

# Asthma in Maryland 2004

Prepared by the State of Maryland  
Department of Health and Mental Hygiene  
Family Health Administration  
Maryland Asthma Control Program



# MARYLAND ASTHMA SURVEILLANCE REPORT

2004

## ACKNOWLEDGEMENTS

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Photo Source: Allergy and Asthma Foundation of America  
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## Main Findings

- ♦ Statewide, about 11.9% of Maryland adults and 11.1% of children have a history of asthma. About 7.8% of adults and 8.6% of children currently have asthma.
- ♦ Among Medicaid enrollees, 8.7% currently have asthma. Children under the age of 14 have the highest asthma prevalence among Medicaid enrollees.
- ♦ In 2003, approximately 9000 Maryland residents were hospitalized for asthma, and approximately 38,000 residents were treated in emergency departments for asthma.
- ♦ Asthma caused an average of 84 deaths per year in Maryland over the past 5 years.
- ♦ Many disparities can be seen in the morbidity and mortality from asthma. Persons at increased risk for asthma and its complications include the very young, the elderly, African-Americans, low-income individuals, and individuals in some jurisdictions, particularly Baltimore City.
- ♦ Workplace exposures may cause or exacerbate work-related asthma. Physicians usually rely on patient report to diagnose work-related asthma. The most common workplace settings for occupational asthma identified by physicians include construction and chemical manufacturing.
- ♦ In 2003, charges for hospitalizations due to asthma totaled \$41 million. Charges for emergency department visits due to asthma totaled an additional \$28 million.
- ♦ Compared to those without asthma, adults with asthma perceive their general health less favorably than those without asthma. Asthma may interfere with all aspects of daily life, including work, sleep, and daily activities.



Photo Source: Digital Vision Ltd.

## Introduction

Asthma is a chronic inflammatory disease of the small airways in the lungs. Asthma is characterized by recurring episodes of swelling and narrowing of the small airways in response to “triggers” such as upper respiratory infections, inhaled allergens, and irritants such as tobacco smoke. Symptoms during an asthma attack may include wheezing, cough, shortness of breath, and chest pain or tightness. Asthma affects both adults and children, and it is the most common chronic disease of childhood (Bloom, et al., 2003). In 2002, 12% of all U.S. children had been diagnosed with asthma during their lifetime, and 6% of all children had an asthma attack in the previous 12 months (CDC, National Health Interview Survey, 2002). Nearly 11% of U.S. adults have been diagnosed with asthma at some point during their lifetime, and 6.8% still have asthma (CDC, National Health Interview Survey, 2002). In 2002, asthma was responsible for 484,000 hospitalizations nationwide.

This is the third annual surveillance report of the Maryland Asthma Control Program (MACP). The MACP began in 2001, with funding by the Centers for Disease Control and Prevention (CDC) to develop a State Asthma Surveillance Program and Plan. In 2002, the Maryland State Legislature established the MACP in statute (General Article §§13-1701 through 13-1706, Annotated Code of Maryland). With the support of the Centers for Disease Control and Prevention (CDC), the Maryland Department of Health and Mental Hygiene (DHMH), and a legislative mandate, the MACP is ready to provide leadership in reducing the morbidity and mortality due to asthma in Maryland, particularly for its most vulnerable populations. Annual surveillance of asthma morbidity and mortality provides MACP with direction for the targeting of interventions, and it will ultimately serve as a key measure of MACP’s success.

Like the 2003 surveillance report, this report presents current data on asthma prevalence, mortality, and health care utilization, comparing state data to previous years, as well as to national data. This year’s report has been expanded to include more detailed information about asthma morbidity and mortality. Chapters have been added to address work-related asthma, asthma among Medicaid enrollees, as well as disparities in asthma morbidity and mortality in Maryland. In addition, the chapter on asthma prevalence has been expanded to include more detailed information about asthma symptoms and treatment among adults.

Data sources for this surveillance report include the CDC Behavioral Risk Factor Surveillance System (BRFSS), the Maryland Health Services Cost Review Commission (HSCRC), Maryland Medicaid encounter and claims data, and the Maryland Vital Statistics Administration. In addition to these existing data sets, the surveillance report contains original data from a survey of Maryland physicians who care for adults with work-related asthma. For BRFSS data, asthma is identified by report from the questionnaire respondents. For HSCRC data, asthma is identified by the use of International Classification of Disease, 9<sup>th</sup> Edition (ICD-9) codes. Asthma includes all codes from 493.0 to 493.9. For mortality data, asthma was identified through ICD-9 codes until 2001. ICD-10 codes of J45 to J46 are used for 2001-2003 mortality data. Work-related asthma is identified as new-onset asthma caused by workplace exposure to allergens or irritants as well as work-aggravated asthma, in which existing asthma is worsened by workplace exposures. Rates are based on 2002 population statistics from the Vital Statistics Administration, as 2003 population data was not available at the time this report was drafted. Where possible, data have been age-adjusted to the 2000 U.S. estimated population in order to reliably compare populations with different age distributions.

## Prevalence

Prevalence is the proportion of individuals who have asthma at a specific point in time. Lifetime prevalence is the proportion of individuals who have **ever** been diagnosed with asthma. Current prevalence refers to the proportion of individuals who still have a diagnosis of asthma at the time the question is asked.

As in previous years, asthma prevalence in Maryland was measured using the Behavioral Risk Factor Surveillance System (BRFSS), a statewide ongoing telephone survey of adults coordinated by the CDC and conducted in all 50 states. Each year, 4900 Maryland residents are surveyed, and results are weighted in order to estimate responses for the entire state population. Because the results are estimates based on a population sample, 95% confidence intervals for Maryland data are listed in the appendix.

The BRFSS survey includes questions about the respondents' lifetime and current asthma prevalence. Since 2001, the lifetime prevalence question has been, "Have you ever been told by a doctor, nurse, or health professional that you had asthma?" Current prevalence is assessed by the question, "Do you still have asthma?"

Measurement of childhood asthma prevalence was changed for the 2003 BRFSS. The 2002 BRFSS asked only about lifetime asthma prevalence for children. A question assessing current prevalence was added to the 2003 BRFSS, which asks, "(Does this child/How many of these children) still have asthma?"

Lifetime asthma prevalence for Maryland residents more than 18 years of age was 11.9%, and current prevalence was 7.8% (Figures 1-1 and 1-2). Therefore, it is estimated that 501,620 Maryland adults have a history of asthma and 318,100 adults currently have asthma. Fifty-three percent of adult asthmatics in Maryland were diagnosed with asthma as children, with about 1/3 diagnosed with asthma before the age of 10 (Figure 1-3).

Figure 1-1

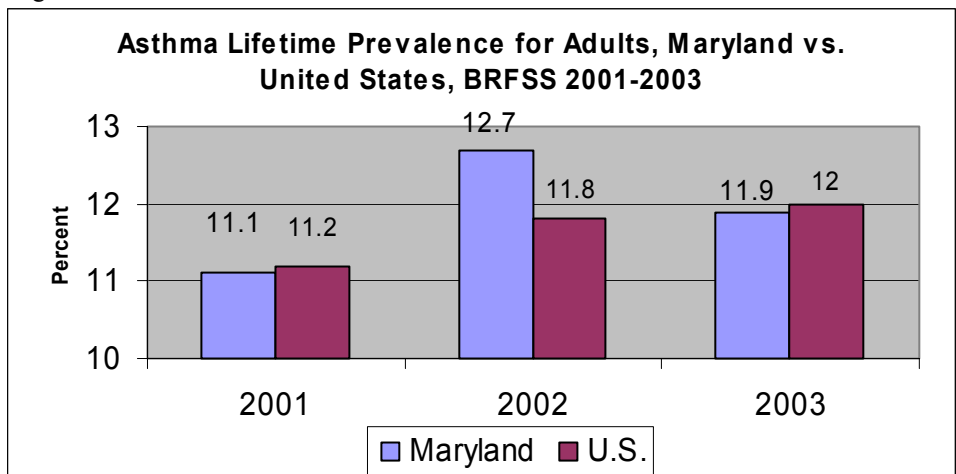
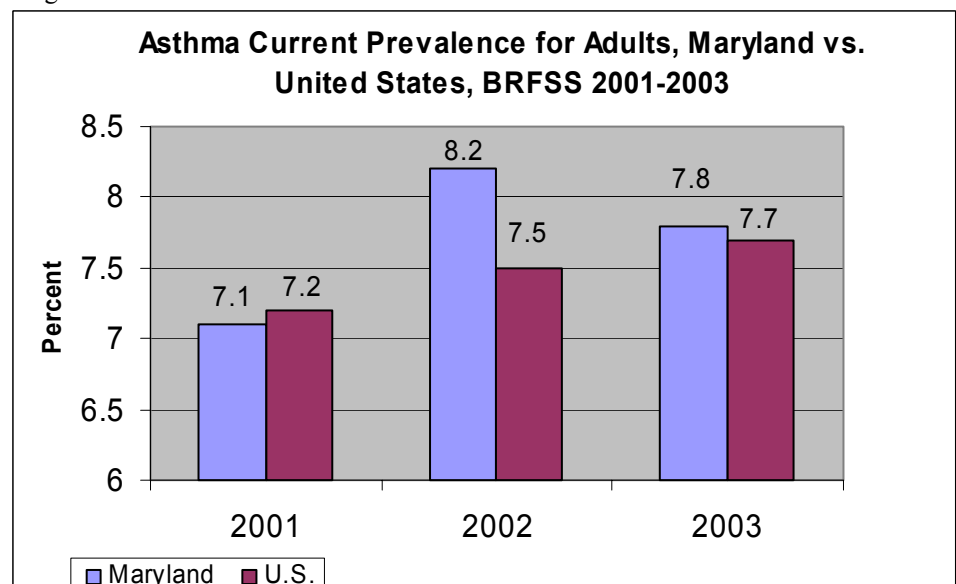


Figure 1-2



Continue →

## Prevalence—continued

The disparities identified in last year's asthma report have persisted. Among those more than 18 years of age, African-Americans, women, and younger adults are disproportionately burdened by asthma, as are persons with low income. There is a trend toward increased burden of asthma with more limited education (Figures 1-4 through 1-8).

Figure 1-3

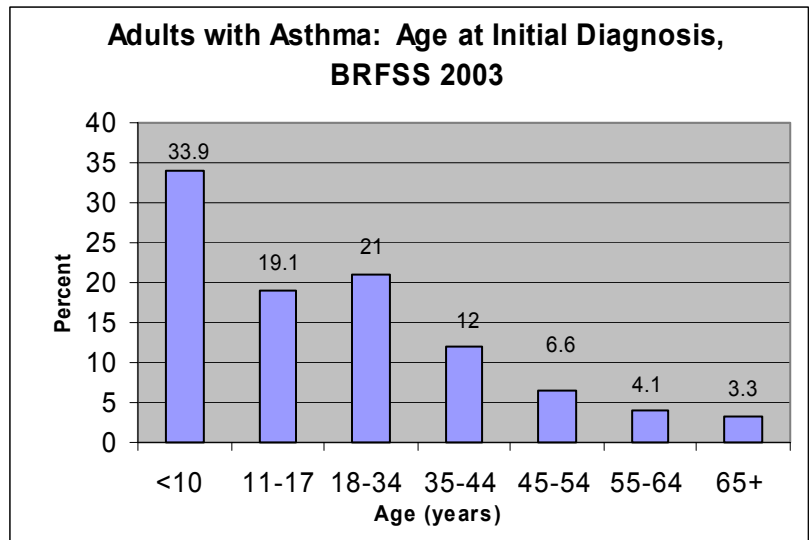


Figure 1-4

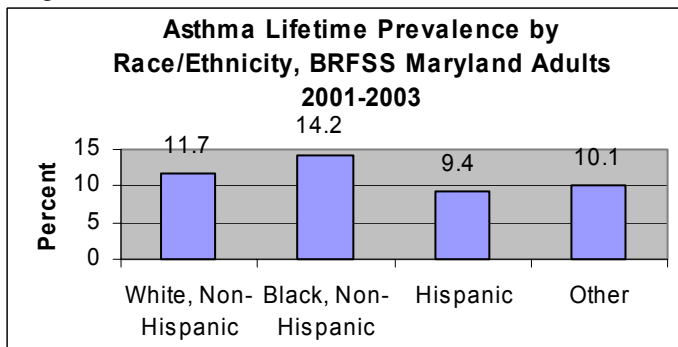


Figure 1-5

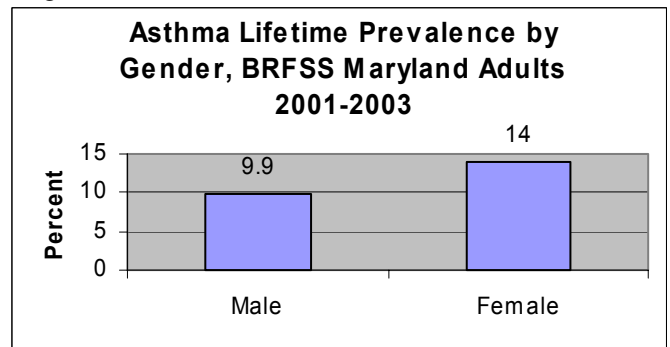
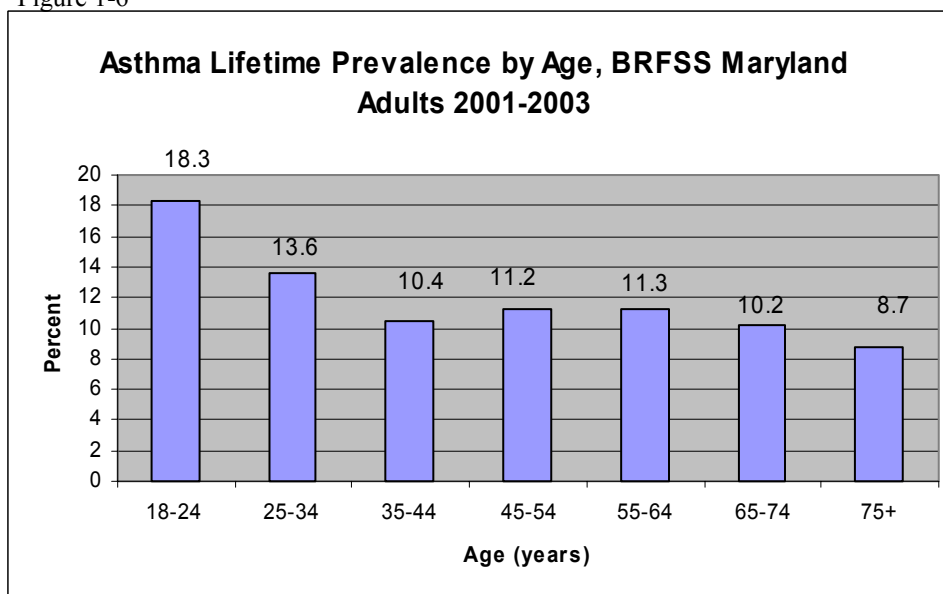


Figure 1-6

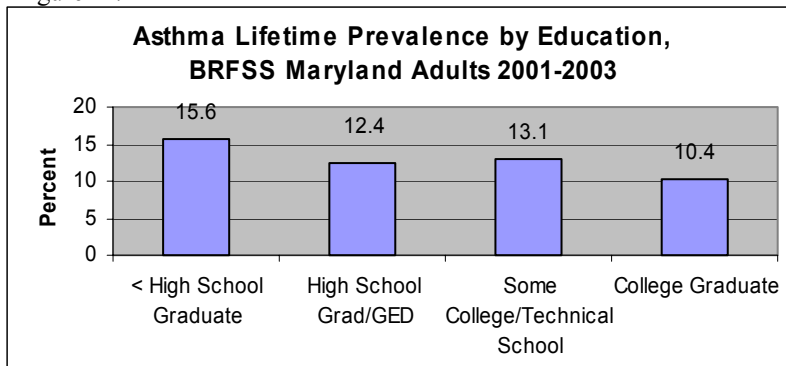


Continue →



## Prevalence—continued

Figure 1-7



Among Maryland children < 18 years of age, an estimated 153,172 have been diagnosed with asthma at some point during their lifetime, representing 11.1% of children. An estimated 118,673 children (8.6%) currently have asthma.

