



Q: What do  
these PEOPLE  
have in  
common?



Missouri Asthma Surveillance Report

2006

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# A: They are Missourians currently living with ASTHMA.

## List of Abbreviations

BRFSS

Behavioral Risk Factor Surveillance System

CDC

Centers for Disease Control and Prevention

ED

Emergency Department

HP 2010

Healthy People 2010

MAC

Missouri Asthma Coalition

MAPCP

Missouri Asthma Prevention and Control Program

MDHSS

Missouri Department of Health and Senior Services

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## Missouri Asthma Surveillance Report

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# Asthma Prevalence and Risk Factors

## *About this Section*

This section estimates the number of adults and children with asthma in Missouri, and compares Missouri rates to national rates. It also identifies which adult populations have asthma, and describes risk factors and health care access issues for these adults. The majority of the information in this report is from the year 2004.

## *About the BRFSS<sup>3</sup>*

The Behavioral Risk Factor Surveillance System (BRFSS) was developed by the Centers for Disease Control and Prevention (CDC) in the early 1980s and Missouri has been participating since 1986.

BRFSS data are collected through random-digit-dialed telephone interviews with adult (18 years or older) residents of the state. Adults may be asked questions about children living in the household as well. The survey contains about 140 questions on demographics and health-related topics. In 2004, the sample size for the Missouri BRFSS was 5,135 completed interviews. BRFSS data are used for many purposes, including:

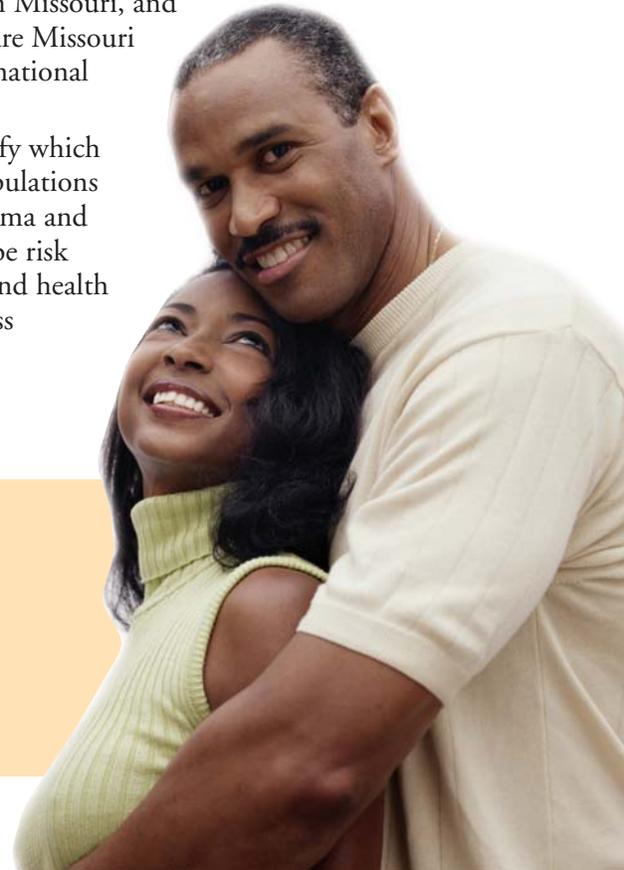
- Assessing risk for chronic diseases, infectious diseases and injuries
- Identifying demographic differences and trends in health-related behaviors
- Designing, monitoring and evaluating health interventions and services
- Addressing emergent and critical health issues
- Formulating policy and proposing legislation for health initiatives
- Measuring progress toward achieving state and national health objectives

## **DATA SOURCES:**

- Missouri Behavioral Risk Factor Surveillance System (BRFSS)<sup>1</sup>
- National BRFSS<sup>2</sup>

## **AIM:**

- To estimate the number of adults and children with asthma in Missouri, and to compare Missouri rates to national numbers
- To identify which adult populations have asthma and to describe risk factors and health care access issues



**BACKGROUND:**<sup>3</sup>

- The BRFSS was developed by the Centers for Disease Control and Prevention (CDC) in the early 1980s and Missouri has been participating since 1986
- BRFSS data are collected through random-digit-dialed telephone interviews with adult (18 years or older) residents of the state
- Adults may be asked questions about children living in the household as well
- Surveys contain about 140 questions on demographics and health-related topics
- In 2004, the sample size for the Missouri BRFSS was 5,135 completed interviews
- BRFSS data are used for many purposes, including:
- Assessing risk for chronic diseases, infectious diseases and injuries
- Identifying demographic differences and trends in health-related behaviors
- Designing, monitoring and evaluating health interventions and services
- Addressing emergent and critical health issues
- Formulating policy and proposing legislation for health initiatives
- Measuring progress toward achieving state and national health objectives

**METHODS:**

- Statistical significance is determined based on a probability (p) value of less than 0.05 and describes a mathematical measure of difference between groups. The difference is said to be statistically significant if it is greater than what might be expected to happen by chance alone. Prevalence rates are reported as percents
- For notes on how comparable Missouri statistics are to national rates, see Appendix A

- For a list of BRFSS questions included in this document, see Appendix B

**SPECIAL NOTES:**

- Child prevalence data are available for 2004 only and demographic, risk factor, and other information on these children are not currently available
- Children are defined as individuals under 18 years of age

## *Missouri Asthma Prevalence*

### *How many people have asthma in Missouri?*

Approximately 1 in 11 adults and 1 in 12 children have asthma in Missouri. This is a total of about 500,000 individuals.

TABLE 1

#### LIFETIME AND CURRENT ASTHMA PREVALENCE MISSOURI 2004, ADULTS AND CHILDREN

	LIFETIME (%)	CURRENT (%)
Adult	13.4	9.1
Child	11.0	8.0

*See Appendix B for a list of BRFSS questions*

## CHILDHOOD ASTHMA PREVALENCE

### *Among children, what are lifetime and current asthma prevalence rates?*

In the 2004 BRFSS, adults were asked about asthma among children living in their household. Eleven percent of children had been diagnosed with asthma, and the majority of those still had asthma (72.7%). Current asthma prevalence among children was 8.0%; about 111,000 children were living with asthma based on the 2004 population estimate. (SEE TABLE 1)

### *How do childhood asthma prevalence rates compare to national rates?*

The childhood asthma prevalence questions on the Missouri BRFSS were state-added questions in 2004, so there are no national BRFSS figures available for comparison. However, a similar survey (the National Health Interview Survey) reported that the lifetime asthma prevalence rate for children less than 18 years of age was 12.0% in 2004<sup>4</sup>. This is slightly higher than the Missouri number, however, no data on statistical significance were available.

## ADULT ASTHMA PREVALENCE

*Among adults, what are lifetime and current asthma prevalence rates?*

In 2004, 13.4% of Missouri adults reported that they had been diagnosed with asthma in their lifetime. Most of those

*115,000 children currently living with asthma in MO*

individuals (67.9%) reported that they still had asthma. So, 9.1% of the adult population, or about 400,000 adults, were currently living with asthma. (SEE TABLE 1)

*Among adults, who has asthma in Missouri?*

TABLE 2 shows prevalence of current asthma among adults by various demographic factors. Rates varied among the groups depicted in the table; however, when rates were compared to the overall state rate, none of the differences were statistically significant. The only exception was that the prevalence rate was significantly higher among those who had less than a high school education compared to those with higher education attainment.

*Is adult asthma prevalence on the rise in Missouri?*

Among adults, the prevalence rates of both lifetime and current asthma increased between 1999 and 2004. This trend was statistically significant. (SEE FIGURE 1)

*How do Missouri adult asthma prevalence rates compare to national rates?*

TABLE 3 shows that both lifetime and current asthma prevalence rates were higher for Missouri in all years than for the median of all national prevalence rates. Statistical significance could not be determined for this difference.

TABLE 2  
Prevalence of Current Asthma by Demographic Factors Missouri 2004, Adults

	CURRENT (%)
<b>SEX</b>	
Male	7.9
Female	10.3
<b>RACE/ETHNICITY</b>	
Non-Hispanic White	8.9
Non-Hispanic African American	9.0
Non-Hispanic Other	13.2
Non-Hispanic Multiracial	8.2
Hispanic	9.0
<b>AGE GROUP IN YEARS</b>	
18-24	10.2
25-34	8.5
35-44	9.5
45-54	8.9
55-64	9.8
65 and older	8.0
<b>ANNUAL INCOME</b>	
Less than \$15,000	12.6
\$15,000-24,999	12.1
\$25,000-34,999	9.0
\$35,000-49,999	9.4
\$50,000 and greater	6.5
<b>EDUCATION</b>	
Less than High School	16.4*
High School or GED	8.9
Some Post-High School	8.7
College Graduate	6.8
<b>OVERALL STATE RATE</b>	9.1

\* Significantly different than the overall state rate or higher education groups

Figure 1. Lifetime and Current Asthma Prevalence Rates by Year - Missouri 1999-2004\*  
Adults

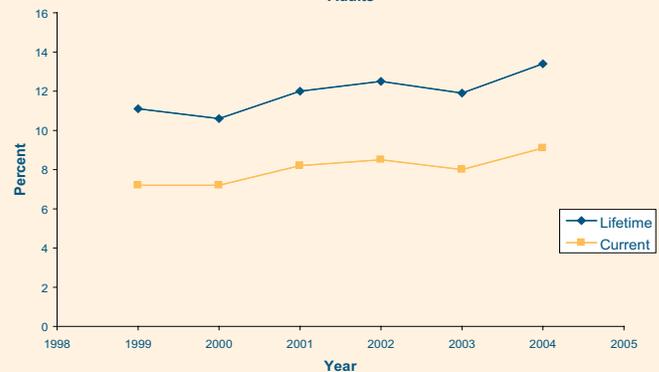


TABLE 3

### Asthma Prevalence Rates Missouri and National Median, 2002-2004

	MISSOURI		NATIONAL MEDIAN	
	LIFETIME (%)	CURRENT (%)	LIFETIME (%)	CURRENT (%)
2002	12.5	8.5	11.8	7.6
2003	11.9	8.0	11.7	7.5
2004	13.4	9.1	13.2	8.2

*Statistical significance could not be determined*

#### *What risk factors for asthma complications are reported among adults with current asthma?*

Some important risk factors for asthma complications include poor indoor and outdoor air quality, smoking, and exposure to environmental tobacco smoke (ETS)<sup>5</sup>. Using data from the 2004 BRFSS, prevalence of selected asthma risk factors was compared among those with current asthma and those not currently living with asthma. (SEE TABLE 4)

Individuals with asthma reported that they think poor indoor air quality (e.g., dust, mold, smoke, chemicals) had made them ill in the past 12 months more often than those who did not currently have asthma. Individuals with asthma also reported that they think outdoor air pollution (e.g., smog, automobile exhaust, chemicals) had made them ill in the past 12 months more often than those who did not have asthma. These differences were statistically significant.

Slightly more people with asthma currently smoke cigarettes than those without asthma, but this difference was not statistically significant. About equal proportions of those with current asthma and those without current asthma were potentially exposed to ETS in the home because smoking is allowed in the home or because there are no rules against smoking in the home.

Individuals with chronic disease, including asthma, are recommended to receive vaccinations against influenza and other communicable respiratory diseases, like pneumonia<sup>6</sup>. About half of those with current asthma had not received a flu shot in the last year and had not been vaccinated against pneumonia in their lifetime.

TABLE 4

### Risk Factors for Asthma Complications Missouri 2004, Adults

BELIEF	CURRENT ASTHMA (%)	NO CURRENT ASTHMA (%)
Indoor air contamination	45.1*	21.6
Outdoor air pollution	24.8*	8.7
<b>Risk</b>		
Currently smoke some or all days	54.6	49.3
Smoking allowed in the home or no rules about smoking	24.1	24.6
No flu shot in the last 12 months	48.4*	66.3
Never had a pneumonia vaccine	55.5*	73.8

*\*Difference between those with current asthma and those without current asthma was statistically significant Note: See Appendix B for a list of BRFSS questions*

#### *What health care access issues are reported among adults with current asthma?*

TABLE 5 shows the differences in health care access between adults with asthma and adults without asthma. About 14% of those with current asthma said they did not have any health care coverage (such as commercial health insurance, HMOs, and government sources such as Medicare). This was not significantly different from those without current asthma.

About 15% of those with current asthma reported that they did not have a personal health care provider such as a primary care physician. Slightly more of those who did not have asthma reported that they did not have a personal health care provider. This difference was not statistically significant.

Nearly one-fourth of those with current asthma reported that in the last year they could not see a doctor when they needed to because of cost. Only 11.2% of those without current asthma said they

could not see a doctor because of cost. This difference was statistically significant.

*400,000 adults  
currently living with  
asthma in MO*

TABLE 5  
Health Care Access  
Missouri 2004, Adults

INDICATOR	CURRENT ASTHMA (%)	NO CURRENT ASTHMA (%)
Do not have health care coverage	14.2	13.0
Do not have a personal health care provider	15.2	17.2
Could not see doctor because of cost in the last year	24.3*	11.2

\*Difference between those with current asthma and those without current asthma was statistically significant. Note: See Appendix B for a list of BRFSS questions

## WORK-RELATED ASTHMA

There are two categories of work-related asthma<sup>7</sup>:

- Work-Aggravated – preexisting asthma that is significantly exacerbated by exposure to a chemical, or agent, in the workplace.
- New-Onset – a new case of asthma that develops following exposure to an agent in the workplace.

It is unknown how many workers in Missouri are potentially exposed to agents that cause or exacerbate asthma, but nationally this number is estimated at 9 million<sup>5</sup>.

### *What is the prevalence of work-related asthma in Missouri?*

Among adults who reported that they had been diagnosed with asthma during their lifetime in 2003 and 2004, 5.6% said that a doctor or other health professional had told them their asthma was work-related. It is unknown whether these individuals had work-aggravated or new-onset asthma.

Missouri results cannot be compared to national data because work-related asthma was a state-added question unique to the Missouri BRFSS.

### *How many adults in Missouri have been told their asthma is work-related?*

Based on 2004 estimates, nearly 30,000 adults in Missouri have been told their asthma is work-related.

*300,000  
adults in MO  
have been told  
their asthma is  
work-related*



# Health Outcomes

There are a variety of health outcomes that affect people with asthma. The first outcome described here is health-related quality of life as measured by the 2004 Missouri BRFSS. Data reported by the Missouri Information for Community Assessment (MICA) system are also important for describing the impact of asthma in Missouri. These include information on asthma-related emergency department (ED) visits, hospitalizations, and deaths.

