

Detroit: The Current Status of Asthma Burden

2021 Update

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Data Sources

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

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.¹
- 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 are coordinated through the Michigan Department of Health and Human Services Asthma Program and partners.

Notes:

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

Executive Summary/Key Findings

2021 Report

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

- The prevalence of current asthma among Detroit adults was 46% higher than in Michigan as a whole.
- The rate of hospitalizations for asthma was at least four times greater for Detroit residents than for Michigan residents as a whole, from 2016-2019.
- In 2019, the rate of asthma hospitalizations for Black residents in Detroit was more than three times the rate for white persons.
- 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 over 50% higher for children enrolled in Medicaid with persistent asthma in Detroit as compared with their counterparts in the state as a whole from 2016-2019.
- Rates of asthma hospitalization, emergency department use, and persistent asthma tended to be lower in the southwestern parts of the city.

Executive Summary/Key Findings

2021 Report, Cont'd

- “Detroit: The Current Status of Asthma Burden-2016 Update” report showed the prevalence of current asthma among adults being 29% higher than Michigan, and this update shows that has increased to 46%.
- There now is a significant difference between the prevalence of asthma among children in Detroit (14.6%) compared to Michigan (8.4%), where there wasn't one in 2016.
- Unfortunately, due to a change in the International Classification of Diseases (ICD) from version 9 to version 10, asthma hospitalization and Medicaid data can not be compared between the last report (2016) and this version (2021).

1. Population demographics¹ of Detroit, Michigan, July 1, 2019

Measure	Detroit Population Estimate
Total population	670,031
% less than 18 years	25.0%
% Black	78.3%
% of those 25 years and older with less than high school diploma	19.0%
Persons without health insurance, under age 65 years	9.6%
Median household income	\$30,894
% in poverty	35.0%
% of housing units that were vacant	25.7%

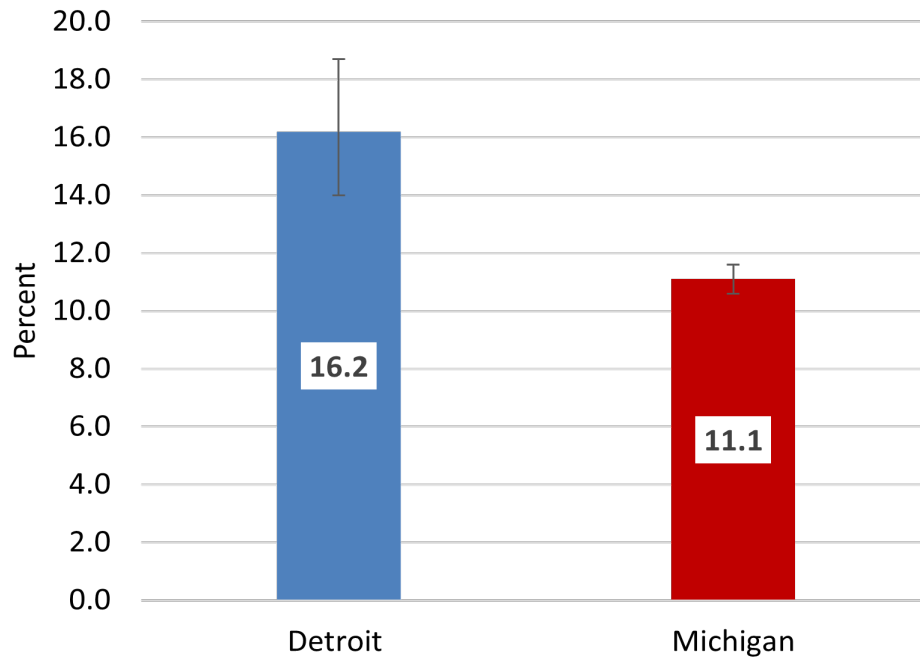
- The total resident population of Detroit, Michigan, in 2019 was over 670,000; 78.3% of this population was Black.
- In 2019, the median household income was \$30,894, with 35.0% of the population living in poverty.
- Of the population <65 years of age, 9.6% did not have health insurance in 2019.
- Among the population ≥25 years of age, 19.0% had not earned a high school diploma.
- The prevalence of vacant housing units was 25.7% in 2019.

Data Notes:

1. Source: United States Census Bureau

Current Asthma Prevalence

2. Prevalence of Current Asthma¹ for Adults (≥18 Years), Detroit and Michigan, 2017-2019

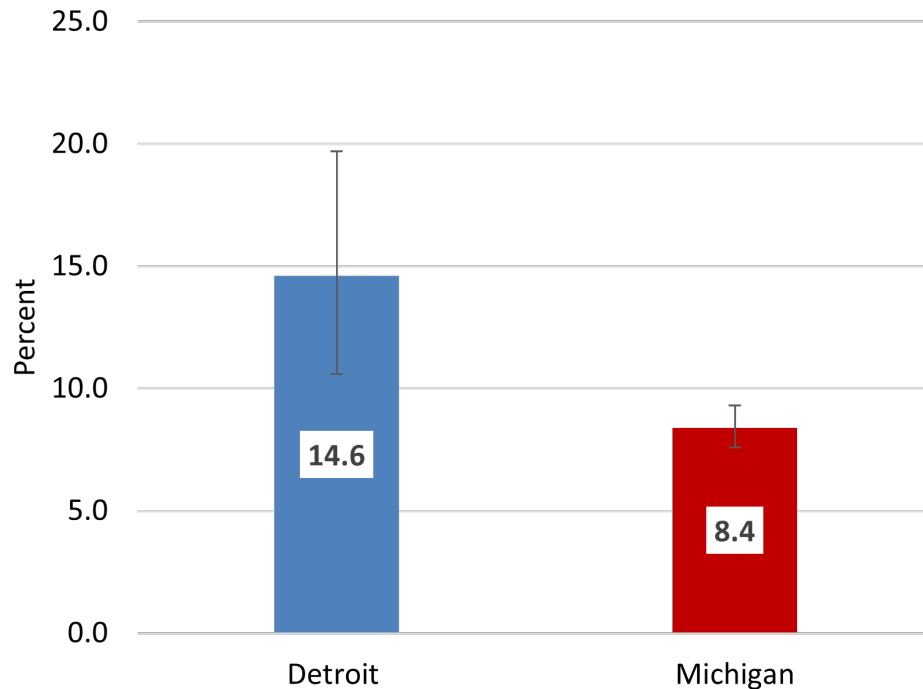


- From 2017-2019, 16.2% of Detroit adults and 11.1% of Michigan adults had current asthma.
- There was a significant difference in current asthma prevalence rates between Detroit and Michigan adults. Detroit had a 46% higher prevalence of current asthma among adults compared to adults in Michigan as a whole.

Data Notes:

1. Source: 2017-2019 Michigan Behavioral Risk Factor Surveys, MDHHS.

3. Prevalence of Current Asthma¹ for Children (<18 Years), Detroit and Michigan, 2017-2019



- From 2017-2019, 14.6% of Detroit children and 8.4% of Michigan children had current asthma.
- There was a significant difference in current asthma prevalence rates between Detroit and Michigan children. Detroit had a 74% higher prevalence of current asthma among children compared to children in Michigan as a whole.

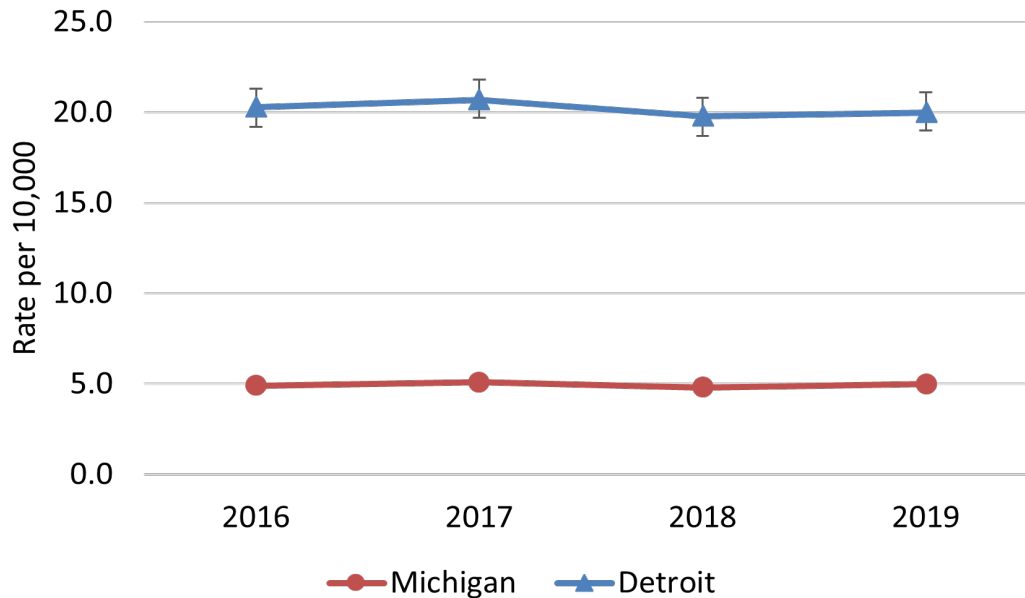
Data Notes:

1. Source: 2017-2019 Michigan Behavioral Risk Factor Surveys, MDHHS

Asthma Hospitalization

Due to a change in International Classification of Diseases (ICD) for asthma hospitalizations in 2015 from version 9 to version 10, asthma hospitalization data in this report should not be compared to estimates in the previous 2016 Detroit Report.

4. Rates¹ of Asthma Hospitalization², Detroit and Michigan, 2016-2019



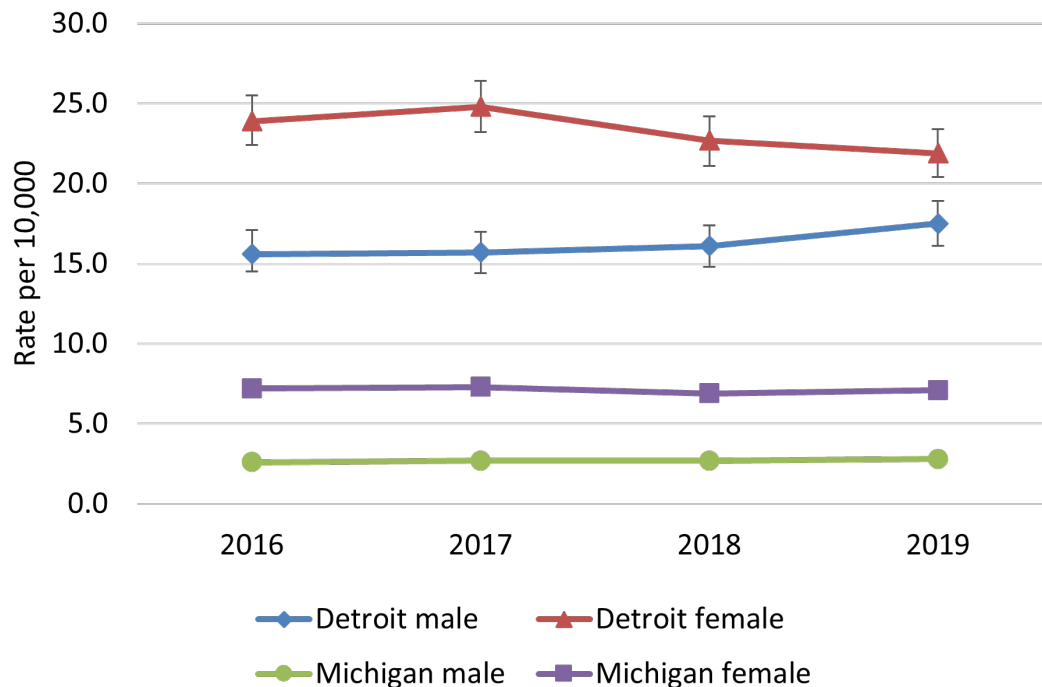
- In 2019, there were 1,458 asthma hospitalizations for Detroit residents. The rate of asthma hospitalizations was 20.3 per 10,000 population.
- The asthma hospitalization rate in Detroit in 2019 was four times the rate in Michigan as a whole.
- Between 2016 and 2019, the rates of asthma hospitalization in Detroit and Michigan did not change significantly ($p > 0.05$).³

