

# Detroit: The Epicenter of Asthma Burden in Michigan

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[www.michigan.gov/asthma](http://www.michigan.gov/asthma)

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# What is Asthma?

- Asthma is a chronic lung disease that inflames and narrows the airways. Asthma causes recurring periods of wheezing, chest tightness, shortness of breath, and coughing. The coughing often occurs at night or early in the morning.
- Asthma has no cure. However, with today's knowledge and treatments, most people who have asthma are able to manage the disease.
- Michigan's efforts to address asthma were coordinated through the Asthma Initiative of Michigan (AIM).

**Data Notes:**

1. Source: <http://www.nhlbi.nih.gov/health/health-topics/topics/asthma/>

# Introduction

**Detroit experiences some of the highest asthma burden in Michigan, particularly among children.**

Here is Marco's story:

Marco is an African American first grader who lives in Detroit with his mom and younger sister. He has missed several days of school most weeks because of asthma. In the last year he has been to the emergency department five times, and has had many urgent doctor visits. He has had six steroid bursts in the last year to try to gain control over his asthma, which leave him sleepless, jittery, and breathing better for only a short time. Most days, he takes nebulizer treatments and his rescue inhaler every three to four hours to quiet his wheeze and cough. His mother doesn't know what triggers his asthma, but she knows its worse when he plays outside, so he is no longer allowed to be outside for too long or to play too hard. He spends most of his time in front of the TV. His mother is frightened for him, but resigned to the fact that this is Marco's, and their family's, "normal."

# Introduction

- This report details the asthma burden in Detroit across many datasets:
  - Surveys
  - Medicaid claims
  - Hospitalizations
  - Mortality

# Key Findings

The asthma burden in Detroit was found to be greater than the overall asthma burden in Michigan.

Nationwide, in recent years, asthma prevalence has ceased to increase significantly among children, and the racial disparity between black and white children has plateaued.<sup>1</sup> Still, large disparities in adverse asthma events exist and must be addressed.

- The prevalence of current asthma among Detroit adults was 29% higher than in Michigan as a whole.
- The rate of hospitalizations for asthma was more than three times greater for Detroit residents than for Michigan residents as a whole.
- The rate of asthma hospitalizations for white persons in Detroit was about 35% less than the rate among black persons in Detroit.
- The rate of emergency department visits among children covered by Michigan Medicaid was twice as high in Detroit as the rate for the state as a whole.
- Reliance on the emergency department for asthma care was 50% higher for children enrolled in Medicaid with persistent asthma in Detroit as compared with their counterparts in the state as a whole.

# 1. Population Demographics<sup>1</sup> of Detroit, Michigan, 2014

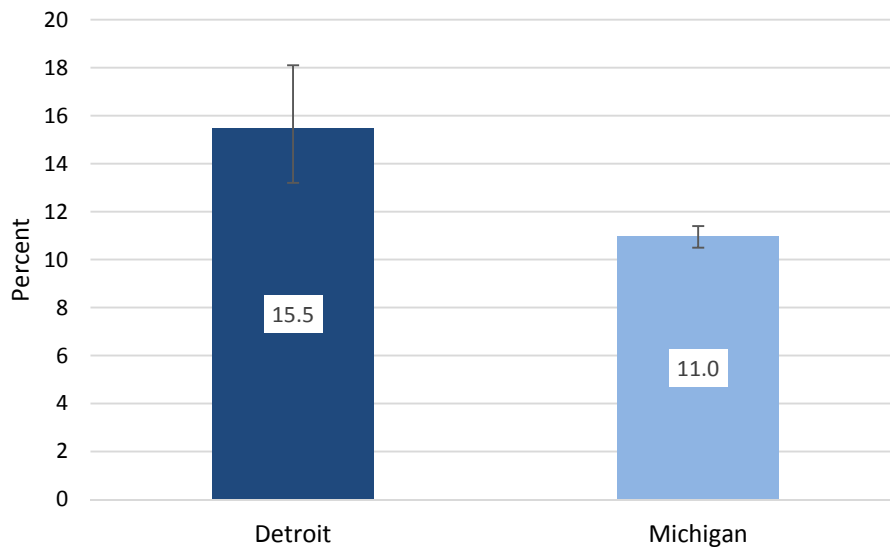
Measure	Detroit Population Estimate
Total population	680,250
% less than 18 years	26.7%
% black	82.7%
% of those 25 years and older with less than high school diploma	22.2%
Persons without health insurance, under age 65 years	21.4%
Median household income	\$26,095
% in poverty	39.8%
% of housing units that were vacant	49.3%

- The total resident population of Detroit, Michigan, in 2010 exceeded 600,000; 83.0% of this population were black.
- In 2014, the median household income was \$26,095, with 39.8% of the population living in poverty.
- Of the population <65 years of age 21.4% did not have health insurance in 2014.
- Among the population ≥25 years of age, 22.2% had not earned a high school diploma in 2014.
- The prevalence of vacant housing units was 49.3% in 2014.

**Data Notes:**

1. Source: American Community Survey, 2010-2014

## 2. Prevalence of Current Asthma<sup>1</sup> for Adults (≥18 Years), Detroit and Michigan, 2012-2014

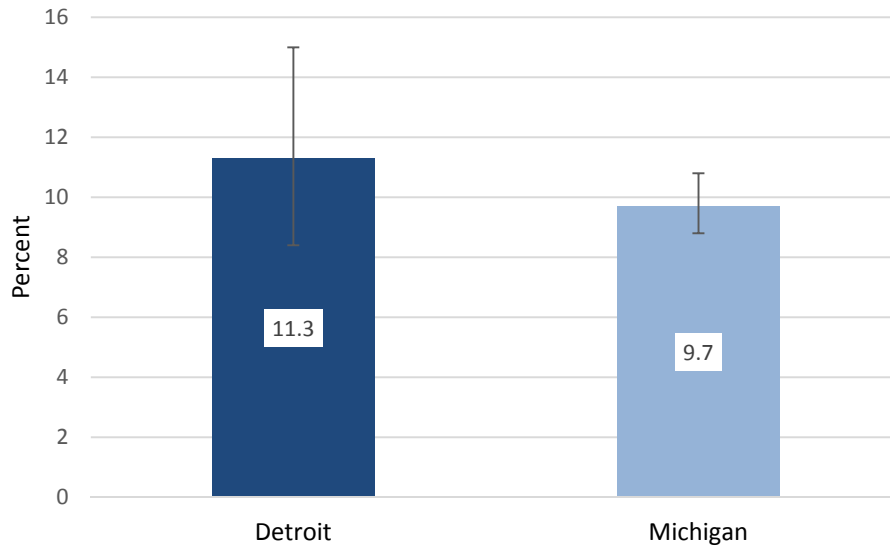


- In 2012-2014, 15.5% of Detroit adults and 11.0% of Michigan adults currently had asthma.
- Current asthma prevalence in Detroit was significantly higher than Michigan as a whole.

**Data Notes:**

1. Source: 2012-2014 Michigan Behavioral Risk Factor Surveys, MDHHS.

### 3. Prevalence of Current Asthma<sup>1</sup> for Children (<18 Years), Detroit and Michigan, 2012-2014



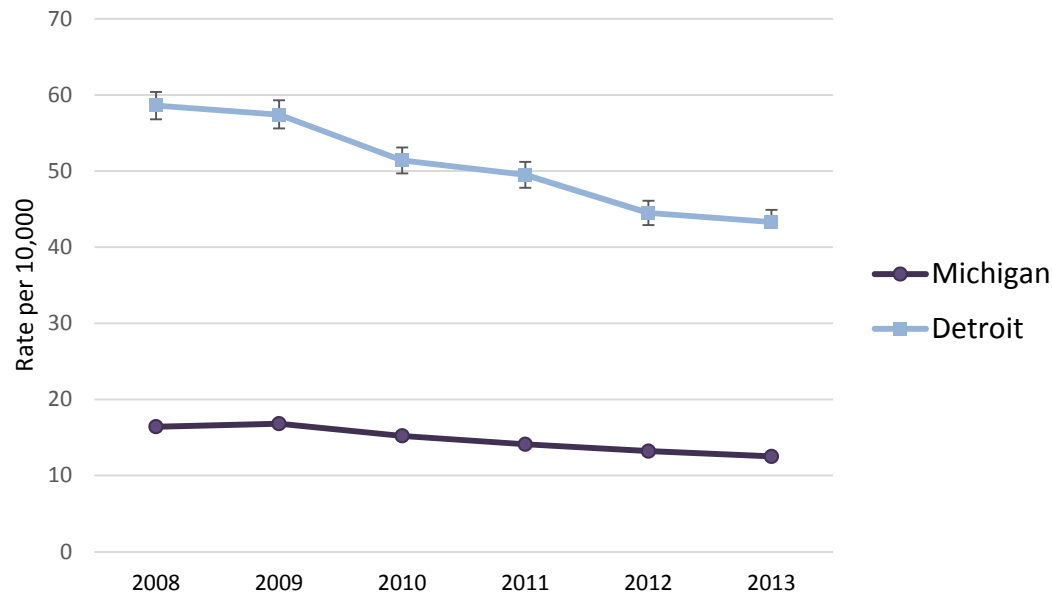
- In 2012-2014, 11.3% of Detroit children and 9.7% of Michigan children currently had asthma.
- Current asthma prevalence for Detroit children was not significantly different from the prevalence for Michigan children.

**Data Notes:**

1. Source: 2012-2014 Michigan Behavioral Risk Factor Surveys, MDHHS



## 4. Rates<sup>1</sup> of Asthma Hospitalization<sup>2</sup>, Detroit and Michigan, 2008-2013



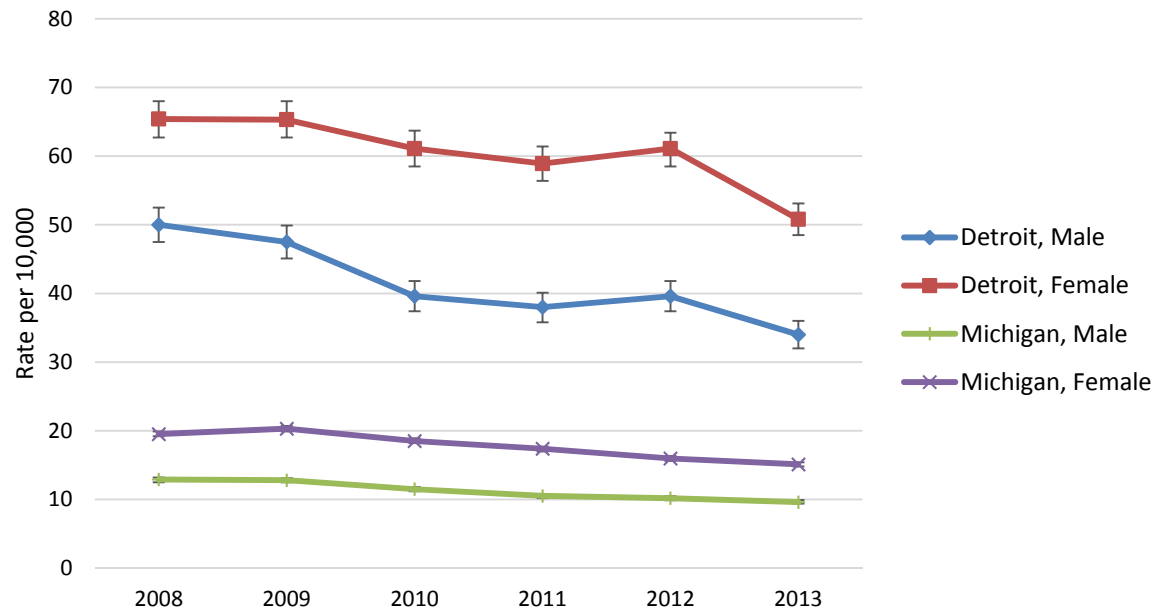
**Data Notes:**

Source: Michigan Inpatient Database, 2008-2013, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-9-CM: 493.XX

- In 2013, 24% of all asthma hospitalizations in Michigan residents occurred in residents of Detroit (3,082 and 12,837 asthma hospitalizations in Detroit and Michigan residents, respectively).
- The rate of asthma hospitalizations in Detroit residents in 2013 was 43.3 per 10,000 population.
- The asthma hospitalization rate in Detroit in 2013 was 3.5 times the rate in Michigan as a whole.
- Between 2008 and 2013, the rates of asthma hospitalization in Detroit and Michigan decreased by 15.3 and 3.9 asthma hospitalizations per 10,000 population, which is a decrease of 24% and 26%, respectively.