## *Health-Related Quality of Life*

### DATA SOURCE:

- Missouri Behavioral Risk Factor Surveillance System (BRFSS)<sup>1</sup>

### AIM:

- To compare health-related quality of life measures among those with asthma and those without asthma

### BACKGROUND:

- The CDC has outlined how BRFSS data should be used to measure health-related quality of life (HRQOL) and these guidelines<sup>8</sup> were used to produce the findings reported here
- For more information on the BRFSS see page 34

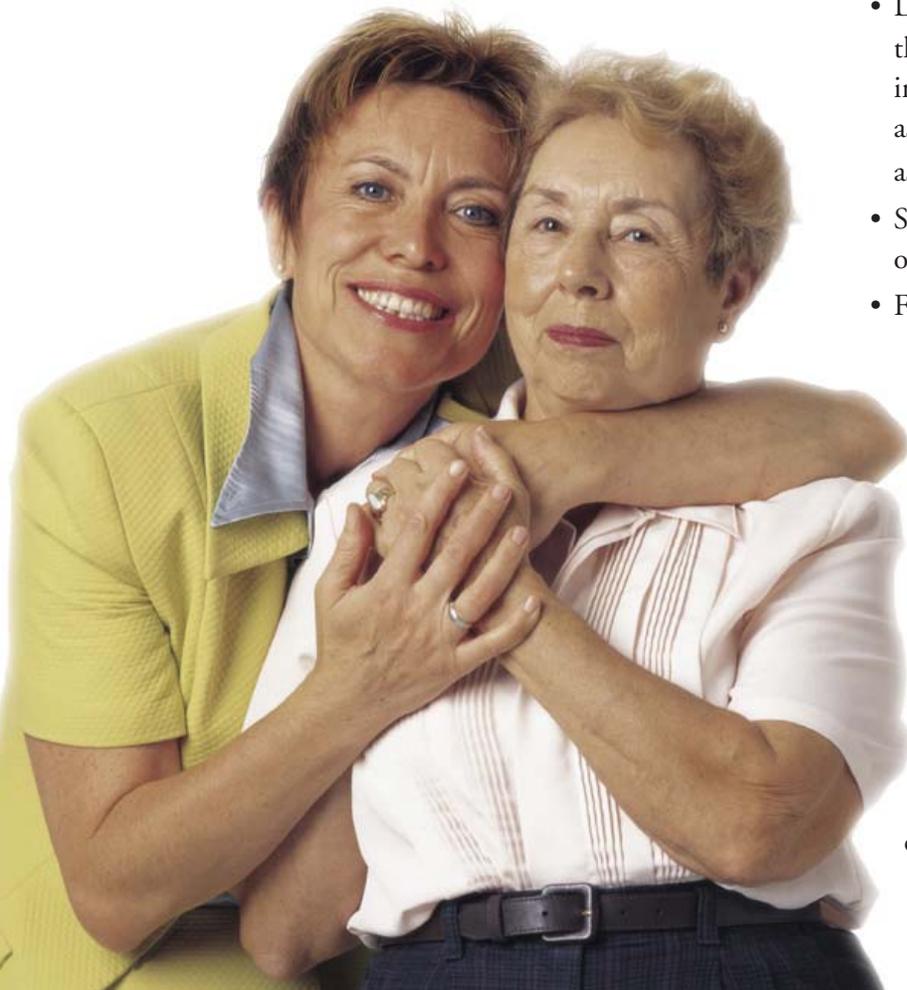
### METHODS:

- Data were analyzed for those with current asthma and those who do not currently have asthma, which includes those who have never been told they had asthma plus those who had been diagnosed with asthma but do not currently have asthma
- Statistical significance is determined based on a p value of less than 0.05
- For a list of BRFSS questions included in this document, see Appendix B

### SPECIAL NOTES:

- No national data on these analyses are available. According to the CDC, health-related quality of life refers to a person or group's perceived physical and mental health over time. This is especially important to examine among individuals with chronic diseases, like asthma, in order to examine how a condition affects everyday life.<sup>8</sup>

BRFSS data can be used to compare different health-related quality of life measures among adults currently living with asthma and those who do not currently have asthma. As stated in the prevalence



section (page 3), 9.1% of adults in Missouri are currently living with asthma. Those without current asthma include the remaining 90.9% of the population. This includes both those who have never been diagnosed with asthma in their lifetime and those who were diagnosed in the past but do not currently have asthma.

## One-third of those with asthma said their general health was fair or poor

TABLE 6

### Health-Related Quality of Life Measures Missouri 2004, Adults

RISK FACTOR	CURRENT ASTHMA (%)	NO CURRENT ASTHMA (%)
Fair or poor general health	32.8*	14.0
14 or more physically unhealthy days	21.6*	9.5
14 or more mentally unhealthy days	16.0*	9.9
14 or more activity limitation days	21.0*	13.2

\*Difference between those with current asthma and those without current asthma was statistically significant Note: See Appendix B for a list of BRFSS questions

### How many adults with current asthma said their general health was fair or poor?

One-third of those with current asthma said their general health was fair or poor (TABLE 6). This is significantly higher than the percentage of those without current asthma who reported their health was fair or poor.

### How many adults with current asthma said their physical health was not good 14 or more days during the past 30 days?

Nearly a quarter of those with current asthma said their physical health was not good 14 or more days in the last month (TABLE 6). This is significantly higher than those who were not currently living with asthma.

### How many adults with current asthma said their mental health was not good 14 or more days during the past 30 days?

Sixteen percent of those currently living with asthma reported that their mental health was not good 14 or more days during the last 30 days, and this was significantly higher than those who did not currently have asthma (TABLE 6).

### How many adults with current asthma said their physical or mental health kept them from doing their usual activities (self-care, work, or recreation) 14 or more days during the past 30 days?

About one-fifth of those with current asthma stated that their activity was limited 14 or more days during the last month due to physical or mental health issues (TABLE 6). This was significantly higher than the proportion without current asthma.

TABLE 7

### Health-Related Quality of Life Measures Missouri 2004, Adults

RISK FACTOR	CURRENT ASTHMA (%)	NO CURRENT ASTHMA (%)
Mean physically unhealthy days	8.4*	3.9
Mean mentally unhealthy days	5.8*	3.3
Mean physically or mentally unhealthy days	11.6*	6.3
Mean days of activity limitation	7.7*	4.7

\*Difference between those with current asthma and those without current asthma was statistically significant Note: See Appendix B for a list of BRFSS questions

### What is the mean number of physically unhealthy days during the past 30 days reported by those with current asthma?

Adults with asthma reported an average of 8.4 days per month that their physical health was not good (TABLE 7). This was significantly higher than the mean number reported by adults not currently living with asthma.

### What is the mean number of mentally unhealthy days during the past 30 days reported by those with current asthma?

Adults with asthma reported an average of 5.8 days per month that their mental health was not good (TABLE 7).

This was significantly higher than the mean number reported by adults not currently living with asthma.

*What is the mean number of physically or mentally unhealthy days during the past 30 days reported by those with current asthma?*

Adults with asthma reported an average of 11.6 days per month that their physical or mental health was not good (TABLE 7). This was significantly higher than the mean number reported by adults not currently living with asthma.

*What is the mean number of days that poor physical or mental health limited activity during the past 30 days reported by those with current asthma?*

Adults with current asthma reported that their activity was limited by poor health an average of 7.7 days in the past month (TABLE 7). This was significantly higher than the mean number reported by adults not currently living with asthma.

## *Emergency Department Visits, Inpatient Hospitalizations and Deaths*

### DATA SOURCES:

- Emergency Department MICA<sup>9</sup>
- Statistics displayed in this report may be slightly different from that found in the current ED MICA due to revisions in the population estimates
- Hospitalizations MICA including inpatient hospitalizations, total days of hospital care, and total hospitalization charges<sup>10</sup>
- Statistics displayed in this report may be slightly different from that found in the current hospital discharge MICA due to revisions in the population estimates
- Death MICA<sup>11</sup>
- Healthy People 2010 Objectives<sup>12</sup>

### AIM:

- To answer important questions about the impact of asthma on Missouri using ED, hospitalization, and death data
- To explore differences in asthma-related ED and hospitalization rates by age, sex, race, and expected payment source

- To explore differences in asthma-related death rates by age, sex, and race
- To compare Missouri findings to national data
- To describe trends in asthma-related ED visits, hospitalizations, and deaths

*30,970 emergency department visits were reported with asthma*

### BACKGROUND<sup>13</sup>:

- MICA is an interactive system that allows users to create, view, and download TABLES containing health data from various data sources about Missouri residents
- MICA can be accessed at <http://www.dhss.mo.gov/MICA>
- MICA allows the user to examine data statewide or by characteristics such as age, sex, race, ethnicity, and county/city of residence
- Data may be accessed for one year or multiple years
- Confidentiality rules are applied in the data displayed to avoid identification of individuals

### METHODS:

- Rates are based on the population in question, (e.g., Missouri residents, males, African Americans)
- Emergency department rates are reported per 1,000 population
- Hospitalization rates are reported per 10,000 population
- Death rates are reported per 100,000 population
- Age-adjusted rates are created using the US 2000 standard population
- Crude or age-specific rates are also reported
- Statistical significance is determined based on a p value of less than 0.05
- For notes on how comparable Missouri statistics are to national rates, see Appendix A

### SPECIAL NOTES:

- Data are reported for Missouri residents only
- Data in this report have asthma as the primary diagnosis or primary cause of death
- Generally, data are reported for the most recent year of

data available: for ED visits and hospitalizations, at the time this report was prepared the latest year was 2003. To observe asthma ED visits and hospitalizations over time multiple years are shown. For deaths the latest year was 2004, and the years 1999-2004 are combined due to the small number of asthma deaths each year beginning with TABLE 18 and FIGURE 25.

Payment source information presented in this report is the first listed expected source of payment (e.g., commercial managed care organization, Medicaid, etc.) on the ED visit or hospitalization claim record

### EMERGENCY DEPARTMENT VISITS

#### *How many ED visits occur each year due to asthma?*

In 2003, 30,970 ED visits were reported with asthma as the underlying cause. The age-adjusted ED rate for all Missouri residents was 5.6 per 1,000 population (TABLE 8).

#### *What groups visit the ED the most due to asthma?*

TABLE 8 shows that age-adjusted asthma ED visit rates were higher among females than males; this

difference was statistically significant. Rates were higher among African Americans than whites, and this difference was also statistically significant. Rates were significantly higher among white females than white males. African American male and female rates were not significantly different.

**TABLE 8\***  
**Age-Adjusted Asthma Emergency Department Visit Rates by Race and Sex Missouri 2003**

RACE	MALES		FEMALES*		BOTH SEXES	
	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
White	7,316	3.1	10,4108*	4.4	17,726	3.7
African American*	6,232	16.5	6,132	16.3	12,364	16.5
All Races	14,012	5.0	16,958	6.1	30,970	5.6

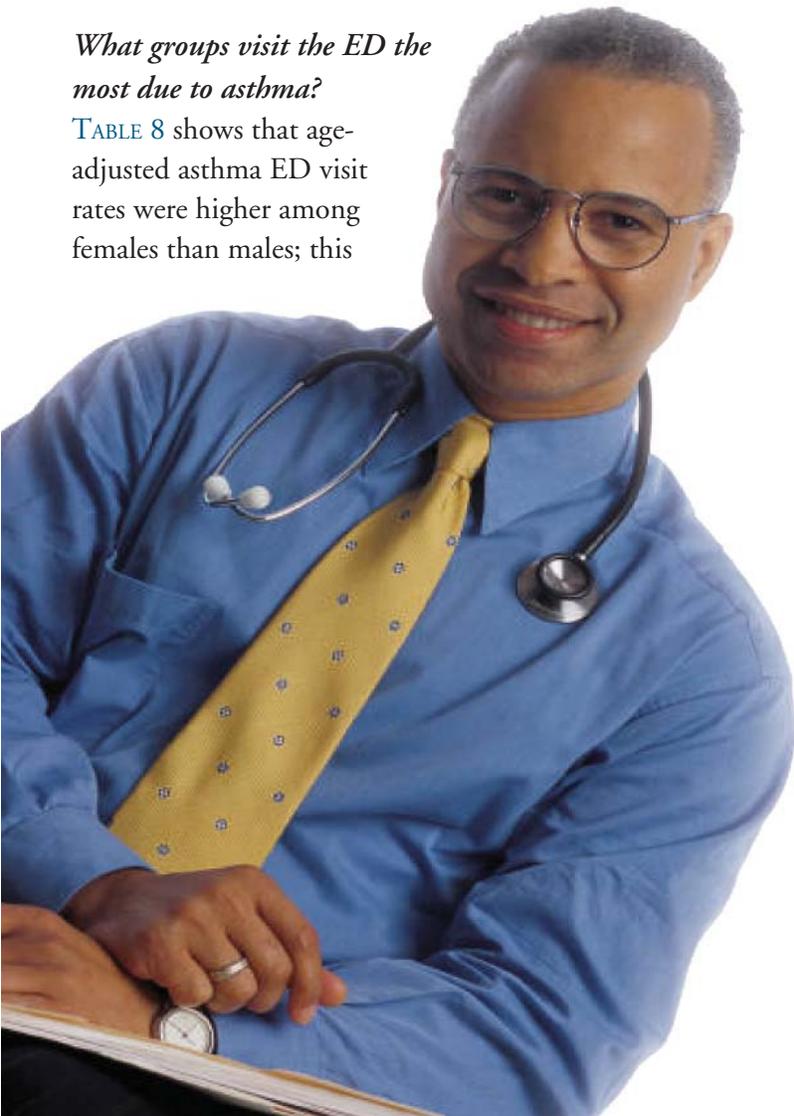
\*Statistical significance discussed above. Age-adjusted rates were generated using the US 200 standard population. Rates per 1,000 population.

#### *Which age groups visit the ED the most due to asthma?*

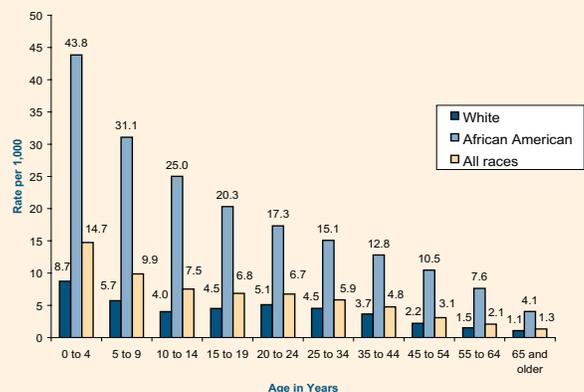
As FIGURE 2 shows, ED visit rates were highest among younger individuals of both sexes and all racial groups. Rates were especially high for those under ten years of age. The lowest rates were observed for those 65 and older.

#### *How do asthma ED visit rates vary by race and age?*

FIGURE 2 shows that rates were much higher for African Americans than whites in all age categories. All of these differences were statistically significant.



**Figure 2. Age-Specific Asthma Emergency Department Rates by Race,\* Missouri 2003, Males and Females**



\*Statistically significantly higher in African Americans

*What is the extent of the racial disparity in asthma ED visits?*

The rate ratios depicted in TABLE 9 show how many times higher the African American ED rate was compared to the white rate. The rate ratios were especially high in younger individuals (under 20 years of age) but they were also elevated among those 45 to 64. The lowest rate ratio was among those 20 to 44 and those 65 and over, although African Americans in these age groups were at about 3.5 times greater risk of visiting the ED due to asthma than whites.

**TABLE 9**  
Asthma Emergency Department Visit Rate Ratio for African Americans Compared to Whites by Age Missouri 2003, Males and Females

AGE IN YEARS	RATE RATIO
0 to 4	5.0
5 to 9	5.5
10 to 14	6.3
15 to 19	4.5
20 to 24	3.4
25 to 34	3.4
35 to 44	3.5
45 to 54	4.8
55 to 64	5.1
65 and older	3.7

*Among males, which age groups visit the ED the most due to asthma?*

As FIGURE 3 shows, asthma ED visit rates were higher among younger males than older males. Rates were especially high for those under 15 years of age. The lowest rates were observed for those in older age groups.

*Among males, how do asthma ED visit rates vary by race and age?*

FIGURE 3 shows that rates were much higher for African American males than white males in all age categories. All of these differences were statistically significant.

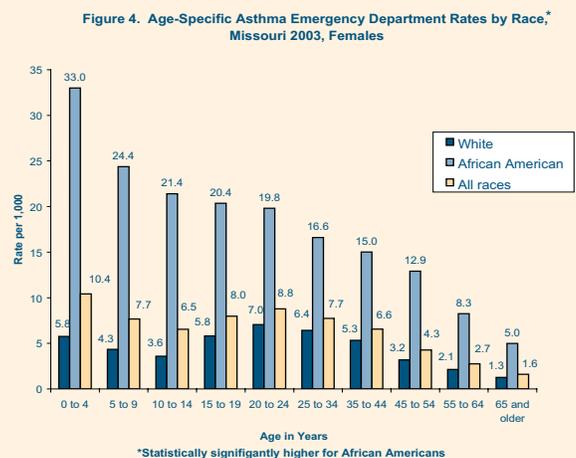
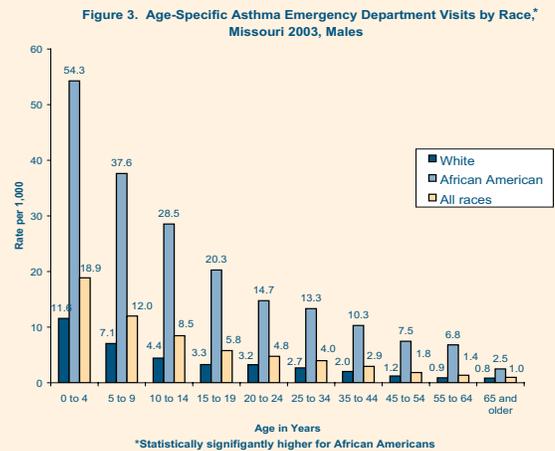
*Among males, what is the extent of the racial disparity in asthma ED visits?*

TABLE 10 shows that rate ratios were especially high among the young (under 20 years of age) and older individuals (45

to 64), but they were considerable among all age groups. The lowest rate ratio was among African American males 65 and older, who were at 3.1 times greater risk of visiting the ED due to asthma than whites of the same age.