The prevalence of asthma among Maryland smokers is similar to that of former smokers and non-smokers (Figure 1-9). Maryland adults who currently have asthma are just as likely to smoke than those who have never had asthma (Figure 1-10). Because this data is cross-sectional, it is not possible to determine

whether smoking caused or exacerbated asthma among Maryland adults. However, the high rates of smoking among Maryland asthmatics is concerning, and could be a target for further interventions.

Figure 1-8

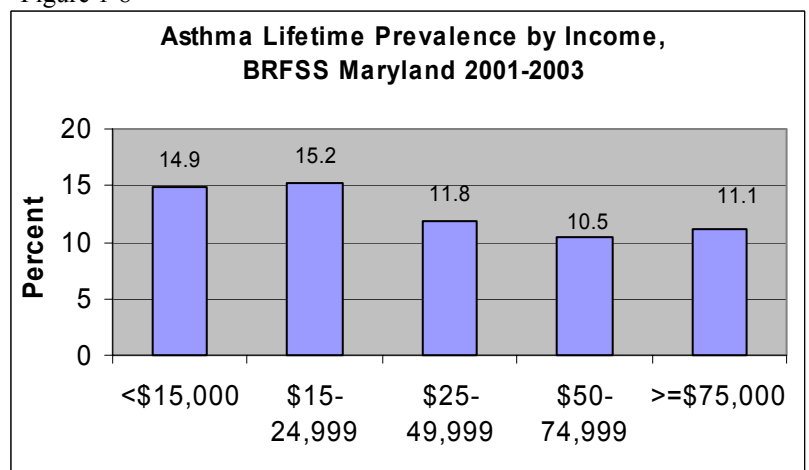


Figure 1-9

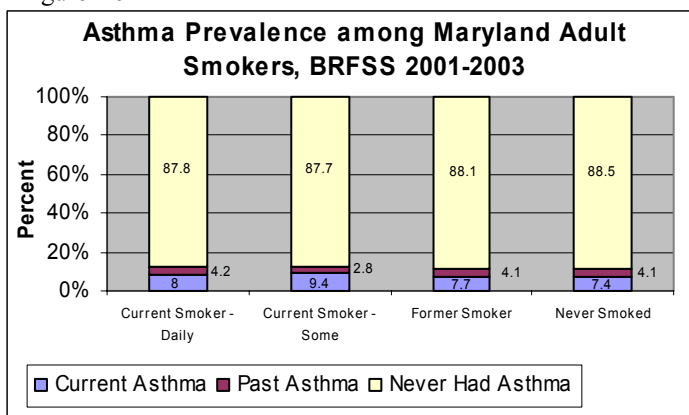
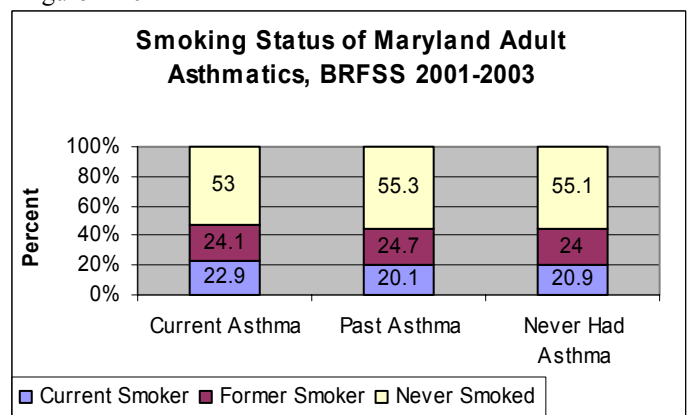


Figure 1-10



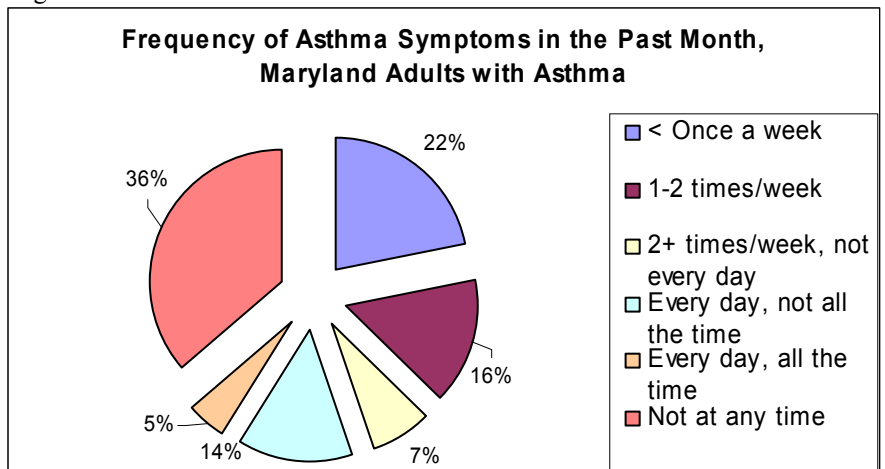
## Health Status of Maryland Asthmatics

Asthma symptoms can have a deleterious effect on quality of life for those who suffer from this disease. The 2003 Maryland BRFSS questionnaire included an additional adult asthma module that elicited information about asthma symptoms and medical care for those symptoms. These adult asthma module questions were asked of all respondents who answered yes to the question, “Have you ever been told by a doctor, nurse, or other health professional that you had asthma?” About 300 people answered each of these questions, and the results were weighted to reflect statewide demographics. Because the number of respondents was low, the data presented below represent estimates of actual symptom rates. As with BRFSS prevalence data, 95% confidence intervals are provided in the appendix for all health status data.

BRFSS data indicate that among Maryland adults with asthma, only 36% did not have symptoms such as coughing or wheezing during the past month (Figure 2-1). Nineteen percent of adults had symptoms every day. Nearly half of adult asthmatics had difficulty sleeping during the past month as a result of their asthma (Figure 2-2). Daily use of asthma medication during the previous month was reported by 37% of BRFSS respondents with asthma (Figure 2-3). The wording of this question did not distinguish between daily use of controller medication vs. rescue medication.

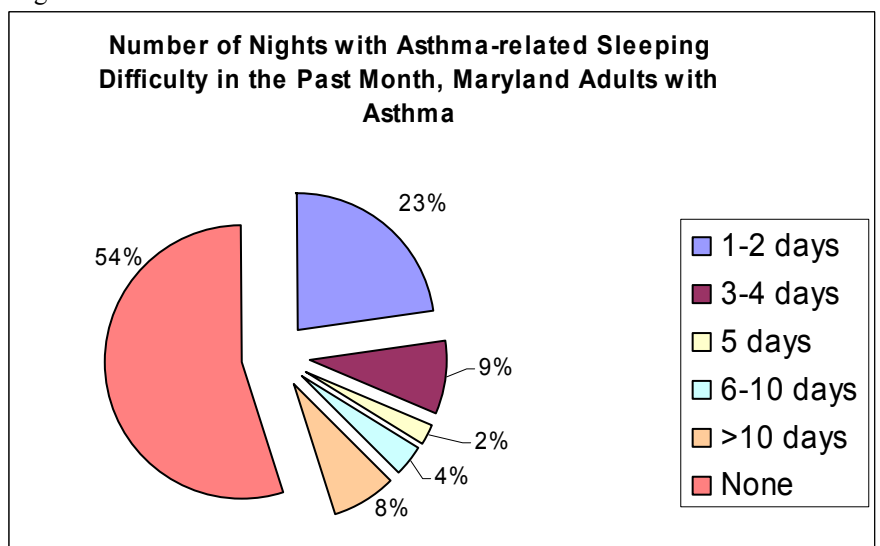
Asthma symptoms made it difficult for many BRFSS respondents to attend work and participate in their normal activities. Thirty-four percent of Maryland adults with asthma had symptoms in the past year that interfered with their work or usual activities (Figure 2-4). Twelve percent of Maryland adults with asthma had at least 30 days of asthma symptoms in the past year that interfered with their work or usual activities. In general, Maryland adults with asthma consider their health to be worse than those without asthma. While only 11.6% of adult Maryland residents without asthma rated their health as fair or poor, 25.7% of those with asthma did so (Figure 2-5).

Figure 2-1



Data from 2003 BRFSS

Figure 2-2

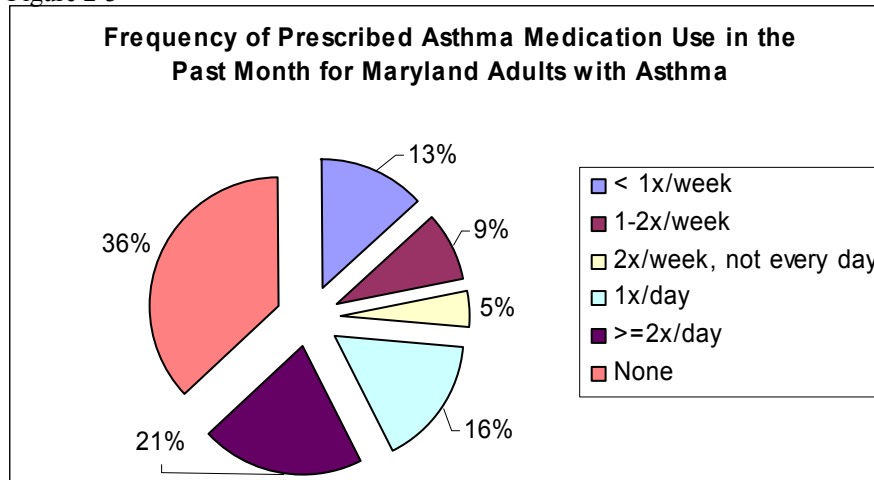


Data from 2003 BRFSS

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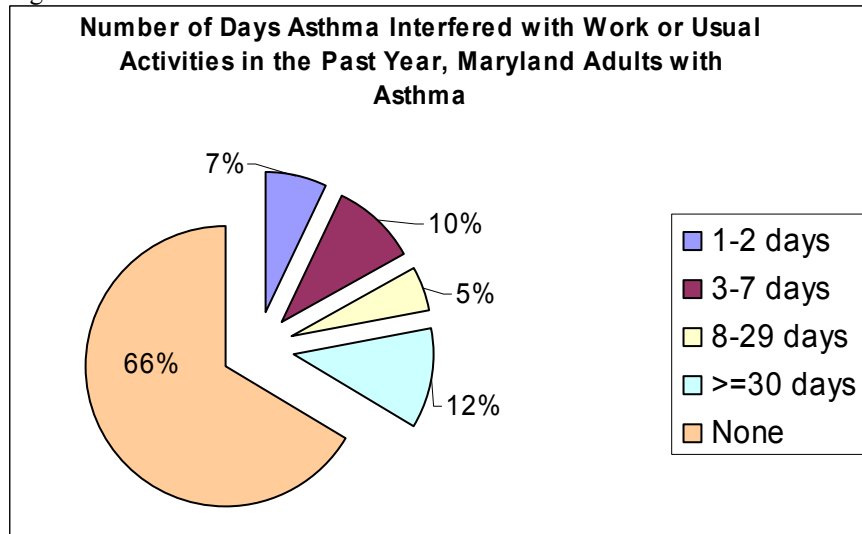
## Health Status of Maryland Asthmatics—Continued

Figure 2-3



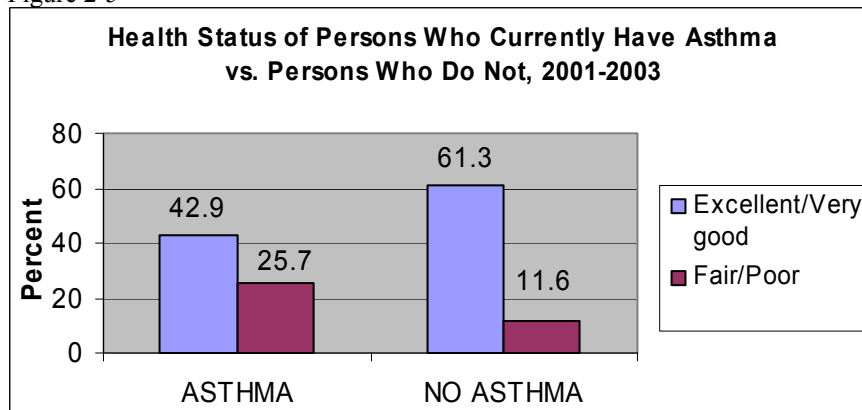
Data from 2003 BRFSS

Figure 2-4



Data from 2003 BRFSS

Figure 2-5



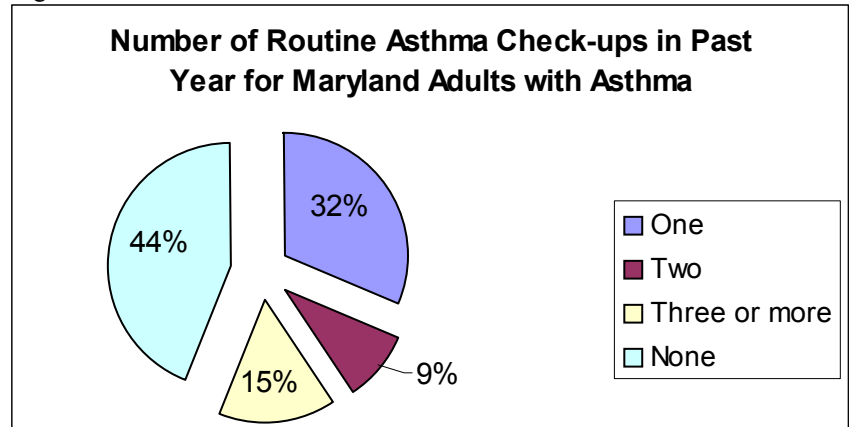
Data from 2001-2003 BRFSS

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## Health Status of Maryland Asthmatics—Continued

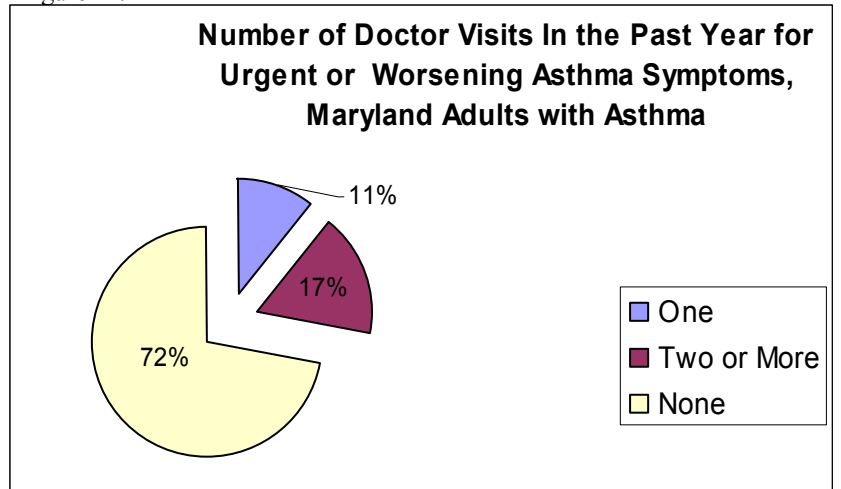
Nearly half (44%) of Maryland adults with asthma received no routine check-ups for their illness in the year prior to the BRFSS survey (Figure 2-6). When they had an asthma exacerbation, Maryland adults sought outpatient care more often than they sought care in an emergency department. While 28% of adult asthmatics had at least one outpatient visit for urgent or worsening asthma symptoms, only 19% were seen in emergency departments for asthma exacerbations (Figures 2-7 and 2-8).

