

Georgia Asthma



Surveillance Report 2007



Acknowledgments

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Highlights

In Georgia,

- More than 100,000 (10%) children ages 0-10 have asthma.
- Approximately 56,000 (15%) middle school students have asthma.
- Approximately 70,000 (16%) high school students have asthma
- Approximately 480,000 (7%) adults have asthma.
- There are more than 47,000 emergency room (ER) visits per year with asthma as the primary diagnosis, and ER charges are approximately \$35 million.
- There are more than 11,000 hospitalizations per year with asthma as the primary diagnosis, and hospital charges total more than \$107 million.
- Approximately 117 persons die every year from asthma.
- Blacks are more likely than Whites and women are more likely than men to visit the ER, be hospitalized or die because of asthma.
- Despite the fact that cigarette smoking may trigger asthma attacks, approximately 4,500 (8%) middle school students 14,000 (20%) high school students, and one in four (25%) adults with asthma smoke cigarettes.
- More than 30% of children ages 0-10, two-thirds of middle school students and three-fourths of high school students are exposed to secondhand smoke regardless of their asthma status.
- Appropriate disease management can reduce the burden of asthma, including avoidance of triggers, proper treatment regime, following an asthma management plan created by you and your doctor, and knowing when to seek medical help.

Asthma is a chronic inflammatory disorder of the lungs and airways that can include recurrent episodes of wheezing, coughing, shortness of breath, and chest pain or tightness. The cause or causes of asthma are not well understood and likely differ among individuals. Heredity, behaviors such as smoking and environmental exposures, and viral infections all play a role. Once a person has asthma a variety of things can trigger an attack such as allergens (e.g. pollen, dust mites, animal dander etc.), infections, exercise, changes in the weather, and exposure to airway irritants (e.g. tobacco smoke, secondhand smoke, industrial chemicals, etc.) Being obese may also be a risk factor for asthma attacks. Asthma attacks differ in severity for each individual and can be life-threatening. With appropriate clinical management including a written management plan, comprehensive pharmacologic therapy, and avoidance of allergens and other triggers asthma can be controlled, people with asthma in Georgia can lead normal lives.

According to a 2005 report from the National Center for Health Statistics, an estimated 33 million Americans have been diagnosed with asthma at some point in their life and nearly 22 million currently have asthma.¹ In 2004, asthma was responsible for 2 million emergency room (ER) visits, 500,000 hospitalizations, and nearly 5,000 deaths nationwide.^{1,2} Georgia accounts for approximately 47,000 ER visits, 11,000 hospitalizations, and 117 deaths.^{2,3} The economic burden of asthma annually (direct and indirect) totaled more than \$16 billion nationwide.⁴ Asthma affects people of all ages, sexes, races, and ethnic groups, but certain subpopulations are disproportionately affected. Blacks and females are more likely to visit the ER, be hospitalized, and die from asthma than Whites and males.^{5,6} Children are also disproportionately affected. This disparity is seen mostly in health care utilization, with ER visit rates and hospitalization rates for children 2 to 3 times higher than for adults.^{5,6}

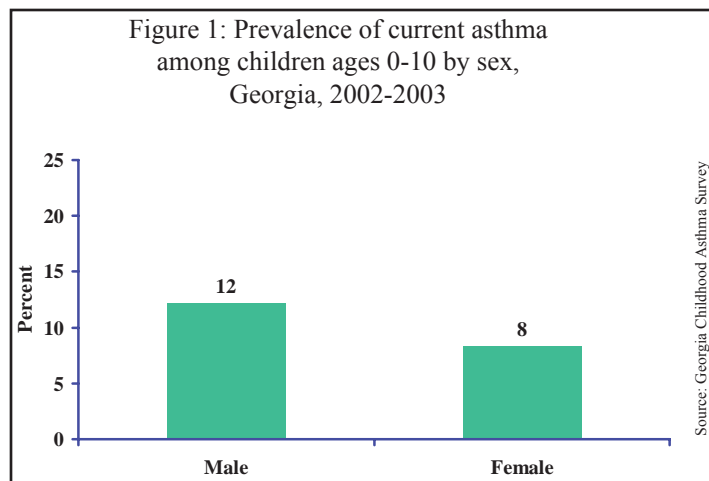
In 2000, the Georgia Department of Human Resource (DHR) and the American Lung Association (ALA) of Georgia jointly produced the first Georgia asthma report, which provided insight into the problem of asthma. Findings highlighted the need for a statewide systematic approach to address the problem of asthma in Georgia.⁷ In 2001, the Centers for Disease Control and Prevention (CDC) awarded a grant to DHR to create and implement a statewide plan to address asthma in Georgia. Surveillance was considered a key component to guide the program in its efforts, and the 2003 Burden of Asthma in Georgia report was developed.⁸ This report focused on prevalence and risk factors for middle and high school students and adults, morbidity, and mortality. The 2003 report further confirmed that asthma was a major public health problem in Georgia.

The 2007 Georgia Asthma Surveillance Report presents data on asthma prevalence and risk factors for asthma, work-related asthma prevalence, healthcare utilization, deaths, asthma severity, and management practices for all age groups. This report is the third and most comprehensive report available to describe the burden of asthma in Georgia. The purpose of this report is to increase awareness of the burden of asthma on Georgia and to guide public health programs, policy makers, and healthcare providers in the planning, implementation, and evaluation of interventions and programs to reduce the burden of asthma in Georgia.

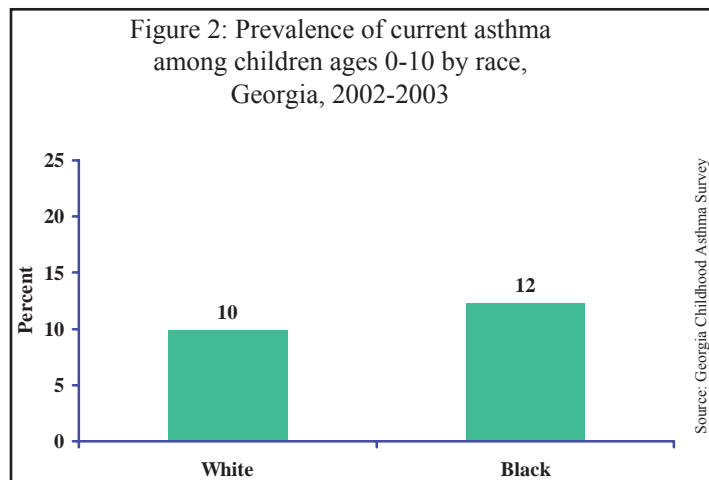
Prevalence of Asthma in Georgia

Prevalence of Asthma among Children Ages 0-10

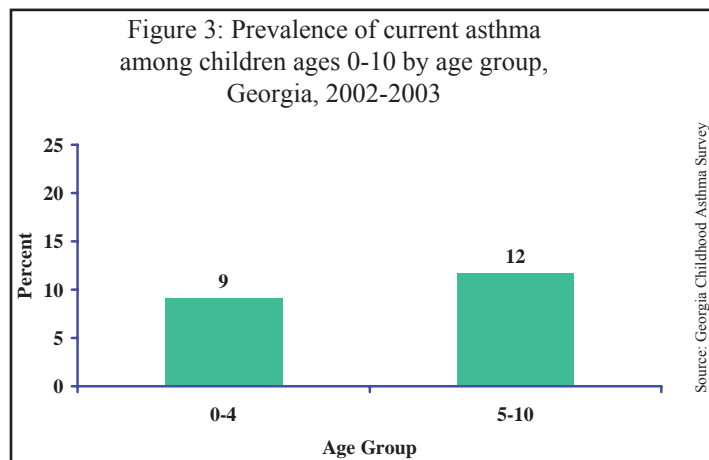
An estimated 137,000 (10%) of children ages 0-10 in Georgia have asthma. Asthma is more common among boys (12%) than girls (8%) (Figure 1).

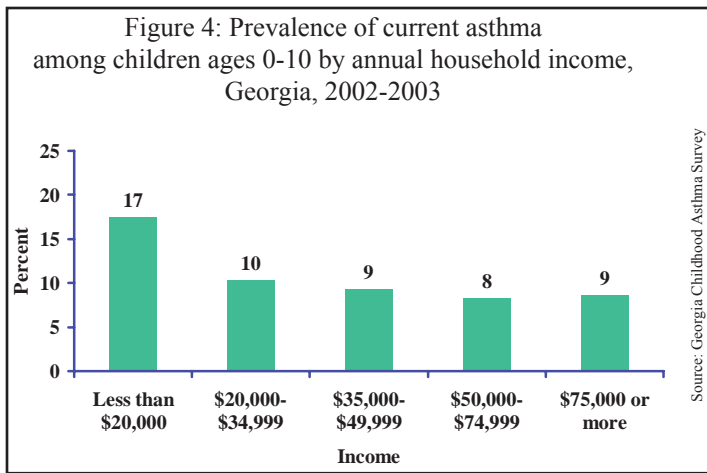


The prevalence of asthma is similar among Black children (12%) and White children (10%) (Figure 2).