## 5. Rates<sup>1</sup> of Asthma Hospitalization<sup>2</sup> by Sex, Detroit and Michigan, 2008-2013



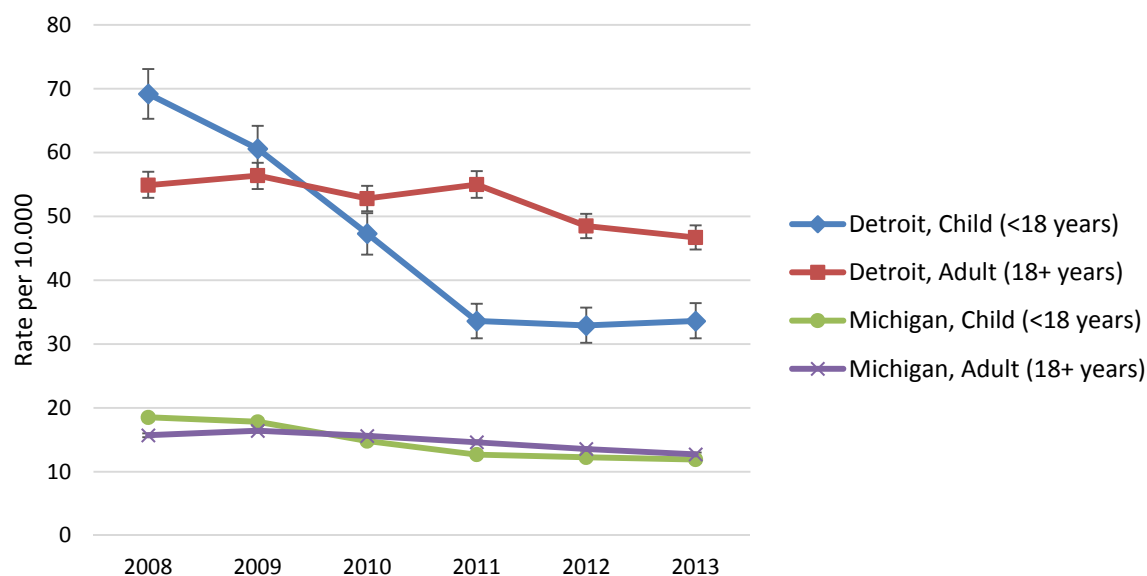
**Data Notes:**

Source: Michigan Inpatient Database, 2008-2013, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-9-CM: 493.XX

- In 2013, the rate of asthma hospitalizations among Detroit females was 50.8 per 10,000. Among males in Detroit, the rate was 34.0 per 10,000.
- In Detroit in 2013, the rate of asthma hospitalizations among females was 49% higher than among males. For Michigan, the female rate was 57% higher than the male rate.
- Sex-specific asthma hospitalization rates in Detroit were over three times the rates for Michigan as a whole.
- Between 2008 and 2013, the rate of asthma hospitalizations for males in Detroit and Michigan decreased, with decreases of 16.0 and 3.3 per 10,000 population, respectively. For females in Detroit and Michigan, the rates decreased by 14.6 and 4.4 per 10,000 population, respectively.

## 6. Rates<sup>1</sup> of Asthma Hospitalization<sup>2</sup> by Age Group, Detroit and Michigan, 2008-2013



### Data Notes:

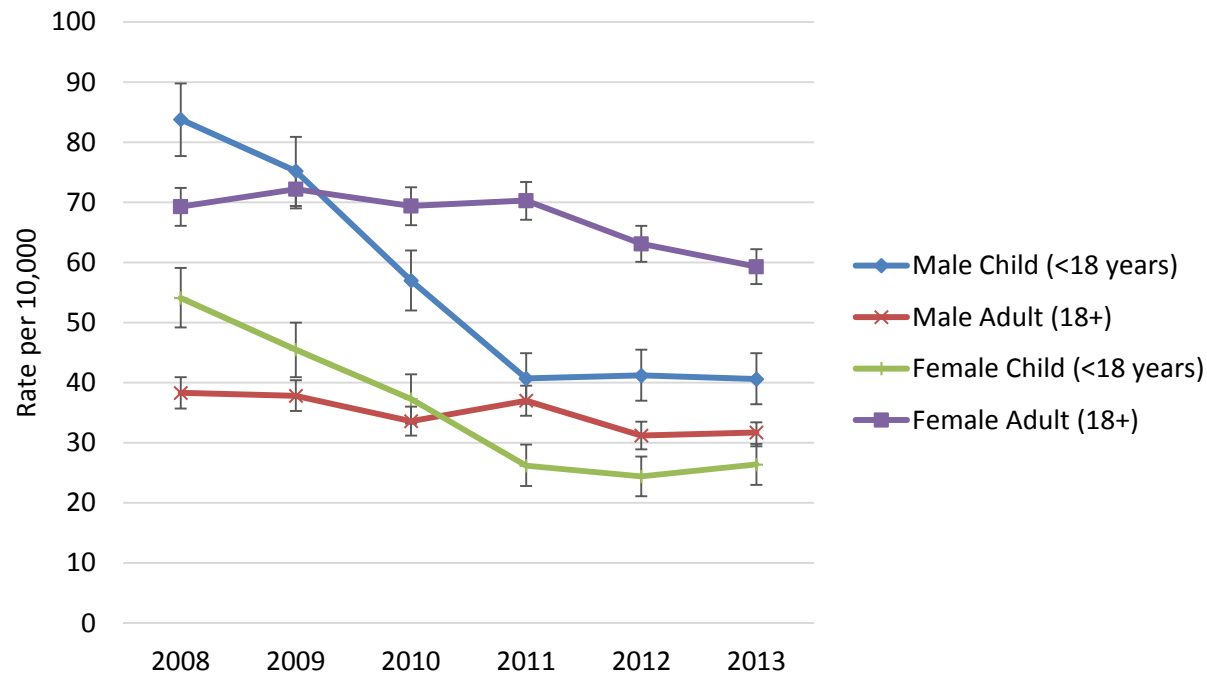
Source: Michigan Inpatient Database, 2008-2013, MDHHS

1. Age-adjusted to the 2000 US Standard Population

2. Asthma as primary diagnosis, ICD-9-CM: 493.XX

- In Detroit, the rate of adult asthma hospitalizations surpassed the rate among children in 2010; in Michigan, adult rates first rose above child rates in 2011.
- In 2013, the rate of asthma hospitalizations among Detroit children was 33.6 per 10,000. Among adults, the rate was 46.7 per 10,000.
- The asthma hospitalization rate for children in Detroit was almost three times the rate in Michigan as a whole. The asthma hospitalization rate for adults in Detroit was almost 3.7 times the rate in Michigan as a whole.
- Between 2008 and 2013, asthma hospitalization rates among children in Detroit and in Michigan decreased, with decreases of 35.6 and 6.6 per 10,000, respectively. Among adults, these rates also decreased in Detroit and in Michigan, with decreases of 8.2 and 3.0 per 10,000, respectively.

## 7. Rates<sup>1</sup> of Asthma Hospitalization<sup>2</sup> by Sex-Age Group, Detroit, 2008-2013



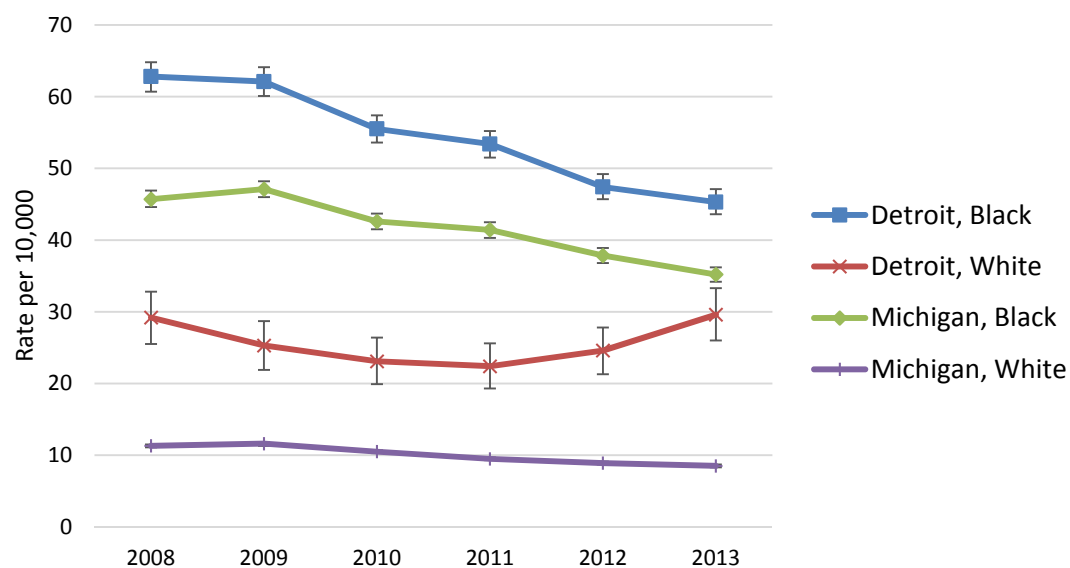
### Data Notes:

Source: Michigan Inpatient Database, 2008-2013, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-9-CM: 493.XX

- In 2013, the rate of asthma hospitalizations among Detroit male children was 40.6 per 10,000. The rate among female Detroit children was 26.4 per 10,000.
- In 2013, the rate of asthma hospitalizations among Detroit male adults was 31.7 per 10,000. Among Detroit female adults, the rate was 59.3 per 10,000.
- Asthma hospitalization rates were about 87% higher among adult females than males in 2013. Among Detroit children, the female rate was 40% lower than males.
- From 2008 to 2013, the rates of asthma hospitalization for male and female children decreased, with decreases of 43.2 and 27.7 per 10,000, respectively. Among adult males and females, the rates decreased 6.6 and 10.0 per 10,000, respectively.

## 8. Rates<sup>1</sup> of Asthma Hospitalization<sup>2</sup> by Race, Detroit and Michigan, 2008-2013



- In 2013, the rate of asthma hospitalizations among black persons in Detroit was 45.3 per 10,000. The rate among white persons in Detroit was 29.6 per 10,000, about 35% less than the rate among black persons in Detroit.

- In 2013, asthma hospitalization rates in Detroit were over three times higher than the rates in Michigan as a whole for white persons, but Detroit vs Michigan rates were only about 22% higher for black persons.

