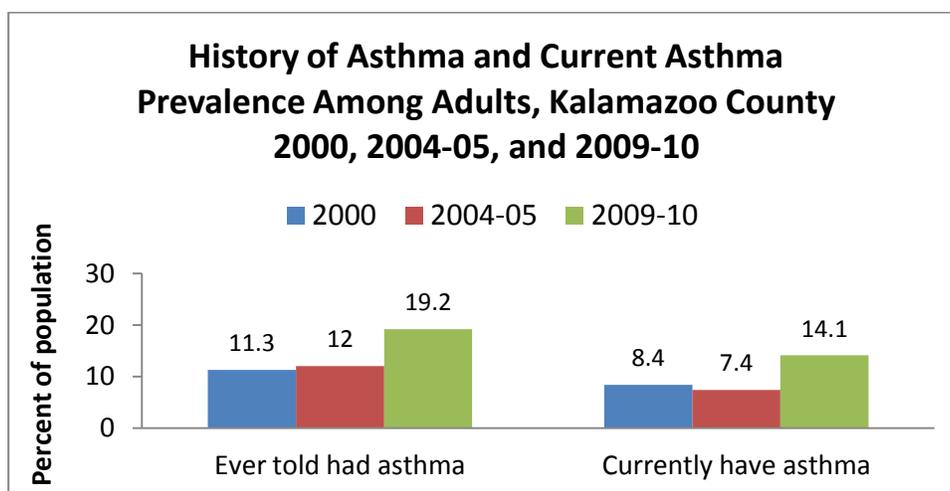


## 7.4 Asthma

Asthma is a disease that affects the lungs.<sup>1</sup> It is one of the most common long-term diseases of children.<sup>2</sup> It causes repeated episodes of wheezing, breathlessness, chest tightness, and nighttime or early morning coughing.<sup>3</sup> Asthma can be controlled by following a medical management plan and by avoiding contact with environmental “triggers,” such as cockroaches, dust mites, furry pets, mold, tobacco smoke, and certain chemicals.<sup>4</sup>

### 7.4.1 Asthma Prevalence

Among all adults in Kalamazoo County surveyed in 2009-10, an estimated 19.2% had ever been told they had asthma and an estimated 14.1% currently had asthma.<sup>5</sup> These estimates were slightly higher than estimates in 2004-05, but differences were not significant statistically (12.0% had ever been told they had asthma, and an estimated 7.4% of adults currently had asthma).<sup>6</sup> Estimates for Kalamazoo County were similar to Michigan for the percentage of adults who had ever been told they had asthma and who had asthma currently (15.8% were ever diagnosed, 10.5% had asthma currently).<sup>7</sup>



Source: Kalamazoo County 2004 Behavioral Risk Factor Survey and Kalamazoo County 2000 Behavioral Risk Factor Survey

<sup>1</sup> Centers for Disease Control Health Topic: Asthma and Allergies, 2006 Centers for Disease Control, accessed at <http://www.cdc.gov/health/asthma.htm>

<sup>2</sup> Centers for Disease Control Health Topic: Asthma and Allergies, 2006 Centers for Disease Control, accessed at <http://www.cdc.gov/health/asthma.htm>

<sup>3</sup> Centers for Disease Control Health Topic: Asthma and Allergies, 2006 Centers for Disease Control, accessed at <http://www.cdc.gov/health/asthma.htm>

<sup>4</sup> Centers for Disease Control Health Topic: Asthma and Allergies, 2006 Centers for Disease Control, accessed at <http://www.cdc.gov/health/asthma.htm>

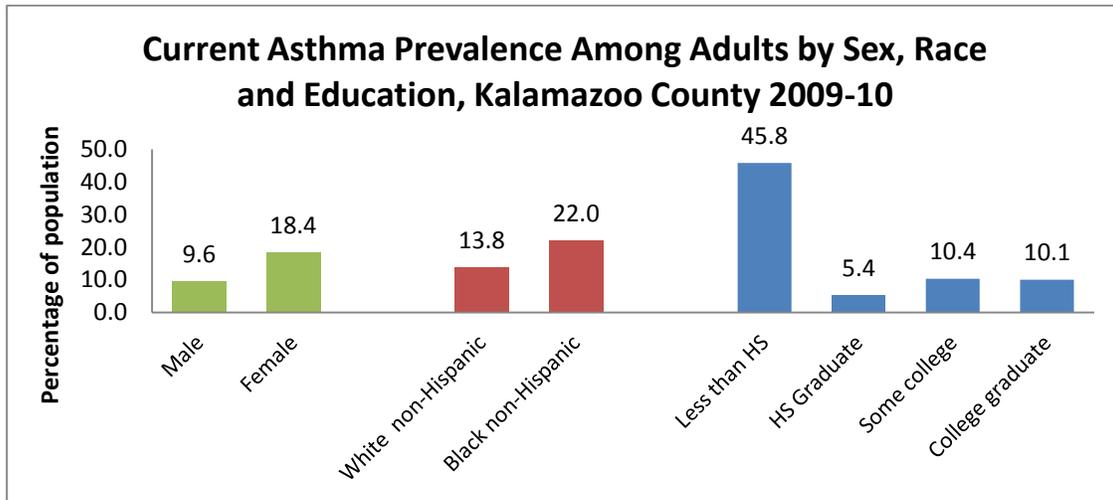
<sup>5</sup> Kalamazoo County 2009-10 Behavioral Risk Factor Survey

<sup>6</sup> Kalamazoo County 2004-05 Behavioral Risk Factor Survey

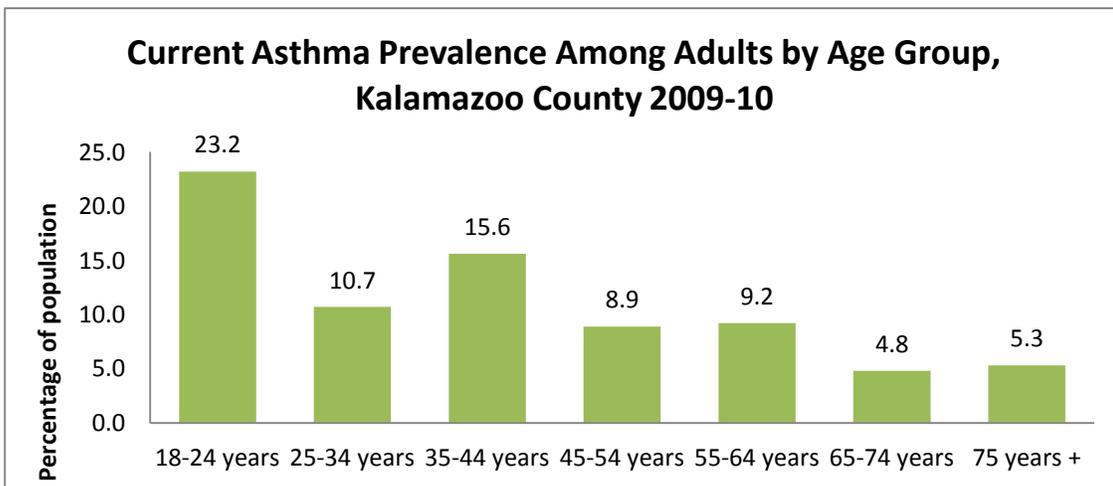
<sup>7</sup> Michigan 2010 Behavioral Risk Factor Survey, accessed online at