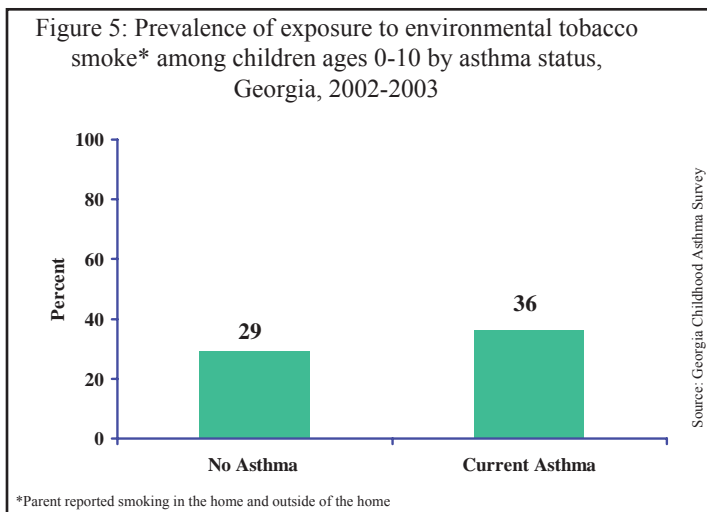


The prevalence of asthma is 9% among those aged 0 to 4 years and 12% among those 5 to 10 years (Figure 3).





Asthma prevalence is higher in children living in households with an annual household income of less than \$20,000 (17%) than in children living in households with higher household income (Figure 4).

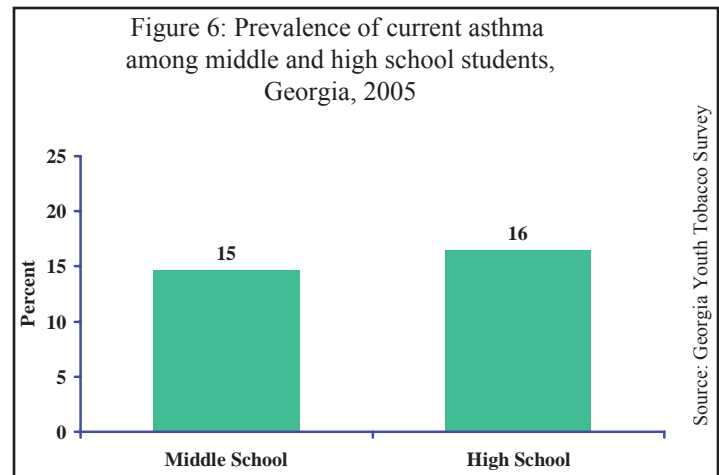


Risk Factors for Asthma Attacks among Children Ages 0-10

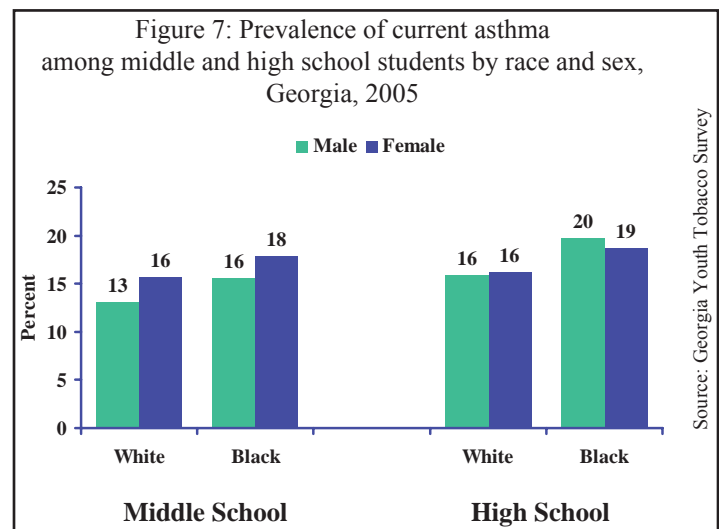
Avoiding tobacco smoke is one way to reduce the frequency of asthma attacks. Tobacco smoke is known to be a trigger for many people with asthma. More than a third (36%) of children with asthma live in a household where at least one parent smokes inside and outside of the home; a significantly lower percent of children without asthma (29%) have this exposure (Figure 5).

Prevalence of Asthma among Middle and High School Students

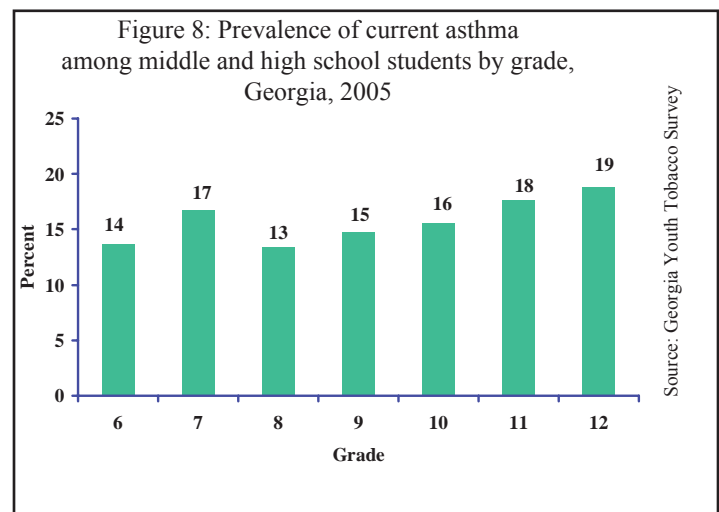
Approximately 56,000 (15%) middle school students and approximately 70,000 (16%) high school students report they currently have asthma (Figure 6).



There are no significant differences in the prevalence of asthma among the four major race/sex groups in Georgia (Figure 7).

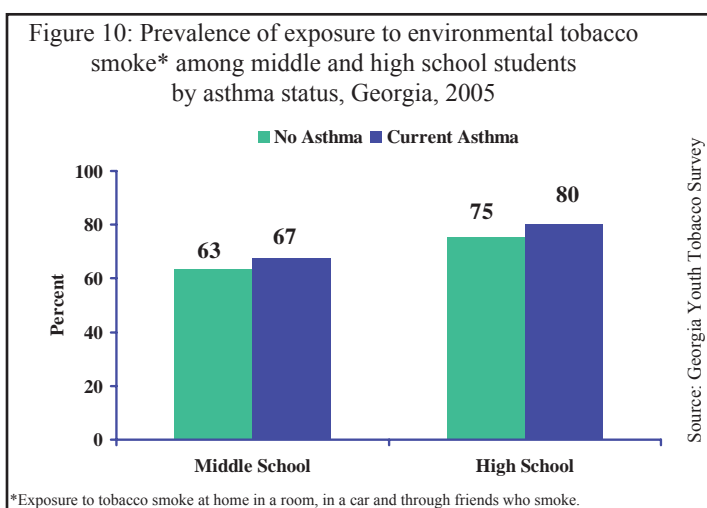
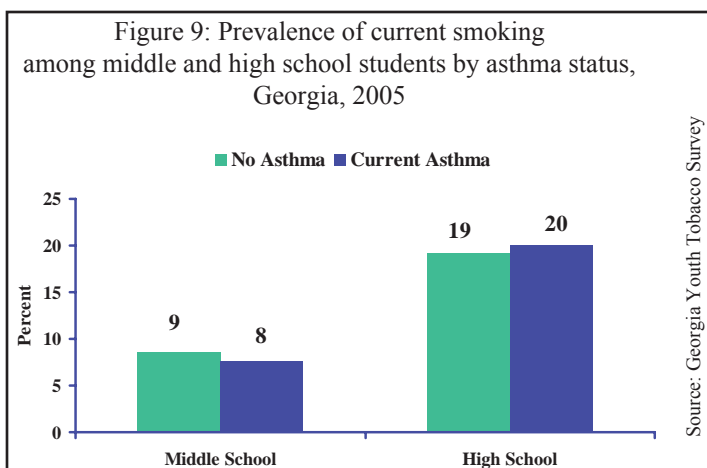


Asthma prevalence by grade level ranges from 13% to 19% (Figure 8).

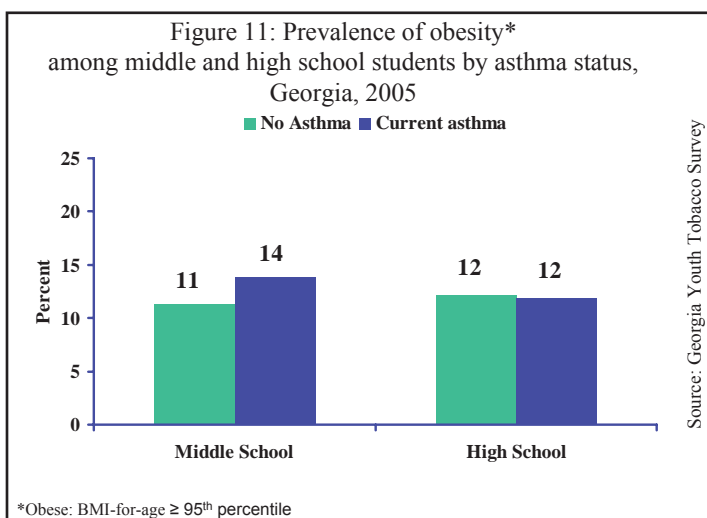


Risk Factors for Asthma Attacks among Middle and High School Students

Despite the fact that smoking may trigger asthma attacks, middle and high school students with asthma in Georgia are just as likely to smoke as students without asthma (Figure 9).



Exposure to environmental tobacco smoke (ETS) also may trigger an asthma attack or may increase the severity of an asthma attack. Approximately two-thirds of middle school students and three-fourths of high school students are exposed to ETS regardless of their asthma status (Figure 10).



In middle school, the prevalence of students who are obese (BMI-for-age \geq 95th percentile) is higher among students with asthma (14%) than among students without asthma (11%). There are no significant differences in the prevalence of obesity among high school students with or without asthma (Figure 11). Although the nature of the relationship between asthma and body weight requires more research, some evidence suggests that people with asthma who are obese experience more symptoms than people with asthma who are not obese.⁹⁻¹¹ Therefore, people with asthma have yet another reason to maintain proper body weight.