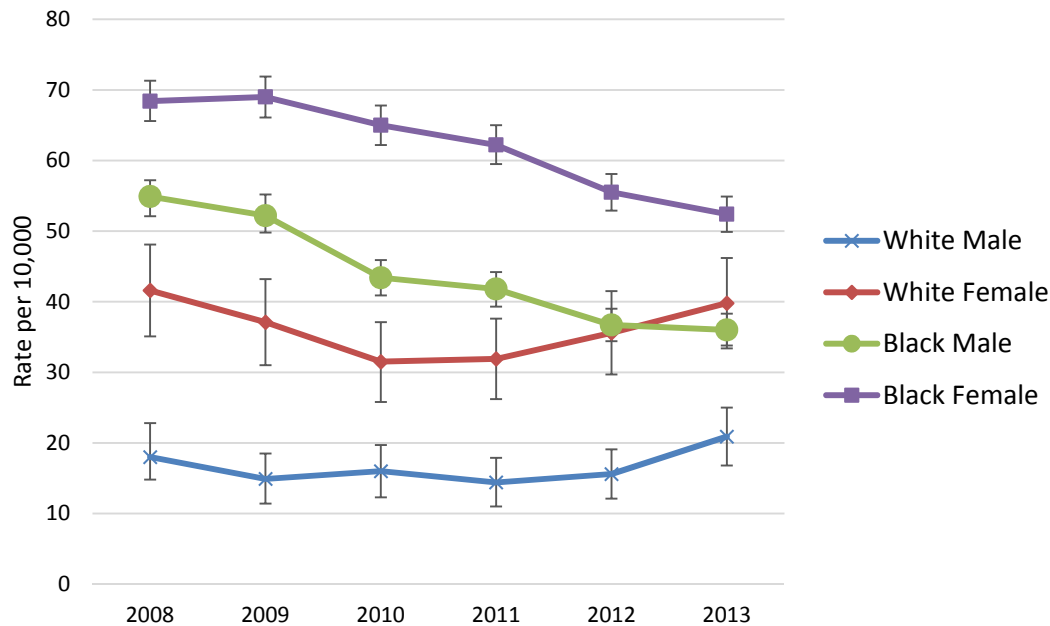
**Data Notes:**

Source: Michigan Inpatient Database, 2008-2013, MDHHS

1. Age-adjusted to the 2000 US Standard Population

2. Asthma as primary diagnosis, ICD-9-CM: 493.XX

# 9. Rates<sup>1</sup> of Asthma Hospitalization<sup>2</sup> by Sex-Race Group, Detroit, 2008-2013



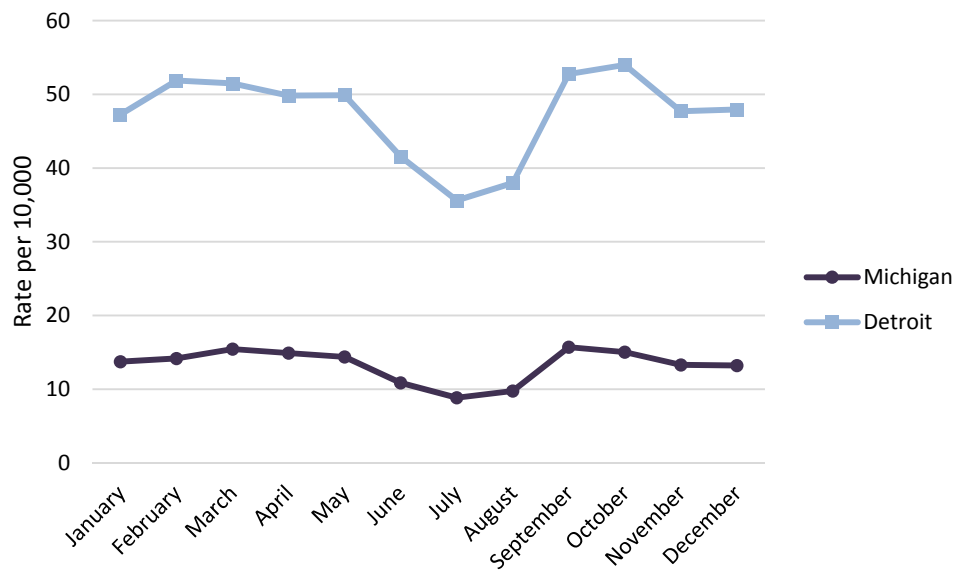
- In 2013, the rate of asthma hospitalizations among white males in Detroit was 20.9 per 10,000. The rate among white females in Detroit was 39.8 per 10,000.
- In 2013, the rate of asthma hospitalizations among Detroit black males was 36.0 per 10,000. Among Detroit black females, the rate was 52.4 per 10,000.

**Data Notes:**

Source: Michigan Inpatient Database, 2008-2013, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-9-CM: 493.XX

# 10. Rates<sup>1</sup> of Asthma Hospitalization<sup>2</sup> by Month of Admission, Detroit and Michigan, 2011-2013



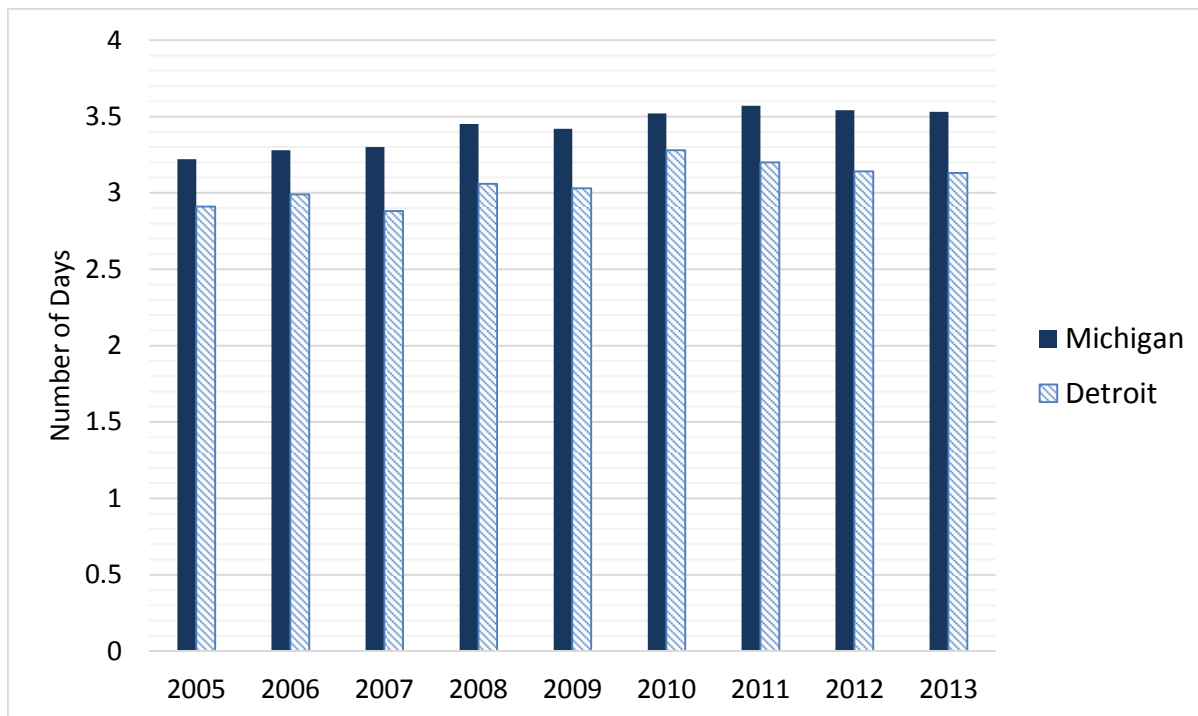
- Throughout the year, rates of asthma hospitalization in Detroit were approximately three to four times higher than they were in Michigan as a whole.
- The seasonal trend in asthma hospitalizations in Detroit followed similar trends in Michigan as a whole: the lowest rates in July and August were immediately followed by increase in September. The highest rates for Detroit were September and October. The highest rates for Michigan were in March and September.

**Data Notes:**

Source: Michigan Inpatient Database, 2011-2013, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-9-CM: 493.XX

# 11. Average Length of Stay for Asthma Hospitalization<sup>1</sup>, Detroit and Michigan, 2005-2013



- In 2005-2013, the average length of stay for an asthma hospitalization in Detroit was about 24 minutes shorter than that for Michigan as a whole.
- Between 2005 and 2013, the average length of stay for an asthma hospitalization in Michigan increased significantly ( $p < 0.05$ )<sup>2</sup> while the change in length of stay in Detroit was not statistically significant.

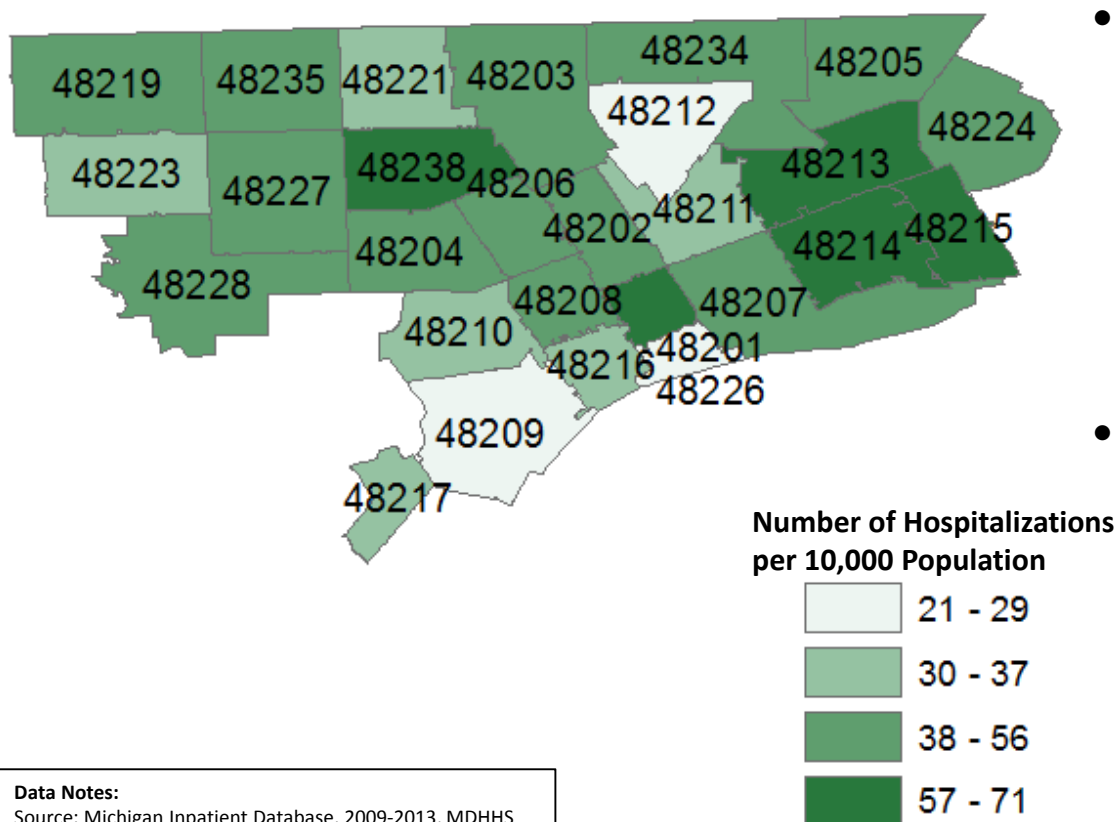
**Data Notes:**

Source: Michigan Inpatient Database, 2005-2013, MDHHS

1. Asthma as primary diagnosis, ICD-9-CM: 493.XX
2. Spearman's correlation and rank correlation test



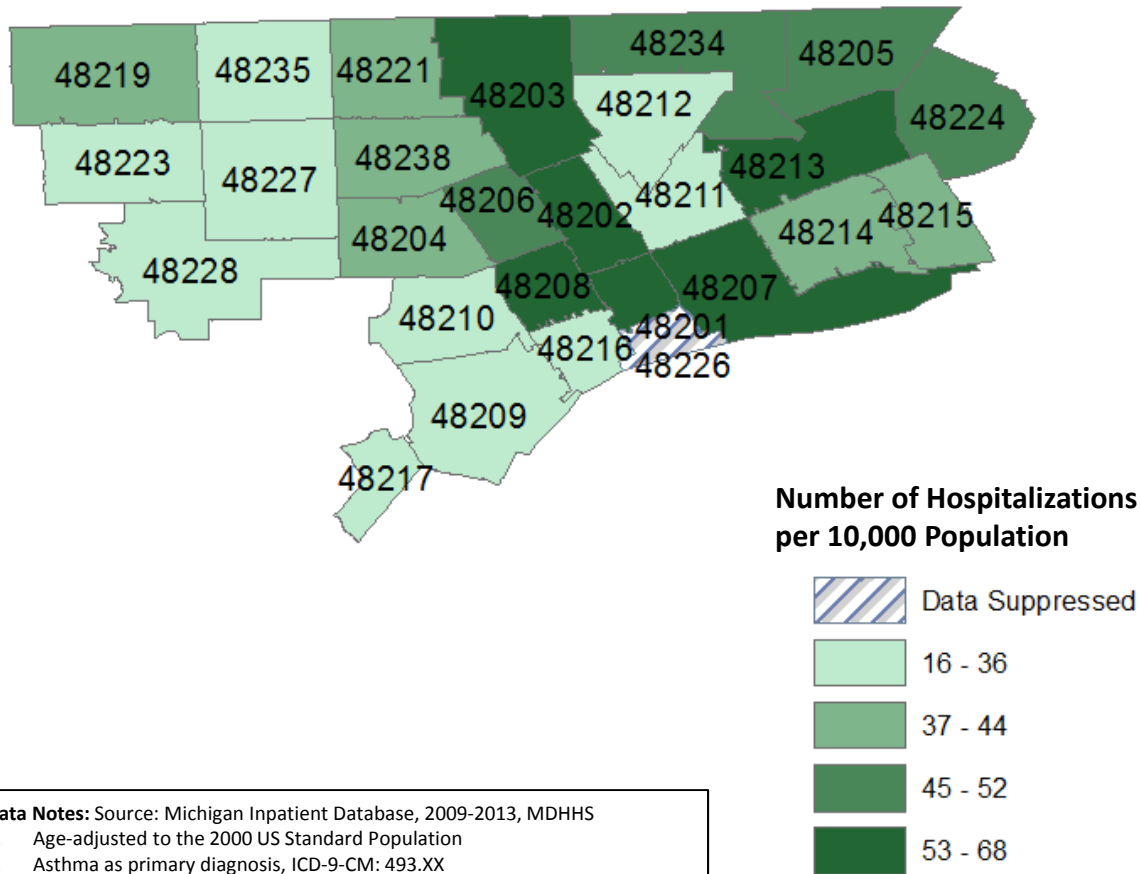
## 12. Rates<sup>1</sup> of Asthma Hospitalization<sup>2</sup> by ZIP Code of Residence, Detroit, 2009-2013