Figure 2-6



Data from 2003 BRFSS

Figure 2-7

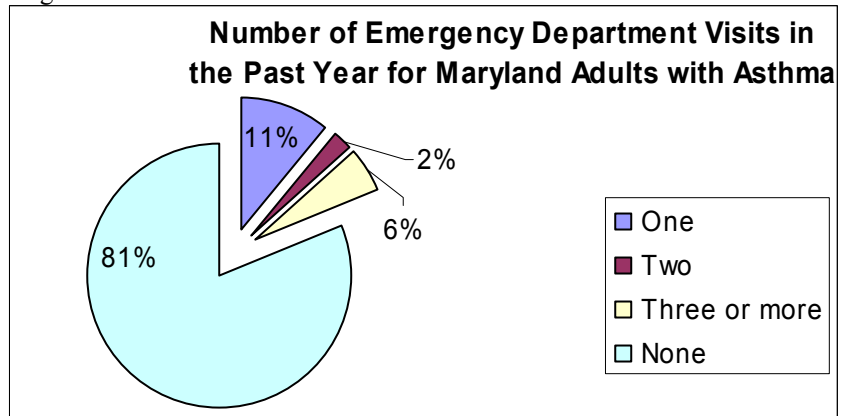


Data from 2003 BRFSS



Photo Source: Allergy and Asthma Foundation of America Maryland-Greater Washington, D.C.

Figure 2-8



Data from 2003 BRFSS

## Emergency Department Visits

Individuals with asthma can usually manage their condition through the avoidance of triggers, appropriate use of medications, and health care by their primary care providers with specialty consultation as needed. Emergency department visits occur when persons with asthma develop symptoms that cannot be managed at home, or they lack access to treatment by a primary care provider.

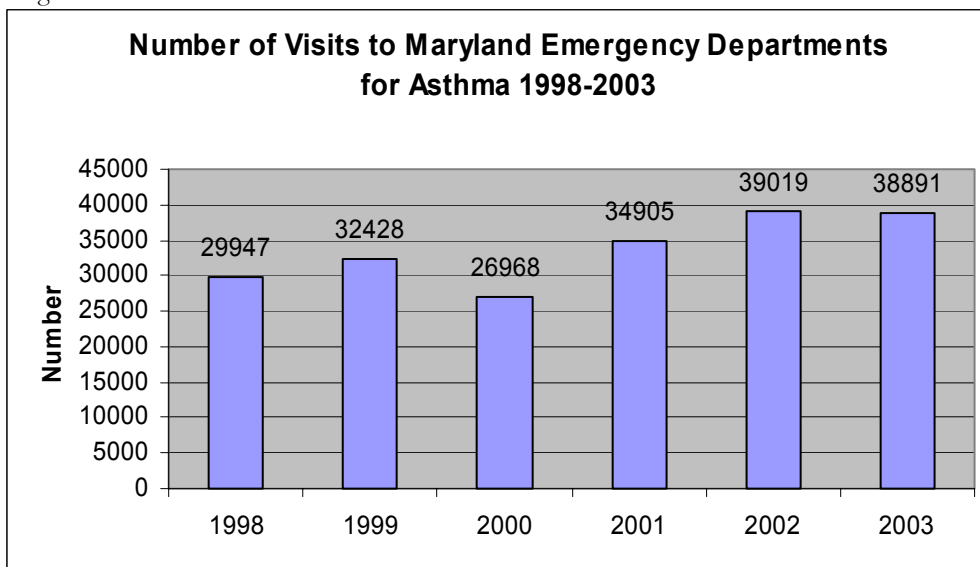
Information regarding emergency department visits for asthma has been abstracted from the Maryland Health Services Cost Review

Commission ambulatory care file. Data are collected only for non-federal hospitals within Maryland, and are available from April of 1997. In 2003, there were 38,891 emergency department visits for asthma (Figure 3-1). This represents a rate of 71.5 emergency departments per 10,000

population in 2003 (Figure 3-2). The total number of visits and the rate of ED visits increased significantly between 2001 and 2002. However, they remained fairly stable between 2002 and 2003. The increases between 2001 and 2002 were partially attributable to changes in the data abstraction methods.

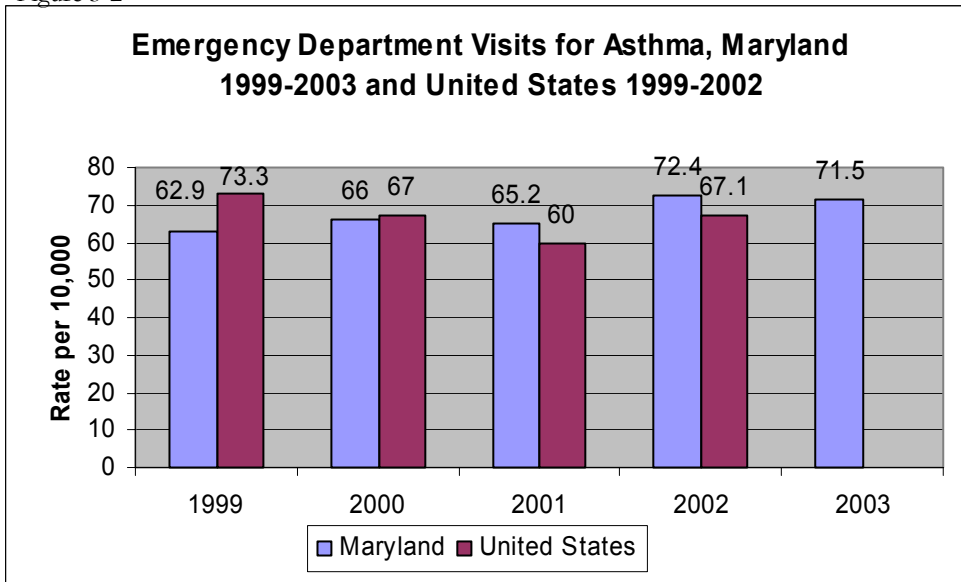
Methods for abstraction of 2003 data are unchanged from the previous year. Maryland emergency department visit rates are higher than the 2002 national rate of 67.1 visits per 10,000 population (Figure 3-2).

Figure 3-1



Data from HSCRC

Figure 3-2



Maryland data from HSCRC.

United States data from National Center for Health Statistics (NCHS)

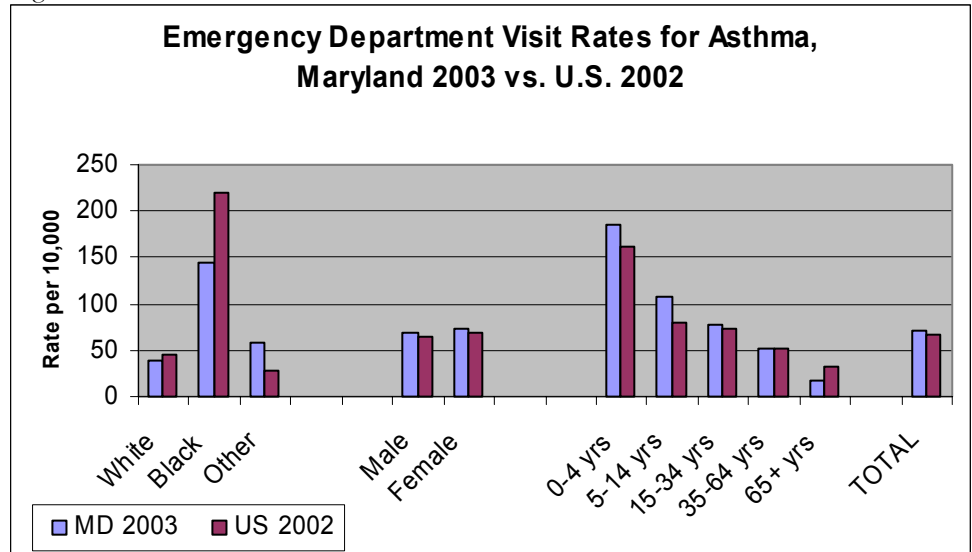
All rates are age adjusted to the 2000 U.S. estimated population.

Continue —>

## Emergency Department Visits—Continued

A number of disparities can be seen in emergency department visit rates (Figure 3-3). African-Americans in Maryland continue to visit the emergency department for asthma at four times the rate of whites. Young children are brought to the emergency department for asthma more often than adults. Disparities in gender persist, but are less pronounced than those noted in last year's report.

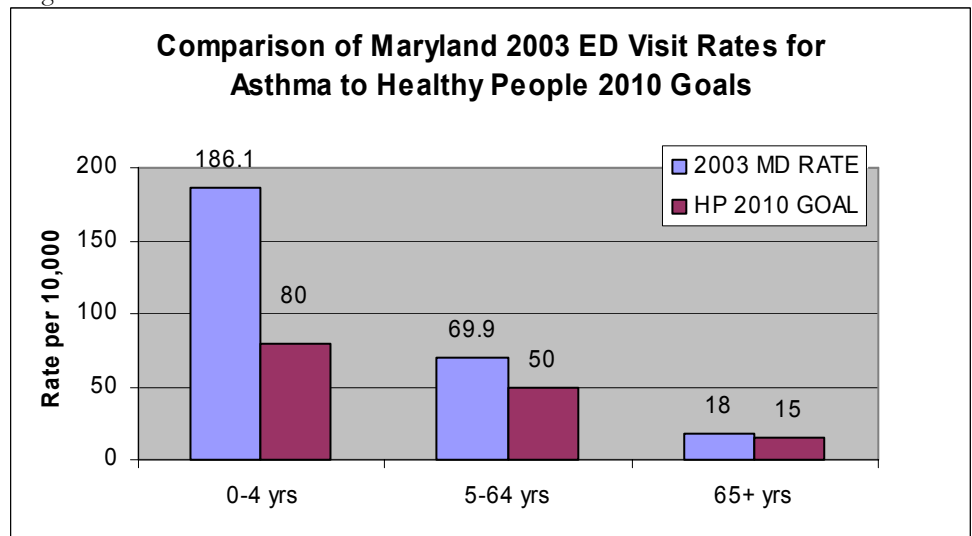
Figure 3-3



Data from HSCRC for total population, and by race and sex are age adjusted to the 2000 U.S. estimated population.

Maryland emergency department visit rates continue to exceed the Healthy People 2010 goals for all age groups (Figure 3-4). This difference remains most dramatic for children under 5 years of age. While the Healthy People 2010 goal is 80 visits per 10,000 population, Maryland's youngest children (age 0-4) had 186.1 visits per 10,000 population.

Figure 3-4



Data from HSCRC for age groups 5-64 and 65+ years are age adjusted to the 2000 U.S. estimated population.

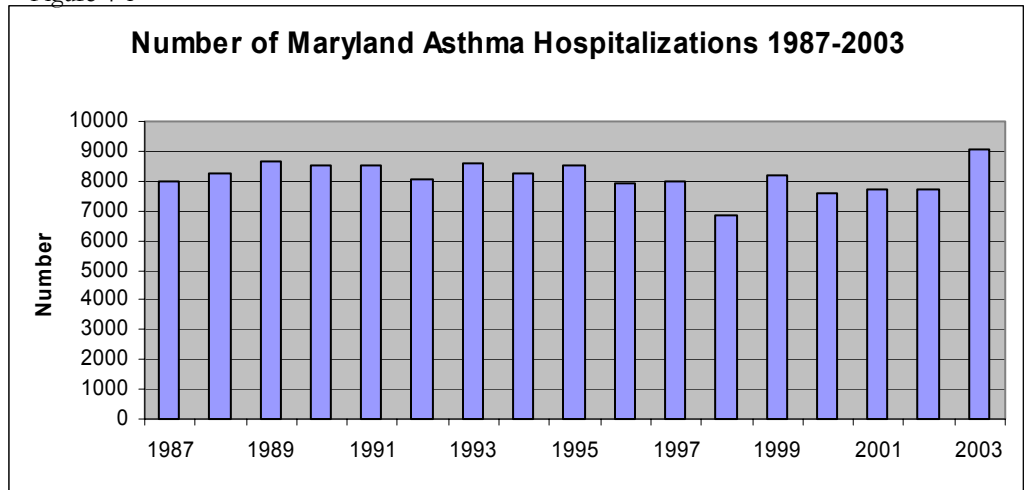
Many emergency department visits are avoidable with appropriate preventive and therapeutic care. Guidelines on asthma management are available from the National Heart, Lung, and Blood Institute of the National Institutes of Health (<http://www.nhlpi.nih.gov/guidelines/asthma/asthgdln.htm>). These guidelines can assist patients and providers in working together to establish an optimal asthma control regimen and to assure adherence to this regimen.

## Hospitalizations

Hospitalization for asthma is generally considered a failure of outpatient management. Maryland hospitalization data from 1987-2003 were obtained from the Maryland Health Services Cost Review Commission. Because some Maryland residents are hospitalized in neighboring states, information from Maryland hospitals has been supplemented with data from the District of Columbia, West Virginia, Virginia, Pennsylvania, and Delaware, when possible. Some data from neighboring jurisdictions and states that were not available for last year's asthma report have also been obtained. Therefore, some revised hospitalization data for the 2002 calendar year has been included in this year's report.

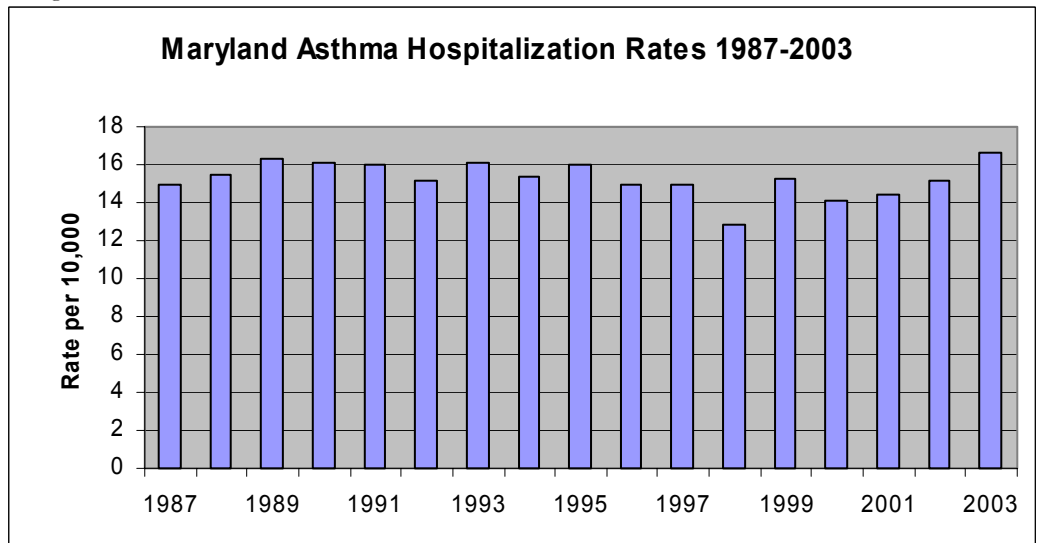
In Maryland hospitals, the number and rate of hospitalizations for asthma as a primary diagnosis increased substantially from previous years. There were 9065 asthma hospitalizations in 2003, an increase of nearly 18% from 2002, when there were 7695 asthma hospitalizations (Figure 4-1). An additional 679 Maryland residents were hospitalized for asthma in neighboring states/jurisdictions. The majority of these Maryland residents were hospitalized in the District of Columbia (544), with 42 hospitalized in Virginia, 12 in West Virginia, 29 in Pennsylvania, and 52 in Delaware. The hospitalization rate for Maryland residents was 16.6 per 10,000 population without including those hospitalizations outside of Maryland, or 17.9 per 10,000 population when hospitalizations outside of Maryland are included (Figure 4-2). While the hospitalization rate in 2002 was below the national average (15.4 vs. 17.4 per 10,000), the 2003 Maryland hospitalization rate is now higher than the 2002 national rate. National hospitalization rates for 2003 were not available at the time this report was drafted.

