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Introduction:

Detroit experiences the greatest asthma burden in Michigan, especially among its children. The following chapter highlights this burden across the many datasets monitored by the Michigan asthma surveillance system, including survey prevalence, hospitalization, Medicaid claims, and mortality.

Key Findings:

- The prevalence of current asthma among Detroit adults is 50% higher than that of Michigan as a whole.
- Rates of asthma hospitalization in Detroit are three times higher than that of Michigan as a whole.
- The rate of asthma hospitalizations for Detroit children is 50% higher than that of Detroit adults.
- In Detroit, recent hospitalization rates for black persons are over two times higher than those for white persons.
- The prevalence of persistent asthma among children covered by Medicaid is consistently 10% higher in Detroit compared to Michigan as a whole.
- Reliance on the emergency department for asthma care is about 50% higher for Detroit children covered by Medicaid compared to the state as a whole.
- Rates of asthma death are over two times higher in Detroit compared to the state as a whole.

Key Recommendation:

- The severity of the asthma burden in Detroit warrants immediate attention. Public health efforts should be should be directed to persons with asthma in Detroit to improve asthma control and prevent severe outcomes.

The Asthma Initiative of Michigan (AIM)

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 this report. For information about AIM's priorities and interventions, please review the strategic plan for the initiative: *Asthma in Michigan 2010: A Blueprint for Action.* (http://www.getasthmahelp.org/reports.asp)

Data Sources:

American Community Survey
US Census Bureau
Michigan Behavioral Risk Factor Survey
Michigan Inpatient Database
Michigan Data Warehouse
Michigan Death Files
Michigan Department of Community Health
Michigan Youth Risk Behavior Survey
Michigan Department of Education

Methods:

Prevalence of Asthma

Michigan prevalence estimates for asthma are based on self-report, population-based surveys 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 is the proportion of respondents who report "yes" to question 1. Current asthma prevalence is the proportion of respondents who report "yes" to both questions 1 and 2.

Prevalence estimates for adults presented in this report are generated from the Michigan Behavioral Risk Factor Survey (BRFS). These data are collected quarterly by telephone interview of a sample of telephone numbers using list-assisted, random-digit dialed methodology. Additionally, estimates for high school students are available from Michigan's Youth Risk Behavior (YRBS), a school-based, self-administered survey. 95% confidence intervals accompany all measures of asthma prevalence.

Asthma Hospitalization

An asthma hospitalization is defined as a 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 are calculated using the direct standardization method and presented per 10,000 population. Rates are age-adjusted, using the 2000 US standard population, so that valid comparisons can be made between populations of different age distributions. 95% confidence intervals accompany all hospitalization rates. In addition to asthma hospitalization rates, the average length of stay for an asthma hospitalization is included in this report.

Asthma hospitalization rates are calculated for various subgroups, including zip code of residence (for Detroit), age, race, sex, and month of admission, to identify disparities and patterns. Maps generated using geographic information system (GIS) tools are used for visual display of the data and to identify areas of high burden. (ArcGIS™, Environmental Systems Research Institute)

Methods Continued:

Overall monotonic trend in asthma hospitalization rates between 2000 and 2006 is statistically evaluated using the Spearman Correlation Coefficient and its accompanying Rank Correlation Test. A p-value of <0.05 for this test is considered statistically significant.

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

Asthma Management for Children Covered by Medicaid

From the Michigan Medicaid beneficiary and administrative claims data (2002-2004), the study population is identified by the following parameters within each year: children 18 years and younger, continuous Medicaid enrollment (11+ months), full Medicaid coverage and no other insurance. These include both Fee for Service and Managed Care beneficiaries, but excludes Title V beneficiaries. Within this population, the following indicators of total asthma burden were measured:

- Persistent asthma prevalence: Persistent asthma is defined according to HEDIS® specifications: in the year of the prevalence measurement year 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. Use of Appropriate Medications for People with Asthma. *HEDIS® 2003, Volume 2: Technical Specifications*. Washington, DC; 2003) Prevalence of persistent asthma is the proportion 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 is 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 emergency department visits for asthma, not the number of persons visiting the emergency department for asthma. The number of asthma emergency department visits divided by the study population generates this measure.

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

- Proportion with an outpatient visit: The proportion of children with persistent asthma in Medicaid with one or more annual asthma outpatient visits. (ICD-9-CM=493.XX)
- Proportion with an emergency department visit: The proportion of children covered by Medicaid with persistent asthma who have had one or more annual asthma emergency department visits. (ICD-9-CM=493.XX)
- Emergency department reliance: The proportion 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 β-agonist overuse: The proportion of children with persistent asthma in Medicaid who have filled thirteen 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 have filled one or more prescriptions for a inhaled corticosteroid medication in a year - inhaled corticosteroids are the preferred, first-line medication recommended for persons with persistent asthma. For this metric, inhaled corticosteriod medication includes bronchodilator combination therapy.

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

Asthma Death

An asthma death is defined by the a primary cause of death. (ICD-10=J45 or J46). Age-adjusted asthma mortality rates are calculated for the three-year period 2004-2006 using the direct standardization method and presented per 1,000,000 population. Rates are age-adjusted, using the 2000 US standard population, so that valid comparisons can be made between populations of different age distributions. Rates are calculated by age, race, and sex, to identify disparities and patterns. 95% confidence intervals accompany all mortality rates.

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

*This measure is computed differently than the NCQA HEDIS® measure "Use of Appropriate Medications for People with Asthma." Therefore, results in this report should not be compared to data strictly applying the specifications of the NCQA Hedis® measure.

Methods Continued:

Defining Detroit

Detroit is defined slightly differently for each data type presented in this chapter. These definitions are as follows:

- Prevalence from survey: On the BRFS, Detroit adults are identified by their affirmative response to the question "Do you live in the city of Detroit?" For the Detroit YRBS, the survey was conducted only within Detroit public high schools.
- Hospitalization: Detroit is defined Zip Code coverage for the city. This coverage includes zip codes for Highland Park and Hamtramck.
- Medicaid Population: Detroit is defined Zip Code coverage for the city. This coverage includes zip codes for Highland Park and Hamtramck.
- Mortality: Detroit is defined by the Detroit Minor Civil Division, which excludes Highland Park and Hamtramck.

List of Figures:

For the General Population

1. Population Demographics of Detroit, 2006

Prevalence of Asthma, Detroit and Michigan, 2005
2. Adults (Current Asthma)
3. High School Students By Sex (Lifetime Asthma)
4. High School Students By School Grade (Lifetime Asthma)

Asthma Hospitalization, Detroit and Michigan, 2000-2006
5. Total
6. By Sex
7. By Age Group
8. By Sex-Age Group (Detroit Only)
9. By Race
10. By Sex-Race Group (Detroit Only)
11. By Month of Admission
12. Average Length of Stay
13. By Zip Code (Detroit Only, 2000-2002)
14. By Zip Code for Children (Detroit Only, 2000-2002)
15. By Zip Code for Adults (Detroit Only, 2000-2002)

For Children Covered by Medicaid

Prevalence of Persistent Asthma
16. Total, Detroit and Michigan, 2002-2004
17. By Zip Code of Residence (Detroit Only, 2004)

Rate of Asthma Emergency Department Visits
18. Total, Detroit and Michigan, 2002-2004
19. By Zip Code of Residence (Detroit Only, 2004)

List of Figures Continued:

For Children Covered by Medicaid with claims evidence consistent with persistent asthma:

20. Proportion with an Outpatient Visit, 2002-2004
21. Emergency Department Reliance, 2002-2004

Proportion with an Emergency Department Visit
22. Total, Detroit and Michigan, 2002-2004
23. By Zip Code of Residence (Detroit Only, 2004)

Short-acting β-agonist Overuse
24. Total, Detroit and Michigan, 2002-2004
25. By Zip Code of Residence (Detroit Only, 2004)

Proportion using an Inhaled Corticosteroid Medication
26. Total, Detroit and Michigan, 2004
27. By Zip Code of Residence (Detroit Only, 2004)

For the General Population

Rates of Asthma Death, Detroit and Michigan, 2004-2006
28. Total
29. By Age Group
30. By Race

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For more information about the Asthma Initiative of Michigan, visit: **www.getasthmahelp.org** or call **1.866.EZLUNGS (1.866.395.8647)**.

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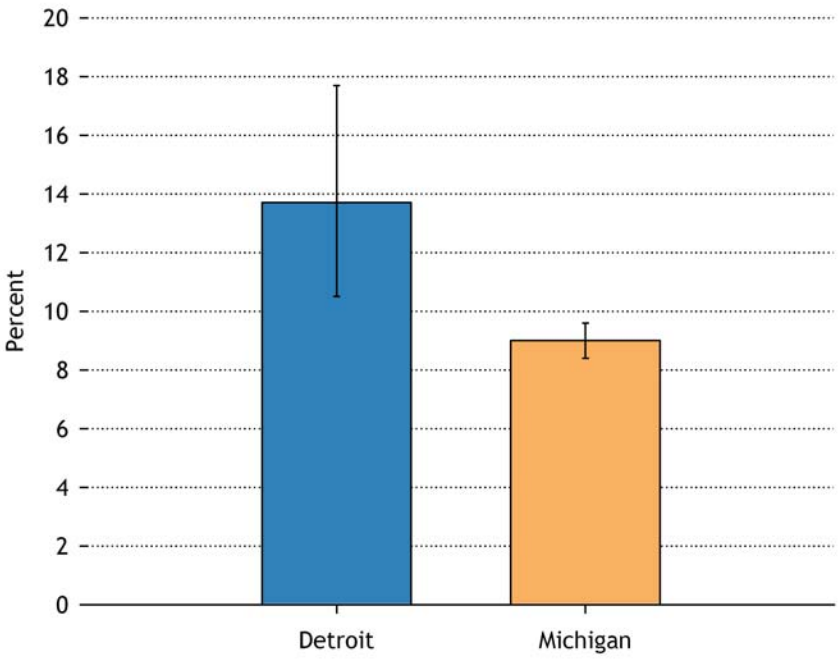
1. Population Demographics[1] of Detroit, Michigan, 2006

Measure	Detroit Population Estimate
Total Population	834,100
% Less than 18 Years	29.8%
% Black	83.1%
% of those 25 Years and Older with Less than High School Diploma	24.3%
% of Labor Force (≥16 Years) that are Unemployed	22.2%
Median Income	$28,364
% In Poverty	32.5%
% of Housing that is Vacant	23.0%

- Detroit, Michigan is a large city whose population exceeds 830,000, 82% of whom are black.
- In 2005, the median household income was $28,069 and 31% of the population was living in poverty.
- Among the population ≥16 years of age in the labor force, 21% were unemployed in 2005.
- Among the population ≥25 years of age, 24% had not earned a high school diploma.
- The prevalence of vacant homes is 23%.
- The *Michigan Household Health Insurance Survey Report* estimates that 4.7% of children (≤17 years) and 17.5% of adults (18 to 64 years) in Detroit are uninsured.[2]

2. Prevalence of Current Asthma[3] for Adults (≥18 Years), Detroit and Michigan, 2005

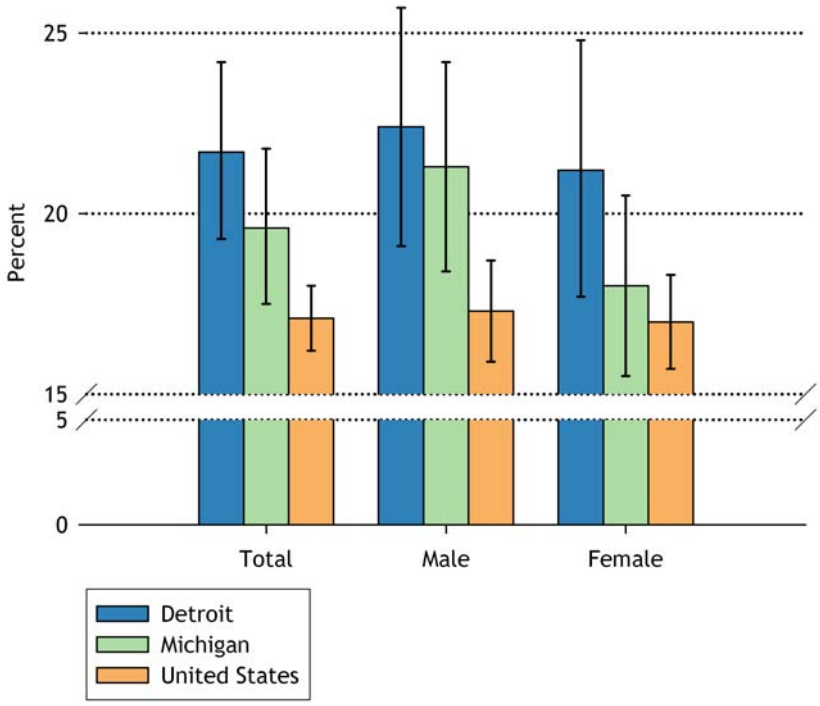


- In 2005, 13.7% of Detroit adults currently had asthma.
- Asthma prevalence in Detroit is significantly higher than the state as a whole.

