

# DISPARITIES IN MICHIGAN'S ASTHMA BURDEN

**Health Disparity:** (1) differences in health outcomes and status and (2) differences in health care, referring to differences in the preventative, diagnostic, and treatment services offered to people with similar health conditions.

Michigan Department of Community Health



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## General Population of Michigan, Children <18 Years

		Hospitalization Rate (per 10,000) 2000-2002	Trend in Hospitalization 1990-2002	Comment
Sex	Male	29.5	↓ *	Male children are hospitalized for asthma at a rate 60% higher than that for female children.**
	Female	18.1	↓ *	
Race	White	14.9	↓ *	Black children are hospitalized for asthma at a rate 4.2 times that for white children.**
	Black	62.3	↓	
Income	Low	50.9	~	Children living in low income areas are hospitalized for asthma at a rate 4.3 times that for children living in high income areas.**
	Middle	20.8	~	
	High	11.9	~	
		Mortality Rate (per 1,000,000) 2000-2002	Trend in Mortality 1990-2002	Comment
Sex	Male	5.5	↑	Asthma deaths for male children occur at a rate 80% higher than that for female children. (ns)
	Female	3.1	↑	
Race	White	2.3	↓	Asthma deaths for black children occur at a rate 6 times that for white children.**
	Black	13.9	↑	

↑ Increasing trend

↓ Decreasing trend

\* Statistically significant trend, p<0.05.

~ Not available.

\*\* Rate ratio significantly different than 1.0, p<0.05.

<b>General Population of Michigan, Adults <math>\geq 18</math> Years</b>				
		Hospitalization Rate (per 10,000) 2000-2002	Trend in Hospitalization 1990-2002	Comment
<b>Sex</b>	Male	7.2	↓ *	The rate of asthma hospitalization for female adults is 2.4 times that for male adults.**
	Female	17.4	↓ *	
<b>Race</b>	White	8.8	↓ *	The rate of asthma hospitalization for black adults is 4.2 times that for white adults.**
	Black	37.0	↑	
<b>Income</b>	Low	29.2	~	The rate of asthma hospitalization for adults living in low income areas is 4.1 times that for adults living in high income areas.**
	Middle	11.1	~	
	High	7.2	~	
		Mortality Rate (per 1,000,000) 2000-2002	Trend in Mortality 1990-2002	Comment
<b>Sex</b>	Male	15.1	↓	Asthma deaths for female adults occur at a rate 50% higher than that for male adults.**
	Female	23.2	↓	
<b>Race</b>	White	14.2	↓ *	The rate of asthma death for black adults is 4 times that for white adults.**
	Black	57.5	↑	

↑ Increasing trend

↓ Decreasing trend

\* Statistically significant trend,  $p < 0.05$ .

~ Not available.

\*\* Rate ratio significantly different than 1.0,  $p < 0.05$ .

<b>Medicaid Population <sup>◇</sup> of Michigan, Children &lt;18 Years</b>				
		Prevalence (%) Persistent Asthma <sup>†</sup> 2001	Prevalence (%) Persistent Asthma <sup>†</sup> 2002	Comment
<b>Sex</b>	Male	5.3	5.3	The prevalence of persistent asthma is 40% higher for male children than female children.**
	Female	3.8	3.8	
<b>Race</b>	White	4.1	4.2	The prevalence of persistent asthma is 23% higher for black children than white children.**
	Black	5.2	5.1	
<b>County</b>	Urban	4.7	4.6	The prevalence of persistent asthma is 5% higher for children of urban counties than children of non-urban counties.**
	Non-Urban	4.0	4.3	
		Emergency Department Visit Rate (per 10,000) 2001	Emergency Department Visit Rate (per 10,000) 2002	Comment
<b>Sex</b>	Male	267.4	229.2	Male children visit the ED for asthma at a rate 42% higher than that for female children.**
	Female	194.9	161.8	
<b>Race</b>	White	128.1	110.5	Black children visit the ED for asthma at a rate 2.7 times that for white children. **
	Black	348.3	302.8	
<b>County</b>	Urban	255.0	215.3	Children of urban counties visit the ED for asthma at a rate 2.2 times that for children of non-urban counties. **
	Non-Urban	106.4	96.4	
		Hospitalization Rate (per 10,000) 2001	Hospitalization Rate (per 10,000) 2002	Comment
<b>Sex</b>	Male	76.8	65.9	Male children are hospitalized for asthma at a rate 48% higher than that for female children.**
	Female	56.5	44.5	
<b>Race</b>	White	41.8	34.2	Black children are hospitalized for asthma at a rate 2.4 times that for white children. **
	Black	94.3	81.9	
<b>County</b>	Urban	72.4	60.2	Children of urban counties are hospitalized for asthma at a rate about 2 times that for children of non-urban counties. **
	Non-Urban	36.7	30.1	

