

# Targeting Asthma in Michigan

## The Healthy People 2010 Objectives

July, 2006

### What are the *Healthy People 2010* objectives?

Sponsored by the U.S. Department of Health and Human Services, the *Healthy People 2010* initiative is a comprehensive set of disease prevention and health promotion objectives for the nation to achieve over the first decade of the new century. Created by scientists both inside and outside of government, it identifies a wide range of public health priorities and specific, measurable objectives. It can be used by many different people, state governments, communities, and organizations to assess progress toward those priorities.

### Why do we use the *Healthy People 2010* objectives as a benchmark?

The *Healthy People 2010* objectives are national benchmarks. They are used widely at the national, state, and community level. In utilizing these objectives for asthma, Michigan can direct its efforts to achieving national goals, compare its asthma burden to others, and measure progress over time in achieving the objectives.

### What are the *Healthy People 2010* objectives relating to asthma?

| Objective  | 2010 Asthma Targets <sup>γ</sup>   |
|--|--|
| 1-9a. Reduce hospitalization rates for three ambulatory-care-sensitive conditions: <b>pediatric asthma</b> , uncontrolled diabetes, and immunization preventable pneumonia and influenza.                            | < 18 Years: 17.3 / 10,000  |
| 24-1. Reduce asthma deaths.  | < 5 Years: 0.9 / million <sup>β</sup><br>5-14 Years: 0.9 / million <sup>β</sup><br>15-34 Years: 1.9 / million <sup>β</sup><br>35-64 Years: 8.0 / million <sup>β</sup><br>≥ 65 Years: 47.0 / million <sup>β</sup> |
| 24-2. Reduce hospitalizations for asthma.  | < 5 Years: 25 / 10,000<br>5-64 Years <sup>α</sup> : 7.7 / 10,000<br>≥ 65 Years <sup>α</sup> : 11 / 10,000  |
| 24-3. Reduce emergency department visits for asthma.   | < 5 Years: 80 / 10,000<br>5-64 Years: 50 / 10,000<br>≥ 65 Years: 15 / 10,000   |
| 24-4. Reduce activity limitations among persons with asthma.   | 6% <sup>α, β</sup>   |
| 24-5. Reduce the number of school or workdays missed by persons with asthma due to asthma.   | 2 <sup>α</sup>   |
| 24-6. Increase the proportion of persons with asthma who receive formal patient education, including information about community and self-help resources, as an essential part of the management of their condition. | 30% <sup>α</sup>   |
| 24-7. Increase the proportion of persons with asthma who receive appropriate asthma care according to the NAEPP Guidelines. Measured as persons with asthma who receive:   |  |
| a. written asthma management plans from health care provider.  | 38% <sup>α</sup>   |
| b. instruction on how to use a prescribed inhaler properly.  | 98.8%  |
| c. education about recognizing early signs & symptoms of asthma episodes and how to respond properly, with lessons on peak flow monitoring for those using daily therapy.  | 71%  |
| d. medication regimens that prevent the need for more than 1 canister of short acting inhaled beta agonists per month for relief of symptoms.  | 92%  |
| e. follow-up medical care for long-term management after a hospitalization due to asthma.  | 87%  |
| f. assistance with assessing and reducing exposure to environmental risk factors.  | 50% <sup>α</sup>   |

Notes:

α. Age adjusted to the year 2000 standard U.S. population.

β. Target has been revised.

γ. Targets are from National Center for Health Statistics, Data 2010 (<http://wonder.cdc.gov/data2010/>)