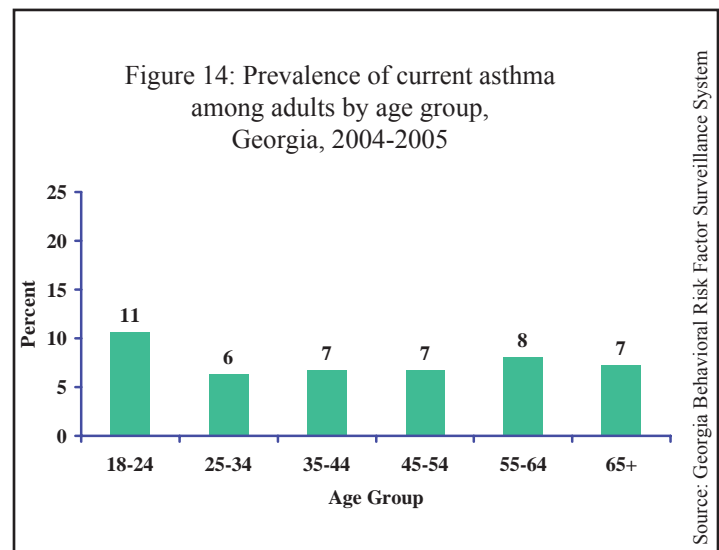
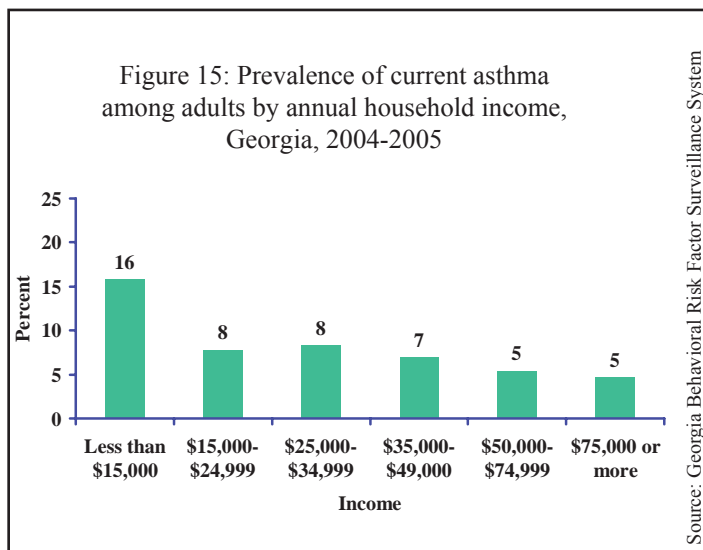
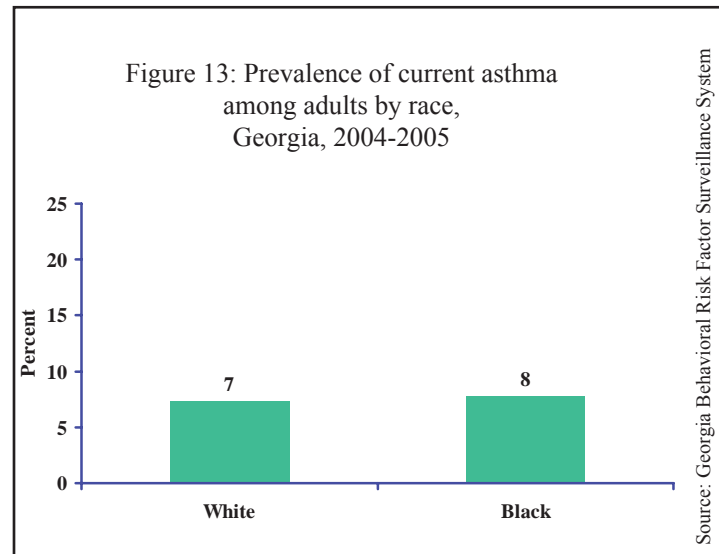
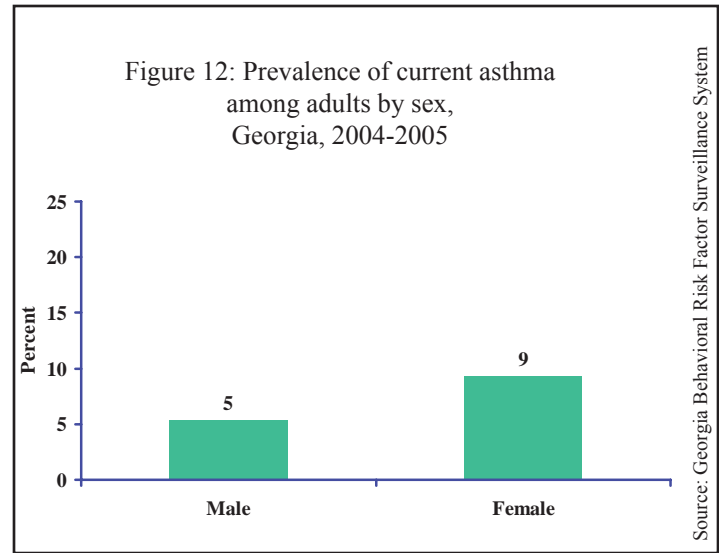
Prevalence of Asthma among Adults

Approximately 480,000 (7%) adults in Georgia have asthma. The prevalence of asthma among females (9%) is significantly higher than among males (5%) (Figure 12). The prevalence among Blacks (8%) is similar to Whites (7%) (Figure 13). The prevalence of asthma by age group in adults ranges from 6% to 11% (Figure 14).

The prevalence of asthma is significantly higher in adults with annual household incomes less than \$15,000 than in adults with household incomes more than \$15,000 (Figure 15). Reasons for these differences are unknown but may be related to environmental exposures more common in low socioeconomic populations.

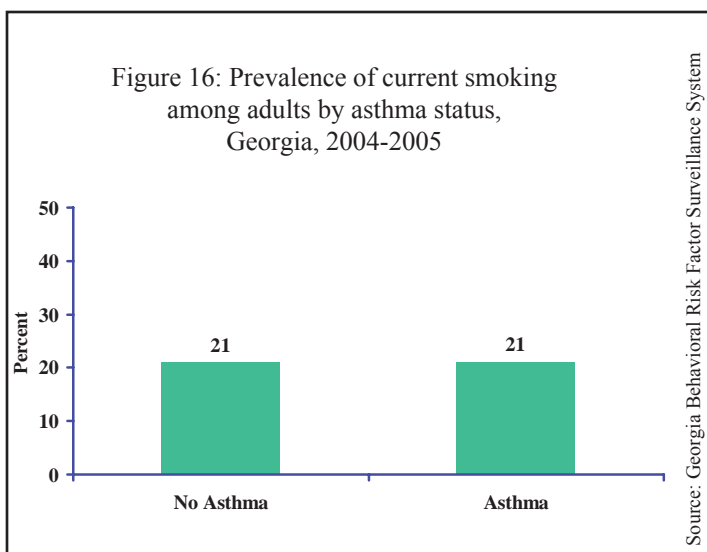
Prevalence of Asthma among Adults by Public Health District

Current asthma prevalence among adult Georgians in the 18 Public Health Districts ranges from 5% to 9% in 2004-2005 (Appendix I, Table 1). There are no significant differences among the Public Health Districts when compared to each other or to the state.

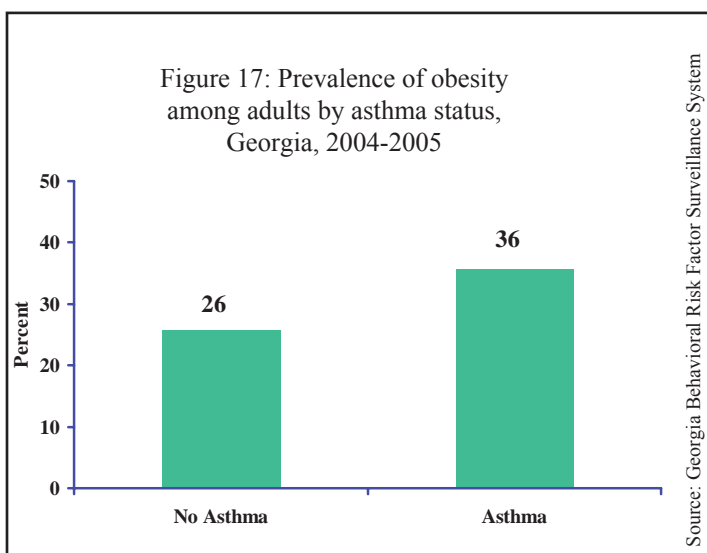


Risk Factors and Preventive Behaviors for Asthma Attacks among Adults

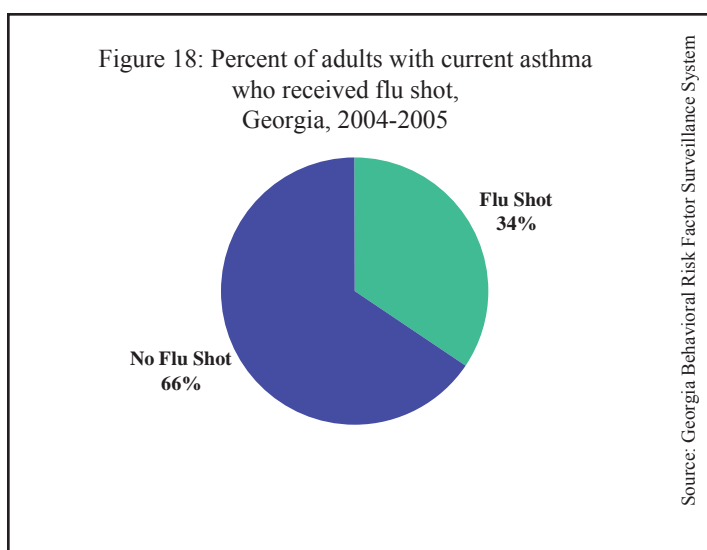
There are many conditions and risk factors that can affect adults with asthma. Despite the fact that smoking may trigger asthma attacks, 21% of adults who currently have asthma report cigarette smoking (Figure 16).