**TABLE 10**  
Asthma Emergency Department Visit Rate Ratio for African Americans Compared to Whites by Age Missouri 2003, Males

AGE IN YEARS	RATE RATIO
0 to 4	4.7
5 to 9	5.3
10 to 14	6.5
15 to 19	6.2
20 to 24	4.6
25 to 34	4.9
35 to 44	5.2
45 to 54	6.3
55 to 64	7.6
65 and older	3.1



*Among females, which age groups visit the ED the most due to asthma?*

As FIGURE 4 shows, ED visit rates were highest among the younger females (under five) and lowest among older individuals (65 and older).

*Among females, how do asthma ED visit rates vary by race and age?*

FIGURE 4 shows that rates were much higher for African American females than white females in all age categories. All of these differences were statistically significant.

*Among females, what is the extent of the racial disparity in asthma ED visits?*

The rate ratios were especially high among the young (under 15 years of age) but they were also elevated for older individuals (45 and older). (SEE TABLE 11) The lowest rate ratios were among African American females 15 to 44, who were around three times more likely to visit the ED due to asthma than white females of the same age.

*How does the racial disparity in asthma ED visits differ among males and females?*

TABLES 10 and 11 show that African American males and females were more likely to visit the ED due to asthma than whites in all age groups. However, the extent of this disparity in males and females varied by age. Rate ratios were similar among males and females under 15 years of age. Ratios were larger for African American males than African American females in age categories that included those 15 to 65 years of age. Ratios were larger for African American females over age 65.

**TABLE 11**  
**Asthma Emergency Department Visit Rate Ratio for African Americans Compared to Whites by Age Missouri 2003, Females**

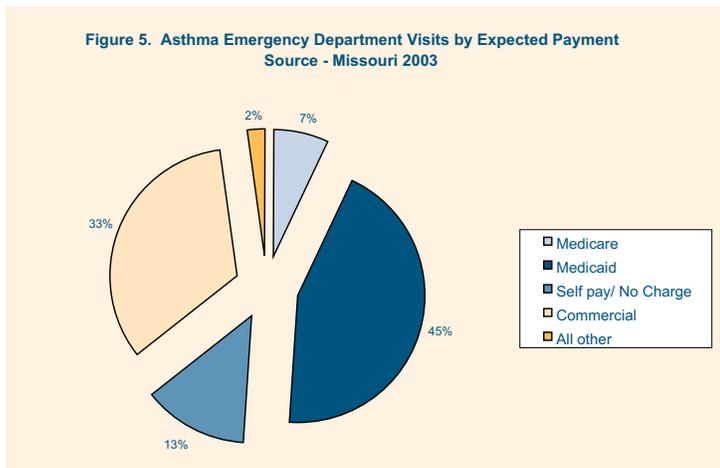
AGE IN YEARS	RATE RATIO
0 to 4	5.7
5 to 9	5.7
10 to 14	5.9
15 to 19	3.5
20 to 24	2.8
25 to 34	2.6
35 to 44	2.8
45 to 54	4.0
55 to 64	4.0
65 and older	3.9

*How do male and female asthma ED visit rates compare by age?*

FIGURES 3 and 4 show that age-specific rates differed somewhat for males and females. Rates were significantly lower for females under age 15 and significantly higher for females in all age groups 15 years and older.

*What payment sources cover asthma ED visits in Missouri?*

FIGURE 5 shows that the two most common payment sources for asthma ED visits among all Missourians were Medicaid and commercial health insurance. About 13% of individuals who visited the ED due to asthma were in the self pay/no charge category, many of whom were likely not covered by any commercial or government payment source.



It is important to note that the “all other” category in this section includes other government payment sources, worker’s compensation, and “other” payment sources. Unknowns were not included in any categories.



*How do asthma ED visit payment source proportions vary by race?*

FIGURE 6 shows that the most common payment source for white ED visits was commercial health insurance, followed closely by Medicaid. The most common payment source for African American ED visits was Medicaid (57%) followed by commercial insurance, which covered a quarter of asthma ED visits. (SEE FIGURE 7) About the same proportions of white and African American ED visits were not covered by any commercial insurance or government program payment source.

*How do asthma ED visit payment source proportions vary by age?*

FIGURES 8 and 9 provide ED visit proportions by payment source for children under 18 years and adults 18 to 64 years of age, respectively. For children, Medicaid covered the majority of ED asthma visits. (SEE FIGURE 8) Commercial insurance was listed as the payment source for about a third of the visits. Only 4% were not covered by some commercial or government payment source. Medicare covered less than one percent of the ED visits in the “all other” category.

The adult age range was selected because Medicare primarily covers individuals 65 years and older. In fact, Medicare covered over 85% of asthma ED visits among those 65 years and older. However, Medicare does cover individuals with certain health conditions who are younger than age 65<sup>14</sup>. ED visits among individuals under 65 that were covered by Medicare are included in the “all other” category in both age groups, along with

other government payment sources, worker’s compensation, and other payment sources.

For adults 18 to 64, the two most common payment sources were commercial insurance and Medicaid. (SEE FIGURE 9) About one-fifth were not covered by any commercial or

Figure 6. Asthma Emergency Department Visits by Expected Payment Source - Missouri 2003 Whites

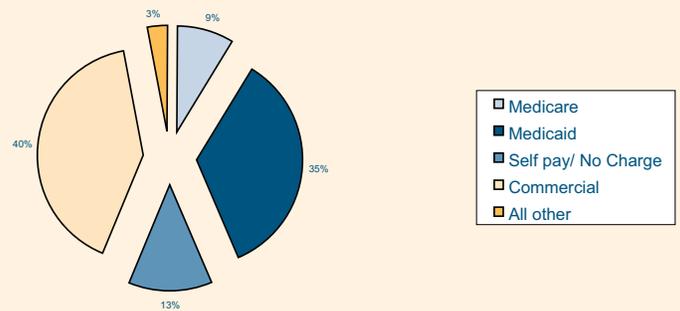


Figure 7. Asthma Emergency Department Visits by Expected Payment Source - Missouri 2003 African Americans

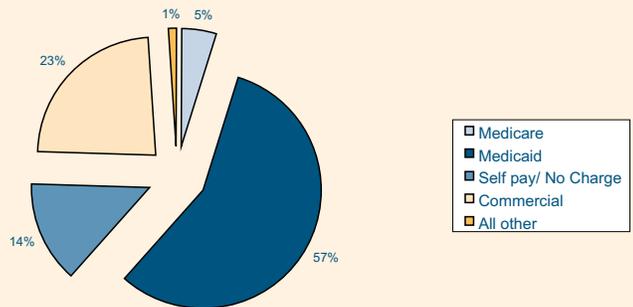
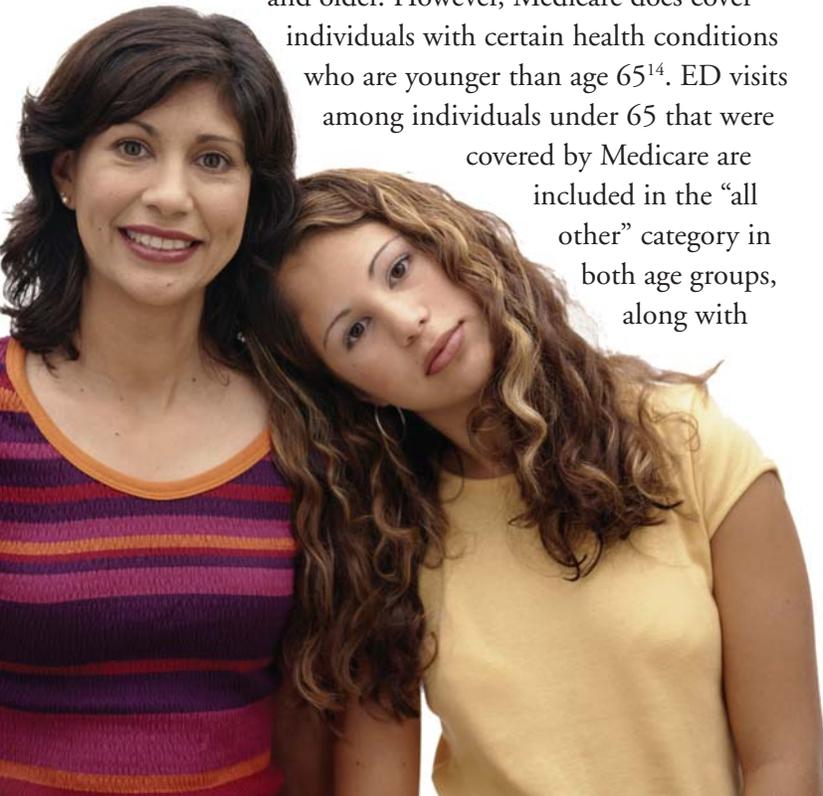
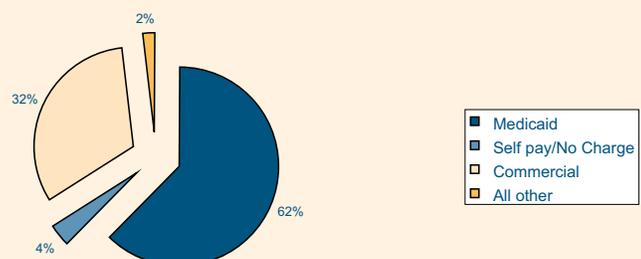


Figure 8. Asthma Emergency Department Visits by Expected Payment Source - Missouri 2003 Children Under 18 Years



government payment source. Medicare covered about 8% of the ED visits in the “all other” category.

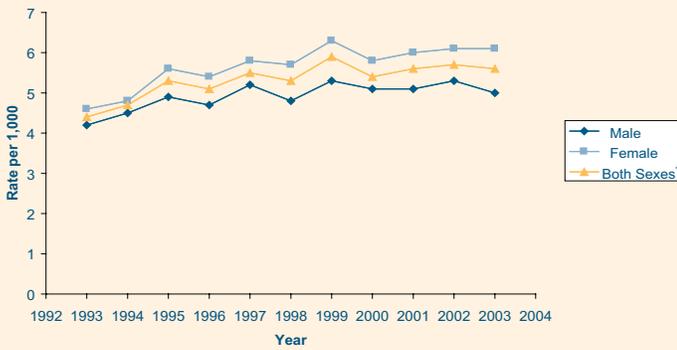
*What is the trend in annual asthma ED visit rates?*

Data are available for 11 years of asthma ED visits. The “both sexes” ED visit rates are depicted in FIGURE 10. The

**Figure 9. Asthma Emergency Department Visits by Expected Payment Source - Missouri 2003  
Adults 18-64 Years**

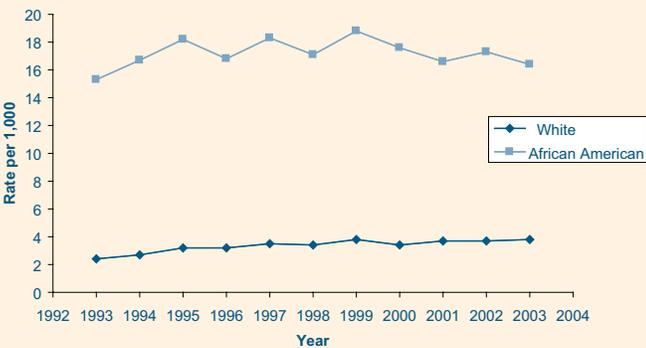


**Figure 10. Age-adjusted Asthma Emergency Department Visits by Year and Sex - Missouri 1993-2003**



\*Statistically significant increase for all Missourians, males and females

**Figure 11. Age-adjusted Asthma Emergency Department Rates by Year and Race\* - Missouri 1993-2003**



\*Statistically significant increase for whites

increase in ED visit rates for all Missourians was statistically significant.

*What is the trend in annual asthma ED visit rates by sex?*

FIGURE 10 shows that ED rates increased during the period 1993 to 2003 for males as well as females. Both trends were statistically significant.

*What is the trend in annual asthma ED visit rates by race?*

FIGURE 11 shows that ED visit rates increased over time for whites, and this increase was statistically significant. There was more variation in ED rates among African Americans, and no statistically significant increase or decrease occurred during the period 1993 to 2003.

*How do Missouri asthma ED visit rates compare to national rates?*

According to 2003 data, the crude asthma ED visit rate for the US was 6.0 per 1,000<sup>15</sup>. Missouri’s crude ED rate was 5.4 per 1,000 in 2003; however, an age-adjusted rate was not available, so statistical significance could not be determined.

*How do Missouri asthma ED visit rates compare to the Healthy People 2010 objectives?*

As TABLE 12 shows, the 2003 Missouri ED rate for those under age 5 was nearly two times higher than the Healthy People (HP) 2010 objective for that age group. The ED rate for those 5 to 64 years of age was nearly equal to the HP 2010 objective, and the rate for those 65 and older was lower than the HP 2010 objective.

**TABLE 12  
Missouri Data and Healthy People 2010 National Target Objectives for Asthma Emergency Department Visits by Age Rates per 10,000 population\***

AGE GROUP	MISSOURI 2003 TARGET	HEALTHY PEOPLE 2010
Under age 5	147.5	80.0
5 to 64 years	53.5	50.0
65 and older	13.5	15.0

\*Rates per 10,000 in accordance with Healthy People 2010 National Target Objectives

## INPATIENT HOSPITALIZATIONS

*How many inpatient hospitalizations occur each year due to asthma?*

In 2003, there were 7,888 inpatient hospitalizations with asthma as the primary diagnosis. TABLE 13 shows asthma hospitalization data by sex and race. The age-adjusted asthma hospitalization rate for all Missouri residents was 13.9 per 10,000 population.

*7,888 inpatient hospitalizations with asthma as a diagnosis*

*What groups are hospitalized due to asthma the most?*  
Age-adjusted asthma hospitalization rates were statistically significantly higher among females than males. For both sexes, rates were higher for African Americans than whites. (SEE TABLE 13) African American male hospitalization rates were higher than white male rates and African American female hospitalization rates were higher than white female rates. All differences by race and sex were statistically significant.

**TABLE 13**  
**Age-Adjusted Asthma Hospitalization Rates by Race and Sex**  
**Missouri 2003, Rates per 10,000**

RACE	MALES		FEMALES		BOTH SEXES	
	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
White	1,778	7.6	3,313	12.8	5,091	10.3
African American	1,155	31.8	1,410	39.3	2,565	36.2
All Races	3,057	11.1	4,831	16.4	7,888	13.9

*Statistical significance discussed below. Age-adjusted rates were generated using the US 2000 standard population.*

*Which age groups are hospitalized the most due to asthma?*  
FIGURE 12 shows that in 2003 hospitalization rates were highest among those less than 15 years of age, particularly for those 0 to 4 years old. Rates were lowest among those 15 to 34, and were elevated for those over 35 years of age.

*How do asthma hospitalization rates vary by race and age?*

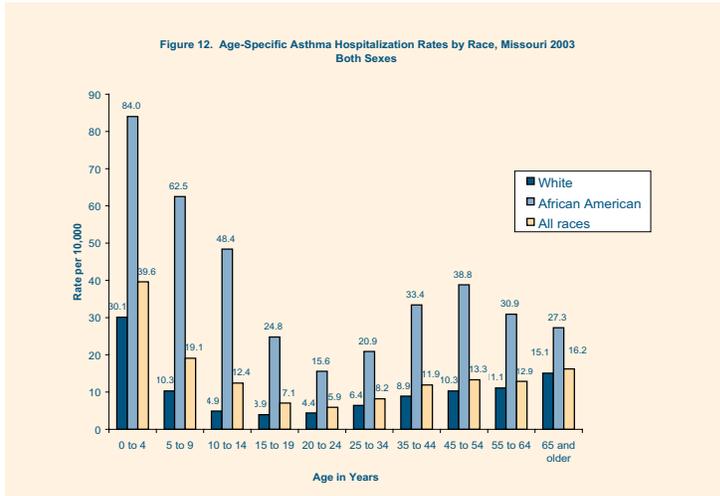
FIGURE 12 shows that rates were higher for African Americans than whites in all age categories. All of these differences were statistically significant.