**Data Notes:**  
 Source: Michigan Inpatient Database, 2009-2013, MDHHS  
 1. Age-adjusted to the 2000 US Standard Population  
 2. Asthma as primary diagnosis, ICD-9-CM: 493.XX

- ZIP Codes 48201, 48202, and 48238 in central Detroit and 48213, 48214, and 48215 in eastern Detroit had the highest asthma hospitalization rates in the city.
- Lower rates of asthma hospitalization tended to occur in ZIP Codes in the western and southwestern parts of the city.

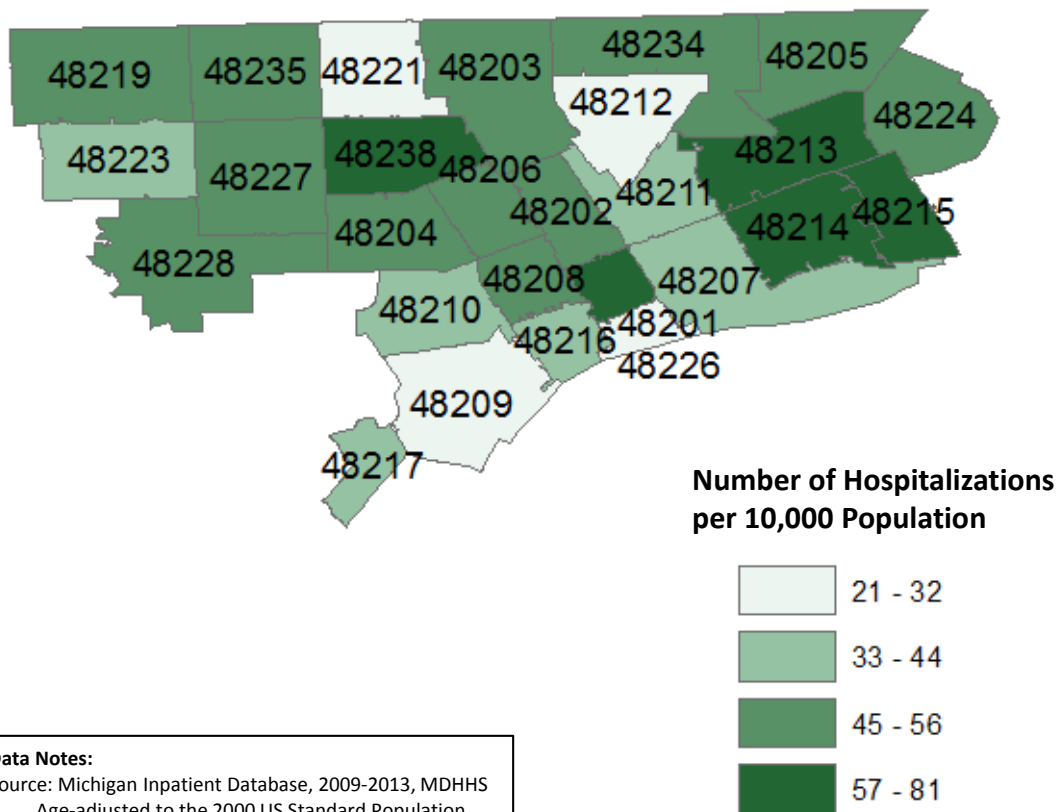
# 13. Rates<sup>1</sup> of Asthma Hospitalization<sup>2</sup> by ZIP Code of Residence for Children (<18 Years), Detroit, 2009-2013



- All of the ZIP Codes with the highest child asthma hospitalization rates were located in the central and eastern parts of the city.
- Lower child asthma hospitalization rates were mostly in ZIP Codes in the western and southwestern parts of the city.

**Data Notes:** Source: Michigan Inpatient Database, 2009-2013, MDHHS  
 1. Age-adjusted to the 2000 US Standard Population  
 2. Asthma as primary diagnosis, ICD-9-CM: 493.XX  
 3. Suppressed due to hospitalization count < 5 or population < 5,000

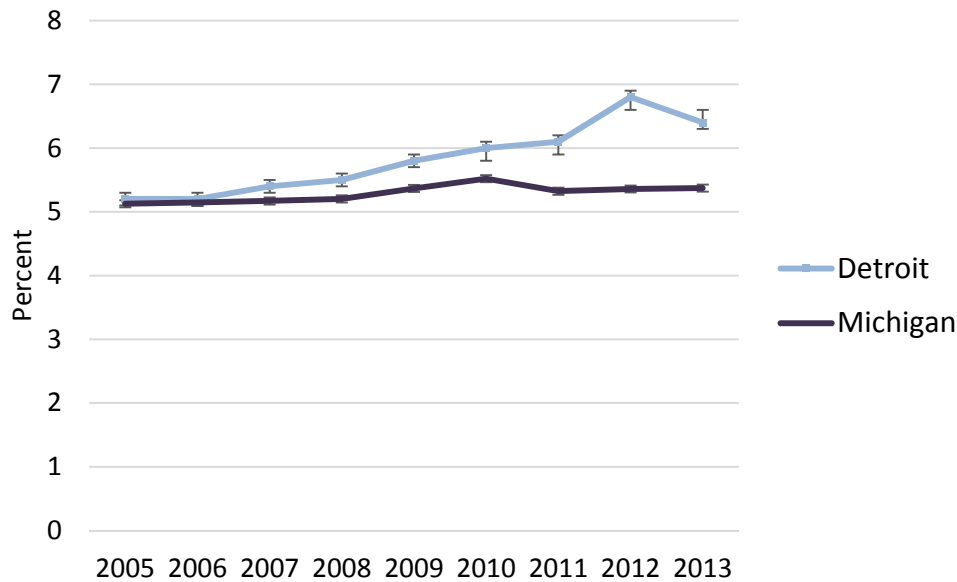
# 14. Rates<sup>1</sup> of Asthma Hospitalization<sup>2</sup> by ZIP Code of Residence for Adults (≥18 Years), Detroit, 2009-2013



- Nearly all of the ZIP Codes with higher adult asthma hospitalization rates were located in central or eastern Detroit.
- Lower rates occurred in a few ZIP Codes in central Detroit but were predominantly found near the southern and western borders of the city.

**Data Notes:**  
 Source: Michigan Inpatient Database, 2009-2013, MDHHS  
 1. Age-adjusted to the 2000 US Standard Population  
 2. Asthma as primary diagnosis, ICD-9-CM: 493.XX

# 15. Prevalence<sup>1</sup> of Persistent Asthma<sup>2</sup>, Children (<18 Years) on Medicaid<sup>3</sup>, Detroit and Michigan, 2005-2013



**Data Notes:**

Source: Data warehouse, MDHHS

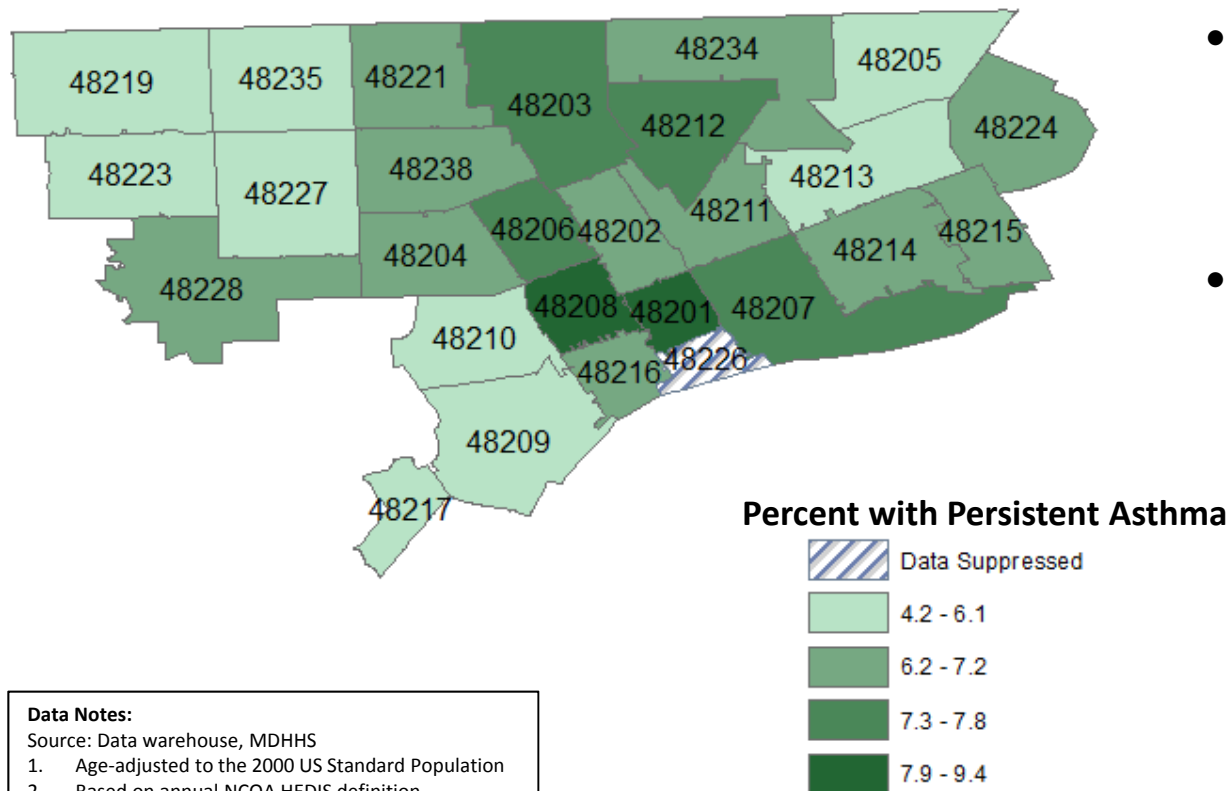
1. Age-adjusted to the 2000 US Standard Population
2. Based on annual NCQA HEDIS definition
3. Medicaid population of children <18 years is restricted to those who are continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance

For the following analyses, the Medicaid study population of children <18 years is restricted to those who are continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance.

By using these restrictions, these data undercount the number of children with asthma covered by Medicaid. Not included were children with asthma who: 1) were not enrolled in Medicaid continuously or 2) did not have a paid Medicaid health utilization claim from 2005 through 2013.