Figure 4-1



Data from HSCRC for Maryland residents hospitalized in Maryland hospitals. For 1987-2001, hospitalizations/year were determined by admission date. For 2002-2003, hospitalizations/year were determined by discharge date.

Figure 4-2



Data from HSCRC for Maryland residents hospitalized in Maryland hospitals. For 1987-2001, hospitalizations/year were determined by admission date. For 2002-2003, hospitalizations/year determined by discharge date. All rates are age adjusted to the 2000 U.S. estimated population.

Continue —>

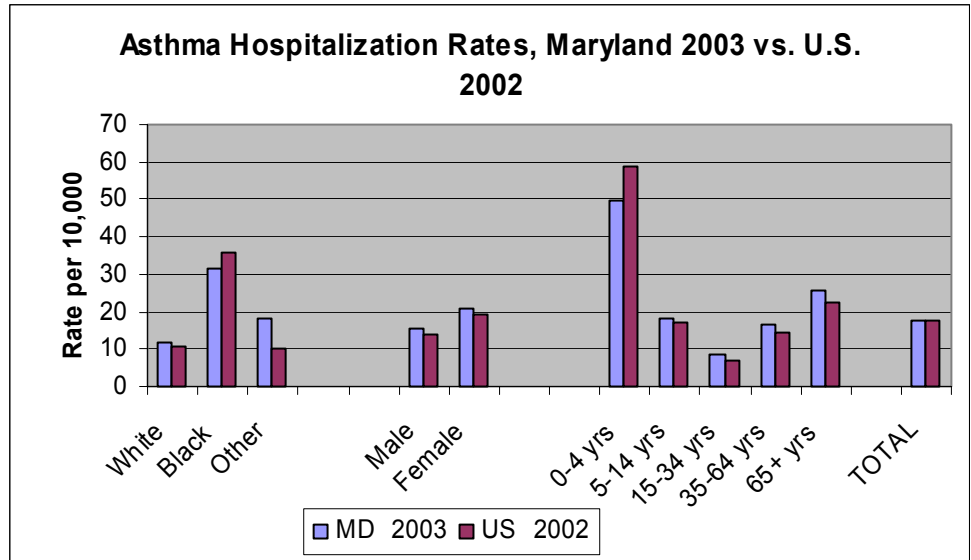
## Hospitalizations—Continued

Hospitalization rates for African-Americans in 2003 continued to be nearly three times that of whites (Figure 4-3). Females continue to have higher hospitalization rates than males, and children under 5 continue to have the highest hospitalization rates compared to other age groups, with a rate of 50 per 10,000. Between 2002 and 2003, Maryland asthma hospitalization rates have increased for all racial groups, both sexes, and all age groups. Hospitalization rates for all age groups continue to exceed Healthy People 2010 goals (Figure 4-4).

Maryland residents hospitalized for asthma spent an average of 2.9 days in the hospital (median of 2 days). The length of hospitalization increases with age. While children under age five spent an average of 1.8 days in the hospital, adults age 65 and older spent, on average, 4.3 days in the hospital for asthma.



Figure 4-3



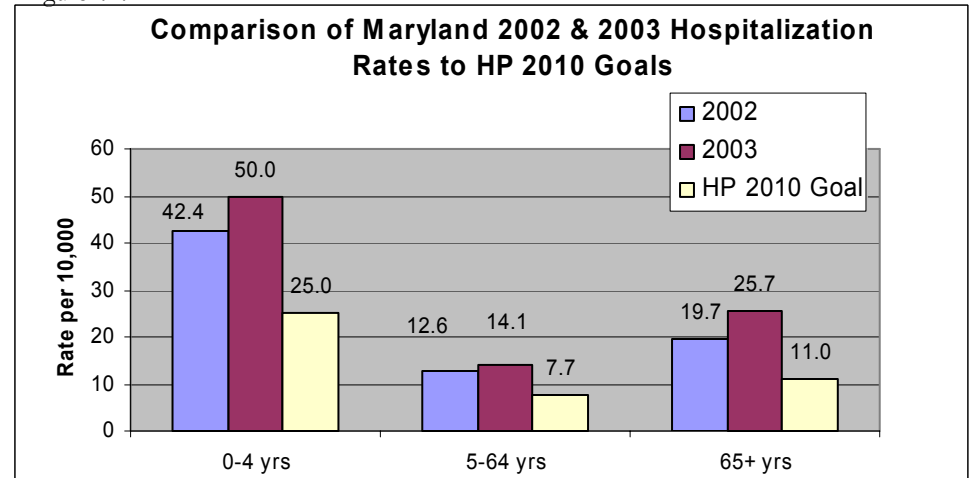
Maryland hospitalization data from HSCRC

Total hospitalization rate and hospitalization rates by race and sex are age adjusted to the 2000 U.S. estimated population.

Hospitalizations of Maryland residents in West Virginia are included in all data except rates by race, because West Virginia does not collect data on race.

Hospitalizations of Maryland residents in the District of Columbia, Virginia, Pennsylvania, and Delaware are included in all data

Figure 4-4



Data for age groups 5-64 and 65+ years are age adjusted to the 2000 U.S. estimated population.

Hospitalizations of Maryland residents in the District of Columbia, West Virginia, Virginia, Pennsylvania, and Delaware are included in all 2002 and 2003 data.



## Medicaid Enrollees and Asthma

Medicaid is a joint federal/state funded insurance program designed to provide health care coverage to lower income children and adults. Maryland Medicaid administrative data is collected for a variety of purposes including program evaluation, rate-setting, federal and state reporting, and program administration. These data, when analyzed, can serve as a proxy for asthma morbidity among the lowest income Maryland residents.

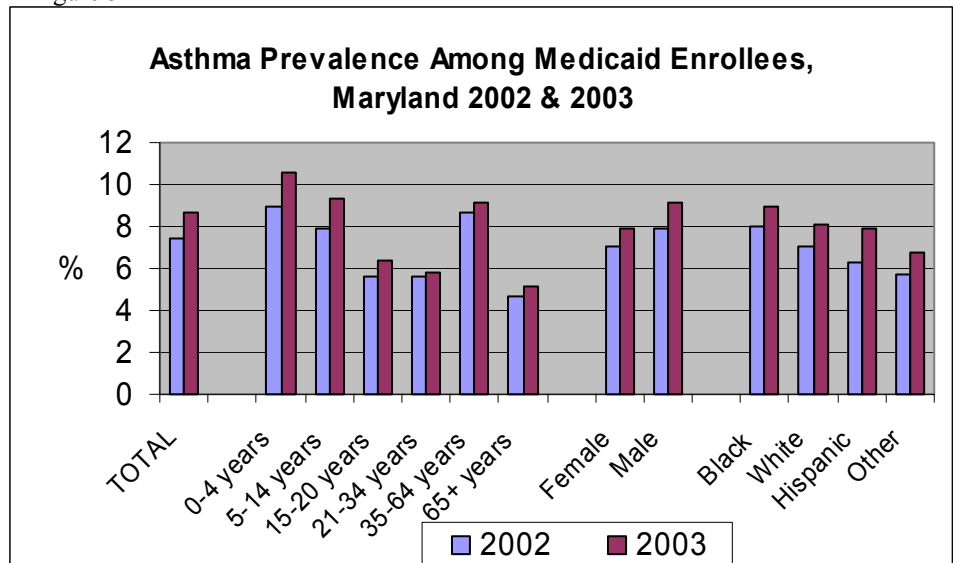
Paid fee-for-service claims and managed care (HealthChoice) encounters were obtained from Maryland Medicaid administrative data for the 2002 and 2003 calendar years. All data were examined by patient age, sex, and race. Asthma prevalence, emergency department visits, hospitalization rates, and outpatient visit rates were derived. Prevalence is defined as the number of Medicaid enrollees having **at least one encounter with a diagnosis of asthma during the year**. Because visits can be linked to specific enrollees, the number of outpatient visits, emergency department visits, and hospitalizations per person can be examined. This is in contrast to HSCRC data, in which visits cannot be matched to individuals and must be calculated according to the **total count** of emergency department visits and hospitalizations.

In 2003, 62,473 Maryland Medicaid enrollees had a diagnosis of asthma. The number of enrollees with asthma increased by 19% from 2002, despite an increase

of less than 2% in the total number of Medicaid enrollees. Asthma prevalence for all Medicaid enrollees in 2003 was 8.7%, up from 7.4% in 2002 (Figure 5-1). The year-to-year comparison shows increases across all age groups. In the aggregate, asthma prevalence rates were higher for Blacks than for whites or Hispanics, higher for males than females, and higher in young children than older children and adults.

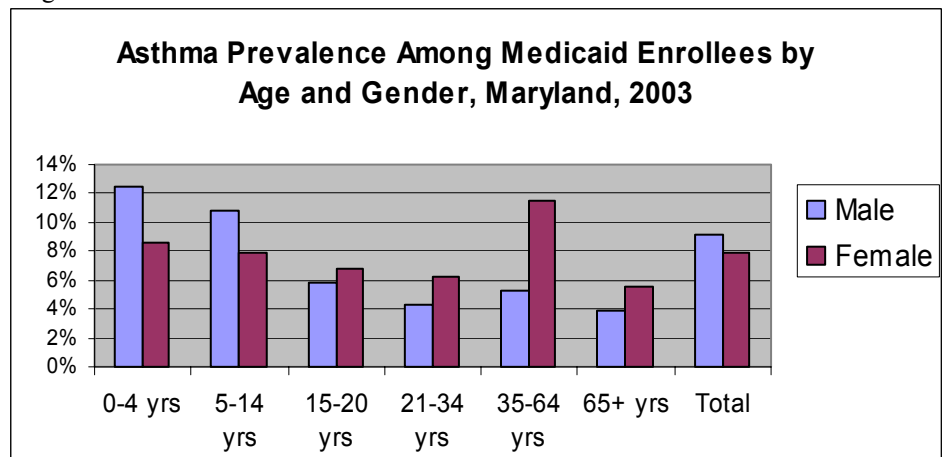
Comparison by age and gender show higher rates among male children ages 0-4 years and 5-14 years (Figure 5-2). From the late teen years through age 64, however, females have a higher prevalence of asthma than males.

Figure 5-1



Source: Maryland Medicaid

Figure 5-2



Source: Maryland Medicaid

Continue —>

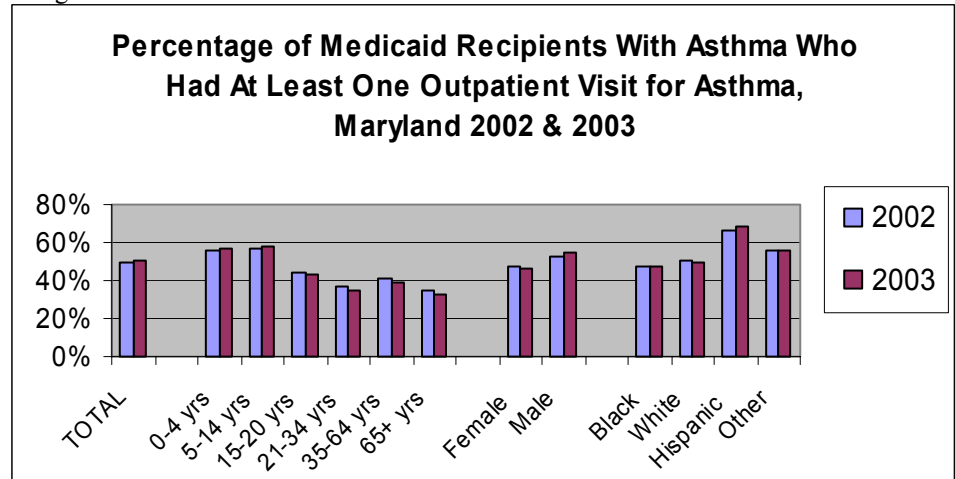
## Medicaid Enrollees and Asthma—Continued

For all Medicaid enrollees with asthma, about half had an outpatient visit for asthma in 2002 and the percentage remained about the same in 2003 (Figure 5-3). Young children with asthma were more likely to have outpatient visits, with 57% and 58% of children age 0-4 and 5-14 years having at least one outpatient visit for asthma. Children in these age groups had an average of one outpatient asthma visit per child per year. The proportion of diagnosed Medicaid enrollees having an outpatient visit for asthma decreased with increasing age. Hispanics had the highest proportion of enrollees having outpatient visits for asthma, and men with asthma were more likely than women to have an outpatient visit for asthma.

While Medicaid enrollees diagnosed with asthma have low rates of outpatient asthma care, the reasons for this are unclear. Low visit rates may represent inadequate management of patients with asthma. Those Medicaid enrollees without outpatient visits may also have milder disease than those who had outpatient visits. In addition, the encounter and claims data may not have captured every asthma visit. For example, asthma may be addressed during well child checks, but not coded as such.

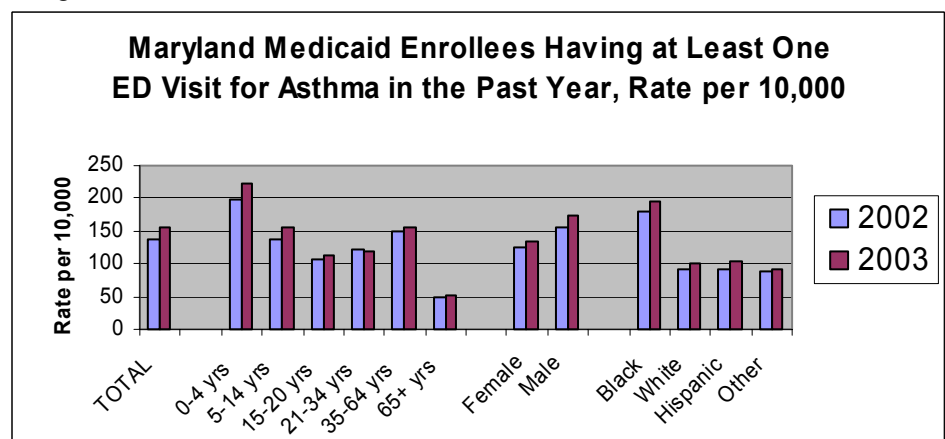
About 156 per 10,000 Medicaid enrollees were seen in emergency departments for asthma symptoms in 2003 (Figure 5-4). This rate is more than double that for the Maryland population as a whole (71.5 emergency department visits per 10,000). Emergency department visit rates were highest for Medicaid enrollees age 0-4 years with a rate of 223 enrollees per 10,000 requiring at least one visit. Rates were higher for Black Medicaid enrollees than for whites or Hispanics.

