others. Some with latent infection will develop the active form of disease. The symptoms of TB depend on where in the body the infection is located. TB in the lungs can cause symptoms such as a cough that lasts three weeks or longer, chest pain, and coughing up blood or sputum. Other symptoms of TB disease include generalized weakness, weight loss, fever, loss of appetite, and night sweats. Other symptoms depend on the part of the body that is affected. If not treated properly TB can be fatal.

Mode of transmission: TB is primarily an airborne disease. The disease is spread from person to person in tiny microscopic droplets when a TB sufferer coughs, sneezes, speaks, sings, or laughs. Only people with active disease are contagious. One in ten people that are infected with *M. tuberculosis* may develop active TB at some time in their lives. The risk of developing active disease is greatest in the first year after infection. However, active disease often does not occur until many years later.

Period of communicability: Patients with active pulmonary or laryngeal TB can transmit the bacteria to others as long as they are discharging tubercle bacilli in their sputum. Generally, when TB patients start adequate and appropriate treatment, their sputum becomes free of bacilli within two to three weeks.

Incubation period: Most people who are exposed to TB germs will develop a positive tuberculin skin test approximately 2 - 10 weeks after exposure. Ninety percent of these people will never develop TB disease. The risk for developing active TB disease is highest in the first two years after a positive tuberculin skin test is identified.

High-risk groups: Anyone can get TB. Higher risk persons include:

⇒ Infants and small children

⇒ People who share the same breathing space (such as family members, friends, and coworkers) with someone who has TB disease

⇒ People with low income who live in crowded conditions, have poor nutrition, and have poor health care (e.g., homeless persons)

⇒ People living in countries where TB is endemic

⇒ Nursing home residents and prisoners

⇒ Alcoholics and injection drug users

⇒ People with medical conditions such as diabetes, kidney failure, and those with weakened immune systems (such as HIV or AIDS)

⇒ People who have been recently (<2yrs) infected with TB

⇒ Those who were not received adequate TB treatment in the past

Tuberculosis

Prevention of tuberculosis: A vaccine for TB, the Bacille Calmette-Guerin (BCG) vaccine is available, however, it is not used widely in the United States. BCG vaccination does not completely prevent people from getting TB. Individuals tested positive for TB without exhibiting any symptoms can be treated with medication to greatly reduce their risk of developing full-blown TB. People who have not tested positive but who are at higher risk of contracting the infection, people in contact with an infected person, and those with compromised immune systems can also be given the same medication as a preventative measure.

Guidelines for those infected with TB to prevent transmission to others include:

⇒ Always completing course of medication.

⇒ Cover the mouth with a tissue when coughing, sneezing or laughing. Dispose of tissues in a closed paper sack and throw it away.

⇒ Do not go to work or school. Avoid close contact with anyone. Sleep in a bedroom away from other household members.

⇒ Air out living quarters to the outside of the building frequently. TB spreads in small closed spaces where air doesn't move. Place fans in windows to blow out (exhaust) air that may be filled with TB bacteria.

References: http://www.michigantb.org

http://www.cdc.gov/tb/default.htm

American Public Health Association. Tuberculosis. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 639–660.

Tuberculosis

Table 1. Demographic characteristics of tuberculosis cases, Michigan 2011

*N= 170	Number of Cases	Percent Total
Sex		
Male	103	61%
Female	67	39%
Race		
African American	61	36%
American Indian or Alaska Native	1	1%
Asian	48	28%
Caucasian	59	35%
Hawaiian or Pacific Islander	1	1%
Other	0	0%
Ethnicity		
Hispanic or Latino	12	7%
Age groups (years)		
<1	3	2%
1-9	4	2%
10-19	6	4%
20-29	21	12%
30-39	19	11%
40-49	31	18%
50-59	33	19%
60-69	25	15%
≥70	31	18%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