*What is the extent of the racial disparity in asthma hospitalizations?*

TABLE 14 shows that rate ratios were especially high among those 5 to 19 years of age. The lowest rate ratio was among those 65 and older, who were at 1.8 times greater risk of being hospitalized due to asthma than whites of the same age.

**TABLE 14**  
**Asthma Hospitalization Rate Ratio for African Americans Compared to Whites by Age**  
**Missouri 2003, Males and Females**

AGE IN YEARS	RATE RATIO
0 to 4	2.8
5 to 9	6.1
10 to 14	9.9
15 to 19	6.4
20 to 24	3.5
25 to 34	3.3
35 to 44	3.8
45 to 54	3.8
55 to 64	2.8
65 and older	1.8



*Among males, which age groups are hospitalized the most due to asthma?*

Asthma hospitalization rates were highest for males under 15 years old, especially those under five years of age. (SEE FIGURE 13) Rates were also elevated among those 65 years and older.

*Among males, how do asthma hospitalization rates vary by race and age?*

FIGURE 13 shows that rates were higher for African American males than white males in all age categories. All of these differences were statistically significant.

*Among males, what is the extent of the racial disparity in asthma hospitalizations?*

Rate ratios were high for many age categories, but were especially high for those 10 to 19 years of age. The lowest rate ratio was among those 65 and older. (SEE TABLE 15)

*Among females, which age groups are hospitalized the most due to asthma?*

The highest asthma hospitalization rate among females was in those under age five. (SEE FIGURE 14) The next highest rates were among those 65 years and older.

*Among females, how do asthma hospitalization rates vary by race and age?*

FIGURE 14 shows that rates were higher for African American females than white females in all age categories. All of these differences were statistically significant.

*Among females, what is the extent of the racial disparity in asthma hospitalizations?*

TABLE 16 shows the extent of the racial disparity in asthma hospitalizations among females. This disparity was greatest among those 5 to 14 years of age and lowest among those 65 and older.

**TABLE 15**  
Asthma Hospitalization Rate Ratio for African Americans Compared to Whites by Age Missouri 2003, Males

AGE IN YEARS	RATE RATIO
0 to 4	2.6
5 to 9	6.5
10 to 14	12.2
15 to 19	10.1
20 to 24	4.6
25 to 34	5.1
35 to 44	4.3
45 to 54	5.2
55 to 64	4.2
65 and older	1.9

**TABLE 16**  
Asthma Hospitalization Rate Ratio for African Americans Compared to Whites by Age Missouri 2003, Females

AGE IN YEARS	RATE RATIO
0 to 4	3.1
5 to 9	5.6
10 to 14	7.6
15 to 19	3.1
20 to 24	3.1
25 to 34	2.6
35 to 44	3.4
45 to 54	3.2
55 to 64	2.3
65 and older	1.7

Figure 13. Age-Specific Asthma Hospitalization Rates by Race, Missouri 2003  
Males

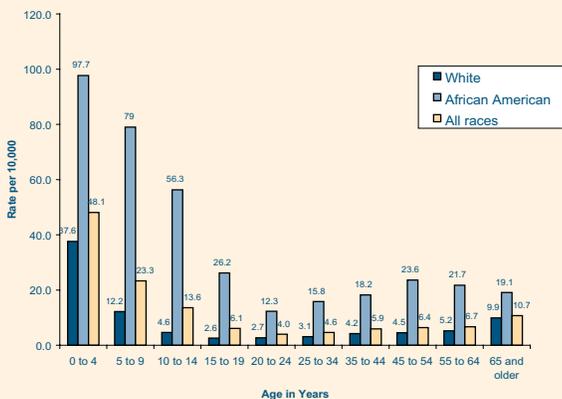
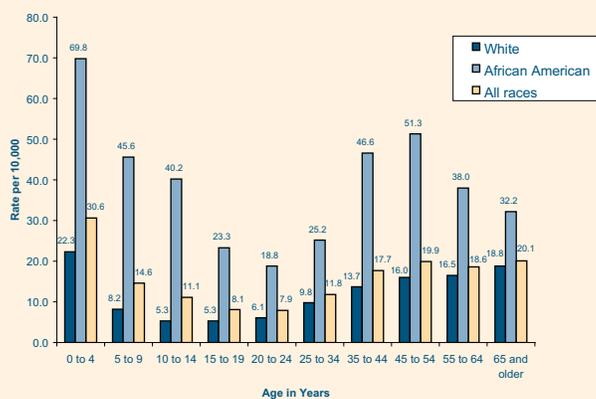


Figure 14. Age-Specific Asthma Hospitalization Rates by Race, Missouri 2003  
Females



### *How does the racial disparity in asthma hospitalizations differ among males and females?*

When TABLES 15 and 16 are compared, rate ratios were higher for African American males in all age groups. For African Americans, the highest rate ratios were among males 5 to 19, compared to females whose highest rate ratios were among those 5 to 14.

### *How do male and female asthma hospitalization rates compare by age?*

FIGURES 13 and 14 show that age-specific rates differed for males and females. Rates were significantly higher for males than females in age groups under 10 years of age. Rates were not significantly different for those 10 to 19 years old. For those 20 and older, asthma hospitalization rates were significantly higher for females than males.

### *What payment sources cover asthma hospitalizations in Missouri?*

FIGURE 15 shows that the most common payment source for asthma hospitalizations was Medicaid, followed by commercial health insurance. Medicare covered about a fourth of all hospitalizations. Only about 6% were not covered by any commercial or government payment source.

It is important to note that the “all other” category in this section includes other government payment sources, worker’s compensation, and “other” payment sources. Unknowns were not included in any categories.

### *How do asthma hospitalization payment source proportions vary by race?*

FIGURE 16 shows that the most common payment source for white asthma hospitalizations was commercial health insurance. Medicaid covered about a third of asthma hospitalizations. Medicare covered about 30% as well. Five percent were not covered by any commercial or government payment source.

As displayed in FIGURE 17, the most common payment source for African American asthma hospitalizations was Medicaid (about 60%). Commercial health insurance was the second most common payment source, but covered only 22% of African American asthma hospitalizations. Medicare

covered only 13%, much less than the proportion observed among white asthma hospitalizations. Seven percent of African American asthma hospitalizations were not covered by any commercial or government payment source, comparable to the proportion observed for white asthma hospitalizations.

Figure 15. Asthma Hospitalizations by Expected Payment Source - Missouri 2003

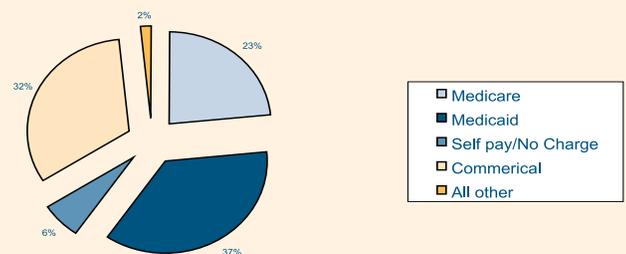
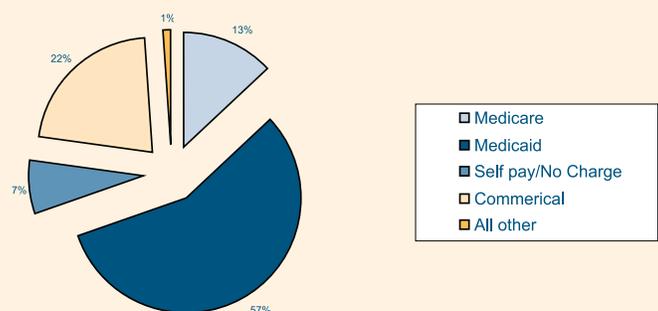


Figure 16. Asthma Hospitalizations by Expected Payment Source - Missouri 2003 Whites



Figure 17. Asthma Hospitalizations by Expected Payment Source - Missouri 2003 African Americans



*How do asthma hospitalizations payment source proportions vary by age?*

FIGURES 18 and 19 provide asthma hospitalization proportions by payment source for children less than 18 years and adults 18 to 64 years, respectively. It is important to note that for individuals 65 and older, Medicare covered 95% of all asthma hospitalizations. Individuals younger than 65 whose hospitalizations were covered by Medicare are included in the “all other” category.

The most common payment source for asthma hospitalizations among children was Medicaid (55%). Commercial payment sources covered about 28%. Only about 1% of asthma hospitalizations among children were not covered by any commercial or government payment source. Medicare covered less than one percent of the hospitalizations in the “all other” category. The most common payment source for adults 18 to 64 years was commercial health insurance. Medicaid covered about one third of asthma hospitalizations. Twelve percent of adult asthma hospitalizations were not covered by any commercial or government payment source. Medicare covered about 18% of the hospitalizations in the “all other” category.

*What is the trend in annual asthma hospitalization rates?*

Data are available for 11 years of asthma hospitalizations; rates are depicted in FIGURE 20 (see rate for

both sexes). The rate decrease observed over time was not statistically significant.

*What is the trend in annual asthma hospitalization rates by sex?*

FIGURE 20 shows that asthma hospitalization rates decreased

Figure 18. Asthma Hospitalizations by Expected Payment Source - Missouri 2003  
Children (Under 18 Years)

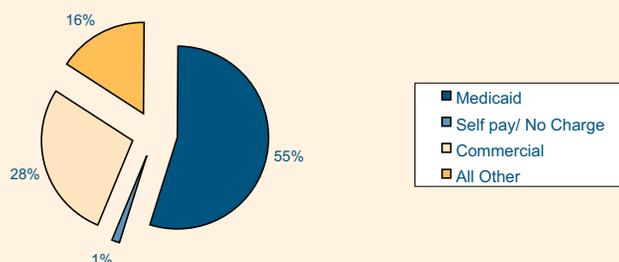


Figure 19. Asthma Hospitalizations by Expected Payment Source - Missouri 2003  
Adults (18 to 64 Years)

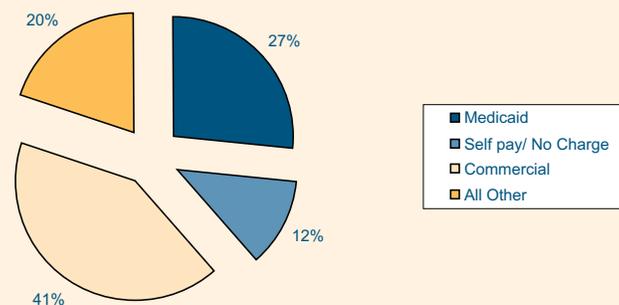
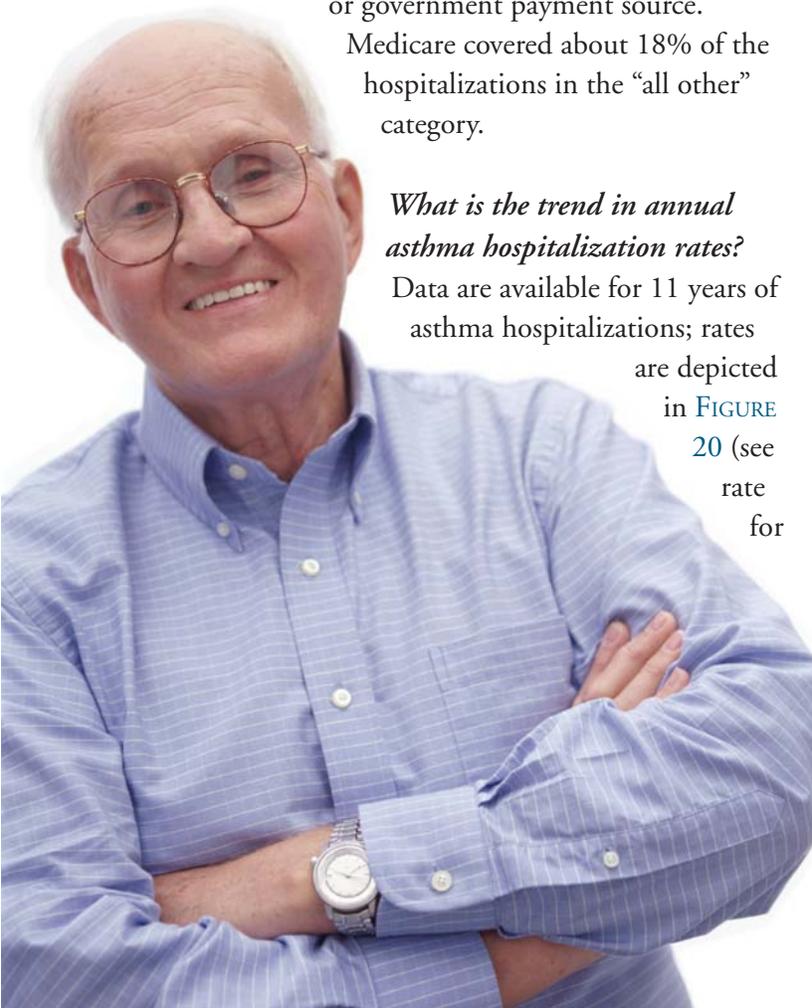
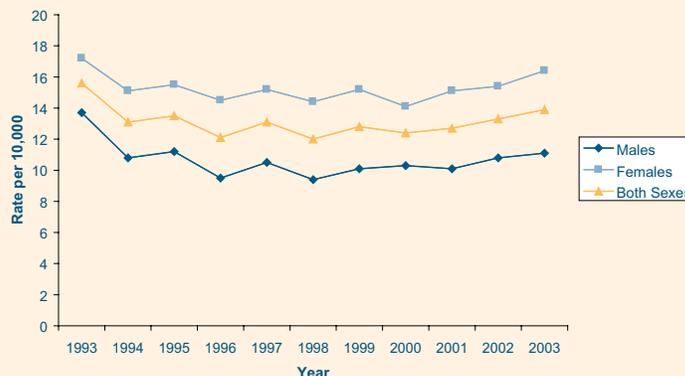


Figure 20. Age-adjusted Asthma Hospitalizations by Year and Sex - Missouri 1993-2003



during the period 1993 to 2003 for both males and females. This trend was not statistically significant.

*What is the trend in annual asthma hospitalization rates by race?*

FIGURE 21 shows that there was a slight decrease in hospitalization rates among whites, but this was not statistically significant. In African Americans, however, the decrease observed during the period 1993 to 2003 was statistically significant.

*How do Missouri asthma hospitalization rates compare to national rates?*

According to 2003 data, the age-adjusted rate for hospitalizations due to asthma in the United States was 19.8 per 10,000<sup>16</sup>. This was significantly higher than the rate observed in Missouri, 13.9 per 10,000.

*How do Missouri asthma hospitalization rates compare to the Healthy People 2010 objectives?*

As TABLE 17 shows, the 2003 Missouri hospitalization rate for those under age 5 was about 40% higher than the HP 2010 objective for that age group. The hospitalization rates for those 5 to 64 years and 65 and older were each about 30% higher than the HP 2010 target.

**TABLE 17**  
Missouri Data and Healthy People 2010 National Target Objectives for Asthma Hospitalizations by Age Rates per 10,000 population

AGE GROUP	MISSOURI 2003	HEALTHY PEOPLE 2010 TARGET
Under age 5	39.6	25.0
5 to 64 years	11.3	7.7
65 and older	16.2	11.0

*What is the trend in annual days of hospital care due to asthma?*

FIGURE 22 shows that there was an overall decrease in annual days of hospital care due to asthma during the period 1993 through 2003. This trend was statistically significant.

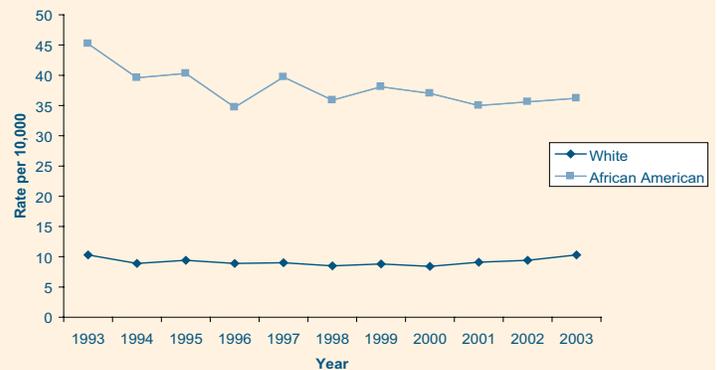
*What is the trend in annual days of hospital care due to asthma by sex?*

FIGURE 22 shows that there was a decrease in days of hospital care in both males and females, and these decreases were statistically significant. It is important to note that the number of hospitalizations was higher among females in each year.