Data Notes:

Source: Michigan Inpatient Database, 2016-2019, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis ICD-10–CM=J45.XX
3. Spearman's correlation and rank correlation test

5. Rates¹ of Asthma Hospitalization² by Sex, Detroit and Michigan, 2016-2019



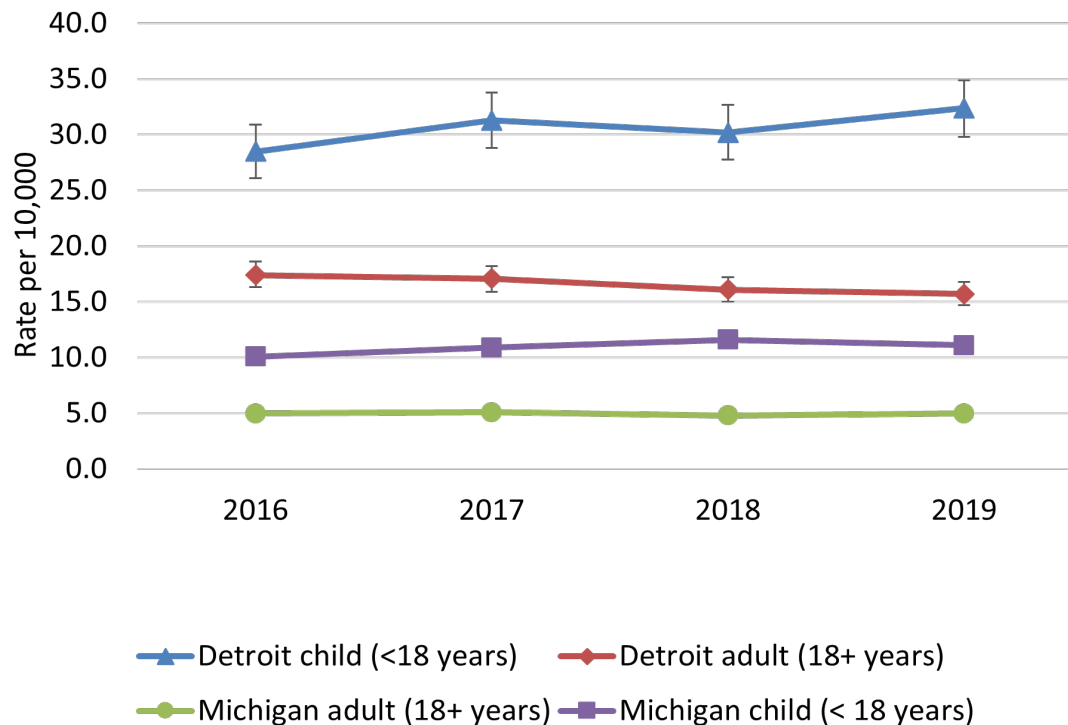
- In 2019, the rate of asthma hospitalizations among Detroit females was 21.9 per 10,000. Among males in Detroit, the rate was 17.5 per 10,000. Females in Detroit had a 25% higher rate of asthma hospitalization compared to males.
- In Michigan as a whole, the rate was 153.6% higher among females than among males (male rate was 2.8 and female rate was 7.1).
- For each respective sex, asthma hospitalization rates in Detroit were over three times higher than that in Michigan as a whole.
- Between 2016 and 2019, the rate of asthma hospitalizations for males and females in Detroit and Michigan as a whole did not change significantly ($p > 0.05$).³

Data Notes:

Source: Michigan Inpatient Database, 2016-2019, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-10–CM=J45.XX
3. Spearman’s correlation and rank correlation test

6. Rates¹ of Asthma Hospitalization² by Age Group, Detroit and Michigan, 2016-2019



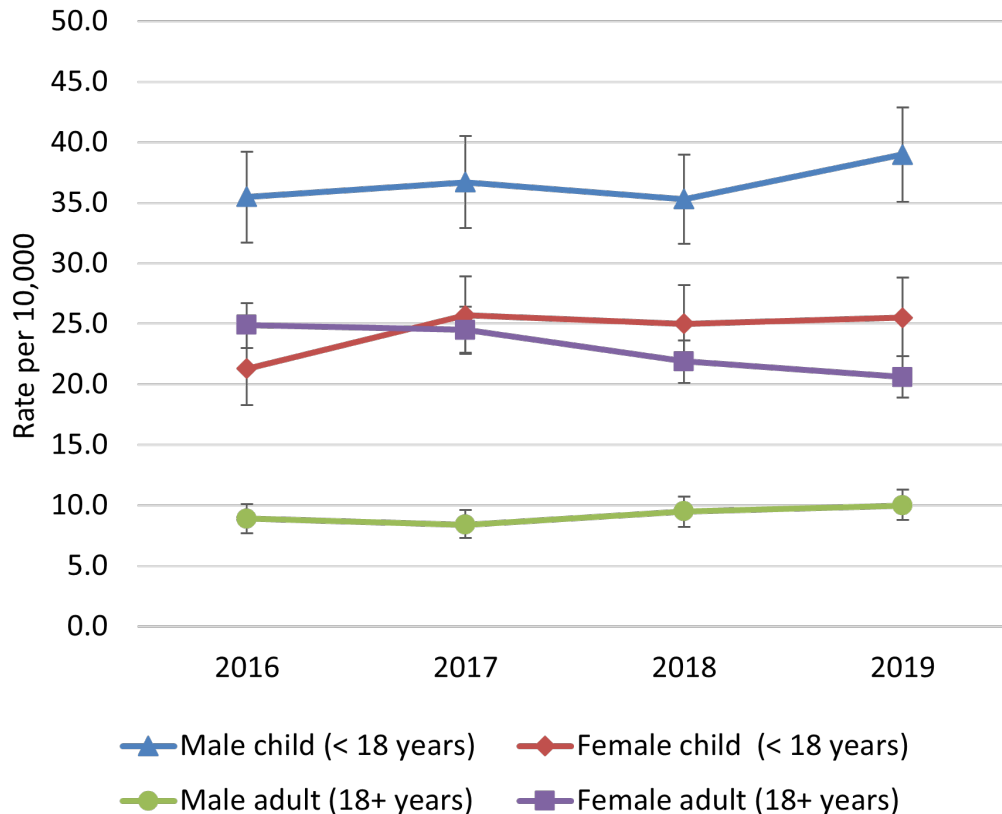
- In Detroit, the rate of child asthma hospitalization was consistently higher compared to adults from 2016 to 2019; likewise in Michigan, child hospitalization rates were consistently higher than that of adults for all four years.
- In 2019, the rate of asthma hospitalizations among Detroit children was 32.4 per 10,000. Among adults, the rate was 15.7 per 10,000.
- Asthma hospitalizations rates in Detroit were at least two times higher among Detroit children than Michigan children and three times higher than that in Michigan as a whole for adults and for all four years.
- Between 2016 and 2019, adult and child hospitalization rates for Detroit and Michigan did not change significantly ($p > 0.05$).³

Data Notes:

Source: Michigan Inpatient Database, 2016-2019, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis ICD-10 –CM=J45.XX
3. Spearman's correlation and rank correlation test

7. Rates¹ of Asthma Hospitalization² by Sex-Age Group, Detroit, 2016-2019



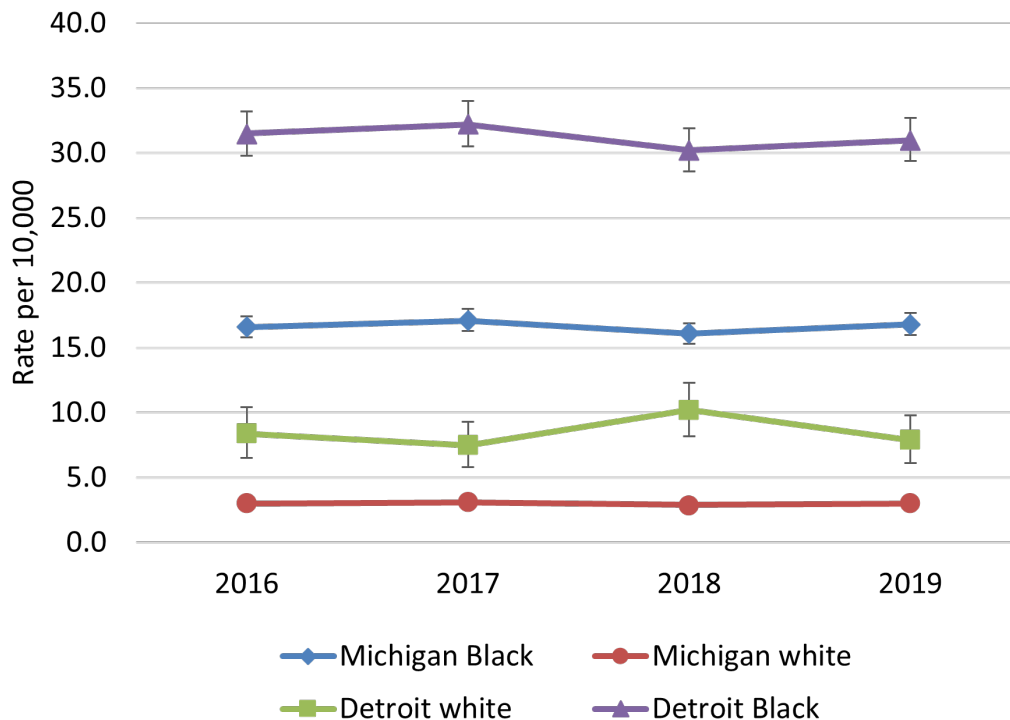
- In 2019, the rate of asthma hospitalization among Detroit male children was 39.0 per 10,000. The rate among female Detroit children was 25.5 per 10,000.
- In 2019, the rate of asthma hospitalization among Detroit male adults was 10.0 per 10,000. Among Detroit female adults, the rate was 20.6 per 10,000.
- Asthma hospitalization rates were over 100% higher among adult females than males in 2019. Among Detroit children, the male rate was about 50% higher than females.
- From 2016 to 2019, the rates of asthma hospitalization for female adult decreased by 20.8%. Male child, male adult and female child rates did not change significantly ($p > 0.05$).³

Data Notes:

Source: Michigan Inpatient Database, 2016-2019, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis ICD-10-CM=J45.XX
3. Spearman's correlation and rank correlation test