[http://www.michigan.gov/documents/mdch/2010\\_MiBREFS\\_Standard\\_Tables\\_FINAL\\_350512\\_7.pdf](http://www.michigan.gov/documents/mdch/2010_MiBREFS_Standard_Tables_FINAL_350512_7.pdf)

The estimated prevalence of asthma among adults in Kalamazoo County differed by sex, race, age, and educational level in 2009-10. A higher percentage of females than males reported current asthma, and a higher proportion of the black population than the white population reported current asthma. The prevalence of asthma was higher among younger age groups and those with less than a high school education than among those with higher levels of educational attainment.<sup>8</sup>



Source: Kalamazoo County 2009-10 Behavioral Risk Factor Survey



Source: Kalamazoo County 2009-10 Behavioral Risk Factor Survey

The percentage of adults who had ever been told they had asthma was particularly high among the black population living in the City of Kalamazoo, compared with the white population living in the City of Kalamazoo. While an estimated 14.5% of white adults in the City of Kalamazoo had ever been told they had asthma, 40.7% of black adults in the City had been told they had asthma.<sup>9</sup>

<sup>8</sup> Kalamazoo County 2009-10 Behavioral Risk Factor Survey

<sup>9</sup> Kalamazoo County 2009-10 Behavioral Risk Factor Survey

**Asthma Prevalence Among Adults, Kalamazoo County 2009-10**

Demographic Characteristics	Ever Told Asthma <sup>a</sup>		Still Have Asthma <sup>b</sup>	
	%	95% C.I.	%	95% C.I.
<b>Total</b>	19.2	(11.9 - 29.5)	14.1	(7.3 - 25.5)
<b>Age</b>				
18-24 years	24.5	(6.9 - 58.7)	23.2	(6.1 - 58.6)
25-34 years	28.5	(16.0 - 45.4)	10.7	(4.6 - 22.7)
35-44 years	20.3	(12.7 - 30.9)	15.6	(8.7 - 26.1)
45-54 years	11.4	(6.7 - 18.8)	8.9	(4.9 - 15.7)
55-64 years	14.8	(9.0 - 23.2)	9.2	(5.1 - 16.1)
65-74 years	11.8	(6.9 - 19.5)	4.8	(2.2 - 9.9)
75 years +	8.6	(4.2 - 16.9)	5.3	(1.9 - 13.8)
<b>Gender</b>				
Male	15.5	(9.3 - 24.7)	9.6	(4.9 - 18.0)
Female	22.9	(11.5 - 40.3)	18.4	(7.6 - 38.1)
<b>Race</b>				
White non-Hispanic	18.3	(10.3 - 30.4)	13.8	(6.4 - 27.2)
Black non-Hispanic	31.1	(14.0 - 55.8)	22.0	(7.3 - 50.3)
<b>Education</b>				
Less than HS	55.4	(23.2 - 83.6)	45.8	(14.3 - 81.1)
HS Graduate	8.6	(5.1 - 14.1)	5.4	(2.9 - 9.8)
Some college	14.2	(8.7 - 22.3)	10.4	(5.9 - 17.7)
College graduate	16.4	(11.0 - 23.7)	10.1	(6.0 - 16.6)
<b>Income</b>				
LT \$20,000	25.4	(13.3 - 43.0)	15.6	(5.7 - 36.4)
\$20-34,999	11.0	(5.9 - 19.7)	9.4	(4.7 - 17.9)
\$35-49,999	23.2	(9.6 - 46.2)	7.7	(3.0 - 18.3)
\$50-74,999	12.3	(5.9 - 24.0)	11.1	(5.0 - 23.0)
\$75,000+	27.3	(10.8 - 54.0)	24.0	(8.1 - 53.2)
<b>City/Out-County</b>				
City of Kalamazoo	21.4	(13.1 - 33.1)	15.9	(8.3 - 28.1)
Rest of County	19.8	(8.9 - 38.3)	16.3	(6.2 - 36.7)
<b>Within City of Kalamazoo</b>				
White in City	14.5	(8.5 - 23.7)	10.8	(5.8 - 19.1)
Black in City	40.7	(20.1 - 65.3)	29.8	(10.8 - 59.8)

<sup>a</sup> The proportion who reported that they were ever told by a doctor, nurse, or other health care professional that they had asthma.

<sup>b</sup> Among all respondents, the proportion who reported that they still had asthma.

Source: Kalamazoo County 2009-10 Behavioral Risk Factor Survey

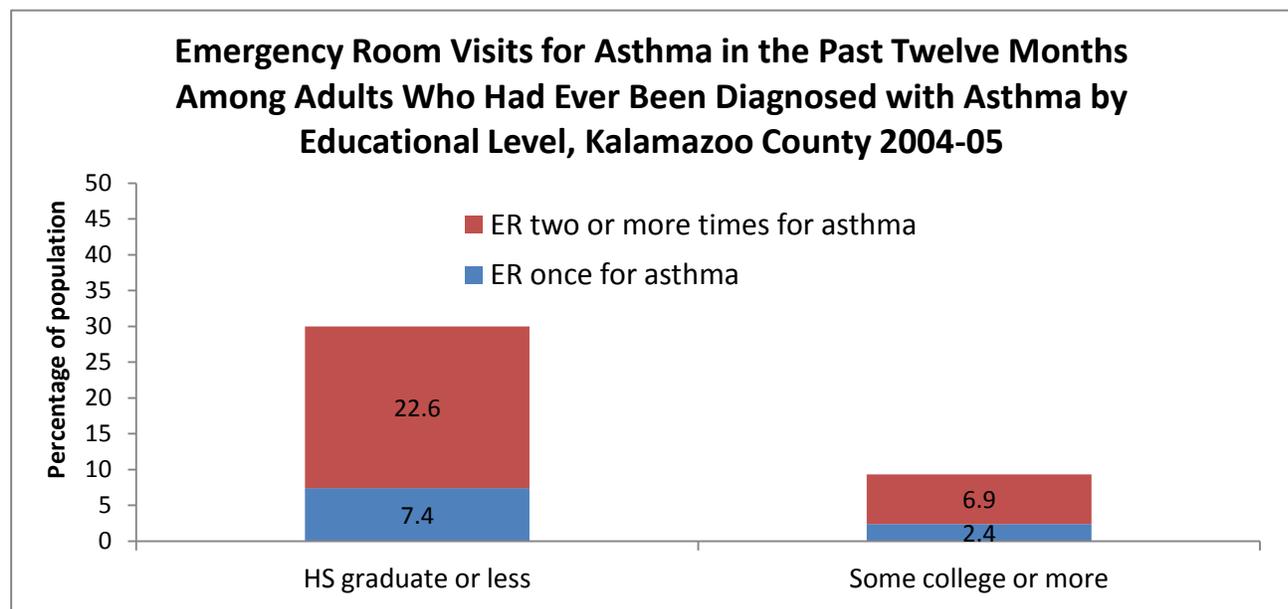
## 7.4.2 Asthma Morbidity

Asthma morbidity data was not collected in the most recent Kalamazoo County Behavioral Risk Factor Survey. All data in this section was collected during the 2004-05 Kalamazoo County Behavioral Risk Factor Survey, so this is the most current local asthma morbidity data available.