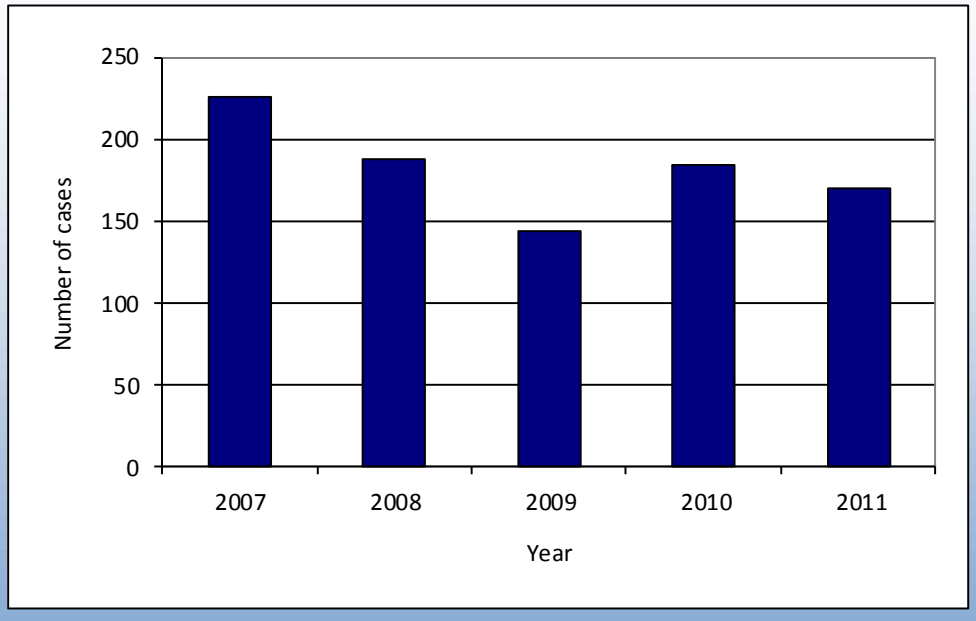
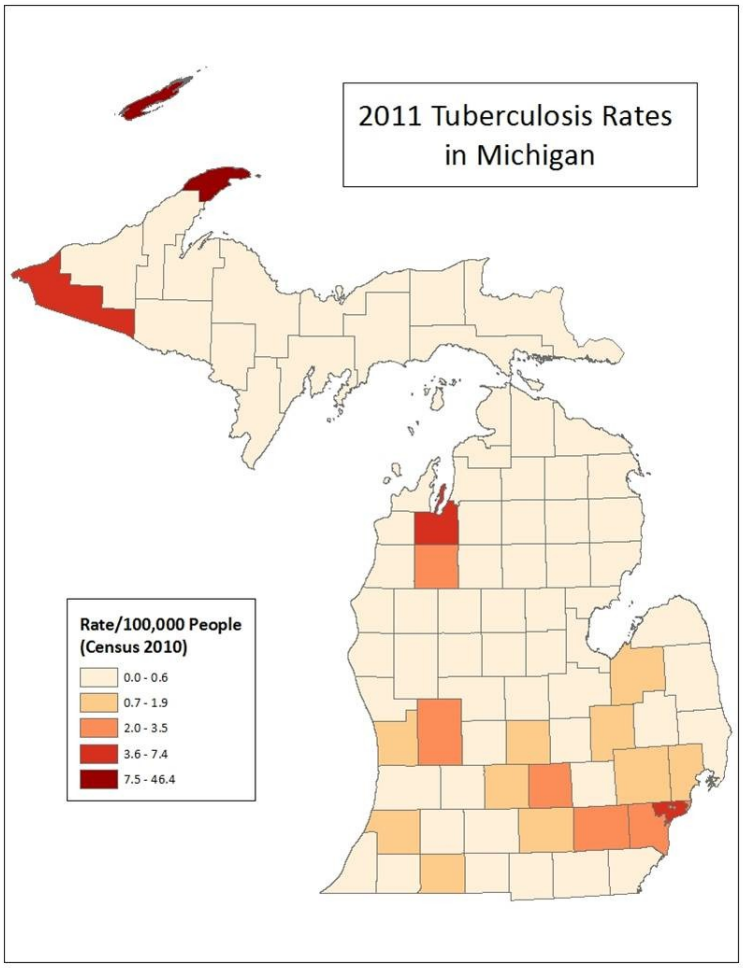


Figure 1. Number of tuberculosis cases in Michigan, 2007–2011

Tuberculosis

Michigan statistics: The incidence rate for Tuberculosis (TB) in 2011 was 1.7 cases per 100,000. While Michigan is considered to have 'low incidence' of TB, the demographic characteristics warrant some attention. Sixty four percent of the 170 reported TB cases reside in the Detroit Metro Area (DMA). Of these, 49 percent (53 cases) are residents of the City of Detroit. These cases are managed and reported by the Detroit Department of Health and Wellness Promotion (DDHWP). Specifically, DDHWP manages and reports all TB cases that are residents of Detroit and its surrounding areas. The remaining cases in the DMA are residents of the following counties: Wayne County (excluding Detroit) (22 percent, 24 cases), Macomb County (8 percent, 9 cases), and Oakland County (20 percent, 22 cases).

In 2011, Michigan continued to align with National data that show that the majority of TB cases are found in persons born outside the US. In 2011, 50 percent of Michigan cases were born in the US and 50 percent were foreign-born. It is expected that the number of foreign born cases will increase.



Co-infection with TB and HIV remains at a low level in Michigan. During the period 2007–2011, the percent of incident TB cases reported to be co-infected with HIV averaged 5 % (range 2.9%–6.5%). However, the TB Program has greatly improved the percent of incident TB cases for which HIV status was reported, from ~62% in 2007 to 81% in 2011.