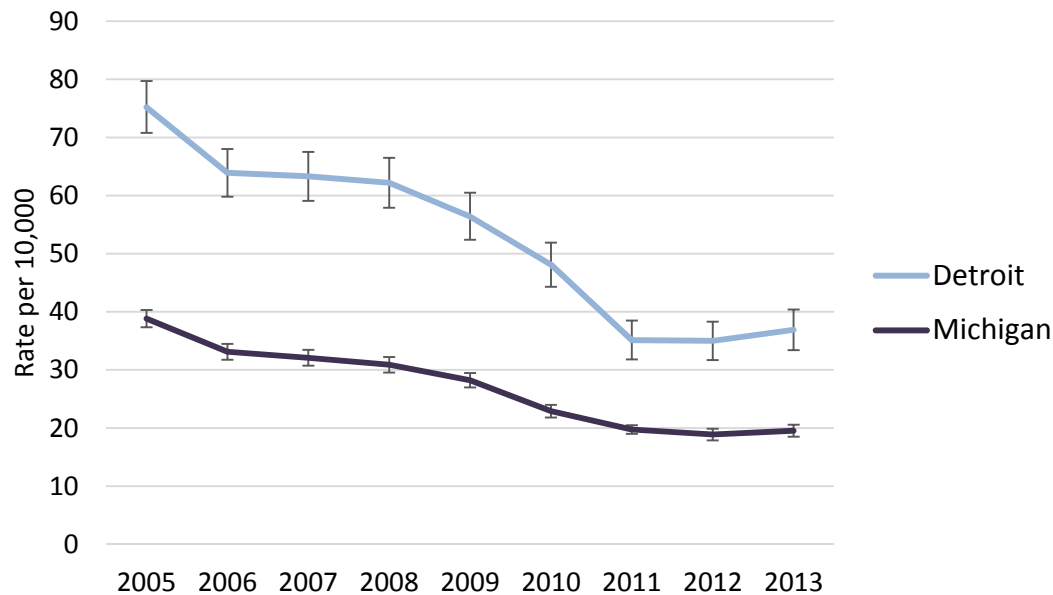
- The prevalence of asthma in Detroit has been consistently higher than in Michigan as a whole. The difference between prevalence in Detroit and Michigan as a whole increased between 2007 and 2012 and then decreased slightly in 2013.
- More than 7,300 Detroit children covered by Medicaid have health care utilization consistent with persistent asthma.

## 16. Prevalence<sup>1</sup> of Persistent Asthma<sup>2</sup> by ZIP Code of Residence, Children (<18 Years) on Medicaid<sup>3</sup>, Detroit, 2013



- The highest rates of persistent asthma were among children in ZIP codes 48201 and 48208.
- The ZIP Codes of lowest prevalence were 48209, 48210, and 48223.

# 17. Rate<sup>1</sup> of Asthma<sup>2</sup> Hospitalizations, Children (<18 Years) on Medicaid<sup>3</sup>, Detroit and Michigan, 2005-2013



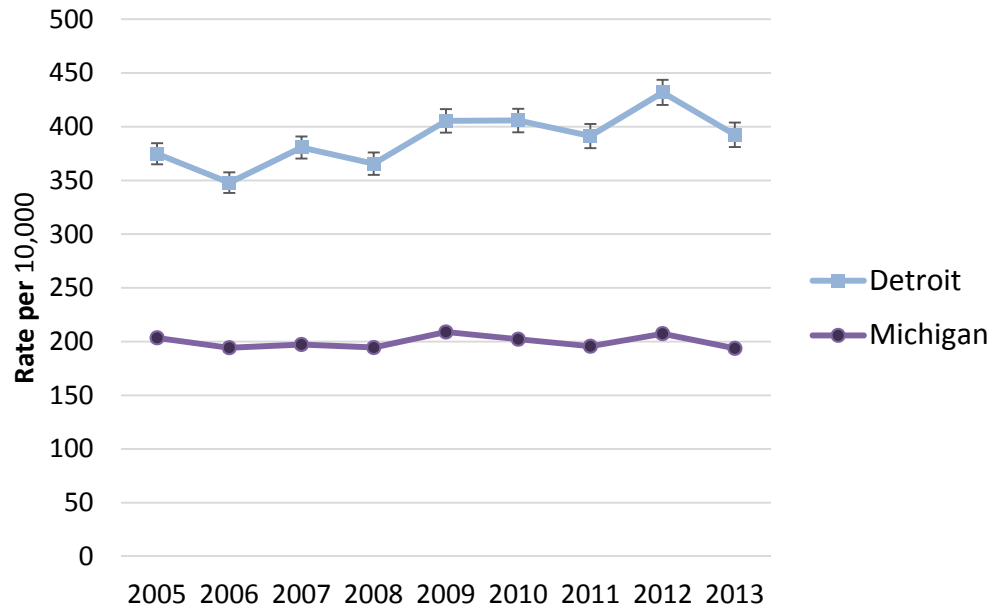
- In 2013, the total number of hospitalizations for Detroit children covered by Medicaid was about 440. The rate was 36.9 hospitalization visits per 10,000 children on Medicaid in Detroit. The rate for Michigan was 19.5 per 10,000 children on Medicaid. There was a total of 1,414 hospitalizations in Michigan children covered by Medicaid.
- The rate of asthma hospitalization visits for children in Detroit in 2013 was about twice the rate for children in Michigan.
- From 2005 to 2013, the disparities between these rates decreased from 38.3 to 19.3 per 10,000 children on Medicaid, respectively.

**Data Notes:**

Source: Data warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-9-CM: 493.XX
3. Medicaid population of children ≤18 years is restricted to those who are continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance

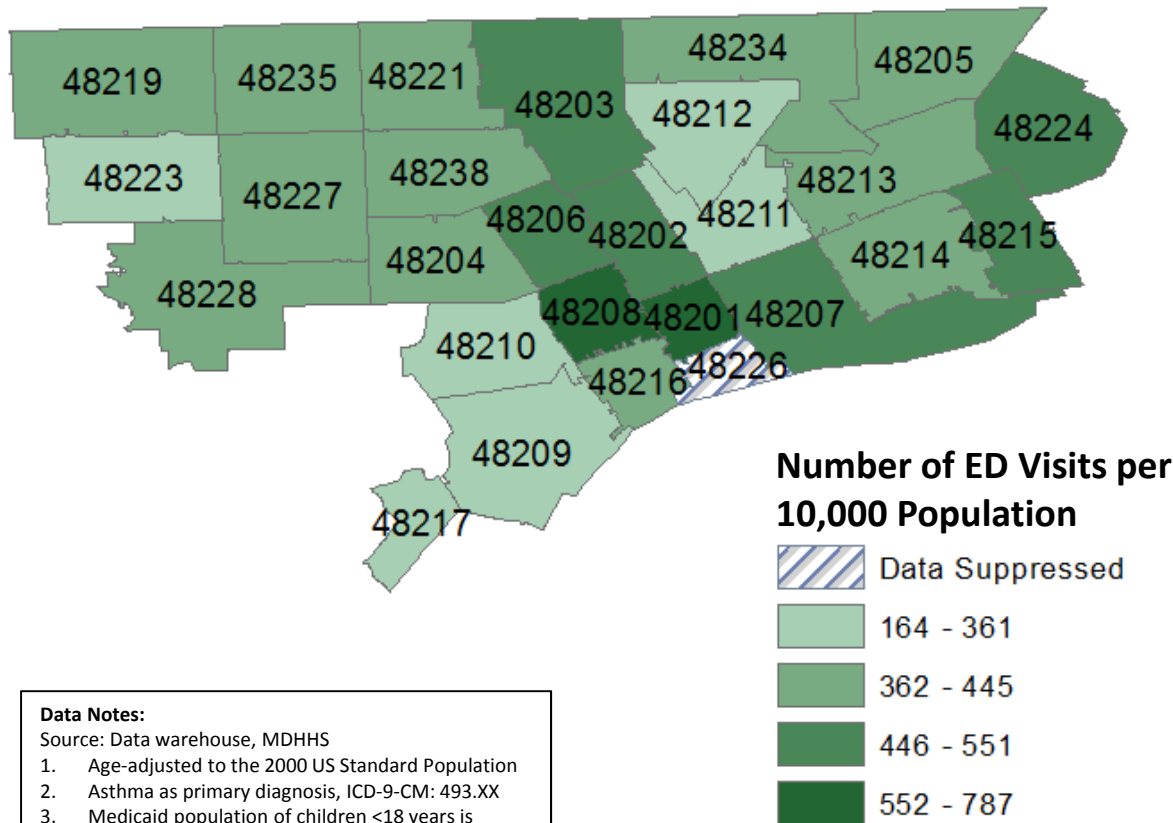
# 18. Rate<sup>1</sup> of Asthma<sup>2</sup> Emergency Department Visits, Children (<18 Years) on Medicaid<sup>3</sup>, Detroit and Michigan, 2005-2013



- In 2013, the total number of emergency department (ED) visits for Detroit children covered by Medicaid was about 4,600. The rates for Detroit and Michigan were 392.5 and 193.7 ED visits per 10,000 children on Medicaid, respectively.
- The rate of asthma ED visits for children in Detroit in 2013 was about twice the rate for children in Michigan.
- From 2005 to 2013, the disparity between Detroit and Michigan in the asthma emergency department (ED) visit rate increased, from 171.4 to 198.9 per 10,000.

**Data Notes:**  
 Source: Data warehouse, MDHHS  
 1. Age-adjusted to the 2000 US Standard Population  
 2. Asthma as primary diagnosis, ICD-9-CM: 493.XX  
 3. Medicaid population of children <18 years is restricted to those who are continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance

# 19. Rate<sup>1</sup> of Asthma<sup>2</sup> Emergency Department Visits by ZIP Code of Residence, Children (<18 Years) on Medicaid<sup>3</sup>, Detroit, 2013



- With few exceptions, ZIP Codes in the center and eastern parts of Detroit tended to have the highest emergency department rates for asthma in the city.

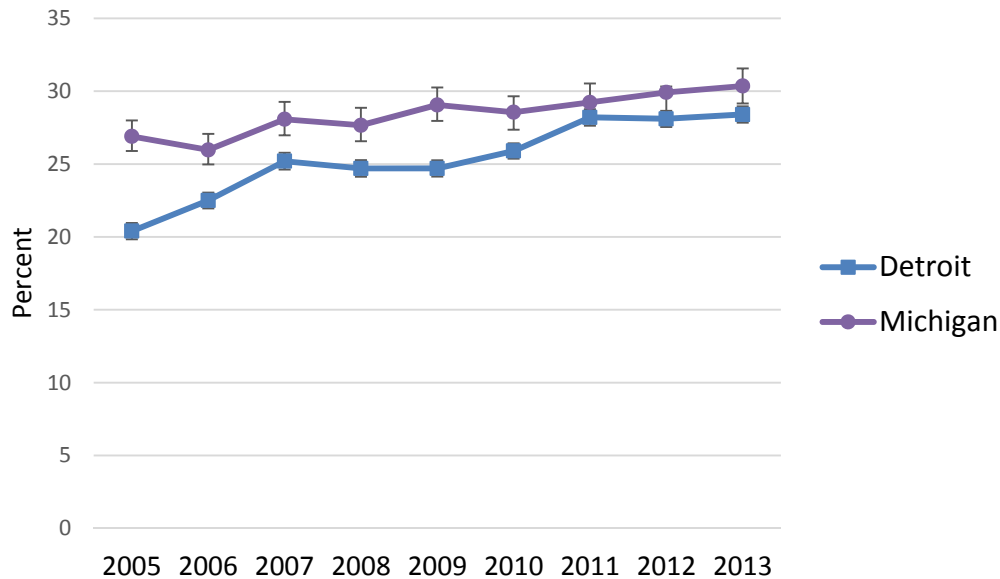
**Data Notes:**  
 Source: Data warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-9-CM: 493.XX
3. Medicaid population of children <18 years is restricted to those who are continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance
4. Suppressed due to hospitalization count < 5 or population < 5,000



The following asthma statistics are among children in Medicaid *with asthma*, not the entire child Medicaid population.