8. Rates¹ of Asthma Hospitalization² by Race, Detroit and Michigan, 2016-2019



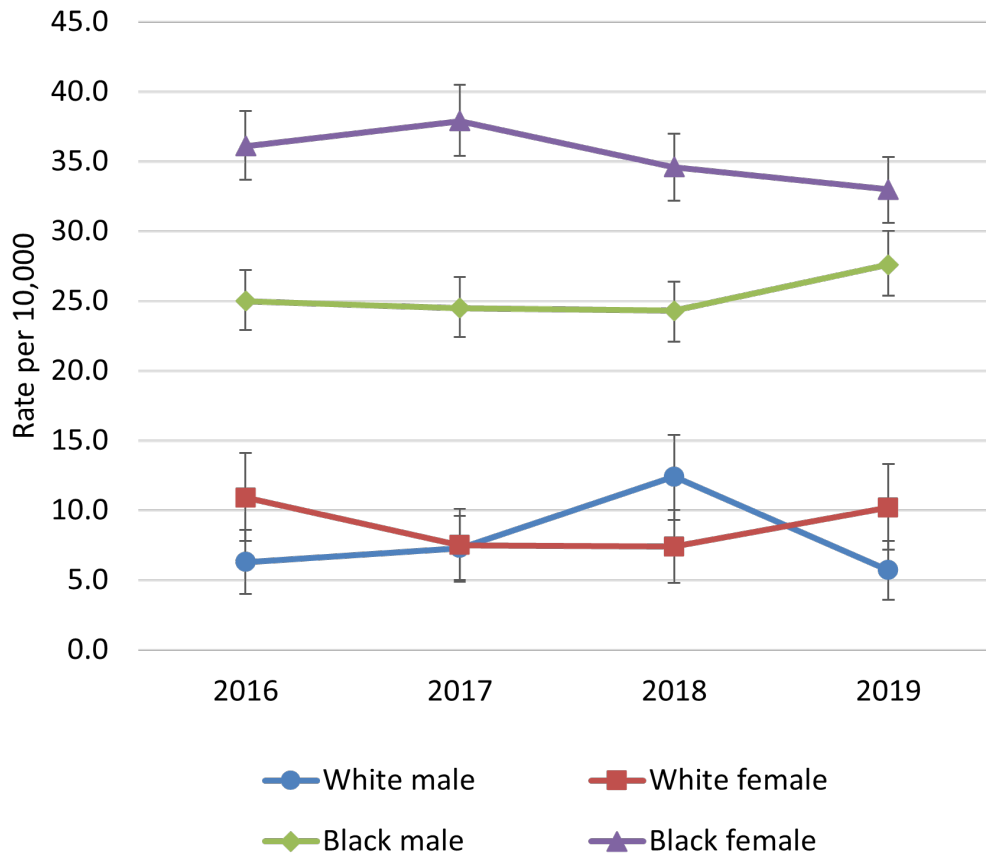
- In 2019, the rate of asthma hospitalization among Black persons in Detroit was 31.0 per 10,000. The rate among white persons in Detroit was 7.9 per 10,000.
- Asthma hospitalization among Detroit Blacks were over three times that of Detroit whites. Michigan Blacks had over five times the hospitalization rate of Michigan whites.
- Between 2016 and 2019, the rates of asthma hospitalization for Black persons and white residents in Michigan and Detroit did not change significantly ($p > 0.05$).³

Data Notes:

Source: Michigan Inpatient Database, 2016-2019, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-10-CM=J45.XX
3. Spearman's correlation and rank correlation test

9. Rates¹ of Asthma Hospitalization² by Sex-Race Group, Detroit, 2016-2019



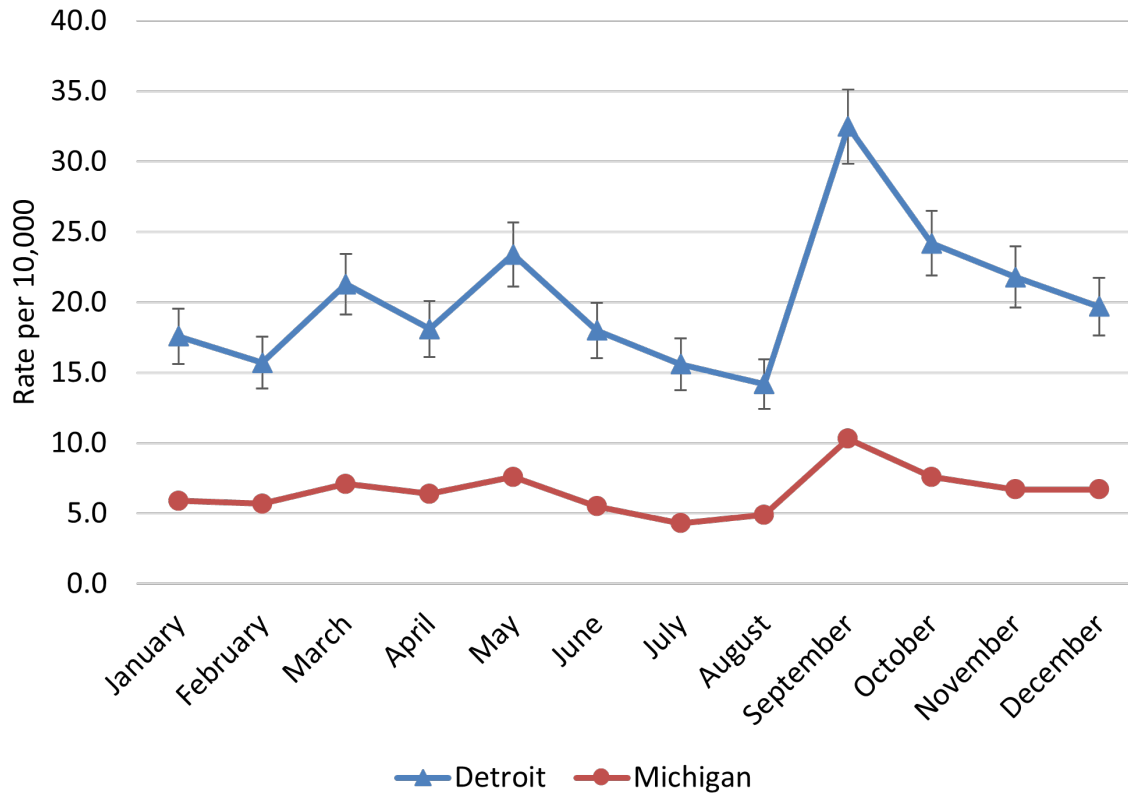
- In 2019, the rate of asthma hospitalizations among Detroit white males was 5.7 per 10,000. The rate among Detroit white females was 10.2 per 10,000.
- In 2019, the rate of asthma hospitalizations among Detroit Black males was 27.6 per 10,000. Among Detroit Black females, the rate was 33.0 per 10,000.
- Between 2016 and 2019, rates of asthma hospitalizations for Black males and females did not change significantly ($p > 0.05$)³. The rate for white males declined by 50% from 2018-2019 while the rates for white females did not change significantly ($p > 0.05$).³

Data Notes:

Source: Michigan Inpatient Database, 2016-2019, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-10-CM=J45.XX
3. Spearman's correlation and rank correlation test

10. Rates¹ of Asthma Hospitalization² by Month of Admission, Detroit and Michigan, 2017-2019



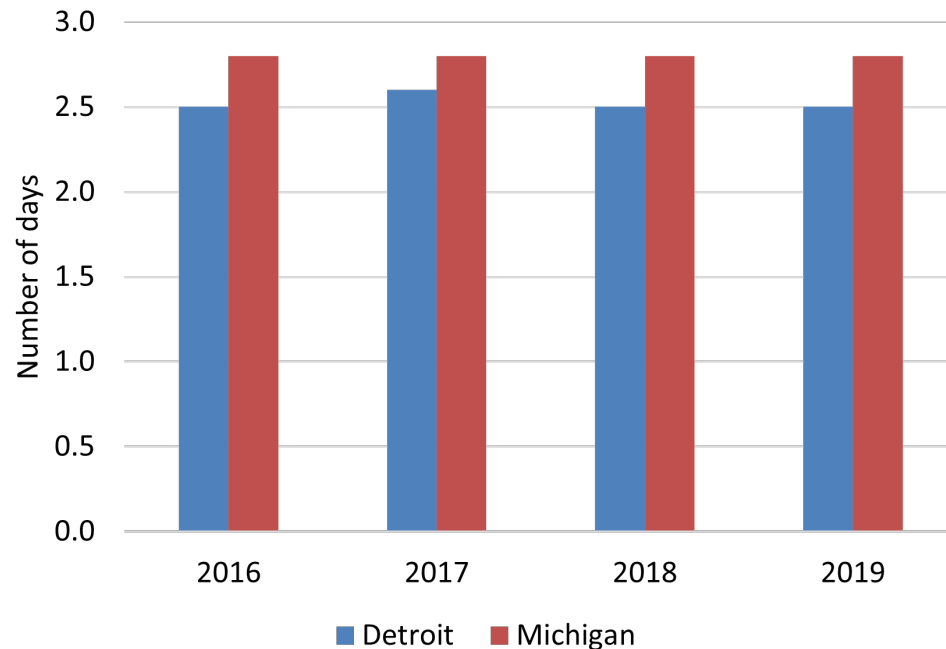
- Rates of asthma hospitalization in Detroit were approximately three to four times the rates for Michigan as a whole, throughout the year.
- Seasonal trends in asthma hospitalization for Detroit and Michigan followed a similar pattern throughout the year. The lowest rates in July and August were immediately followed by an increase in September. The highest rates for both Detroit and Michigan were in September.

Data Notes:

Source: Michigan Inpatient Database, 2016-2019, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-10 –CM=J45.XX

11. Average Length of Stay for Asthma Hospitalization¹, Detroit and Michigan, 2016-2019



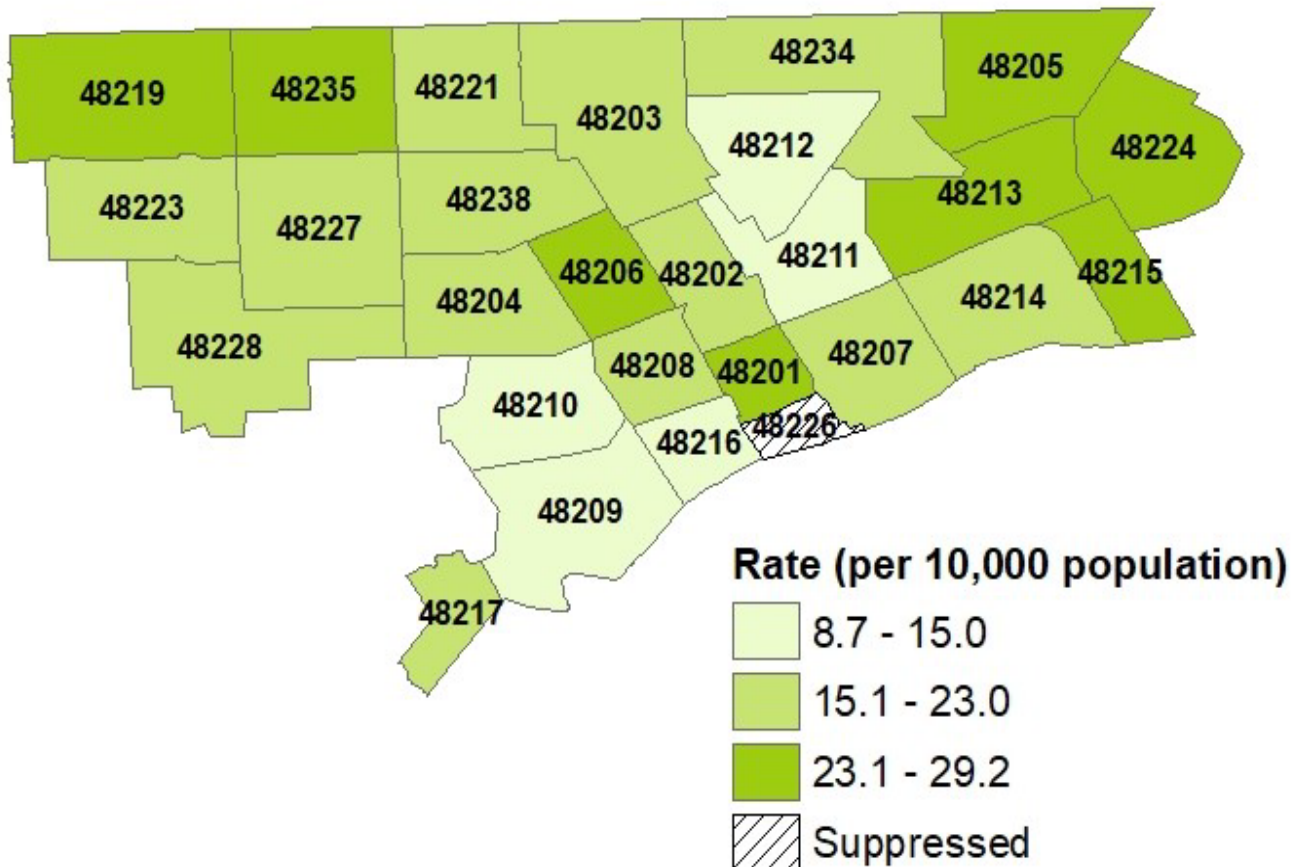
- In 2019, the average length of asthma hospitalization in Detroit was 2.5 days and that for Michigan was 2.8 days.
- From 2016-2019, the average length of asthma hospitalization in Detroit was generally shorter compared to that for Michigan.
- The average length of hospital stay did not change significantly from 2016-2019 for both Detroit and Michigan.