Homelessness and substance abuse are growing problems in the TB population in Michigan. In 2007 only 2.7% of total cases were reported as having been homeless in the prior 12 months. This number climbed annually to 10% of total cases in 2011. During the period 2007–2011 an average of 22% of total morbidity reported using alcohol, injection or non-injection drugs within the prior 12 months. Given the difficult economic times in Michigan, this number will most likely continue to increase. The TB program recognizes the challenges that arise in locating and treating this population and are working with local partners to address these issues.

Figure 2. Incidence of tuberculosis by county, Michigan 2011

VRSA

Causative agent: Vancomycin-Resistant *Staphylococcus aureus* (VRSA) is defined as a *Staphylococcus aureus* with a vancomycin MIC≥16. Vancomycin is a drug that is commonly used to treat methicillin-resistant *Staphylococcus aureus* (MRSA) infections.

Clinical features: *Staphylococcus aureus*, often simply referred to simply as "staph", are bacteria commonly found on the skin and in the noses of healthy people. Occasionally, staph can cause infection; staph bacteria are one of the most common causes of skin infections in the United States. Most of these infections are minor (such as pimples, boils, and other skin conditions) and most can be treated without antimicrobial agents (also known as antibiotics or antibacterial agents). However, staph bacteria can also cause serious and sometimes fatal infections (such as bloodstream infections, surgical wound infections, and pneumonia). In the past, most serious staph bacterial infections were treated with a type of antimicrobial agent related to penicillin. Over the past 50 years, treatment of these infections has become more difficult because staph bacteria have become resistant to various antimicrobial agents, now including vancomycin.

Mode of transmission: No reported case of VRSA has been acquired through transmission. All cases have occurred by unique bacterial genetic mutations.

Period of communicability: Period of communicability cannot be determined due to the lack of transmission.

Incubation period: Incubation period cannot be determined due to the lack of transmission.

High-risk groups: Persons with several underlying health conditions (such as diabetes and kidney disease), previous infections with methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant *Enterococcus*, tubes going into their bodies (such as intravenous [IV] catheters), recent hospitalizations, and recent exposure to vancomycin and other antimicrobial agents are at a higher risk of developing disease.

Prevention of VRSA: Use of appropriate infection control practices (such as wearing gloves before and after contact with infectious body substances and adherence to hand hygiene) by healthcare personnel can ensure that VRSA does not spread.

Because VRSA is only part of the larger problem of antimicrobial resistance in healthcare settings, the CDC has started a *Campaign to Prevent Antimicrobial Resistance*. The campaign centers around four strategies that clinicians can use to prevent antimicrobial resistance: prevent infections, diagnose and treat infections effectively, use antimicrobials wisely, and prevent transmission. A series of evidence-based steps are described that can reduce the development and spread of resistant organisms such as VRSA.

References: http://www.cdc.gov/ncidod/dhqp/ar_visavrsa.html

Michigan statistics: In 2002, Michigan identified and investigated the first clinical case of VRSA in the world. Since then, twelve additional cases of vancomycin-resistant *Staphylococcus aureus* (VRSA) have been reported in the United States. These cases occurred in Michigan (n=8), Pennsylvania (n=1), Delaware (n=3), and New York (n=1). All of the eight Michigan cases with VRSA were from southeastern Michigan. VRSA is a reportable condition in Michigan that can be reported on a Michigan Disease Surveillance System (MDSS) form.

VRSA

The major transition in the resistance pattern of *S. aureus*, from oxacillin to vancomycin, is a significant warning of the infections to come if resistant organisms aren't dealt with seriously. Overall measures to reduce emergence of antibiotic resistant bacteria include: appropriate antibiotic use, hospital-acquired infection control, and increasing vaccine coverage. However, maintaining a surveillance system that will monitor the significant organisms and detect changes and trends in levels of resistance over time is necessary to make appropriate recommendations to our healthcare providers and consumers regarding control of risk factors and appropriate antibiotic use. These activities are necessary in order to protect our antibiotic lifeline.