Data Notes:

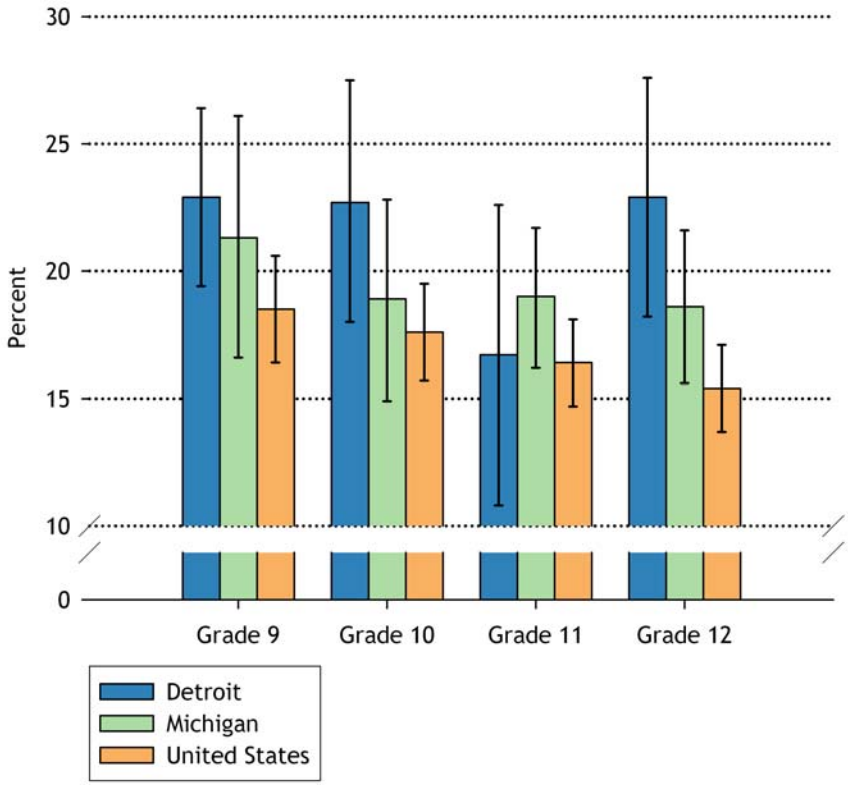
1. Source: American Community Survey, 2006
2. Source: *Michigan Household Health Insurance Survey Report, August 2006*
3. Source: Behavioral Risk Factor Survey, MDCH

3. Prevalence of Lifetime Asthma for High School Children, By Sex, Detroit[1], Michigan[2], and the United States[3], 2005



- In 2005, 21.7% of Detroit high school children had lifetime asthma.
- The prevalence of lifetime asthma is slightly higher among males compared to females for high school children in Detroit.
- Lifetime asthma prevalence in Detroit is not significantly different from the state as a whole.
- Lifetime asthma prevalence in Detroit is significantly higher than the prevalence for the United States as a whole.

4. Prevalence of Lifetime Asthma for High School Children, By School Grade, Detroit[1], Michigan[2], and the United States[3], 2005

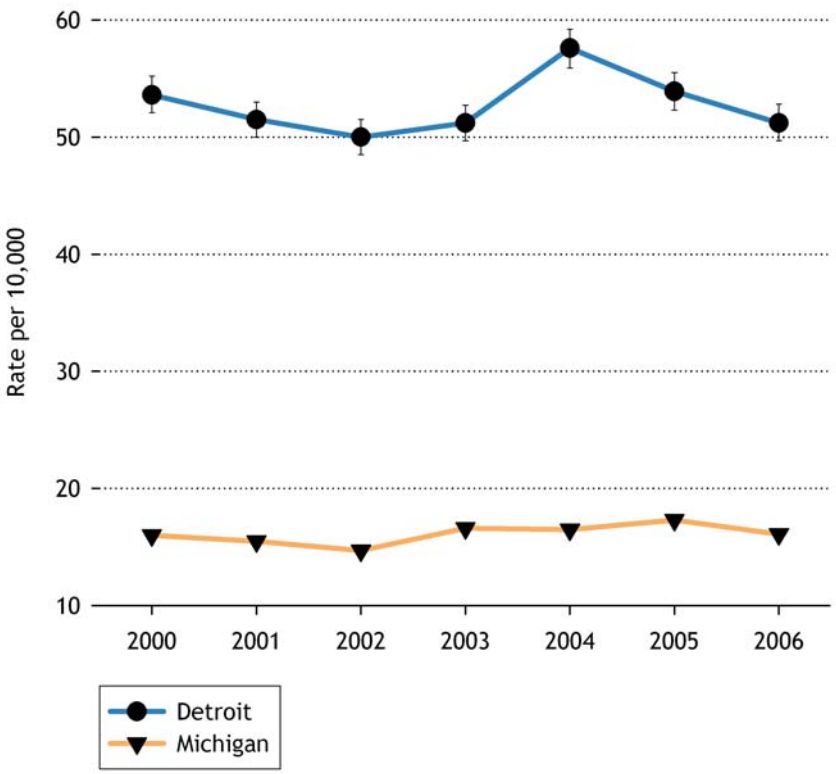


- The prevalence of lifetime asthma is not significantly different between high school grades in Detroit or Michigan.
- Among 12th graders, the prevalence of lifetime asthma is significantly higher in Detroit compared to the United States as a whole.

Data Notes:

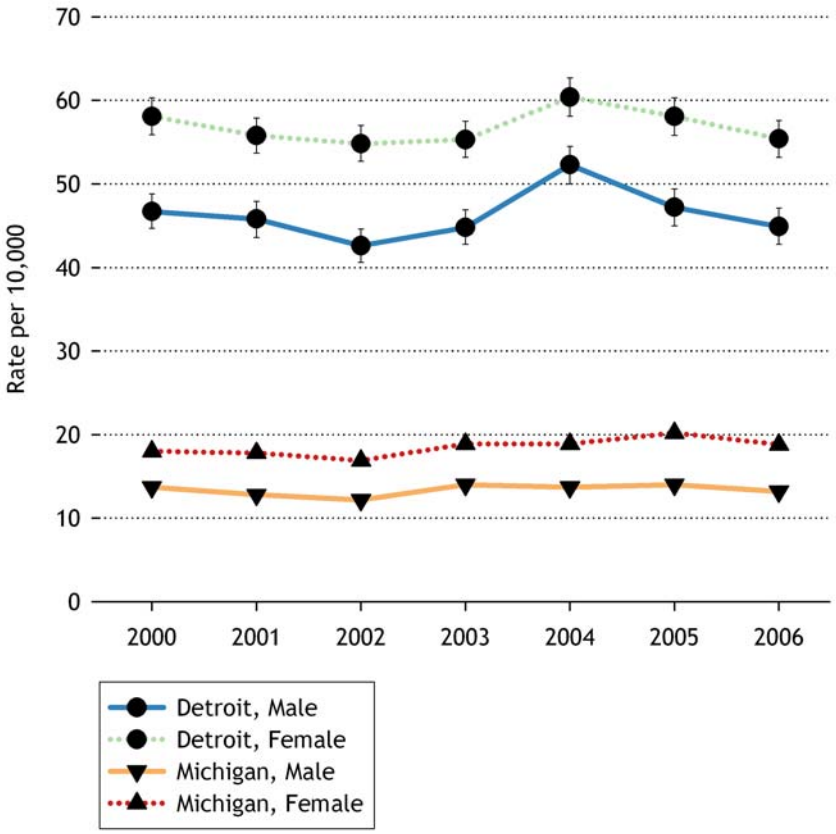
1. Source: Youth Risk Behavior Survey, Detroit Public Schools
2. Source: Youth Risk Behavior Survey, MDE
3. Source: Centers for Disease Control and Prevention.Youth Risk Behavior Surveillance — United States, 2005. Surveillance Summaries, June 9, 2006. MMWR 2006;55(No. SS-5).

5. Rates[1] of Asthma Hospitalization[2] , Detroit and Michigan, 2000-2006



- In 2006, there were 4,184 asthma hospitalizations for Detroit residents. The rate of asthma hospitalizations among Detroit residents was 51.2 per 10,000 population.
- Asthma hospitalization rates in Detroit are over three times higher than the rates in Michigan as a whole.
- Between 2000 and 2006, the rates of asthma hospitalization in Detroit and Michigan are consistent over time, with no distinguishable trend. ($p>0.05$)[3]

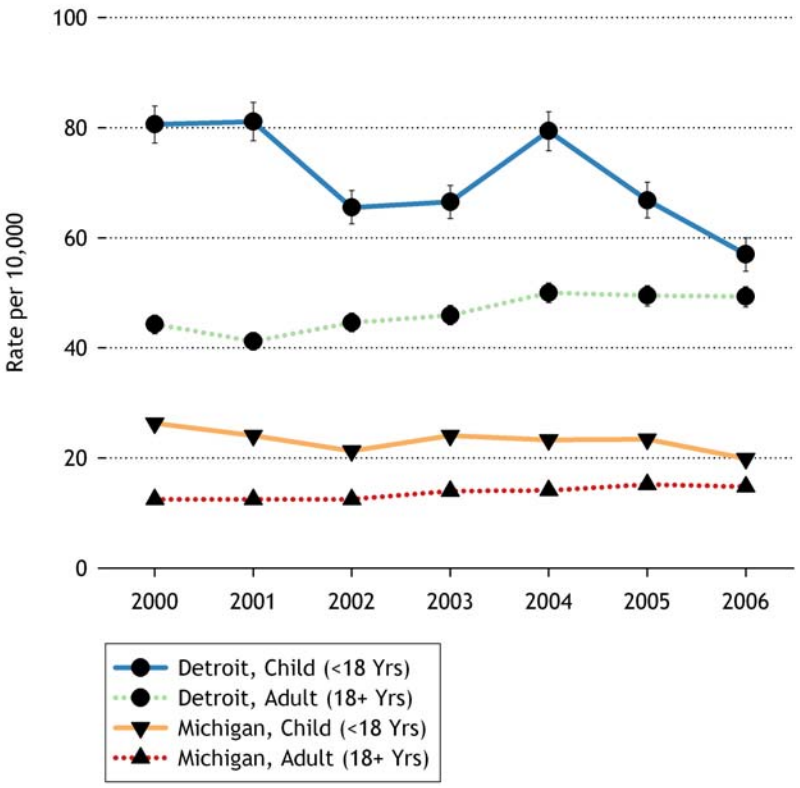
6. Rates[1] of Asthma Hospitalization[2] by Sex, Detroit and Michigan, 2000-2006



- In 2006, the rate of asthma hospitalizations among Detroit males was 44.9 per 10,000. The rate among Detroit females was 55.4 per 10,000.
- In Detroit, the asthma hospitalization rate among females is 20% higher than that for males. In Michigan as a whole, the rate among females is 40% higher than among males.
- Asthma hospitalization rates in Detroit are over three times higher than the rates in Michigan as a whole, regardless of sex.
- Between 2000 and 2006, the rates of asthma hospitalization in Detroit and Michigan are consistent over time, regardless of sex. ($p>0.05$ for each)[3]

Data Notes:
Source: Michigan Inpatient Database, MDCH
1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-9-CM:493.xx.
3. Spearman's correlation and rank correlation test.

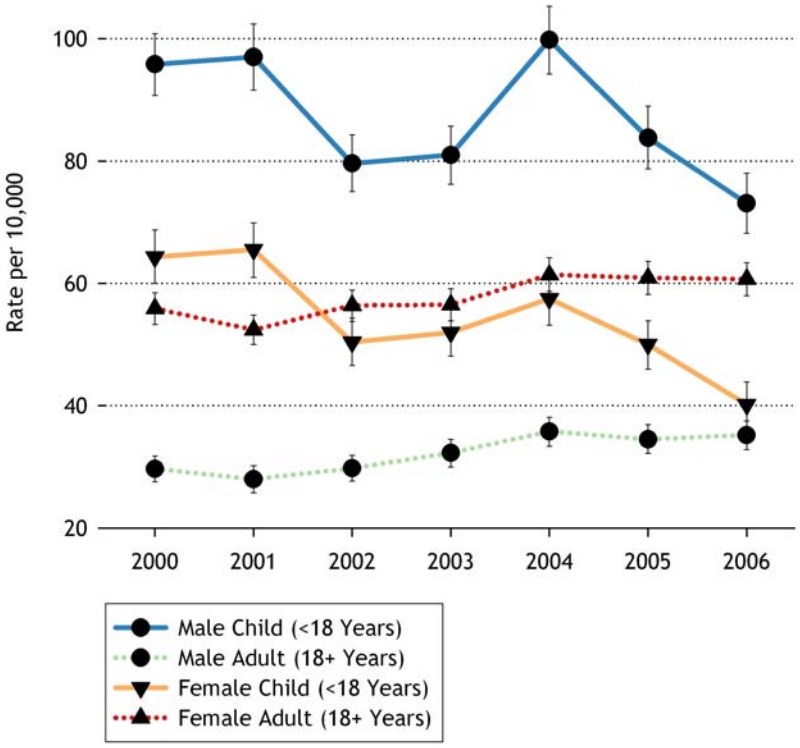
7. Rates[1] of Asthma Hospitalization[2] by Age Group, Detroit and Michigan, 2000-2006



- In 2006, the rate of asthma hospitalizations among Detroit children was 57.0 per 10,000. The rate among Detroit adults was 49.3 per 10,000.
- In Detroit, recent asthma hospitalization rates for children are on average about 50% higher than that for adults. The disparity is similar for the state as a whole.
- Asthma hospitalization rates in Detroit are three times higher than the rates in Michigan as a whole, regardless of age.
- Between 2000 and 2006, the rates of asthma hospitalization for both Detroit and Michigan adults increased significantly. ($p<0.05$)[3] Rates for children are decreasing, especially between 2004 and 2006; overall, however, the trend is not statistically significant. ($p>0.05$)[3]

Data Notes:
Source: Michigan Inpatient Database, MDCH
1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-9-CM:493.xx.
3. Spearman's correlation and rank correlation test.