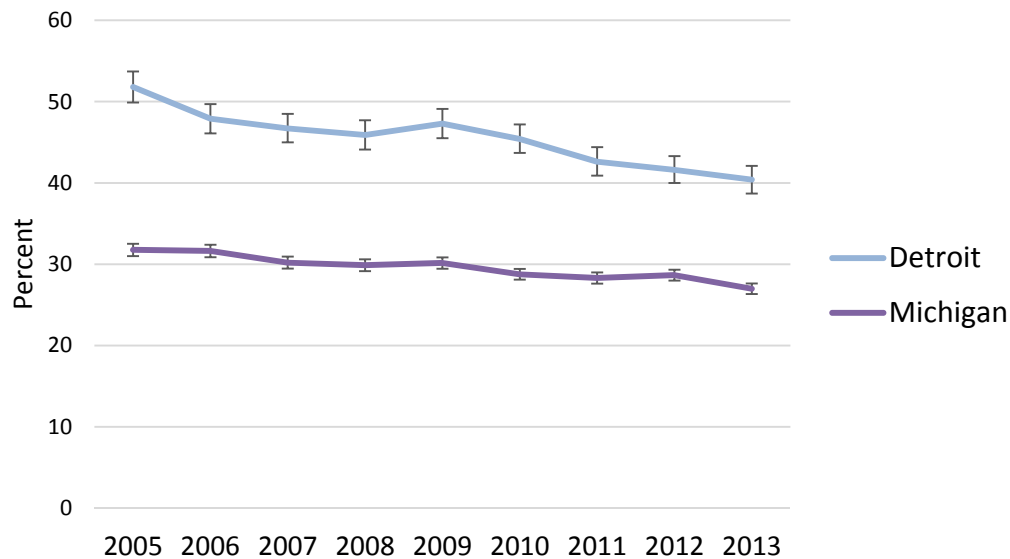
## 20. Percent<sup>1</sup> of Children (<18 Years) with Asthma<sup>2</sup> with $\geq 2$ Office Visits for Asthma<sup>3</sup> on Medicaid<sup>4</sup>, Detroit and Michigan, 2008-2013



- According to national guidelines, persons with asthma should visit their primary care provider for routine asthma care at least twice per year.
- In 2013, just over 28% of Detroit children covered by Medicaid and about 30% of Michigan children with persistent asthma had at least two office visits for asthma.
- The proportion of Detroit children covered by Medicaid with persistent asthma with at least two office visits for asthma was significantly lower than that for the state as a whole.

**Data Notes:**  
 Source: Data warehouse, MDHHS  
 1. Age-adjusted to the 2000 US Standard Population  
 2. Based on NCQA HEDIS Definition  
 3. Asthma as primary diagnosis, ICD-9-CM: 493.XX  
 4. Medicaid population of children <18 years is restricted to those who are continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance.

## 21. Percent of Reliance on Emergency Department for Primary Care<sup>1</sup> among Children (<18 Years) with Asthma<sup>2</sup> on Medicaid<sup>3</sup>, Detroit and Michigan, 2005-2013



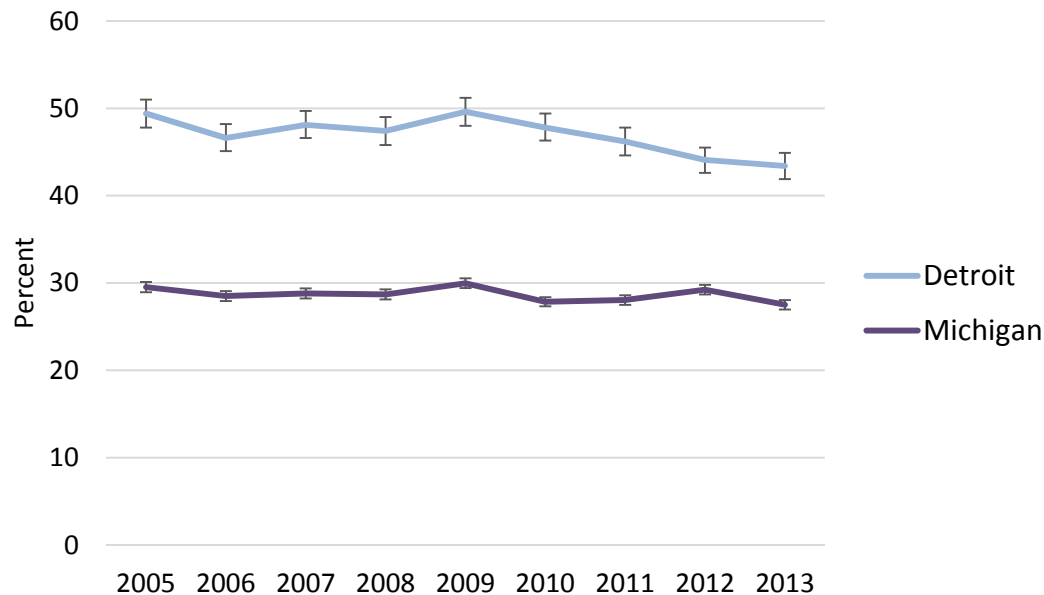
- Reliance on the emergency department for primary care is a measure of the proportion of all outpatient visits for asthma that are emergency department visits.
- In 2013, the proportion of outpatient visits for asthma that occurred in the emergency department for Detroit and Michigan children covered by Medicaid with persistent asthma was 40.6% and 27.0%, respectively.
- Emergency department reliance for primary care was about 51% higher among children in Detroit compared to the state as a whole in 2013.
- From 2005 to 2013, emergency department reliance dropped in Detroit and Michigan, by 11.4% and 4.8%, respectively.

### Data Notes:

Source: Data warehouse, MDHHS

1. Proportion of all outpatient visits for asthma that are emergency department visits (Asthma as primary diagnosis, ICD-9-CM: 493.XX), age-adjusted to the 2000 US Standard Population
2. Based on annual NCQA HEDIS definition
3. Medicaid Population of children <18 years is restricted to those who are continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance.

## 22. Percent<sup>1</sup> of Children (<18 Years) with Asthma<sup>2</sup> with $\geq 1$ Emergency Department Visits for Asthma<sup>3</sup>, Medicaid<sup>4</sup>, Detroit and Michigan, 2005-2013



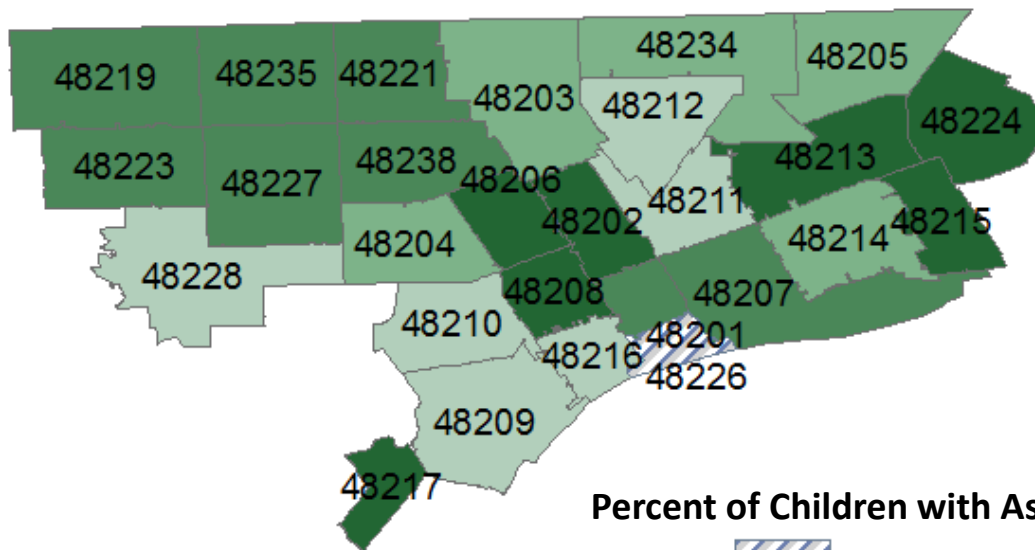
- It is a goal of asthma therapy that persons with asthma experience minimal or no emergency department visits for asthma.<sup>5</sup>
- In 2013, 43.2% of Detroit children and 27.5% of Michigan children enrolled in Medicaid with persistent asthma had one or more emergency department visits for asthma.
- The proportion of Detroit children covered by Medicaid with persistent asthma with at least one emergency department visit for asthma in 2013 was 57% higher than that for Michigan as a whole.
- From 2005 to 2013, the disparity between Detroit and Michigan decreased slightly, from 19.9% to 15.9%.

### Data Notes:

Source: Data warehouse, MDHHS

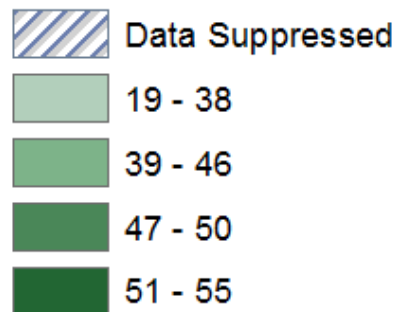
1. Age-adjusted to the 2000 US Standard Population
2. Based on NCQA HEDIS Definition
3. Asthma as primary diagnosis, ICD-9-CM: 493.XX
4. Medicaid population of children <18 years is restricted to those who are continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance.
5. National Heart, Lung, and Blood Institute. *Guidelines for the Diagnosis and Management of Asthma: Expert Panel Report 3*. National Institutes of Health Publication Number 09-5846. October 2007.

## 23. Percent<sup>1</sup> of Children (<18 Years) with Asthma<sup>2</sup> with ≥1 Emergency Department Visits for Asthma<sup>3</sup> by ZIP Code of Residence, Medicaid<sup>4</sup>, 2013



- Residents of ZIP codes 48202, 48206, 48208, 48213, 48215, 48217, and 48224 had the highest percent of children with asthma using emergency departments.

Percent of Children with Asthma Using ED

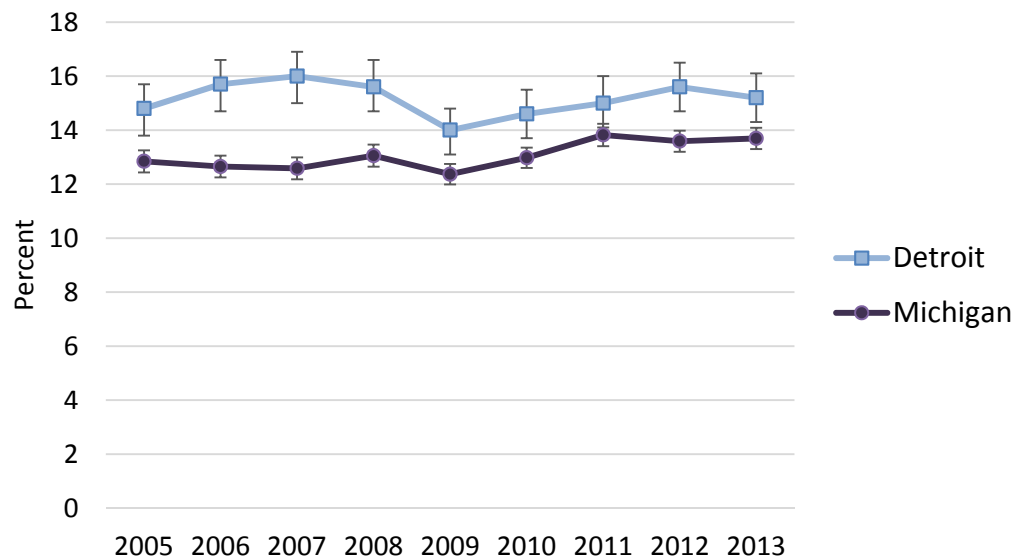


**Data Notes:**

Source: Data warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Based on NCQA HEDIS Definition
3. Asthma as primary diagnosis, ICD-9-CM: 493.XX
4. Medicaid Population of children <18 years is restricted to those who are continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance.
5. Suppressed due to hospitalization count < 5 or population < 5,000.