Thirty-six percent of adults with asthma are currently obese (Figure 17). This is a significantly higher prevalence than that for people without asthma (26%).

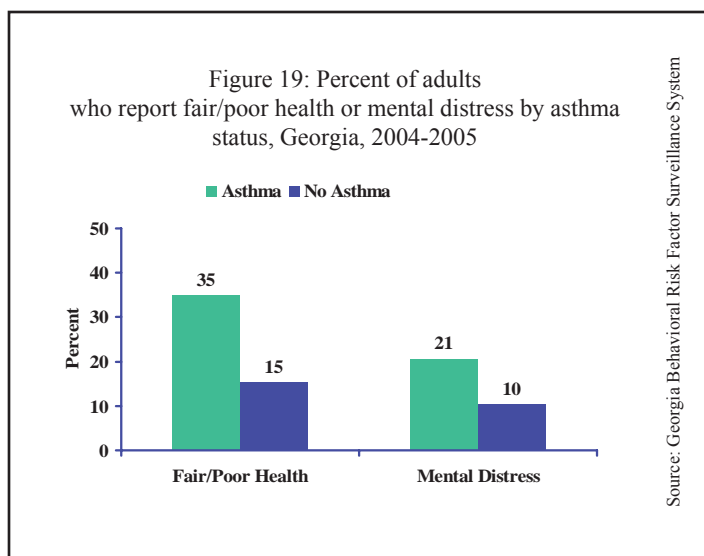


Influenza is associated with substantial adverse effects especially among people who have asthma, including time lost from work or school, costly ER visits and hospitalization.^{12, 13} Vaccination reduces morbidity in patients with asthma and immunization is recommended for all such patients.^{12, 13} Only one-third (34%) of the adults with asthma in Georgia reported receiving a flu shot in the past year (Figure 18).

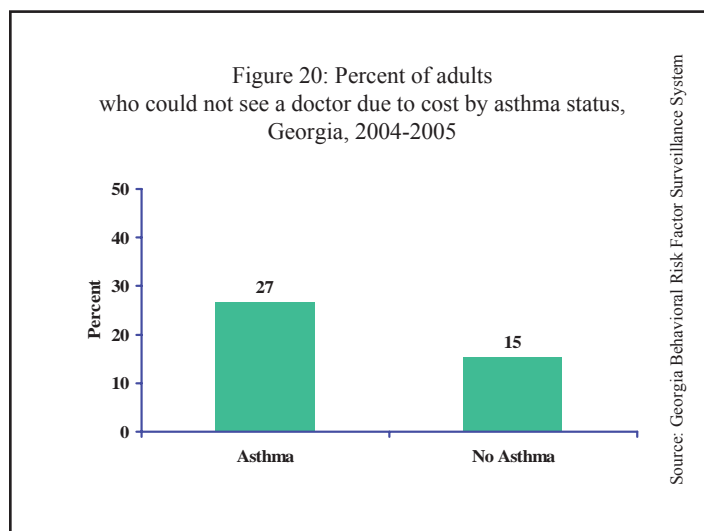


Health Status

Asthma has a considerable effect on how adult Georgians perceive their health status. Persons with asthma (35%) are more likely to report fair or poor health than those who do not have asthma (15%). Adults with asthma (21%) are also more likely to report mental distress than adults without asthma (10%) (Figure 19).

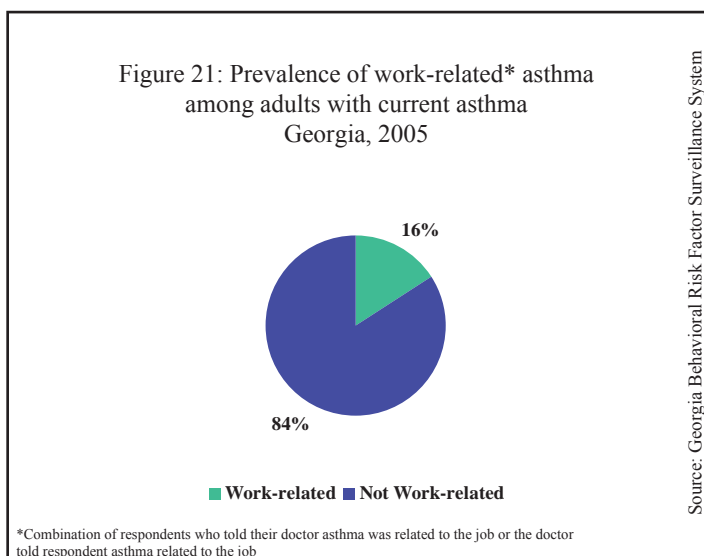


Adults with asthma (27%) are significantly more likely to report being unable to see a doctor due to cost than those without asthma (15%) (Figure 20).



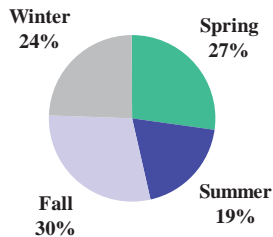
Work-related Asthma Prevalence

Work-related asthma is the most prevalent occupational respiratory lung disorder in the United States.^{14,15} It is estimated that 15% of asthma cases in the United States are due to exposure to allergens or irritants in the workplace.^{14,15} Not much data is available in Georgia on work-related asthma because it is not a reportable condition, but according to the Georgia Behavioral Risk Factor Surveillance System (BRFSS), 16% of adults with current asthma stated that their doctor told them their asthma was work-related or they told their doctor their asthma was work-related (Figure 21). Work-related asthma is a key target group because adults spend the majority of their day at work. Interventions should be developed to improve ventilation or elimination of triggers within the workplace that can increase the frequency and severity of asthma exacerbations or attacks.



Asthma Morbidity in Georgia

Figure 22: Asthma ER visits by season, Georgia, 2004

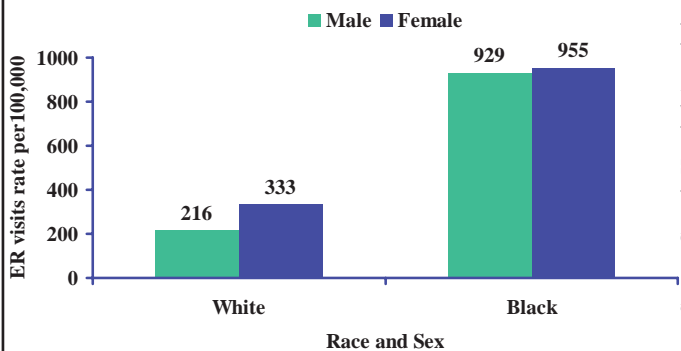


Source: Georgia Hospital Association

Asthma Emergency Room (ER) Visits in Georgia

There were approximately 47,000 ER visits in 2004 in Georgia with asthma as the primary diagnosis. The overall rate of ER visits due to asthma was 510 per 100,000 population. Asthma ER charges were approximately \$35 million. There are fewer ER visits during the summer than in any other season of the year (Figure 22).

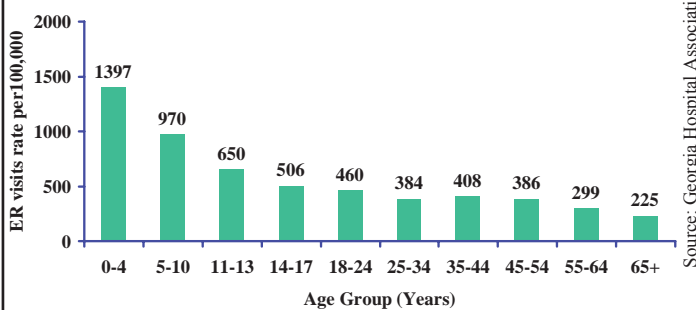
Figure 23: Age-adjusted asthma ER visit rates by race and sex, Georgia, 2004



Source: Georgia Hospital Association

Blacks are 3 times more likely to visit the ER with asthma than Whites (947 vs. 273 per 100,000 population). Females are 1.2 times more likely to visit the ER than males (516 vs. 417 per 100,000 population). Black females have the highest ER visit rate (955 per 100,000 population) among the four major race-sex groups in Georgia (Figure 23). Black females are 3 times more likely to visit the ER than White females. Black males are 4 times more likely to visit the ER than White males (Figure 23).

Figure 24: Age-specific asthma ER visit rates by age group, Georgia, 2004



Source: Georgia Hospital Association

Children aged 0-4 have the highest ER visit rate, 1,397 per 100,000 population. A possible contributing factor is that asthma is often misdiagnosed and confused with other upper respiratory diseases in this age group (Figure 24).