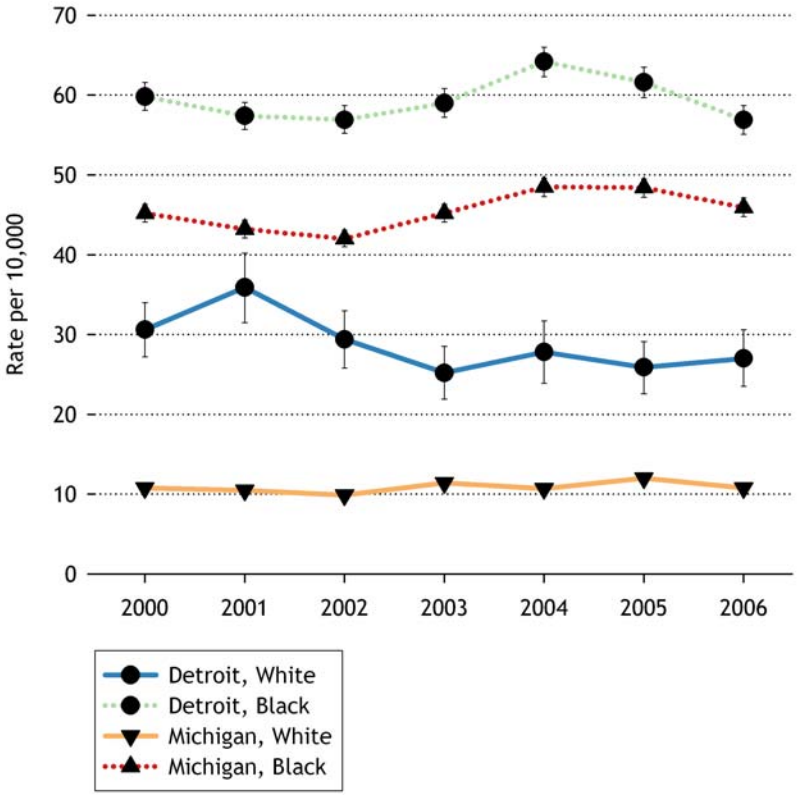
8. Rates[1] of Asthma Hospitalization[2] by Sex-Age Group, Detroit, 2000-2006



- In 2006, the rate of asthma hospitalizations among Detroit male children was 73.1 per 10,000. The rate among Detroit female children was 40.2 per 10,000.
- In 2006, the rate of asthma hospitalizations among Detroit male adults was 35.2 per 10,000. The rate among Detroit female adults was 60.7 per 10,000.
- In Detroit, recent asthma hospitalization rates for male children are consistently over two times higher than that for male adults. This disparity is not observed among females.
- Recent rates of asthma hospitalization for Detroit children are about 70% higher among males than females. Among adults, the rate is about 40% lower.
- Between 2000 and 2006, the rates of asthma hospitalization for adults are significantly increasing, regardless of sex. ($p<0.05$)[3] Rates for female children are significantly decreasing ($p<0.05$), however the decreasing trend among male children is not significant.[3]

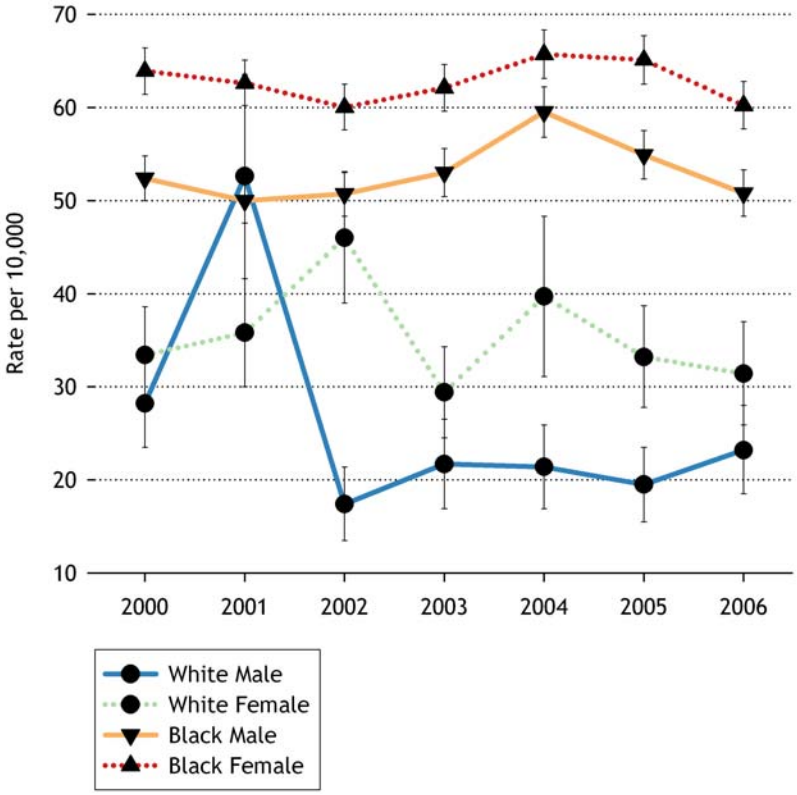
Data Notes:
Source: Michigan Inpatient Database, MDCH
1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-9-CM:493.xx.
3. Spearman's correlation and rank correlation test.

9. Rates[1] of Asthma Hospitalization[2] by Race, Detroit and Michigan, 2000-2006



- In 2006, the rate of asthma hospitalizations among white persons in Detroit was 27.0 per 10,000. The rate among black persons in Detroit was 56.9 per 10,000.
- In Detroit, recent asthma hospitalization rates for black persons are over two times higher than that for white persons.
- Asthma hospitalization rates in Detroit are over two times higher than the rates in Michigan as a whole for white persons, but only about 30% higher for black persons.
- Between 2000 and 2006, the rates of asthma hospitalization for both Detroit and Michigan are not significantly changing, regardless of race. ($p>0.05$ for each)[3]

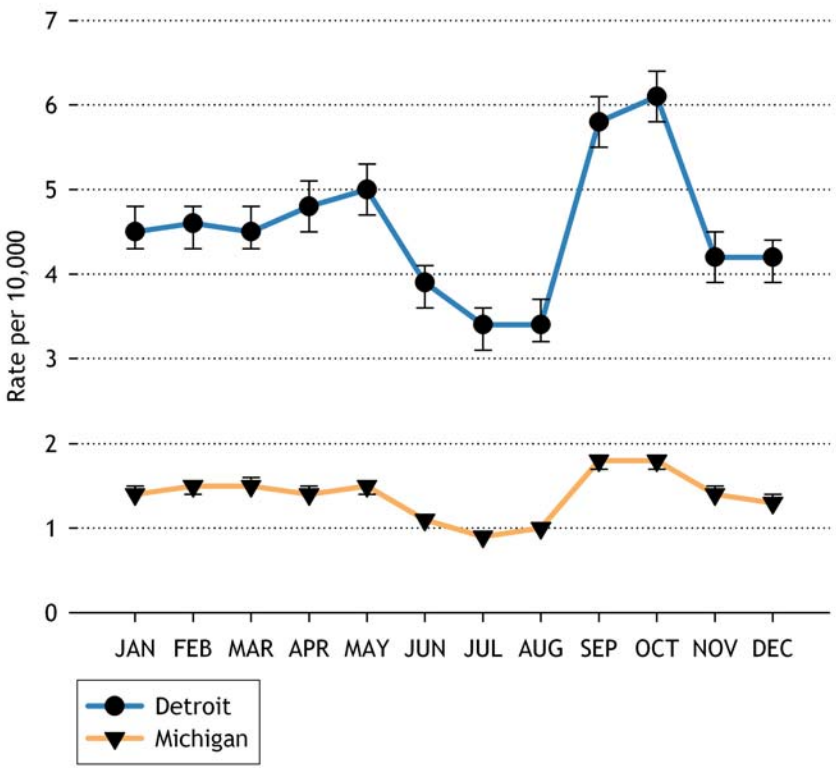
10. Rates[1] of Asthma Hospitalization[2] by Sex-Race Group, Detroit, 2000-2006



- In 2006, the rate of asthma hospitalizations among Detroit white males was 23.2 per 10,000. The rate among Detroit white females was 31.4 per 10,000.
- In 2006, the rate of asthma hospitalizations among Detroit black males was 50.8 per 10,000. The rate among Detroit black females was 60.2 per 10,000.
- The disparity in asthma hospitalization rates between black and white persons is more strongly observed among males, where the rate is consistently over two times higher.
- Between 2000 and 2006, the rates of asthma hospitalization for Detroit males and females are not significantly changing, regardless of race. ($p>0.05$ for each)[3]

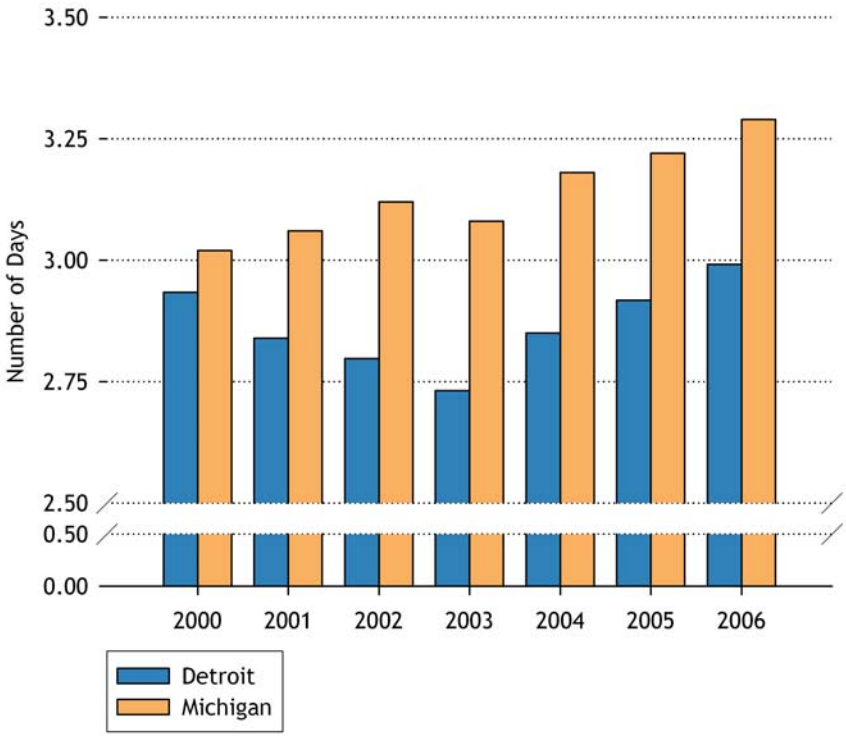
Data Notes:
Source: Michigan Inpatient Database, MDCH
1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-9-CM:493.xx.
3. Spearman's correlation and rank correlation test.

11. Rates[1] of Asthma Hospitalization[2] by Month of Admission, Detroit and Michigan, 2004-2006



- The asthma hospitalization rates for Detroit are consistently over three times higher across the year than the state as a whole.
- Detroit demonstrates a seasonal trend in asthma hospitalization rates similar to the state as a whole - the highest rates in September/October and the lowest rates in July/August.

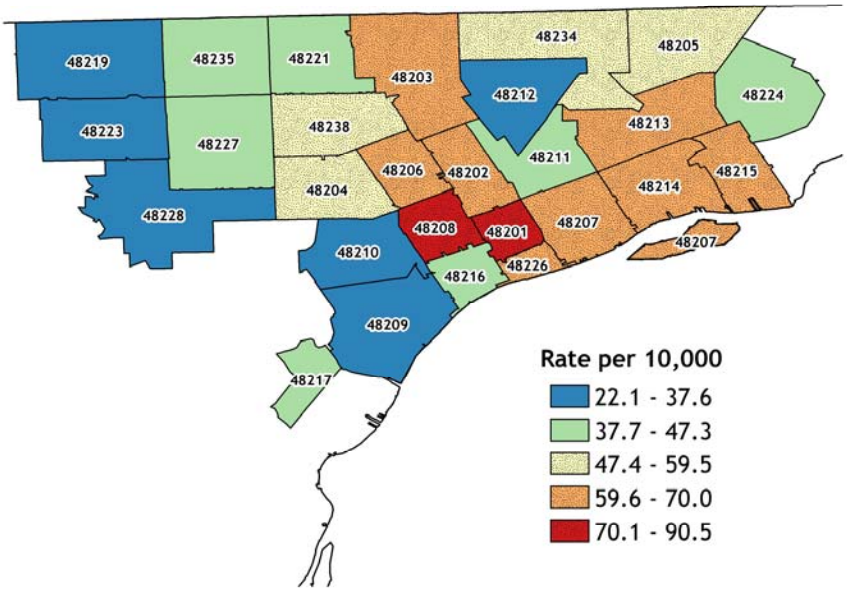
12. Average Length of Stay for Asthma Hospitalization[2], Detroit and Michigan, 2000-2006



- The average length of stay for an asthma hospitalization in Detroit is about 10% shorter than that for the state as a whole.
- Between 2000 and 2006, the average length of stay for an asthma hospitalization in Michigan is significantly increasing. ($p<0.05$)[3] This trend is not observed in Detroit.[3]

Data Notes:
Source: Michigan Inpatient Database, MDCH
1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-9-CM:493.xx.
3. Spearman's correlation and rank correlation test.

