

## 6.9 Meningitis

Meningitis is an illness in which there is inflammation of the tissues that cover the brain and spinal cord. Meningitis is usually caused by a viral or bacterial infection. Viral meningitis is usually less severe and resolves without specific treatment, while bacterial meningitis can be quite severe and may result in brain damage, hearing loss, learning disability, or death.

**Meningitis Cases Reported to Kalamazoo County  
Communicable Disease Surveillance Program, 2004 – 2008**

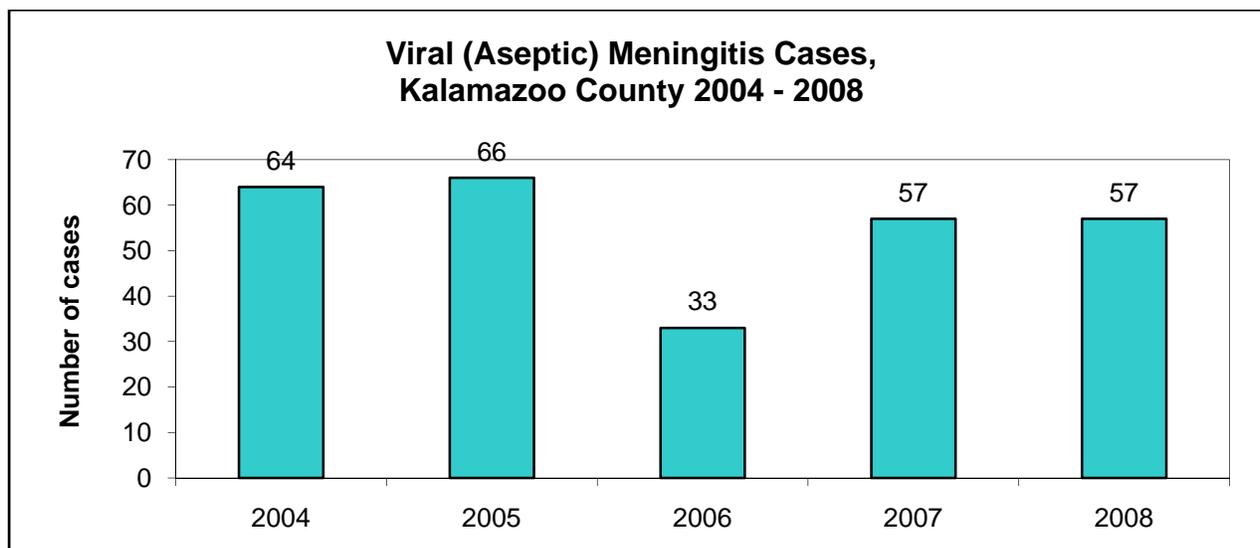
Disease		Number of cases reported
Viral (Aseptic) Meningitis		277
Bacterial Meningitis	Meningococcal Disease (Neisseria meningitidis)	8

Michigan Disease Surveillance System, completed cases as of 7/28/09

## 6.9.1 Aseptic Meningitis

Viral or "aseptic" meningitis is the most common type of meningitis. It is caused by an infection with one of the members of a group of viruses known as enteroviruses. These viruses are more common during summer and fall months. Herpes viruses and the mumps virus can also cause viral meningitis. The more common symptoms of meningitis are fever, severe headache, stiff neck, bright lights hurting the eyes, drowsiness or confusion, and nausea and vomiting. In babies, the symptoms are more difficult to identify. They may include fever, fretfulness or irritability, difficulty in awakening the baby, or the baby refuses to eat. The symptoms of meningitis may not be the same for every person. Viral ("aseptic") meningitis is serious but rarely fatal in persons with normal immune systems. Usually, the symptoms last from 7 to 10 days and the patient recovers completely. Enteroviruses, the most common cause of viral meningitis, are most often spread through direct contact with respiratory secretions (e.g., saliva, sputum, or nasal mucus) of an infected person. This usually happens by shaking hands with an infected person or touching something they have handled, and then rubbing your own nose or mouth. The virus can also be found in the stool of persons who are infected. The virus is spread through this route mainly among small children who are not yet toilet trained. It can also be spread this way to adults changing the diapers of an infected infant. The incubation period for enteroviruses is usually between 3 and 7 days from the time you are infected until you develop symptoms. You can usually spread the virus to someone else beginning about 3 days after you are infected until about 10 days after you develop symptoms.<sup>1</sup>