Figure 5-3



Source: Maryland Medicaid

Figure 5-4



Source: Maryland Medicaid

Continue —>

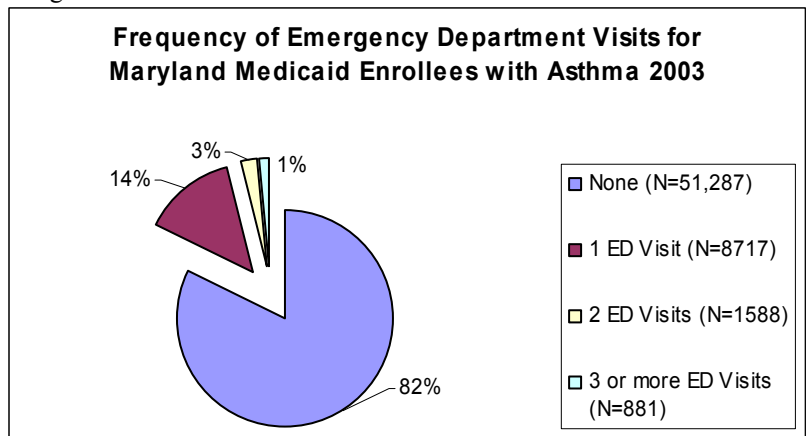
## Medicaid Enrollees and Asthma—Continued

Most Medicaid enrollees with asthma (51,287 or 82%) required no emergency department visits in 2003. However, 14% of Medicaid enrollees had one emergency department visit, and 4% had two or more visits in 2003 (Figure 5-5).

The hospitalization rate for Maryland Medicaid enrollees in 2003 was 32 per 10,000 (Figure 5-6). These rates are higher than those for the Maryland population as a whole (17.9 hospitalizations per 10,000). For children, the hospitalization rate varied by age. Hospitalizations were highest for those age 0-4 years (49.8 children per 10,000). Among adults, hospitalization rates were highest for those age 35-64 years (50.4 enrollees per 10,000). Black Medicaid enrollees with asthma had higher rates of hospitalization than any other racial or ethnic group.

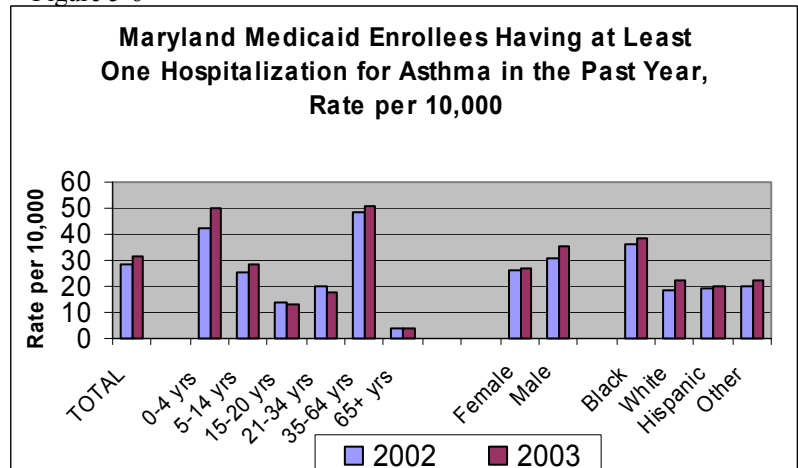
Few Medicaid enrollees with asthma required hospitalization in 2003 (Figure 5-7). However, 3% of Medicaid enrollees were hospitalized once, and 1% had two or more hospitalizations.

Figure 5-5



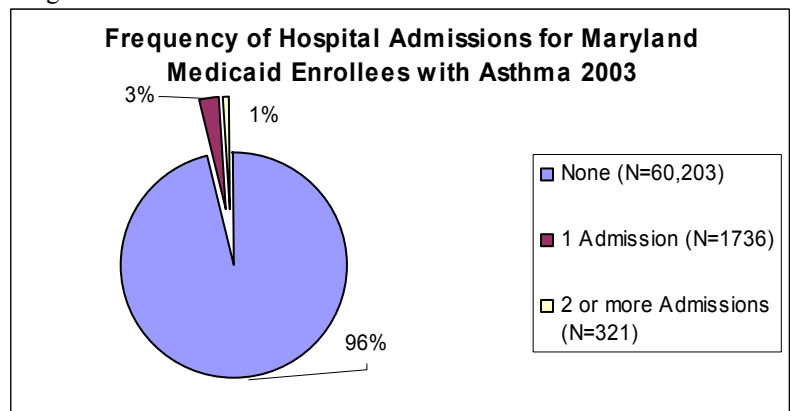
Source: Maryland Medicaid

Figure 5-6



Source: Maryland Medicaid

Figure 5-7



Source: Maryland Medicaid



## Deaths

Mortality from asthma is potentially preventable. Therefore, to some extent, trends in asthma mortality reflect the state's overall success in the management and control of asthma. The Maryland Asthma Control Program tracks asthma mortality by using data from the Maryland Vital Statistics Administration. These data included deaths of Maryland residents that occurred in Maryland. Data from 2002 and 2003 also include out-of-state deaths of Maryland residents. Mortality rates have been age-adjusted to the 2000 U.S. estimated population.

In 2003, both the overall number and rate of Maryland asthma deaths decreased from 2002. However, mortality has remained within about the same range over the past 5 years. From 1999-2003, an average of 84 Maryland residents died each year from asthma as an underlying cause (Table 6-1). Asthma was a contributing cause of death each year for an average of 175 additional Maryland residents. These rates are slightly lower than the 1998-2002 annual averages of 88 deaths as an underlying cause and 179 deaths as a contributing cause. The age adjusted mortality rate in 2003 was 16.2 deaths per 1,000,000 population (Figure 6-1). The average age adjusted mortality for 1999-2003 was 15.9 deaths per 1,000,000 population, slightly lower than the 1998-2002 rate of 16.7.

Maryland asthma mortality rates can be compared to national statistics through 2002. Mortality rates for the total state population have remained similar to national rates over time. Over the past five years there has been no specific trend in deaths by month or season of death.

In 2003, a cluster of asthma deaths among young Baltimore residents was identified. Seven Baltimore area residents under the age of 19 died from asthma within a period of approximately 2 months. Five of the seven were known asthmatics and all were African-American. The CDC is currently completing a case control study to assess whether there might be a common cause or contributor to these deaths.

Disparities in asthma mortality continue to exist, both in Maryland and nationally (Figure 6-2). Blacks continue to die at a three times higher rate than whites. Women have nearly twice the mortality rate of men. Asthma mortality rates are highest in the elderly, although the 5 year average mortality for persons 65 years and older decreased from 59.4 deaths per 1,000,000 in 1998-2002 to 50.4 in 1999-2003 (Figure 6-3).

While recent decreases in asthma mortality are encouraging, the Maryland Asthma Control program will continue to follow mortality rates to determine whether these trends persist. Specific circumstances surrounding asthma deaths will also be followed to better identify and address the risk factors that may lead to fatal asthma events.

Continue —>

## Deaths—Continued

Table 6-1

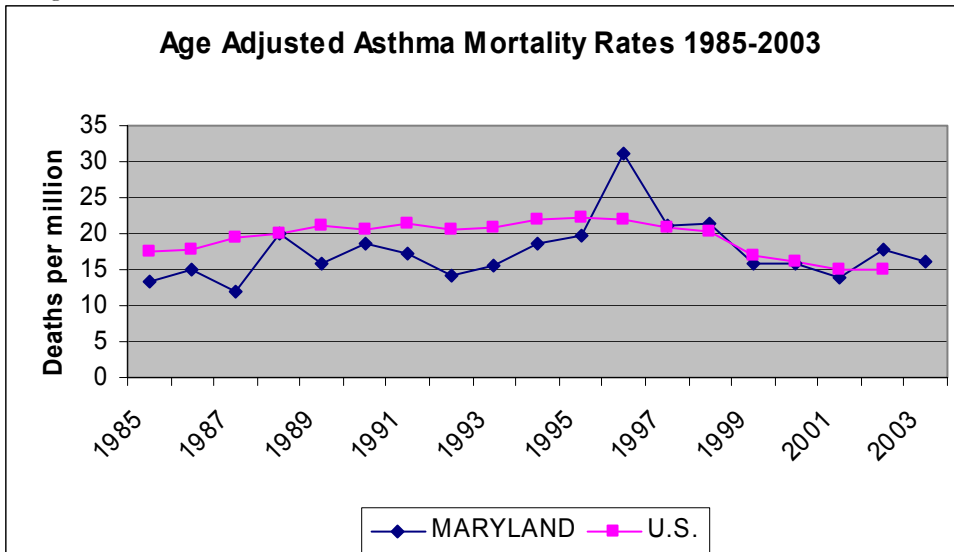
Year	Number of Deaths, Asthma as Underlying Cause	Number of Deaths, Asthma as Underlying or Contributing Cause
1985	53	N/A
1986	61	N/A
1987	50	N/A
1988	86	N/A
1989	70	N/A
1990	82	N/A
1991	76	N/A
1992	65	N/A
1993	73	186
1994	88	232
1995	95	239
1996	150	239
1997	103	241
1998	107	277
1999	81	278
2000	81	252
2001	74	260
2002	96	267
2003	87	239

Data from Maryland Vital Statistics Administration

Continue —>

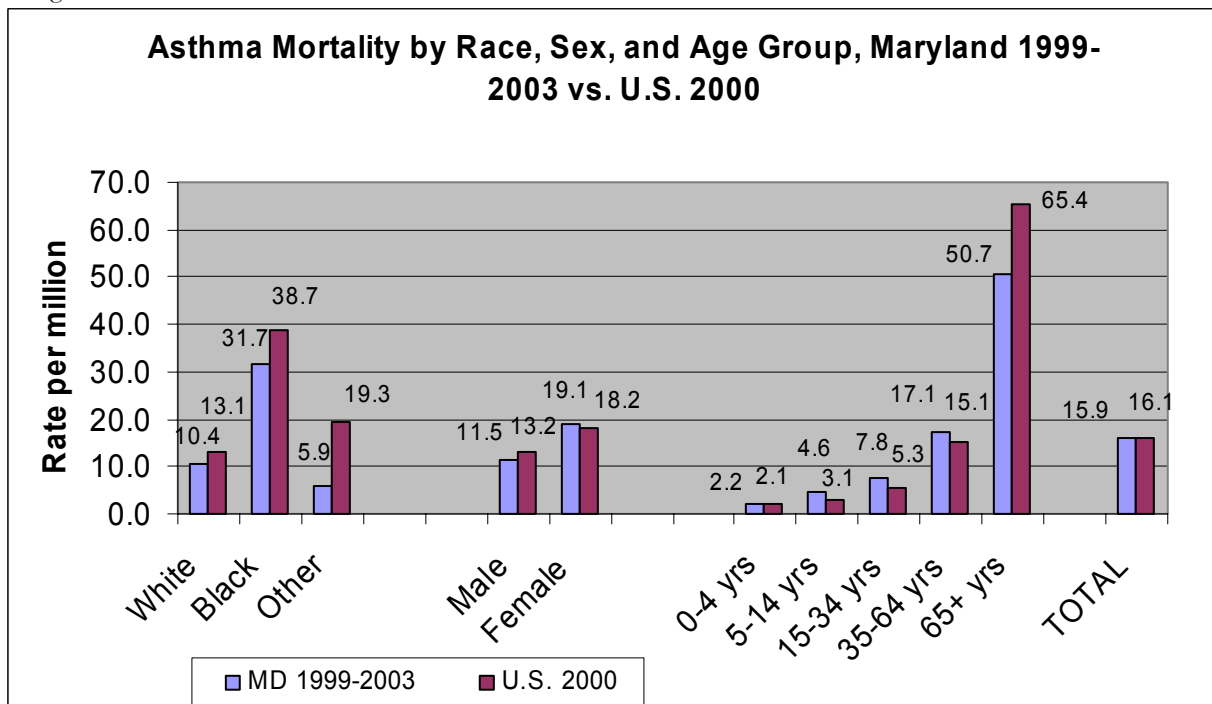
## Deaths—Continued

Figure 6-1



Maryland mortality data from Maryland Vital Statistics Administration  
 U.S. data from CDC Wonder

Figure 6-2

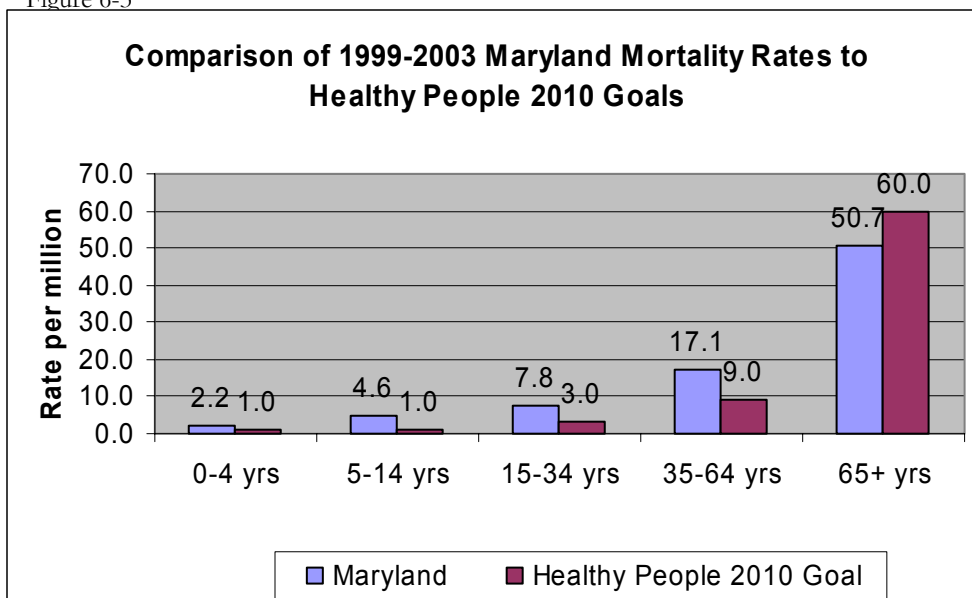


Maryland mortality data from Maryland Vital Statistics Administration  
 U.S. data from CDC Wonder  
 Total mortality rate, and rates by race and sex are age adjusted to the 2000 U.S. estimated population

Continue —>

## Deaths—Continued

Figure 6-3

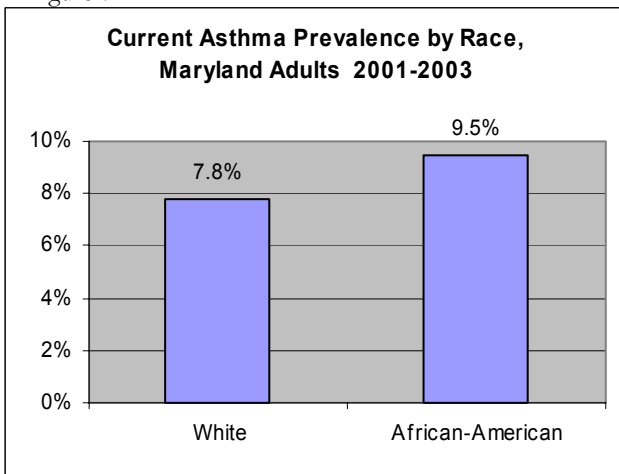


## Disparities and Asthma

Data from the previous sections demonstrates many disparities in asthma morbidity and mortality. For example, among Maryland adults, African-Americans have a higher asthma prevalence than whites, and women are more likely to have asthma than men. In addition, asthma prevalence increases with lower income and less education. Disparities are also seen when examining hospitalization and emergency department visit rates. When looking at Maryland residents of all ages, African-Americans have much higher hospitalization and emergency department visit rates than whites. Young children (under 5 years of age) have disproportionate numbers of hospitalizations and emergency department visits compared to older asthmatics. African-Americans have higher asthma mortality rates than whites.

