

The Current Status of the Asthma Burden in Saginaw County

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What is Asthma?

- Asthma is a chronic lung disease that inflames and narrows the airways. Asthma causes recurring periods of wheezing, chest tightness, shortness of breath, and coughing. The coughing often occurs at night or early in the morning.
- Asthma has no cure. However, with today's knowledge and treatments, most people who have asthma are able to manage the disease and live active lives.
- Michigan's efforts to address asthma are led by the Michigan Department of Health and Human Services (MDHHS) Asthma Program.

Data Notes:

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

Introduction

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

Key Findings

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

- The asthma hospitalization rate in Saginaw County is 74% higher than the rate for the State of Michigan.
- The asthma mortality rate in Saginaw County is twice as high as Michigan's asthma mortality rate.
- Fewer Saginaw children on Medicaid attended primary care office visits for asthma in comparison to all Michigan children on Medicaid.
- More Saginaw children on Medicaid visited the emergency department for asthma in comparison to all Michigan children on Medicaid.
- A larger percentage of Saginaw children on Medicaid overused Short-Acting β -Agonist (SABA) compared to all Michigan children on Medicaid.

Population Demographics of Saginaw County and Michigan

Measure	Saginaw County	Michigan
Total population	196,479	9,900,571
% less than 18 years	22.3%	22.7%
% black	18.4%	14.0%
% of those 25 years and older with less than high school diploma	12.0%	10.4%
% of persons without health insurance	8.9%	9.6%
Median household income	\$43,042	\$49,576
% of population in poverty	18.3%	16.7%
% of population with a disability	16.2%	14.1%

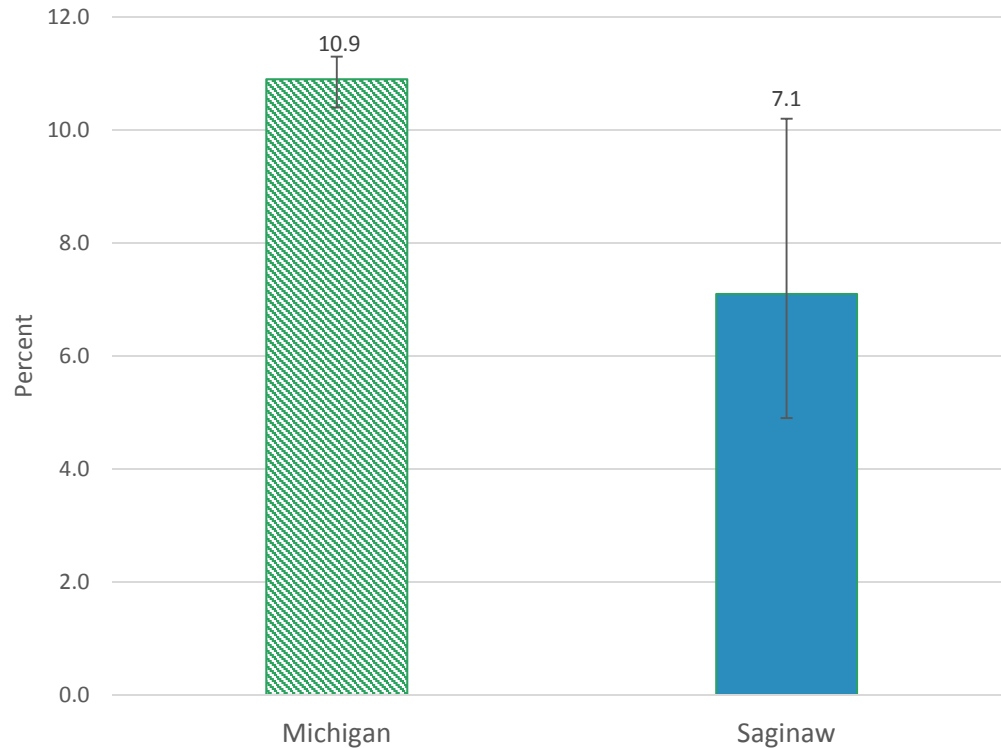
- 18.4% of Saginaw County’s population were black, while 14.0% of Michigan’s population were black.
- The median household income in Saginaw was \$43,042, with 18.3% of the population in poverty. The median household income of Michigan was \$49,576, with 16.7% of the population in poverty.
- 8.9% of Saginaw’s population did not have health insurance.
- The Saginaw County unemployment rate was 11.1%, which is approximately 5% higher than the 2015 United States unemployment rate (data not shown).

Data Notes:

1. Source: American Community Survey, 2011-2015

Asthma Prevalence

Prevalence of Current Asthma for Adults (≥ 18 Years), Saginaw and Michigan, 2013-2015

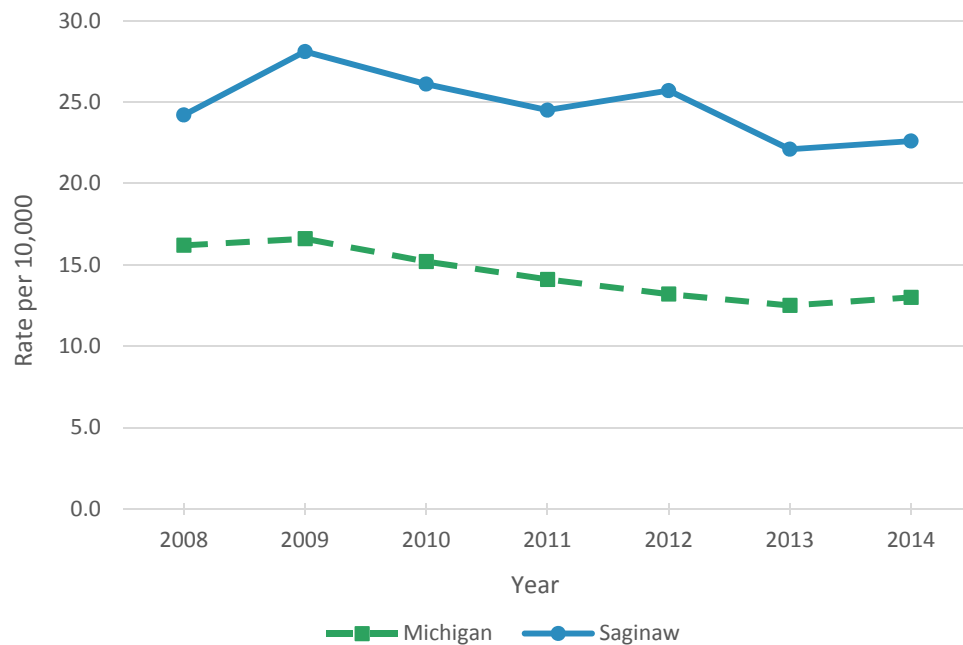


- In 2013-2015, 7.1% of Saginaw adults and 10.9% of Michigan adults currently had asthma.
- The prevalence of asthma among children in Saginaw could not be calculated due to insufficient sample size.

Data Notes:
1. Source: 2013-2015 Michigan Behavioral Risk Factor Survey, Regional and Local Health Department Estimates, MDHHS

Asthma Hospitalization

Rates of Asthma Hospitalization, Saginaw and Michigan, 2008-2014



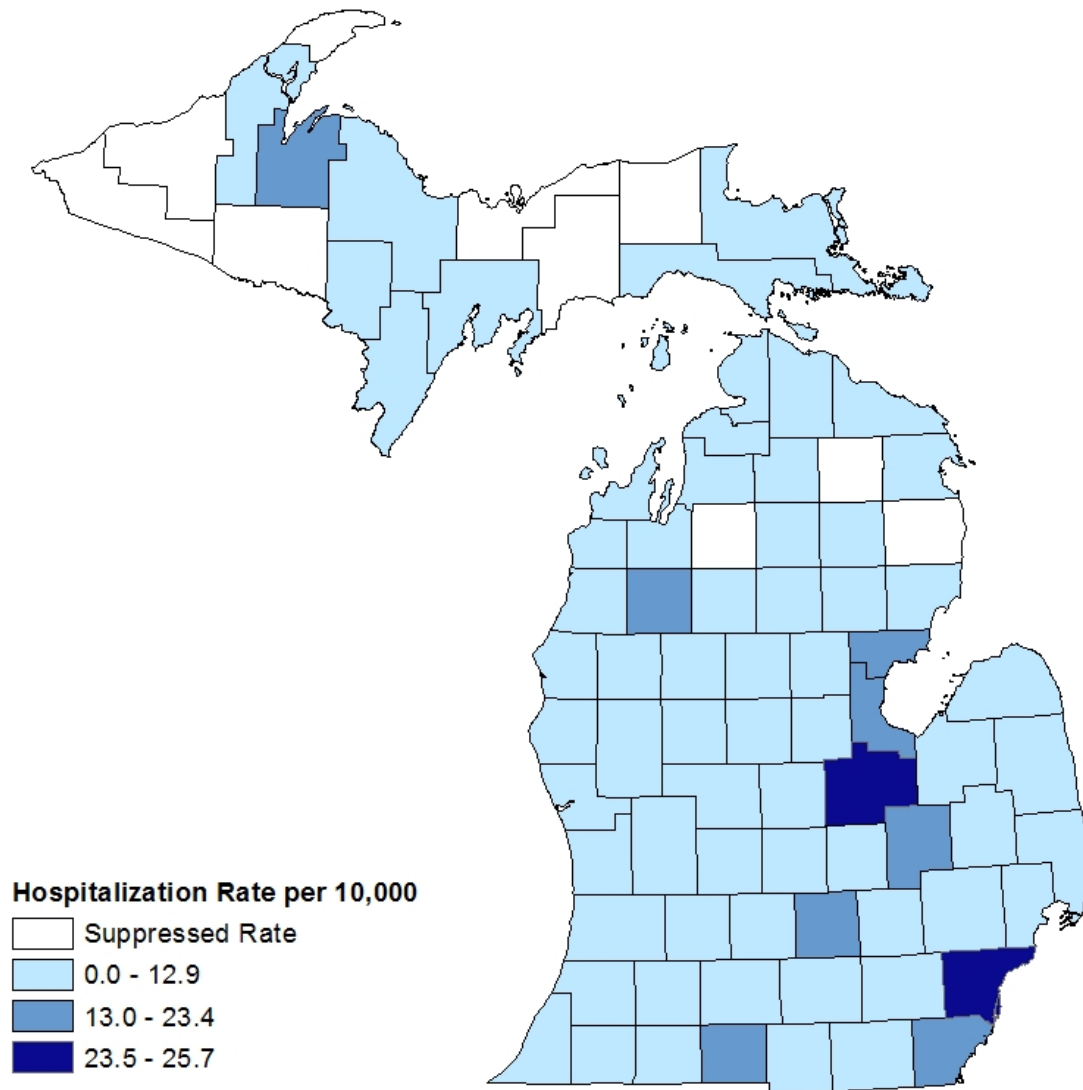
Data Notes:

Source: Michigan Inpatient Database, 2008-2014, MDHHS

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

- In 2014, 451 Saginaw residents were hospitalized for asthma (data not shown).
- The rate of asthma hospitalizations for Saginaw residents in 2014 was 22.6 per 10,000 population.
- The 2014, Saginaw asthma hospitalization rate was 1.7 times higher than the overall asthma hospitalization rate in Michigan (13.0 per 10,000).
- Between 2008 and 2014, the rates of asthma hospitalization in Saginaw and Michigan decreased by 1.6 and 3.2 asthma hospitalizations per 10,000, respectively.

Rates of Asthma Hospitalization by County, Michigan, 2012-2014



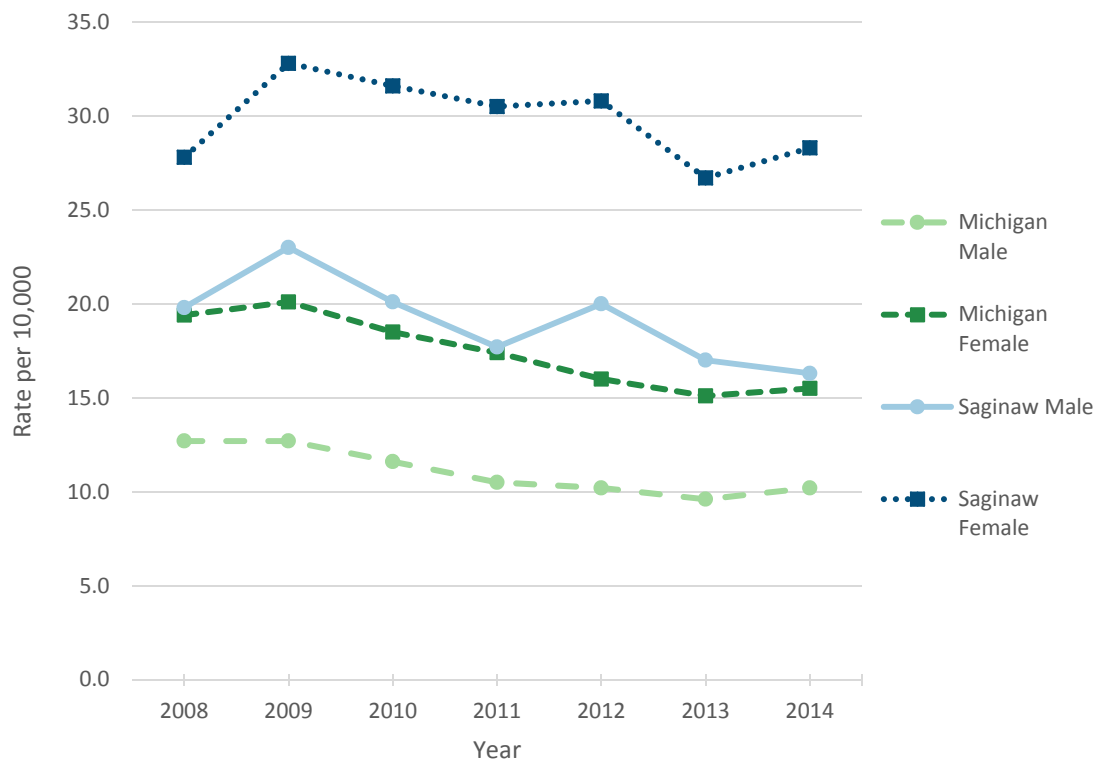
- From 2012 to 2014, Wayne County and Saginaw County experienced the highest asthma hospitalization rates (25.7 and 23.5 per 10,000, respectively).
- Michigan's asthma hospitalization rate was 12.9 per 10,000 during this time period; ten counties had asthma hospitalization rates above the state rate.

Data Notes:

Source: Michigan Inpatient Database, 2012-2014, MDHHS

1. Age-adjusted to the 2000 US Standard Population
2. Asthma as primary diagnosis, ICD-9-CM: 493.XX
3. Rate suppressed if hospitalization count < 20

Rates of Asthma Hospitalization by Sex, Saginaw and Michigan, 2008-2014

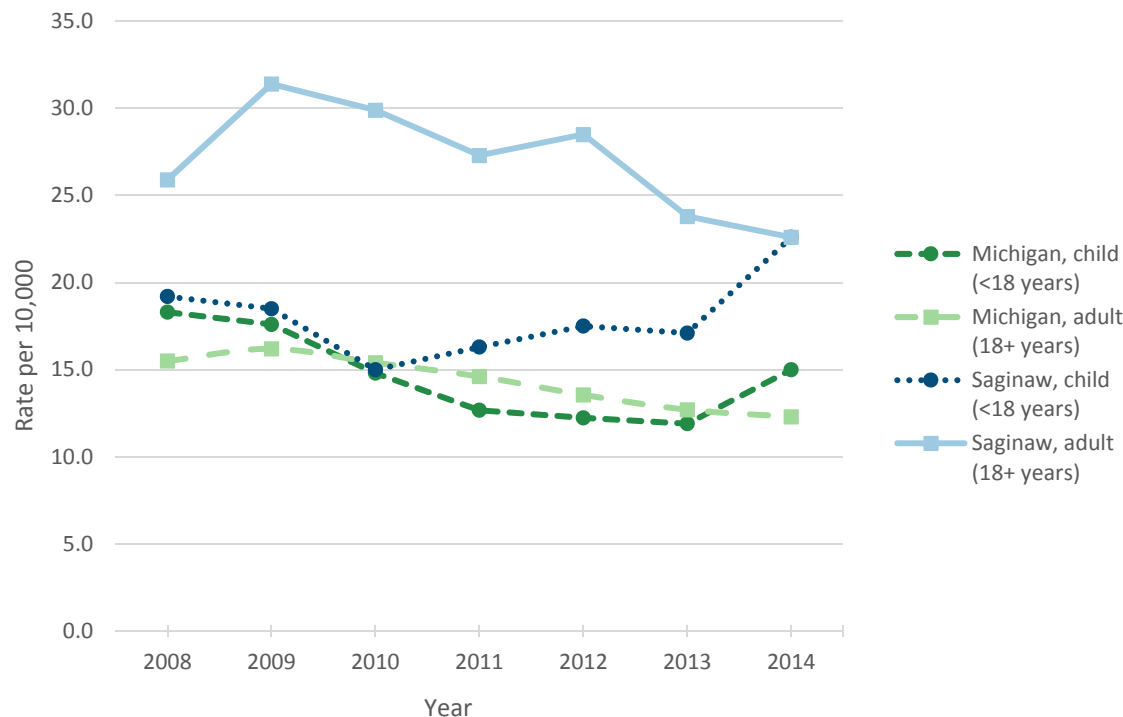


- In 2014, the rate of asthma hospitalizations among Saginaw females was 28.3 per 10,000. The rate of asthma hospitalizations among Saginaw males was 16.3 per 10,000.
- The rate of asthma hospitalization for Saginaw females in 2014 was 1.8 times higher than the asthma hospitalization rate for Michigan females (15.5 per 10,000).
- In 2014, the rate of asthma hospitalizations for Saginaw males was 1.6 times higher than the asthma hospitalization rate for Michigan males (10.2 per 10,000).
- Between 2008 and 2014, the rate of asthma hospitalizations decreased for Saginaw males, Michigan males, and Michigan females.