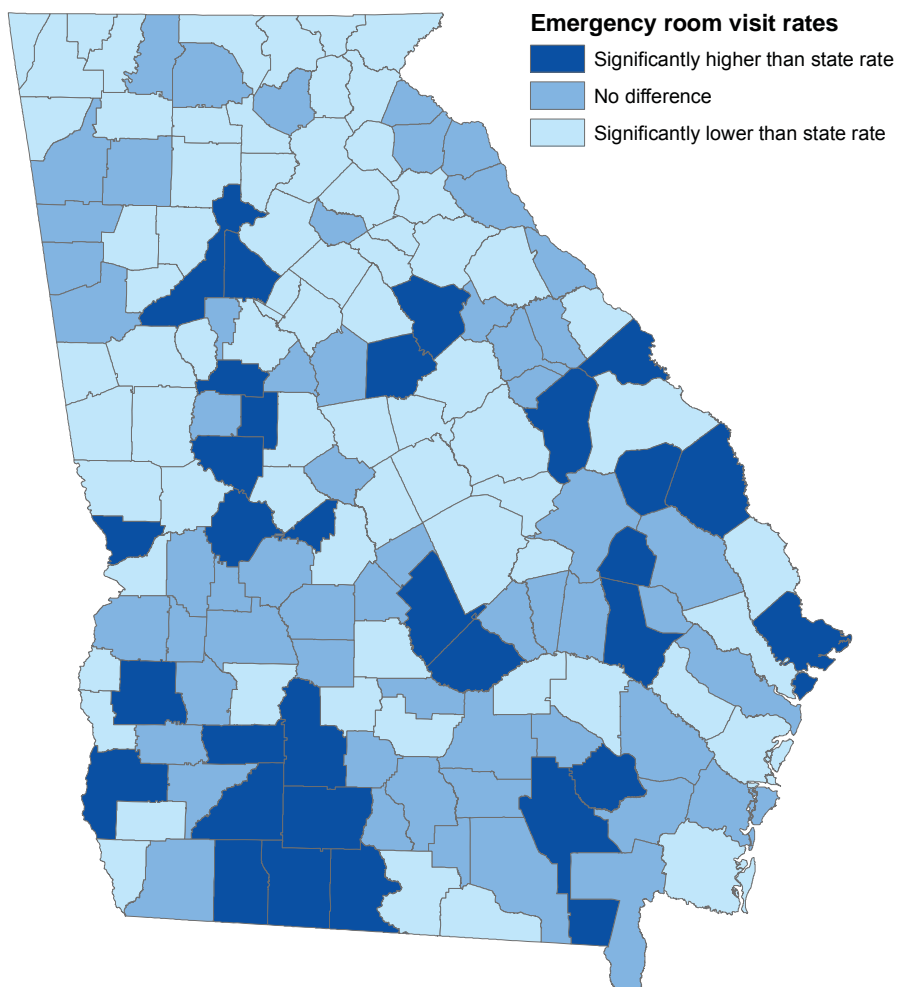
Asthma ER Visits by County

Thirty of Georgia's 159 counties had significantly higher ER visit rates than the state rate (510 ER visits per 100,000 per year) in 2004 (Appendix I, Table 2). Counties with high rates are located throughout Georgia, but high rates are more common in the southwest corner of the state (Figure 25).

Asthma ER Visits by District

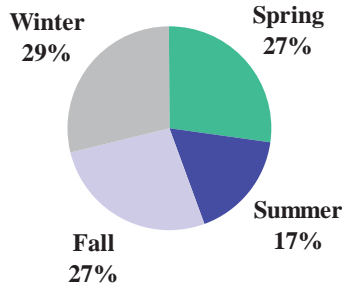
Six of Georgia's 18 Public Health Districts had significantly higher ER visit rates than the state rate in 2004 (Appendix I, Table 3).

Figure 25: Age-adjusted emergency room visit rates for asthma by county, Georgia, 2004



Source: Georgia Hospital Association

Figure 26: Asthma hospitalizations by season, Georgia, 2004

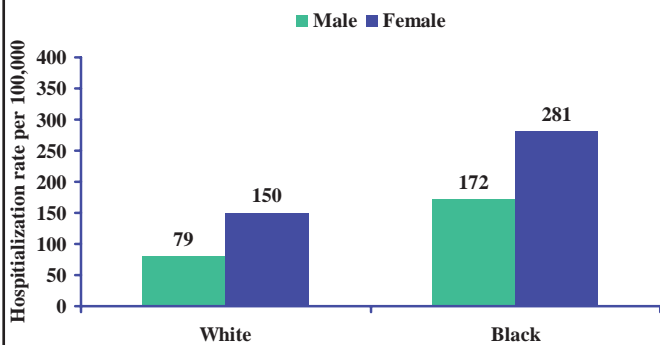


Source: Georgia Hospital Association

Hospitalizations from Asthma in Georgia

During 2004, there were more than 11,000 hospitalizations (133 per 100,000 population) in Georgia with asthma as the primary diagnosis. Hospital charges total more than \$107 million dollars annually. Hospitalization rates in Georgia are 66 times higher than death rates. There are fewer hospitalizations in the summer than in any other season of the year (Figure 26).

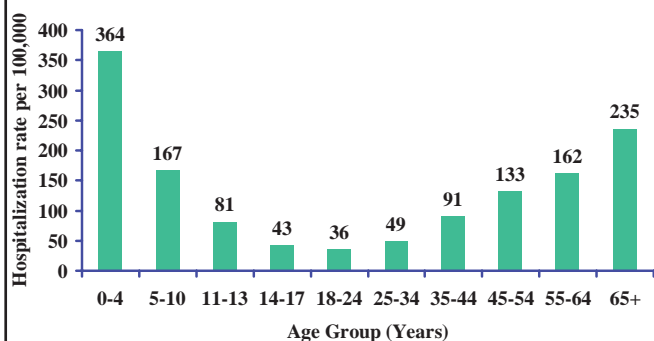
Figure 27: Age-adjusted asthma hospitalization rates by race and sex, Georgia, 2004



Source: Georgia Hospital Association

Blacks are twice as likely to be hospitalized as Whites (237 vs. 118 per 100,000 population). Females are almost 2 times more likely to be hospitalized than males (185 vs. 104 per 100,000 population). Black females have the highest hospitalization rate (281 per 100,000 population) among the four major race-sex groups in Georgia (Figure 27).

Figure 28: Age-specific asthma hospitalization rates by age group, Georgia, 2004



Source: Georgia Hospital Association

Hospitalization rates are the highest among the young and elderly (Figure 28). Rates are 2 to 4 times higher for the 0 to 4 years old and the 65+ age group than other age groups.

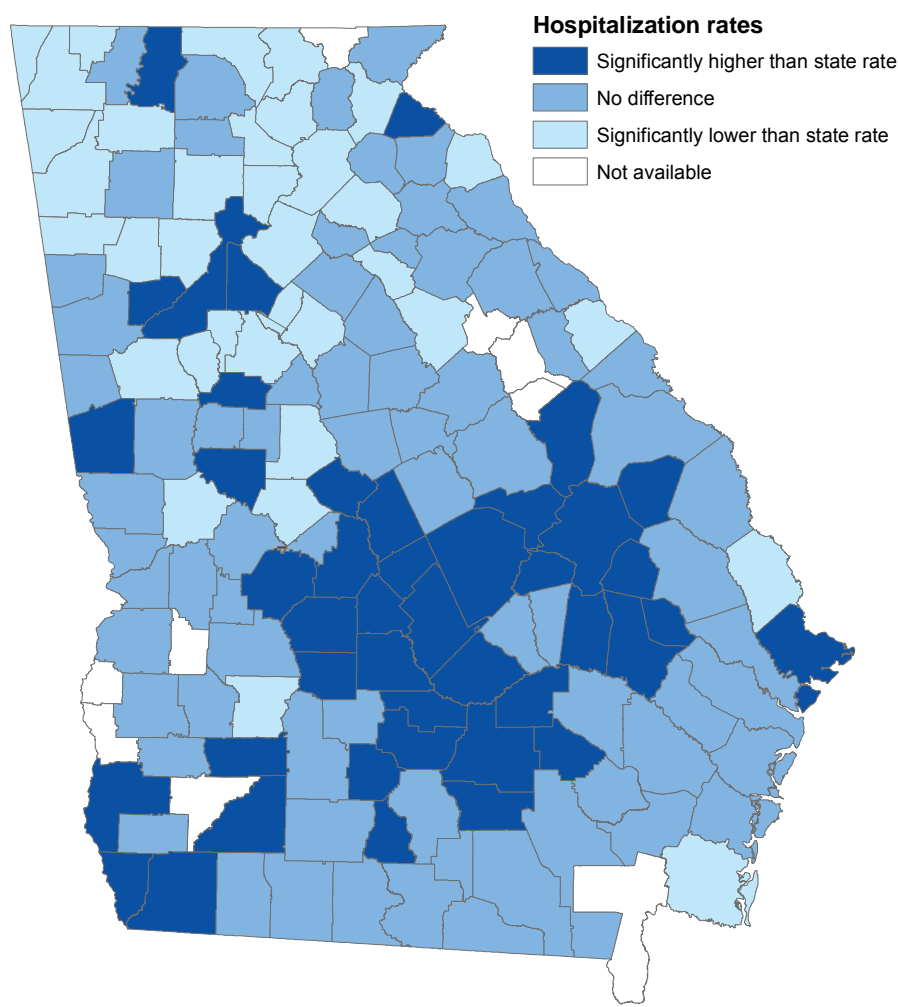
Asthma Hospitalizations by County

Forty-three of Georgia's 159 counties had significantly higher hospitalization rates than the state rate (133 hospitalizations per 100,000 per year) in 2004 (Appendix I, Table 4). Counties with high rates are located throughout Georgia, but high rates are generally more common in the southern counties of the state (Figure 29).

Asthma Hospitalizations by District

Nine of Georgia's 18 Public Health Districts had significantly higher hospitalization rates than the state rate in 2004 (Appendix I, Table 5).