Less than half of adults (42.1%) in Kalamazoo County in 2004-05 who had ever been told they had asthma were diagnosed with asthma when they were less than 16 years old. Males were more likely than females to have been diagnosed when they were younger than 16 years old (58.5% of males compared with 28.3% of females were diagnosed with asthma before they were 16 years old).<sup>10</sup>

Among all adults who had ever been diagnosed with asthma in Kalamazoo County, in 2004-05 more than half (53.4%) had had at least one asthma attack in the past twelve months. An estimated 17.2% of adults who had ever been diagnosed with asthma visited an emergency room for asthma at least once in the previous twelve months; 12.9% visited an emergency room for asthma two or more times in the past year.<sup>11</sup> Females were more likely than males to have had an asthma attack in the past twelve months (62.3% of females had an attack vs. 37.5% of males); similar proportions of males and females visited an emergency room one or more times for asthma in the previous year.

Although similar proportions of Kalamazoo County adults in 2004-05 reported having had an asthma attack in the past twelve months by educational level, those with less education were more likely to have visited an emergency room for asthma in the previous year (30.0% who were high school graduates or had less education visited an emergency room in the previous year compared with 9.3% of adults with some college or more education).<sup>12</sup>



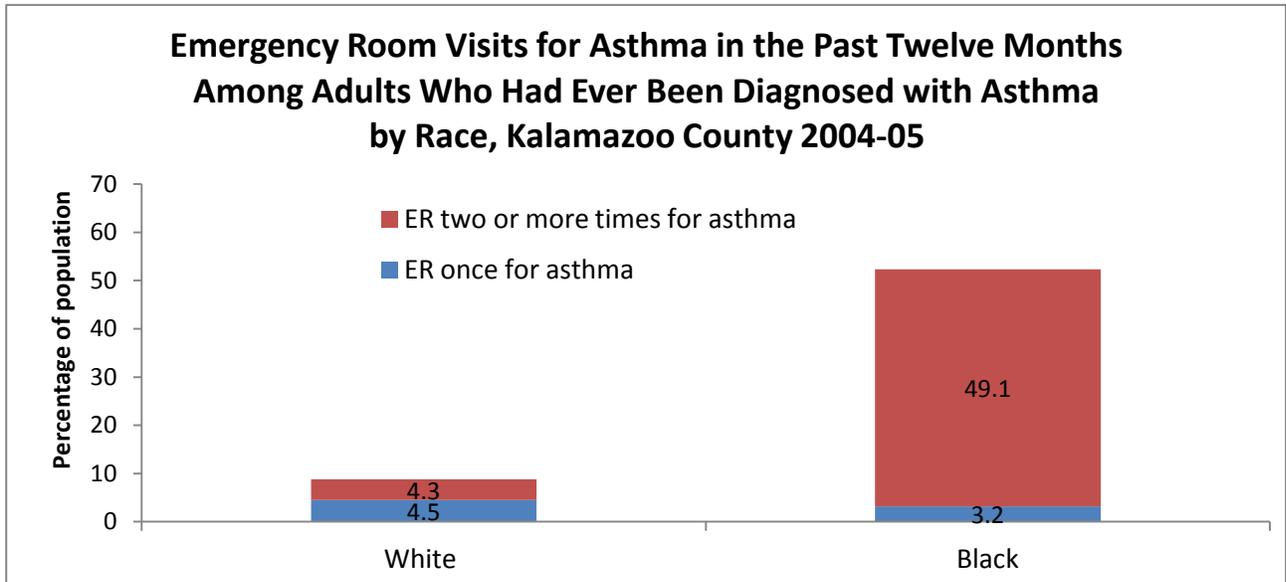
Source: Kalamazoo County 2004-05 Behavioral Risk Factor Survey

<sup>10</sup> Kalamazoo County 2004-05 Behavioral Risk Factor Survey

<sup>11</sup> Kalamazoo County 2004-05 Behavioral Risk Factor Survey

<sup>12</sup> Kalamazoo County 2004-05 Behavioral Risk Factor Survey

Black adults were also more likely than white adults to have visited an emergency room for asthma in the previous year (52.3% of black adults reported visiting an emergency room at least once compared with 8.8% of white adults).



Source: Kalamazoo County 2004-05 Behavioral Risk Factor Survey

### Age at Diagnosis, Asthma Attacks in the Past 12 Months, and ER Visits for Asthma Among Adults Who Were Ever Told They Had Asthma, Kalamazoo County 2004-05

Demographic Characteristics	Less Than 16 Years Old When Told Had Asthma <sup>a</sup>		Had an Asthma Attack in the Past 12 Months <sup>b</sup>		Went to ER One or More Times for Asthma in Past 12 Months <sup>c</sup>		Went to ER Two or More Times for Asthma in Past 12 Months <sup>c</sup>	
	%	95% C.I.	%	95% C.I.	%	95% C.I.	%	95% C.I.
<b>Total</b>	42.1	(31.5 – 52.6)	53.4	(41.2 – 65.5)	17.2	(7.2 – 27.1)	12.9	(3.2 – 22.5)
<b>Age</b>								
18-34 years	55.2	(33.1 – 77.4)	43.3	(17.1 – 69.4)	23.8	*	21.4	*
35-54 years	35.7	(20.6 – 50.7)	53.9	(36.1 – 71.7)	13.1	(3.0 – 23.3)	10.0	(0.9 – 19.1)
55 years +	34.6	(19.2 – 50.0)	59.4	(40.6 – 78.1)	19.3	(4.2 – 34.4)	10.8	*
<b>Gender</b>								
Male	58.5	(40.8 – 76.1)	37.5	(16.4 – 58.6)	16.7	*	15.5	*
Female	28.3	(17.6 – 39.0)	62.3	(49.4 – 75.2)	17.5	(8.0 – 26.9)	11.4	(3.4 – 19.4)
<b>Race</b>								
White	35.1	(24.7 – 45.5)	56.9	(44.1 – 69.7)	8.8	(2.4 – 15.1)	4.3	*
Black	57.1	(29.5 – 84.7)	34.2	(6.4 – 62.0)	52.3	(19.1 – 85.5)	49.1	(15.4 – 82.8)
<b>Education</b>								
HS graduate or less	41.8	(23.9 – 59.8)	53.8	(32.4 – 75.1)	30.0	(8.7 – 51.3)	22.6	(1.4 – 43.8)
Some college or more	42.2	(29.2 – 55.2)	53.1	(38.6 – 67.6)	9.3	(1.9 – 16.7)	6.9	(0.4 – 13.4)
<b>Income</b>								
LT \$35,000	40.7	(23.9 – 57.4)	61.6	(42.7 – 80.5)	25.7	(6.9 – 44.6)	23.9	(4.9 – 42.9)
\$35,000+	36.8	(22.8 – 50.8)	46.6	(29.0 – 64.1)	8.1	*	3.4	*
<b>City/Out-County</b>								
City of Kalamazoo	48.9	(32.8 – 65.1)	48.5	(30.7 – 66.2)	23.6	(6.5 – 40.7)	21.3	(4.0 – 38.5)
Rest of County	35.1	(21.8 – 48.4)	57.9	(41.5 – 74.3)	11.2	(1.8 – 20.7)	4.8	*
<b>Within City of Kalamazoo</b>								
White in City	41.6	(22.9 – 60.3)	57.4	(37.2 – 77.6)	4.5	*	3.3	*
Black in City	58.2	(30.2 – 86.2)	31.7	(3.9 – 59.4)	54.3	(20.3 – 88.3)	51.0	(16.5 – 85.4)

<sup>a</sup> Among all who were ever told they had asthma, the proportion who reported they were younger than 16 years old when they were told by a health professional that they had asthma.