## How do Michigan and the United States compare to the *Healthy People 2010* targets for asthma?

| Objective   | Age Group   | HP 2010 Target     | United States <sup>α</sup> | Michigan <sup>α</sup>           |
|---|-------------|--------------------|----------------------------|---------------------------------|
| 1-9a. Reduce pediatric asthma hospitalization rate. (Rate per 10,000)   | < 18 Years  | 17.3               | 22.6 <sup>1</sup>          | 23.5 <sup>6</sup>               |
| 24-1. Reduce asthma deaths. (Rate per million)  | < 5 Years   | 0.9 <sup>β</sup>   | 2.2 <sup>2</sup>           | < 5 deaths <sup>ε, 7</sup>      |
|   | 5-14 Years  | 0.9 <sup>β</sup>   | 2.7 <sup>2</sup>           | 4.8 <sup>7</sup>                |
|   | 15-34 Years | 1.9 <sup>β</sup>   | 4.7 <sup>2</sup>           | 8.0 <sup>7</sup>                |
|   | 35-64 Years | 8.0 <sup>β</sup>   | 14.2 <sup>2</sup>          | 13.0 <sup>7</sup>               |
|   | ≥ 65 Years  | 47.0 <sup>β</sup>  | 54.4 <sup>2</sup>          | 43.7 <sup>7</sup>               |
| 24-2. Reduce hospitalizations for asthma. (Rate per 10,000)   | < 5 Years   | 25                 | 59.0 <sup>3</sup>          | 51.1 <sup>6</sup>               |
|   | 5-64 Years  | 7.7 <sup>γ</sup>   | 12.4 <sup>γ, 3</sup>       | 13.0 <sup>γ, 6</sup>            |
|   | ≥ 65 Years  | 11 <sup>γ</sup>    | 22.4 <sup>γ, 3</sup>       | 20.7 <sup>γ, 6</sup>            |
| 24-3. Reduce emergency department visits for asthma. (Rate per 10,000)  | < 5 Years   | 80                 | 159.6 <sup>4</sup>         | Data not available <sup>η</sup> |
|   | 5-64 Years  | 50                 | 69.9 <sup>4</sup>          |                                 |
|   | ≥ 65 Years  | 15                 | 31.5 <sup>4</sup>          |                                 |
| 24-4. Reduce activity limitations among persons with asthma.  | δ           | 6% <sup>β, γ</sup> | 8% <sup>γ, 5</sup>         | Data not available <sup>η</sup> |
| 24-5. Reduce number of school/work days missed due to asthma.   | 5-64 Years  | 2 <sup>γ</sup>     | 4.9 <sup>γ, 5</sup>        | Data not available <sup>η</sup> |
| 24-6. Increase number who receive formal asthma education.  | ≥ 18 Years  | 30% <sup>γ</sup>   | 12.4% <sup>γ, 5</sup>      | Data not available              |
| 24-7. Increase number who receive appropriate asthma care.  |             |                    |                            |                                 |
| a. written asthma management plans from health care provider.   | δ           | 38% <sup>γ</sup>   | 35% <sup>5</sup>           | Data not available              |
| b. instruction on how to use a prescribed inhaler properly.   | δ           | 98.8%              | 96.0% <sup>5</sup>         | Data not available              |
| c. education about recognizing early signs & symptoms of asthma episodes and how to respond properly, with lessons on peak flow monitoring for those using daily therapy. | δ           | 71%                | 68% <sup>5</sup>           | Data not available              |
| d. medication regimens that prevent the need for more than 1 canister of short acting inhaled beta agonists per month for relief of symptoms.                             | δ           | 92%                | 80% <sup>5</sup>           | Data not available              |
| e. follow-up medical care for long-term management after a hospitalization due to asthma.   | δ           | 87%                | 76% <sup>5</sup>           | Data not available              |
| f. assistance with assessing and reducing exposure to environmental risk factors.   | δ           | 50% <sup>γ</sup>   | 49% <sup>5</sup>           | Data not available              |

- Notes:
- α. Latest data available that is comparable to the *Healthy People 2010* targets.
  - β. Target has been revised.
  - γ. Age adjusted to the year 2000 standard U.S. population.
  - δ. No specified age group.
  - ε. Insufficient data to compute a stable rate. (Number of deaths < 5, but > 0)
  - η. Additional information is available below.

Data Sources: All national data available at the Data 2010 website: <http://wonder.cdc.gov/data2010/>.

<sup>1</sup>Healthcare Cost and Utilization Project 2003, AHRQ.

<sup>2</sup>National Vital Statistics System-Mortality 2003, CDC, NCHS.

<sup>3</sup>National Hospital Discharge Survey 2002, CDC, NCHS.

<sup>4</sup>National Hospital Ambulatory Medical Care Survey 1998-2000, CDC, NCHS.

<sup>5</sup>National Health Interview Survey 2003, CDC, NCHS.

<sup>6</sup>Michigan Inpatient Database 2003, MDCH.

<sup>7</sup>Michigan Resident Death File 2003, MDCH.