13. Rates[1] of Asthma Hospitalization[2] by Zip Code of Residence, Detroit, 2000-2002

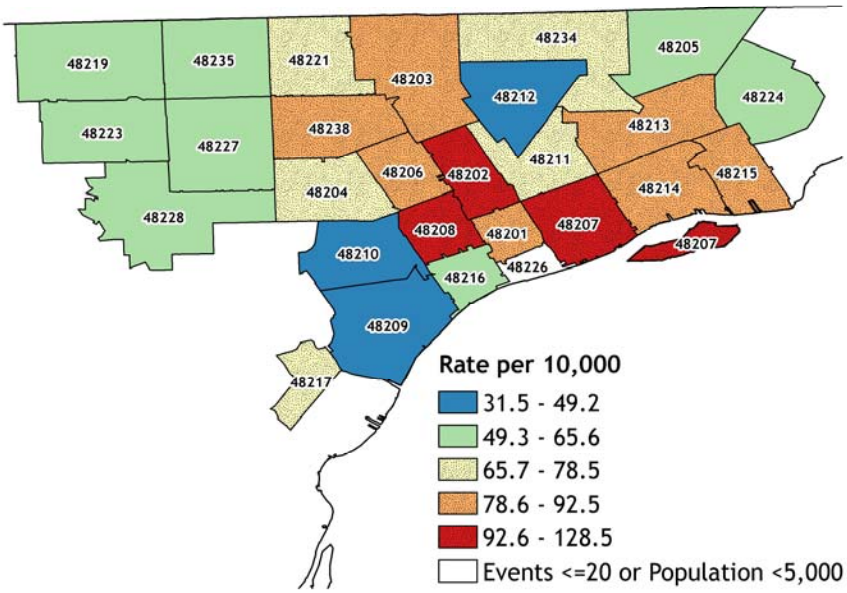


- Detroit zip codes with the highest asthma hospitalization rates are:

  48201
  48208

- During this time period, the rate of asthma hospitalizations for Michigan was 15.4 per 10,000 population. (95% Confidence Interval: 15.3-15.6)

14. Rates[1] of Asthma Hospitalization[2] by Zip Code of Residence for Children (<18 years), Detroit, 2000-2002



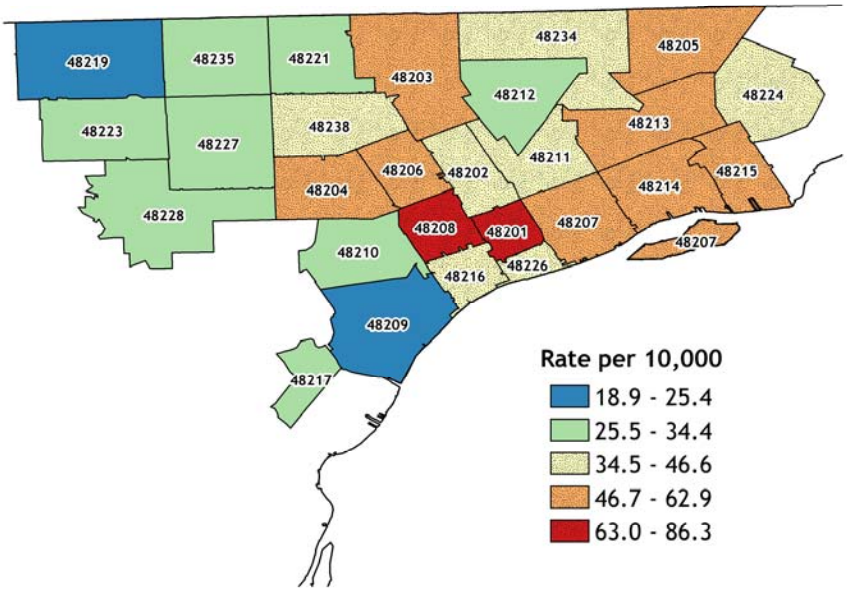
- Detroit zip codes with the highest asthma hospitalization rates for children are:

  48202
  48207
  48208

- During this time period, the rate of asthma hospitalizations for Michigan children was 23.9 per 10,000 population. (95% Confidence Interval: 23.6-24.3)

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

15. Rates[1] of Asthma Hospitalization[2] by Zip Code of Residence for Adults (≥18 years), Detroit, 2000-2002



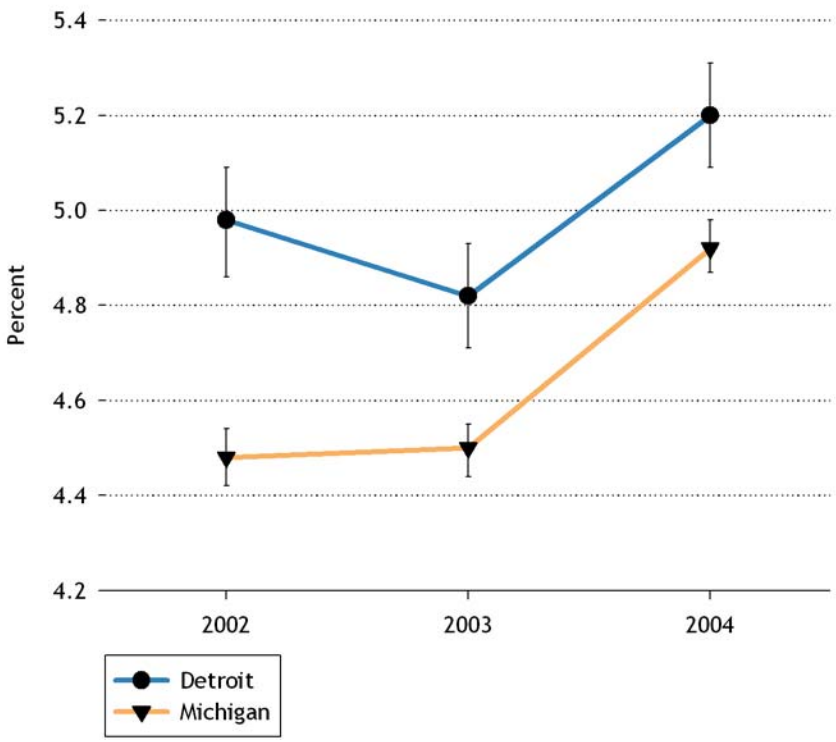
- Detroit zip codes with the highest asthma hospitalization rates for adults are:

  48201
  48208

- During this time period, the rate of asthma hospitalizations for Michigan adults was 12.5 per 10,000 population. (95% Confidence Interval: 12.3-12.6)

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

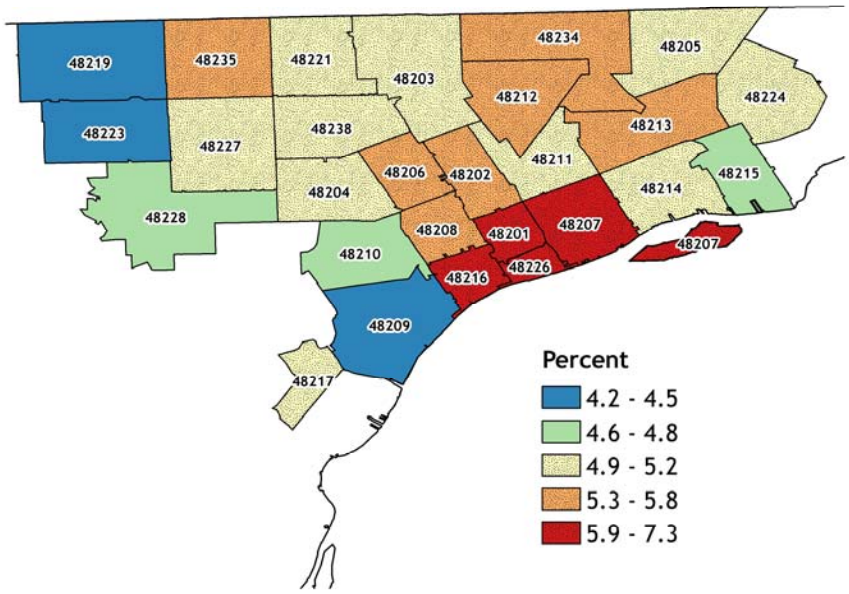
16. Prevalence[1] of Persistent Asthma[2], Children (≤18 years), Medicaid[3], Detroit and Michigan, 2002-2004



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

- About 7,700 Detroit children covered by Medicaid have health care utilization consistent with persistent asthma.
- The prevalence of persistent asthma in Detroit is consistently about 10% higher than that for the state as a whole.

17. Prevalence[1] of Persistent Asthma[2] by Zip Code of Residence, Children (≤18 years), Medicaid[3], Detroit, 2004

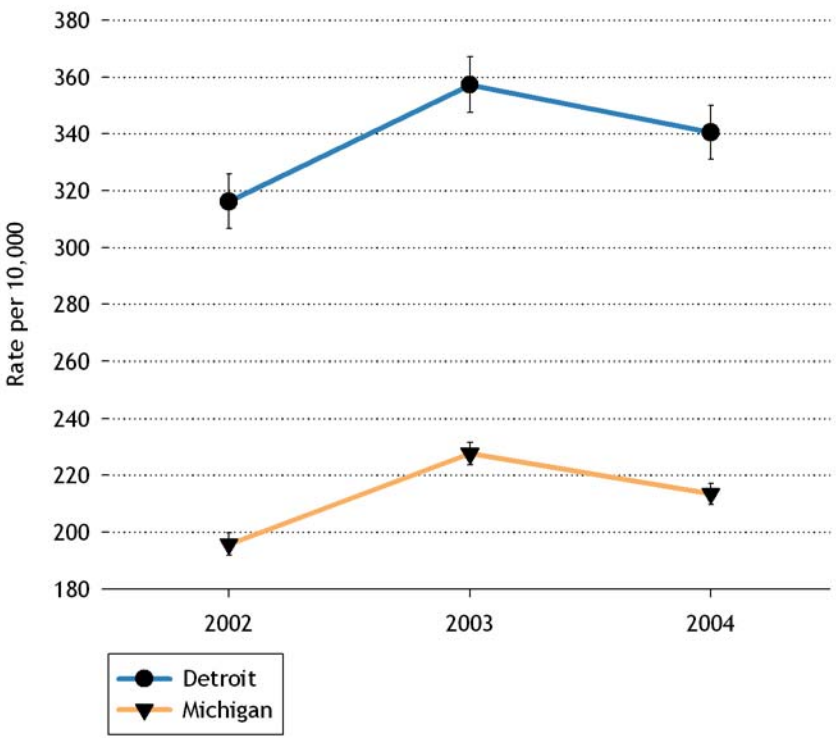


- Detroit zip codes with the highest prevalence of persistent asthma for children covered by Medicaid:

  48201
  48207
  48216
  48226

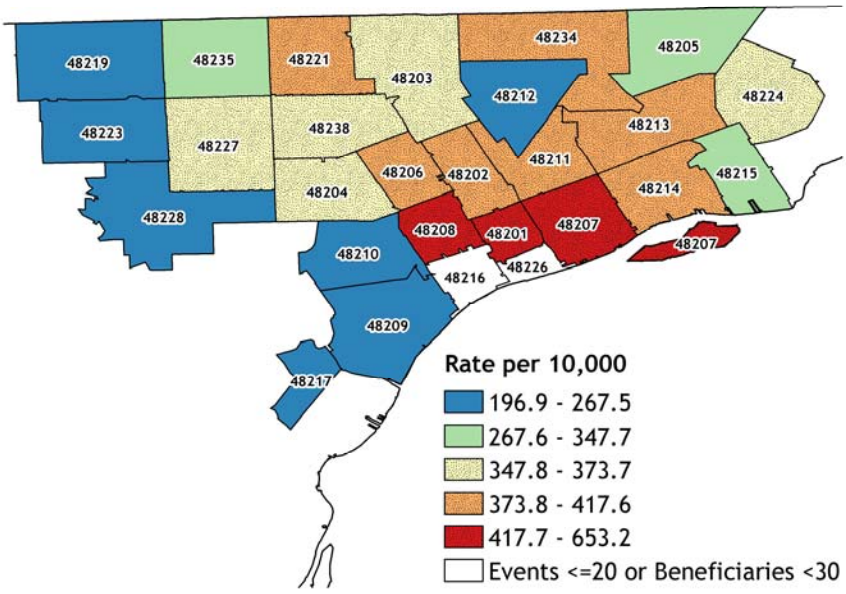
Data Notes:
Source: Data Warehouse, MDCH
1. Age-adjusted to the 2000 US Standard Population
2. Based on annual NCQA HEDIS definition
3. Medicaid population of children ≤18 years is restricted to those who are continuously enrolled in Medicaid with full coverage and no other insurance.