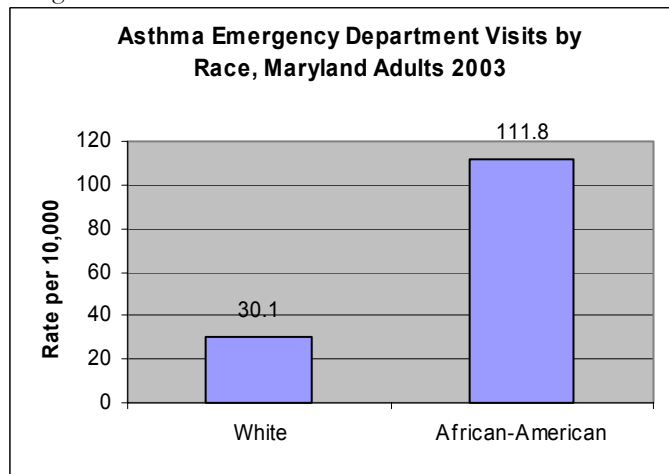
For some groups, increased hospitalization, emergency department visit, and mortality rates may be a direct result of the increased prevalence of asthma in those groups. For example, if one group had twice the prevalence of asthma, that group might be expected to also have twice the rate of hospitalizations, emergency department visits, and deaths. In order to examine whether increased prevalence of asthma among African-Americans could explain the higher morbidity and mortality, the “disparity ratio,” the ratio of African-American to whites for each measure, was examined. Figures 7-1 through 7-4 provide the rates for African-Americans and whites.

Figure 7-1



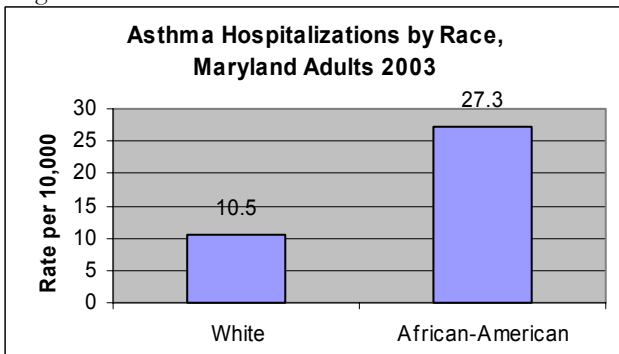
BRFSS data for Maryland adults

Figure 7-2



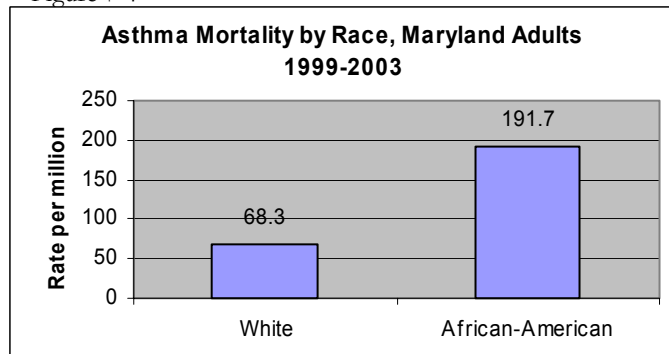
HSCRC data for Maryland adults ≥18 years. Age adjusted to 2000 U.S. estimated population

Figure 7-3



HSCRC data for Maryland adults ≥18 years. Age adjusted to 2000 U.S. estimated population

Figure 7-4



Data from Maryland Vital Statistics Administration for Maryland adults ≥ 18 years  
Age adjusted to 2000 U.S.

Continue —>



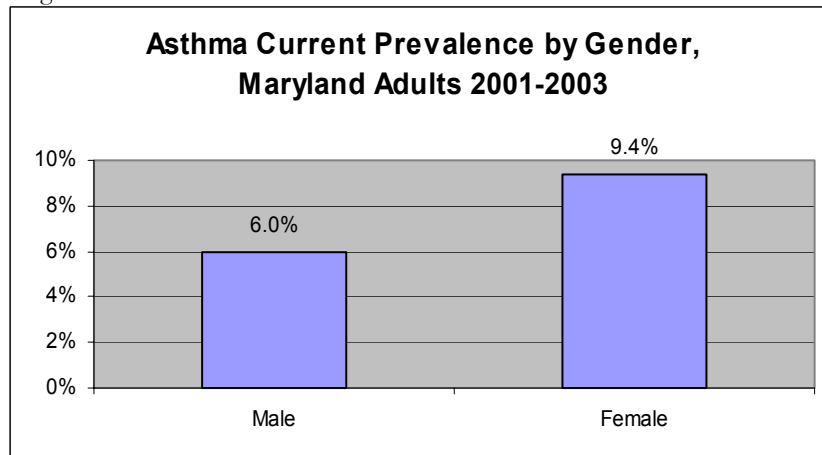
## Disparities and Asthma—Continued

African-American adults in Maryland had a 1.2 times higher asthma prevalence than white adults (9.5% vs. 7.8%, Figure 7-1). However, they had a 3.7 times higher rate of emergency department visits (111.8 vs. 30.1 visits per 10,000, Figure 7-2), a 2.6 times higher hospitalization rate (27.3 vs. 10.5 hospitalizations per 10,000, Figure 7-3), and a 2.8 times higher mortality rate (191.7 vs. 68.3 deaths per million, Figure 7-4). Disparity ratios from the above are presented in Figure 7-5. The increased asthma morbidity and mortality among African-Americans cannot be fully explained by higher prevalence. Other factors, such as higher asthma severity, poorer asthma control, and/or more limited access to health care may further explain these differences. Because of small sample sizes, it was not possible to conduct similar analyses for other minority groups.

Similar comparisons were made for women and men with asthma, because women consistently have higher prevalence, as well as higher hospitalization, emergency department visit, and mortality rates when compared to men. The higher prevalence of asthma among women might be explained by physiological differences such as smaller airways or hormones, increased health care seeking among women, as well as

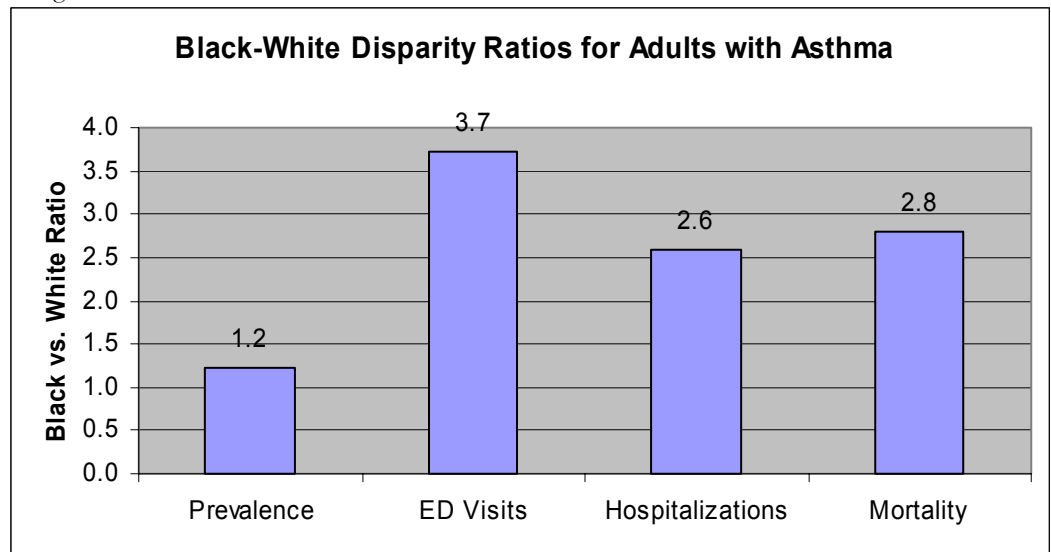
higher smoking rates among men, leading more men to be diagnosed with chronic obstructive pulmonary disease rather than asthma. The prevalence of asthma among Maryland women is 1.6 times higher than that among men (9.4% vs. 6%, Figure 7-6). Similarly, women have a 1.6 times higher emergency department visit rate (65.2 vs. 41 visits per 10,000, Figure 7-7) and a 1.7 times higher mortality rate (1.2 vs. 0.7 deaths per

Figure 7-6



Data from BRFSS

Figure 7-5

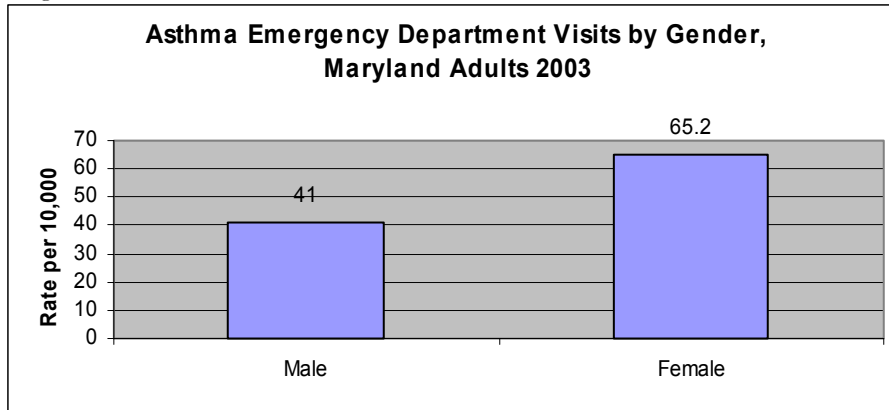


million, Figure 7-8). Therefore, much of the difference in emergency department visit and mortality rates by sex can be explained by the difference in prevalence. In contrast, women have a 2.1 times higher hospitalization rate (19.8 vs. 9.4 hospitalizations per 10,000, Figure 7-9), which cannot be explained solely by the increased prevalence of asthma among women. The above disparity ratios are summarized in Figure 7-10.

Continue —>

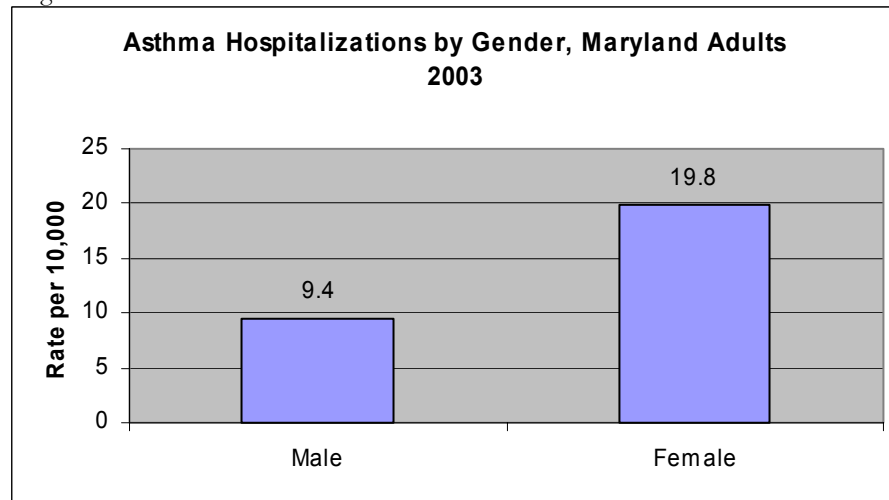
## Disparities and Asthma—Continued

Figure 7-7



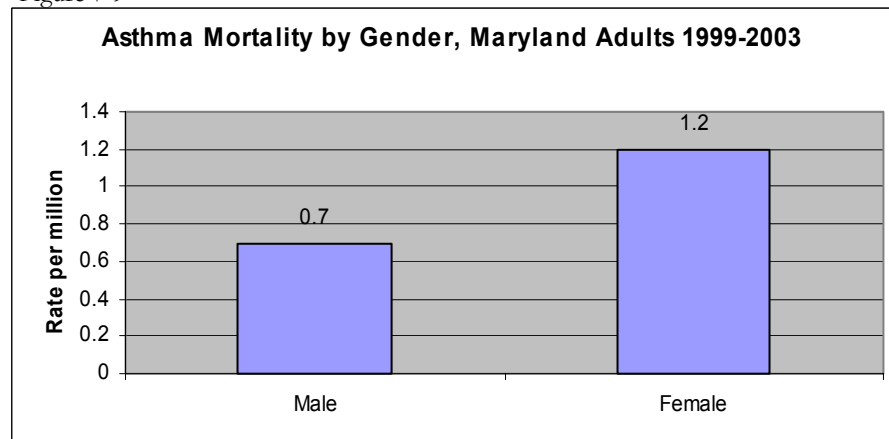
Data from HSCRC for adults  $\geq 18$  years.  
Data has been age adjusted to the 2000 U.S. estimated population

Figure 7-8



Data from HSCRC for adults  $\geq 18$  years.  
Data has been age adjusted to the 2000 U.S. estimated population

Figure 7-9



Data from Maryland Vital Statistics Administration for Maryland adults  $\geq 18$  years  
Age adjusted to 2000 U.S. estimated population

Continue —>

## Disparities and Asthma—Continued

Figure 7-10

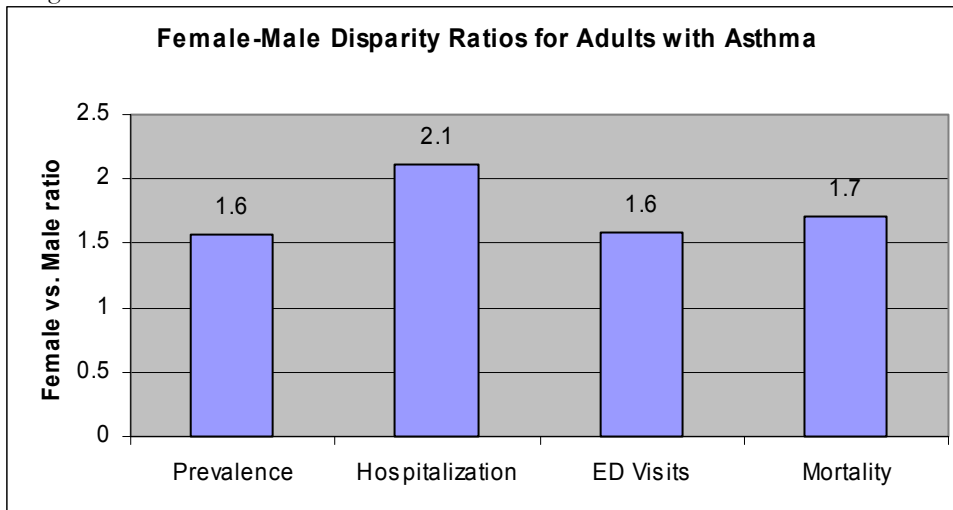


Photo Source: American Lung Association of Maryland

## Maryland Jurisdictions and Asthma

The burden of the prevalence, hospitalizations, emergency department visits, and deaths from asthma differs across the state. Baltimore City residents consistently have among the highest prevalence rates, emergency department visit rates, hospitalization rates, and death rates. While all Baltimore City rates are above the state average, other counties may have high rates in one category, but lower rates in others. This is because multiple factors such as differences in population risk, access to primary care, access to emergency care, and quality of care may affect emergency department visit, hospitalization, and death rates.