*What is the trend in annual days of hospital care due to asthma by race?*

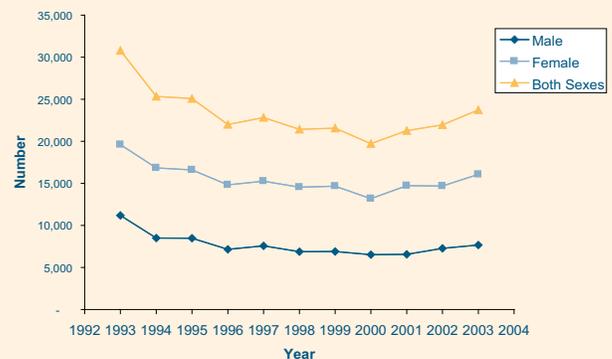
FIGURE 23 shows that there was a decrease in days of hospital care due to asthma among whites and African Americans. This trend was significant among African Americans but not among whites. The higher number of hospitalizations among whites than African Americans is the most likely reason for the difference in total days of care observed between whites and African Americans.

Figure 21. Age-adjusted Asthma Hospitalizations by Year and Race - Missouri 1993-2003



\*Statistically significant decline among African Americans

Figure 22. Total Days of Hospital Care Due to Asthma by Year and Sex - Missouri 1993-2003



\*Statistically significant decline in hospital days over this time period

*What is the total amount of hospitalization charges due to asthma?*

In 2003, \$61.8 million in hospitalization charges were attributed to asthma. (SEE FIGURE 24)

*How do hospitalization charges due to asthma vary by sex and race?*

FIGURE 24 shows that overall asthma hospitalization charges were greater among females than males. This was true for both African Americans and whites. African Americans accounted for 31.6% of all asthma hospitalization charges, but made up only 11.8% of the population in 2003. The higher number of asthma hospitalizations among females than males is the most likely reason for the difference in total asthma hospitalization charges observed between males and females. Similarly, the higher number of asthma hospitalizations among whites than African Americans is the most likely reason for the difference in observed between whites and African Americans.

*What is the trend in asthma hospitalization charges?*

During the period 1993-2003, asthma hospitalization charges increased by 48% — from \$41.8 million in 1993 to \$61.8 million in 2003. While the percent increase for all consumer items during this time period was 24.6%, the health service inflation rate increased by 42.2%<sup>17</sup>. This may explain the increase in charges observed in spite of an overall decrease in asthma-related hospital days of care during the 11-year period.

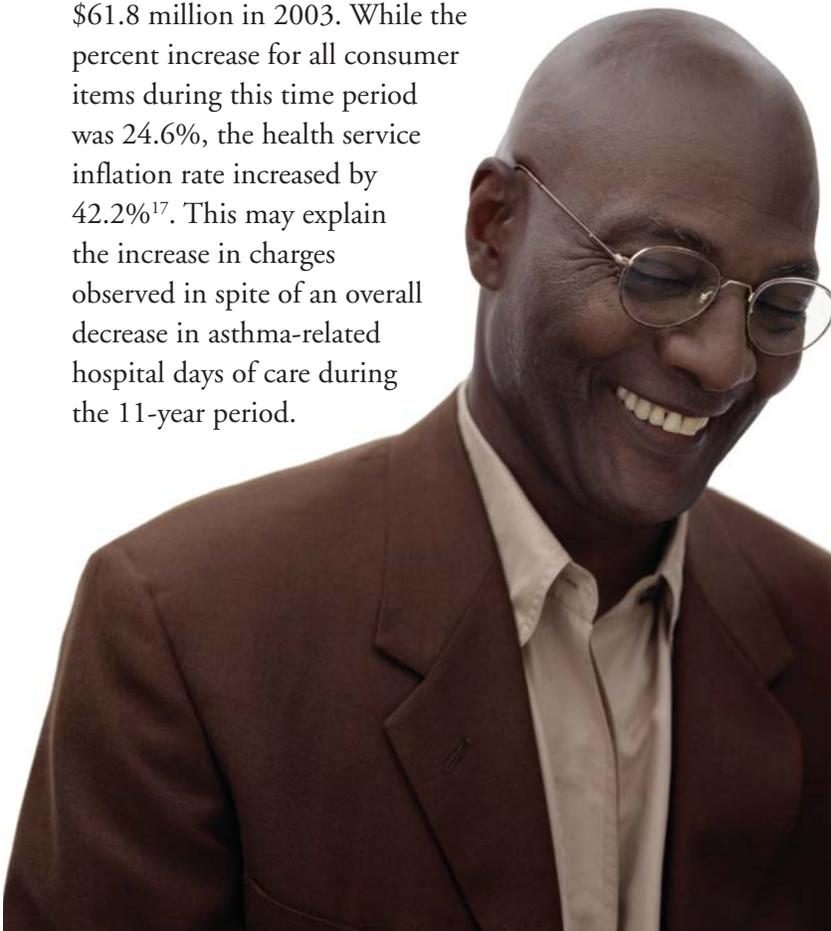


TABLE 18

**Age-Adjusted Asthma Mortality Rates by Race and Sex Missouri 1999-2004, Rates per 100,000**

RACE	MALES		FEMALES		BOTH SEXES	
	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
WHITE	125	0.9	239	1.3	364	1.1
AFRICAN AMERICAN	65	3.9	75	4.0	140	4.0*
ALL RACES	194	1.2	315	1.6	509	1.4

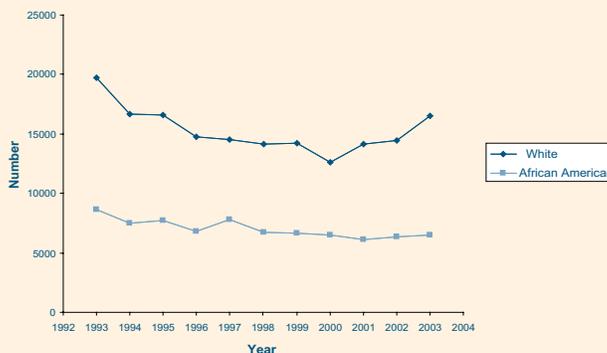
*\*Statistical significance higher among African Americans  
Age-adjusted rates were generated using the US 2000 standard population*

**DEATHS**

*How many deaths occur each year due to asthma?*

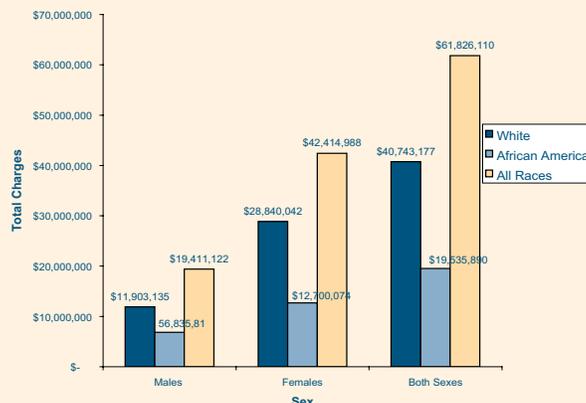
In 2004, asthma was the underlying cause of death in 79 individuals. The age-adjusted mortality, or death, rate was 1.3 per 100,000. Six of those that died due to asthma were

Figure 23. Total Days of Hospital Care Due to Asthma by Year and Race - Missouri 1993-2003



*\*Statistically significant decline among African Americans*

Figure 24. Total Asthma Hospitalization Charges by Sex and Race - Missouri 2003



children. TABLE 18 shows that the total number of deaths due to asthma during the period 1999-2004 was 509. This is an average of 85 deaths per year.

*How many years of potential life lost are due to asthma?*

Although all asthma deaths are preventable, deaths in individuals below 75 years of age are considered ‘premature.’ During the period 1999-2004, premature asthma deaths led to an average of 1,696 years of life lost per year.

*Which groups are most likely to die due to asthma?*

TABLE 18 shows that age-adjusted asthma mortality rates during the period 1999-2004 were higher among females than males; however, this difference was not statistically significant. Rates were higher among African Americans than whites, and this difference was statistically significant.

*Which age groups are most likely to die due to asthma?*

As FIGURE 25 shows, asthma death rates increase with age. Deaths due to asthma are rare among children, with 34 occurring during the period 1999-2004. During the same time period, 475 adults died due to asthma.

*How do asthma mortality rates vary by sex and age?*

Overall, mortality rates were higher among females than males, but this difference was not statistically significant. Rates were higher among males under 18 years and lower among males 18 to 64 years old, but these differences were not significant. Female mortality rates were higher among those 65 years and older, and this difference was statistically significant.

It is important to note that fewer than 20 deaths were reported among males and females less than 18 years during this time period, so rates by sex should be interpreted with caution.

*What is the extent of the variation by sex in asthma mortality?*

Male children were at 20% increased risk of dying due to asthma than female children. Females 18 to 64 were at 1.2 times increased risk of dying due to asthma than males of the same age. Females 65 years and older were nearly twice as likely to die due to asthma than males in the same age group.

**TABLE 19**  
Asthma Mortality Rate Ratio for Females Compared to Males by Age Missouri 1999-2004, All Races

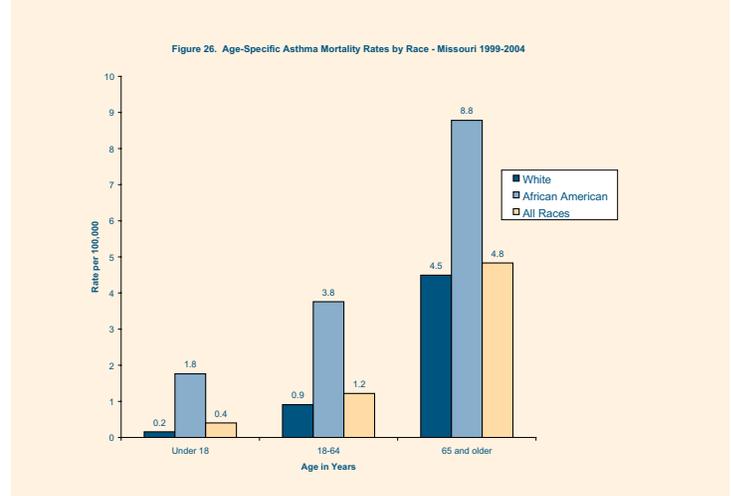
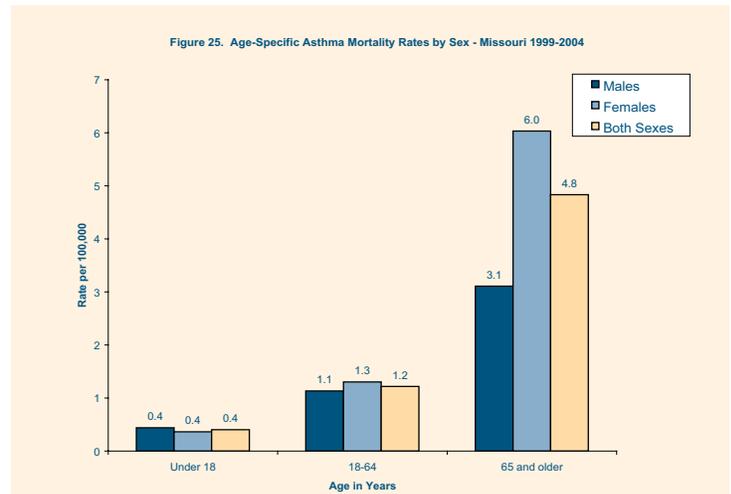
AGE IN YEARS	RATE RATIO
0 to 17	0.8**
18 to 64	1.2
65 and older	1.9

*\*\*Results should be interpreted with caution due to the low number of asthma deaths among males and females under age 18*

*How do asthma mortality rates vary by race and age?*

As FIGURE 26 shows, asthma mortality rates were higher among African Americans in all age categories. These differences were all statistically significant.

It is important to note that fewer than 20 deaths were reported among whites under age 18 years during this time period, so results for this group should be interpreted with caution.



**What is the extent of the racial disparity in asthma mortality?**

TABLE 20 shows that the African Americans were at 2 to 11.2 times increased risk of dying due to asthma than whites of the same age group. The highest rate ratio was for African American children, who had an 11-fold increased death rate over white children.

**TABLE 20**  
**Asthma Mortality Rate Ratio for African Americans Compared to Whites by Age Missouri 1999-2004**

AGE IN YEARS	RATE RATIO
0 TO 17	11.2**
18 TO 64	4.1
65 and older	2.0

\*\*Results should be interpreted with caution due to the low number of asthma deaths among whites under age 18

**What is the trend in asthma deaths?**

A statistically significant decrease in death rates was observed between 1990 and 2004; however, International Classification of Disease (ICD) codes changed in 1998. For asthma, this change resulted in potentially fewer deaths being classified due to asthma after 1998<sup>18</sup>. When rates were compared for 1999-2004 only, a decrease was observed over time (FIGURE 27), but this trend was not statistically significant.

**How does the trend in asthma deaths vary by sex?**

FIGURE 27 shows that death rates decreased for both males and females during the period 1999-2004, but the trends were not statistically significant.

**How does the trend in asthma deaths vary by race?**

Rates decreased for both whites and African Americans during the period 1999-2004 (FIGURE 28), but these trends were not statistically significant.

**How do Missouri asthma mortality rates compare to national rates?**

In 2002, the national asthma death rate was 1.5 per 100,000<sup>19</sup>, the same as the Missouri rate in that year.

**TABLE 21**  
**Missouri Data and Healthy People 2010 National Target Objectives for Asthma Mortality by Age Rates per 1,000,000 population\***

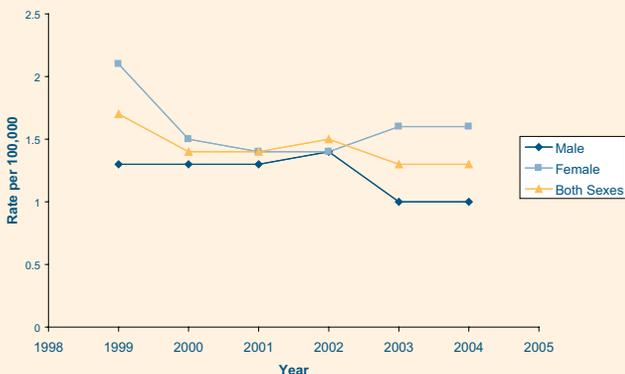
AGE GROUP	MISSOURI 2004	HEALTHY PEOPLE 2010 TARGET
Under age 5	NC	1.0
5 to 14 years	NC	1.0
15 to 34 years	NC	2.0
35 to 64 years	13.7	9.0
65 and older	45.7	60.0

NC=Number of deaths too low for rate calculation \*Rates per 1,000,000 in accordance with Healthy People 2010 National Target Objectives

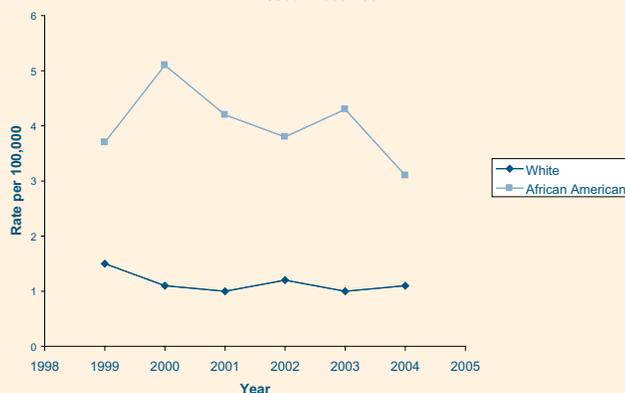
**How do Missouri asthma death rates compare to the Healthy People 2010 objectives?**

In 2004, there were too few asthma deaths to calculate rates on the three youngest age categories (TABLE 21). In the age groups that include those 35 to 64 years old, the state asthma death rate was higher than the HP 2010 objective. The mortality rate in the 65 years and older age group was lower than the HP 2010 target.