18. Rate of Asthma[1] Emergency Department Visits[2], Children (≤18 years), Medicaid[3], Detroit and Michigan, 2002-2004



- In 2004, the total number of asthma emergency department visits for Detroit children covered by Medicaid was about 5,100. The rate was 340.5 per 10,000.
- The rate of asthma emergency department visits for children in Detroit is consistently 60% higher than that for the state as a whole - a statistically significant difference.

19. Rate[1] of Asthma Emergency Department Visits[2] by Zip Code of Residence, Children (≤18 years), Medicaid[3], Detroit, 2004

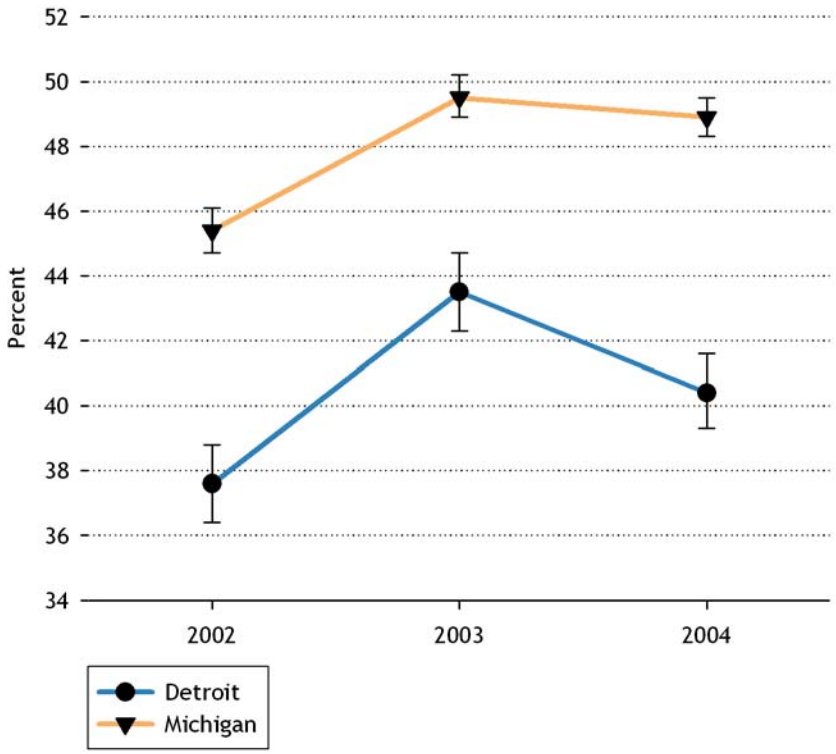


- Detroit zip codes with the highest rates of asthma emergency department visits for children covered by Medicaid:

  48201
  48207
  48208

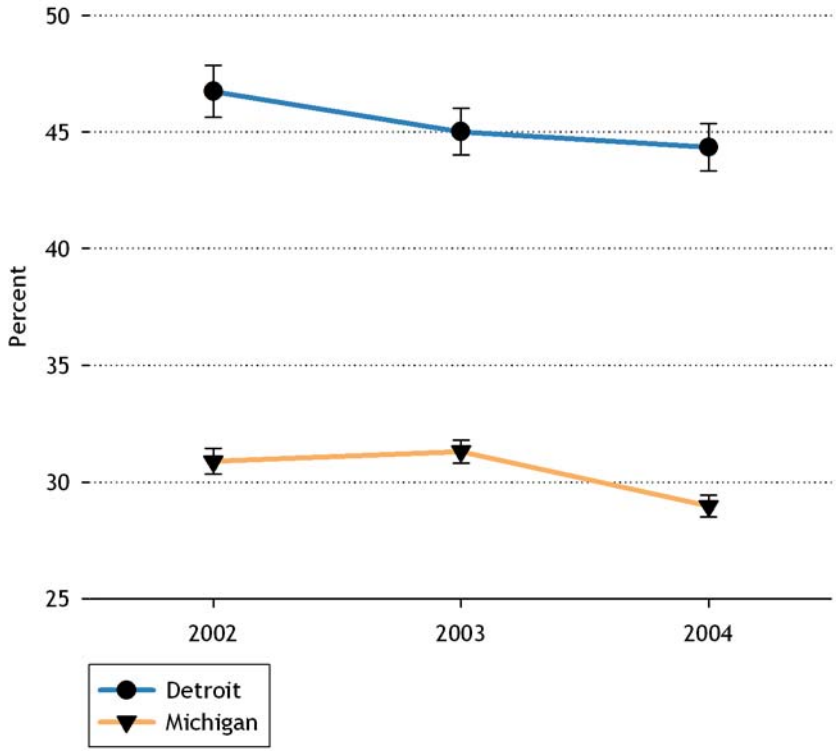
Data Notes:
Source: Data Warehouse, MDCH
1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-9-CM: 493.xx
3. Medicaid population of children ≤18 years is restricted to those who are continuously enrolled in Medicaid with full coverage and no other insurance.

20. Percent[1] of Children (≤18 years) with Persistent Asthma[2] with ≥1 Outpatient Visits for Asthma[3], Medicaid[5], Detroit and Michigan, 2002-2004



- Only 40% of Detroit children covered by Medicaid with persistent asthma had at least one outpatient visit for asthma in 2004.
- According to national guidelines[6], persons with asthma should visit their primary care provider for routine asthma care at least twice a year.
- The proportion of Detroit children covered by Medicaid with persistent asthma with at least one outpatient visit for asthma is 20% lower than that for the state as a whole.

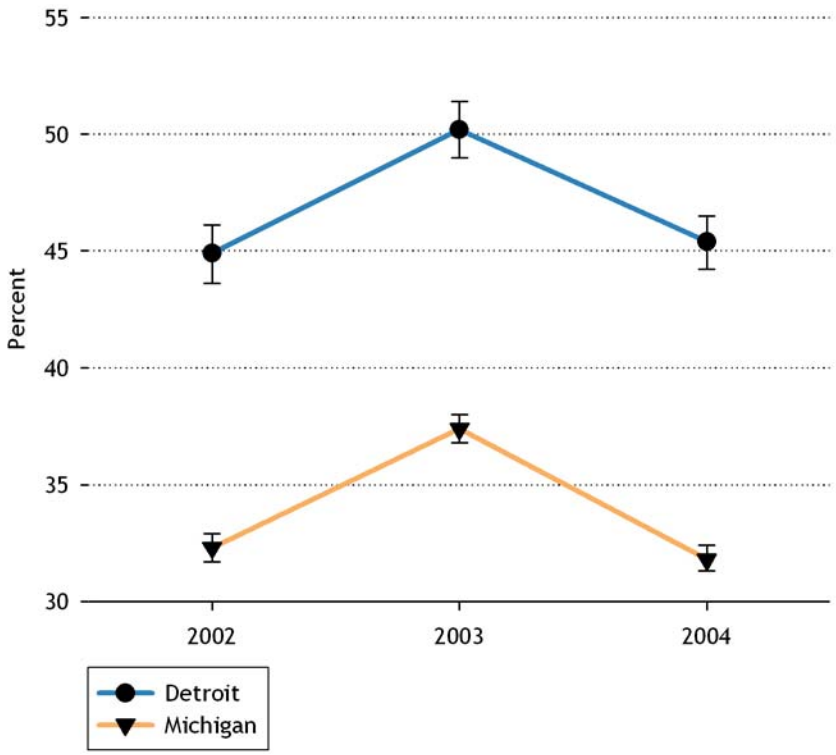
21. Percent of Reliance on Emergency Department[4] among Children (≤18 years) with Persistent Asthma[2], Medicaid[5], Detroit and Michigan, 2002-2004



- The proportion of outpatient visits for asthma that occur in the emergency department for Detroit children covered by Medicaid with persistent asthma is about 44.3%. (2004)
- Emergency department reliance is about 50% higher for Detroit children covered by Medicaid with persistent asthma compared to the state as whole - a statistically significant difference.

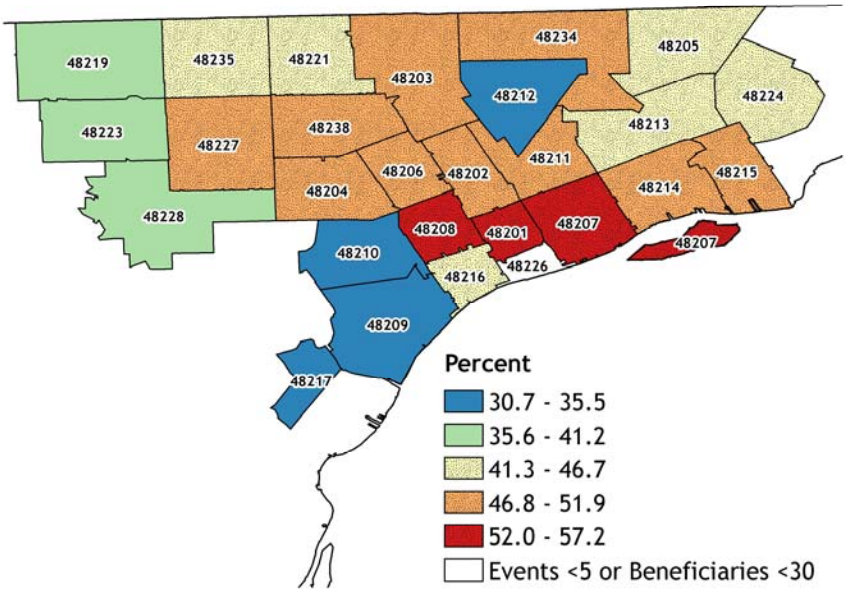
Data Notes:
Source: Data Warehouse, MDCH
1. Age-adjusted to the 2000 US Standard Population
2. Based on annual NCQA HEDIS definition
3. Asthma as primary diagnosis, ICD-9-CM: 493.xx
4. Proportion of all outpatient visits for asthma that are emergency department visits (Asthma as primary diagnosis, ICD-9-CM: 493.xx), age-adjusted to the 2000 US Standard Population
5. Medicaid population of children ≤18 years is restricted to those who are continuously enrolled in Medicaid with full coverage and no other insurance.
6. 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.

22. Percent[1] of Children (≤18 years) with Persistent Asthma[2] with ≥1 Emergency Department Visits[3] for Asthma, Medicaid[4], Detroit and Michigan, 2002-2004



- 45.4% of Detroit children covered by Medicaid with persistent asthma had at least one emergency department visit for asthma in 2004.
- It is the goal of asthma therapy that persons with asthma experience minimal or no emergency department visits.[5]
- The proportion of Detroit children covered by Medicaid with persistent asthma with at least one emergency department visit for asthma is 43% higher than that for the state as a whole.

23. Percent[1] of Children (≤18 years) with Persistent Asthma[2] with ≥1 Emergency Department Visits[3] for Asthma by Zip Code of Residence, Medicaid[4], Detroit, 2004

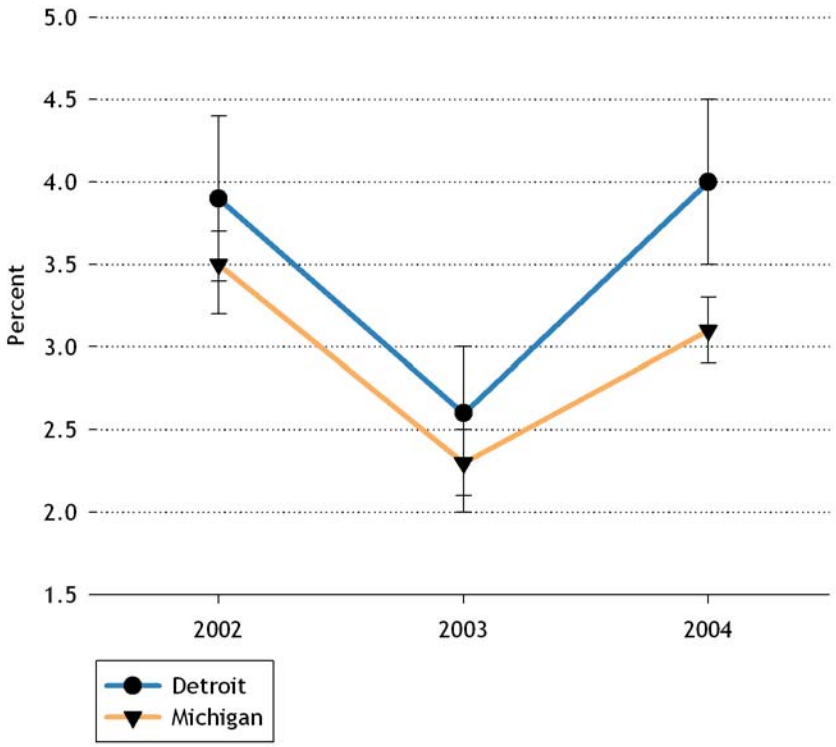


- Detroit zip codes with the highest proportion of Detroit children covered by Medicaid with persistent asthma having at least one emergency department visit for asthma are:

  48201
  48207
  48208

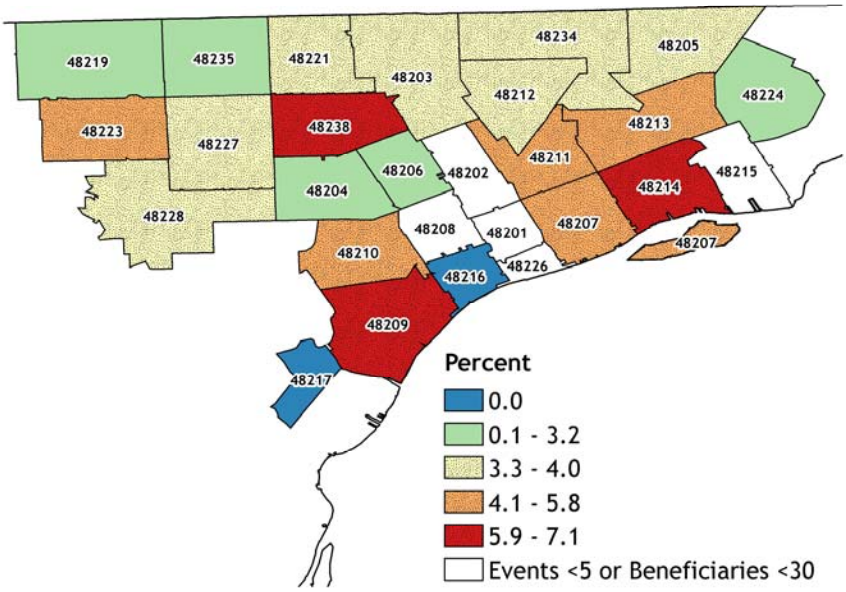
Data Notes:
Source: Data Warehouse, MDCH
1. Age-adjusted to the 2000 US Standard Population
2. Based on annual NCQA HEDIS definition
3. Asthma as primary diagnosis, ICD-9-CM: 493.xx
4. Medicaid population of children ≤18 years is restricted to those who are continuously enrolled in Medicaid with full 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.