Data Notes:

Source: Michigan Inpatient Database, 2008-2014, MDHHS
 1. Age-adjusted to the 2000 US Standard Population
 2. Asthma as primary diagnosis, ICD-9-CM: 493.XX

Rates of Asthma Hospitalization by Age Group, Saginaw and Michigan, 2008-2014



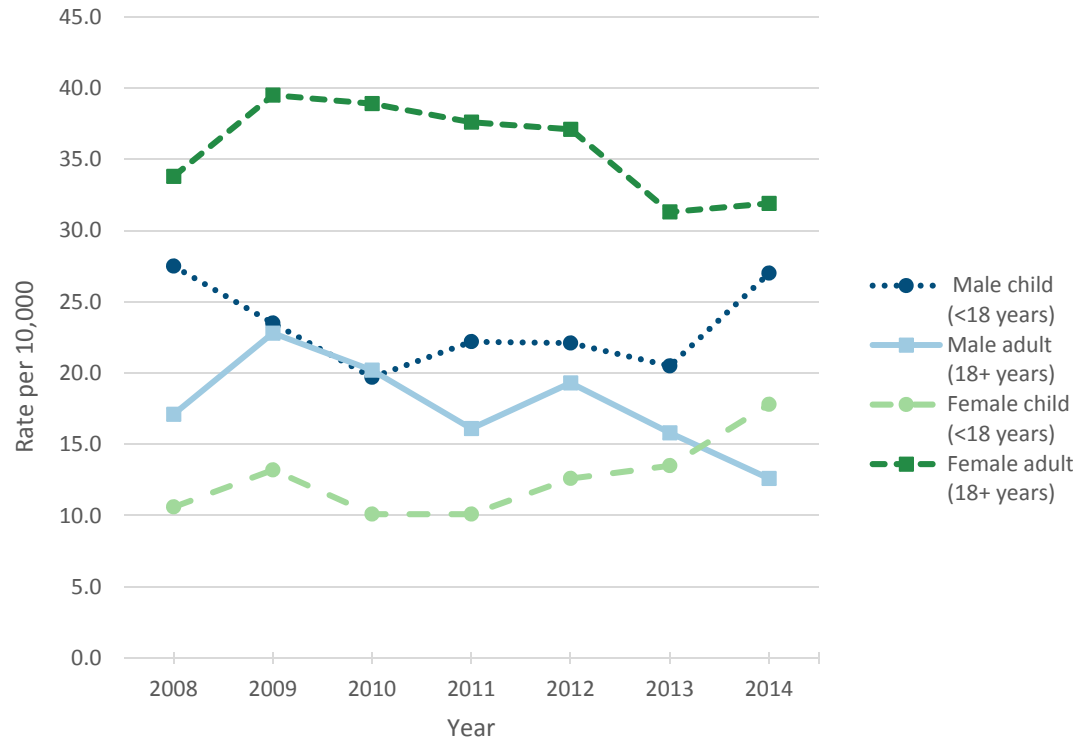
- In 2014, the rate of asthma hospitalizations for both Saginaw children and Saginaw adults was 22.6 per 10,000.
- The 2014 asthma hospitalization rate for Saginaw children was 1.5 times higher than the asthma hospitalization rate for Michigan children (15.0 per 10,000).
- In 2014, the asthma hospitalization rate among Saginaw adults was 1.8 times higher than the asthma hospitalization rate for Michigan adults (12.3 per 10,000).
- Between 2008 and 2014, asthma hospitalization rates increased among Saginaw children, while asthma hospitalization rates decreased for Michigan children, Michigan adults, and Saginaw adults.

Data Notes:

Source: Michigan Inpatient Database, 2008-2014, MDHHS

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

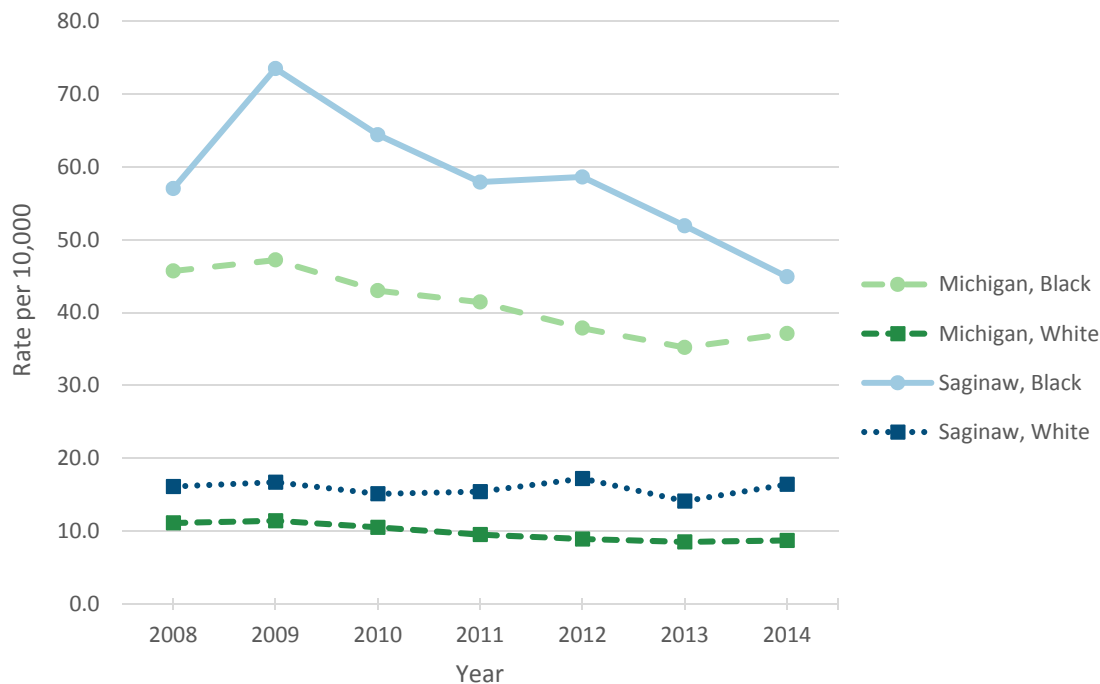
Rates of Asthma Hospitalization by Sex-Age Group, Saginaw, 2008-2014



- In 2014, the rate of asthma hospitalizations among male Saginaw children was 27.0 per 10,000. The rate among female Saginaw children was 17.8 per 10,000.
- In 2014, the rate of asthma hospitalizations among male Saginaw adults was 12.6 per 10,000. The asthma hospitalization rate for female Saginaw adults was 31.9 per 10,000.
- Male children experienced a higher asthma hospitalization rate in comparison to male adults. In contrast, female children experienced a lower asthma hospitalization rate in comparison to female adults.
- Overall, from 2008 to 2014, the asthma hospitalization rate among female children increased by 7.2 per 10,000. The asthma hospitalization rate decreased for male adults and female adults during this time period.

Data Notes:
 Source: Michigan Inpatient Database, 2008-2014, MDHHS
 1. Age-adjusted to the 2000 US Standard Population
 2. Asthma as primary diagnosis, ICD-9-CM: 493.XX

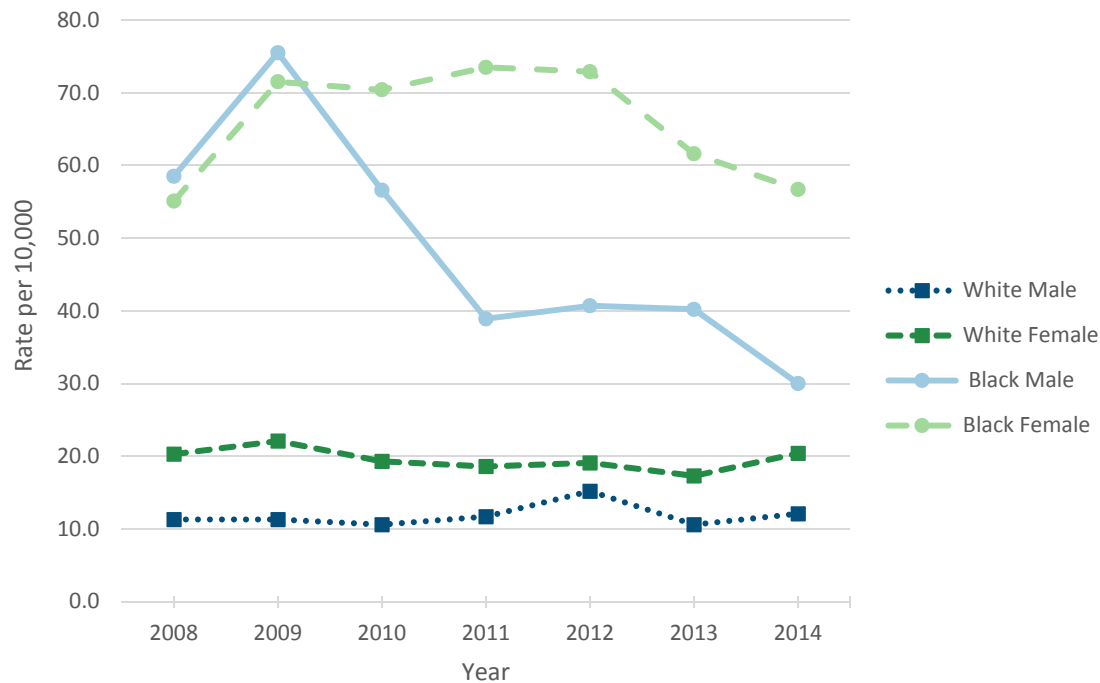
Rates of Asthma Hospitalization by Race, Saginaw and Michigan, 2008-2014