<sup>b</sup> Among all who were ever told they had asthma, the proportion who reported they had an asthma episode or attack in the past 12 months.

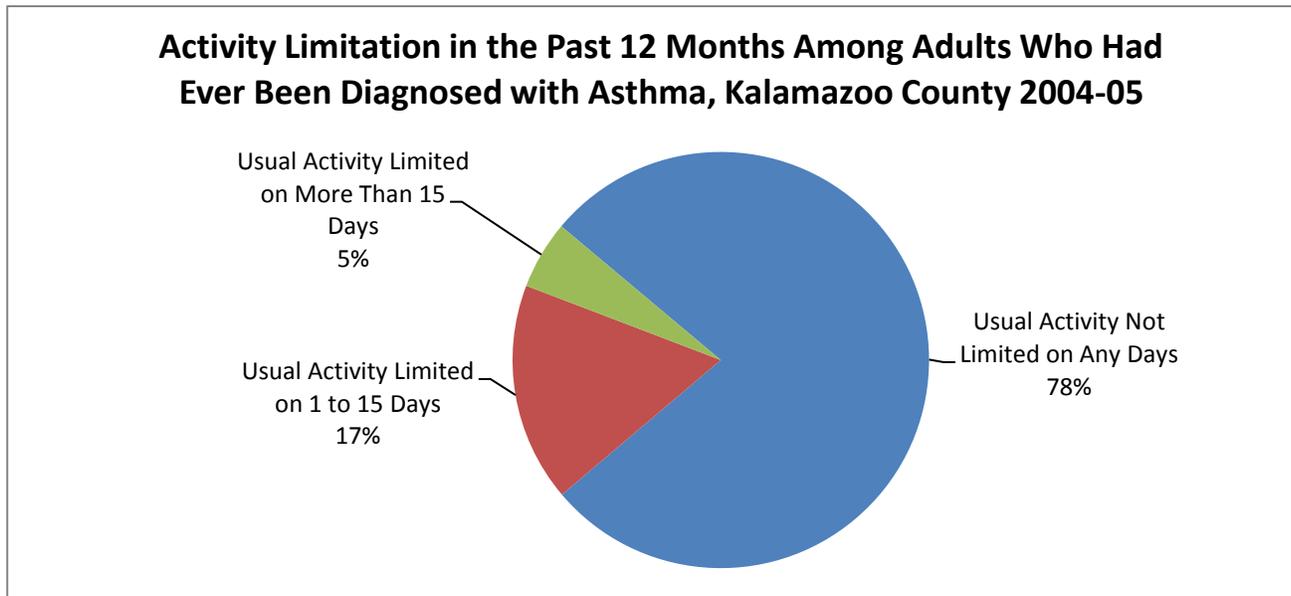
<sup>c</sup> Among all who were ever told they had asthma, the proportion who reported they visited an emergency room or urgent care at least one time in the past 12 months because of their asthma.

<sup>d</sup> Among all who were ever told they had asthma, the proportion who reported they visited an emergency room or urgent care two or more times in the past 12 months because of their asthma.

\*Confidence interval exceeds possible limits

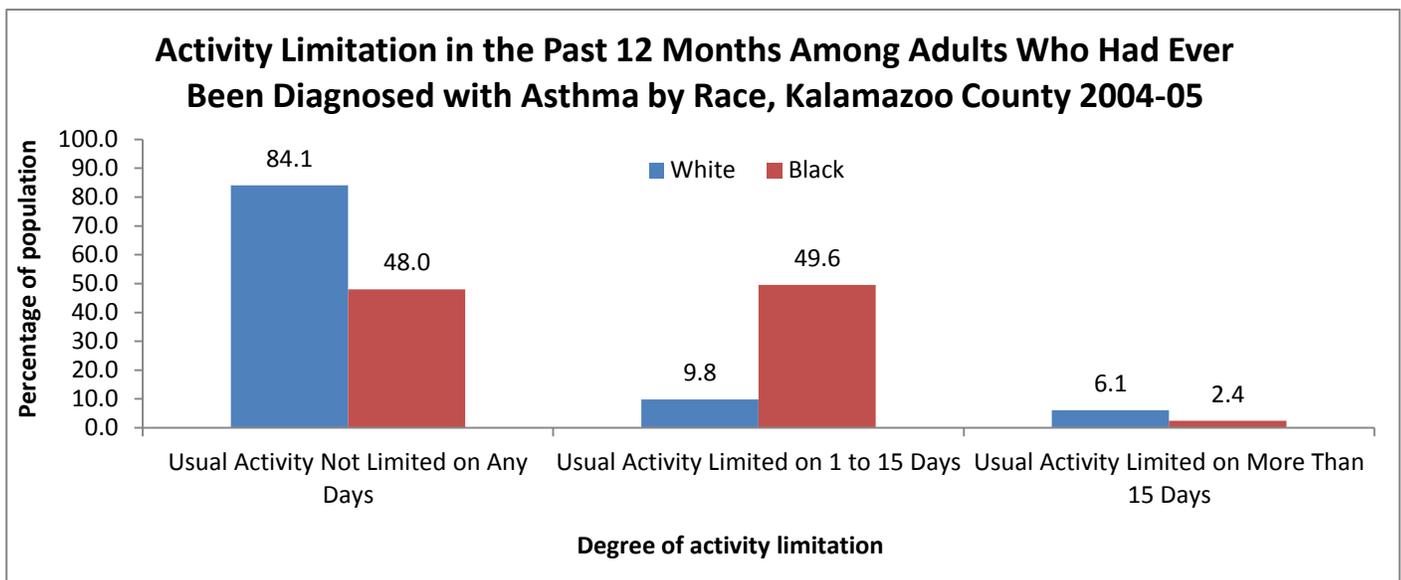
Source: Kalamazoo County 2004-05 Behavioral Risk Factor Survey

Among adults who had ever been diagnosed with asthma in Kalamazoo County, an estimated 22.3% had their usual activity limited due to asthma on least one day in the previous twelve months; 5.3% had activity limitations on more than fifteen days in the previous year.<sup>13</sup>



Source: Kalamazoo County 2004-05 Behavioral Risk Factor Survey

Activity limitation due to asthma differed by race in Kalamazoo County in 2004-05. The percentage of black adults with activity limitation was higher than the percentage of white adults with activity limitation due to asthma (among adults who had been diagnosed with asthma).<sup>14</sup>



Source: Kalamazoo County 2004-05 Behavioral Risk Factor Survey

<sup>13</sup> Kalamazoo County 2004-05 Behavioral Risk Factor Survey

<sup>14</sup> Kalamazoo County 2004-05 Behavioral Risk Factor Survey

**Activity Limitation in the Past 12 Months Among Adults  
Who Were Ever Told They Had Asthma, Kalamazoo County 2004-05**