Figure 29: Age-adjusted hospitalization rates for asthma by county, Georgia, 2004

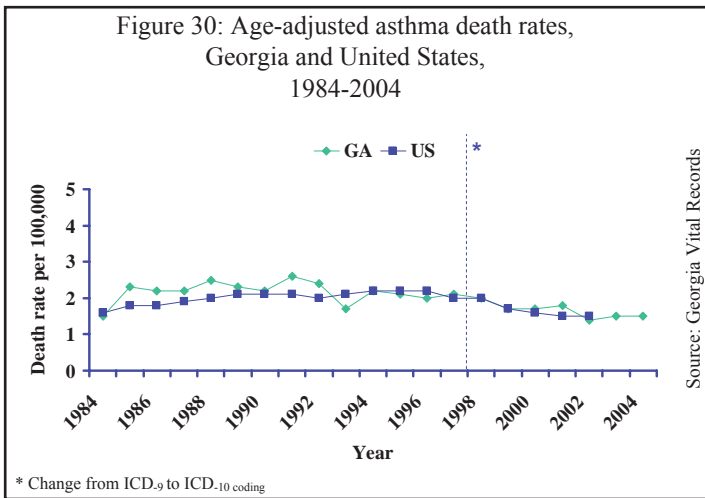


Source: Georgia Hospital Association

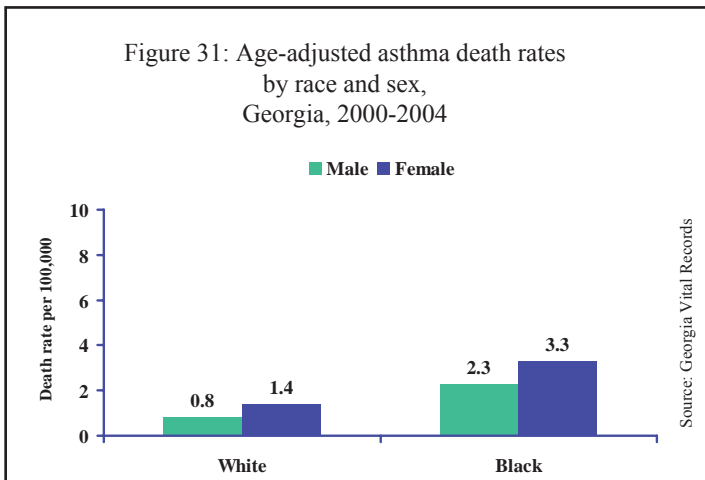
Asthma Mortality in Georgia

Deaths from Asthma in Georgia

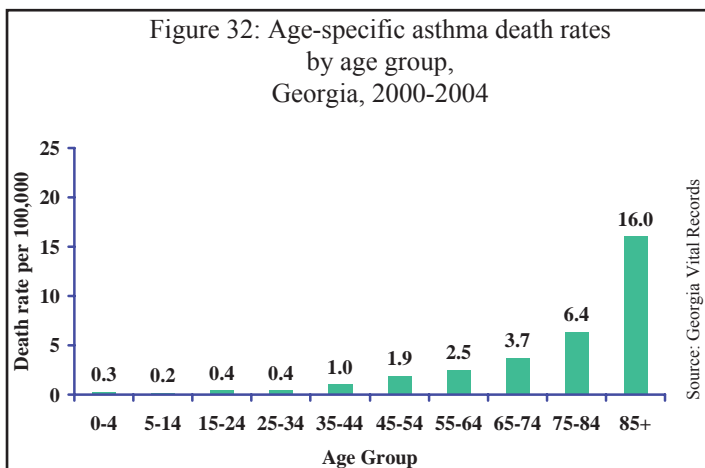
On average, from 2000 to 2004 there were 117 asthma deaths per year (1.6 per 100,000). Age-adjusted asthma death rates in the United States and Georgia increased during the 1980's and early 1990's (Figure 30). In 1999, the classification system for cause of death coding changed from ICD-9 to ICD-10, making it difficult to interpret recent trends in asthma mortality, but the rate appears to be falling.



Asthma deaths affect all races and sexes but death rates disproportionately affect minority populations in the U.S. and Georgia. In Georgia, Blacks are more than twice as likely to die from asthma than Whites (2.9 per 100,000 vs. 1.1 per 100,000 population). Women are 1.6 times more likely to die from asthma than men (1.9 per 100,000 vs. 1.2 per 100,000 population). Death rates by race and sex ranged from 0.8 per 100,000 populations for White males to 3.3 per 100,000 population for Black females (Figure 31).



Deaths from asthma are more common among the elderly (Figure 32).



Asthma Severity and Impact in Georgia

Asthma is a life threatening disease that can have a negative effect on the lives of children and adults with asthma, as well as the family members who care for them. When asthma is not in control a person's daily life can be disrupted.

Children

According to the second Statewide Georgia Childhood Asthma Survey, 60% of children with asthma have had an asthma attack in the past 12 months. Among children 5 to 17 in Georgia, about 75,000 (48%) children reportedly missed 470,000 days of school due to their asthma. In addition, about 48,000 (23%) of children with asthma reportedly had "moderate" to "a lot" of activity limitation when compared to their friends over a lifetime period. (Figure 33). When a person's asthma is under control daily activity should not be limited.

Adults

The National, Heart, Lung and Blood Institute (NHLBI) guidelines classify asthma into four different categories ranging from mild to severe.¹⁶ Among adults with asthma in Georgia, 21% fall into the severe persistent category, signifying their asthma is not in control (Figure 34).

More than half (56%) of the adults with current asthma reported having an episode of asthma or an asthma attack in the past twelve months. In addition, 14% of adults with asthma reported they were unable to work or carry out usual activities on one or more days during the past twelve months (Figure 35).

Figure 33: Asthma severity and impact among children with current asthma: attacks, missed school days, and activity limitation in past 12 months, Georgia, 2002-2003

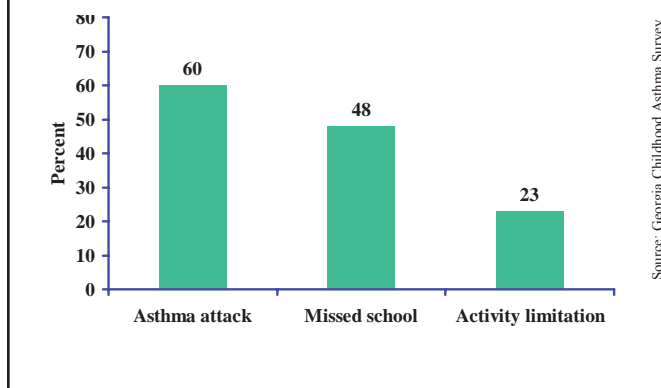


Figure 34: Asthma severity classification distribution among adults with current asthma, Georgia, 2005

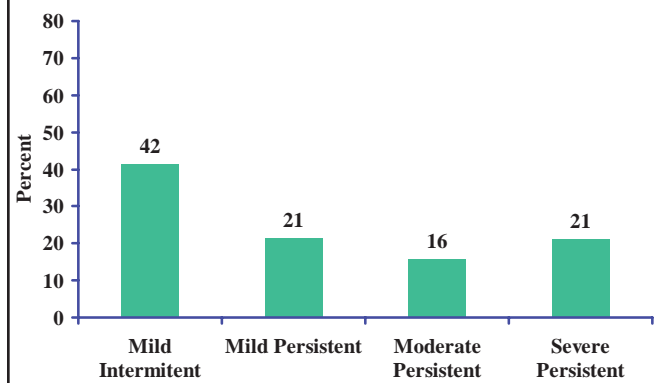


Figure 35: Severity and impact of asthma in adults: attacks and activity limitation in past 12 months Georgia, 2005

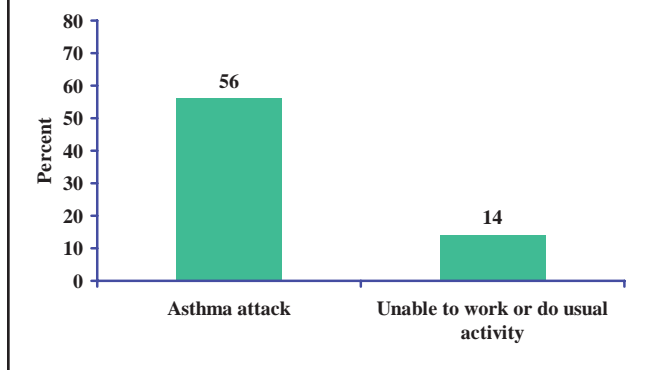
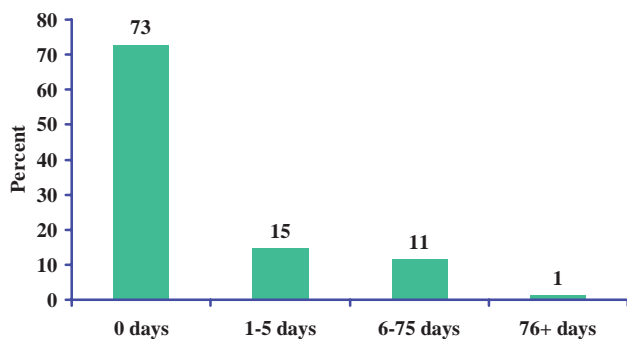


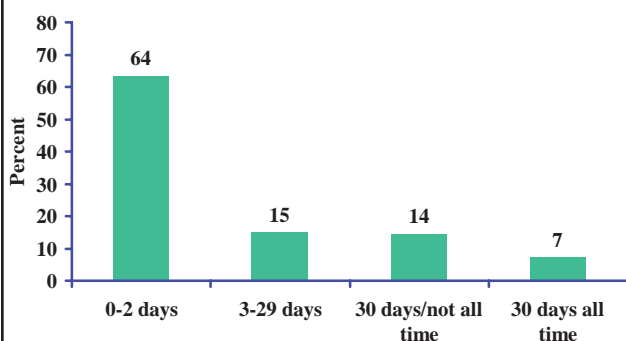
Figure 36: Activity limitation days in the last 12 months among adults with current asthma, Georgia, 2005



Source: Georgia Behavioral Risk Factor Surveillance System

Among adults with current asthma, 15% had activity limited on 1-5 days, 11% reported limitation on 6-75 days, and 1% reported limitation on 76 or more days in the past 12 months (Figure 36).