## Additional Information

- **HP 2010 Objective 24-3:** The 2004 Michigan Behavioral Risk Factor Surveillance Survey, conducted by the Michigan Department of Community Health, provides a period prevalence estimate for emergency department use. Among adults ( $\geq 18$  years) reporting that they have current asthma, 19.0% reported having 1 or more visits to the Emergency Room or Urgent Care Center for treatment of asthma in the past 12 months.
- **HP 2010 Objective 24-4:** An estimate of the prevalence of activity limitations can be determined for the adult's with asthma from the 2004 Michigan Behavioral Risk Factor Surveillance Survey. Among adults ( $\geq 18$  years) who stated that they had current asthma, 29.3% reported limitations in their activities due to physical, mental, or emotional problems or required the use of special equipment for a health problem.
- **HP 2010 Objective 24-5:** An estimate of the number of school/work days missed due to asthma can be determined for the adult population from the 2004 Michigan Behavioral Risk Factor Surveillance Survey. Adults ( $\geq 18$  years) who stated that they had current asthma experienced an average of 7.9 days of restricted activities due to their asthma.

## What reduction is necessary to achieve the *Healthy People 2010* targets for asthma in Michigan?

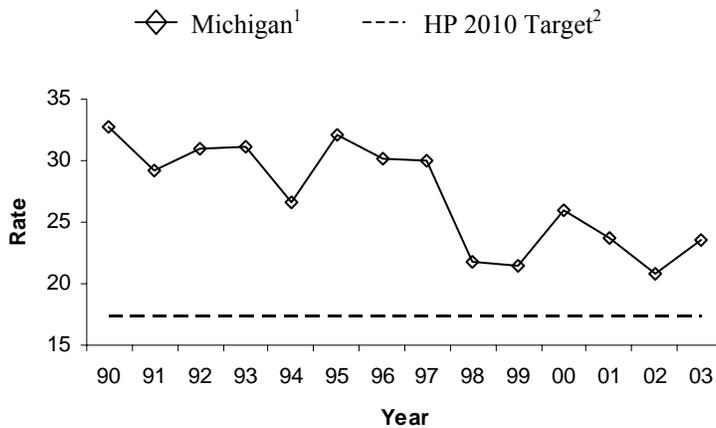
| Objective   | Age Group       | Michigan Events <sup>a</sup> | Reduction To Reach HP 2010 Target |                      |
|---|-----------------|------------------------------|-----------------------------------|----------------------|
|   |                 |                              | Number <sup>b</sup>               | Percent <sup>b</sup> |
| 1-9a. Reduce pediatric asthma hospitalization rate. (Rate per 10,000) | < 18 Years      | 5974                         | -1582                             | -27%                 |
| 24-1. Reduce asthma deaths. (Rate per million)                        | < 5 Years       | < 5 deaths <sup>γ</sup>      | δ                                 | δ                    |
|   | 5-14 Years      | 7                            | -6                                | -81%                 |
|   | 15-34 Years     | 22                           | -17                               | -76%                 |
|   | 35-64 Years     | 52                           | -20                               | -39%                 |
|   | $\geq 65$ Years | 54                           | 0 <sup>ε</sup>                    | 0% <sup>ε</sup>      |
| 24-2. Reduce hospitalizations for asthma. (Rate per 10,000)           | < 5 Years       | 3,312                        | -1,693                            | -51%                 |
|   | 5-64 Years      | 10,692                       | -4,381                            | -41%                 |
|   | $\geq 65$ Years | 2,568                        | -1,208                            | -47%                 |

- Notes:
- α. Data from Michigan Inpatient Database 2003, MDCH, and Michigan Resident Death File 2003, MDCH.
  - β. Estimates based on 2003 Michigan population.
  - γ. Insufficient data to compute a stable rate. (Number of deaths < 5, but > 0).
  - δ. Event and percent reductions cannot be calculated due to low number of Michigan events (Number of deaths < 5, but > 0).
  - ε. Event and percent reductions not needed since Michigan has already reached the HP 2010 target for this age group, 2003.

- Based on the 2003 Michigan population, in order for the State of Michigan to reach the *Healthy People 2010* target rate for pediatric asthma hospitalizations (objective 1-9a), the number of pediatric asthma hospitalization events must be 4,392, a reduction of 1,582 events (27%) from 2003.
- Based on the 2003 Michigan population, no further reduction of events is necessary to meet the target for objective 24-1 for individuals aged 65 years and older.