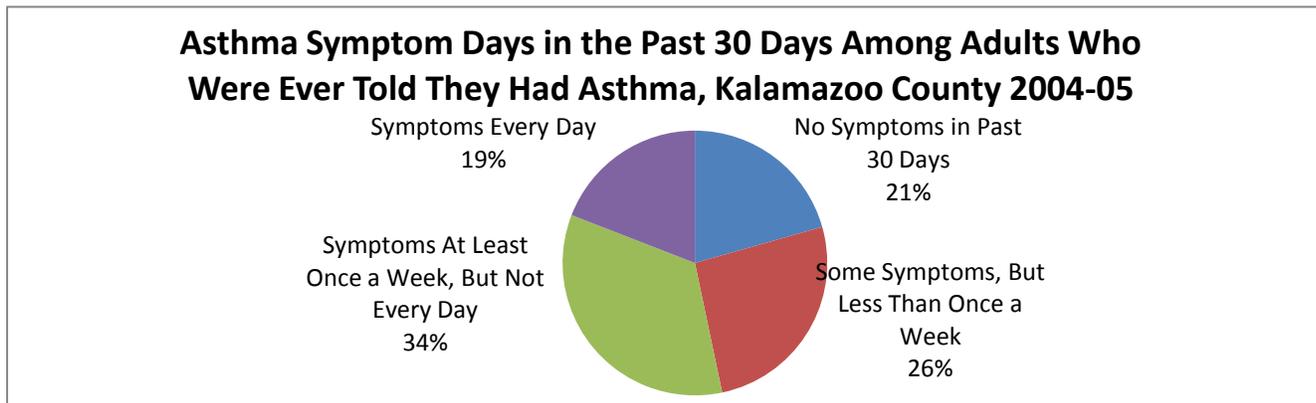
Demographic Characteristics	Usual Activity Not Limited on Any Days in the Past 12 Months <sup>a</sup>		Usual Activity Limited on 1 to 15 Days in the Past 12 Months <sup>a</sup>		Usual Activity Limited on More Than 15 Days in the Past 12 Months <sup>a</sup>	
	%	95% C.I.	%	95% C.I.	%	95% C.I.
<b>Total</b>	77.7	(66.8 - 88.6)	17.0	(6.9 - 27.1)	5.3	*
<b>Age</b>						
18-34 years	77.4	*	22.6	*	0.0	(0.0 - 0.0)
35-54 years	78.0	(65.4 - 90.7)	18.5	(6.5 - 30.5)	3.5	*
55 years +	76.2	(57.1 - 95.4)	10.1	*	13.7	*
<b>Gender</b>						
Male	77.8	*	14.9	*	7.3	*
Female	77.7	(67.3 - 88.0)	18.2	(8.4 - 27.9)	4.2	(0.0 - 8.3)
<b>Race</b>						
White	84.1	(75.1 - 93.1)	9.8	(3.3 - 16.3)	6.1	*
Black	48.0	(14.4 - 81.7)	49.6	(15.6 - 83.6)	2.4	*
<b>Education</b>						
HS graduate or less	67.3	(45.0 - 89.6)	20.6	*	12.1	*
Some college or more	84.1	(74.7 - 93.4)	14.8	(5.7 - 24.0)	1.2	*
<b>Income</b>						
LT \$35,000	70.4	(50.7 - 90.0)	19.5	(0.8 - 38.2)	10.1	*
\$35,000+	84.0	(72.4 - 95.6)	14.3	(3.1 - 25.4)	1.8	*
<b>City/Out-County</b>						
City of Kalamazoo	80.8	(63.5 - 98.2)	18.3	(0.9 - 35.7)	0.9	(0.0 - 1.8)
Rest of County	75.7	(62.1 - 89.4)	16.2	(5.7 - 26.6)	8.1	*
<b>Within City of Kalamazoo</b>						
White in City	98.6	(97.2 - 100.0)	1.4	(0.0 - 2.8)	0.0	(0.0 - 0.0)
Black in City	49.8	(14.8 - 84.9)	47.7	(12.2 - 83.2)	2.5	*

<sup>a</sup> Among all who were ever told they had asthma, the proportion who reported they were unable to work or carry out their usual activities because of their asthma for each amount of time during the past twelve months. (Some respondents reported activity was limited every day of the past twelve months.)

\*Confidence interval exceeds possible limits

Source: Kalamazoo County 2004-05 Behavioral Risk Factor Survey

More than three-quarters of adults in Kalamazoo County who had ever been diagnosed with asthma reported that in the previous 30 days they had asthma symptoms (79.4%) in 2004-05; 19.1% had symptoms every day and 34.2% reported having symptoms at least once a week in the past month.<sup>15</sup>



Source: Kalamazoo County 2004-05 Behavioral Risk Factor Survey

**Asthma Symptom Days in the Past 30 Days Among Adults Who Were Ever Told They Had Asthma, Kalamazoo County 2004-05**

Demographic Characteristics	No Symptoms in Past 30 Days <sup>a</sup>		Some Symptoms, But Less Than Once a Week <sup>a</sup>		At Least Once a Week, But Not Every Day <sup>a</sup>		Every Day <sup>a</sup>	
	%	95% C.I.	%	95% C.I.	%	95% C.I.	%	95% C.I.
<b>Total</b>	20.6	(10.2 - 31.0)	26.1	(15.5 - 36.8)	34.2	(22.5 - 45.8)	19.1	(10.2 - 28.0)
<b>Age</b>								
18-34 years	3.3	(0.0 - 6.6)	35.3	(9.9 - 60.7)	53.4	(26.2 - 80.6)	8.0	*
35-54 years	30.7	(12.9 - 48.5)	26.5	(10.4 - 42.6)	26.8	(12.4 - 41.1)	16.0	(5.2 - 26.9)
55 years +	19.0	(3.4 - 34.6)	17.9	(4.7 - 31.2)	31.5	(13.5 - 49.4)	31.6	(10.8 - 52.3)
<b>Gender</b>								
Male	28.4	(5.2 - 51.6)	19.3	(2.8 - 35.8)	31.0	(7.1 - 54.9)	21.3	(3.4 - 39.2)
Female	16.5	(7.1 - 25.9)	29.7	(16.5 - 42.9)	35.9	(23.2 - 48.5)	17.9	(8.1 - 27.8)
<b>Race</b>								
White	19.4	(8.4 - 30.3)	28.8	(16.5 - 41.1)	32.4	(20.7 - 44.0)	19.5	(9.3 - 29.7)
Black	27.5	*	17.7	*	42.0	(7.2 - 76.9)	12.8	*
<b>Education</b>								
HS graduate or less	16.8	(2.2 - 31.4)	18.4	(0.9 - 35.9)	42.9	(20.7 - 65.1)	21.9	(4.7 - 39.1)
Some college or more	22.9	(9.1 - 36.7)	30.7	(17.5 - 43.9)	29.0	(16.7 - 41.2)	17.4	(7.6 - 27.3)
<b>Income</b>								
LT \$35,000	8.2	*	17.1	(2.4 - 31.8)	44.7	(25.8 - 63.7)	30.0	(13.8 - 46.2)
\$35,000+	31.3	(13.5 - 49.1)	32.5	(16.1 - 48.9)	25.3	(10.6 - 39.9)	10.9	(0.5 - 21.4)
<b>City/Out-County</b>								
City of Kalamazoo	22.4	(6.4 - 38.4)	25.3	(10.0 - 40.7)	36.6	(18.7 - 54.5)	15.7	(4.8 - 26.5)
Rest of County	19.3	(5.7 - 32.8)	27.5	(12.5 - 42.6)	30.1	(15.3 - 44.9)	23.1	(9.0 - 37.2)
<b>Within City of Kalamazoo</b>								
White in City	18.9	(1.0 - 36.8)	30.1	(9.6 - 50.6)	31.3	(13.3 - 49.3)	19.7	(4.4 - 34.9)
Black in City	28.6	*	18.3	*	43.6	(7.9 - 79.3)	9.5	*