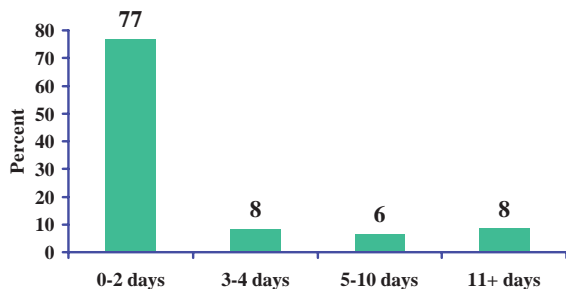
Figure 37: Symptom frequency in the past 30 days among adults with current asthma, Georgia, 2005



Source: Georgia Behavioral Risk Factor Surveillance System

Among adults with current asthma, 64% have symptoms only up to two days in the past 30 days and 7% reported symptoms every day in the past 30 days (Figure 37).

Figure 38: Difficulty sleeping in the past 30 days due to asthma symptoms among adults with current asthma, Georgia, 2005



Source: Georgia Behavioral Risk Factor Surveillance System

Approximately 77% of adults with current asthma reported that they had difficulty sleeping because of asthma symptoms up to two days of the past 30 days (Figure 38). With proper treatment and management the severity and impact of asthma can be reduced.

Asthma Management in Georgia

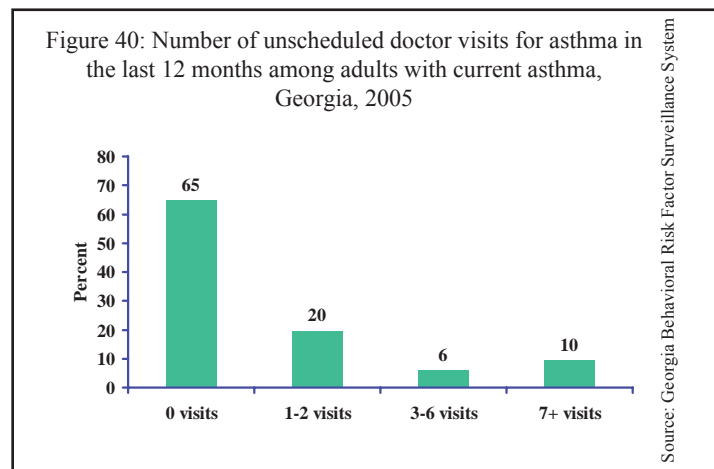
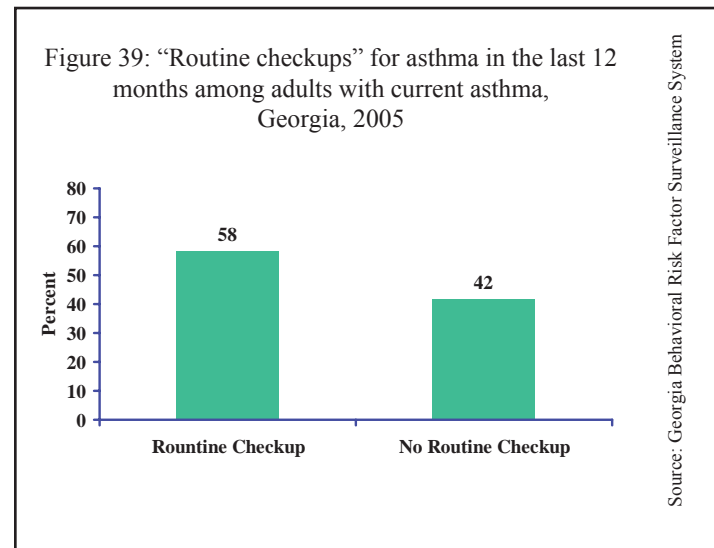
Disease Management

Asthma self-management, the direct involvement of patients and their caregivers in strategies to control their disease, has become an important component of asthma care. Asthma self-management reduces ER visits, hospitalizations, unscheduled office visits, and asthma-related healthcare cost. Asthma management should begin with a proper diagnosis of the disease, identification of triggers that are common to people with asthma as well as knowing your personal triggers, and reducing exposure to these triggers. The NHLBI recommends that individuals with asthma work with their doctor to create an asthma management plan, which can help persons recognize early signs and symptoms of an attack, determine which medicines to take and when to take them, and recognize when to seek medical attention. Asthma cannot be cured, but with proper pharmacologic therapy, avoidance of triggers, and management, it can be controlled.

Adults

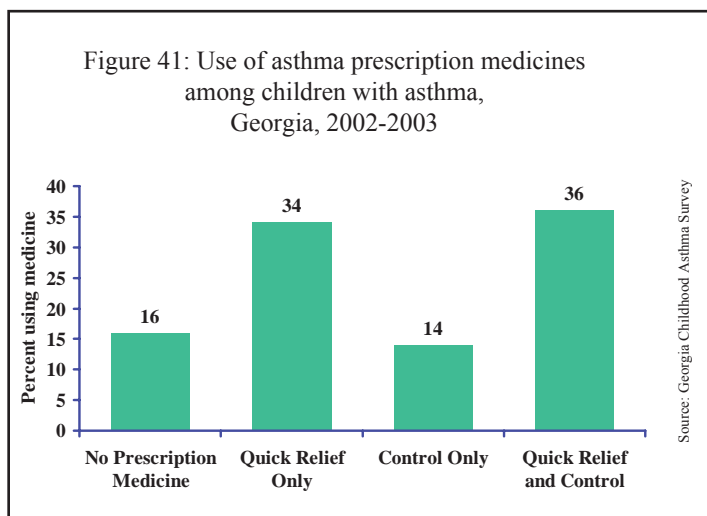
Routine visits recommended by the NHLBI guidelines should be used to discuss asthma-related problems.¹⁶ Patients should develop their management plan and let their doctor know when anything in their management plan is not working, and the doctor should work with them to modify the plan to better suit their needs. Despite these recommendations, in Georgia 42% of adults with asthma have not had a routine checkup for their asthma in the past 12 months (Figure 39).

Among adults with asthma, 20% have had 1-2 unscheduled doctor visits, 6% have had 3-6 unscheduled visits and 10% have had seven or more unscheduled visits in the past 12 months (Figure 40). With proper management unscheduled visits for asthma can be avoided.



Children

Among children with asthma, 84% use prescription medicine, including 36% who use prescriptions for both control[§] and quick-relief[¶] medicine, 14% who use a prescription only for control medicine, and 34% who use a prescription only for quick relief medicine (Figure 41).



NHLBI guidelines state that use of ≥ 2 quick-relief treatments per week or ≥ 2 prescriptions per year may indicate need for control medicine to reduce inflammation and prevent exacerbations.¹⁶ Among Georgia children with asthma who have a prescription only for quick relief medicine, 17% of all children with asthma use ≥ 2 prescriptions per year. The NHLBI Guidelines also recommend that patients receive periodic assessments and be given a written plan by their health care provider.¹⁶

Figure 42: Disease management practices and training for children with asthma, Georgia, 2002-2003

Management practice/training	% (95% CI)
No routine check-ups for asthma	30 (25,35)
No written asthma management plan	65 (59,70)
2 or more quick-relief prescriptions per year but no control medicine	17 (13,21)
No training on how to manage asthma*	18 (14,23)
No training to recognize signs and symptoms of an attack *	28 (23,33)
No training about things that can trigger asthma attacks*	23 (20,25)
No training on use of peak flow meter *	13 (9,18)
No training on use of inhaler (among those with inhaler)*	6 (2,9)
No training on use of a spacer (among those with inhaler)*	30 (24,37)

* For either caregiver or child ≥ 5 years
Source: Georgia Childhood Asthma Survey

In Georgia, 30% of children with asthma do not have regular asthma check-ups and 65% do not have a written plan to help them manage their asthma (Figure 42). There are other asthma management and training areas in which Georgia could use improvement to help prevent frequency and severity of attacks.

§ Control Medicine: medicine designed to control airway inflammation and prevent attacks from occurring

¶ Quick-relief medicine: medicine designed to provide quick relief of asthma symptoms during an attack or exacerbation

Conclusions

Asthma is a major public health issue in Georgia, as it is in the United States. In Georgia, 10% of children ages 0-10, 15% of middle school students, 16% of high school students, and 7% of adults report currently having asthma. This report shows that asthma affects all age, race, and sex groups, but certain groups are disproportionately affected. Blacks and women are more likely to visit the ER, be hospitalized, and die from asthma than Whites and men. Asthma hospitalizations are highest among the older and younger age groups. Death rates are 25 times higher for the elderly (65 years of age and older) than for the younger age groups (0 to 4 years and 5 to 24 years).

Findings presented in this report suggest at least five ways by which the burden of asthma in Georgia can be reduced:

- 1) Reduce cigarette smoking and exposure to environmental tobacco smoke
- 2) Improve access to quality healthcare
- 3) Increase receipt of annual flu vaccination
- 4) Increase physical activity and improve diet to reduce obesity
- 5) Increase knowledge and adherence to proper treatment and management practices

Reduce smoking and exposure to environmental tobacco smoke (ETS)

Despite the fact that cigarette smoking may trigger asthma attacks, youth and adults with asthma continue to smoke: 25% of adults with asthma, 20% of high school students with asthma, and 8% of middle school students with asthma currently smoke. Approximately two-thirds middle school students and three-fourths of high school students with asthma are exposed to environmental tobacco smoke. Smoking and exposure to environmental tobacco smoke (ETS) have been shown to increase the frequency and severity of asthma attacks. Stopping smoking and limiting exposure to ETS can help reduce the frequency and severity of asthma attacks. Policies that prohibit or restrict smoking are important factors in this effort.