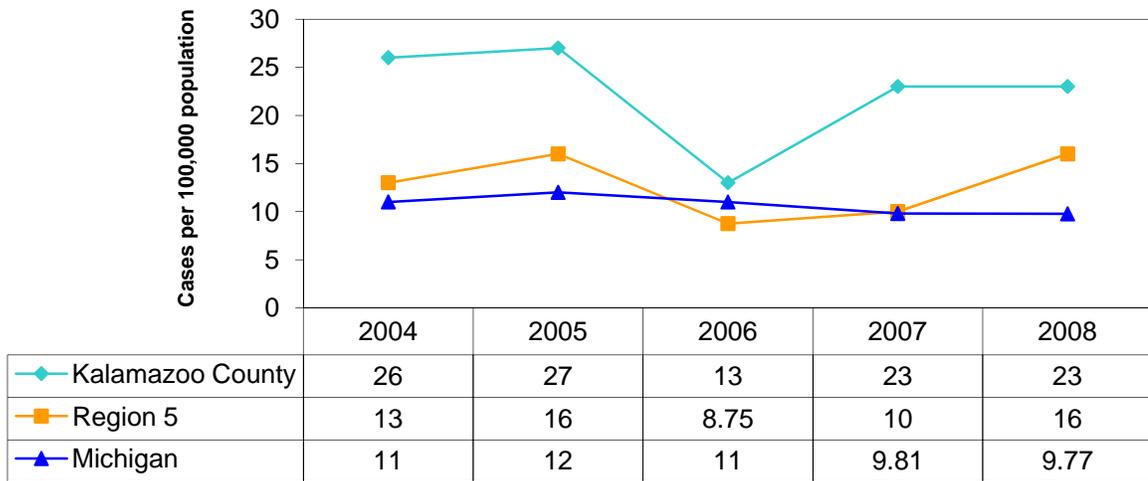
Between 2004 and 2008, rates of viral meningitis were higher in Kalamazoo County than in Region 5 or the state of Michigan except for in 2006 when the number of cases reported in Kalamazoo County dropped and the rate was similar to the state rate.



Michigan Disease Surveillance System, completed cases as of 7/28/09

<sup>1</sup> Centers for Disease Control and Prevention, accessed online:  
[http://www.cdc.gov/ncidod/dvrd/revb/enterovirus/viral\\_meningitis.htm](http://www.cdc.gov/ncidod/dvrd/revb/enterovirus/viral_meningitis.htm)

**Viral (Aseptic) Meningitis Rates:  
Kalamazoo County, Region 5 and Michigan 2004 - 2008**



Michigan Disease Surveillance System, completed cases as of 7/28/09

**Viral (Aseptic) Meningitis: Demographic Characteristics of  
Kalamazoo County Cases 2004-2008**

<b>N=277</b>		<b>Number of Cases</b>	<b>Percent of Total</b>
<b>Sex</b>			
	Female	152	55%
	Male	125	45%
	Unknown	0	0%
<b>Age Group</b>			
	<1 yr	30	11%
	1-4 yrs	9	3%
	5-9 yrs	14	5%
	10-14 yrs	17	6%
	15-19 yrs	28	10%
	20-24 yrs	30	11%
	25-29 yrs	31	11%
	30-34 yrs	30	11%
	35-39 yrs	20	7%
	40-44 yrs	15	5%
	45-49 yrs	15	5%
	50-54 yrs	13	5%
	55-59 yrs	8	3%
	60-64 yrs	5	2%
	65-69 yrs	5	2%
	>70 yrs	7	3%
	Unknown	0	0%

Michigan Disease Surveillance System, completed cases as of 7/28/09

## 6.9.2 Bacterial Meningitis

One of the leading causes of bacterial meningitis is infection with *Neisseria meningitidis* bacteria (which causes meningococcal disease). Before the 1990s, *Haemophilus influenzae* type b (Hib) was the leading cause of bacterial meningitis, but new vaccines being given to all children as part of their routine immunizations have reduced the occurrence of invasive disease due to *H. influenzae*.