- In 2014, the asthma hospitalization rate was highest among blacks in Saginaw (44.9 per 10,000).
- The asthma hospitalization rate for whites in Saginaw was 16.4 per 10,000, about 63% lower than the rate among blacks in Saginaw.
- In 2014, the asthma hospitalization rate for whites in Saginaw was 1.9 times higher than the asthma hospitalization rate for whites in Michigan (8.7 per 10,000).
- From 2008 to 2014, the asthma hospitalization rate for black Saginaw residents decreased from 57.0 to 44.9 per 10,000. Their 2014 asthma hospitalization rate, however, was 1.2 times higher than the asthma hospitalization rate for black Michigan residents (37.1 per 10,000).

Data Notes:
 Source: Michigan Inpatient Database, 2008-2014, MDHHS
 1. Age-adjusted to the 2000 US Standard Population
 2. Asthma as primary diagnosis, ICD-9-CM: 493.XX

Rates of Asthma Hospitalization by Sex-Race Group, Saginaw, 2008-2014

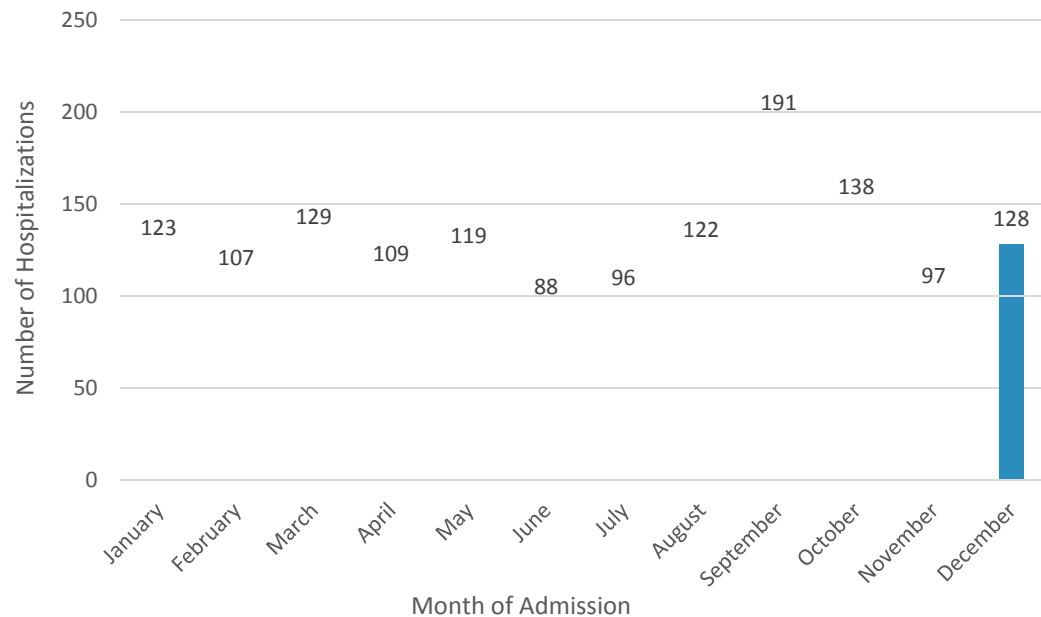


- In 2014, the rate of asthma hospitalizations among white Saginaw males was 12.1 per 10,000. The rate among white Saginaw females was 20.4 per 10,000.
- In 2014, the rate of asthma hospitalizations among black Saginaw males was 30.0 per 10,000. In comparison, the rate among black Saginaw females was 56.7 per 10,000.
- The asthma hospitalization rate for black Saginaw females was 2.8 times higher than the asthma hospitalization rate for white Saginaw females.
- From 2008 to 2014, the asthma hospitalization rate among black Saginaw males decreased by 28.5 per 10,000.

Data Notes:

Source: Michigan Inpatient Database, 2008-2014, MDHHS
 1. Age-adjusted to the 2000 US Standard Population
 2. Asthma as primary diagnosis, ICD-9-CM: 493.XX

Number of Asthma Hospitalizations by Month of Admission, Saginaw, 2012-2014

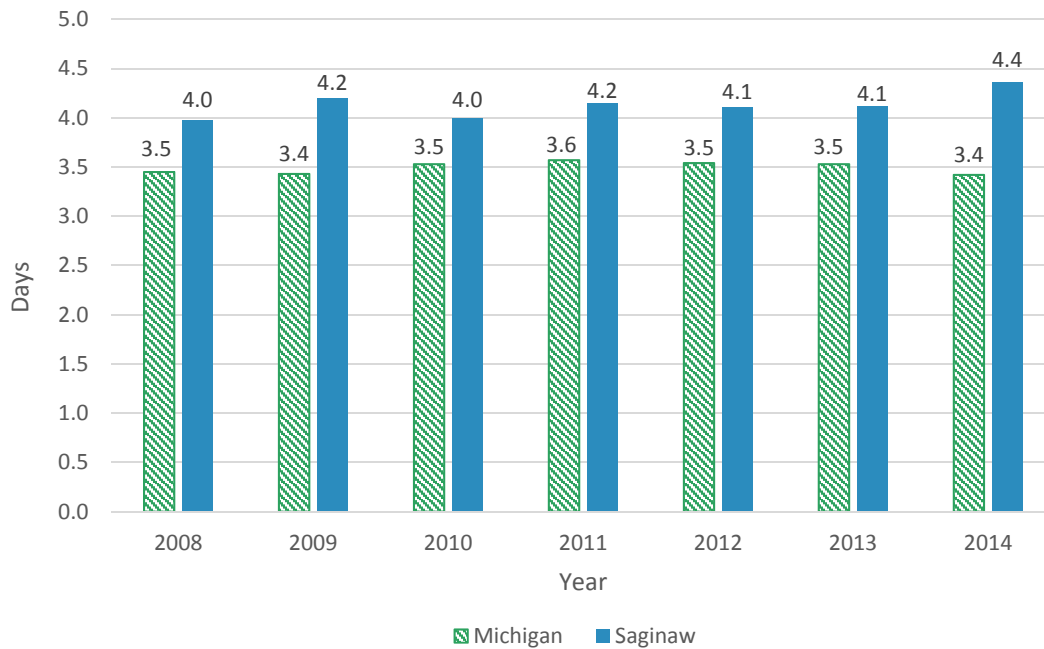


- The seasonal trend of asthma hospitalizations in Saginaw is parallel to the seasonal asthma trend of the entire state of Michigan (data not shown for Michigan).
- The fewest number of hospitalizations occurred in June and July for both Saginaw and Michigan.
- The largest number of hospitalizations occurred in September for both Saginaw and Michigan.

Data Notes:

Source: Michigan Inpatient Database, 2012-2014, MDHHS
1. Asthma as primary diagnosis, ICD-9-CM: 493.XX

Average Length of Stay for Asthma Hospitalizations, Saginaw and Michigan, 2008-2014