<sup>◇</sup>Population restricted to those children continuously enrolled in Medicaid with full coverage and no other insurance.

<sup>†</sup>Persistent asthma is defined according to HEDIS® specifications: in the year prior to 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.)

\*\*Based on comparisons of 2002 data, prevalence or rate ratio significantly different than 1.0, p<0.05.

## NOTES

### Definitions:

- Asthma hospitalization defined as a primary discharge diagnosis of asthma, ICD-9-CM=493.XX. These data represent the number of inpatient hospitalizations for asthma, not the number of persons hospitalized for asthma.
- Asthma death defined as the primary cause of death being asthma, ICD-9=493 or ICD-10=J45 or J46.
- Asthma emergency department visit defined as 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.
- Medicaid population of children <18 is restricted to those children continuously enrolled in Medicaid with full coverage and no other insurance.
- Persistent asthma is defined according to HEDIS® specifications: in the year prior to the prevalence measurement year having (1)  $\geq 4$  asthma medication dispensing events OR (2)  $\geq 1$  emergency department visits for asthma OR (3)  $\geq 1$  hospitalization for asthma OR (4)  $\geq 4$  outpatient visits for asthma and  $\geq 2$  asthma medication dispensing events. (National Committee for Quality Assurance. Use of Appropriate Medications for People with Asthma. *HEDIS® 2003, Volume 2: Technical Specifications*. Washington, DC; 2003. )
- When data was missing, race was assigned based on the 1990 Census population to calculate hospitalization rates for the general population by race.
- Income of area of residence is defined by the median household income by zip code from the US Census 2000: High income=top 20%, low income = bottom 20%, and all others considered middle income areas.
- Urban counties are defined as those including a Metropolitan Statistical Area (MSA) per the U.S. Department of Commerce Census Bureau, Michigan Metropolitan Areas, Counties, and Central Cities. (<http://www.census.gov/geo/www/mapGallery/stma99.pdf>)

### Methods:

- All rates are age adjusted to the 2000 US standard population by the direct standardization method. Prevalence of persistent asthma for children in Medicaid is also age adjusted.
- A prevalence or rate ratio is considered statistically significant if its confidence interval does not contain 1.0, the value for no association. For the Medicaid population, 2002 data is used for comparisons between subgroups.
- Trend analysis was conducted for mortality rates and select hospitalization rates for the general population of Michigan. Since data is available for only 2 years for the Medicaid population, trend analysis could not be conducted. The Spearman Correlation Coefficient is used to test for statistical trends in asthma 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.

### Data Sources:

- Michigan Inpatient Database, 1990-2002, Michigan Department of Community Health.
- Michigan Resident Death File, 1990-2002, Michigan Department of Community Health.
- Managed Care Production Encounters, Fee for Service Paid Claims, Medicaid Beneficiary Files, Data Warehouse, 2001-2002, Michigan Department of Community Health.
- Michigan Population Estimates, 1990-2002, Michigan Department of Community Health.

## FOR MORE INFORMATION

About *Disparities in Michigan's Asthma Burden*, contact the Epidemiology Services Division and the Michigan Department of Community Health, 517.335.8806.

### SUGGESTED CITATION:

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