## Are Michigan pediatric asthma hospitalization rates decreasing toward the *Healthy People 2010* target?

**Asthma Hospitalization Rates (per 10,000) Compared to *Healthy People 2010* Target for Objective 1-9a, Age < 18 Years, Michigan, 1990 to 2003.**



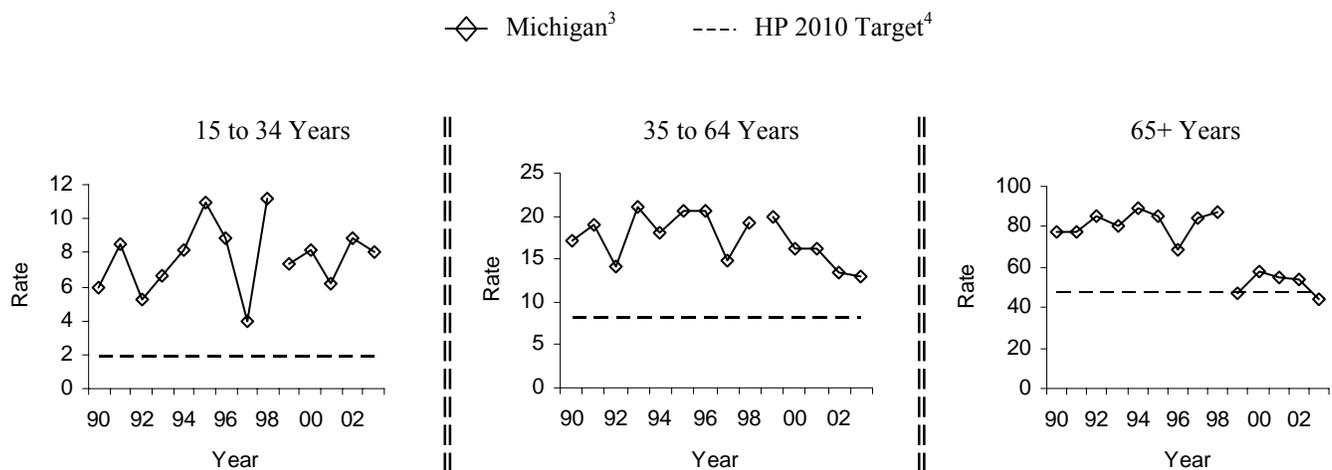
- ❑ All annual Michigan asthma hospitalization rates for children under 18 years are significantly greater than the *Healthy People 2010* target of 17.3/10,000 population.
- ❑ From 1990 to 2003, there has been a significant decline in asthma hospitalization rates for this age group in Michigan, toward the *Healthy People 2010* target rate. ( $p < 0.01$ )
- ❑ From 1999 to 2003, there have been fluctuations in asthma hospitalization rates for this age group in Michigan, with no observed decline.

<sup>1</sup> Source: Michigan Inpatient Database 1990-2003, MDCH.

<sup>2</sup> Objective 1-9a. Reduce pediatric (<18 years) hospitalization rate.

## Are Michigan asthma mortality rates decreasing toward the *Healthy People 2010* target?

**Asthma Mortality Rates (per 1,000,000) Compared to *Healthy People 2010* Target for Objective 24-1, Age > 14 Years<sup>1</sup>, Michigan, 1990 to 2003<sup>2</sup>.**



<sup>1</sup> For age groups 0 to 4 and 5 to 14, there is insufficient data to compute stable annual rates for all years. (Number of deaths < 5)

<sup>2</sup> Due to a change in coding for asthma deaths beginning in 1999, rates calculated for 1999-2003 are not comparable to rates calculated for 1990-1998.