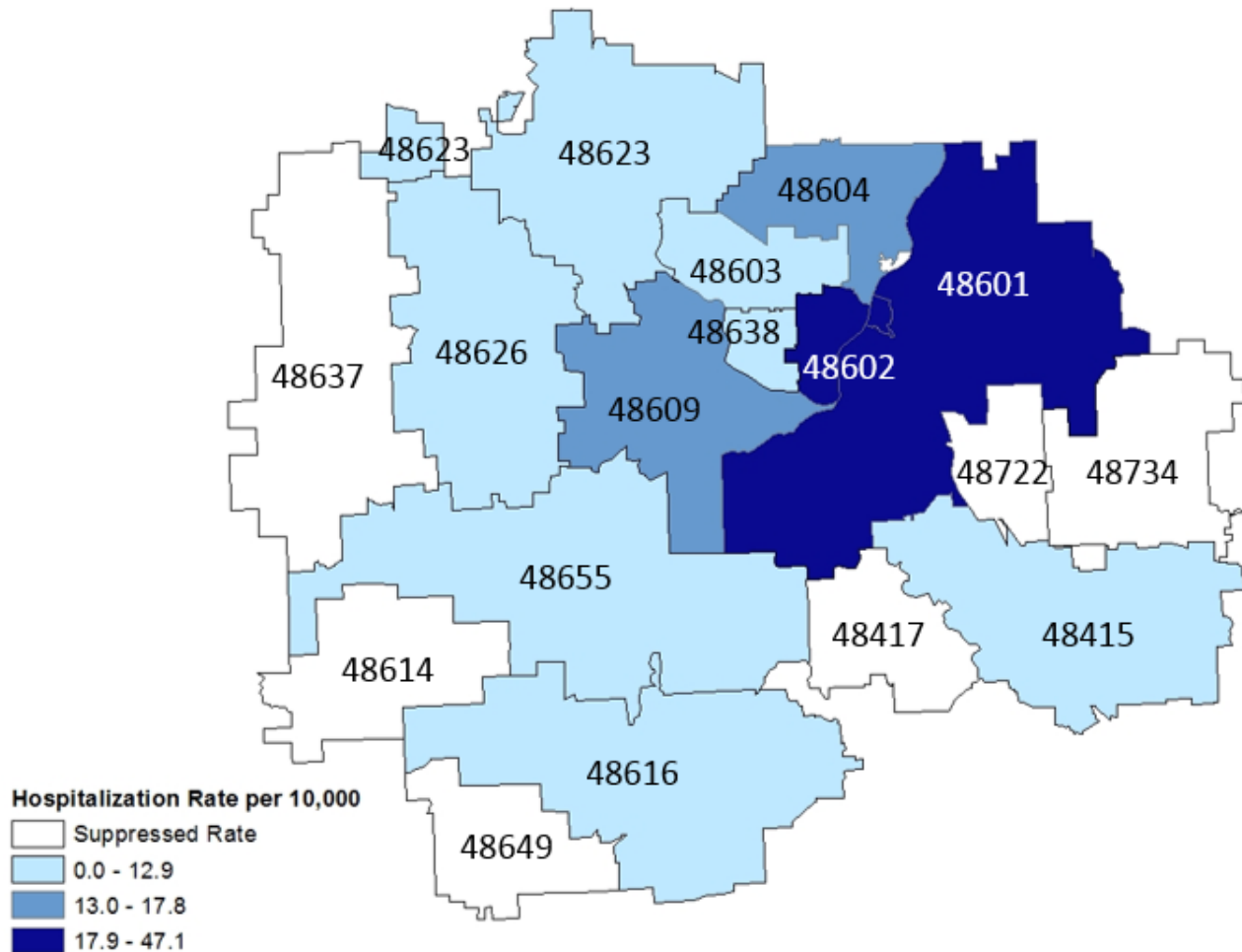


- In 2014, the average length of stay for an asthma hospitalization in Saginaw was approximately 4 days and 10 hours. Meanwhile, the average length of hospitalization in Michigan was 3 days and 9 hours.
- From 2008 to 2014, the average length of stay for an asthma hospitalization increased in Saginaw County, but not in Michigan.

Data Notes:

Source: Michigan Inpatient Database, 2008-2014, MDHHS
1. Asthma as primary diagnosis, ICD-9-CM: 493.XX

Rates of Asthma Hospitalization by Zip Code of Residence, Saginaw, 2012-2014



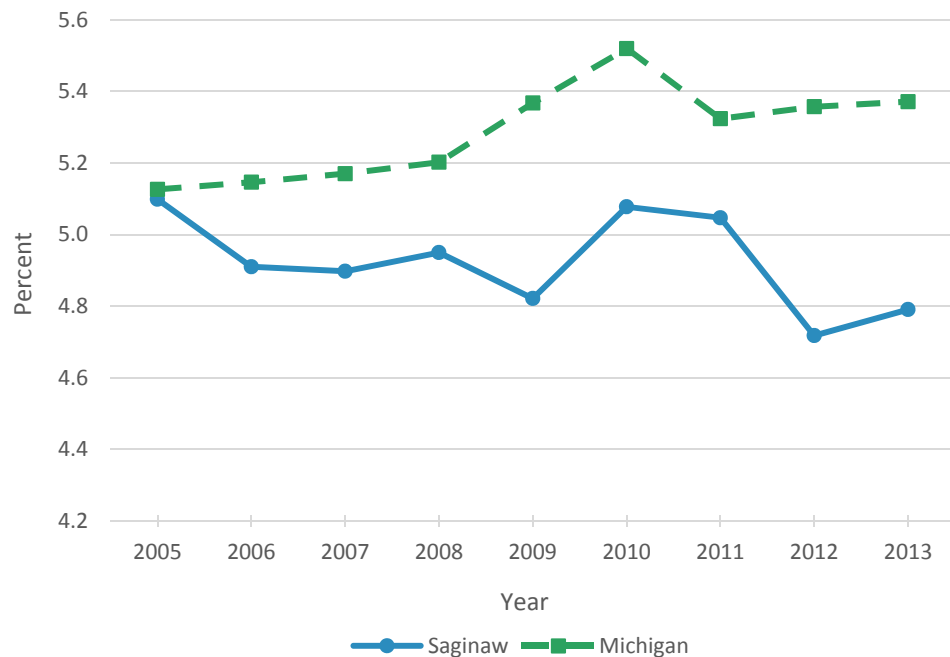
- The zip codes 48601 and 48602, which correspond to the city of Saginaw, had the highest asthma hospitalization rates of Saginaw County.
- The asthma hospitalization rates of zip codes 48601 and 48602 were 47.1 and 40.8 per 10,000, respectively.
- 38.0% of asthma hospitalizations in Saginaw County occurred in zip code 48601.

Data Notes:

- Source: Michigan Inpatient Database, 2012-2014, MDHHS
1. Age-adjusted to the 2000 US Standard Population
 2. Asthma as primary diagnosis, ICD-9-CM: 493.XX
 3. Rates suppressed if hospitalization count < 20

Asthma Medicaid Claims Data

Prevalence of Persistent Asthma, Children (<18 Years) on Medicaid, Saginaw and Michigan, 2005-2013



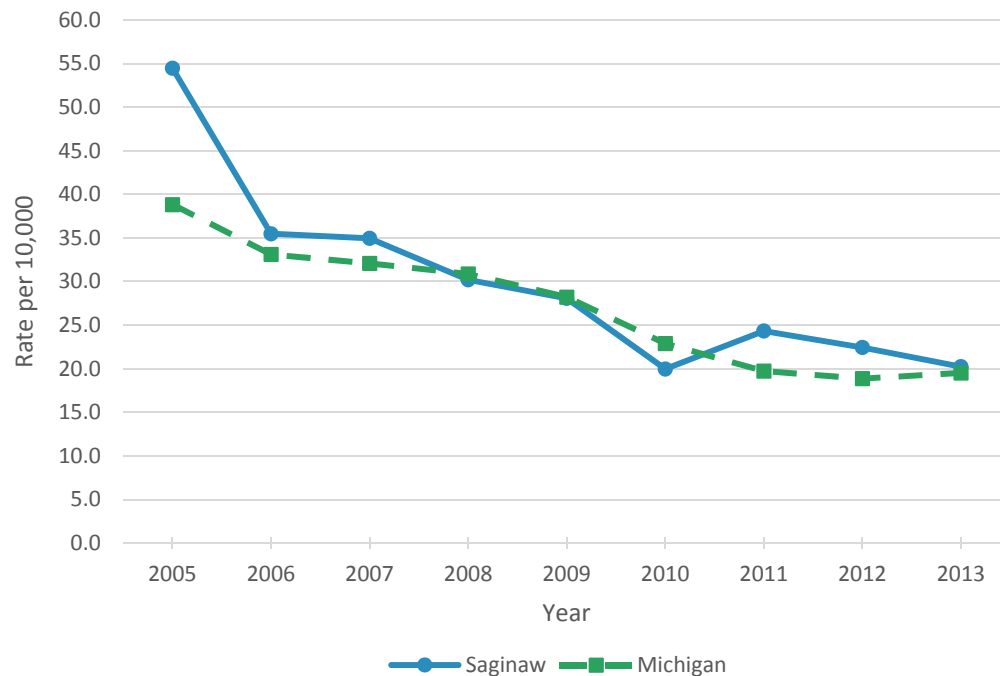
- In 2013, 4.8% of Saginaw children and 5.4% of Michigan children experienced persistent asthma.
- The prevalence of persistent asthma in Saginaw has been consistently lower than the prevalence for Michigan.
- From 2012 to 2013, both Saginaw and Michigan experienced an increase in persistent asthma rates.