Data Notes:

Source: Michigan Inpatient Database, 2016-2019, MDHHS

1. Asthma as primary diagnosis, ICD-10-CM=J45.XX

12. Rates¹ of Asthma Hospitalization² by ZIP Code of Residence, Detroit, 2016-2019



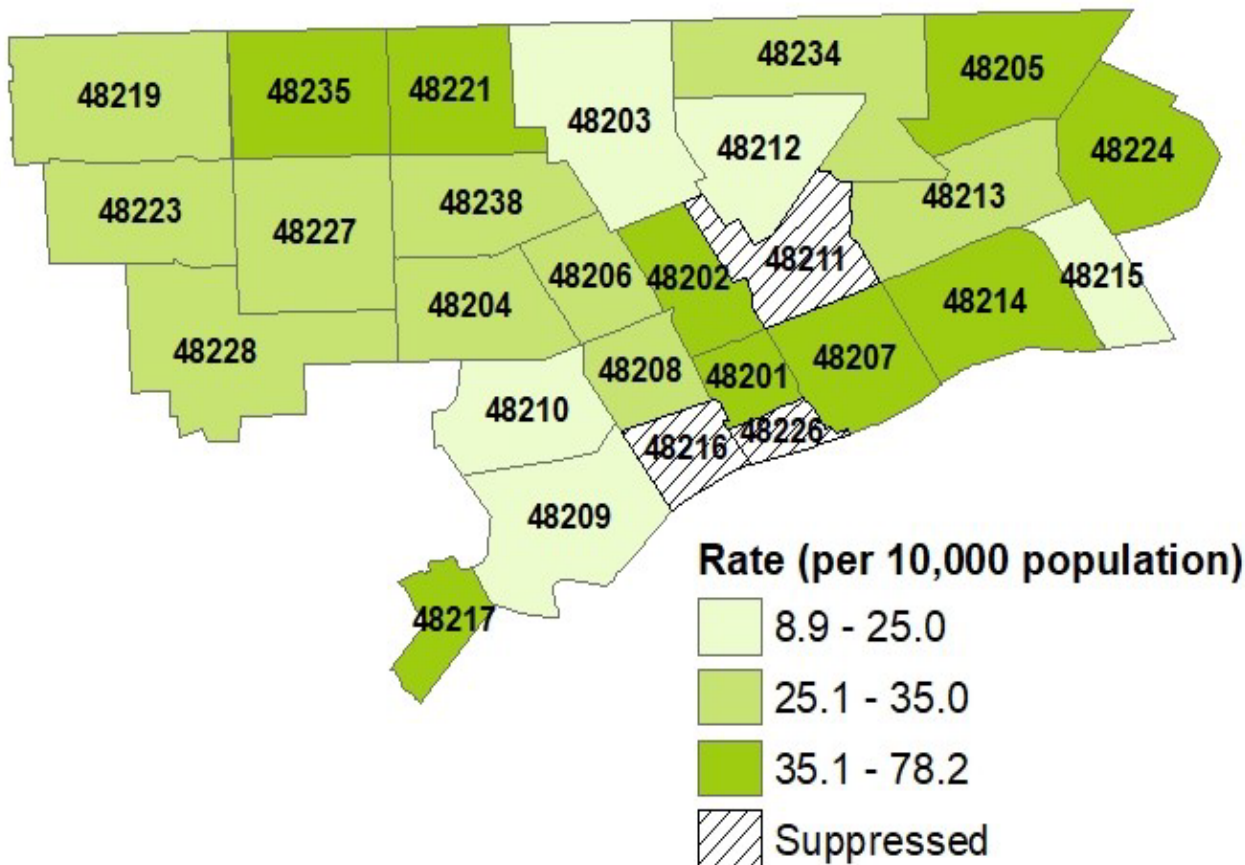
- ZIP codes 48201 and 48206 in central Detroit, 48219 and 48235 in western Detroit and 48205, 48213, 48224, and 48215 in eastern Detroit had the highest asthma hospitalization rates (all ages) in the city.
- Lower rates of asthma hospitalization occurred in ZIP codes 48212 and 48211 in the central part of Detroit and three other ZIP codes in the southwestern and part of the city.
- Data was suppressed for ZIP codes with asthma hospitalization counts less than 20.

Data Notes:

Source: Michigan Inpatient Database, 2016-2019, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-10 –CM=J45.XX

13. Rates¹ of Asthma Hospitalization² by ZIP Code of Residence for Children (<18 Years), Detroit, 2016-2019

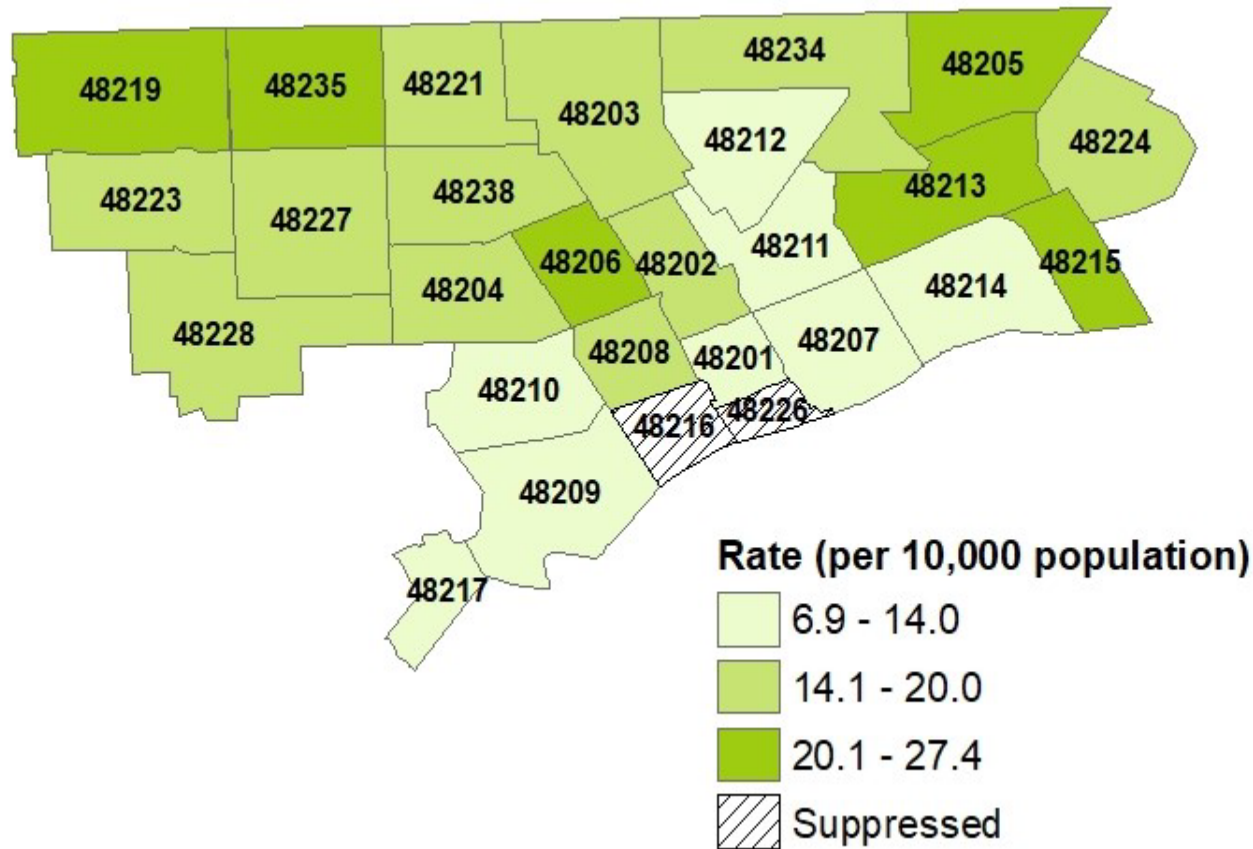


- ZIP codes with the highest child asthma hospitalization rates tended to occur in the central, western and eastern parts of the city.
- Lower child asthma hospitalization rates mostly concentrated in ZIP codes in the northcentral and southwestern parts of the city.
- Data was suppressed for ZIP codes with asthma hospitalization counts less than 20.

Data Notes: Source: Michigan Inpatient Database, 2016-2019, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-10-CM=J45.XX

14. Rates¹ of Asthma Hospitalization² by ZIP Code of Residence for Adults (≥18 Years), Detroit, 2016-2019



- Higher adult asthma hospitalization rates were concentrated in western and eastern Detroit.
- Lower rates occurred in ZIP codes in central Detroit, southeastern and southwestern parts of the city.
- Data was suppressed for ZIP codes with asthma hospitalization counts less than 20.

Data Notes:

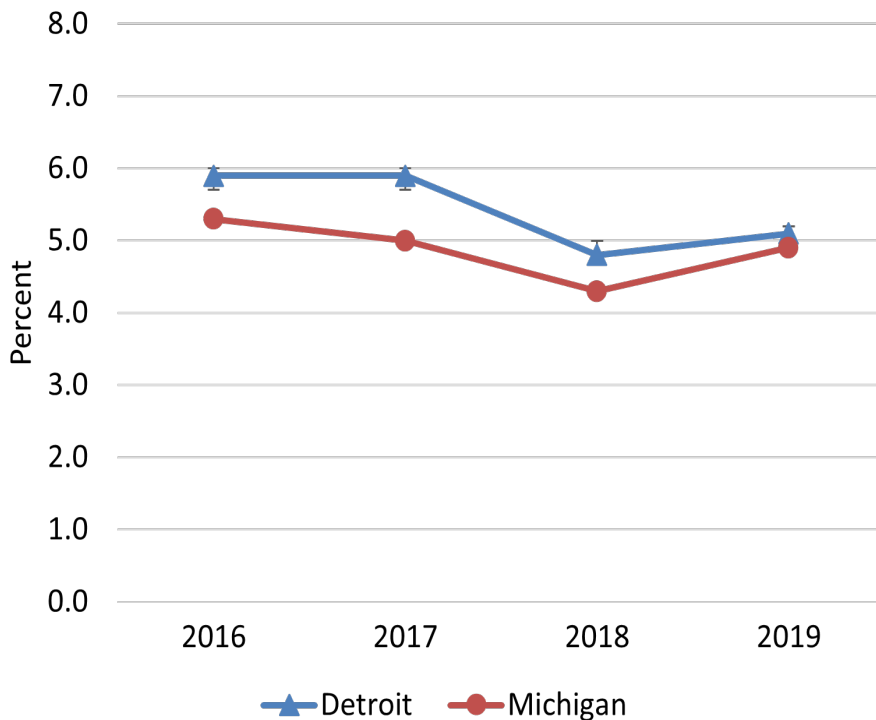
Source: Michigan Inpatient Database, 2016-2019, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-10 –CM=J45.XX

Medicaid Rates

Due to a change in International Classification of Diseases (ICD) for asthma Medicaid rates in 2015 from version 9 to version 10, asthma Medicaid data in this report should not be compared to estimates in the previous 2016 Detroit Report.

15. Prevalence¹ of Persistent Asthma², Children (5-17 Years) on Medicaid³, Detroit and Michigan, 2016-2019



For the following analyses, the Medicaid study population of children 5-17 years was restricted to those who were continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance.

Not included in this data are children with asthma who:

- Were younger than five years.
- Were not enrolled in Medicaid continuously.
- Did not have a paid Medicaid health utilization claim from 2016 through 2019.