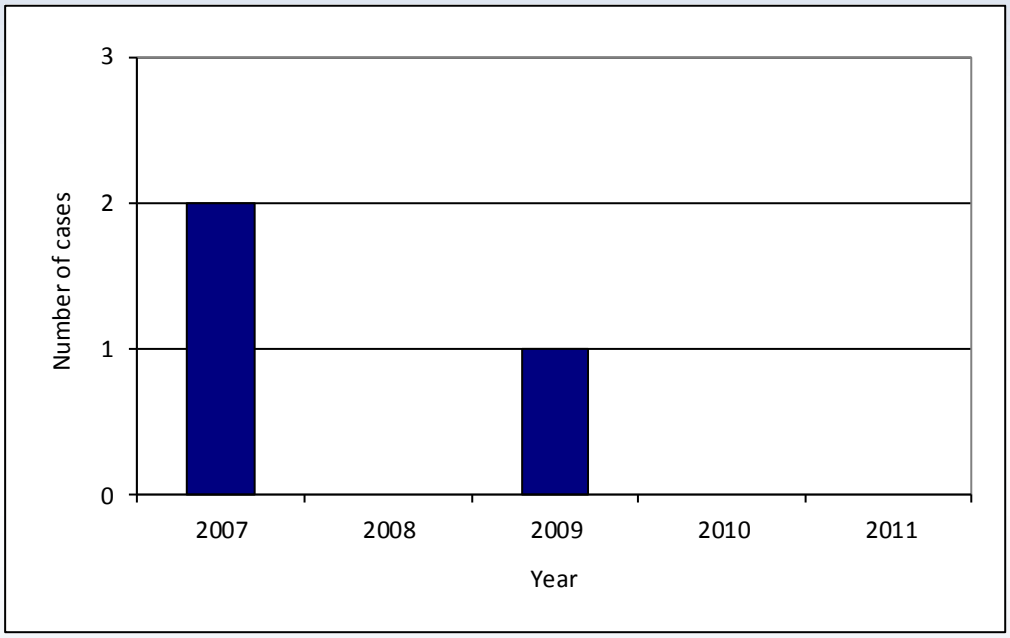


Figure 1. Number of VRSA cases in Michigan, 2007-2011

West Nile Virus

Causative agent: West Nile Virus (WNV) is a single-stranded RNA virus of the Flaviviridae family (flavivirus). It is carried by mosquitoes and can be transmitted across various species including humans, birds, horses, and other mammals.

Clinical features: Approximately 80% of people that become infected with the WNV have no illness and <20% experience only a mild flu-like illness that includes fever, headache, and body aches lasting only a few days. Some may also develop a mild rash or swollen lymph nodes. Less than one percent of those infected may develop meningitis or encephalitis, the most severe forms of the disease, which occurs primarily in persons over 50 years of age. Symptoms of encephalitis or meningitis may include severe headache, high fever, neck stiffness, stupor, disorientation, tremors, convulsions, paralysis, coma, and sometimes death.

Mode of transmission: West Nile virus is spread to humans by the bite of an adult infected mosquito. Biting a bird that carries the virus infects a mosquito. In areas where WNV is actively circulating, less than 1 in 100 mosquitoes will be infected. In a small number of cases, WNV has also been spread by blood transfusions, organ transplants, breastfeeding, and from mother to baby during pregnancy. Currently all blood banks screen for WNV. The virus is not spread by person-to-person contact such as touching or caring for someone who is infected.

Period of communicability: Mosquitoes remain infective for their entire lifespan.

Incubation period: Symptoms generally appear 3 to 6 days after exposure but may appear as early as 1 day after exposure or as late as 15 days.

High-risk groups: Anyone who is bitten by an infected mosquito can get the disease. Persons over the age of 50 or those with poor immune systems are more likely to develop a serious illness if they are infected.

Prevention of West Nile virus: The following measures may prevent WNV transmission:

⇒ Avoid exposure to mosquitoes, especially at peak activity hours (dusk and dawn).

⇒ Wear lightweight long sleeve shirts and long pants to avoid mosquito exposure.

⇒ Use DEET containing mosquito repellent when outdoors. Repellants containing Picaridin and oil of lemon eucalyptus have been approved by the EPA and recommended by the CDC. Follow the manufacturers label instructions.

⇒ Eliminate breeding places for mosquitoes.

⇒ Maintain window and door screens to keep mosquitoes out of buildings.

References: http://www.cdc.gov/ncidod/dvbid/westnile/wnv_factsheet.htm

http://www.michigan.gov/emergingdiseases/0,1607,7-186-25805---,00.html

American Public Health Association. West Nile Virus. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 52–55.

West Nile Virus

Table 1. Demographic characteristics of West Nile virus cases by year, Michigan 2007–2011

*N= 104	Number of Cases	Percent Total
Sex		
Male	64	62%
Female	39	38%
Race		
African American	16	15%
American Indian or Alaska Native	0	0%
Asian	0	0%
Caucasian	66	63%
Hawaiian or Pacific Islander	0	0%
Other	1	1%
Ethnicity		
Hispanic or Latino	2	2%
Age groups (years)		
0-9	1	1%
10-19	4	4%
20-29	7	7%
30-39	11	11%
40-49	14	13%
50-59	21	20%
60-69	21	20%
≥70	25	24%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