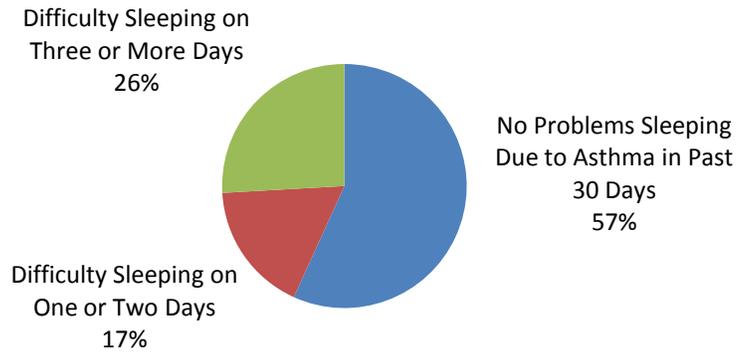
<sup>a</sup> Among all who were ever told they had asthma, the proportion who reported they had asthma symptoms (including cough, wheezing, shortness of breath, chest tightness and phlegm production in the absence of a cold or respiratory infection) at each frequency during the past 30 days.

\*Confidence interval exceeds possible limits

Source: Kalamazoo County 2004-05 Behavioral Risk Factor Survey

Among Kalamazoo County adults who had ever been diagnosed with asthma, almost half reported having had sleeping problems in the past 30 days due to asthma (43.2%) in 2004-05. More than one-quarter (25.9%) had difficulty sleeping on three or more days in the previous month.<sup>16</sup>

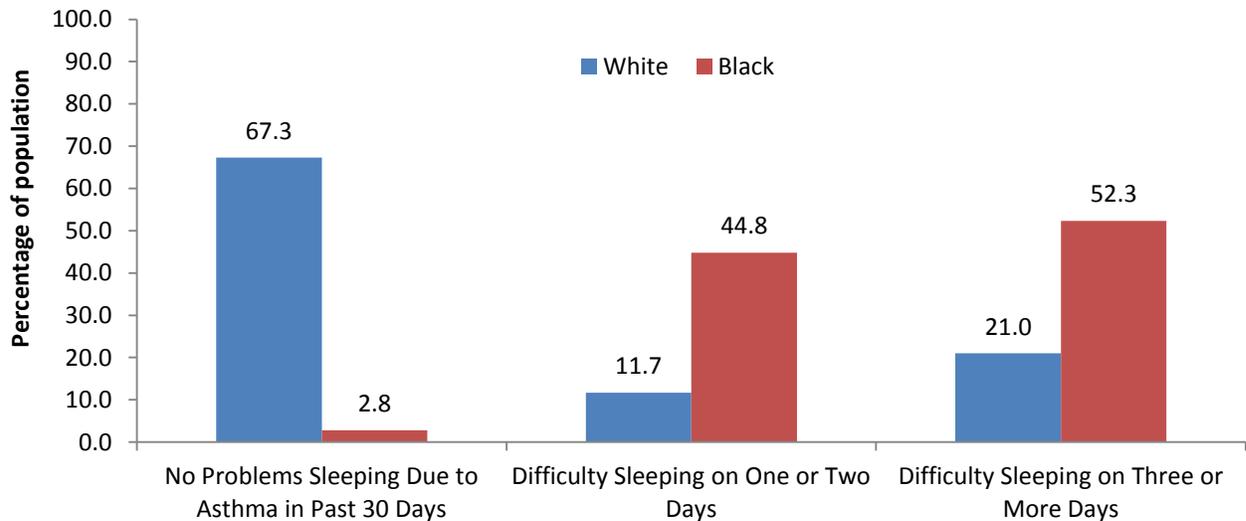
**Sleeping Problems Due to Asthma in the Past 30 Days Among Adults Who Were Ever Told They Had Asthma, Kalamazoo County 2004-05**



Source: Kalamazoo County 2004-05 Behavioral Risk Factor Survey

Sleeping problems due to asthma were more prevalent among black adults who had been diagnosed with asthma than among white adults. While 32.7% of white adults who had been diagnosed with asthma reported sleeping problems in the past 30 days, 97.1% of black adults who had been diagnosed with asthma reported sleeping problems on at least one day.<sup>17</sup>

**Sleeping Problems Due to Asthma in the Past 30 Days Among Adults Who Were Ever Told They Had Asthma by Race, Kalamazoo County 2004-05**



Source: Kalamazoo County 2004-05 Behavioral Risk Factor Survey

<sup>16</sup> Kalamazoo County 2004-05 Behavioral Risk Factor Survey

<sup>17</sup> Kalamazoo County 2004-05 Behavioral Risk Factor Survey

**Sleeping Problems Due to Asthma in the Past 30 Days Among Adults  
Who Were Ever Told They Had Asthma, Kalamazoo County 2004-05**

Demographic Characteristics	No Problems Sleeping Due to Asthma in Past 30 Days <sup>a</sup>		Difficulty Sleeping on One or Two Days <sup>a</sup>		Difficulty Sleeping on Three or More Days <sup>a</sup>	
	%	95% C.I.	%	95% C.I.	%	95% C.I.
<b>Total</b>	56.8	(43.3 - 70.3)	17.3	(7.7 - 26.9)	25.9	(12.9 - 38.9)
<b>Age</b>						
18-34 years	42.4	(15.5 - 69.4)	30.5	(5.7 - 55.2)	27.1	*
35-54 years	58.3	(39.5 - 77.2)	15.7	(3.1 - 28.3)	26.0	(9.6 - 42.4)
55 years +	67.8	(45.3 - 90.3)	6.2	*	26.0	(4.0 - 47.9)
<b>Gender</b>						
Male	42.4	(17.2 - 67.6)	20.5	(1.1 - 39.9)	37.1	(7.9 - 66.2)
Female	63.7	(49.5 - 77.8)	15.8	(4.9 - 26.7)	20.6	(9.2 - 31.9)
<b>Race</b>						
White	67.3	(53.8 - 80.7)	11.7	(2.1 - 21.4)	21.0	(9.5 - 32.5)
Black	2.8	*	44.8	(7.3 - 82.4)	52.3	(13.6 - 91.0)
<b>Education</b>						
HS graduate or less	44.7	(20.7 - 68.8)	16.9	(1.6 - 32.3)	38.4	(13.0 - 63.7)
Some college or more	64.8	(50.0 - 79.5)	17.6	(5.2 - 29.9)	17.7	(6.3 - 29.1)
<b>Income</b>						
LT \$35,000	45.3	(25.8 - 64.7)	13.8	(1.8 - 25.7)	41.0	(20.3 - 61.7)
\$35,000+	68.6	(49.5 - 87.6)	18.4	(1.5 - 35.4)	13.0	(0.4 - 25.6)
<b>City/Out-County</b>						
City of Kalamazoo	49.0	(28.8 - 69.3)	21.2	(6.9 - 35.4)	29.8	(8.5 - 51.1)
Rest of County	62.9	(45.2 - 80.6)	14.2	(0.5 - 27.9)	22.9	(7.7 - 38.1)
<b>Within City of Kalamazoo</b>						
White in City	72.7	(53.5 - 91.9)	10.1	*	17.2	(0.7 - 33.8)
Black in City	2.9	*	41.9	(4.0 - 79.9)	55.1	(16.0 - 94.3)

<sup>a</sup> Among all who were ever told they had asthma, the proportion who reported that asthma symptoms made it difficult for them to stay asleep at each frequency during the past 30 days.