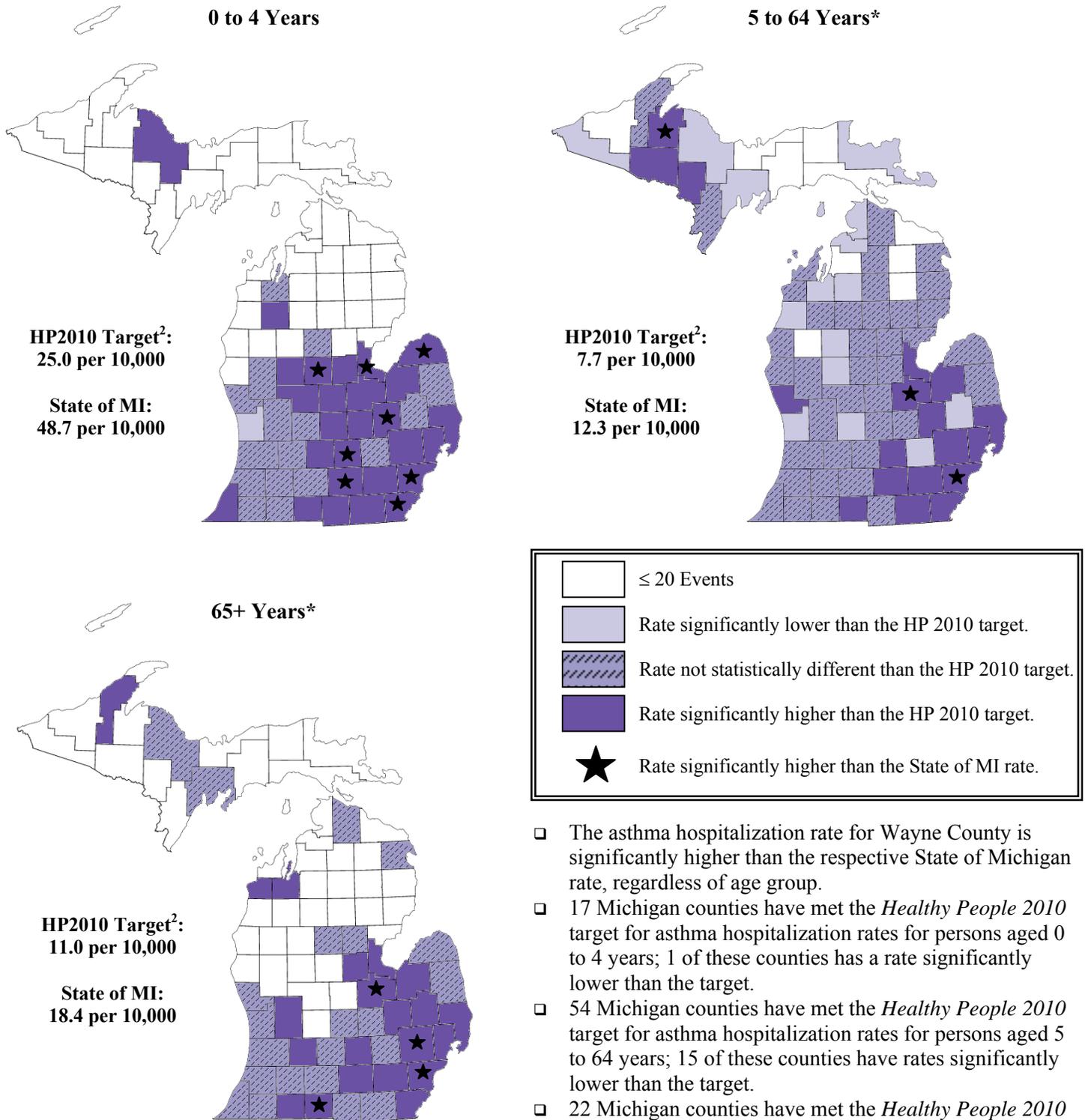
<sup>3</sup> Source: Michigan Resident Death File 1990-2003, MDCH.

<sup>4</sup> Objective 24-1. Reduce asthma deaths, age groups 15-34, 35-64, and 65+.

- ❑ The annual rates of mortality in Michigan are significantly higher than the *Healthy People 2010* target rate for persons ages 15 to 34, except in 1997.
- ❑ The annual rates of asthma mortality in Michigan are significantly higher than the *Healthy People 2010* target rate for adults ages 35 to 64.
- ❑ For adults age 65 years and older, asthma mortality rates in recent years (1999-2003) have met the *Healthy People 2010* target rate.

**Have any Michigan counties attained the *Healthy People 2010* targets for asthma hospitalization rates?**

**County Level Attainment of the *Healthy People 2010* Targets for Rates of Asthma Hospitalization<sup>1</sup> (Objective 24-2) by Age Group, Michigan, 2001 to 2003.**



<sup>1</sup> Source: Michigan Inpatient Database, 2001-2003, MDCH.

<sup>2</sup> Objective 24-2. Reduce hospitalizations for asthma, age groups 0-4, 5-64, and 65+.

\*Rates were age adjusted to the year 2000 standard U.S. population.