**Figure 27. Age-adjusted Asthma Mortality Rates by Year and Sex - Missouri 1999-2004**



**Figure 28. Age-adjusted Asthma Mortality Rates by Year and Race - Missouri 1999-2004**



# Missouri Data by BRFSS Region

## About this Section

### DATA SOURCES:

- Missouri Behavioral Risk Factor Surveillance System (BRFSS)<sup>1</sup>
- Emergency Department MICA<sup>9</sup>
- Statistics displayed in this report may be slightly different from that found in the current ED MICA due to revisions in the population estimates
- Hospitalizations MICA including inpatient hospitalizations, total days of hospital care, and total hospitalization charges<sup>10</sup>
- Statistics displayed in this report may be slightly different from that found in the current hospital discharge MICA due to revisions in the population estimates
- Death MICA<sup>11</sup>
- Population MICA<sup>20</sup>

### AIM:

- To describe the burden of asthma in the 7 BRFSS regions, St. Louis City, Kansas City and the Bootheel and to compare these findings to Missouri as a whole

### BACKGROUND:

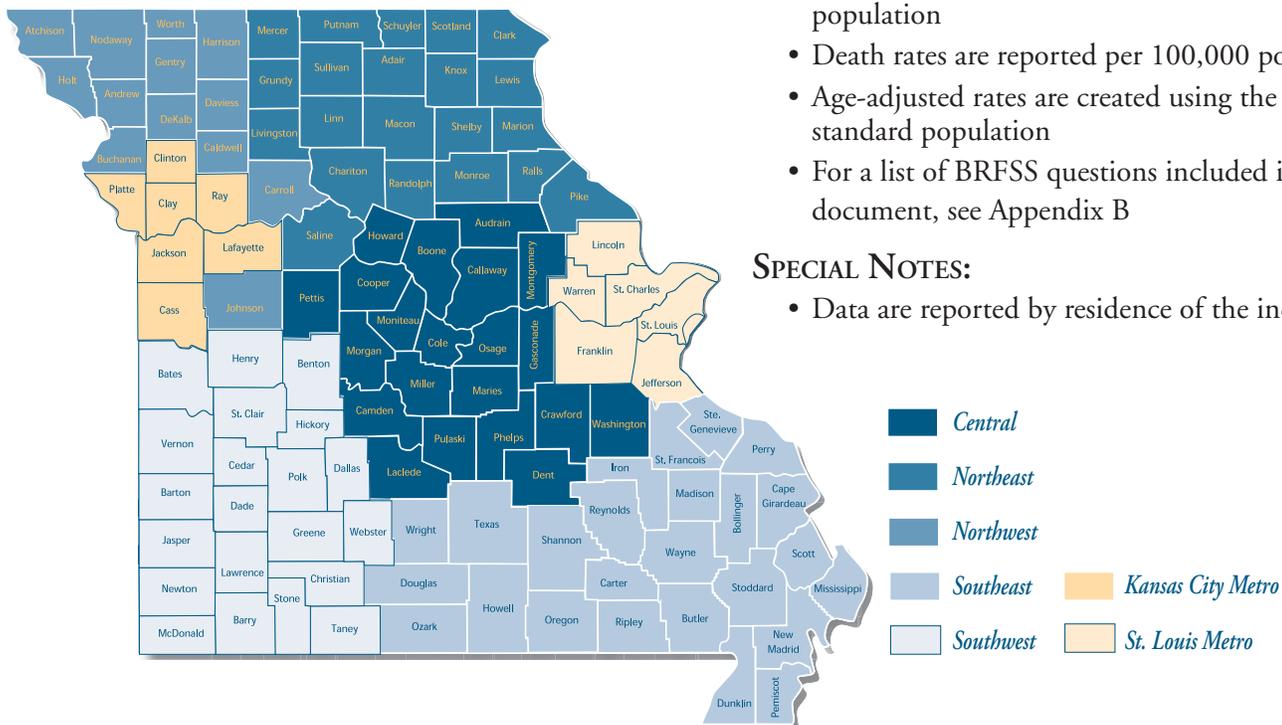
- For more information on the BRFSS see page 34
- For more information on MICA see page 9

### METHODS:

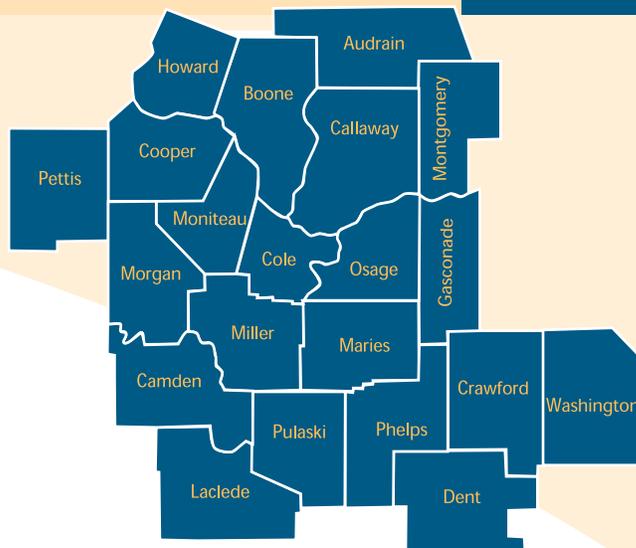
- Statistical significance is determined based on a p value of less than 0.05
- Rates are based on the population in question, (e.g., Missouri residents, region residents, males, African Americans)
- Prevalence rates are reported in percents
- Emergency department rates are reported per 1,000 population
- Hospitalization rates are reported per 10,000 population
- Death rates are reported per 100,000 population
- Age-adjusted rates are created using the U.S. 2000 standard population
- For a list of BRFSS questions included in this document, see Appendix B

### SPECIAL NOTES:

- Data are reported by residence of the individual



# Central Region



## Asthma Fact Sheet: 2003-2004

### PREVALENCE

- Based on 2004 estimates, approximately 40,000 adults and 8,000 children under 18 in the central region are currently living with asthma
- Current asthma prevalence among adults living in the central region was 6.9%, compared to 9.1% for all adults in Missouri\*
- Current asthma prevalence among children was 4.6%, compared to 8.0% for all children living in Missouri\*\*

### ASTHMA EMERGENCY DEPARTMENT VISITS

*There were 2,629 emergency department (ED) visits in the central region in 2003*

- The age-adjusted asthma ED visit rate was 3.9 per 1,000 persons, which was lower than the state rate (5.6 per 1,000)\*\*
- See table at right for ED visit rates by county
- Children accounted for 37.2% of all asthma ED visits in this region compared to 45.0% for the state as a whole
- African Americans made up only 5.3% of the region's population, but accounted for 15.3% of all asthma ED visits
- ED visit rates were higher among females than males\*\*

### ASTHMA HOSPITALIZATIONS

*There were 646 hospitalizations in the central region in 2003*

- The age-adjusted asthma hospitalization rate was 9.7 per 10,000, which was lower than the state rate (13.9 per 10,000)\*\*
- Children accounted for 31.4% of all asthma hospitalizations in this region compared to 36.7% for the state as a whole
- African Americans made up only 5.3% of the region's population, but accounted for 9.8% of all asthma hospitalizations
- Asthma led to 2,210 days of hospital care
- Charges totaled nearly \$5 million for asthma hospitalizations

### DATA SOURCES

**PREVALENCE DATA:** Missouri Department of Health and Senior Services. Missouri Behavioral Risk Factor Surveillance System, 2004.

**ED AND HOSPITALIZATION DATA:** Missouri Department of Health and Senior Services — Bureau of Health Informatics. Missouri Information for Community Assessment (MICA). Accessed August 1, 2005. <http://www.health.state.mo.us/MICA>

**POPULATION DATA:** Missouri Census Data Center. 2003 Population Estimates for Missouri and the United States. <http://mcdc2.missouri.edu/trends/estimates.shtml>

**AGE-ADJUSTED ASTHMA EMERGENCY DEPARTMENT VISIT RATES BY COUNTY, CENTRAL MISSOURI 2003**

COUNTY	RATE PER 1,000
Audrain	5.7
Boone	4.2
Callaway	5.0
Camden	4.7
Cole	3.4
Cooper	4.3
Crawford	3.6
Dent	6.6
Gasconade	2.3
Howard	3.4
Laclède	3.7
Maries	NC
Miller	4.0
Moniteau	2.4
Montgomery	3.9
Morgan	3.0
Osage	NC
Pettis	5.3
Phelps	3.2
Pulaski	1.6
Washington	8.7‡
<b>Region</b>	<b>3.9</b>
<b>State</b>	<b>5.6</b>

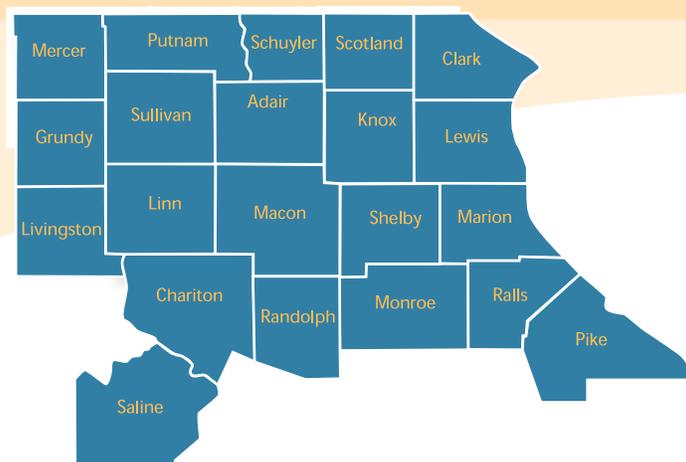
NC = Sample size was not sufficient for rate calculation  
‡ = Statistically significantly higher than the state ED rate

\*Differences were not statistically significant

\*\*Differences were statistically significant

Note: Emergency department and hospitalization rates have been age adjusted based on the US 2000 standard population; county and regional data are reported by patient residence.

# Northeast Region



## Asthma Fact Sheet: 2003-2004

### PREVALENCE

- Based on 2004 estimates, approximately 20,000 adults and over 5,000 children under 18 in the northeast region are currently living with asthma
- Current asthma prevalence among adults living in the northeast region was 6.5%, compared to 9.1% for adults in the entire state\*
- Current asthma prevalence among children was 7.6% in the northeast region, compared to 8.0% for all children in Missouri\*

### ASTHMA EMERGENCY DEPARTMENT VISITS

*There were 892 emergency department (ED) visits in the northeast region in 2003*

- The age-adjusted asthma ED visit rate was 3.8 per 1,000 persons, which was lower than the state rate (5.6 per 1,000)\*\*
- See table at right for ED visit rates by county
- Children accounted for 37.8% of all asthma ED visits in this region, compared to 45.0% for the state as a whole
- African Americans made up only 3.4% of the region's population, but accounted for 8.3% of all asthma ED visits
- ED visit rates were higher among females than males\*\*

### ASTHMA HOSPITALIZATION RATES

*There were 307 hospitalizations in the northeast region in 2003*

- The age-adjusted asthma hospitalization rate was 12.3 per 10,000, which was lower from the state rate (13.9 per 10,000)\*
- Children accounted for 33.2% of all asthma hospitalizations in this region, compared to 36.7% for the state as a whole
- African Americans made up only 3.4% of the region's population, but accounted for 10.4% of all asthma hospitalizations
- Asthma led to 913 days of hospital care
- Charges totaled \$2 million for asthma hospitalizations

\*Differences were not statistically significant

\*\*Differences were statistically significant

Note: Emergency department and hospitalization rates have been age adjusted based on the US 2000 standard population; county and regional data are reported by patient residence.

### DATA SOURCES

**PREVALENCE DATA:** Missouri Department of Health and Senior Services. Missouri Behavioral Risk Factor Surveillance System, 2004.

**ED AND HOSPITALIZATION DATA:** Missouri Department of Health and Senior Services — Bureau of Health Informatics. Missouri Information for Community Assessment (MICA). Accessed August 1, 2005. <http://www.health.state.mo.us/MICA>

**POPULATION DATA:** Missouri Census Data Center. 2003 Population Estimates for Missouri and the United States. <http://mcdc2.missouri.edu/trends/estimates.shtml>

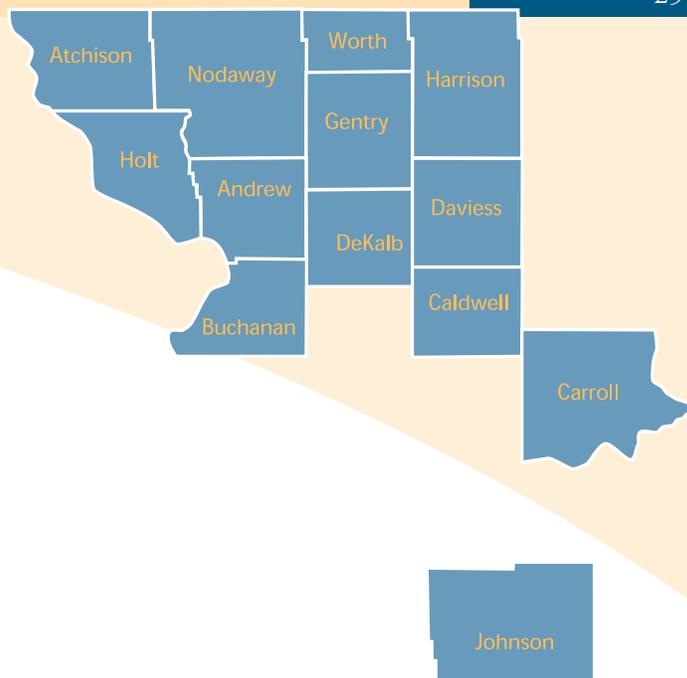
### AGE-ADJUSTED ASTHMA EMERGENCY DEPARTMENT RATES BY COUNTY, NORTHEAST MISSOURI 2003

COUNTY	RATE PER 1,000
Adair	3.5
Chariton	NC
Clark	NC
Grundy	8.0‡
Knox	NC
Lewis	NC
Linn	4.2
Livingston	5.4
Macon	3.0
Marion	4.7
Mercer	NC
Monroe	2.8
Pike	4.7
Putnam	NC
Ralls	2.6
Randolph	5.9
Saline	3.0
Schuyler	NC
Scotland	NC
Shelby	NC
Sullivan	3.9
<b>Region</b>	<b>3.8</b>
<b>State</b>	<b>5.6</b>

NC\* = Sample size was not sufficient for rate calculation

‡ = Statistically significantly higher than the state rate

# Northwest Region



## Asthma Fact Sheet: 2003-2004

### PREVALENCE

- Based on 2004 estimates, over 12,000 adults and over 7,000 children under 18 years in the northwest region are currently living with asthma
- Current asthma prevalence among adults living in the northwest region was 6.7%, compared to 9.1% for adults in the entire state\*
- Current asthma prevalence among children was 10.2%, compared to 8.0% for all children living in Missouri\*\*

### ASTHMA EMERGENCY DEPARTMENT VISITS

*There were 1,131 emergency department (ED) visits in the northwest region in 2003*

- The age-adjusted asthma ED visit rate was 4.7 per 1,000 persons, which was lower than the state rate (5.6 per 1,000)\*\*
- See table at right for ED visit rates by county
- Children accounted for 37.3% of all asthma ED visits in this region, compared to 45.0% for the state as a whole
- African Americans made up only 3.4% of the region's population, but accounted for 9.6% of all asthma ED visits
- ED visit rates were higher among females than males\*\*

### ASTHMA HOSPITALIZATION RATES

*There were 318 hospitalizations in the northwest region in 2003*

- The age-adjusted asthma hospitalization rate was 13.3 per 10,000, which was lower than the state rate (13.9 per 10,000)\*
- Children accounted for 25.8% of all asthma hospitalizations in this region, compared to 36.7% for the state as a whole
- African Americans made up only 3.4% of the region's population, but accounted for 6.6% of all asthma hospitalizations
- Asthma led to 992 days of hospital care
- Charges totaled \$2.3 million for asthma hospitalizations

\*Differences were not statistically significant

\*\*Differences were statistically significant

Note: Emergency department and hospitalization rates have been age adjusted based on the US 2000 standard population; county and regional data are reported by patient residence.

### DATA SOURCES

**PREVALENCE DATA:** Missouri Department of Health and Senior Services. Missouri Behavioral Risk Factor Surveillance System, 2004.