For prevalence data using the BRFSS, sample sizes for each jurisdiction are relatively small per year, but greater stability of the estimates is obtained when years are combined. As with the 2002 and 2003 Maryland Asthma Reports, three years of data, 2001-2003, have been combined in order to provide better estimates of prevalence. Because BRFSS prevalence data are estimates based on a sampling of the population, 95% confidence intervals have been provided to account for possible sampling error. For mortality rates, five years of jurisdiction-specific data have been combined, as the number of asthma deaths per year in each jurisdiction is small. Mortality data are presented for 1999-2003. Even when several years of data are combined, there may still be large changes in rates from last year's report for some small counties. Data may still be somewhat unstable because of the small number of deaths and the low number of BRFSS respondents in these smaller counties.

The numbers of hospitalizations and emergency department visits are much larger than those for prevalence and mortality. Therefore data are presented for 2003 only. In previous reports, hospitalization data for Maryland jurisdictions have been limited by incomplete information about Maryland residents hospitalized in nearby states and the District of Columbia. For this year's report, data were obtained from the District of Columbia, Virginia, West Virginia, Pennsylvania, and Delaware. More detailed data were obtained this year, allowing us to calculate age-adjusted hospitalization rates for each jurisdiction that includes hospitalizations in neighboring states. Because more complete data on asthma hospitalizations was available for this year's report, increases in hospitalization rates in some counties may reflect better ascertainment of data rather than true increases in hospitalization rates. Because data were not collected on emergency department visits of Maryland residents in neighboring states, emergency department visit rates may be underestimated, particularly for those jurisdictions that border other states.



Photo Source: Digital Vision Ltd.

Continue —>

## Maryland Jurisdictions and Asthma—Continued

**Table 8-1: Asthma Lifetime and Current Prevalence, 2001-2003, Three-year average.  
Emergency Department Visit and Hospitalization Rates, 2003.  
Average Mortality Rate 1999-2003. Data by Region and Jurisdiction**

Jurisdiction	Lifetime Prevalence 2001-2003 Weighted Percent (95% CI)	Current Prevalence 2001-2003 Weighted Percent (95% CI)	ED Visits 2003 Rate per 10,000	Hospitalizations 2003 Rate per 10,000	Mortality 1999-2003 Rate per 1,000,000
<b>NORTHWEST</b>			53.8**	17.9	13
Garrett	13.2 (+/- 6.6)	9.6 (+/- 5.8)	35**	13.3**	6.5**
Allegany	13.2 (+/- 4.2)	9.4 (+/- 3.6)	79.4	34.3**	9.3**
Washington	12.0 (+/- 3.0)	8.3 (+/- 2.5)	74.6	13.7**	16.7
Frederick	11.5 (+/- 2.5)	7.5 (+/- 2.1)	34.8**	14.8	13.3
<b>BALTIMORE METRO</b>			93.2**	21.0	18.2
Baltimore City	14 (+/- 2.7)	9.6 (+/- 2.2)	203.4**	42.4**	37.9**
Baltimore County	12.2 (+/- 2.0)	8.2 (+/- 1.7)	65.7	16.6	15.6
Anne Arundel	11.8 (+/- 2.4)	7.0 (+/- 1.9)	51.1**	13.7**	10**
Carroll	14.2 (+/- 4.6)	11.3 (+/- 4.2)	39.6**	12.0**	12.4**
Howard	9.5 (+/- 3.1)	4.8 (+/- 2.2)	58.2	9.0**	8.6**
Harford	12.3 (+/- 3.8)	8.2 (+/- 3.2)	51.1**	13.5**	7**
<b>NATIONAL CAPITOL</b>			49.3**	12.7**	14
Montgomery	10.6 (+/- 1.7)	6.6 (+/- 1.4)	38.7**	9.9**	11.4**
Prince George's	12.7 (+/- 2.2)	7.1 (+/- 1.7)	60.3	16.3	17.1
<b>SOUTHERN MD</b>			50.1**	17.3	20.2**
Calvert	12.3 (+/- 4.1)	8.0 (+/- 3.4)	56.3**	15.7	24.9**
Charles	13.2 (+/- 3.6)	8.8 (+/- 3.0)	45.1**	15.4	13.9
Saint Mary's	12.5 (+/- 4.1)	7.5 (+/- 3.2)	52.1**	21.7**	24.1**
<b>EASTERN SHORE</b>			61.8	20.1	10.4**
Cecil	11.4 (+/- 4.0)	6.2 (+/- 3.0)	39.8**	25.7**	11.8**
Kent	8.7 (+/- 7.3)	3.6 (+/- 4.8)	55**	23.3**	26.8**
Queen Anne's	11.7 (+/- 5.5)	8.0 (+/- 4.6)	37**	10.3**	8.8**
Caroline	13.4 (+/- 6.8)	9.8 (+/- 5.9)	65.2	26.4**	13.9
Talbot	9.0 (+/- 4.9)	6.7 (+/- 4.3)	79.8	26.8**	9**
Dorchester	7.7 (+/- 5.3)	6.8 (+/- 5.0)	90.1**	28.8**	15.5
Wicomico	12.5 (+/- 3.9)	8.7 (+/- 3.4)	92.6**	16.7	6.9**
Somerset	14.4 (+/- 9.0)	11.6 (+/- 8.3)	95.8**	24.2**	15.3
Worcester	12.1 (+/- 4.8)	8.6 (+/- 4.1)	71.2	11.6**	2.6**
<b>TOTAL</b>	12.3 (+/- 0.7)	7.8 (+/- 0.6)	71.3	17.9	15.8

Continue —>

**Table 8-2: Number of Residents with Lifetime History of Asthma and Current History of Asthma 2001-2003, Three-year Average. Total Number of Emergency Department Visits and Hospitalizations, 2003. Average Number of Deaths 1999-2003. Data by Region and Jurisdiction.**

Jurisdiction	Number of Residents Who Ever Had Asthma Ave. 2001-03	Number of Residents Who Currently Have Asthma Ave. 2001-03	Number of Emergency Department Visits 2003	Number of Hospitalizations 2003	Average Number of Deaths per Year 1999-2003
<b>NORTHWEST</b>			2357	798	5.8
Garrett	3190	2288	100	40	<1
Allegany	7631	5409	551	279	<1
Washington	13,297	9209	970	180	2.4
Frederick	17,276	11,236	736	299	2.4
<b>BALTIMORE METRO</b>			23629	5380	46.4
Baltimore City	67,274	46,318	12955	2699	24.2
Baltimore County	71,074	47,532	4801	1281	12.6
Anne Arundel	44,730	26,699	2555	682	4.6
Carroll	16,195	12,850	617	186	1.8
Howard	18,790	9,410	1546	232	1.8
Harford	19,739	13,115	1155	300	1.4
<b>NATIONAL CAPITOL</b>			8705	2207	22.2
Montgomery	74,368	46,270	3492	899	9.8
Prince George's	73,087	40,488	5213	1308	12.4
<b>SOUTHERN MD</b>			1537	487	4.8
Calvert	7098	4740	459	123	1.6
Charles	11,821	7883	597	178	1.4
Saint Mary's	8016	4774	481	186	1.8
<b>EASTERN SHORE</b>			2635	815	4.6
Cecil	6922	3733	359	228	1
Kent	1244	512	101	48	<1
Queen Anne's	3866	2644	150	45	<1
Caroline	3177	2331	193	79	<1
Talbot	2684	2013	239	82	<1
Dorchester	1755	1544	246	83	<1
Wicomico	8190	5673	793	141	<1
Somerset	1984	1590	231	55	<1
Worcester	4732	3349	323	54	<1
<b>TOTAL</b>	<b>488,139</b>	<b>311,605</b>	<b>38891*</b>	<b>9744*</b>	<b>83.8</b>

For the above two tables:

Lifetime and Current Prevalence from BRFSS. Percentages are weighted to the 2003 Maryland population.

Emergency Department and Hospitalization data from HSCRC

Mortality data from Maryland Vital Statistics Administration. Five year average provided because of small numbers of deaths per year

All rates are age adjusted to the 2000 U.S. estimated population

\*Total ED visits includes 28 persons with county of residence unknown

\*Total hospitalizations includes 4 persons with county of residence unknown

Hospitalization data includes Maryland residents hospitalized in D.C., West Virginia, Pennsylvania, and Virginia. Delaware data not included because age categories provided were not consistent with those needed for age adjustment

\*\*Rate significantly different from the State of Maryland rate ( $p < 0.05$ )

Continue —>

## Occupational Asthma

Occupational or work-related asthma is characterized by recurring episodes of swelling and narrowing of the small airways in response to triggers in a person's work environment. Cases of work-related asthma may include new-onset asthma caused by workplace exposure to allergens or irritants as well as work-aggravated asthma, in which existing asthma is exacerbated by workplace exposures. More than 350 different agents have been associated with work-related asthma. These agents include chemical dusts and vapors, animal or plant substances, and metals. Exposure to these agents occurs in a variety of work environments that include, but are not limited to, chemical manufacturing, health care and food services, farming, mining and construction (Petsonk, 2002).

Work-related asthma has become the most prevalent occupational respiratory disease in developed countries. Epidemiological studies suggest that 10% -25% of adult asthma is attributable to workplace exposures (Petsonk, 2002). However, the true incidence and prevalence of work-induced asthma remain uncertain, because work-related asthma is under-diagnosed, misdiagnosed and under-reported. Early recognition of work-related asthma is important for several reasons. First, the sooner the ill worker is removed from further exposure, the better the prognosis. In addition, early recognition can minimize the risk to other workers through institution of control measures, and thus decrease the public health burden of work-related asthma.

In order to better assess the prevalence, the most common causes, and the barriers to reporting work-related asthma in Maryland, a survey was developed by Dr. Sania Amr, a specialist in Occupational Medicine. The questionnaire was distributed, along with an occupational asthma fact sheet, to Maryland physicians (primary care and subspecialists) who care for adult patients. Physicians were asked to provide information about how often they see patients with asthma and how often they see patients with work-related asthma. They were also asked about the occupational settings and sources of exposure for their patients with work-related asthma. Lastly, physicians were asked about how they typically made the diagnosis of work-related asthma and whether they perceived any barriers to reporting occupational disease.

Six hundred twenty questionnaires were returned for a response rate of 13.8%. While 77% of respondents reported seeing patients with asthma, only 66% of those physicians (51% of all respondents) reported seeing patients with work-related asthma. The workplace settings identified most frequently as exposure sources were construction and chemical manufacturing (Table 9-1). Specific allergens/irritants and the frequency with which physicians identified them are listed in Table 9-2. Cleaning products and chemicals were identified most frequently. Physicians usually made the diagnosis of work-related asthma based on specific concerns raised by the patient. Few physicians diagnosed work-related asthma by pulmonary function testing, measurements of airway peak flow at work, or by taking a detailed occupational exposure history. Seventy

Table 9-1

Workplace settings	
Type	Frequency of Exposure Settings Identified by Respondents*
Construction	41%
Chemical manufacturing	31%
Technical sales and Administration	16%
Healthcare	15%

Table 9-2

Exposures	
Types	Frequency of Exposure Sources Identified by Respondents*
Cleaning Products	53%
Chemicals	46%
Smoke	37%
Indoor Air	36%
Wood dust	32%
Solvents	25%
Latex	21%
Paint	15%

\*Denominator is number of respondents who identified any setting or exposure source (N=319).

Continue —>

## Occupational Asthma—Continued

percent of respondents said they were reluctant to report because the diagnosis of work-related asthma was not definite.

While this survey was useful in identifying frequent sources of exposure in the state, it also helped to clarify necessary future steps for occupational asthma surveillance and prevention efforts. Because most (78%) physicians rely on concerns raised by patients as the basis for diagnosis of work-related asthma, this survey suggests that direct questioning of patients may be an equally valid method for determining prevalence. The 2006 Asthma Surveillance Report will therefore include such data, using the 2005 BRFSS occupational asthma module. In addition, the survey made clear the need for further education of the medical community about diagnosis and reporting of occupational asthma. The Maryland Asthma Control Program began this educational process with an occupational asthma summit in May 2005. The summit brought together experts in asthma and work-related illness to develop strategies for improved identification, reporting, management, and prevention of work-related asthma.



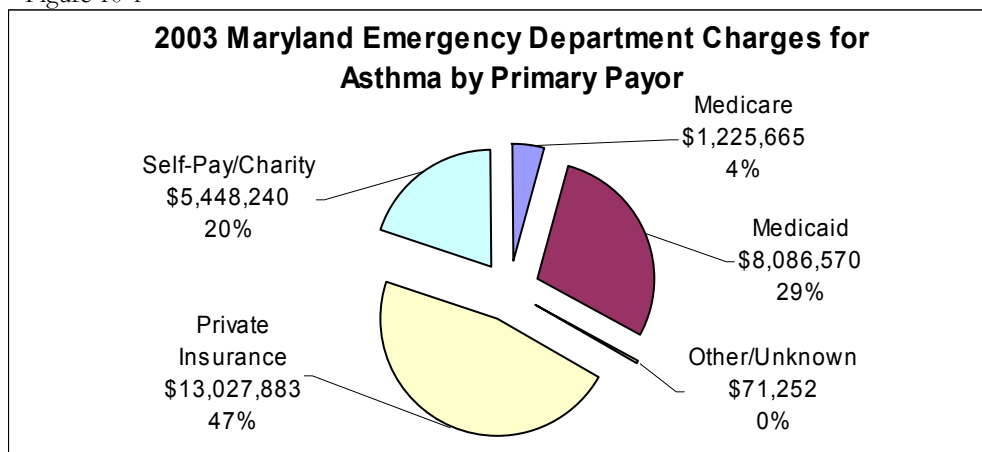


## Costs of Asthma

The financial burden of asthma in Maryland is substantial. Direct financial costs include hospitalization, emergency department and outpatient visits, as well as medication and durable medical equipment such as nebulizers, spacers, and peak flow meters.

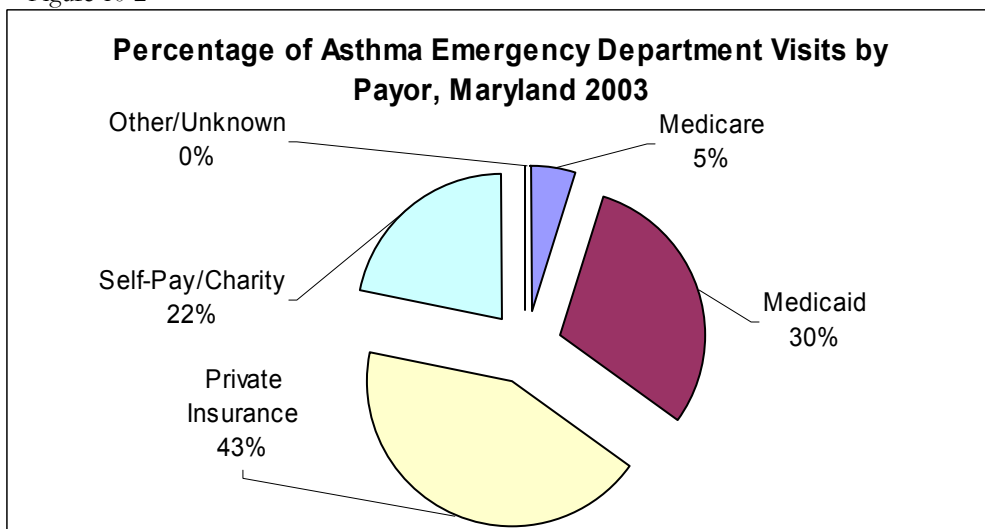
Direct financial costs of asthma hospitalization and emergency department visits can be estimated from total charges included in the HSCRC data. The average charge for an inpatient stay for asthma in 2003 was \$4532. The average charge for an emergency department visit for asthma was \$716. Total charges for asthma hospitalizations in 2003 were \$41,086,482. Emergency department visits accounted for an additional \$27,859,611. The proportion of emergency department visits and hospitalizations paid for by public sources has remained fairly stable over the past year. Likewise the percentage of visits and hospitalizations by persons with public insurance has also remained stable. Maryland residents with private insurance had higher charges per emergency department visit compared to those insured by Medicare or Medicaid. While 43% of asthma emergency department visits were for persons with private insurance, 47% of the charges were to private insurance (Figures 10-1 and 10-2). Hospitalizations paid for by Medicare or Medicaid incurred higher charges than those paid for by private insurance. While 54% of hospitalizations were for persons insured by Medicare or Medicaid, 59% of the total charges were to Medicare or Medicaid (Figures 10-3 and 10-4).