### *Meningococcal Disease*

Symptoms of meningococcal disease in people over the age of two years include high fever, headache, and stiff neck. These symptoms can develop over several hours, or they may take one to two days. Other symptoms may include nausea, vomiting, discomfort looking into bright lights, confusion, and sleepiness. In newborns and small infants, the classic symptoms of fever, headache, and neck stiffness may be absent or difficult to detect, and the infant may only appear slow or inactive, or be irritable, have vomiting, or be feeding poorly.<sup>2</sup>

The bacteria that cause meningococcal meningitis are spread through the exchange of respiratory and throat secretions by coughing, kissing, and sharing food or food utensils. The incubation period is two to ten days (commonly three to four days) and the disease is communicable as long as the meningococcal bacteria are present in nasal and oral secretions.<sup>3</sup> Those who are close contacts of a person with meningococcal meningitis (such as those living in the same household or attending the same daycare center) are at increased risk of the disease as are those who live in college dormitories and overseas travelers to countries with high endemic levels of meningococcal disease.<sup>4</sup>

Up to 5% to 10% of people may have nasopharyngeal colonization by *N. meningitidis* bacteria and never develop meningococcal disease. Less than 1% of people who are colonized with *N. meningitidis* go on to develop invasive disease.

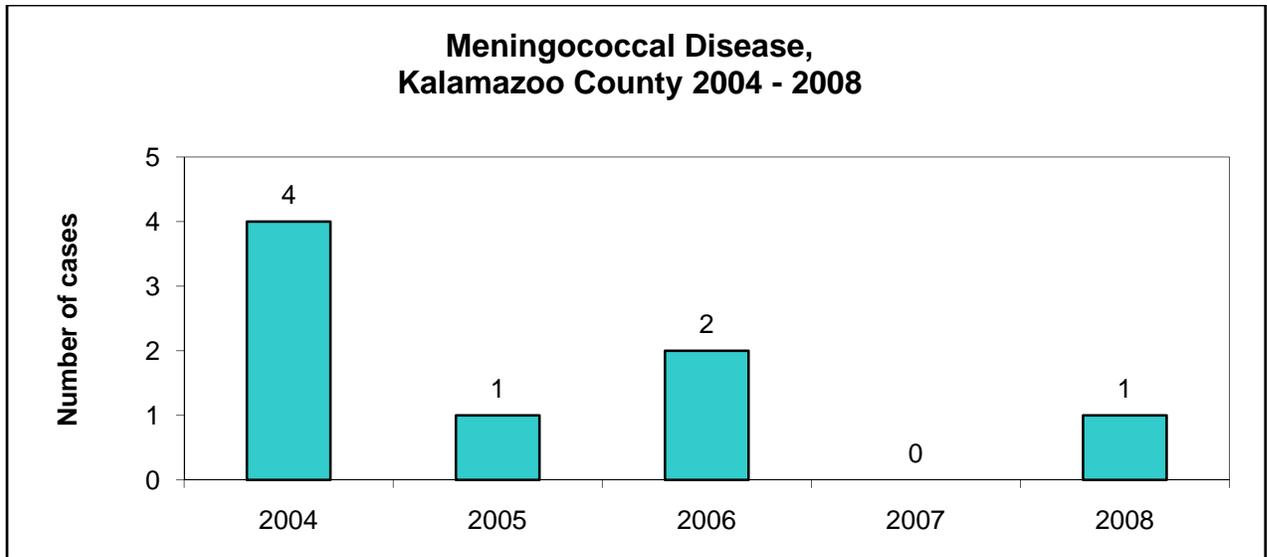
Rates of meningococcal disease have been low in recent years in both the county and state. In 2004 and 2006, the rate of meningococcal disease reported in Kalamazoo County was slightly higher than the rate in the state of Michigan, and rates were similar in years 2005, 2007 and 2008.