Data Notes:

Source: Michigan Medicaid Data Warehouse, 2005-2013, MDHHS

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

Rate of Asthma Hospitalizations, Children (<18 Years) on Medicaid, Saginaw and Michigan, 2005-2013



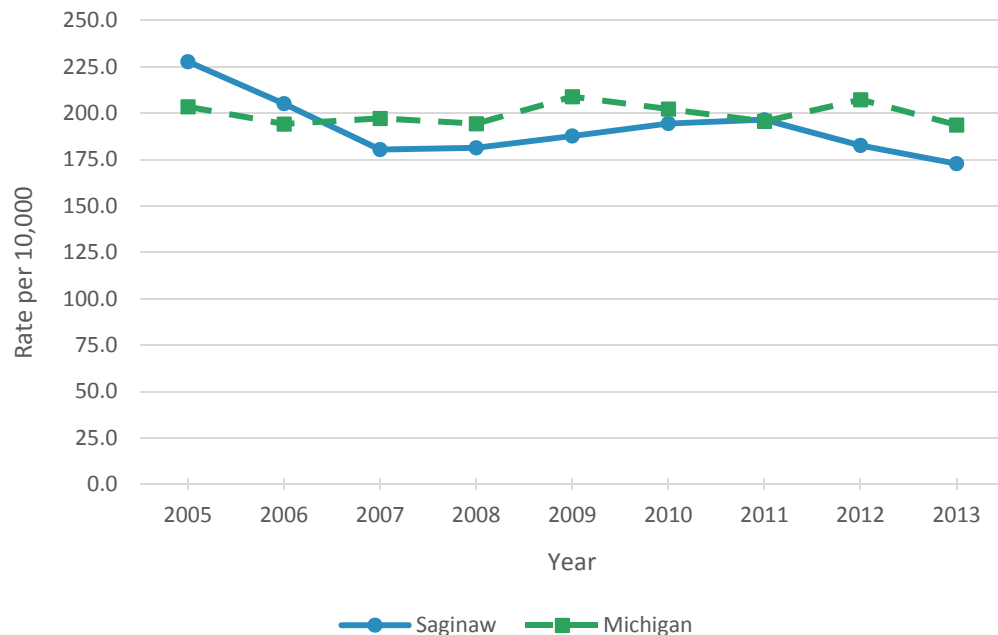
- In 2013, the Medicaid asthma hospitalization rate among Saginaw children was 20.2 per 10,000. The rate for Michigan was 19.5 per 10,000.
- From 2011 to 2013, the Medicaid asthma hospitalization rate among Saginaw children was higher than the asthma hospitalization rate for all Michigan children on Medicaid.
- From 2005 to 2013, the asthma hospitalization rate among children on Medicaid significantly decreased for both Saginaw and Michigan.

Data Notes:

Source: Michigan Medicaid Data Warehouse, 2005-2013, MDHHS

1. Age-adjusted to the 2000 US Standard Population; all rates per 10,000 population
2. Asthma as primary diagnosis, ICD-9-CM: 493.XX
3. Medicaid population of children ≤ 18 years is restricted to those who are continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance

Rate of Asthma Emergency Department (ED) Visits, Children (<18 Years) on Medicaid, Saginaw and Michigan, 2005-2013



- In 2013, the Medicaid rate of asthma ED visits was 172.8 per 10,000 children in Saginaw, while the rate for Michigan was 193.7 per 10,000.
- This rate decreased in both Saginaw and Michigan from 2012 to 2013.
- In the Medicaid population, 28.0% of Saginaw children and 27.0% of Michigan children with persistent asthma relied on the ED for outpatient visits in 2013.

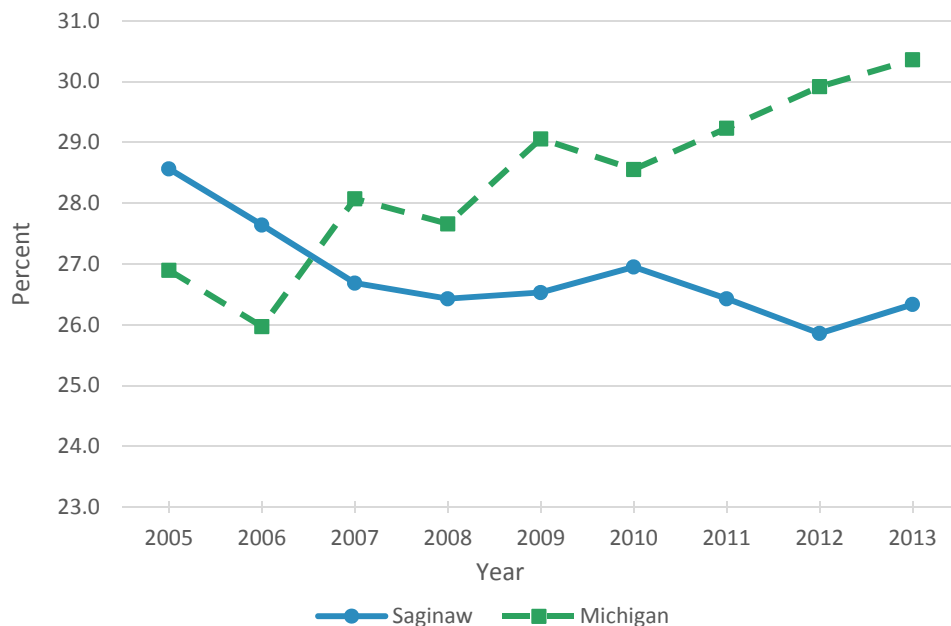
Data Notes:

Source: Michigan Medicaid Data Warehouse, 2005-2013, MDHHS

1. Age-adjusted to the 2000 US Standard Population; all rates per 10,000 population
2. Asthma as primary diagnosis, ICD-9-CM: 493.XX
3. Medicaid population of children <18 years is restricted to those who are continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance

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

Percent of Children (<18 Years) on Medicaid with Asthma and ≥2 Office Visits for Asthma, Saginaw and Michigan, 2005-2013



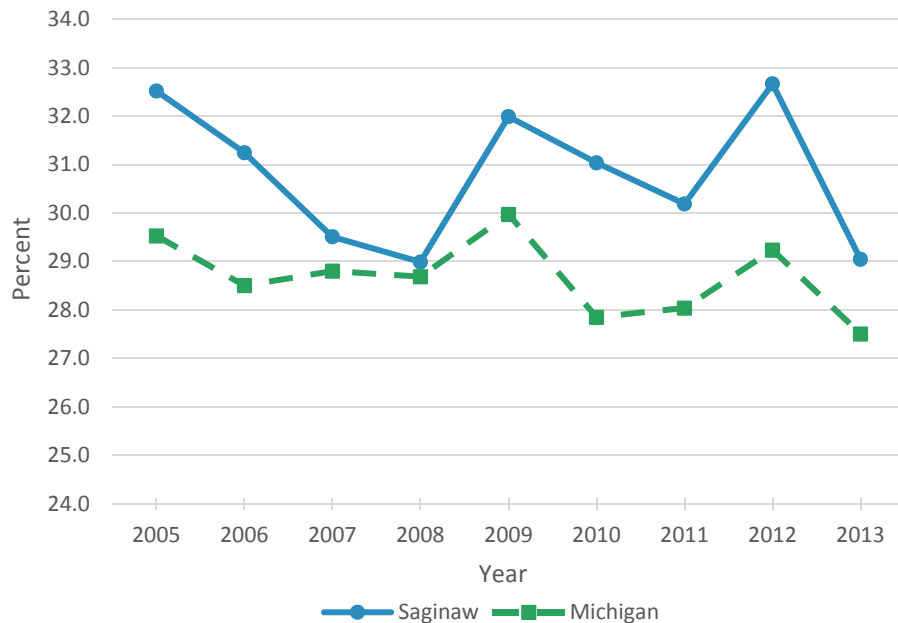
Data Notes:

Source: Michigan Medicaid Data Warehouse, 2005-2013, MDHHS

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

- According to national guidelines, persons with asthma should visit their primary care provider for routine asthma care at least twice per year.⁵
- In 2013, 26.3% of Saginaw children with persistent asthma on Medicaid had at least two office visits for asthma. In comparison, 30.4% of Michigan children on Medicaid had two annual asthma visits.
- From 2007 to 2013, this rate was significantly lower for Saginaw children than for the state as a whole.

Percent of Children (<18 Years) on Medicaid with Asthma, ≥1 Asthma-Related Emergency Department (ED) Visits, Saginaw and Michigan, 2005-2013

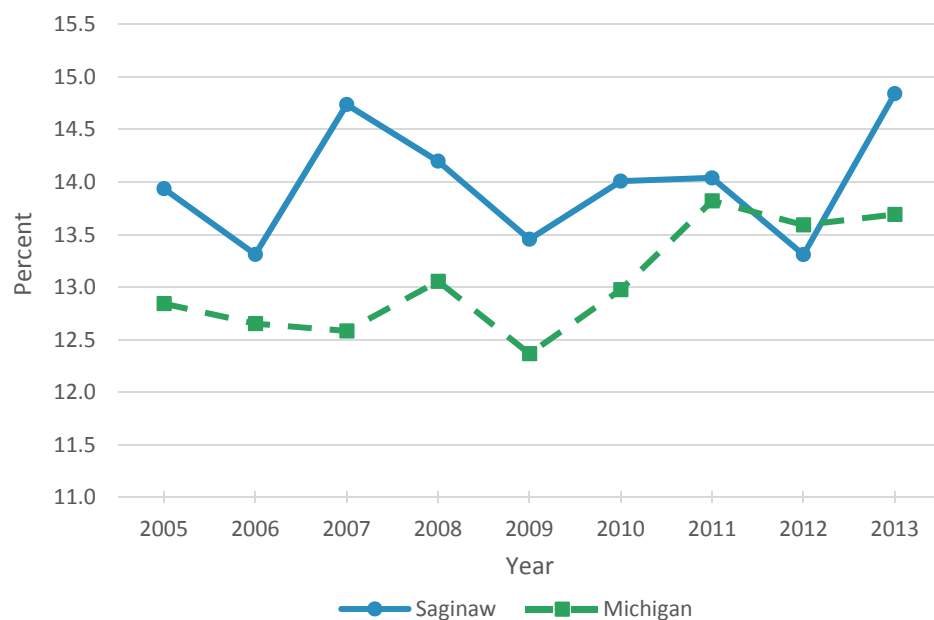


- It is a goal of asthma therapy that persons with asthma experience minimal or no ED visits for asthma.⁵
- In 2013, 29.0% of Saginaw children and 27.5% of Michigan children enrolled in Medicaid with persistent asthma had one or more ED visits for asthma.
- From 2005 to 2013, the proportion of Saginaw children on Medicaid with persistent asthma and at least one ED visit for asthma per year was consistently higher than that for Michigan as a whole.
- From 2005 to 2013, the proportion of children on Medicaid with at least one ED visit decreased by 3.5% in Saginaw and 2.0% in Michigan.