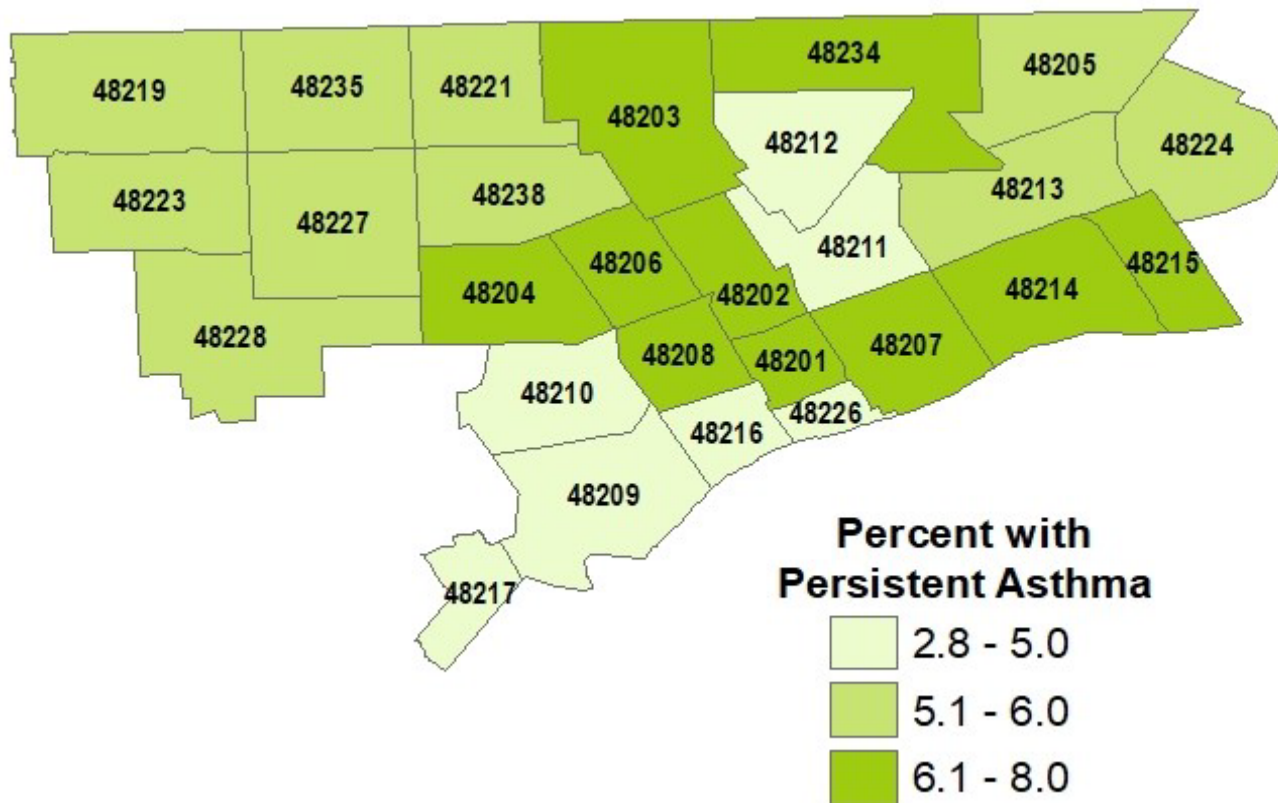
- The prevalence of asthma in Detroit has been consistently higher than in Michigan as a whole. The difference between prevalence in Detroit and Michigan as a whole decreased from 2016 to 2019.
- More than 4,000 Detroit children aged 5-17 years covered by Medicaid have health care utilization consistent with persistent asthma.

Data Notes:

Source: Michigan Health Data Warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Based on annual NCQA HEDIS definition
3. Medicaid population of children 5-17 years is restricted to those who are continuously enrolled in Medicaid with full coverage and no other insurance

16. Prevalence¹ of Persistent Asthma² by ZIP Code of Residence, Children (5-17 Years) on Medicaid³, Detroit, 2016-2019



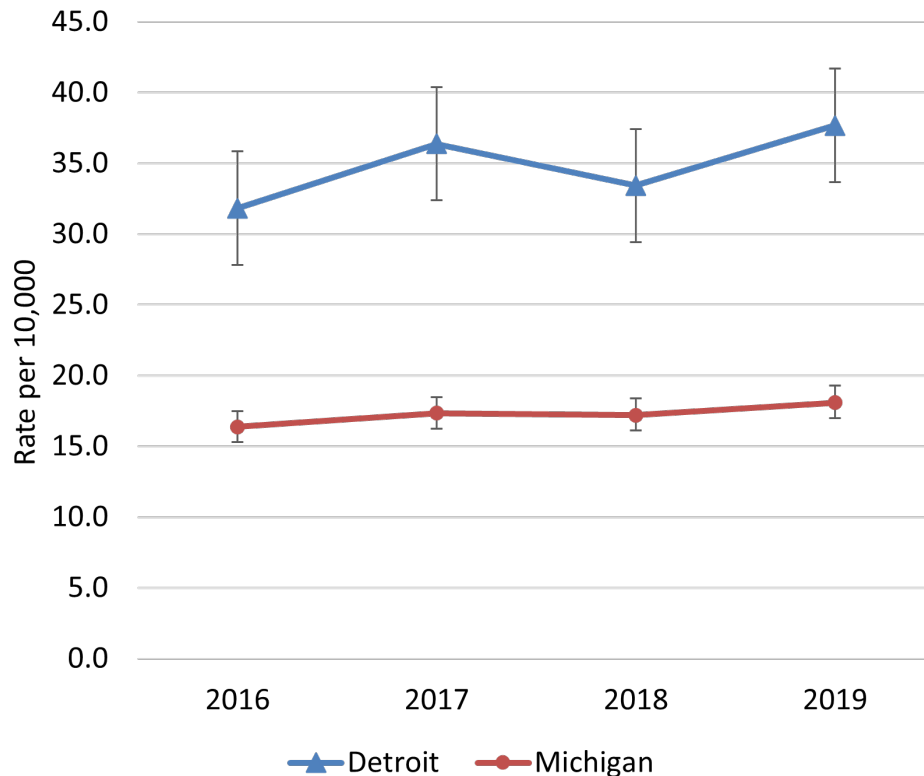
- The highest rates of persistent asthma among children in Detroit occurred around the center and the eastern parts of the city.
- The ZIP codes of lowest prevalence were primarily located in the southwestern parts of the city and two other ZIP codes in central Detroit, 48212 and 48211 .

Data Notes:

Source: Michigan Health Data Warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Based on annual NCQA HEDIS definition
3. Medicaid population of children 5-17 years is restricted to those who are continuously enrolled in Medicaid with full coverage and no other insurance

17. Rate¹ of Asthma² Hospitalizations, Children (5-17 years) on Medicaid³, Detroit and Michigan, 2016-2019



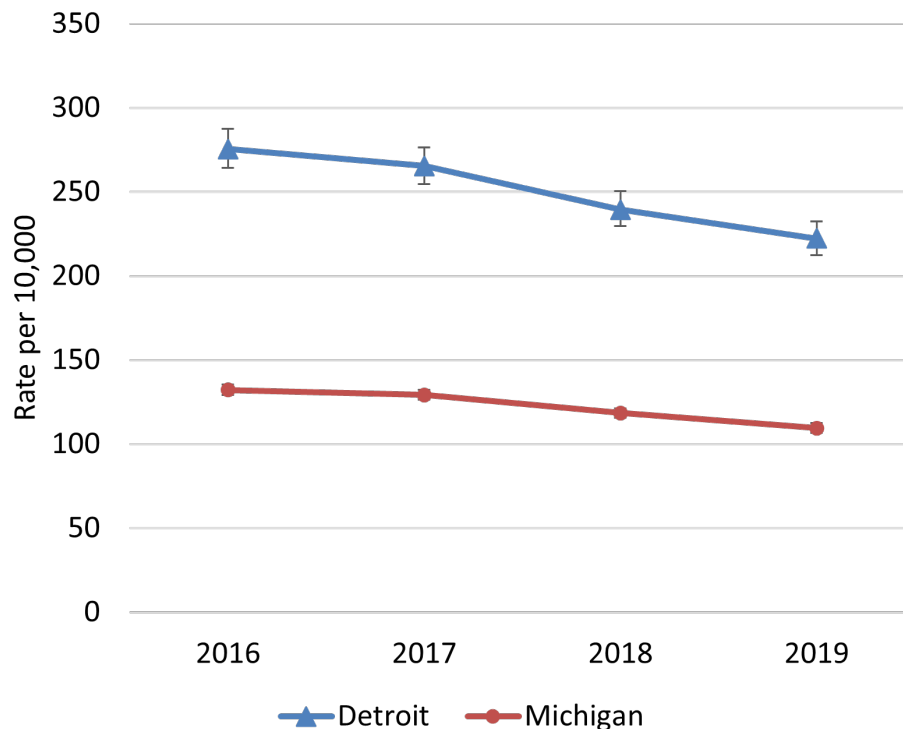
- In 2019, the total number of hospitalizations for Detroit children covered by Medicaid was about 305. The rate was 38.0 hospitalization visits per 10,000 children on Medicaid in Detroit.
- The rate for Michigan was 18.1 per 10,000 children on Medicaid. There was a total of 926 hospitalizations in Michigan children covered by Medicaid.
- The rate of asthma hospitalization visits for children in Detroit in 2019 was over twice the rate for children in Michigan.
- Rates did not change significantly ($p > 0.05$)⁴ for both Detroit and Michigan from 2016-2019.

Data Notes:

Source: Michigan Health Data Warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Based on annual NCQA HEDIS definition
3. Medicaid population of children 5-17 years is restricted to those who are continuously enrolled in Medicaid with full coverage and no other insurance
4. Spearman's correlation and rank correlation test

18. Rate¹ of Asthma² Emergency Department Visits, Children (5-17 Years) on Medicaid³, Detroit and Michigan, 2016-2019



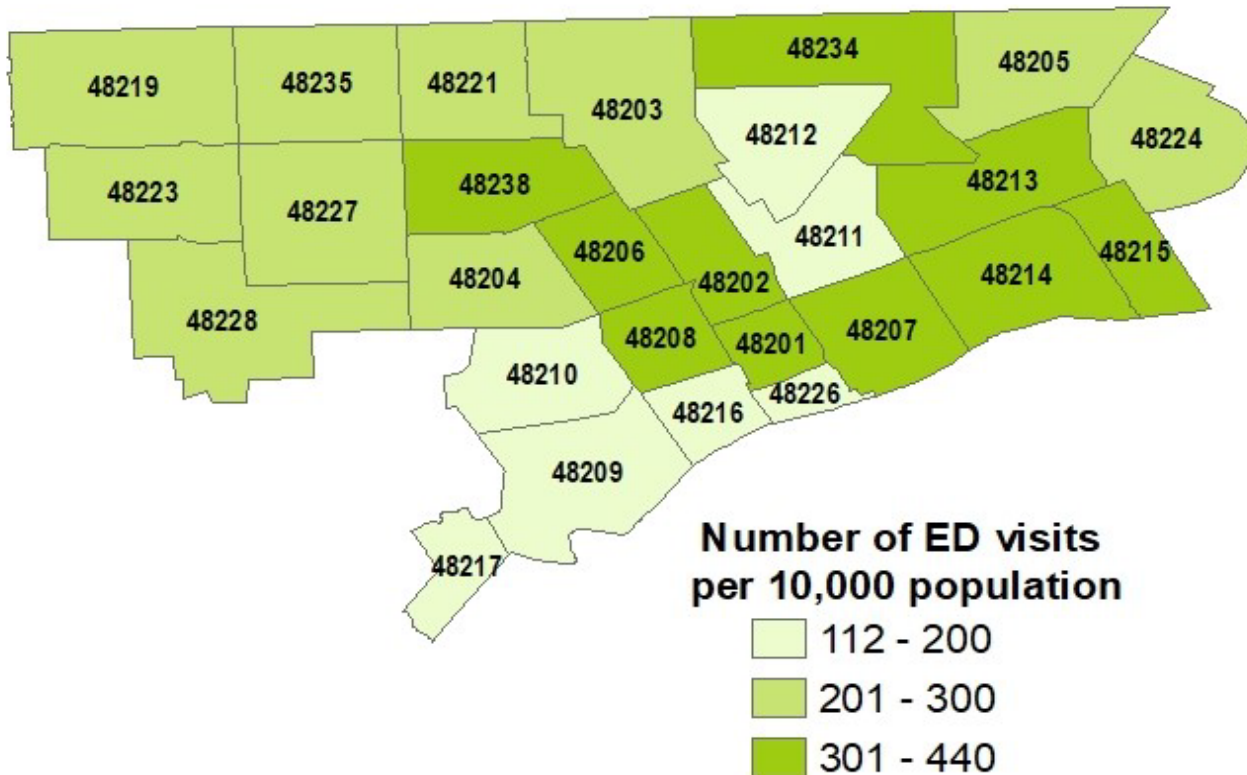
- In 2019, the total number of emergency department (ED) visits for Detroit children covered by Medicaid was about 1,800. The rates for Detroit and Michigan were 222 and 110 ED visits per 10,000 children on Medicaid, respectively.
- The rate of asthma emergency department visits for children in Detroit in 2019 was about twice the rate for children in Michigan.
- From 2016 to 2019, the disparity between Detroit and Michigan in the asthma emergency department (ED) visit rate decreased, from 143 to 112 per 10,000.