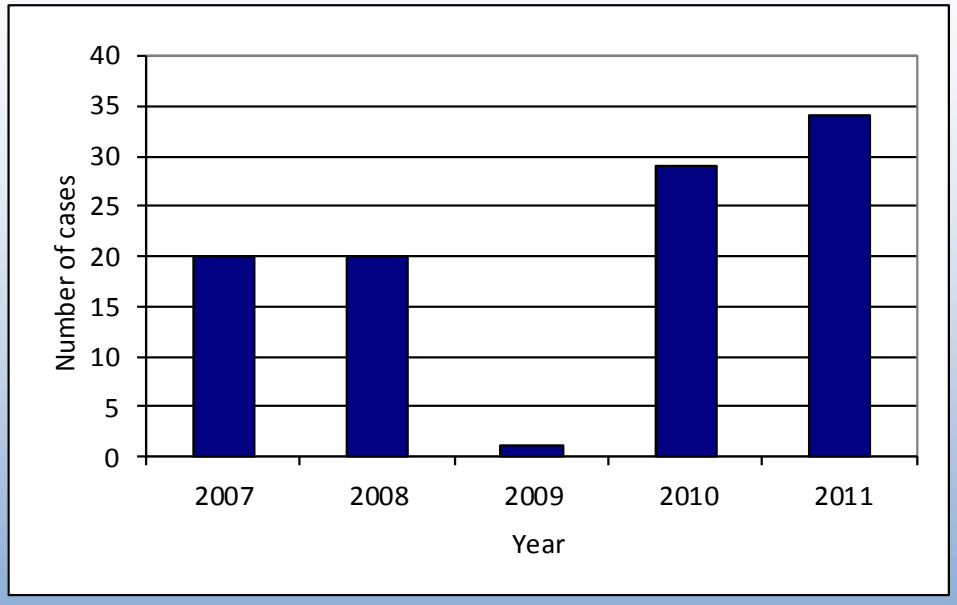


Figure 1. Number of West Nile virus cases in Michigan, 2007–2011

West Nile Virus

Michigan statistics: The Michigan Department of Community Health's Bureau of Epidemiology and Bureau of Laboratories in partnership with the Michigan Departments of Agriculture and Rural Development, Natural Resources, and Michigan State University continue to conduct comprehensive surveillance for WNV in order to give communities early warning of potential outbreaks.

MDCH received 104 reports of WNV during 2007–2011. The majority of cases were male (62%). Age analysis of WNV demonstrated that almost one-fourth of reported cases were found to be in persons 70 years and older (24%). Caucasians (63%) and African Americans (15%) had the highest incidence of disease. Two percent of reported cases were Hispanic or Latino.