**ED AND HOSPITALIZATION DATA:** Missouri Department of Health and Senior Services — Bureau of Health Informatics. Missouri Information for Community Assessment (MICA). Accessed August 1, 2005. <http://www.health.state.mo.us/MICA/>

**POPULATION DATA:** Missouri Census Data Center. 2003 Population Estimates for Missouri and the United States. <http://mcdc2.missouri.edu/trends/estimates.shtml>

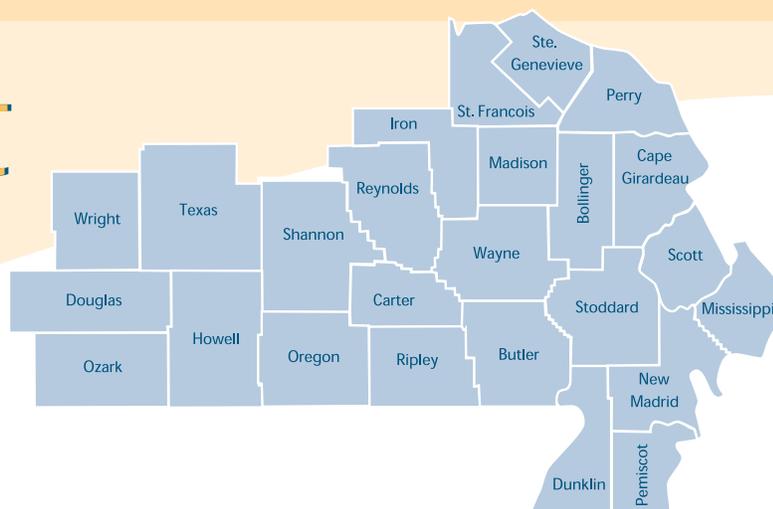
#### AGE-ADJUSTED ASTHMA EMERGENCY DEPARTMENT RATES BY COUNTY, NORTHWEST MISSOURI, 2003

COUNTY	RATE PER 1,000
Andrew	3.1
Atchison	4.1
Buchanan	7.1‡
Caldwell	2.9
Carroll	2.6
Daviess	3.9
DeKalb	2.0
Gentry	5.1
Harrison	2.8
Holt	6.1
Johnson	3.9
Nodaway	3.8
Worth	NC
<b>Region</b>	<b>4.7</b>
<b>State</b>	<b>5.6</b>

NC = Sample size was not sufficient for rate calculation

‡ = Statistically significantly higher than the state rate

# Southeast Region



## Regional Fact Sheet: 2003-2004

### PREVALENCE

- Based on 2004 estimates, nearly 46,000 adults and 10,000 children under 18 in the southeast region are currently living with asthma
- Current asthma prevalence among adults living in the southeast region was 10.3%, compared to 9.1% for the entire state\*
- Current asthma prevalence among children was 7.2%, compared to 8.0% for the entire state\*\*

### ASTHMA EMERGENCY DEPARTMENT VISITS

*There were 2,403 emergency department (ED) visits in the southeast region in 2003*

- The age-adjusted asthma ED visit rate was 4.5 per 1,000 persons, which was lower than the state rate (5.6 per 1,000)\*\*
- See table at right for ED visit rates by county
- Children accounted for 38.9% of all asthma ED visits in this region, compared to 45.0% for the state as a whole
- African American made up only 5.0% of the region's population, but accounted for 19.3% of all ED visits
- ED visit rates were higher among females than males\*\*

### ASTHMA HOSPITALIZATION RATES

*There were 878 hospitalizations in the southeast region in 2003*

- The age-adjusted asthma hospitalization rate was 16.0 per 10,000, which was higher than the state rate (13.9 per 10,000)\*\*
- Children accounted for 44.4% of all asthma hospitalizations in this region, compared to 36.7% for the state as a whole
- African Americans made up only 5.0% of the region's population, but accounted for 17.3% of all hospitalizations
- Asthma led to 2,627 days of hospital care
- Charges totaled \$5.6 million for asthma hospitalizations

\*Differences were not statistically significant

\*\*Differences were statistically significant

Note: Emergency department and hospitalization rates have been age adjusted based on the US 2000 standard population; county and regional data are reported by patient residence.

### DATA SOURCES

**PREVALENCE DATA:** Missouri Department of Health and Senior Services. Missouri Behavioral Risk Factor Surveillance System, 2004.

**ED AND HOSPITALIZATION DATA:** Missouri Department of Health and Senior Services — Bureau of Health Informatics. Missouri Information for Community Assessment (MICA). Accessed August 1, 2005. <http://www.health.state.mo.us/MICA>

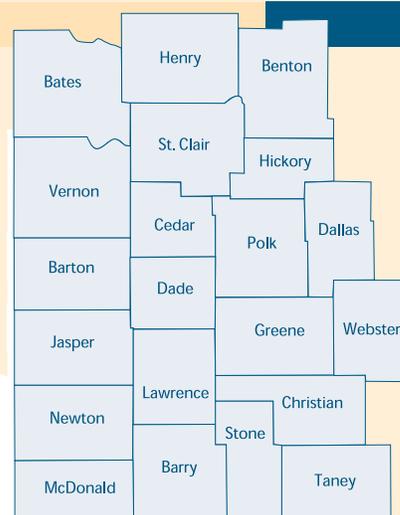
**POPULATION DATA:** Missouri Census Data Center. 2003 Population Estimates for Missouri and the United States. <http://mcdc2.missouri.edu/trends/estimates.shtml>

### AGE-ADJUSTED ASTHMA EMERGENCY DEPARTMENT RATES BY COUNTY, SOUTHEAST MISSOURI 2003

COUNTY	RATE PER 1,000
Bollinger	4.2
Butler	4.7
Cape Girardeau	2.8
Carter	4.3
Douglas	NC
Dunklin	4.7
Howell	4.0
Iron	4.0
Madison	8.0‡
Mississippi	6.4
New Madrid	5.6
Oregon	4.2
Ozark	NC
Pemiscot	10.0‡
Perry	7.3‡
Reynolds	NC
Ripley	4.0
St. Francois	6.1
Ste. Genevieve	2.3
Scott	6.1
Shannon	3.8
Stoddard	4.4
Texas	2.9
Wayne	2.7
Wright	2.0
<b>Regional</b>	<b>4.5</b>
<b>State</b>	<b>5.6</b>

NC = Sample size was not sufficient for rate calculation  
‡ = Statistically significantly higher than the state ED rate

# Southwest Region



## Asthma Fact Sheet: 2003-2004

### PREVALENCE

- Based on 2004 estimates, nearly 70,000 adults and over 13,000 children under 18 in the southwest region are currently living with asthma
- Current asthma prevalence among adults living in the southwest region was 10.5%, compared to 9.1% for adults in the entire state\*
- Current asthma prevalence among children was 6.1%, compared to 8.0% for all children in Missouri\*\*

### ASTHMA EMERGENCY DEPARTMENT VISITS

*There were 3,908 emergency department (ED) visits in the southwest region in 2003*

- The age-adjusted asthma ED visit rate was 4.8 per 1,000 persons, which was lower than the state rate (5.6 per 1,000)\*\*
- See table at right for ED visit rates by county
- Children accounted for 31.4% of all asthma ED visits in this region, compared to 45.0% for the state as a whole
- African Americans made up only 1.2% of the region's population, but accounted for 3.7% of all asthma ED visits
- ED visit rates were higher among females than males\*\*

### ASTHMA HOSPITALIZATION RATES

*There were 981 hospitalizations in the southwest region in 2003*

- The age-adjusted asthma hospitalization rate was 11.6 per 10,000, compared to the state rate (13.9 per 10,000)\*\*
- Children accounted for 26.7% of all asthma hospitalizations in this region, compared to 36.7% for the state as a whole
- African Americans made up only 1.2% of the region's population, but accounted for 2.3% of all asthma hospitalizations
- Asthma led to 3,224 days of hospital care
- Charges totaled \$7.0 million for asthma hospitalizations

\*Differences were not statistically significant

\*\*Differences were statistically significant

Note: Emergency department and hospitalization rates have been age adjusted based on the US 2000 standard population; county and regional data are reported by patient residence.

### DATA SOURCES

**PREVALENCE DATA:** Missouri Department of Health and Senior Services. Missouri Behavioral Risk Factor Surveillance System, 2004.

**ED AND HOSPITALIZATION DATA:** Missouri Department of Health and Senior Services — Bureau of Health Informatics. Missouri Information for Community Assessment (MICA). Accessed August 1, 2005. <http://www.health.state.mo.us/MICA>

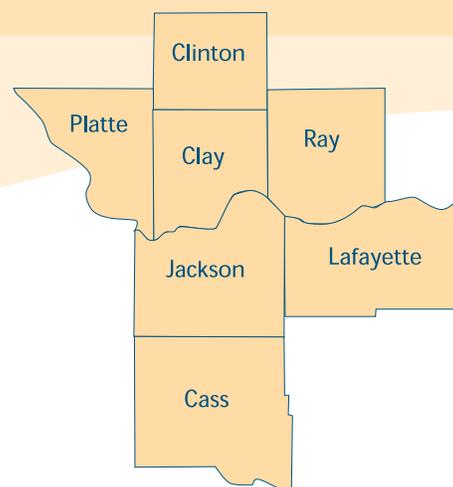
**POPULATION DATA:** Missouri Census Data Center. 2003 Population Estimates for Missouri and the United States. <http://mcdc2.missouri.edu/trends/estimates.shtml>

### AGE-ADJUSTED ASTHMA EMERGENCY DEPARTMENT RATES BY COUNTY, SOUTHWEST MISSOURI, 2003

COUNTY	RATE PER 1,000
Barry	5.1
Barton	5.6
Bates	5.4
Benton	3.0
Cedar	6.3
Christian	2.1
Dade	4.3
Dallas	3.1
Greene	4.3
Henry	3.6
Hickory	3.2
Jasper	8.2‡
Lawrence	6.2
McDonald	2.6
Newton	7.6‡
Polk	4.4
St. Clair	4.1
Stone	2.8
Taney	3.4
Vernon	7.8
Webster	2.0
<b>Regional</b>	<b>4.8</b>
<b>State</b>	<b>5.6</b>

‡ = Statistically significantly higher than the state rate

# Kansas City Metro Region



## PREVALENCE

- Based on 2004 estimates, approximately 83,000 adults and over 25,000 children under 18 years in the Kansas City Metro region are currently living with asthma
- Current asthma prevalence among adults living in the Kansas City Metro region was 9.8%, compared to 9.1% for adults in the entire state\*
- Current asthma prevalence among children was 9.8% in the Kansas City Metro region, compared to 8.0% for all children in Missouri\*\*

## ASTHMA EMERGENCY DEPARTMENT VISITS

*There were 6,925 asthma emergency department (ED) visits in the Kansas City Metro region in 2003*

- The age-adjusted asthma ED visit rate was 6.3 per 1,000 persons, which was higher than the state rate (5.6 per 1,000)\*\*
- See table for ED visit rates by county
- Children accounted for 42.7% of all asthma ED visits in this region, compared to 45.0% for the state as a whole
- African Americans made up 15.6% of the region's population, but accounted for 48.5% of all asthma ED visits
- ED visit rates were higher among females than males\*\*

## ASTHMA HOSPITALIZATION RATES

*There were 1,648 asthma hospitalizations in the Kansas City Metro region in 2003*

- The age-adjusted asthma hospitalization rate was 15.0 per 10,000, which was higher than the state rate (13.9 per 10,000)\*\*
- See table for hospitalization rates by county
- Children accounted for 33.3% of all asthma hospitalizations in this region, compared to 36.7% for the state as a whole
- African Americans made up 15.6% of the region's population, but accounted for 35.6% of all asthma hospitalizations
- Asthma led to 5,192 days of hospital care
- Charges totaled \$14.1 million for asthma hospitalizations

\*Differences were not statistically significant

\*\*Differences were statistically significant

Note: Emergency department and hospitalization rates have been age adjusted based on the US 2000 standard population; county and regional data are reported by patient residence.

## DATA SOURCES

**PREVALENCE DATA:** Missouri Department of Health and Senior Services. Missouri Behavioral Risk Factor Surveillance System, 2004.

**ED AND HOSPITALIZATION DATA:** Missouri Department of Health and Senior Services — Bureau of Health Informatics. Missouri Information for Community Assessment (MICA). Accessed August 1, 2005. <http://www.health.state.mo.us/MICA>

**POPULATION DATA:** Missouri Census Data Center. 2003 Population Estimates for Missouri and the United States. <http://mcdc2.missouri.edu/trends/estimates.shtml>

### AGE-ADJUSTED ASTHMA EMERGENCY DEPARTMENT AND HOSPITALIZATION RATES BY COUNTY, KANSAS CITY METRO, MISSOURI 2003

	COUNTY ED RATE PER 1,000	HOSPITALIZATION RATE PER 10,000
Cass	3.3	10.0
Clay	2.9	13.0
Clinton	2.8	14.5
Jackson	8.4‡	16.6‡
Lafayette	3.8	15.8

*6,925 Asthma  
emergency  
department visits in  
the Kansas City  
metro region*

# St. Louis Metro Region



## Asthma Fact Sheet: 2003-2004

### PREVALENCE

- Based on 2004 estimates, approximately 140,000 adults and over 45,000 children under 18 in the St. Louis Metro region are currently living with asthma
- Current asthma prevalence among adults living in the St. Louis region was 9.2%, compared to 9.1% for adults in the entire state\*
- Current asthma prevalence among children was 9.1% in the St. Louis region, compared to 8.0% for all children in Missouri\*\*

### ASTHMA EMERGENCY DEPARTMENT VISITS

*There were 13,077 asthma emergency department (ED) visits in the St. Louis Metro region in 2003*

- The age-adjusted asthma ED visit rate was 6.6 per 1,000 persons, which was higher than the state rate (5.6 per 1,000)\*\*
- See table at right for county and city ED rates
- Children accounted for 54.0% of all asthma ED visits in this region, compared to 45.0% for the state as a whole
- African Americans made up 19.5% of the region's population, but accounted for 59.7% of all asthma ED visits
- ED rates were higher among females than males\*

### ASTHMA HOSPITALIZATION RATES

*There were 3,109 asthma hospitalizations in the St. Louis Metro region in 2003*

- The age-adjusted asthma hospitalization rate was 15.4 per 10,000, which was higher than the state rate (13.9 per 10,000)\*\*
- See table for county and city hospitalization rates
- Children accounted for 42.1% of all asthma hospitalizations in this region, compared to 36.7% for the state as a whole
- African Americans made up only 19.5% of the region's population, but accounted for 54.2% of all asthma hospitalizations
- Asthma led to 8,570 days of hospital care
- Charges totaled \$25.9 million for asthma hospitalizations

\*Differences were not statistically significant

\*\*Differences were statistically significant

Note: Emergency department and hospitalization rates have been age adjusted based on the US 2000 standard population; county and regional data are reported by patient residence.

### DATA SOURCES

**PREVALENCE DATA:** Missouri Department of Health and Senior Services. Missouri Behavioral Risk Factor Surveillance System, 2004.

**ED AND HOSPITALIZATION DATA:** Missouri Department of Health and Senior Services — Bureau of Health Informatics. Missouri Information for Community Assessment (MICA). Accessed August 1, 2005. <http://www.health.state.mo.us/MICA>

**POPULATION DATA:** Missouri Census Data Center. 2003 Population Estimates for Missouri and the United States. <http://mcdc2.missouri.edu/trends/estimates.shtml>

#### AGE-ADJUSTED ASTHMA EMERGENCY DEPARTMENT AND HOSPITALIZATION RATES BY COUNTY OR CITY, ST. LOUIS METRO, MISSOURI 2003

	COUNTY/CITY ED RATE PER 1,000	HOSPITALIZATION RATE PER 10,000
Franklin	3.2	7.7
Jefferson	4.1	10.5
Lincoln	4.7	5.5
St. Charles	3.6	7.9
St. Louis	6.2‡	14.2
St. Louis City	13.6‡	33.2‡
Warren	4.3	14.6
<b>Region</b>	<b>6.6‡</b>	<b>15.4‡</b>
<b>State</b>	<b>5.6</b>	<b>13.9</b>

‡ = Statistically significantly higher than the state rate

*13,077 Asthma  
emergency department  
visits in the St. Louis  
metro region*

# Special Focus Areas

## St. Louis City and Kansas City

About 14% of Missouri’s population resides within St. Louis City and Kansas City. This is about 9% of the white population and nearly half of the African American population for the entire state.

Nearly 30% of all Missouri ED visits were among residents of St. Louis City and Kansas City. (SEE TABLE 25) Asthma ED visit rates were significantly higher among residents of each city than the state rate. More than half of all African American ED visits in the state were among residents of St. Louis City and Kansas City, compared to only 8.7% of all white ED visits.