Data Notes:

- Source: Michigan Medicaid Data Warehouse, 2005-2013, MDHHS
1. Age-adjusted to the 2000 US Standard Population
 2. Based on NCOA HEDIS Definition
 3. Asthma as primary diagnosis, ICD-9-CM: 493.XX
 4. Medicaid population of children <18 years is restricted to those who are continuously enrolled in Medicaid (11+ months) with full coverage and no other insurance
 5. National Heart, Lung, and Blood Institute. *Guidelines for the Diagnosis and Management of Asthma: Expert Panel Report 3*. National Institutes of Health Publication Number 09-5846. October 2007.

Percent of Overuse of Short-Acting β -Agonist (SABA) Medication among Children (<18 Years) on Medicaid with Asthma, Saginaw and Michigan, 2005-2013

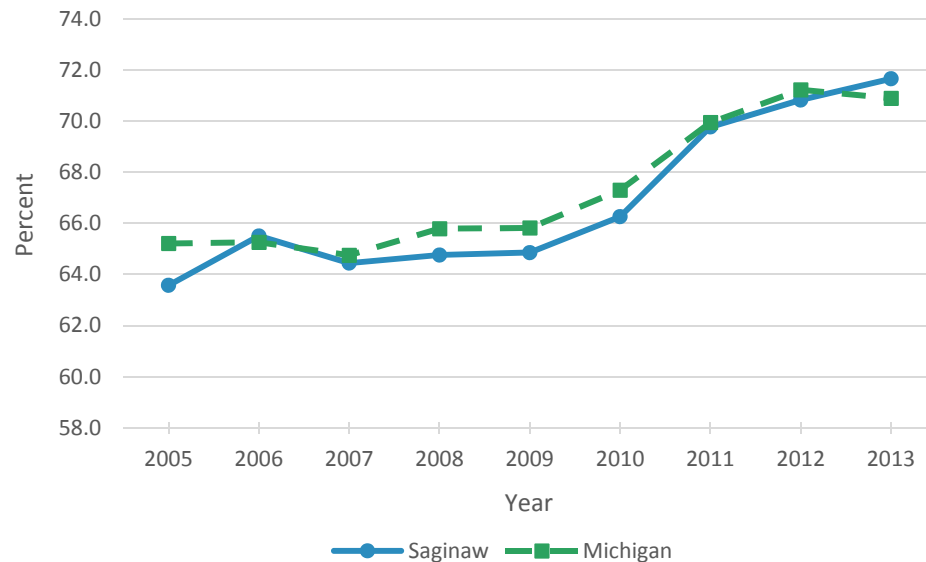


- A goal of asthma therapy is minimal use of SABA⁴ – less than one canister per month. For this indicator, overuse is defined as filling 7 or more prescriptions for SABA in a year.
- In 2013, the prevalence of SABA overuse among Saginaw children and Michigan children covered by Medicaid with persistent asthma was 14.8% and 13.7%, respectively.
- From 2005 to 2013, the rate of SABA overuse in Saginaw was higher than the rate of SABA overuse in Michigan, except for a brief period between 2011 and 2012.

Data Notes:
 Source: Michigan Medicaid Data Warehouse, 2005-2013, MDHHS

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

Percent of Children (<18 Years) on Medicaid with Asthma, ≥1 Inhaled Steroid Fills, Saginaw and Michigan, 2005-2013



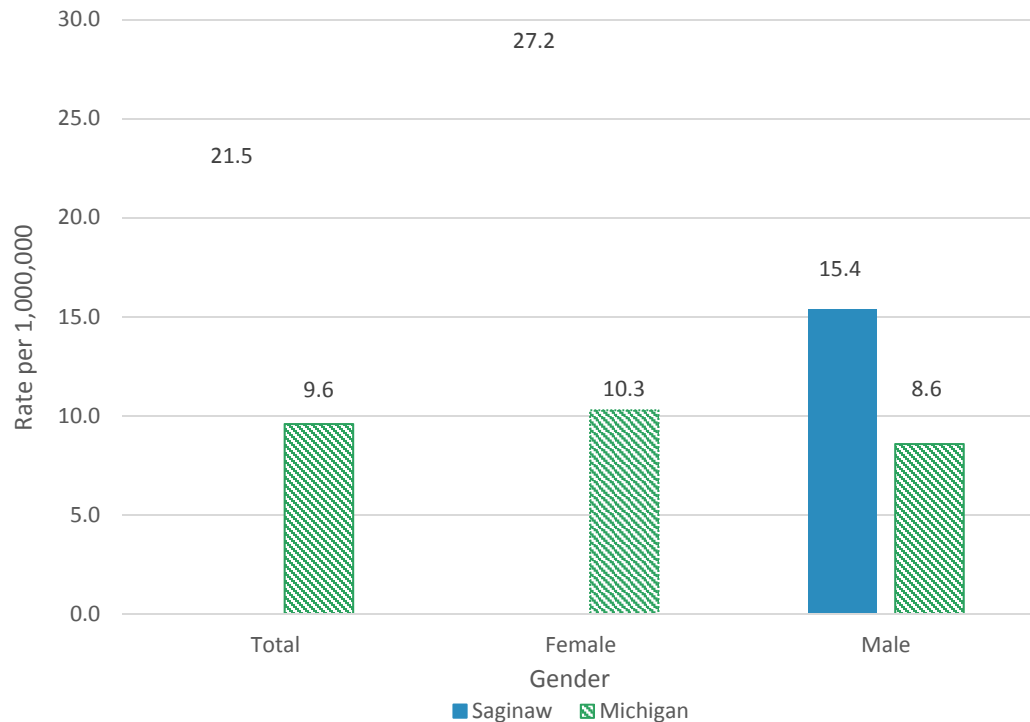
- Long-term asthma control medications, such as inhaled corticosteroids, are recommended for children with persistent asthma.⁴
- In 2013, 70.9% of Michigan children and 71.7% of Saginaw children on Medicaid with persistent asthma filled a prescription for one or more inhaled steroids.

Data Notes:
 Source: Michigan Medicaid Data Warehouse, 2005-2013, MDHHS

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

Asthma Mortality

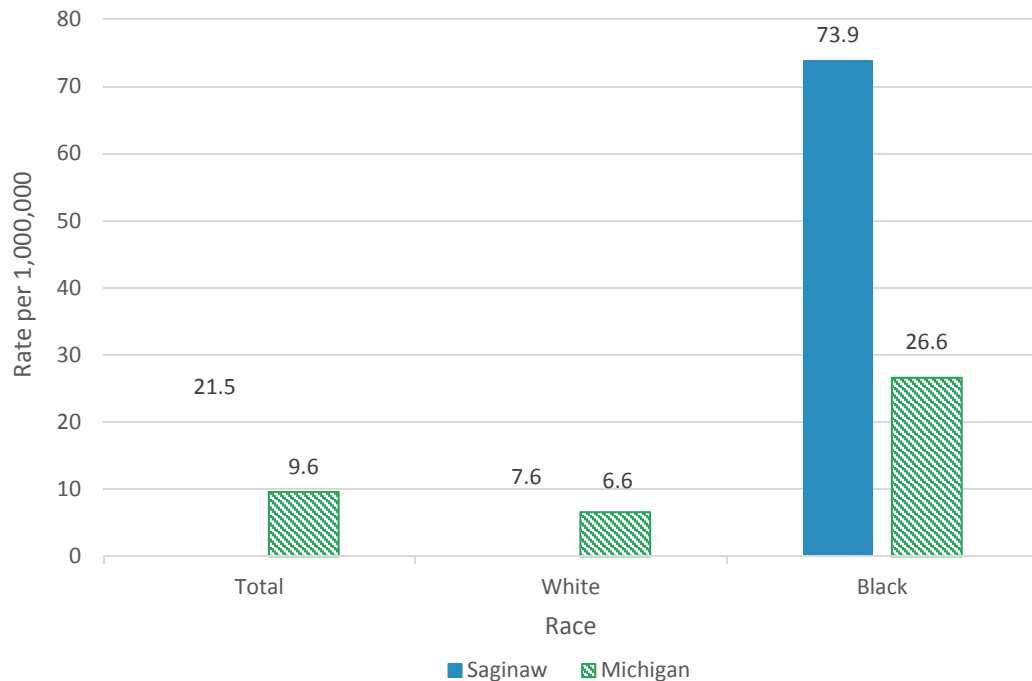
Rates of Asthma Mortality by Sex, Saginaw and Michigan, 2013-2015



- From 2013 to 2015, 15 Saginaw residents died due to asthma. The rate of asthma mortality among Saginaw residents was 21.5 per 1,000,000 population.
- From 2013 to 2015, the asthma mortality rate among Saginaw males was 15.4 per 1,000,000 and 27.2 per 1,000,000 among Saginaw females.
- The mortality rate was higher in females in comparison to males in both Saginaw County and Michigan.