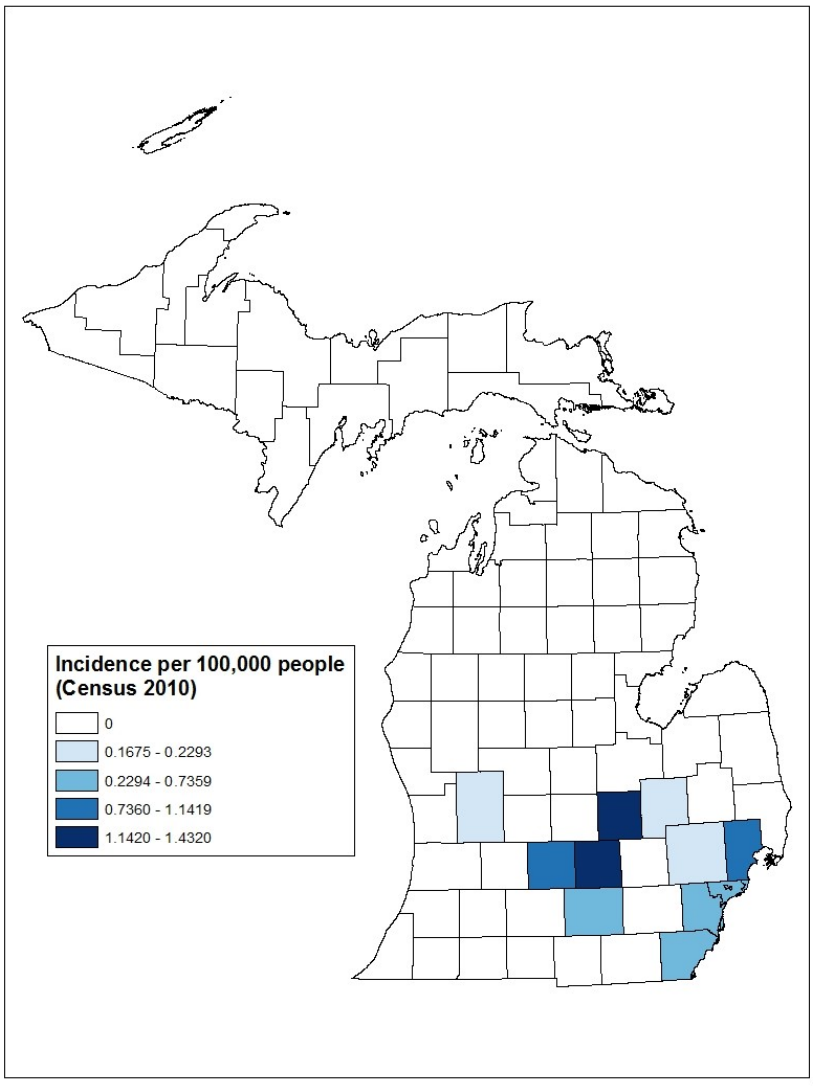


Figure 2. Incidence of West Nile virus by county, Michigan 2011

Yersiniosis

Causative agent: Yersiniosis is a diarrheal illness caused by a bacterium known as *Yersinia enteritis*.

Clinical features: Common symptoms in children include watery diarrhea (which is often bloody), abdominal pain, and fever. In older children and adults, fever and right-sided abdominal pain (which can be confused with appendicitis) predominate. In a small number of cases complications such as joint pain, skin rash, or spread of the bacteria into the blood stream can occur. People who have not had antibiotics may have the bacteria in their stool for 2 to 3 months, even if they have no symptoms.

Mode of transmission: Eating contaminated food, especially raw or undercooked pork products most commonly cause infection. Preparation of chitterlings (pork intestines) can be particularly risky for spreading infection. Caretakers who handle raw pork and have poor hand hygiene can infect infants. Persons who have had contact with feces from infected animals or drink unpasteurized milk or untreated water are also at risk for infection. *Yersinia enteritis* is rarely transmitted through the fecal-oral route or through blood transfusions.

Period of communicability: Fecal shedding occurs for as long as symptoms persist (about two to three weeks). If untreated, shedding may occur for two to three months.

Incubation period: The incubation period is typically 3–7 days but can be as high as 10 days.

High-risk groups: Immunocompromised individuals and elderly people are at higher risk of developing yersiniosis than the general population. Children are affected more commonly then adults.

Prevention of yersiniosis: Preventive measures that can be taken to avoid the illness include:

⇒ Avoid eating raw or undercooked pork.

⇒ Consume only pasteurized milk or milk products.

⇒ Wash hands with soap and water after using the toilet, handling raw meat, coming in contact with farm animals and pets, after changing diapers, and before eating or preparing food.

⇒ After handling raw chitterlings, clean hands and fingernails scrupulously with soap and water before touching infants or their toys, bottles or pacifiers. Someone other than the food handler should care for children while chitterlings are being prepared.

⇒ Thoroughly cook meat, especially pork. Leftover foods should be completely heated.

⇒ Store raw meat on the lowest shelf of the fridge to keep the juices from dripping onto other foods.

⇒ Store cold foods below 33°F.

⇒ Thoroughly clean knives, cutting boards, and other surfaces after contact with raw meat and before contact with other foods.

⇒ Before eating raw fruits and vegetables, thoroughly wash with drinking quality water to remove bacteria.

References: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/yersinia_g.htm

American Public Health Association. Yersiniosis. In: Heymann D, ed. *Control of Communicable Diseases Manual.* 19th ed. Washington, DC: American Public Health Association; 2008: 690–693.

Yersiniosis

Table 1. Demographic characteristics of yersiniosis cases by year, Michigan 2007–2011

*N= 109	Number of Cases	Percent Total
Sex		
Male	42	39%
Female	67	61%
Race		
African American	20	18%
American Indian or Alaska Native	0	0%
Asian	2	2%
Caucasian	63	58%
Hawaiian or Pacific Islander	0	0%
Other	1	1%
Ethnicity		
Hispanic or Latino	3	3%
Age groups (years)		
<1	15	14%
1-9	12	11%
10-19	23	21%
20-29	11	10%
30-39	3	3%
40-49	9	8%
50-59	13	12%
60-69	14	13%
≥70	23	21%

* totals for each demographic variable may not equal to total number of cases because of information missing from the case report form.