24. Percent[1] of Overuse of Short-Acting β-Agonist Medication among Children (≤18 years) with Persistent Asthma[2], Medicaid[3], Detroit and Michigan, 2002-2004



- According to national guidelines[4], it is the goal of asthma therapy that there be minimal use of Short Acting β-Agonist medication - less than one canister per month.
- The prevalence of Short Acting β-Agonist medication overuse among Detroit children covered by Medicaid with persistent asthma is 4%. This is 30% higher the state as whole - a statistically significant difference. (2004)

25. Percent[1] of Overuse of Short-Acting β-Agonist Medication among Children (≤18 years) with Persistent Asthma[2] by Zip Code of Residence, Medicaid[3], Detroit and Michigan, 2004

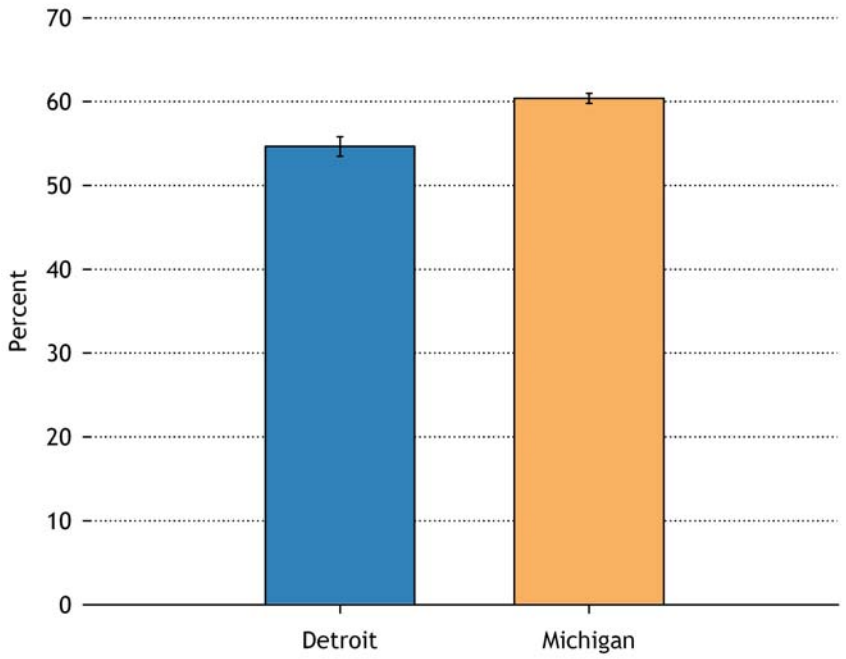


- Detroit zip codes with the highest proportion of Short Acting β-Agonist medication overuse among Detroit children covered by Medicaid with persistent asthma are:

  48209
  48214
  48238

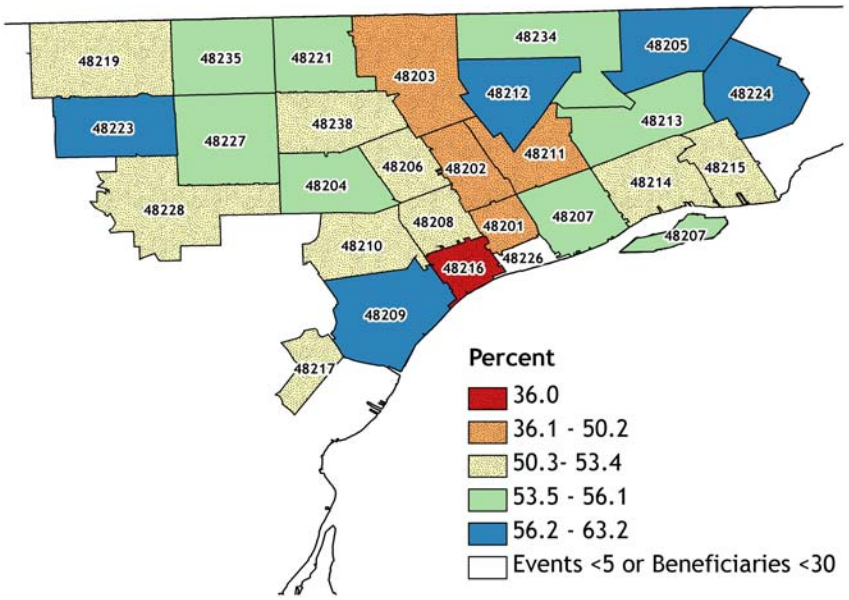
Data Notes:
Source: Data Warehouse, MDCH
1. Age-adjusted to the 2000 US Standard Population
2. Based on annual NCQA HEDIS definition
3. Medicaid population of children ≤18 years is restricted to those who are continuously enrolled in Medicaid with full coverage and no other insurance.
4. National Heart, 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.

26. Percent[1] of Children (≤18 years) with Persistent Asthma[2] with ≥1 Inhaled Corticosteroid Medication[3,4], Medicaid[5], Detroit and Michigan, 2004



- Inhaled corticosteroid medication is the preferred, first line medication for those with persistent asthma.
- In 2004, 54.7% of Detroit children with persistent asthma covered by Medicaid have had ≥1 Inhaled Corticosteroid medication[3] prescription filled. This is significantly less than the state as a whole, 60.4%.

27. Percent[1] of Children (≤18 years) with Persistent Asthma[2] with ≥1 Inhaled Corticosteroid Medication[3,4] by Zip Code of Residence, Medicaid[5], Detroit, 2004

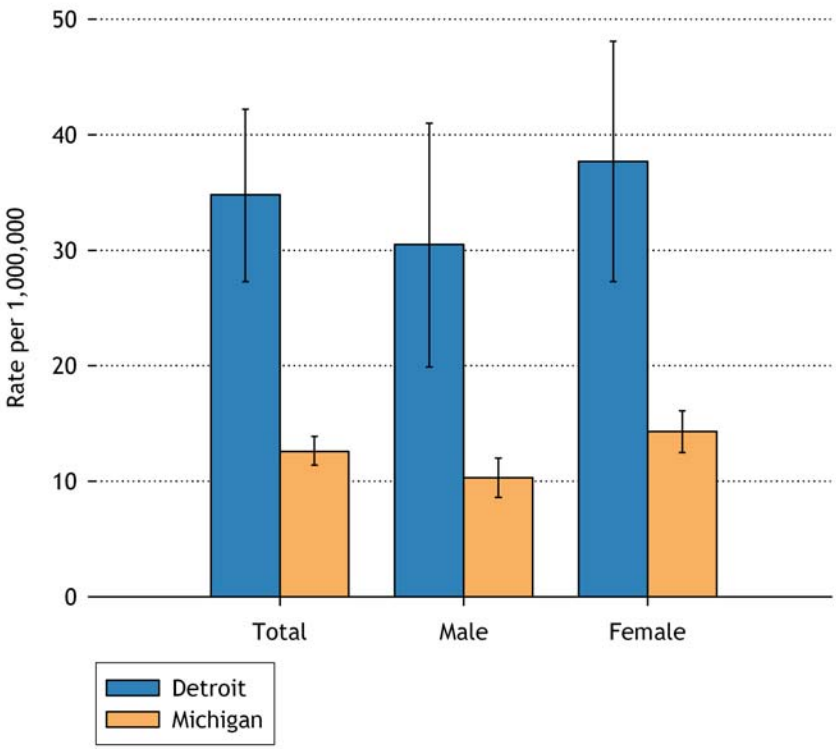


- Detroit zip codes with the lowest proportion (<50%) of Detroit children covered by Medicaid with persistent asthma filling ≥1 Inhaled Corticosteroid medication prescription[3] are:

  48216
  48201
  48202
  48203

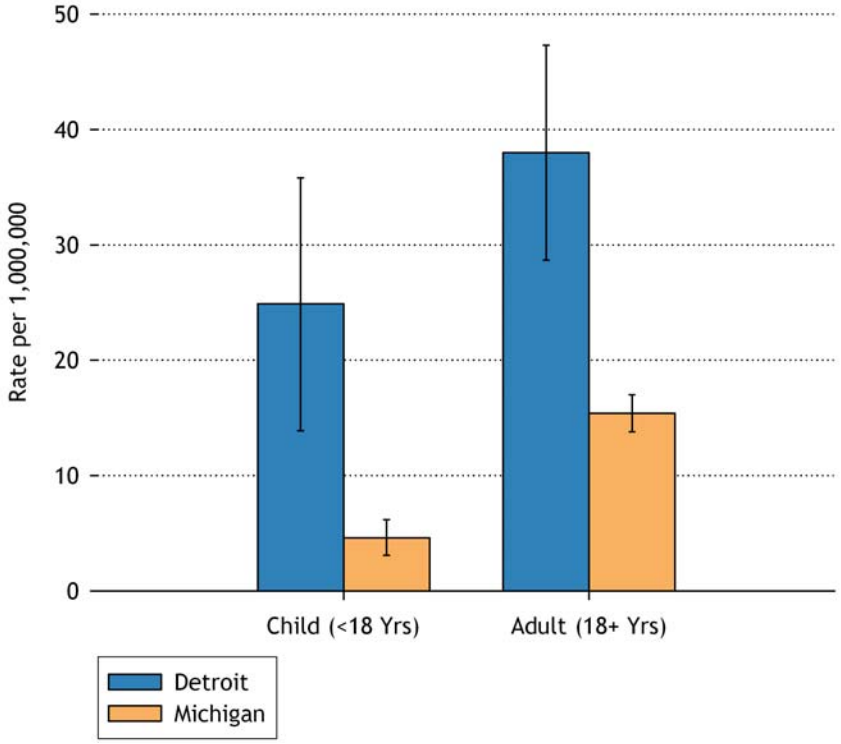
Data Notes:
Source: Data Warehouse, MDCH
1. Age-adjusted to the 2000 US Standard Population
2. Based on annual NCQA HEDIS definition
3. Inhaled corticosteroid medication includes bronchodilator combination therapy.
4. This measure is computed differently than the NCQA HEDIS® measure "Use of Appropriate Medications for People with Asthma." Therefore, results in this report should not be compared to data strictly applying the specifications of the NCQA Hedis® measure.
5. Medicaid population of children ≤18 years is restricted to those who are continuously enrolled in Medicaid with full coverage and no other insurance.

28. Rates[1] of Asthma Death[2] by Sex, Detroit and Michigan, 2004-2006



- Between 2004 and 2006, there were 85 asthma deaths for Detroit residents. The rate of asthma mortality among Detroit residents was 34.8 per 1,000,000.
- 22% of asthma deaths in Michigan were among Detroit residents during this time period, yet only nine percent of Michigan's population lived in Detroit during this time period.
- The rate of asthma death among males was 30.5 per 1,000,000 and the rate for females was 37.7 per 1,000,000. (2004-2006)
- Rates of asthma death in Detroit are over two times higher than rates for Michigan as a whole, for the total population and for both sexes.
- Rates of asthma death are not significantly different between males and females for either Detroit or Michigan.