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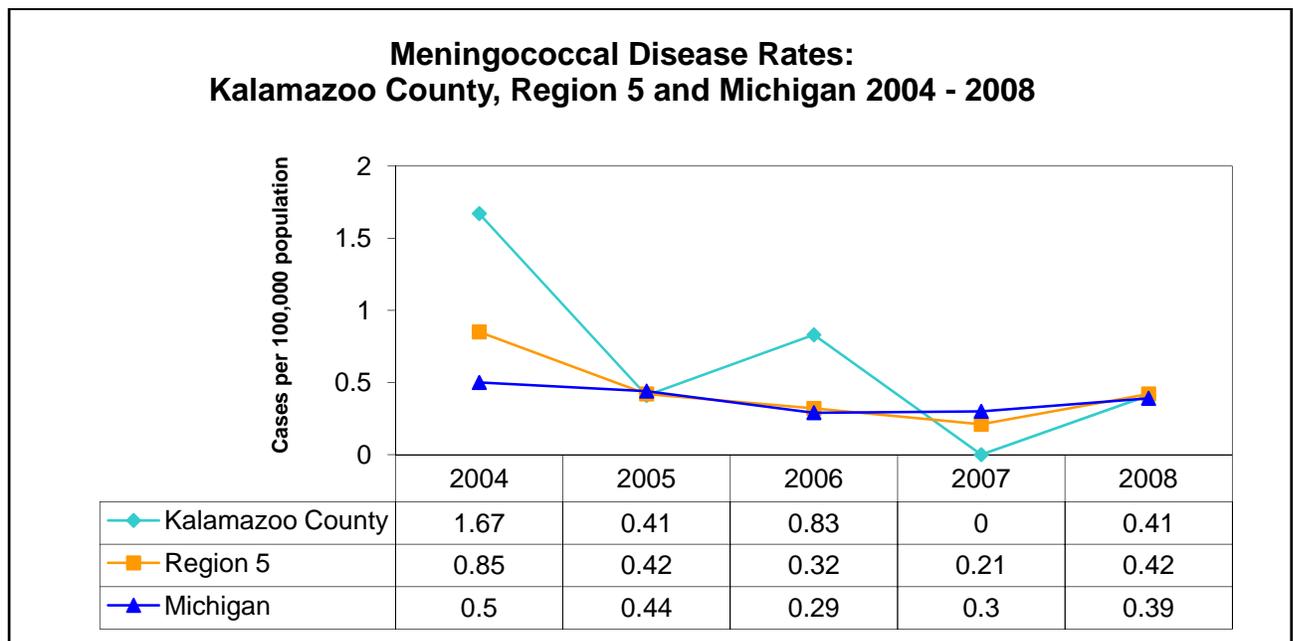
<sup>2</sup> Centers for Disease Control and Prevention, accessed online:  
[http://www.cdc.gov/ncidod/dbmd/diseaseinfo/meningococcal\\_g.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/meningococcal_g.htm)

<sup>3</sup> Control of Communicable Diseases Manual 18<sup>th</sup> Edition, editor D.L. Heymann.

<sup>4</sup> Centers for Disease Control and Prevention, accessed online:  
[http://www.cdc.gov/ncidod/dbmd/diseaseinfo/meningococcal\\_g.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/meningococcal_g.htm)



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**Meningococcal Disease: Demographic Characteristics of  
Kalamazoo County Cases 2004-2008**

<b>N=8</b>	<b>Number of Cases</b>	<b>Percent of Total</b>
<b>Sex</b>		
Female	7	88%
Male	1	13%
Unknown	0	0%
<b>Age Group</b>		
<1 yr	3	38%
1-4 yrs	0	0%
5-9 yrs	0	0%
10-14 yrs	0	0%
15-19 yrs	1	13%
20-24 yrs	1	13%
25-29 yrs	0	0%
30-34 yrs	0	0%
35-39 yrs	0	0%
40-44 yrs	0	0%
45-49 yrs	1	13%
50-54 yrs	0	0%
55-59 yrs	0	0%
60-64 yrs	0	0%
65-69 yrs	1	13%
>70 yrs	1	13%
Unknown	0	0%

Michigan Disease Surveillance System, completed cases as of 7/28/09