\*Confidence interval exceeds possible limits

Source: Kalamazoo County 2004-05 Behavioral Risk Factor Survey

### 7.4.3 Asthma Hospitalizations

Hospitalizations are defined as inpatient hospital stays completed during a specified year. A hospitalization is further defined as a continuous stay of one or more days; therefore a patient who was hospitalized on more than one separate occasion during the time period would be counted as more than one hospitalization.<sup>18</sup>

The Michigan Department of Community Health defines ambulatory care sensitive (ACS) hospitalizations as those hospitalizations “for conditions where timely and effective ambulatory care can decrease hospitalizations by preventing the onset of an illness or condition, controlling an acute episode of an illness or managing a chronic disease or condition.” Ambulatory care sensitive hospitalizations may reflect a lack of or failure of prevention efforts, a primary care resource shortage, poor performance of primary health care delivery systems, or other factors that create barriers to obtaining timely and effective care.<sup>19</sup> All hospitalizations due to asthma are considered ACS hospitalizations. Ambulatory care sensitive asthma hospitalizations are related to any type of asthma including extrinsic asthma (allergic, atopic or childhood), intrinsic/late-onset asthma and chronic obstructive asthma (asthma with chronic obstructive pulmonary disease or chronic asthmatic bronchitis).

In Kalamazoo County in 2009, 0.8% of all hospitalizations were due to asthma (227). The rate of hospitalizations due to asthma in Kalamazoo County was similar in 2009 to the average rate between 2004 and 2008, and the rate remained lower than the rate in Michigan.<sup>20</sup>

**Hospitalizations and Rates per 10,000 Population for Asthma and All Causes, Kalamazoo County and Michigan 2004-2008 vs. 2009**

Disease	Area	Hospitalizations		Rate per 10,000	
		Average number 2004-2008	2009	Average annual rate 2004-2008 (+/- 95% CI)	2009 (+/- 95% CI)
Asthma	Kalamazoo County	227	227	9.4 ± 0.6	9.1 ± 1.2
	Michigan	16,309	16,870	16.2 ± 0.1	16.9 ± 0.3
All Hospitalizations	Kalamazoo County	28,422	28,528	1,171.3 ± 6.1	1,148.4 ± 13.3
	Michigan	1,326,194	1,318,741	1,315.6 ± 1.0	1,322.7 ± 2.3

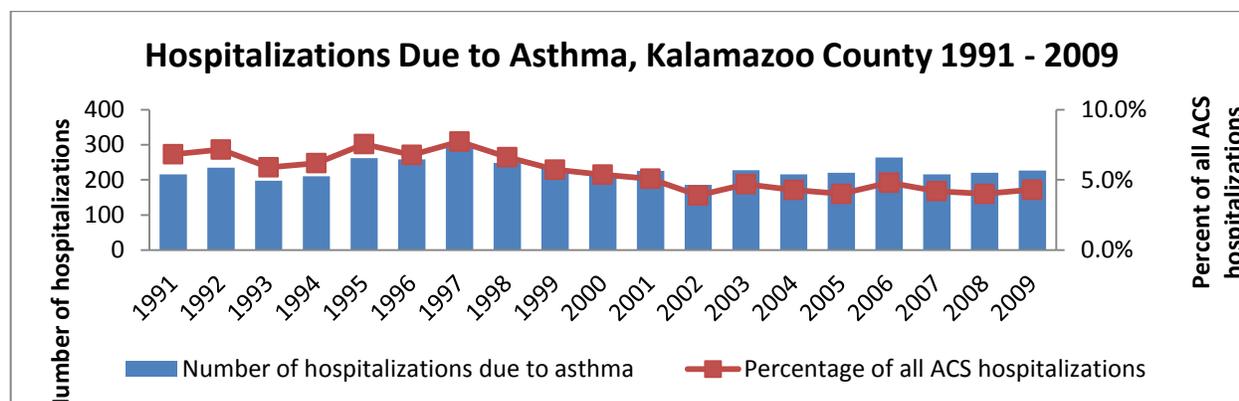
Source: Michigan Department of Community Health, Division for Vital Records and Health Data Development, Michigan Resident Inpatient Files

<sup>18</sup> Michigan Department of Community Health, Division for Vital Records and Health Data Development, accessed online at <http://www.mdch.state.mi.us/pha/osr/chi/hosp/frame.html>

<sup>19</sup> Michigan Department of Community Health, Division for Vital Records and Health Data Development, accessed online at <http://www.mdch.state.mi.us/pha/osr/chi/hosp/frame.html>

<sup>20</sup> Michigan Department of Community Health, Division for Vital Records and Health Data Development, Michigan Resident Inpatient Files

In 2009, asthma was the 6<sup>th</sup> most common cause of ACS hospitalization in Kalamazoo County (4.3% of all ACS hospitalizations). In 2009, asthma was the cause of 6.2% of the ACS hospitalizations in Michigan. Among ACS hospitalizations that were for chronic conditions, asthma was responsible for 11.3% of hospitalizations in Kalamazoo County in 2009.<sup>21</sup>



Source: Michigan Department of Community Health, Division for Vital Records and Health Statistics, Michigan Resident Inpatient Files

### Hospitalizations due to Asthma in Kalamazoo County and Michigan

Year	Number	Percent of ACS hospitalizations	
	Kalamazoo County	Kalamazoo County	Percent in Michigan
1991	216	6.8%	7.7%
1992	235	7.2%	7.9%
1993	198	5.9%	8.1%
1994	210	6.2%	7.4%
1995	262	7.6%	7.9%
1996	258	6.8%	7.6%
1997	293	7.7%	7.4%
1998	248	6.6%	6.5%
1999	232	5.7%	6.5%
2000	219	5.4%	6.7%
2001	226	5.1%	6.3%
2002	186	3.9%	5.8%
2003	228	4.7%	6.5%
2004	216	4.3%	6.4%
2005	220	4.0%	6.5%
2006	264	4.8%	6.1%
2007	216	4.2%	5.8%
2008	220	4.0%	6.1%
2009	227	4.3%	6.2%

Source: Michigan Department of Community Health, Division for Vital Records and Health Statistics, Michigan Resident Inpatient Files

Among Kalamazoo County residents in 2009, there were 66 pediatric (0-17 years old) hospitalizations for asthma for a rate of 12.0 per 10,000 population.<sup>22</sup>