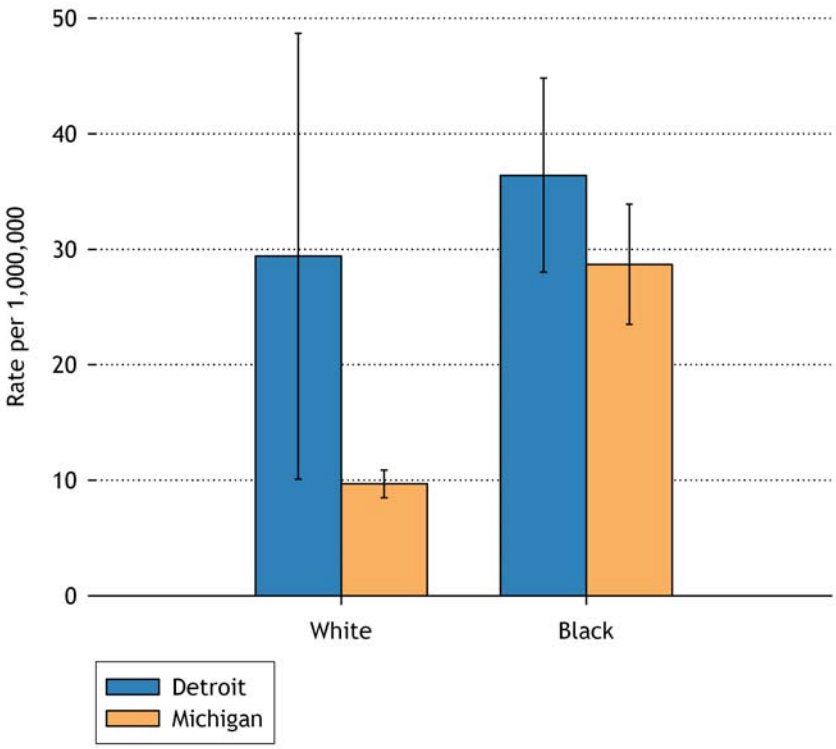
29. Rates[1] of Asthma Death[2] by Age Group, Detroit and Michigan, 2004-2006



- The rate of asthma death for Detroit children is 24.9 per 1,000,000. (2004-2006)
- The rate of asthma death for Detroit adults is 38.0 per 1,000,000. (2004-2006)
- Rates of asthma death for Detroit children are 5.4 times higher than rates for Michigan children as a whole.
- Rates of asthma death for Detroit adults are 2.5 times higher than rates for Michigan adults as a whole.

Data Notes:
Source: Michigan Death File, MDCH
1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary cause of death, ICD-10:J45-J46.

30. Rates[1] of Asthma Death[2] by Race, Detroit and Michigan, 2004-2006



- The rate of asthma death for white persons in Detroit is 29.4 per 1,000,000. (2004-2006)
- The rate of asthma death for black persons in Detroit is 36.4 per 1,000,000. (2004-2006)
- Rates of asthma death for white persons in Detroit are three times higher than rates for white persons in Michigan as a whole.
- Rates of asthma death among black persons in Detroit are not significantly different than rates for Michigan as a whole.

Data Notes:
Source: Michigan Death File, MDCH
1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary cause of death, ICD-10:J45-J46.

Prevalence of Asthma (%), Detroit, Michigan, and the United States, 2005

			Detroit	Michigan	United States
Current Asthma for Adults[1]	Total [Figure 2]		13.7 (10.5-17.7)	9.0 (8.4-9.6)	-
Lifetime Asthma for High School Children[2, 3, 4]	Total [Figure 3]		21.7 (19.3-24.2)	19.6 (17.5-21.8)	17.1 (16.2-18.0)
	Sex [Figure 3]	Male	22.4 (19.1-25.7)	21.3 (18.4-24.2)	17.3 (15.9-18.7)
		Female	21.2 (17.7-24.8)	18.0 (15.5-20.5)	17.0 (15.7-18.3)
	Grade [Figure 4]	Grade 9	22.9 (19.4-26.4)	21.3 (16.6-26.1)	18.5 (16.4-20.6)
		Grade 10	22.7 (18.0-27.5)	18.9 (14.9-22.8)	17.6 (15.7-19.5)
		Grade 11	16.7 (10.8-22.6)	19.0 (16.2-21.7)	16.4 (14.7-18.1)
		Grade 12	22.9 (18.2-27.6)	18.6 (15.6-21.6)	15.4 (13.7-17.1)

1. Source: Behavioral Risk Factor Survey, MDCH
2. Source: Youth Risk Behavior Survey, Detroit Public Schools
3. Source: Youth Risk Behavior Survey, MDE
4. Source: Source: Centers for Disease Control and Prevention.Youth Risk Behavior Surveillance — United States, 2005. Surveillance Summaries, June 9, 2006. MMWR 2006;55(No. SS-5).

Number of Asthma Hospitalizations, Detroit, 2000-2006

		2000	2001	2002	2003	2004	2005	2006
Total		4,887	4,645	4,474	4,562	4,819	4,462	4,184
Sex	Male	2,175	1,963	1,919	1,971	2,164	1,880	1,781
	Female	2,712	2,682	2,555	2,591	2,655	2,582	2,403
Age	<18 Years	2,249	2,078	1,787	1,856	1,942	1,638	1,338
	≥18 Years	2,638	2,567	2,687	2,706	2,877	2,824	2,846
Sex-Age	Male, <18 Years	1,391	1,235	1,119	1,138	1,260	1,022	872
	Male, ≥18 Years	784	728	800	833	904	858	909
	Female, <18 Years	858	843	668	718	682	616	466
	Female, ≥18 Years	1,854	1,839	1,887	1,873	1,973	1,966	1,937
Race	White	320	302	288	250	212	247	234
	Black	4,540	4,312	4,149	4,244	4,540	4,185	3,868
Sex-Race	White, Male	144	121	95	97	91	94	97
	White, Female	176	181	193	153	121	153	137
	Black, Male	2,019	1,826	1,803	1,840	2,040	1,769	1,647
	Black, Female	2,521	2,486	2,346	2,404	2,500	2,416	2,221

Age-Adjusted Rate of Asthma Hospitalization (per 10,000), Detroit, 2000-2006

		2000	2001	2002	2003	2004	2005	2006
Total [Figure 5]		53.6 (52.1-55.2)	51.5 (50.0-53.0)	50.0 (48.5-51.5)	51.2 (49.7-52.7)	57.6 (55.9-59.2)	53.9 (52.3-55.5)	51.2 (49.7-52.8)
Sex [Figure 6]	Male	46.7 (44.7-48.8)	45.8 (43.6-47.9)	42.6 (40.6-44.6)	44.8 (42.8-46.9)	52.3 (50.0-54.5)	47.2 45.0-49.4)	44.9 (42.8-47.1)
	Female	58.1 (55.9-60.3)	55.8 (53.7-57.9)	54.8 (52.7-57.0)	55.3 (53.2-57.5)	60.4 (58.1-62.7)	58.1 (55.8-60.3)	55.4 (53.2-57.6)
Age [Figure 7]	<18 Years	80.6 (77.2-83.9)	81.1 (77.6-84.6)	65.5 (62.5-68.6)	66.5 (63.5-69.5)	79.4 (75.8-82.9)	66.8 (63.6-70.1)	57.0 (53.9-60.0)
	≥18 Years	44.3 (42.6-46.0)	41.2 (39.6-42.8)	44.6 (42.9-46.3)	45.9 (44.2-47.7)	50.0 (48.2-51.8)	49.5 (47.6-51.3)	49.3 (47.4-51.1)
Sex-Age [Figure 8]	Male, <18 Years	95.8 (90.7-100.8)	97.0 (91.6-102.4)	79.6 (75.0-84.3)	81.0 (76.2-85.7)	99.8 (94.2-105.3)	83.8 (78.7-89.0)	73.1 (68.2-78.0)
	Male, ≥18 Years	29.7 (27.6-31.8)	28.0 (25.8-30.2)	29.8 (27.7-31.9)	32.3 (30.0-34.5)	35.8 (33.4-38.1)	34.5 (32.2-36.9)	35.2 (32.8-37.5)
	Female, <18 Years	64.3 (60.0-68.7)	65.5 (61.0-69.9)	50.4 (46.6-54.3)	52.0 (48.1-55.8)	57.5 (53.2-61.9)	50.0 (46.0-53.9)	40.2 (36.5-43.9)
	Female, ≥18 Years	55.9 (53.3-58.5)	52.4 (50.0-54.8)	56.4 (53.8-58.9)	56.5 (53.9-59.1)	61.4 (58.7-64.2)	60.9 (58.2-63.6)	60.7 (58.0-63.4)
Race [Figure 9]	White	30.6 (27.7-34.0)	35.9 (31.5-40.2)	29.4 (25.8-33.0)	25.2 (21.9-28.5)	27.8 (23.9-31.7)	25.9 (22.6-29.1)	27.0 (23.5-30.6)
	Black	59.8 (58.1-61.6)	57.4 (55.7-59.1)	56.9 (55.2-58.7)	59.0 (57.2-60.8)	54.2 (62.3-66.0)	61.6 (59.7-63.5)	56.9 (55.1-58.7)
Sex-Race [Figure 10]	White, Male	28.2 (23.5-32.8)	52.6 (41.6-63.5)	17.4 (13.5-21.4)	21.7 (16.9-26.5)	21.4 (16.9-25.9)	19.5 (15.5-23.5)	23.2 (18.5-28.0)
	White, Female	33.4 (28.3-38.6)	35.8 (30.0-41.6)	46.0 (39.0-53.0)	29.4 (24.5-34.3)	39.7 (31.1-48.3)	33.2 (27.8-38.7)	31.4 (25.9-37.0)
	Black, Male	52.4 (50.0-54.8)	50.0 (47.6-52.4)	50.7 (48.3-53.1)	53.0 (50.4-55.6)	59.5 (56.8-62.2)	54.9 (52.3-57.5)	50.8 (48.3-53.3)
	Black, Female	63.9 (61.4-66.4)	62.6 (60.2-65.1)	60.0 (57.6-62.5)	62.1 (59.6-64.6)	65.7(63.1-68.3)	65.1 (62.5-67.7)	60.2 (57.7-62.8)

Source: Michigan Inpatient Database, MDCH

Number of Asthma Hospitalizations (per 10,000), Michigan, 2000-2006

		2000	2001	2002	2003	2004	2005	2006
Total		15,878	15,363	14,696	16,572	16,567	17,423	16,238
Sex	Male	6,741	6,271	5,971	6,788	6,669	6,841	6,353
	Female	9,137	9,092	8,725	9,784	9,898	10,582	9,885
Age	<18 Years	6,688	6,089	5,359	5,974	5,757	5,746	4,824
	≥18 Years	9,190	9,274	9,337	10,598	10,810	11,677	11,414
Race	White	8,773	8,541	8,133	9,367	8,933	10,015	9,116
	Black	6,888	6,518	6,279	6,788	7,142	7,125	6,631

Age-Adjusted Rate of Asthma Hospitalization (per 10,000), Michigan, 2000-2006

		2000	2001	2002	2003	2004	2005	2006
Total [Figure 5]		16.0 (15.8-16.3)	15.5 (15.2-15.7)	14.7 (14.5-15.0)	16.6 (16.4-16.9)	16.5 (16.2-16.8)	17.3 (17.1-17.6)	16.1 (15.9-16.4)
Sex [Figure 6]	Male	13.7 (13.4-14.0)	12.8 (12.5-13.1)	12.2 (11.9-12.5)	14.0 (13.6-14.3)	13.7 (13.4-14.1)	14.0 (13.7-14.4)	13.2 (12.8-13.5)
	Female	18.0 (17.6-18.4)	17.8 (17.4-18.2)	16.9 (16.5-17.3)	18.9 (18.5-19.3)	18.9 (18.5-19.3)	20.2 (19.8-20.6)	18.8 (18.4-19.1)
Age [Figure 7]	<18 Years	26.3 (25.6-26.9)	24.1 (23.5-24.7)	21.3 (20.7-21.8)	24.1 (23.5-24.7)	23.3 (22.7-23.9)	23.4 (22.8-24.0)	19.9 (19.4-20.5)
	≥18 Years	12.5 (12.2-12.7)	12.5 (12.2-12.7)	12.5 (12.2-12.7)	14.0 (13.7-14.3)	14.1 (13.9-14.4)	15.2 (14.9-15.5)	14.8 (14.5-15.1)
Race [Figure 9]	White	10.8 (10.6-11.0)	10.5 (10.2-10.7)	9.9 (9.7-10.1)	11.4 (11.1-11.6)	10.7 (10.5-10.9)	12.0 (11.7-12.2)	10.8 (10.6-11.1)
	Black	45.2 (44.1-46.3)	43.2 (42.1-44.3)	42.0 (41.0-43.1)	45.2 (44.1-46.3)	48.5 (47.3-49.6)	48.4 (47.2-49.5)	45.9 (44.8-47.1)

Source: Michigan Inpatient Database, MDCH

Age-Adjusted Rate of Asthma Hospitalization (per 10,000) by Month of Admission, Detroit and Michigan, 2004-2006

[Figure 11]	Detroit		Michigan	
Month	Count	Rate	Count	Rate
January	1,095	4.5 (4.3-4.8)	4,337	1.4 (1.4-1.5)
February	1,115	4.6 (4.3-4.8)	4,532	1.5 (1.4-1.5)
March	1,109	4.5 (4.3-4.8)	4,673	1.5 (1.5-1.6)
April	1,193	4.8 (4.5-5.1)	4,286	1.4 (1.4-1.5)
May	1,249	5.0 (4.7-5.3)	4,455	1.5 (1.4-1.5)
June	951	3.9 (3.6-4.1)	3,330	1.1 (1.1-1.1)
July	817	3.4 (3.1-3.6)	2,700	0.9 (0.9-0.9)
August	835	3.4 (3.2-3.7)	2,990	1.0 (1.0-1.0)
September	1,464	5.8 (5.5-6.1)	5,304	1.8 (1.7-1.8)
October	1,554	6.1 (5.8-6.4)	5,339	1.8 (1.7-1.8)
November	1,059	4.2 (3.9-4.5)	4,268	1.4 (1.4-1.5)
December	1,024	4.2 (3.9-4.4)	4,014	1.3 (1.3-1.4)