Data Notes:
 Source: Michigan Death File, 2013-2015, MDHHS
 1. Age-adjusted to the 2000 US Standard Population; all rates per 1,000,000 population
 2. Asthma as the underlying cause of death, ICD-10: J45-J46

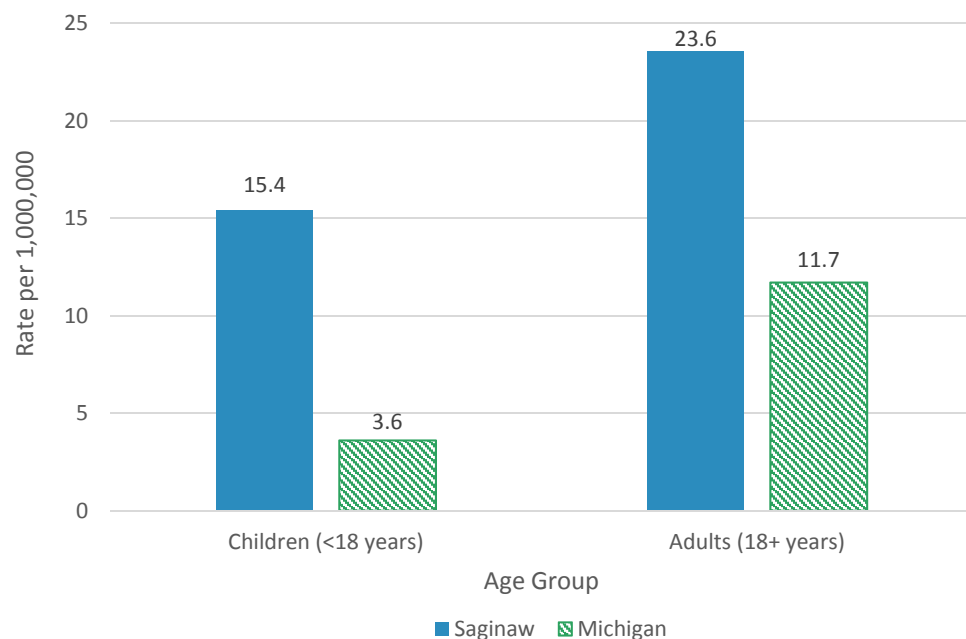
Rates of Asthma Mortality by Race, Saginaw and Michigan, 2013-2015



- From 2013 to 2015, six white and eight black residents of Saginaw County died from asthma.
- The asthma mortality rate among white and black Saginaw residents was 7.6 and 73.9 per 1,000,000, respectively.
- From 2013 to 2015, the mortality rate for white and black Saginaw residents was higher than the rate for white and black Michigan residents.

Data Notes:
 Source: Michigan Death File, 2013-2015, MDHHS
 1. Age-adjusted to the 2000 US Standard Population; all rates per 1,000,000 population
 2. Asthma as the underlying cause of death, ICD-10: J45-J46

Rates of Asthma Mortality by Age Group, Saginaw and Michigan, 2013-2015



- From 2013 to 2015, the asthma mortality rate for Saginaw children was 15.4 per 1,000,000.
- Among Saginaw adults, the asthma mortality rate was 23.6 per 1,000,000.
- The asthma mortality rate among Saginaw children was 4.3 times higher than the mortality rate for children in Michigan.
- The asthma mortality rate for Saginaw adults was approximately 2.0 times higher than the rate for adults in Michigan.

Data Notes:

Source: Michigan Death File, 2013-2015, MDHHS

1. Age-adjusted to the 2000 US Standard Population; all rates per 1,000,000 population
2. Asthma as primary cause of death, ICD-10: J45-J46

Key Recommendation

The asthma burden in Saginaw County is significant, and warrants continued attention. Community and public health efforts should be directed to people with asthma in Saginaw to improve asthma control, prevent severe outcomes, and improve quality of life.

Data Sources

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

Methods

Asthma Prevalence

- 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?
 2. Do you still have 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. All measures of asthma prevalence were accompanied by 95% confidence intervals.
- Annual estimates of asthma prevalence for adults (≥ 18 years) were provided by 2013-2015 MiBRFS.

Methods

Asthma Hospitalization

- An asthma hospitalization was defined as an inpatient stay with a primary discharge diagnosis of asthma (ICD-9-CM=493.XX). These data represent the number of hospitalizations for asthma, not the number of persons with a hospitalization for asthma.
- Age-adjusted asthma hospitalization rates were calculated and presented per 10,000 population. Rates were age-adjusted, using the 2000 US standard population, so that valid comparisons could be made between populations of different age distributions. In addition to asthma hospitalization rates, the average length of stay and number of hospitalizations by month of admission were calculated.
- Asthma hospitalization rates were calculated for demographic and geographic subgroups, including zip codes of residence (for Saginaw County), age, race, and sex, to identify disparities and patterns. Maps were generated using geographic information systems (GIS; ArcGIS™, Environmental Systems Research Institute) to visually display the data and to identify areas of high burden. Census data from 2010 were used to calculate the Saginaw hospitalization rates by zip code. Yearly bridged-race population estimates provided by the National Vital Statistics System maintained by the Centers for Disease Control and Prevention were used to calculate Michigan and Saginaw County's hospitalization rates.
- The data source for these analyses was the Michigan Inpatient Database (MIDB), which includes virtually all hospital discharges for Michigan residents during the study period.

Methods

Asthma Management for Children Covered by Medicaid

- The study population was identified from the Michigan Medicaid beneficiary and administrative claims data (2005-2013) by the following parameters within each year: children 17 years of age and younger who had continuous Medicaid enrollment (11+ months), full Medicaid coverage, and no other insurance. Both fee-for-service and managed care beneficiaries were included, but Title V beneficiaries were excluded.
- By using these restrictions, these data undercount the number of children with asthma covered by Medicaid. This data does not include children with asthma who: 1) were not enrolled in Medicaid continuously or 2) did not have a paid Medicaid health utilization claim from 2005 through 2013.
- Within this population, the following indicators of total asthma burden were measured:
 - *Persistent asthma prevalence*: Utilization consistent with the diagnosis of asthma was defined according to HEDIS[®] 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-9-CM=493.XX). These data represent the number of persons visiting the emergency department for asthma. The number of asthma emergency department visits, divided by the study population, then multiplied by 10,000 generated this measure.
 - *Rate of asthma hospitalizations*: An asthma hospitalization is one where asthma is the primary reason for the hospital stay. The number of asthma hospitalizations, divided by the study population, then multiplied by 10,000 generated this measure.

Methods

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 two or more office visits*: The percentage of children with persistent asthma in Medicaid with two or more annual asthma office visits. This includes visits in a physician's office, but some home and urgent care visits may also be included in this measure (ICD-9-CM=493.XX).
 - *Percentage with an emergency department visit*: The percentage of children covered by Medicaid with persistent asthma who have had one or more annual asthma emergency visits (ICD-9-CM=493.XX).
 - *Emergency department reliance*: The percentage of all ambulatory asthma visits (ICD-9-CM=493.XX, outpatient and emergency department) among children covered by Medicaid with persistent asthma that occur in the emergency department. It estimates the reliance on the emergency department for primary care.
 - *Short-acting 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.
- For all of the above, indicators were age-adjusted using the 2000 US standard population.

Methods

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 2013-2015 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.
- The data source for these analyses was the Michigan Death Files, which included all deaths for Michigan residents during the study period.

Defining Saginaw County

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

- *Current asthma prevalence*: On MiBRFS, Saginaw adults were identified by their response to the question, “What county do you live in?”
- *Hospitalization*: Saginaw zip codes were defined by Zip Code Tabulation Areas (ZCTAs) for the county. Saginaw county hospitalization statistics were identified by the county code 73.
- *Mortality*: Saginaw county mortality statistics were identified by the county code 73.

Michigan Asthma Resources

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

(URL: www.michigan.gov/asthma)

[MDHHS Asthma Surveillance, Data, and Reports](http://www.michigan.gov/asthmaepi)

(URL: www.michigan.gov/asthmaepi)

[Asthma Initiative of Michigan](http://www.getastmahelp.org)

(URL: www.getastmahelp.org)

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