Data Notes:

Source: Michigan Health Data Warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis ICD-10 –CM=J45.XX
3. Medicaid population of children 5-17 years is restricted to those who are continuously enrolled in Medicaid with full coverage and no other insurance

19. Rate¹ of Asthma² Emergency Department Visits by ZIP Code of Residence, Children (5-17 Years) on Medicaid³, Detroit, 2016-2019



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

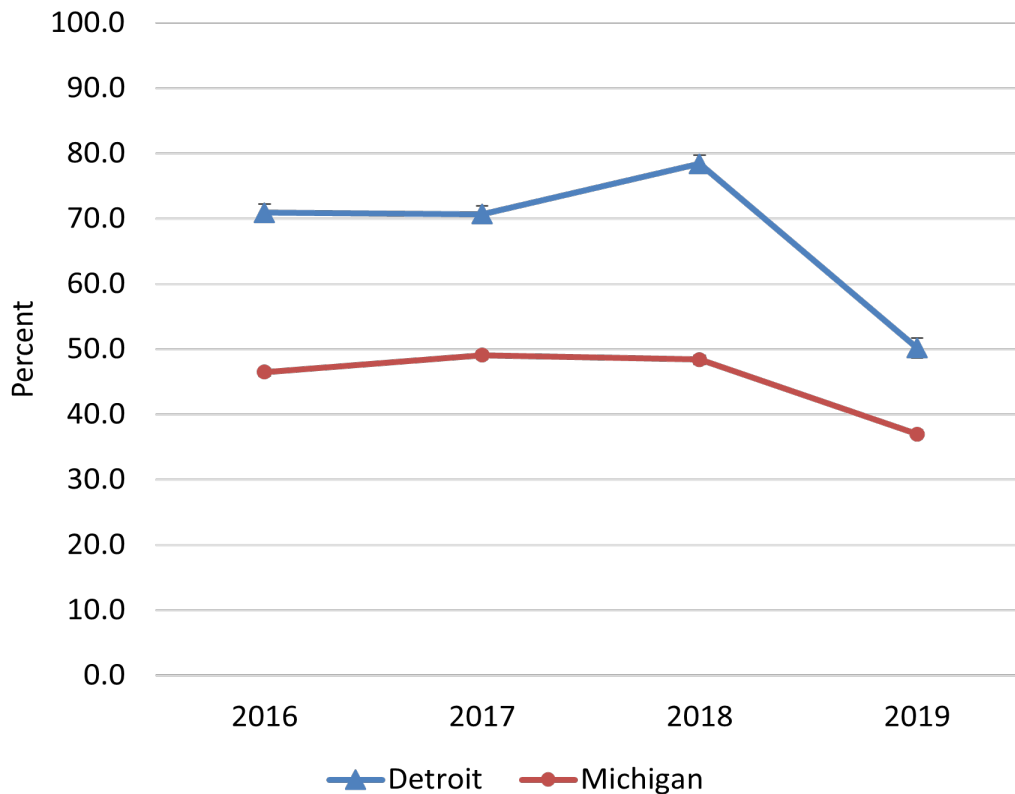
Data Notes:

Source: Michigan Health Data Warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis ICD-10–CM=J45.XX
3. Medicaid population of children 5-17 years is restricted to those who are continuously enrolled in Medicaid with full coverage and no other insurance

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

20. Percent¹ of Children (5-17 Years) with Asthma² with ≥ 2 Outpatient Visits for Asthma on Medicaid³, Detroit and Michigan, 2016-2019



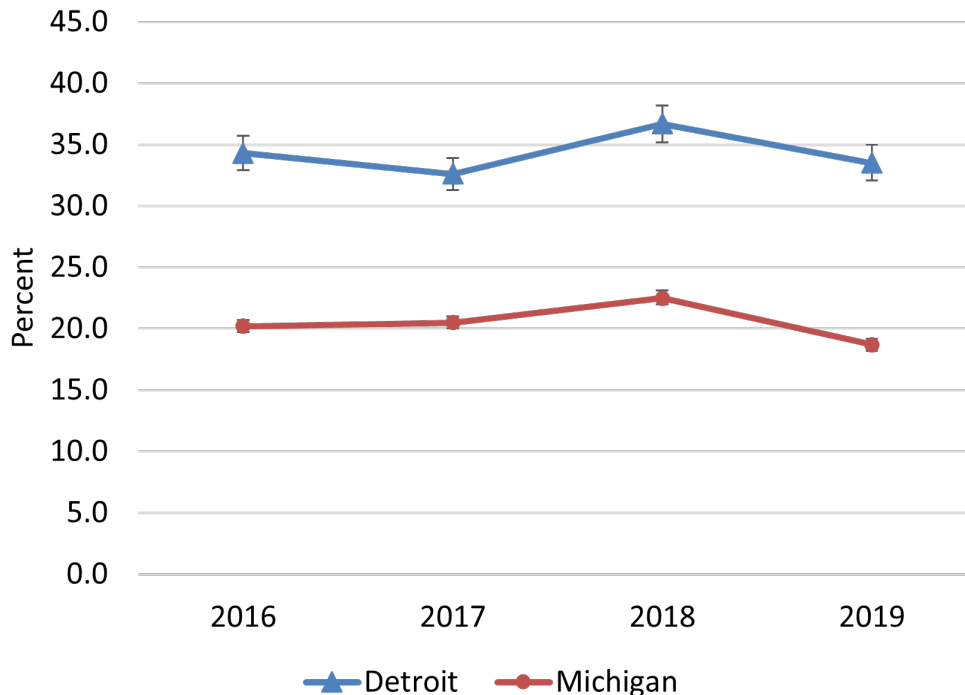
- In 2019, 50.2% of Detroit children covered by Medicaid and 37% of Michigan children with persistent asthma had at least two outpatient visits for asthma.
- There was a significant decline in the rates of two or more outpatient visits from 2016-2019 among both Detroit and Michigan children with asthma under Medicaid.
- The proportion of Detroit children covered by Medicaid with persistent asthma with at least two office visits for asthma was significantly higher ($p < 0.05$)⁴ compared to that for the state as a whole.

Data Notes:

Source: Michigan Health Data Warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis ICD-10 –CM=J45.XX
3. Medicaid population of children 5-17 years is restricted to those who are continuously enrolled in Medicaid with full coverage and no other insurance
4. Spearman's correlation and rank correlation test

21. Percent of Reliance on Emergency Department for Primary Care¹ among Children (5-17 Years) with Asthma² on Medicaid³, Detroit and Michigan, 2016-2019



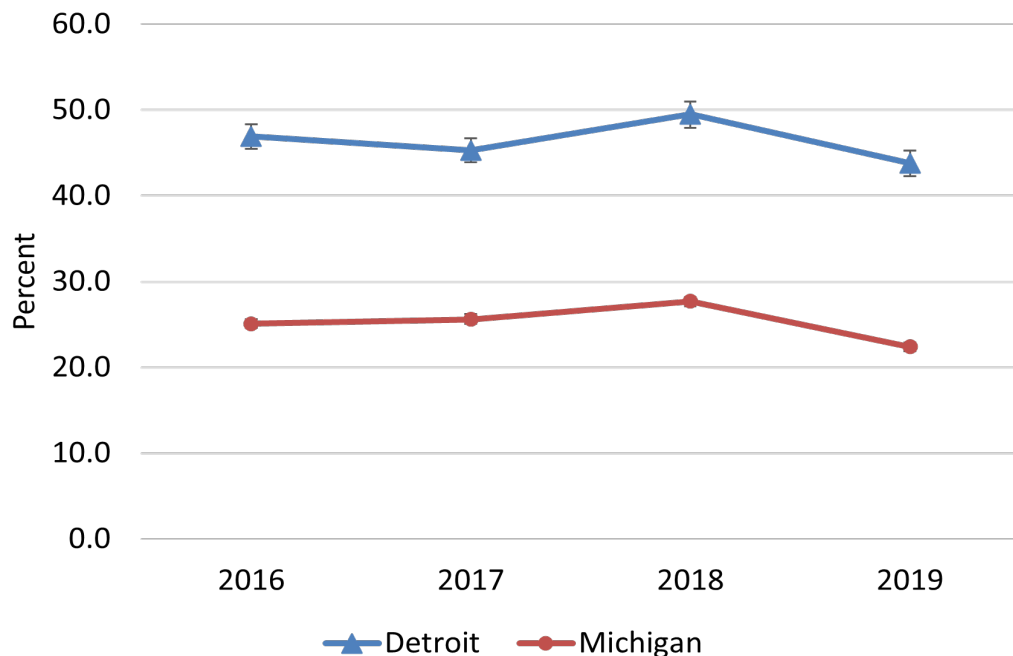
- Reliance on the emergency department for primary care is a measure of the proportion of all outpatient visits for asthma that are emergency department visits.
- In 2019, the proportion of outpatient visits for asthma that occurred in the emergency department for Detroit and Michigan children covered by Medicaid with persistent asthma was 33.5% and 18.7%, respectively.
- Emergency department reliance for primary care was about 79% higher among children in Detroit compared to the state as a whole in 2019.
- From 2016 to 2019, emergency department reliance dropped in Michigan by 8%, but did not change significantly ($p > 0.05$)⁴ in Detroit.

Data Notes:

Source: Michigan Health Data Warehouse, MDHHS

1. Proportion of all outpatient visits for asthma that are emergency department visits (Asthma as primary diagnosis, ICD-10–CM=J45.XX), age-adjusted to the 2000 US Standard Population
2. Based on annual NCQA HEDIS definition
3. Medicaid Population of children 5-17 years is restricted to those who are continuously enrolled in Medicaid with full coverage and no other insurance.
4. Spearman's correlation and rank correlation test

22. Percent¹ of Children (5-17 Years) with Asthma² with ≥ 1 Emergency Department Visits for Asthma³, Medicaid⁴, Detroit and Michigan, 2016-2019