**Are there differences between blacks and whites in Michigan in meeting the *Healthy People 2010* targets for asthma hospitalization rates?**

**Rates of Asthma Hospitalization<sup>1</sup> (per 10,000) by Race<sup>2,3</sup> and Age Group, Compared to *Healthy People 2010* Target for Objective 24-2, Michigan, 2003.**

Rate Ratio

| Age Group      | HP 2010 Target <sup>4</sup> | Total | White | Black |
|----------------|-----------------------------|-------|-------|-------|
| 0 to 4 Years   | 25                          | 51.1  | 35.1  | 113.3 |
| 5 to 64 Years* | 7.7                         | 13.0  | 8.3   | 39.6  |
| 65+ Years*     | 11                          | 20.7  | 17.9  | 44.1  |

| Black vs. White (95% CI) |
|--------------------------|
| 3.2 (3.0, 3.5)           |
| 4.8 (4.6, 5.0)           |
| 2.5 (2.2, 2.7)           |

<sup>1</sup> Source: Michigan Inpatient Database 2003, MDCH.

<sup>2</sup> For records that are missing data on race, race was assigned based on the 1990 census population.

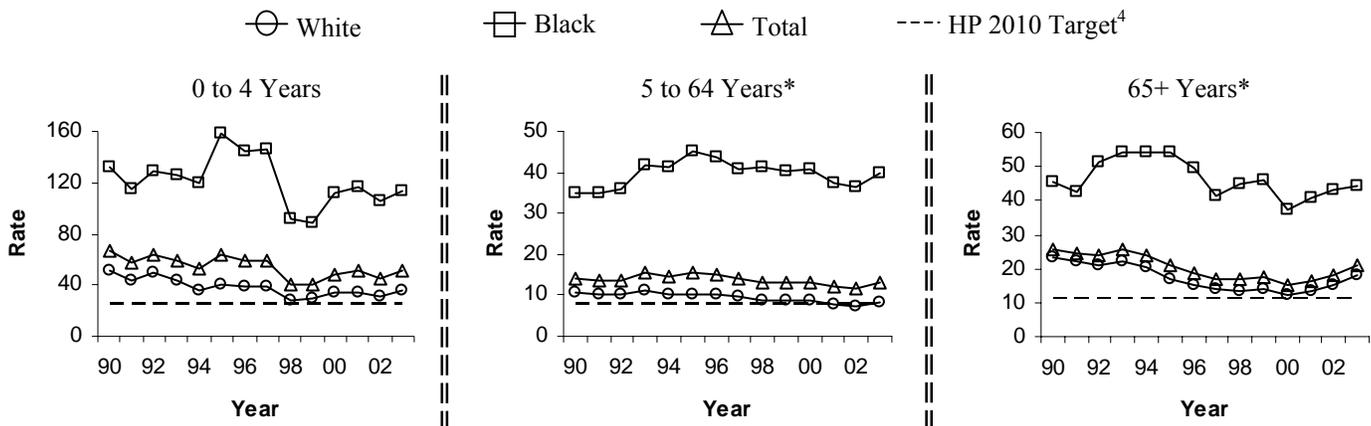
<sup>3</sup> Insufficient data to compute a stable rate for races other than white or black.

<sup>4</sup> Objective 24-2. Reduce hospitalizations for asthma, age groups 0-4, 5-64, and 65+.

\*Age adjusted to the year 2000 standard U.S. population.

- Within each age group, asthma hospitalization rates overall and by race are significantly higher than the *Healthy People 2010* target.
- Blacks have significantly higher asthma hospitalization rates than whites in all age groups. Black rates of hospitalization are 2.5 to 4.8 times the rates of whites.

**Rates of Asthma Hospitalization<sup>1</sup> (per 10,000) by Year, Age Group, and Race<sup>2,3</sup>, Compared to *Healthy People 2010* Target for Objective 24-2, Michigan, 1990 to 2003.**



<sup>1</sup> Source: Michigan Inpatient Database 1990-2003, MDCH.

<sup>2</sup> For records that are missing data on race, race was assigned based on the 1990 census population.

<sup>3</sup> Insufficient data to compute a stable rate for races other than white or black.

<sup>4</sup> Objective 24-2. Reduce hospitalizations for asthma, age groups 0-4, 5-64, and 65+.

\*Age adjusted to the year 2000 standard U.S. population.

- Asthma hospitalization rates for whites (○) aged 5 to 64 years met the *Healthy People 2010* target in 2001 and 2002. Rates for all other groups in all years have not reached their respective targets.
- Since 1990, asthma hospitalization rates for whites (○) have declined significantly for all three age groups. Among blacks (□), a significant decline was only observed for children aged 0 to 4 years.
- Asthma hospitalization rates for blacks (□) are significantly greater than those for whites (○) for all years and age groups.