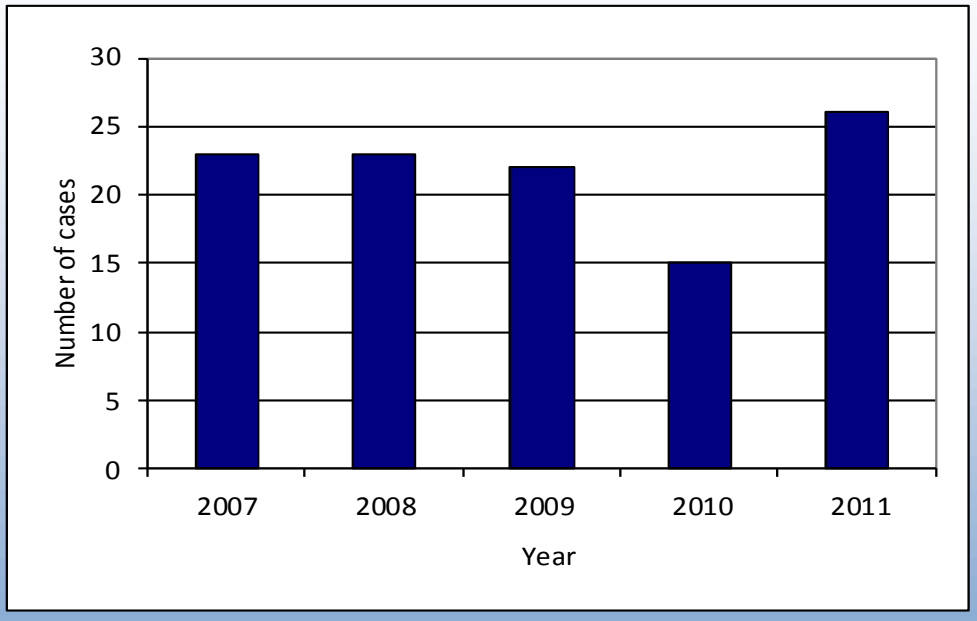


Figure 1. Number of yersiniosis cases in Michigan, 2007–2011

Yersiniosis

Michigan statistics: The total number of reported yersiniosis cases during 2007–2011 were 109. Sixty-one percent of cases were female. Three-fourths of the reported cases were Caucasian (58%) or African American (18%). One-quarter of cases were less than or equal to 9 years of age (25%). Three percent of cases were Hispanic or Latino.