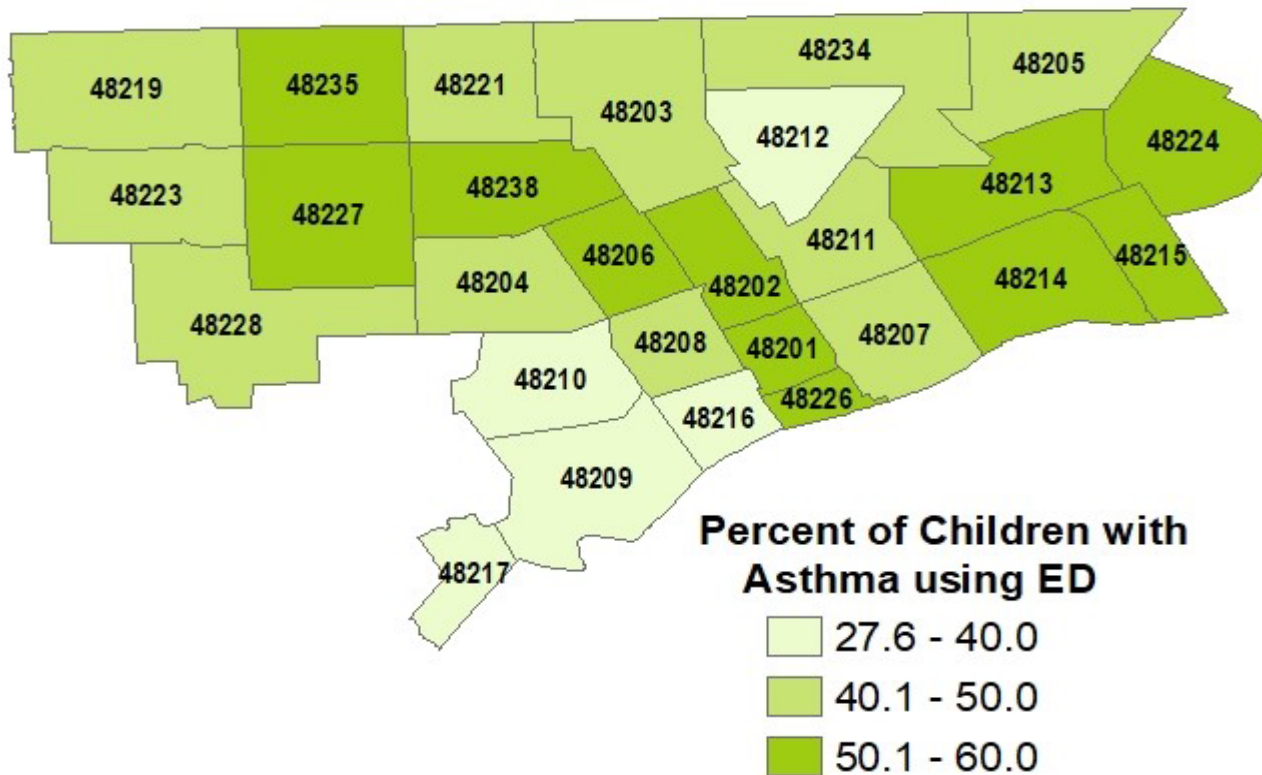
- It is the goal of asthma therapy that persons with asthma experience minimal or no emergency department visits for asthma.⁵
- In 2019, 43.8% of Detroit children enrolled in Medicaid with persistent asthma had one or more emergency department visits for asthma.
- The proportion of Detroit children covered by Medicaid with persistent asthma with at least one emergency department visit for asthma in 2019 was almost two times the rate for Michigan as a whole.

Data Notes:

Source: Michigan Health Data Warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Based on NCQA HEDIS Definition
3. Asthma as primary diagnosis ICD-10-CM=J45.XX
4. Medicaid population of children 5-17 years is restricted to those who are continuously enrolled in Medicaid 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. Percent¹ of Children (5-17 Years) with Asthma² with ≥ 1 Emergency Department Visits for Asthma³ by ZIP Code of Residence, Medicaid⁴, Detroit, 2016-2019

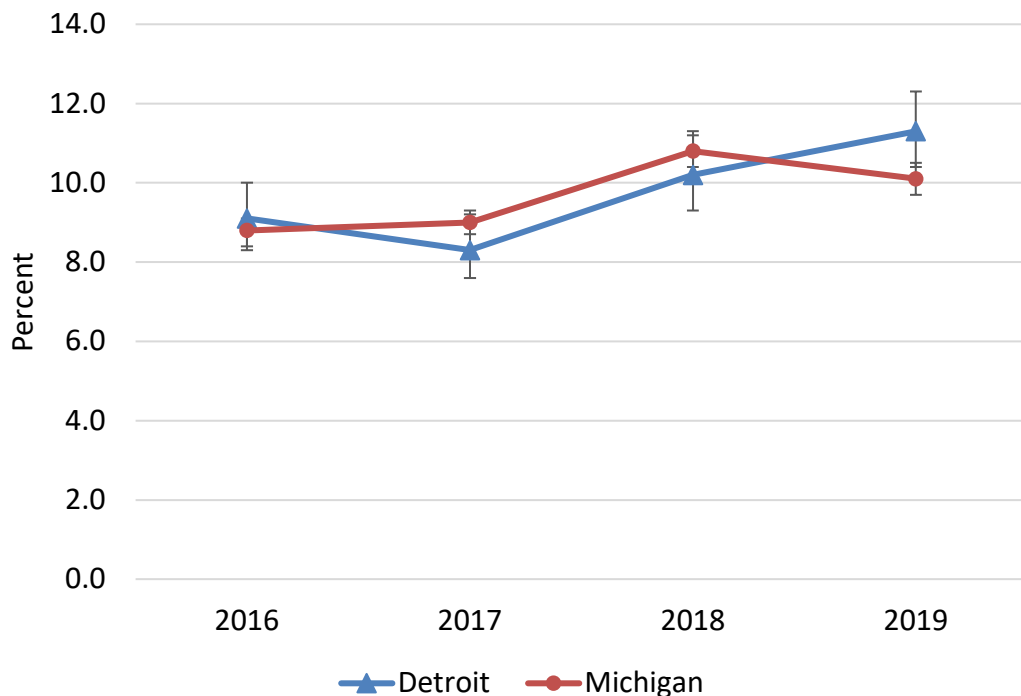


- ZIP codes with the lowest rates were concentrated in the southwestern part of the city. One ZIP code 48212 in the central part of the city also recorded lowest rate.

Data Notes:

- Source: Michigan Health Data Warehouse, MDHHS
1. Age-adjusted to the 2000 US Standard Population
 2. Based on NCQA HEDIS Definition
 3. Asthma as primary diagnosis, ICD-10 –CM=J45.XX
 4. Medicaid Population of children 5-17 years is restricted to those who are continuously enrolled in Medicaid with full coverage and no other insurance.

24. Percent¹ of Overuse of Short-Acting β -Agonist Medication among Children (5-17 Years) with Persistent Asthma², Medicaid³, Detroit and Michigan, 2016-2019



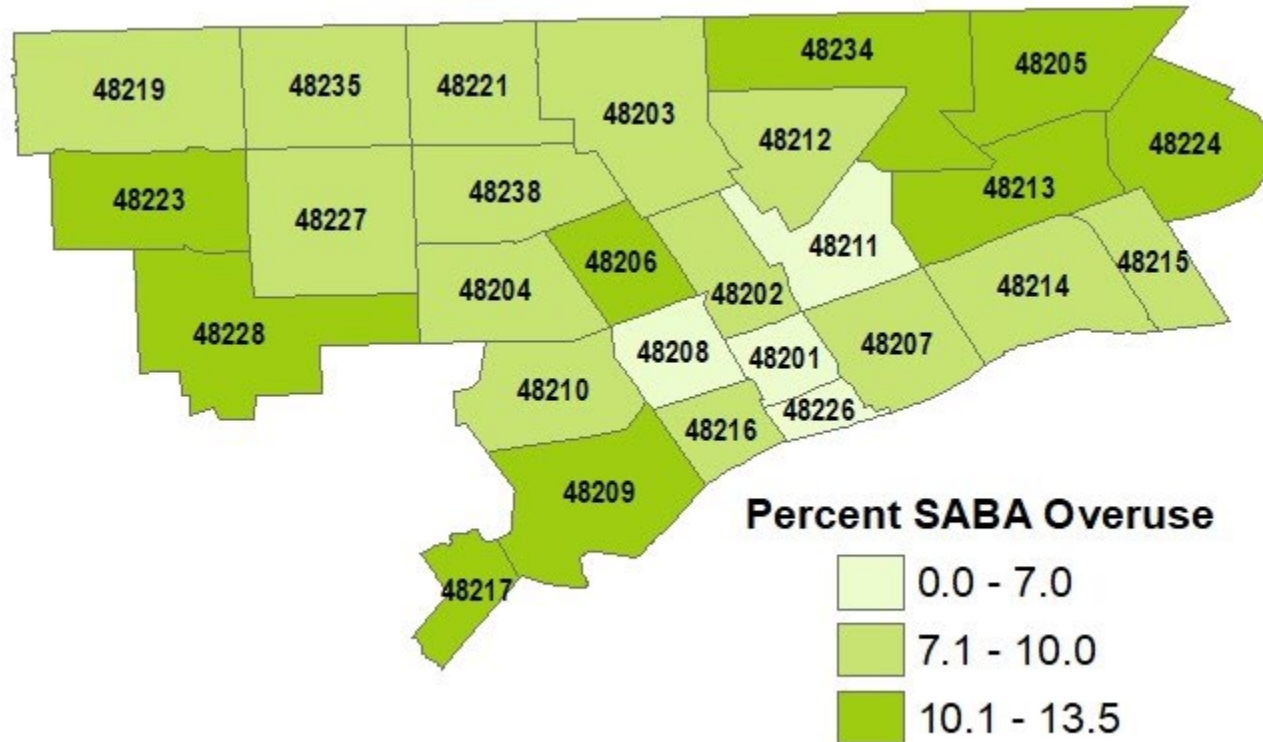
Data Notes:

Source: Michigan Health Data Warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Based on NCQA HEDIS Definition
3. Medicaid Population of children 5-17 years is restricted to those who are continuously enrolled in Medicaid 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.

- It is the goal of asthma therapy that there be minimal use of short-acting β -agonist medication⁴ – less than one canister per month. For this indicator, overuse is defined as filling seven or more prescriptions for short-acting β -agonist in a year.
- In 2019, the prevalence of short-acting β -agonist medication overuse among Detroit children and Michigan children covered by Medicaid with persistent asthma was 11.3% and 10.1% respectively.

25. Percent¹ of Overuse of Short-Acting β -Agonist (SABA) Medication among Children (5-17 Years) with Asthma² by ZIP Code of Residence, Medicaid³, Detroit, 2016-2019



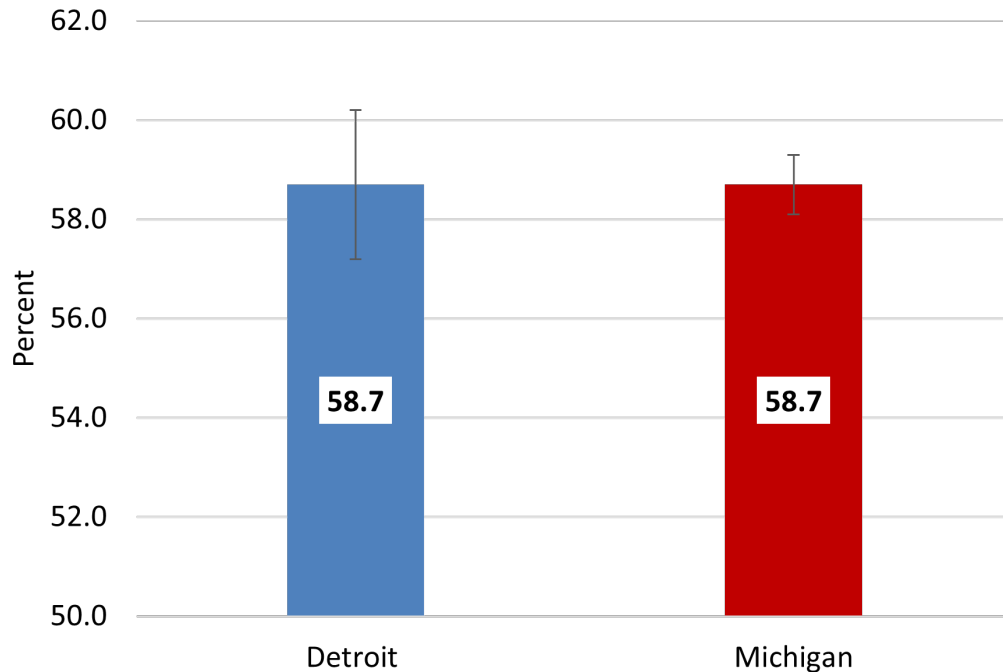
- Highest rates of SABA overuse were mostly concentrated in the northeastern, western and southwestern parts of the city.
- ZIP codes 48208, 48201, 48226 and 48211 had the lowest rates of SABA overuse.

Data Notes:

Source: Michigan Health Data Warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Based on NQCA HEDIS Definition
3. Medicaid population of children 5-17 years is restricted to those who are continuously enrolled in Medicaid with full coverage and no other insurance.