Average Length of Stay for Asthma Hospitalization (per 10,000), Detroit and Michigan, 2000-2006

[Figure 12]	Detroit	Michigan
2000	2.9	3.0
2001	2.8	3.1
2002	2.8	3.1
2003	2.7	3.1
2004	2.9	3.2
2005	2.9	3.2
2006	3.0	3.3

Source: Michigan Inpatient Database, MDCH

Age-Adjusted Rate of Asthma Hospitalization (per 10,000) for Detroit Zip Codes, 2000-2002

	Total [Figure 13]		<18 Years [Figure 14]		≥18 Years [Figure 15]	
Zip Code	Count	Rate	Count	Rate	Count	Rate
48201	395	90.5 (81.5-99.5)	80	84.6 (65.9-103.4)	315	86.3 (75.9-96.6)
48202	417	65.9 (59.5-72.2)	198	128.5 (110.5-146.4)	219	42.5 (36.3-48.7)
48203	869	63.2 (58.9-67.5)	379	88.3 (79.3-97.2)	490	54.5 (49.6-59.3)
48204	754	59.5 (55.2-63.8)	309	78.5 (69.7-87.3)	445	52.9 (47.9-57.8)
48205	1,053	53.8 (50.2-57.4)	513	65.6 (59.9-71.3)	540	49.6 (45.1-54.1)
48206	654	67.7 (62.4-73.0)	272	88.3 (77.8-98.8)	382	60.5 (54.4-66.7)
48207	499	66.1 (60.2-71.9)	175	101.8 (86.7-116.9)	324	53.4 (47.6-59.3)
48208	319	83.8 (74.5-93.0)	109	106.2 (86.2-126.3)	210	75.9 (65.6-86.3)
48209	261	22.1 (19.2-25.0)	129	31.5 (26.1-37.0)	132	18.9 (15.5-22.3)
48210	441	35.8 (32.3-39.3)	199	46.8 (40.3-53.4)	242	32.0 (27.9-36.1)
48211	162	47.3 (39.8-54.7)	82	75.8 (59.4-92.3)	80	37.3 (29.1-45.6)
48212	489	35.0 (31.9-38.2)	209	49.2 (42.5-55.9)	280	30.1 (26.5-33.7)
48213	868	62.8 (58.5-67.1)	431	92.5 (83.7-101.2)	437	52.4 (47.5-57.4)
48214	636	63.4 (58.4-68.4)	207	82.9 (71.6-94.2)	429	56.6 (51.1-62.1)
48215	412	70.0 (63.1-76.9)	170	90.4 (76.8-104.0)	242	62.9 (54.9-70.9)
48216	79	42.6 (32.9-52.3)	31	55.9 (36.2-75.6)	48	38.0 (26.9-49.1)
48217	125	40.7 (33.5-47.9)	56	70.9 (52.3-89.5)	69	30.2 (22.9-37.4)
48219	620	34.0 (31.3-36.7)	310	59.1 (52.5-65.6)	310	25.4 (22.5-28.2)
48221	548	41.3 (37.9-44.8)	251	75.7 (66.3-85.1)	297	29.4 (26.0-32.8)
48223	431	37.6 (33.9-41.4)	203	54.2 (46.7-61.7)	228	31.9 (27.5-36.2)
48224	771	46.4 (42.9-49.8)	355	63.2 (56.6-69.8)	416	40.4 (36.4-44.5)
48226	75	61.9 (43.5-80.3)	15	*	60	41.9 (30.8-53.0)
48227	770	41.2 (38.2-44.2)	357	61.0 (54.6-67.3)	413	34.4 (31.0-37.8)
48228	717	35.3 (32.6-37.9)	350	54.0 (48.4-59.7)	367	28.7 (25.7-31.7)
48234	744	52.8 (49.0-56.7)	346	77.3 (69.1-85.5)	398	44.3 (40.0-48.7)
48235	646	40.4 (37.3-43.6)	274	65.3 (57.5-73.0)	372	31.8 (26.8-35.1)
48238	763	55.7 (51.6-59.7)	343	81.8 (73.1-90.5)	420	46.6 (42.1-51.0)

Source: Michigan Inpatient Database, MDCH
*Number of events ≤20 or population <5000.

Asthma Burden (Age-Adjusted) for Children Covered by Medicaid, Detroit and Michigan, 2002-2004

		Among All Children Covered by Medicaid Average n per year: Detroit=142,730; Michigan=542,961		Among Children Covered by Medicaid with Persistent Asthma Average n per year: Detroit=7,257; Michigan=25,761				
	Year	Prevalence [Figure 16]	Rate of Emergency Department Visits (per 10,000) [Figure 18]	Percent (%) with 1+ Outpatient Visits [Figure 20]	Percent (%) Emergency Department Reliance [Figure 21]	Percent (%) with 1+ Emergency Department Visits [Figure 22]	Percent (%) Overuse of Short-Acting β-Agonist Medication [Figure 24]	Percent (%) with 1+ Inhaled Corticosteroid Medication‡ Rx [Figure 26]
Detroit	2002	5.0 (4.9-5.1)	316.2 (306.6-325.8)	37.6 (36.4-38.8)	46.8 (45.6-47.9)	44.9 (43.6-46.1)	3.9 (3.4-4.4)	*
	2003	4.8 (4.7-4.9)	357.3 (347.6-367.1)	43.5 (42.3-44.7)	45.0 (44.0-46.0)	50.2 (49.0-51.4)	2.6 (2.1-3.0)	*
	2004	5.2 (5.1-5.3)	340.5 (331.1-349.9)	40.4 (39.3-41.6)	44.3 (43.3-45.4)	45.4 (44.2-46.5)	4.0 (3.5-4.5)	54.7 (53.5-55.8)
Michigan	2002	4.5 (4.4-4.5)	195.8 (191.9-199.7)	45.4 (44.7-46.1)	30.9 (30.3-31.4)	32.3 (31.7-32.9)	3.5 (3.2-3.7)	*
	2003	4.5 (4.4-4.6)	227.6 (223.6-231.6)	49.5 (48.9-50.2)	31.3 (30.8-31.8)	37.4 (36.8-38.0)	2.3 (2.0-2.5)	*
	2004	4.9 (4.9-5.0)	213.5 (209.8-217.3)	48.9 (48.3-49.5)	29.0 (28.5-29.4)	31.8 (31.3-32.4)	3.1 (2.9-3.3)	60.4 (59.8-61.0)

Source: Data Warehouse, MDCH
*Insufficient data.
‡ Inhaled corticosteroid medication does include bronchodilator combination therapy.

Asthma Burden (Age-Adjusted) for Children Covered by Medicaid for Detroit Zip Codes 2004

			Among All Children Covered by Medicaid		Among Children Covered by Medicaid with Persistent Asthma		
Zip Code	Number of Children Covered by Medicaid	Number of Children Covered by Medicaid with Persistent Asthma	Prevalence [Figure 17]	Rate of Emergency Department Visits (per 10,000) [Figure 19]	Percent (%) with 1+ Emergency Department Visits [Figure 23]	Percent (%) Overuse of Short-Acting β-Agonist Medication [Figure 25]	Percent (%) with 1+ Inhaled Corticosteroid Medication‡ Rx [Figure 27]
48201	1,616	120	7.0 (5.8-8.2)	653.2 (531.7-774.8)	57.2 (45.9-68.6)	*	48.9 (37.4-60.3)
48202	2,864	158	5.4 (4.6-6.3)	393.0 (320.8-465.3)	50.1 (41.7-58.5)	*	49.6 (41.1-58.2)
48203	8,182	429	5.2 (4.7-5.7)	354.0 (313.1-394.8)	48.5 (43.7-53.2)	3.9 (1.8-5.9)	49.9 (45.0-54.8)
48204	7,330	387	5.2 (4.7-5.8)	359.3 (315.9-402.7)	48.2 (43.0-53.3)	2.4 (0.9-3.9)	54.2 (49.1-59.3)
48205	12,748	664	5.2 (4.8, 5.6)	347.7 (314.8-380.6)	45.2 (41.4-49.0)	4.0 (2.4-5.6)	57.6 (53.7-61.4)
48206	5,548	319	5.6 (5.0-6.2)	417.6 (364.0-471.3)	51.9 (46.0-57.9)	3.0 (0.6-5.5)	52.5 (46.5-58.6)
48207	2,926	215	7.3 (6.3-8.2)	575.5 (488.2-662.8)	56.7 (49.8-63.6)	5.8 (2.0-9.6)	56.1 (49.0-63.1)
48208	2,035	111	5.4 (4.4-6.4)	509.0 (411.9-606.1)	55.8 (45.6-66.0)		53.3 (42.9-63.7)
48209	5,838	268	4.2 (3.7-4.7)	196.9 (159.9-233.9)	34.8 (27.7-42.0)	7.1 (2.7-11.4)	57.5 (50.4-64.7)
48210	7,451	381	4.8 (4.3-5.2)	242.6 (208.6-276.5)	35.3 (30.1-40.5)	5.0 (2.4-7.5)	51.8 (46.0-57.6)
48211	1,845	98	5.1 (4.1-6.1)	382.9 (294.9-470.8)	50.2 (37.9-62.5)	4.7 (0.8-8.7)	50.2 (38.0-62.4)
48212	7,272	414	5.5 (4.9-6.0)	260.1 (223.1-297.2)	35.5 (30.2-40.8)	3.9 (1.7-6.0)	63.2 (57.9-68.4)
48213	8,567	493	5.8 (5.3-6.3)	384.9 (342.9-426.9)	45.9 (41.5-50.2)	5.3 (3.2-7.4)	55.5 (51.0-59.9)
48214	4,333	227	5.2 (4.5-5.8)	405.0 (344.7-465.3)	51.8 (44.9-58.7)	6.8 (3.0-10.6)	51.6 (44.8-58.5)
48215	3,577	165	4.6 (3.9-5.3)	328.5 (268.4-388.5)	50.2 (42.7-57.7)	*	51.8 (44.1-59.6)
48216	626	43	6.7 (4.7-8.7)	*	45.2 (33.7-56.7)	0.0	36.0 (23.4-48.5)
48217	1,150	59	5.1 (3.8-6.4)	231.3 (141.6-320.9)	30.7 (17.4-44.1)	0.0	52.7 (37.5-67.8)
48219	6,901	313	4.5 (4.0-5.0)	254.8 (217.1-292.5)	40.8 (35.4-46.1)	3.2 (1.2-5.2)	53.4 (47.7-59.1)
48221	3,980	205	5.2 (4.5-5.8)	390.8 (329.3-452.3)	46.7 (40.2-53.3)	3.8 (0.9-6.6)	55.2 (48.1-62.4)
48223	5,136	233	4.5 (3.9-5.0)	267.5 (223.5-311.5)	41.2 (34.9-47.4)	5.8 (1.9-9.6)	58.0 (51.2-64.7)
48224	7,268	381	5.2 (4.7-5.7)	355.8 (312.0-399.6)	46.6 (41.4-51.7)	2.9 (0.9-4.9)	58.5 (53.3-63.7)
48226	155	10	7.0 (2.8-11.3)	*	*	0.0	*
48227	9,318	468	5.1 (4.6-5.5)	365.4 (325.6-405.2)	48.4 (43.7-53.0)	3.8 (1.8-5.8)	54.9 (50.3-59.5)
48228	9,930	483	4.8 (4.3-5.2)	261.5 (229.6-293.5)	38.8 (34.1-43.5)	3.7 (1.5-6.0)	53.1 (48.4-57.9)
48234	7,195	405	5.6 (5.0-6.1)	393.9 (347.5-440.3)	50.5 (45.6-55.5)	3.4 (1.4-5.5)	56.0 (50.9-61.1)
48235	5,435	296	5.6 (5.0-6.2)	345.9 (295.2-396.5)	45.0 (45.6-50.6)	3.0 (1.0-5.1)	54.3 (48.7-59.9)
48238	7,632	395	5.2 (4.7-5.7)	373.7 (329.6-417.9)	51.8 (46.7-57.0)	6.5 (3.9-9.2)	52.5 (47.2-57.7)

Source: Data Warehouse, MDCH
*Insufficient data.
‡ Inhaled corticosteroid medication does include bronchodilator combination therapy.

Age-Adjusted Rate of Asthma Death (per 1,000,000), Detroit and Michigan, 2004-2006

		Detroit		Michigan	
		Count	Rate	Count	Rate
Total		85	34.8 (27.3-42.2)	393	12.6 (11.4-13.9)
Sex	Male	34	30.5 (19.9-41.0)	146	10.3 (8.6-12.0)
	Female	51	37.7 (27.3-48.1)	247	14.3 (12.5-16.1)
Age	<18 Years	20	24.9 (13.9-35.8)	36	4.6 (3.1-6.2)
	≥18 Years	65	38.0 (28.7-47.3)	357	15.4 (13.8-17.0)
Race	White	9	29.4 (10.1-48.7)	262	9.7 (8.5-10.9)
	Black	75	36.4 (28.0-44.8)	123	28.7 (23.5-33.9)

Source: Michigan Death File, MDCH