Figure 10-1



Data Source: HSCRC

Figure 10-2

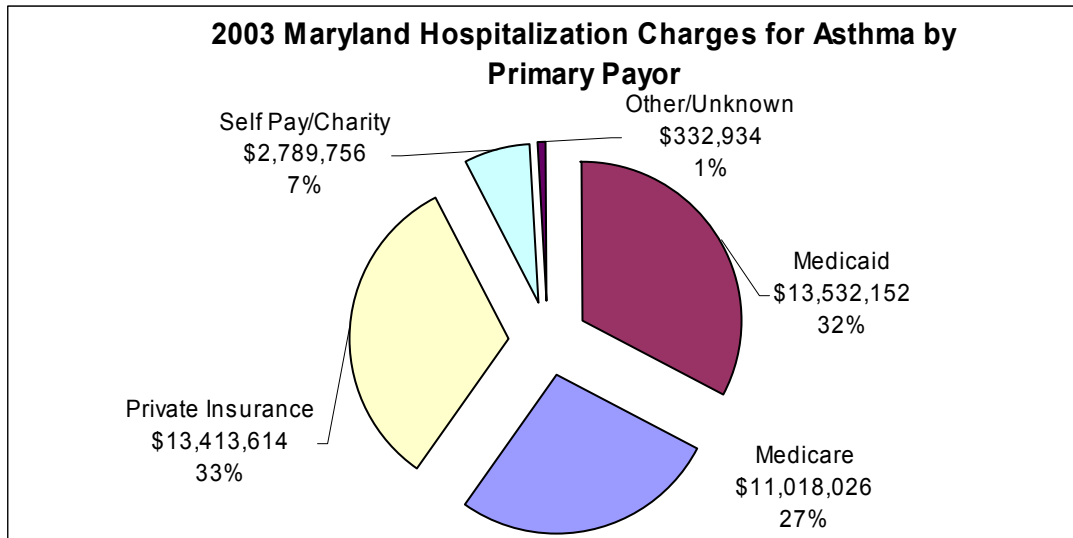


Data Source: HSCRC

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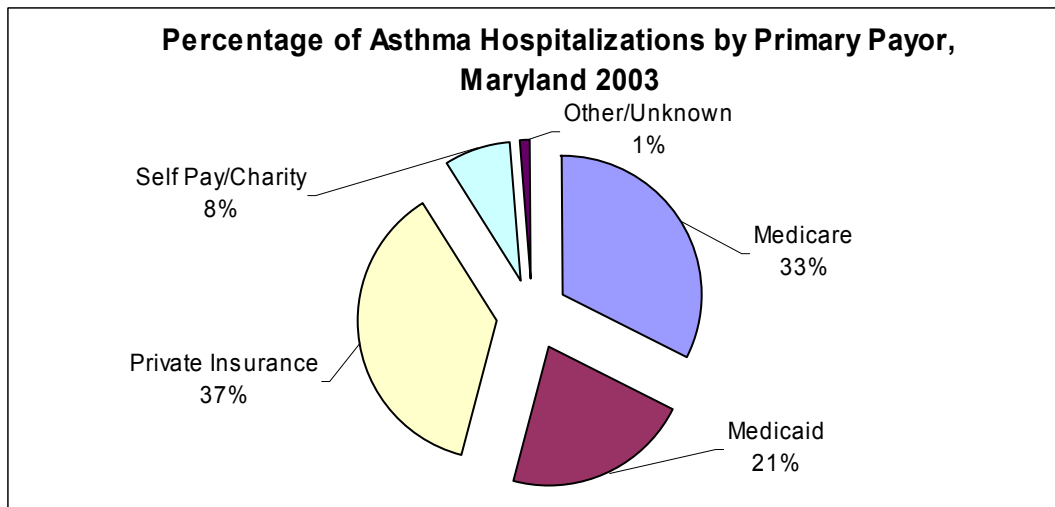
## Costs of Asthma—Continued

Figure 10-3



Data Source: HSCRC

Figure 10-4



Data Source: HSCRC

## Conclusions

This report confirms that asthma continues to be a major health problem in Maryland. An estimated 11.9% of Maryland adults and 11.1% of Maryland children have been diagnosed with asthma. An estimated 7.8% of adults and 8.6% of children in Maryland currently have asthma. While emergency department visits decreased slightly since 2002, the number of hospitalizations for asthma increased by 18% between 2002 and 2003. Asthma prevalence, hospitalization rates, emergency department visit rates, and mortality rates still remain well above the Healthy People 2010 goals. As indicated in the chapters on disparities and on Medicaid enrollees, asthma and its complications continue to disproportionately affect the very young, the elderly, African-Americans, low-income individuals, and individuals in certain jurisdictions, particularly Baltimore City. The monetary cost of asthma hospitalizations and emergency department visits is substantial and rising. Non-monetary costs such as lowered quality of life, disrupted sleep, and work absences are also significant. Additional tracking of asthma prevalence, morbidity and mortality is vital to improve understanding of individual and environmental factors that contribute. Information gleaned from analyzing the epidemiology of asthma is critical to planning, implementing, and evaluating activities aimed at reducing the personal and public health burden of asthma for Maryland residents. Because programs to reduce the burden of asthma take time to work, the effectiveness of asthma control programs, and reductions in the burden of asthma will be seen in the coming years and decades.



## Future Directions

The Maryland Asthma Control Program expects to produce ongoing asthma surveillance reports. We anticipate continued expansion of data included in our annual report. We have begun to assess the burden of occupational asthma in Maryland. These efforts will continue through the inclusion of the BRFSS Occupational Asthma Module to the 2005 BRFSS survey in Maryland. Additional data on asthma in children will also be obtained through the expanded BRFSS Childhood Asthma module to the 2004 BRFSS survey. The Maryland Asthma Control Program is in the process of developing a workgroup that will assess other sources of asthma data, and ensure consistency and clarity of data presentation. Finally, we will conduct an evaluation of our surveillance system in order to determine which components are effective, and which need improvement.

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## Appendix – 95% Confidence Intervals for BRFSS Data

Figure 1-1: Asthma Lifetime Prevalence for Adults, Maryland vs. United States, BRFSS 2001-2003

<b>Year</b>	<b>Maryland Prevalence (95% Confidence Interval)</b>	<b>U.S. Prevalence (95% CI)</b>
2001	11.1% (10% - 12.2%)	
2002	12.7% (11.5%-13.9%)	
2003	11.9% (10.7%-13.1%)	12% (11.8%-12.2%)

Figure 1-2: Asthma Current Prevalence for Adults, Maryland vs. United States, BRFSS 2001-2003

<b>Year</b>	<b>Maryland Prevalence (95% CI)</b>	<b>U.S. Prevalence (95% CI)</b>
2001	7.1% (6.2%-8.0%)	7.2% (7.1%-7.3%)
2002	8.2% (7.2%-9.2%)	7.5% (7.4%-7.6%)
2003	7.8% (6.8%-8.8%)	7.7% (7.6%7.8%)

Figure 1-3: Age at Initial Asthma Diagnosis for Adults, BRFSS 2003

<b>Age</b>	<b>Percent Diagnosed at that Age (95% CI)</b>
<10 years	33.9% (28.7%-39.1%)
11-17 years	19.1% (14.8%-23.4%)
18-34 years	21.0% (16.5%- 25.5%)
35-44 years	12.0% (8.4%-15.6%)
45-54 years	6.6% (3.9%-9.3%)
55-64 years	4.1% (1.9%-6.3%)
65+ years	3.3% (1.3%-5.3%)

Continue —>

## Appendix – 95% Confidence Intervals for BRFSS Data—Continued

Figure 1-4: Asthma Lifetime Prevalence by Race/Ethnicity,  
BRFSS Maryland Adults 2001-2003

<b>Race/Ethnicity</b>	<b>Prevalence (95% CI)</b>
White, Non-Hispanic	11.7% (10.9%-12.5%)
Black, Non-Hispanic	14.2% (12.4%-16.0%)
Hispanic	9.4% (5.9%-12.9%)
Other	10.1% (7.1%-13.1%)

Figure 1-5: Asthma Lifetime Prevalence by Gender,  
BRFSS Maryland Adults 2001-2003

<b>Gender</b>	<b>Prevalence (95% CI)</b>
Male	9.9% (8.9%-10.9%)
Female	14.0% (13.1%-14.9%)

Figure 1-6: Asthma Lifetime Prevalence by Age,  
BRFSS Maryland Adults 2001-2003

<b>Age</b>	<b>Prevalence (95% CI)</b>
19-24 years	18.3% (15.2%-21.4%)
25-34 years	13.6% (11.8%-15.4%)
35-44 years	10.4% (9.1%-11.7%)
45-54 years	11.2% (9.7%-12.7%)
55-64 years	11.3% (9.6%-13.0%)
65-74 years	10.2% (8.2%-12.2%)
75+ years	8.7% (6.5%-10.9%)

Figure 1-7: Asthma Lifetime Prevalence by Education,  
BRFSS Maryland Adults 2001-2003

<b>Education Level</b>	<b>Prevalence (95% CI)</b>
Less than High School Graduate	15.6% (12.8%-18.4%)
High School Graduate/GED	12.4% (11.1%-13.7%)
Some College/Technical School	13.1% (11.7%-14.5%)
College Graduate	10.4% (9.4%-11.4%)

Continue —>

## Appendix – 95% Confidence Intervals for BRFSS Data—Continued

Figure 1-8: Asthma Lifetime Prevalence by Income, BRFSS Maryland 2001-2003

Income	Prevalence (95% CI)
<\$15,000	14.9% (11.8%-18.0%)
\$15,000-\$24,999	15.2% (13.0%-17.4%)
\$25,000-\$49,999	11.8% (10.5%-13.1%)
\$50,000-\$74,999	10.5% (9.0%-12.0%)
>=\$75,000	11.1% (9.9%-12.3%)

Figure 1-9: Asthma Prevalence Among Maryland Adult Smokers, BRFSS 2001-2003

Smoking Category	% With Current Asthma (95% CI)	% With Past Asthma (95% CI)	% Never Had Asthma (95% CI)
Current Smoker-Daily	87.8% (86.1%-89.5%)	4.2% (3.1%-5.3%)	8.0% (6.6%-9.4%)
Current Smoker-Some	87.7% (84.5%-90.9%)	2.8% (1.2%-4.4%)	9.4% (6.6%-12.2%)
Former Smoker	88.1% (86.8%-89.4%)	4.1% (3.3%-4.9%)	7.7% (6.6%-8.8%)
Never Smoked	88.5% (87.6%-89.4%)	4.1% (3.5%-4.9%)	7.4% (6.7%-8.1%)

Figure 1-10: Smoking Prevalence Among Maryland Adult Asthmatics, BRFSS 2001-2003

Asthma Status	% Current Smokers	% Former Smokers	% Never Smoked
Current Asthma	53% (49.3%-56.7%)	24.1% (20.9%-27.3%)	22.9% (19.8%-26.0%)
Past Asthma	55.3% (50.0%-60.6%)	24.7% (20.1%-29.3%)	20.1% (15.5%-24.7%)
Never Had Asthma	55.1% (54.0%-56.2%)	24.0% (23.0%-25.0%)	20.9% (20.0%-21.8%)

Continue —>



## Appendix – 95% Confidence Intervals for BRFSS Data—Continued

Figure 2-1: Frequency of Asthma Symptoms in the Past Month, Maryland Adults With Asthma, BRFSS 2003

Frequency of Symptoms	Percent of Respondents (95% CI)
Less than once a week	21.8% (16.1%-27.5%)
1-2 times per week	15.5% (10.5%-20.5%)
2+ times per week, not every day	7.3% (3.8%-10.8%)
Every day, not all the time	14.1% (9.4%-18.8%)
Every day, all the time	4.8% (1.8%-7.8%)
Not at any time	36.4% (29.8%-43.0%)

Figure 2-2: Number of Nights with Asthma-related Sleeping Difficulty in the Past Month, Maryland Adults with Asthma

Number of Nights	Percent of Respondents (95% CI)
1-2	22.8% (17.0%-28.6%)
3-4	8.6% (4.7%-12.5%)
5	2.4% (0.5%-4.3%)
6-10	3.6% (0.9%-6.3%)
>10	7.6% (3.9%-11.3%)
None	55.0% (48.2%-61.8%)

Figure 2-3: Frequency of Prescribed Asthma Medication Use in the Past Month For Maryland Adults with Asthma

Frequency of Medication Use	Percent of Respondents (95% CI)
< One time per week	13.2% (8.6%-17.8%)
1-2 times per week	8.7% (4.8%-12.6%)
2 times per week, not every day	4.5% (1.5%-7.5%)
One time per day	16.0% (11.0%-21.0%)
>= 2 times per day	20.5% (14.9%-26.1%)
None	37.1% (30.5%-43.7%)

Continue —>

## Appendix – 95% Confidence Intervals for BRFSS Data—Continued

Figure 2-4: Number of Days Asthma Interfered with Work or Usual Activities In the Past Year, Maryland Adults with Asthma

Number of Days	Percent of Respondents (95% CI)
1-2	6.9% (3.5%-10.3%)
3-7	10.1% (6.0%-14.2%)
8-29	5.0% (2.1%-7.9%)
>=30	11.6% (7.2%-16.0%)
None	66.4% (60.0%-72.8%)

Figure 2-5: Health Status of Persons who Currently Have Asthma vs. Persons Who Do Not, 2001-2003

Health Status	Percent With Asthma (95% CI)	Percent Without Asthma (95% CI)
Excellent/Very Good	42.9% (39.2%-46.6%)	61.3% (60.2%-62.4%)
Fair/Poor	25.7% (22.4%-29.0%)	11.6% (10.9%-12.3%)

Figure 2-6: Number of Routine Asthma Check-Ups in Past Year for Maryland Adults with Asthma

Number of Check-Ups	Percent of Respondents (95% CI)
One	31.5% (25.2%-37.8%)
Two	9.0% (5.2%-12.8%)
Three or More	15.2% (10.4%-20.0%)
None	44.3% (37.6%-51.0%)

Figure 2-7: Number of Doctor Visits In the Past Year for Urgent or Worsening Asthma Symptoms, Maryland Adults with Asthma

Number of Doctor Visits	Percent of Respondents (95% CI)
One	10.8% (6.6%-15.0%)
Two or More	17.3% (12.3%-22.3%)
None	71.9% (65.9%-77.9%)

Continue —>

## Appendix – 95% Confidence Intervals for BRFSS Data—Continued

Figure 2-8: Number of Emergency Department Visits in the Past Year for Maryland Adults with Asthma

<b>Number of Emergency Department Visits</b>	<b>Percent of Respondents (95% CI)</b>
One	11.1% (6.9%-15.3%)
Two	2.2% (0.3%-4.1%)
Three or More	5.6% (2.4%-8.8%)
None	81.1% (75.8%-86.4%)



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