26. Percent¹ of Children (5-17 Years) with Asthma² with ≥1 Inhaled Corticosteroid Medication, Medicaid³, Detroit and Michigan, 2019



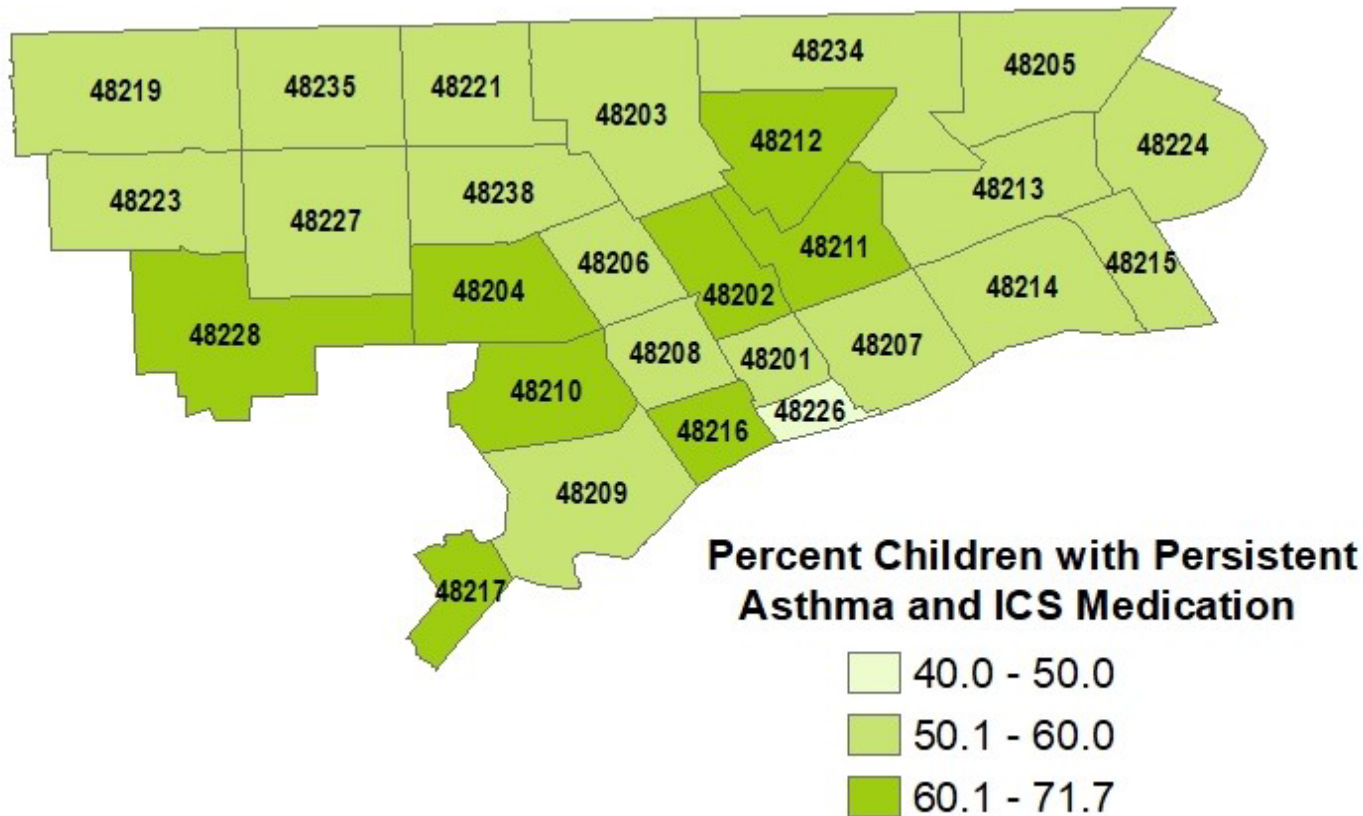
- Long-term asthma control medications, such as inhaled corticosteroids, are recommended for children with persistent asthma.⁴
- 58.7% of children in Detroit and Michigan in 2019 filled a prescription for inhaled corticosteroids.
- There was no statistical difference between the rate for Detroit and Michigan in 2019.

Data Notes:

Source: Michigan Health Data Warehouse, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Based on NCQA HEDIS Definition
3. Medicaid Population of children 5-17 years is restricted to those who are continuously enrolled in Medicaid 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. Percent¹ of Children (5-17 Years) with Asthma² with ≥ 1 Inhaled Corticosteroid Medication by ZIP Code of Residence, Medicaid³ Detroit, 2016-2019



- ZIP codes with the highest percent of children filling inhaled corticosteroids tended to be in the southwestern and central areas of Detroit. Only one ZIP code 48226 recorded the lowest rate.

Data Notes:

Source: Michigan Health Data Warehouse, MDHHS

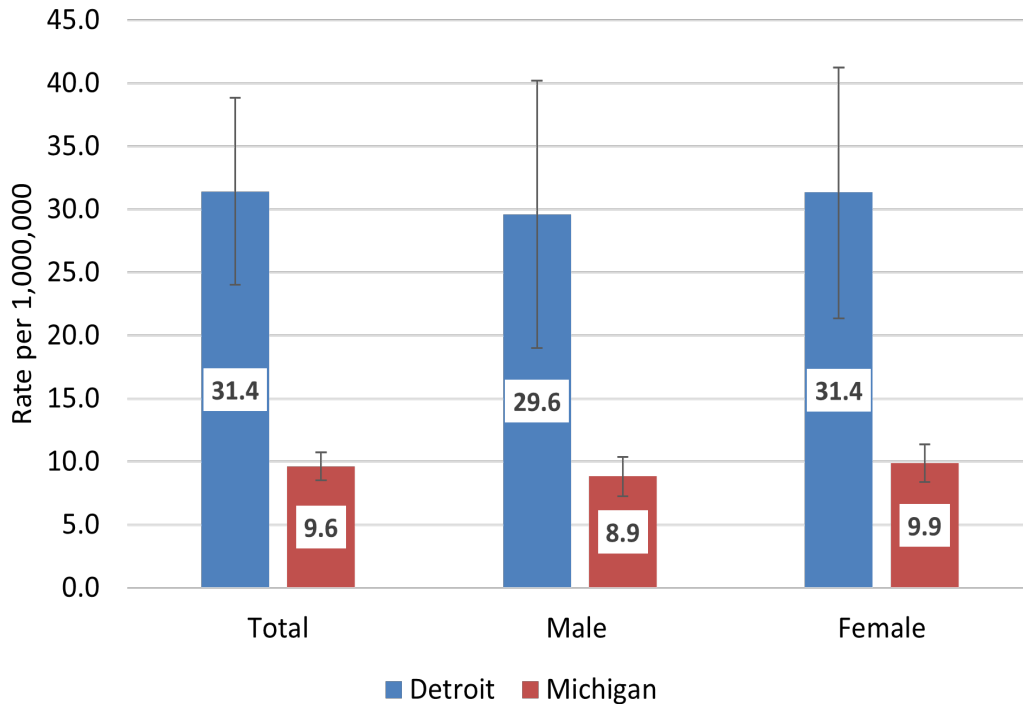
1. Age-adjusted to the 2000 US Standard Population

2. Based on NCQA HEDIS Definition

3. Medicaid Population of children 5-17 years is restricted to those who are continuously enrolled in Medicaid with full coverage and no other insurance.

Asthma Mortality

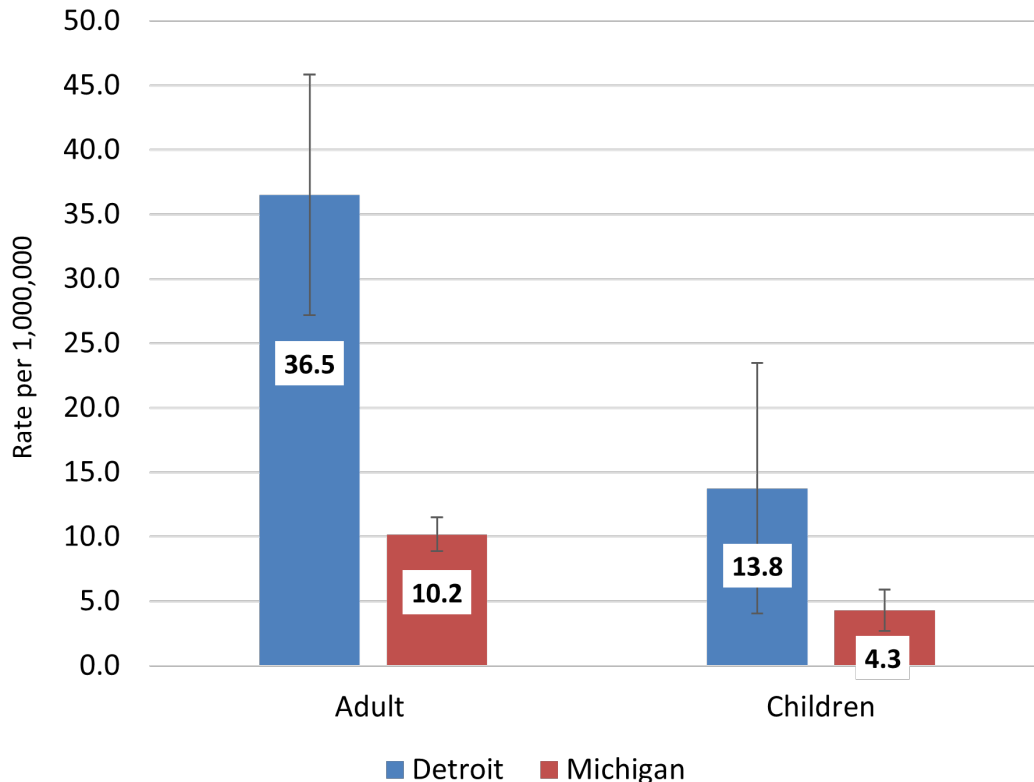
28. Rates¹ of Asthma Death² by Sex, Detroit and Michigan, 2017-2019



- Between 2017 and 2019, 71 Detroit residents died due to asthma. The rate of asthma mortality among Detroit residents was 31.4 per 1,000,000 population.
- The rate of asthma mortality in Detroit in 2017-2019 was about three times the rate for Michigan as a whole.
- Between 2017 and 2019, the rate of asthma mortality among Detroit males was 29.6 per 1,000,000 and the rate for Detroit females was 31.4 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 Files, MDHHS
 1. Age-adjusted to the 2000 US Standard Population
 2. Asthma as the underlying cause of death, ICD-10:J45-J46

29. Rates¹ of Asthma Mortality² by Age Group, Detroit and Michigan, 2017-2019



- The rate of asthma mortality for Detroit children between 2017 and 2019 was 13.8 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 three times higher.
- Among Detroit adults, the rate of asthma mortality between 2017 and 2019 was 36.5 per 1,000,000.
- The rate of asthma mortality for Detroit adults was over three times the rate for adults in Michigan as a whole.

Data Notes:

Source: Michigan Death Files, MDHHS

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

Conclusion

- 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.
- MDHHS will share this update with its partners in the City of Detroit and across the state.

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 (visit https://www.michigan.gov/documents/mdhhs/2019-MiBRFS-Standard-Tables_711893_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 (≥ 18 years) were provided by 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 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-10 –CM=J45.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™) 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 (2016-2019), the study population was identified by the following parameters within each year: children 5-17 years of age 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 2016 through 2019.

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® specifications; in the year of the prevalence measurement, having (1) ≥ 4 asthma medication dispensing events OR (2) ≥ 1 emergency department visits for asthma OR (3) ≥ 1 hospitalization for asthma OR (4) ≥ 4 outpatient visits for asthma and ≥ 2 asthma medication dispensing events (National Committee for Quality Assurance. Appropriate Medications for People with Asthma. HEDIS® 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-10 –CM=J45.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 emergency department visit:* The percentage of children covered by Medicaid with persistent asthma who have had one or more annual asthma emergency visits (ICD-10 – CM=J45.XX).
- *Emergency department reliance:* The percentage of all ambulatory asthma visits (ICD-10 –CM=J45.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 β -agonist overuse:* The percentage of children with persistent asthma in Medicaid who have filled seven or more prescriptions for short-acting β -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™) 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 2017-2019 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.

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