## 24. Percent<sup>1</sup> of Overuse of Short-Acting $\beta$ -Agonist (SABA) Medication among Children (<18 Years) with Asthma<sup>2</sup>, Medicaid<sup>3</sup>, Detroit and Michigan, 2005-2013



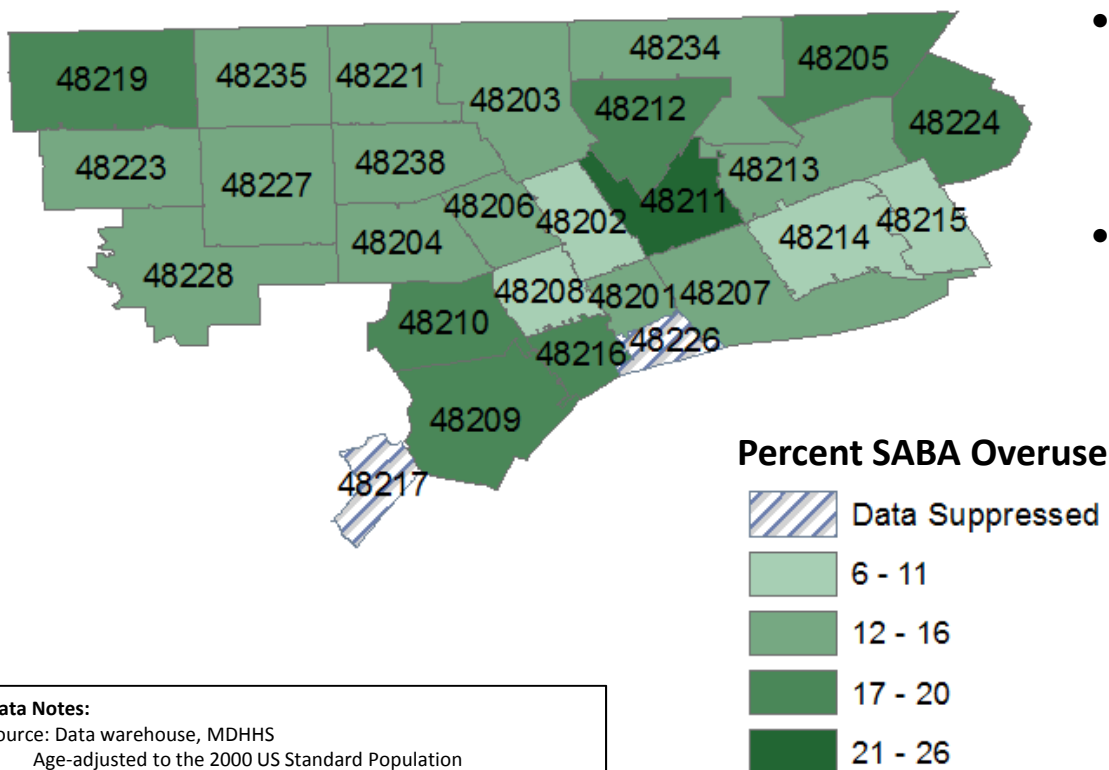
- A goal of asthma therapy is that there be minimal use of short-acting  $\beta$ -agonist medication<sup>4</sup> – less than one canister per month. For this indicator, overuse is defined as filling 7 or more prescriptions for short-acting  $\beta$ -agonist (SABA) in a year.
- In 2013, prevalence of SABA overuse among Detroit children and Michigan children covered by Medicaid with asthma was 15.2% and 13.7%, respectively. The Detroit rate was 11% higher than the rate for Michigan as a whole.

### Data Notes:

Source: Data warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Based on NCQA HEDIS Definition
3. Medicaid Population of children <18 years is restricted to those who are continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance.
4. National Heart, Lung, and Blood Institute. *Guidelines for the Diagnosis and Management of Asthma: Expert Panel Report 3*. National Institutes of Health Publication Number 09-5846. October 2007.

## 25. Percent<sup>1</sup> of Overuse of Short-Acting $\beta$ -Agonist (SABA) Medication among Children (<18 Years) with Asthma<sup>2</sup> by Zip Code of Residence, Medicaid<sup>3</sup>, Detroit, 2013



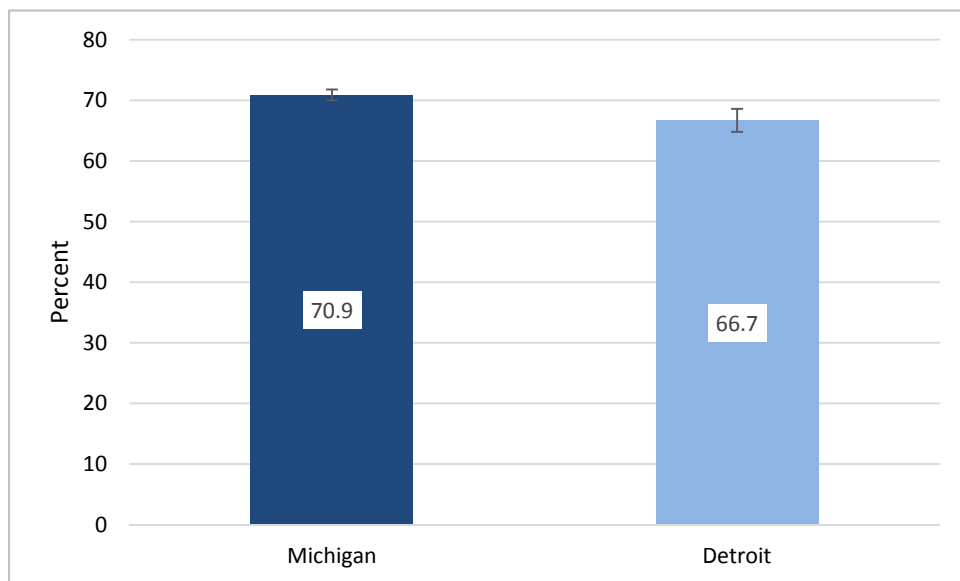
- Residents of ZIP codes 48205, 48209, 48210, 48211, 48212, 48216, 48219 and 48224 had the highest rates of SABA overuse.
- The ZIP codes with the lowest rates of SABA overuse were 48202, 48208, 48214, and 48215.

**Data Notes:**

Source: Data warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Based on NCQA HEDIS Definition
3. Medicaid population of children <18 years is restricted to those who are continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance.
4. Suppressed due to hospitalization count < 5 or population < 5,000.

## 26. Percent<sup>1</sup> of Children (<18 Years) with Asthma<sup>2</sup> with ≥1 Inhaled Corticosteroid Fills, Medicaid<sup>3</sup>, Detroit and Michigan, 2013



- Long-term asthma control medications, such as inhaled corticosteroids, are recommended for children with persistent asthma.<sup>4</sup>
- 67% of Detroit children on Medicaid in 2013 filled a prescription for inhaled corticosteroids, a significantly lower percent compared with children on Medicaid statewide.

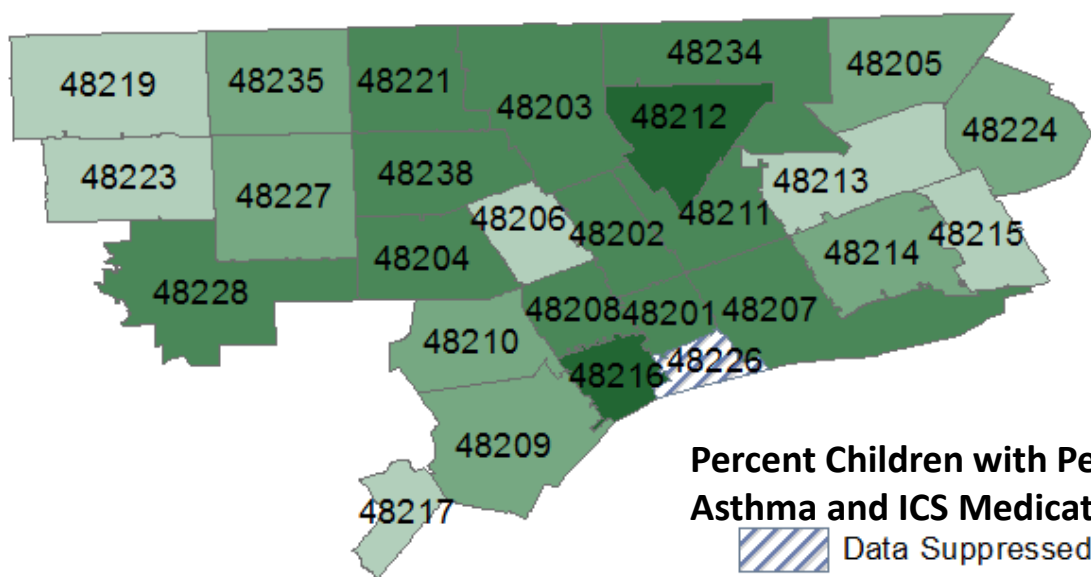
### Data Notes:

Source: Data warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Based on NCQA HEDIS Definition
3. Medicaid Population of children <18 years is restricted to those who are continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance.
4. National Heart, Lung, and Blood Institute. *Guidelines for the Diagnosis and Management of Asthma: Expert Panel Report 3*. National Institutes of Health Publication Number 09-5846. October 2007.

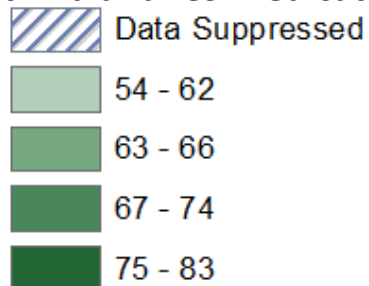


# 27. Percent<sup>1</sup> of Children (<18 Years) with Asthma<sup>2</sup> with ≥1 Inhaled Corticosteroid Fills by ZIP Code of Residence, Medicaid<sup>3</sup> Detroit, 2013



- ZIP Codes with the lowest percent of children filling inhaled corticosteroids (ICS) tended to be located in the northwestern and eastern areas of Detroit.

**Percent Children with Persistent Asthma and ICS Medication**

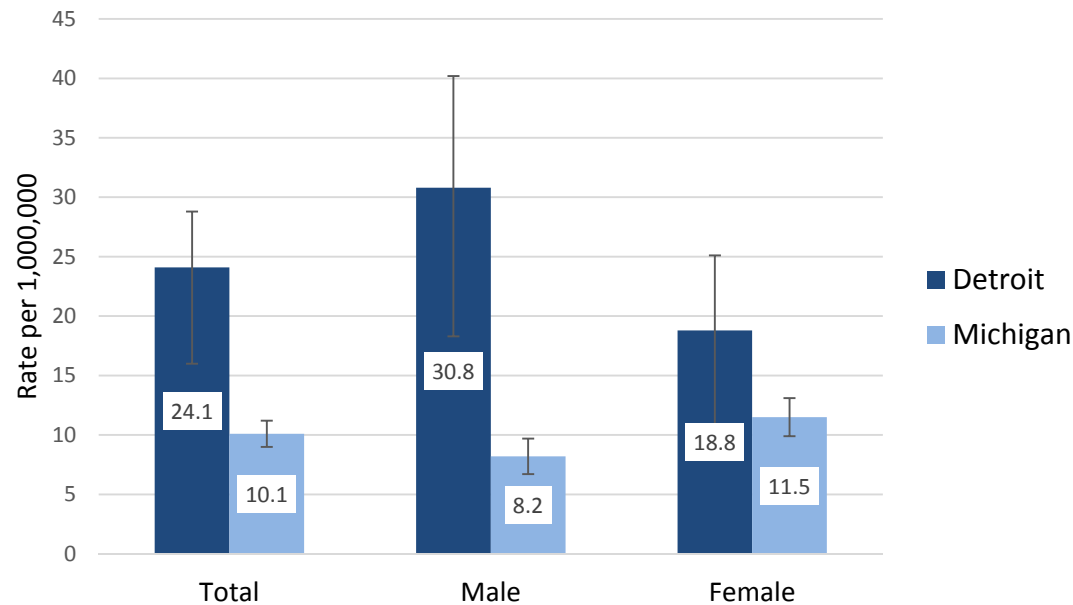


**Data Notes:**

Source: Data warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Based on NCQA HEDIS Definition
3. Medicaid Population of children <18 years is restricted to those who are continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance.
4. National Heart, Lung, and Blood Institute. Guidelines for the Diagnosis and Management of Asthma: Expert Panel Report 3. National Institutes of Health Publication Number 09-5846. October 2007.
5. Suppressed due to hospitalization count < 5 or population < 5,000.