## Summary

- ❑ Neither the United States nor Michigan has met all the *Healthy People 2010* targets for asthma.
- ❑ Michigan is demonstrating progress toward meeting the targets for asthma hospitalization rates overall and among whites for all age groups. However, rates for all groups are not improving; asthma hospitalization rates for blacks aged 5 to 64 years are moving away from the *Healthy People 2010* target.
- ❑ To reach the *Healthy People 2010* targets for asthma hospitalization rates, 7,282 asthma hospitalization events must be prevented in the State of Michigan each year.
- ❑ Sixty seven percent of Michigan counties have met or surpassed the target for asthma hospitalization rates for at least one age group. Fourteen percent have not yet met the target for any age group.
- ❑ Michigan's asthma mortality for adults aged 65 years and older is not significantly different than the *Healthy People 2010* target rate. Additionally, Michigan is demonstrating progress toward meeting the target asthma mortality rates for persons aged 35 to 64 years.
- ❑ In order to reach the *Healthy People 2010* targets for asthma mortality rates, 43 asthma related deaths must be prevented in the State of Michigan each year.
- ❑ Despite these encouraging results, there remains a dramatic racial disparity in asthma hospitalization and mortality rates in Michigan. Efforts to reduce the burden of asthma in Michigan must address this issue.

## Next Steps

- ❑ Michigan's surveillance of asthma is incomplete due to the lack of access to key data systems. It is important to acquire new sources of data, particularly information related to emergency department visits, activity limitations, and disease management, to measure Michigan's progress toward meeting all the *Healthy People 2010* targets.
- ❑ In 2005, Michigan conducted a survey of adults and children with asthma to ask about asthma management, education, and activity limitations. These data are currently being analyzed.
- ❑ The Michigan Department of Community Health is using state funds and federal grant dollars to support education and intervention activities for the improvement of asthma management and outcomes at state and local levels. Go to [www.GetAsthmaHelp.org](http://www.GetAsthmaHelp.org) or call 1-866-EZLUNGS (1-866-395-8647) for more information.

## References

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## Methods

Hospitalization analyses: all in-patient hospitalizations where asthma was the primary reason for the stay (primary discharge diagnosis coded to ICD-9-CM codes 493.XX) were selected from the Michigan Inpatient Database (MIDB). These data represent the number of in-patient hospitalizations for asthma, not the number of individual people hospitalized for asthma. Age adjusted hospitalization rates are adjusted to the 2000 US standard population. All hospitalization rates are presented on a per 10,000 population basis. Hospitalization rates for geographic or demographic units with 20 or fewer events or a population of less than 5,000 are not calculated because these rates exhibit considerable variation over time and from place to place.

Mortality analyses: all deaths where asthma was the primary cause of death (underlying cause of death coded to ICD-9 493.XX or ICD-10 J45 or J46) were selected from the Michigan Resident Death File (MRDF). Mortality rates are presented on a per 1,000,000 population basis. For demographic units with 4 or fewer events, mortality rates are not calculated. Due to a change in coding for asthma deaths beginning in 1999, rates calculated for 1999 and later are not comparable to rates calculated for 1990-1998.

Michigan rates are considered statistically different than the *Healthy People 2010* target if their 95% confidence intervals do not include the target rate. When comparing two Michigan rates, they are considered statistically different if their 95% confidence intervals do not overlap. The Spearman Correlation Coefficient is used to test for statistical trends in asthma hospitalization rates over time, with a p-value < 0.05 considered statistically significant. This method was chosen since it makes no assumption about the underlying distribution of the data analyzed and gives an overall test of monotonic increasing or decreasing of rates over time.

Suggested citation: Wasilevich EA, Lyon-Callo S. Targeting Asthma in Michigan, The Healthy People 2010 Objectives, Bureau of Epidemiology, Michigan Department of Community Health, 2006.

For more information about asthma and the Asthma Initiative of Michigan, please visit: [www.getastmahelp.org](http://www.getastmahelp.org)  
or call **1-866-EZLUNGS (1-866-395-8647)**

For more information about *Targeting Asthma in Michigan, The Healthy People 2010 Objectives* Fact Sheet, contact the Chronic Disease Epidemiology Section at (517) 335-9080.

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