In 2003, African Americans made up 52% of the total population of St. Louis City, but accounted for 85.1% of all ED visits. African Americans comprised 32% of Kansas City’s population, but accounted for 71.7% of all ED visits.

**TABLE 25**  
**Age-Adjusted Emergency Department Visits by Race, St. Louis City and Kansas City Missouri 2003, Rates per 1,000**

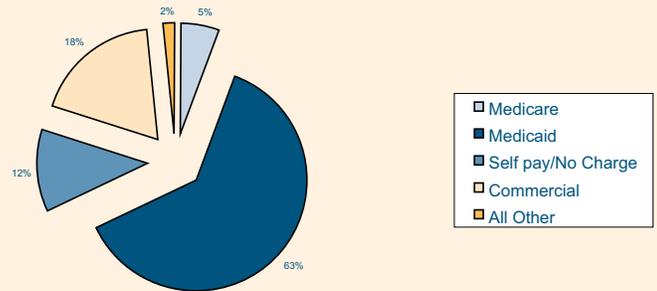
	WHITE		AFRICAN AMERICAN		ALL RACES	
	N	Rate	N	Rate	N	Rate
ST. LOUIS CITY	573	4.3	3,845	20.0	4,520	13.6*
KANSAS CITY	961	3.5	2,927	18.7	4,082	8.9*
MISSOURI TOTAL	17,726	3.8	12,364	16.4	30,970	5.6

FIGURES 29 and 30 show payment sources for asthma ED visits among residents of St. Louis City and Kansas City. Medicaid was the most common payment source for both cities. Medicaid covered a greater proportion of asthma ED visits in St. Louis than the state; the proportion was comparable between Kansas City and Missouri as a whole. Fewer ED visits were covered by commercial health

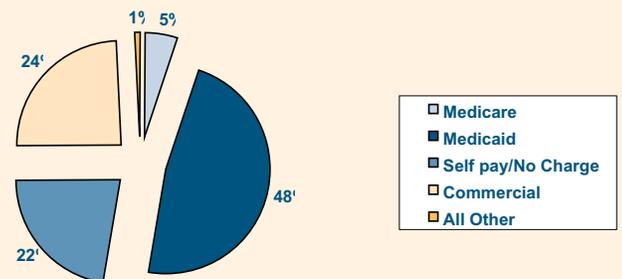
insurance in St. Louis City and Kansas City than in the state as a whole. The proportions of ED visits not covered by any commercial or government payment source were similar among residents of St. Louis City and the state at 12% and 13%, respectively; this proportion was much higher among Kansas City residents (22%).

About a quarter of the state’s total asthma hospitalizations were among residents of St. Louis City and Kansas City.

**Figure 29. Asthma Emergency Department Visits by Expected Payment Source - Missouri 2003 St. Louis City**



**Figure 30. Asthma Emergency Department Visits by Expected Payment Source - Missouri 2003 Kansas City**



Hospitalization rates were significantly higher among residents of these two cities than the state rate. More than half of all African American asthma hospitalizations in Missouri were among St. Louis City and Kansas City residents, compared to only 10% of white asthma hospitalizations.

FIGURES 31 and 32 show that Medicaid was the most common payment source for asthma hospitalizations among residents of St. Louis City and Kansas City. The proportion observed for St. Louis City residents was higher than the state proportion (58% versus 37%) whereas the Kansas City proportion was more similar to the state (39%). Fewer hospitalizations were covered by commercial health insurance among St. Louis City residents (18%) than for all Missouri residents (32%). The proportion observed for Kansas City residents was (28%). On the other hand, the proportion of hospitalizations not covered by any commercial or government payment source among Kansas City residents was higher (13%) than the proportion observed among St. Louis City residents (7%) and for Missouri residents (6%).

*Nearly 30% of ED visits were residents of St. Louis and Kansas City*

the Bootheel have large African American populations, and as already demonstrated in this report, African Americans are at increased risk of asthma ED visits and hospitalizations in Missouri. According to 2003 estimates, the proportion of African Americans in the six Bootheel counties ranged from

1.2% to 26.1%. Overall, African Americans made up 12.3% of the Bootheel's population. This is slightly higher than the proportion of African Americans in Missouri as a whole (11.8%).

As reported in TABLE 27, the ED visit rate for the Bootheel was higher than the state rate, but this difference was not significantly different. One county had rates significantly higher than the state rate. African Americans made up 12.3% of the Bootheel's population, but accounted for 39.2% of asthma ED visits.

### The Bootheel

Six counties in southeast Missouri make up the Bootheel. (SEE TABLE 26 for a county list) This area is of special interest because of a variety of socioeconomic issues.

Furthermore, some areas in



Figure 31. Asthma Hospitalizations by Expected Payment Source - Missouri 2003 St. Louis City

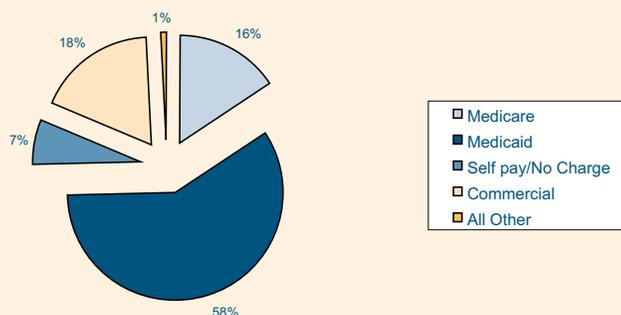


Figure 32. Asthma Hospitalizations by Expected Payment Source - Missouri 2003 Kansas City

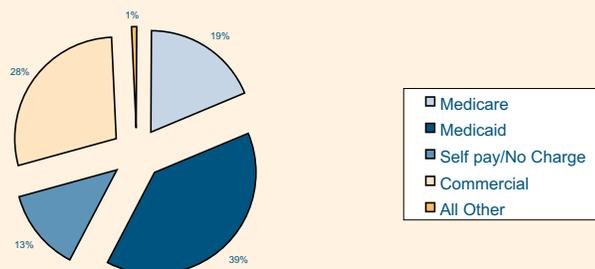


FIGURE 33 shows that the most common payment source for asthma ED visits among Bootheel residents was Medicaid at 62%, which is higher than the state proportion of Medicaid-paid ED visits, at 45%. The proportion of ED visits covered by commercial health insurance was lower in the Bootheel (21%) than in Missouri as a whole (33%). Only 5% of asthma ED visits in the Bootheel were not covered by any commercial or government payment source, compared to 13% for the state as a whole.

TABLE 27 demonstrates that the asthma hospitalization rate for the Bootheel was significantly higher than the state rate; this was true of half of the counties as well. African Americans made up 12.3% of the Bootheel’s population, but accounted for 29.9% of all asthma hospitalizations of residents in this area.

FIGURE 34 shows that the most common payment source for asthma hospitalizations among Bootheel residents was Medicaid at 55%, which is higher than the state proportion (37%). The proportion of asthma hospitalizations covered by commercial health insurance in the Bootheel was 16%, lower than the state proportion (32%). Only 3% of asthma hospitalizations among Bootheel residents were not covered by any commercial or government payment source, compared to 6% for the state as a whole.

TABLE 26

**African American Population Proportion by County Missouri Bootheel 2003**

COUNTY	PERCENT
Dunklin	9.3
Mississippi	21.6
New Madrid	15.5
Pemiscot	26.1
Scott	11.4
Stoddard	1.2
Bootheel Total	12.3
Missouri	9.3

TABLE 27

**Age-Adjusted Asthma Emergency Department and Hospitalization Rates Missouri Bootheel 2003**

COUNTY	EMERGENCY DEPARTMENT VISITS RATE PER 1,000	HOSPITALIZATIONS RATE PER 10,000
Dunklin	4.7	30.1*
Mississippi	6.4	16.5
New Madrid	5.6	27.1*
Pemiscot	10.0*	72.9*
Scott	6.1	12.1
Stoddard	4.4	17.6
Bootheel Total	6.0	26.9*
Missouri	5.6	13.9

\* Significantly different from the state rate. Note: Rates have been age adjusted based on the U.S. 2000 standard population; data are reported by patient residence.

Figure 33. Asthma Emergency Department Visits by Expected Payment Source - Missouri 2003 Bootheel

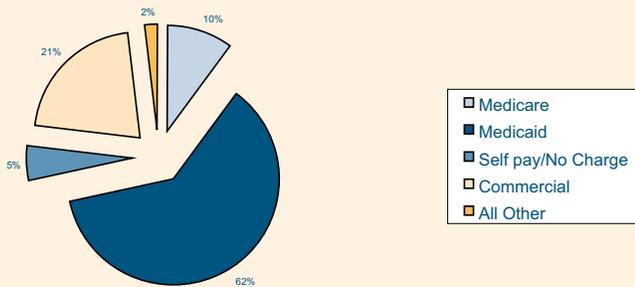
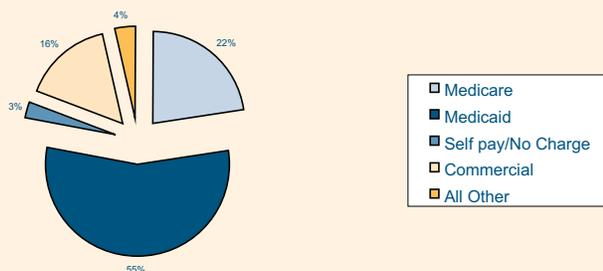


Figure 34. Asthma Hospitalizations by Expected Payment Source - Missouri 2003 Bootheel



# Appendix A

## *Basic Demographics*

### DATA SOURCE:

- Missouri Population Estimates<sup>20</sup>
- United States (U.S.) Population Estimates<sup>21</sup>

### AIM:

To describe how Missouri compares to the nation as a whole for select demographic factors for the most recent available year of data.

### *How does Missouri compare to the United States in terms of demographics?*

One of the main ways in which Missouri differs from the U.S. is in racial and ethnic composition. [TABLE A](#) shows that Missouri was mostly white according to 2004 estimates. This is a higher proportion than in the nation as a whole. A similar proportion of African Americans live in Missouri and in the U.S. About three times more individuals in the U.S. were in the “other” race category than in Missouri. Only about 3% of Missourians were Hispanic in 2004 compared to 14.1% for the nation as a whole. (SEE [TABLE A](#))

According to the 2000 census, the median age in Missouri was 36.1 years compared to 35.3 years for the U.S. as a whole. A greater proportion of Missourians live in rural areas (30.6%) than in the entire nation (21.0%).

TABLE A

### Racial and Ethnic Distribution Missouri, 2004

RACE	MISSOURI (%)	UNITED STATES (%)
White	86.1	81.2
African American	11.8	13.1
Other		
Ethnicity	2.1	5.7
Hispanic	2.6	14.1
Not Hispanic	97.4	85.9

# Appendix B

## *Missouri Behavioral Risk Factor Surveillance System (BRFSS) Questions Referenced in the Missouri Asthma Surveillance Report*

### *Data Source:*

- Missouri BRFSS<sup>1</sup>

### *Variables Used in Missouri Asthma Surveillance Report from 2004 Missouri BRFSS Questions*

#### *Prevalence*

ADULT ASTHMA PREVALENCE: LIFETIME	Have you ever been told by a doctor, nurse, or other health professional that you had asthma?
ADULT ASTHMA PREVALENCE: CURRENT	Do you still have asthma?
CHILDHOOD ASTHMA PREVALENCE: LIFETIME	How many of (the children living in your household) have ever been diagnosed with asthma?
CHILDHOOD ASTHMA PREVALENCE: CURRENT	Does this child/how many of these children still have asthma?
ADULTS: WORK-RELATED ASTHMA	Earlier you indicated that you had asthma. Have you ever been told by a doctor or other health professional that your asthma was work-related?

#### *Risk Factors for Asthma Complications*

INDOOR AIR CONTAMINATION	Things like dust, mold, smoke, and chemicals inside the home or office can cause poor indoor air quality. In the past 12 months have you had an illness or symptom that you think was caused by something in the air inside a home, office, or other building?
OUTDOOR AIR POLLUTION	Things like smog, automobile exhaust, and chemicals can cause outdoor air pollution. In the past 12 months have you had an illness or symptom that you think was caused by pollution in the air outdoors? Note to interviewee: This question does not refer to natural agents like pollen or dust in outdoor air.
CURRENTLY SMOKE SOME OR ALL DAYS	Do you now smoke cigarettes every day, some days, or not at all?

SMOKING ALLOWED IN THE HOME OR  
NO RULES ABOUT SMOKING

Which statement best describes the rules about smoking inside your home? Choices read to interviewee (they pick one): Smoking is not allowed anywhere inside your home, Smoking is allowed in some places or at sometimes

SMOKING IS ALLOWED ANYWHERE INSIDE THE HOME

There are no rules about smoking inside the home

NO FLU SHOT IN THE PAST 12 MONTHS

During the past 12 months, have you had a flu shot?

NEVER HAD A PNEUMONIA VACCINE

Have you ever had a pneumonia shot? This shot is usually given only once or twice in a person's lifetime and is different from the flu shot. It is also called the pneumococcal vaccine.

## *Health Care Access Issues*

DO NOT HAVE HEALTH CARE COVERAGE

Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare?

DO NOT HAVE A PERSONAL HEALTH CARE PROVIDER

Do you have one person you think of as your personal doctor or health care provider?

COULD NOT SEE A DOCTOR BECAUSE OF COST IN THE LAST YEAR

Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?

## *Health-related Quality of Life*

PERCENTAGE WITH FAIR OR POOR GENERAL HEALTH

Would you say that your general health is: Choices read to interviewee (they pick one): Excellent, Very good, Good, Fair, Poor

PERCENTAGE WITH 14 OR MORE PHYSICALLY UNHEALTHY DAYS AND MEAN NUMBER OF PHYSICALLY UNHEALTHY DAYS\*\*

Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?

PERCENTAGE WITH 14 OR MORE MENTALLY UNHEALTHY DAYS AND MEAN NUMBER OF MENTALLY UNHEALTHY DAYS\*\*

Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?

PERCENTAGE WITH 14 OR MORE ACTIVITY LIMITATION DAYS AND MEAN NUMBER OF ACTIVITY LIMITATION DAYS

During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?

\*\*Combined to form mean number of physically or mentally unhealthy days, based on CDC guidelines for analysis

# Definitions

- AGE-ADJUSTED RATE** A procedure for adjusting rates, designed to minimize the distortions created by differences in age distributions (and permit fair comparisons) when comparing rates for populations with different age compositions or when comparing rates from different populations or when comparing rates in the same population over time.
- AGE-SPECIFIC RATE** Rates computed by dividing the number of events in an age group in a geographic area by the estimated population of the same age group/area and then multiplying by 100,000 or the appropriate multiplier.
- CONFIDENCE INTERVAL (CI)** Range of values for a rate that will include the true value of the rate a given percentage of the time. For example, a 95% CI includes the true value of the rate 95% of the time.
- CRUDE RATE** A rate is a measure of some event, disease, or condition in relation to a unit of population, along with some specification of time. The term “crude” distinguishes rates that are adjusted for some characteristic such as age.
- MEDIAN** A common measure of central tendency and is the middle value of the distribution. It is less affected by extreme or outlying values and is the preferred measure for skewed distributions.
- POPULATION ESTIMATES** An estimate of the total Missouri population (by age, gender, race, county) produced and developed by DHSS using information from the U.S. Census Bureau and the Federal State Cooperative Program for Population Estimates.
- PREVALENCE** The proportion (usually a percentage) of a population that has a defined risk factor, disease, or condition, at a particular point in time. Although usually called a “rate”, it is actually a proportion.
- RATE** A rate is a ratio of those having the event of interest to the population of those at risk of having the given health event. Rates are calculated by dividing the number of events by the population at risk, or a related population, and then multiplying by a constant.
- RATE RATIO** The ratio is the rate of the disease (e.g., asthma) in a specific group compared to another group or the total population regarding a particular outcome. A RR of “1” indicates that the rates are the same in the two groups. However, a RR above “1” indicates that those in this group are more likely to have the outcome. In contrast, a RR below “1” indicates that those in this group are less likely to experience the outcome.
- STANDARD POPULATION** A set of arbitrary population weights whose proportions are used as the standard in adjusting rates for different groups in order to eliminate differences between the rates which are based on their composition. The U.S. 2000 standard population is often used when calculating age-adjusted rates. To compare adjusted rates, the same standard population must be used.

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