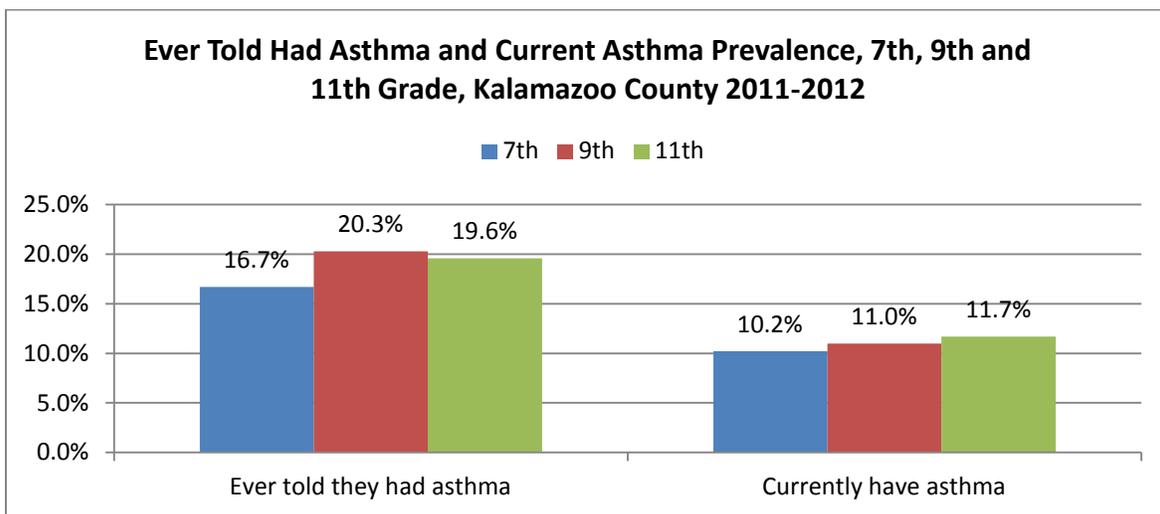
<sup>21</sup> Michigan Department of Community Health, Division for Vital Records and Health Statistics, Michigan Resident Inpatient Files.

<sup>22</sup> Healthy People 2010, US Department of Health and Human Services; accessed online at <http://www.healthypeople.gov/document/html/objectives/01-09.htm>

### 7.4.4 Youth Asthma Prevalence

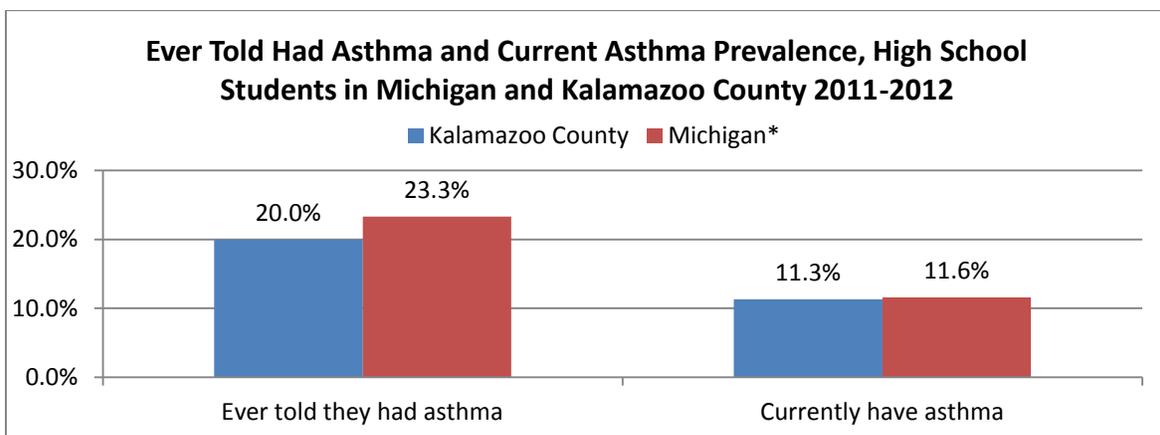
Kalamazoo County youth asthma prevalence estimates are available through the Michigan Profile for Healthy Youth Survey (MIPHY). During the 2011-2012 school year, 7<sup>th</sup>, 9<sup>th</sup> and 11<sup>th</sup> graders throughout the county completed a survey administered in the schools through the Michigan Department of Education and Michigan Department of Community Health. The survey asked students if they had ever been told by a doctor or a nurse that they had asthma, and whether they still had asthma.

Among middle school students, 16.7% had ever been told they had asthma and 10.2% currently had asthma. Rates were slightly higher among high school students, with 20.0% of students having ever been told they had asthma and 11.3% who currently had asthma.



Source: Michigan Profile for Healthy Youth, Kalamazoo County 2011-2012

Asthma prevalence was similar among Michigan high school students and Kalamazoo County high school students. A slightly higher percentage of students in Michigan reported they had ever been told they had asthma.



Source: Michigan Profile for Healthy Youth, Kalamazoo County 2011-2012

\*Michigan Youth Risk Behavior Survey (YRBS) 2009

**Ever Told Had Asthma and Asthma Prevalence Among Middle School Students,  
Kalamazoo County 2011-2012**

	Demographic Characteristic	Ever been told by a doctor or nurse that they had asthma	Ever told by a doctor or nurse that they had asthma and still have asthma (i.e. current asthma)
<b>County</b>		16.7%	10.2%
<b>Grade</b>	<b>7</b>	16.7%	10.2%
<b>Gender</b>	<b>Males</b>	17.6%	9.7%
	<b>Female</b>	15.8%	10.6%
<b>Race/Ethnicity</b>	<b>Black</b>	26.4%	17.0%
	<b>White</b>	14.9%	8.6%
	<b>Hispanic</b>	19.1%	14.2%
	<b>American Indian</b>	5.9%	3.0%
	<b>Asian</b>	5.3%	5.3%
	<b>Arab/Chaldean</b>	21.1%	5.3%
<b>Academics</b>	<b>As/Bs</b>	16.0%	9.4%
	<b>Ds/Fs</b>	18.8%	12.5%

Source: Michigan Profile for Healthy Youth, Kalamazoo County 2011-2012

**Ever Told Had Asthma and Asthma Prevalence Among High School Students,  
Kalamazoo County 2011-2012**

	Demographic Characteristic	Ever been told by a doctor or nurse that they had asthma	Ever told by a doctor or nurse that they had asthma and still have asthma (i.e. current asthma)
<b>Michigan 2009 YRBS</b>		23.3%	11.6%
<b>County</b>		20.0%	11.3%
<b>Grade</b>	<b>9</b>	20.3%	11.0%
	<b>11</b>	19.6%	11.7%
<b>Gender</b>	<b>Males</b>	20.0%	10.5%
	<b>Female</b>	19.8%	11.9%
<b>Race/Ethnicity</b>	<b>Black</b>	25.4%	15.4%
	<b>White</b>	18.3%	10.4%
	<b>Hispanic</b>	25.5%	14.4%
	<b>American Indian</b>	37.5%	28.1%
	<b>Asian</b>	13.5%	3.9%
	<b>Arab/Chaldean</b>	6.7%	2.2%
<b>Academics</b>	<b>As/Bs</b>	19.9%	11.4%
	<b>Ds/Fs</b>	22.5%	12.4%

Source: Michigan Profile for Healthy Youth, Kalamazoo County 2011-2012