## 28. Rates<sup>1</sup> of Asthma Mortality<sup>2</sup> by Sex, Detroit and Michigan, 2011-2013



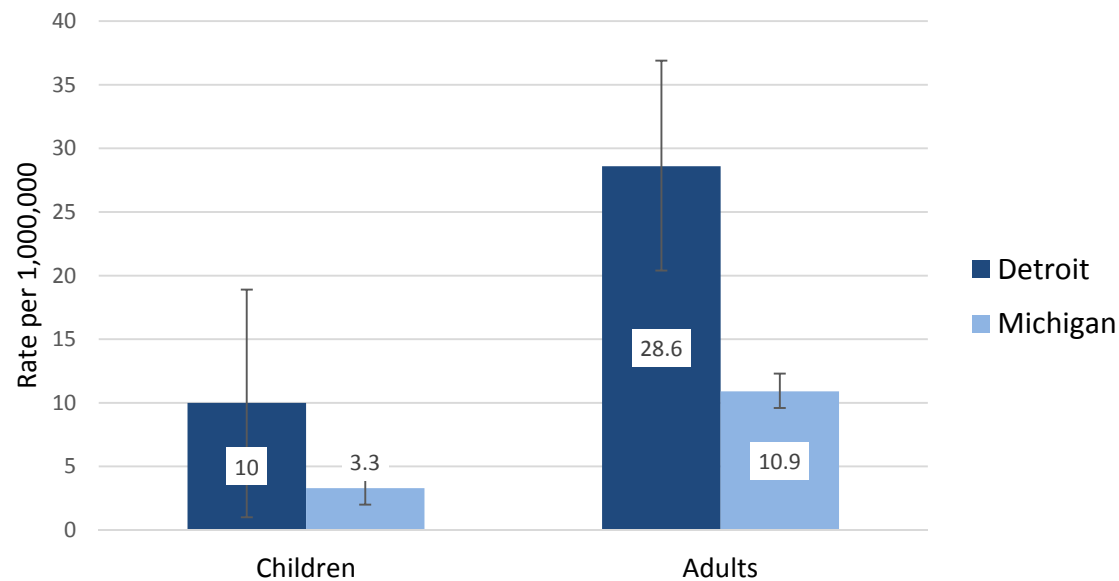
- Between 2011 and 2013, 55 Detroit residents died due to asthma. The rate of asthma mortality among Detroit residents was 24.1 per 1,000,000 population.
- The rate of asthma mortality in Detroit in 2011-2013 was 2.4 times higher than the Michigan rate.
- Between 2011 and 2013, the rate of asthma mortality among Detroit males was 30.8 per 1,000,000 and the rate for Detroit females was 18.8 per 1,000,000.
- The rates of asthma mortality for Detroit males and females were not significantly different during this time period.

**Data Notes:**

Source: Michigan Death File, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as the underlying cause of death, ICD-10:J45-J46

## 29. Rates<sup>1</sup> of Asthma Mortality<sup>2</sup> by Age Group, Detroit and Michigan, 2011-2013



**Data Notes:**

Source: Michigan Death File, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary cause of death, ICD-10:J45-J46

- The rate of asthma mortality for Detroit children between 2011 and 2013 was 10.0 per 1,000,000.
- Among Detroit adults, the rate of asthma mortality between 2011 and 2013 was 28.6 per 1,000,000
- The rate of asthma mortality among children in Detroit was not significantly different than rates for children in Michigan, but was almost three times higher.
- The rate of asthma mortality for Detroit adults was 3.3 times higher than the rate for adults in Michigan.

# Key Recommendation

The disparity in the asthma burden in Detroit warrants continued attention. Public health efforts should continue to be directed to persons with asthma in Detroit to improve asthma control and prevent severe outcomes.

# Data Sources

- American Community Survey, United States Census Bureau
- Michigan Behavioral Risk Factor Survey (MIBRFS), Michigan Department of Health and Human Services (MDHHS)
- Michigan Inpatient Database, MDHHS/Michigan Health and Hospital Association
- Michigan Data Warehouse, MDHHS
- Michigan Death Files, MDHHS

# Methods

## **Prevalence of Asthma**

Michigan prevalence estimates for asthma were based on self-reporting from the Michigan Behavioral Risk Factor Survey (MiBRFS) using two questions:

1. Have you ever been told by a doctor, nurse, or health professional that you had asthma? (lifetime asthma)
2. Do you still have asthma? (current asthma)

'Lifetime asthma prevalence' was the percentage of respondents who reported "yes" to question #1. 'Current asthma prevalence' was the percentage of respondents who reported "yes" to both questions #1 and #2.

MiBRFS data were collected by telephone interview of a sample from both cell phone and landline telephone numbers (see [http://www.michigan.gov/documents/mdch/2014\\_MiBRFS\\_Standard\\_Tables\\_FINAL\\_500159\\_7.pdf](http://www.michigan.gov/documents/mdch/2014_MiBRFS_Standard_Tables_FINAL_500159_7.pdf), page 3 for more information). All measures of asthma prevalence were accompanied by 95% confidence intervals.

Annual estimates of asthma prevalence for adults ( $\geq 18$  years) were provided by 2012-2014 MiBRFS, by sex, race/ethnicity, education, and household income. The MiBRFS was also the source for estimates of prevalence of asthma among children ( $< 18$  years) by asking the adult respondent to act as the proxy for a selected child in the household. Annual estimates of prevalence for children were provided for 2012-2014 by sex, race/ethnicity, proxy's education, and household income.

# Methods continued

## Asthma Hospitalization

An asthma hospitalization was defined as an inpatient stay with a primary discharge diagnosis of asthma (ICD-9 –CM=493.XX). These data represent the number of hospitalizations for asthma, not the number of persons with a hospitalization for asthma.

Age-adjusted asthma hospitalization rates were calculated and presented per 10,000 population. Rates were age-adjusted, using the 2000 US standard population, so that valid comparisons could be made between populations of different age distributions. All hospitalization rates were accompanied by 95% confidence intervals. In addition to asthma hospitalization rates, the average length of stay and hospitalization rates by month of admission were calculated.

Asthma hospitalization rates were calculated for demographic and geographic subgroups, including ZIP Codes of residence (for Detroit), age, race, sex, and month of admission, to identify disparities and patterns. Maps generated using geographic information systems (GIS; ArcGIS™, Environmental Systems Research Institute) were used to visually display the data and to identify areas of high burden. Census data from 2010 were used to calculate the Detroit hospitalization rates. Yearly bridged-race population estimated provided by the National Vital Statistics System maintained by the Centers for Disease Control and Prevention were used to calculate Michigan's rates.

Temporal trends in asthma hospitalization rates were statistically evaluated using the Spearman correlation coefficient and its accompanying rank correlation test. A p-value of <0.05 for this test was considered statistically significant.

The data source for these analyses was the Michigan Inpatient Database, which includes virtually all hospital discharges for Michigan residents during the study period.

# Methods continued

## Asthma Management for Children Covered by Medicaid

From the Michigan Medicaid beneficiary and administrative claims data (2005-2013), the study population was identified by the following parameters within each year: children 17 years of age and younger who had continuous Medicaid enrollment (11+ months), full Medicaid coverage, and no other insurance. Both fee-for-service and managed care beneficiaries were included, but Title V beneficiaries were excluded.

By using these restrictions, these data undercount the number of children with asthma covered by Medicaid. Not included were children with asthma who: 1) were not enrolled in Medicaid continuously or 2) did not have a paid Medicaid health utilization claim from 2005 through 2013.

Within this population, the following indicators of total asthma burden were measured:

- *Persistent asthma prevalence*: Utilization consistent with the diagnosis of asthma was defined according to HEDIS<sup>®</sup> specifications; in the year of the prevalence measurement, having (1)  $\geq 4$  asthma medication dispensing events OR (2)  $\geq 1$  emergency department visits for asthma OR (3)  $\geq 1$  hospitalization for asthma OR (4)  $\geq 4$  outpatient visits for asthma and  $\geq 2$  asthma medication dispensing events (National Committee for Quality Assurance. *Appropriate Medications for People with Asthma. HEDIS<sup>®</sup> 2003, Volume 2: Technical Specifications*. Washington, DC; 2003). Prevalence of persistent asthma was the percentage of beneficiaries in the study population who meet the HEDIS definition of persistent asthma.
- *Rate of asthma emergency department visits*: An asthma emergency department visit was defined as a visit occurring in a hospital emergency department with a primary diagnosis of asthma (ICD-9-CM=493.XX). These data represent the number of persons visiting the emergency department for asthma. The number of asthma emergency department visits, divided by the study population then multiplied by 10,000, generated this measure.



# Methods continued

## Asthma Management for Children Covered by Medicaid, continued

Children with utilization consistent with persistent asthma, as defined above, formed the annual study population upon which indicators of asthma management are measured within that year, including:

- *Percentage with an office visit*: The percentage of children with persistent asthma in Medicaid with one or more annual asthma office visits. This includes visits in a physician's office, but some home and urgent care visits may also be included in this measure (ICD-9-CM=493.XX).
- *Percentage with an emergency department visit*: The percentage of children covered by Medicaid with persistent asthma who have had one or more annual asthma emergency visits (ICD-9-CM=493.XX).
- *Emergency department reliance*: The percentage of all ambulatory asthma visits (ICD-9-CM=493.XX, outpatient and emergency department) among children covered by Medicaid with persistent asthma that occur in the emergency department. It estimates the reliance on the emergency department for primary care.
- *Short-acting  $\beta$ -agonist overuse*: The percentage of children with persistent asthma in Medicaid who have filled seven or more prescriptions for short-acting  $\beta$ -agonists in a year – an indicator of overuse of this medication.
- *Proportion using an inhaled corticosteroid medication*: The proportion of children with persistent asthma in Medicaid who filled one or more prescriptions for an inhaled corticosteroid medication in a year – inhaled corticosteroids are the preferred, first-line medication recommended for persons with persistent asthma. For this metric, inhaled corticosteroid medication includes bronchodilator combination therapy.

# Methods continued

## **Asthma Management for Children Covered by Medicaid, continued**

For all of the above, indicators were age-adjusted using the 2000 US standard population and were accompanied by a 95% confidence interval. Both geographic (ZIP Code) and demographic (age, race, and sex) subpopulation analysis were conducted to identify disparities. Maps generated using geographic information (GIS; ArcGIS™, Environmental Systems Research Institute) systems were used for visual display of the data and to identify areas of high burden.

## **Asthma Death**

An asthma death was defined by the underlying cause of death (ICD-10=J45 or J46). Asthma mortality rates were calculated for the three-year period 2011-2013 and were presented per 1,000,000 population. Rates were age-adjusted, using the 2000 US standard population, so that valid comparisons could be made between populations of different age distributions. Rates were calculated by age, race, and sex, to identify disparities and patterns. All mortality rates were accompanied by 95% confidence intervals.

The data source for these analyses was the Michigan Death Files, which included all deaths for Michigan residents during the study period.

# Methods continued

## Defining Detroit

The definition of Detroit was slightly different for each data type presented in this report. The definitions were as follows:

- *Current asthma prevalence from survey*: On the MiBRFS, Detroit adults were identified by their affirmative response to the question, “Do you live in the city of Detroit?”
- *Hospitalization and Medicaid data*: Detroit was defined by ZIP Code tabulation areas (ZCTAs) for the city. These areas included Highland Park and Hamtramck.
- *Mortality*: Detroit was defined by the Detroit minor civil division, which excluded Highland Park and Hamtramck.

# The Asthma Initiative of Michigan

The Asthma Initiative of Michigan (AIM) is a collaborative effort involving multiple partners from public and private sectors across the state and is committed to reducing the burden of asthma documented in the report. For information about AIM's priorities and interventions, please review the strategic plan for the initiative: ***Asthma in Michigan: A Blueprint for Action, Strategic Plan 2014 – 2017, Fourth Edition*** at <http://www.getastmahelp.org/reports.aspx>.