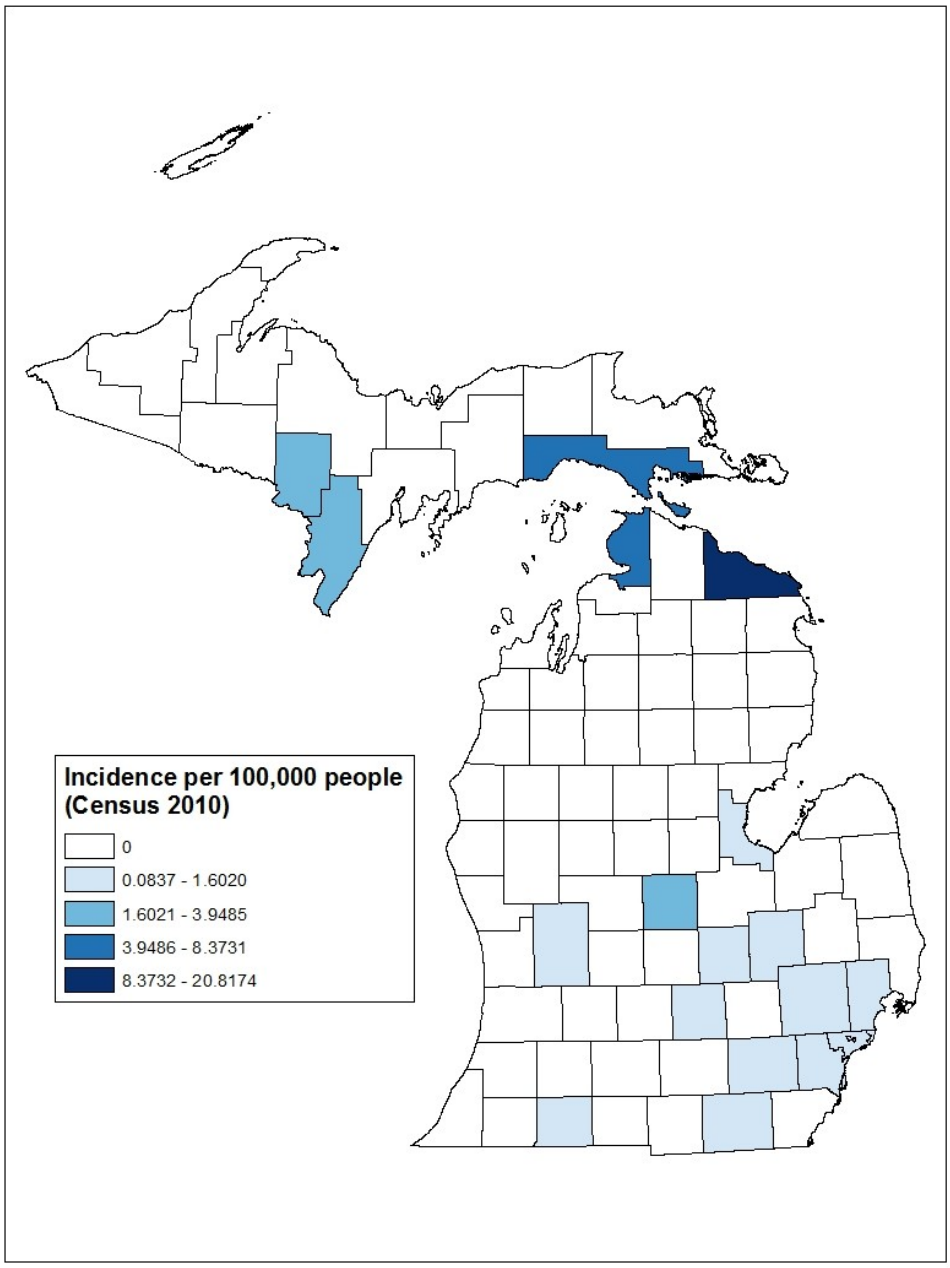


Figure 2. Incidence of yersiniosis by county, Michigan 2011

Appendix A

Glossary

Asymptomatic infection: The presence of infection in a host without recognizable clinical signs or symptoms.

Carrier: A person or animal that harbors a specific infectious agent without discernible clinical disease and serves as a potential source of infection.

Communicable disease: An illness due to a specific infectious agent or its toxic products that arises through transmission of that agent or its products from an infected person, animal or inanimate reservoir to a susceptible host.

Period of communicability: The time during which an infectious agent may be transferred from an infected person to another person, from an infected animal to humans, or from an infected person to animals, including arthropods.

Contamination: The presence of an infectious agent on a body surface, in clothes, bedding, toys, surgical instruments or dressings, or other inanimate articles or substances including water and food.

Endemic: The constant presence of a disease or infectious agent within a given geographic area; it may also refer to the usual prevalence of a given disease within such area.

Epidemic: The occurrence in a community or region of cases of an illness (or an outbreak) with a frequency clearly in excess of normal expectancy.

Host: A person or other living animal, including birds and arthropods, that affords subsistence or lodgment to an infectious agent under natural (as opposed to experimental) conditions.

Immune individual: A person or animal that has specific protective antibodies and/or cellular immunity as a result of previous infection or immunization, or is so conditioned by such previous specific experience as to respond in such a way that prevents the development of infection and/or clinical illness following re-exposure to the specific infectious agent.

Incidence rate: The number of new cases of a specified disease diagnosed or reported during a defined period of time, divided by the number of persons in a stated population in which the cases occurred. This is usually expressed as cases per 1,000 or 100,000 per annum.

Incubation period: The time interval between initial contact with an infectious agent and the first appearance of symptoms associated with the infection.

Infected individual: A person or animal that harbors an infectious agent and has either manifest disease or unapparent infection.

Infectious agent: An organism (virus, rickettsia, bacteria, fungus, protozoan or helminth) that is capable of producing infection or infectious disease.

Infectious disease: A clinically manifest disease of humans or animals resulting from an infection.

Isolation: Isolation represents separation, for the period of communicability, of infected persons or animals from others in such places and under such conditions as to prevent or limit the direct or indirect transmission of the infectious agent from those infected to those who are susceptible to infection or who may spread the agent to others.

Morbidity rate: An incidence rate used to include all persons in the population under consideration who become clinically ill during the period of time stated.

Mortality rate: A rate calculated in the same way as an incidence rate, by dividing the number of deaths occurring in the population during the stated period of time, usually a year, by the number of persons at risk of dying during the period.

Nosocomial infection: An infection occurring in a patient in a hospital or other healthcare facility in whom it was not present or incubating at the time of admission; or the residual of an infection acquired during a previous admission.

Pathogenicity: The property of an infectious agent that determines the extent to which overt disease is produced in an infected population, or the power of an organism to produce disease.

Prevalence rate: The total number of persons sick or portraying a certain condition in a stated population at a particular time (point prevalence), or during a stated period of time (period prevalence), regardless of when that illness or condition began, divided by the population at risk of having the disease or condition at the point in time or midway through the period in which they occurred.

Quarantine: Restriction of the activities of well persons or animals who have been exposed to a case of communicable disease during its period of communicability (i.e., contacts) to prevent disease transmission during the incubation period if infection should occur.

Reservoir (of infectious agents)**:** Any person, animal, arthropod, plant, soil or substance (or combination of these) in which an infectious agent normally lives and multiplies, on which it depends primarily for survival, and where it reproduces itself in such manner that it can be transmitted to a susceptible host.

Sterilization: Involves destruction of all forms of life by heat, irradiation, gas (ethylene oxide or formaldehyde) or chemical treatment.

Susceptible: A person, animal or other organism not possessing sufficient resistance against a particular pathogenic agent to prevent contracting infection or disease when exposed to the agent. Susceptibility also refers to the ability of bacteria to survive in the presence of antibiotics.

Transmission of infectious agents: Any mechanism by which an infectious agent is spread from a source or reservoir to a person.

Appendix B

Michigan Counties and Public Health Preparedness Regions