Improve access to quality healthcare

A substantial number of adults with asthma (27%) were unable to see a doctor because of cost. Lack of access to adequate healthcare can make it difficult for individuals to keep their asthma under control. Asthma is a disease that can be controlled with proper treatment and management. Therefore, programs to help people receive proper treatment and self-management education need to be made available.

Increase receipt annual flu shot

Respiratory infections are a common trigger of asthma attacks. Annual influenza vaccinations for people with asthma will reduce the incidence of asthma attacks. However, only about one-third of adults with asthma have received their annual flu shot.

Increase physical activity and improve diet

A higher percent of high school students with asthma are obese (14%) compared to those without asthma (11%). Thirty-six percent of adults with asthma are currently obese. The relationship between asthma and obesity is not well understood, but obese individuals tend to experience more symptoms than people of normal weight. Asthma is a disease that should not limit an individual's normal activities. Programs to help individuals with asthma participate in physical activities and to eat a healthy diet can help reduce asthma symptoms.

Increase knowledge of proper treatment and management practices

The NHLBI guidelines recommend that patients with asthma receive periodic assessments and be given a written plan by their health care provider. In Georgia, 30% of children with asthma do not have regular asthma checkups and 42% of adults with asthma do not have regular checkups for their asthma. Two-thirds of children with asthma do not have a written management plan to help manage their asthma. Children who have a prescription for quick relief medications only and are refilling the prescription more than two times a year need to be evaluated for control medication.

People with asthma in Georgia can live normal, active, healthy lives by knowing the common asthma triggers and reducing their exposure to them, especially triggers specific to their asthma. Individuals with asthma need to work with their doctor to create an asthma management plan that will tell them what brings on their asthma symptoms, how to avoid triggers and reduce exposure, what medicines to take and when to take them, and when to seek medical help. People with asthma must work with their doctor to understand instructions for their medications and take them as scheduled. If the medications are taken as scheduled and are not working, they should let their physician know and discuss revisions that may be needed.

Asthma education, proper treatment and management, policy changes, and modification of risk factors will help reduce frequency and severity of asthma attacks in individuals with asthma and possibly delay or prevent the development of asthma in individuals without asthma. These actions will ultimately reduce the burden of asthma in Georgia and improve the quality of life of Georgians with asthma, their families, and society at large.

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APPENDIX I: Data Tables

Table 1: Prevalence of asthma among adults by public health district, Georgia, 2004-2005	
District	Percent
Georgia	7.3*
(1-1) Northwest (Rome)	8.8
(1-2) North Georgia (Dalton)	8.2
(2-0) North (Gainesville)	6.5
(3-1) Cobb/Douglas (Marietta)	7.2
(3-2) Fulton (Atlanta)	6.9
(3-3) Clayton (Morrow)	7.7
(3-4) East Metro (Lawrenceville)	5.3
(3-5) Dekalb (Decatur)	6.9
(4-0) LaGrange	8.5
(5-1) South Central (Dublin)	5.6
(5-2) North Central (Macon)	8.4
(6-0) East Central (Augusta)	7.0
(7-0) West Central (Columbus)	7.6
(8-1) South (Valdosta)	5.4
(8-2) Southwest (Albany)	7.7
(9-1) East/Coastal (Savannah/Brunswick)	7.4
(9-2) Southeast (Waycross)	8.4
(10-0) Northeast (Athens)	5.6

* No District rates are significantly higher or lower than the state rate
 Source: Georgia Behavioral Risk Factor Surveillance System (BRFSS)

Table 2: Annual number of emergency room (ER) visits for asthma, age-adjusted ER visit rates, and ER charges by county, Georgia, 2004

County	ER visits			County	ER visits		
	Number	Rate/100,000	Charges		Number	Rate/100,000	Charges
Georgia	46,152	510	\$38,976,000	Dade	11	73†	\$12,200
Appling	23	129†	\$22,400	Dawson	53	297†	\$61,300
Atkinson	52	603	\$75,300	Decatur	163	562	\$4,289,400
Bacon	58	573	\$53,500	DeKalb	5175	758*	\$89,600
Baker	14	351	\$7,400	Dodge	128	664*	\$86,200
Baldwin	156	367†	\$112,000	Dooley	66	571	\$50,200
Banks	40	251†	\$29,100	Dougherty	642	656*	\$573,900
Barrow	282	476	\$298,300	Douglas	495	441†	\$473,400
Bartow	498	554	\$436,900	Early	108	858*	\$68,200
Ben Hill	108	615	\$56,700	Echols	13	301†	\$8,400
Berrien	86	516	\$55,200	Effingham	175	383†	\$115,800
Bibb	755	477	\$680,500	Elbert	101	497	\$78,100
Bleckley	45	392	\$28,600	Emanuel	97	441	\$68,900
Brantley	67	444	\$49,300	Evans	63	569	\$38,700
Brooks	186	1164*	\$123,900	Fannin	61	312†	\$55,300
Bryan	79	288†	\$69,700	Fayette	336	368†	\$233,800
Bulloch	282	515	\$329,500	Floyd	442	474	\$510,700
Burke	72	280†	\$42,500	Forsyth	401	294†	\$555,700
Butts	113	502	\$120,900	Franklin	97	473	\$52,600
Calhoun	36	590	\$11,900	Fulton	7945	958*	\$6,697,500
Camden	197	399†	\$157,700	Gilmer	86	338	\$56,900
Candler	95	945*	\$51,000	Glascocock	11	464	\$17,100
Carroll	480	465	\$285,600	Glynn	360	524	\$217,400
Catoosa	125	211†	\$124,100	Gordon	97	194†	\$81,700
Charlton	50	466	\$53,000	Grady	187	758*	\$120,600
Chatham	1422	593*	\$1,330,500	Greene	99	671*	\$60,700
Chattahoochee	17	131†	\$11,600	Gwinnett	2943	396†	\$3,167,200
Chattooga	74	289†	\$93,000	Habersham	122	320†	\$68,200
Cherokee	568	315†	\$546,100	Hall	645	396†	\$764,700
Clarke	380	412†	\$280,300	Hancock	21	216†	\$17,900
Clay	8	269†	\$10,300	Haralson	133	481	\$83,400
Clayton	1435	494	\$1,085,300	Harris	39	153†	\$28,900
Clinch	45	630	\$26,500	Hart	100	448	\$48,900
Cobb	2800	412†	\$2,397,700	Heard	35	308†	\$20,600
Coffee	232	568	\$263,000	Henry	485	291†	\$322,000
Colquitt	283	620*	\$185,300	Houston	492	386†	\$341,200
Columbia	228	229†	\$201,300	Irwin	31	311†	\$25,300
Cook	69	416	\$37,300	Jackson	153	310†	\$155,300
Coweta	326	300†	\$2,587,000	Jasper	54	420	\$33,000
Crawford	34	262†	\$30,500	Jeff Davis	46	355†	\$39,300
Crisp	122	531	\$75,800	Jefferson	145	851*	\$100,000

* Age-adjusted ER visit rates are significantly higher than the state rate

† Age-adjusted ER visit rates are significantly lower than the state rate

Source: Georgia Hospital Association

Table 3: Annual number of emergency room (ER) visits for asthma, age-adjusted ER visit rates, and ER charges by public health district, Georgia, 2004

ER visits			
District	Number	Rate/100,000	Charges
Georgia	46,152	510	\$38,976,000
(1-1) Northwest (Rome)	2112	364 [†]	\$2,039,000
(1-2) North Georgia (Dalton)	1235	317 [†]	\$1,197,000
(2-0) North (Gainesville)	1897	357 [†]	\$1,945,000
(3-1) Cobb/Douglas (Marietta)	3295	416 [†]	\$2,871,000
(3-2) Fulton (Atlanta)	7945	958*	\$6,698,000
(3-3) Clayton (Morrow)	1435	494	\$1,085,000
(3-4) East Metro (Lawrenceville)	3637	399 [†]	\$3,579,000
(3-5) DeKalb (Decatur)	5175	758*	\$4,289,000
(4-0) LaGrange	2798	390 [†]	\$2,237,000
(5-1) South Central (Dublin)	602	431 [†]	\$477,000
(5-2) North Central (Macon)	2038	408 [†]	\$1,565,000
(6-0) East Central (Augusta)	2680	603*	\$1,843,000
(7-0) West Central (Columbus)	1949	549*	\$1,556,000
(8-1) South (Valdosta)	1052	442	\$683,000
(8-2) Southwest (Albany)	2320	636*	\$1,650,000
(9-1) East/Coastal (Savannah/ Brunswick)	2593	491	\$2,217,000
(9-2) Southeast (Waycross)	1872	558*	\$1,745,000
(10-0) Northeast (Athens)	1517	375 [†]	\$1,299,000

* Age-adjusted ER visit rates are significantly higher than the state rate

† Age-adjusted ER visit rates are significantly lower than the state rate

Source: Georgia Hospital Association

Table 4: Annual number of hospitalizations for asthma, age-adjusted hospitalization rates, and hospital charges by county, Georgia, 2004

County	Hospitalizations			County	Hospitalizations		
	Number	Rate/100,000	Charges		Number	Rate/100,000	Charges
Georgia	11,404	133	\$107,523,000	Dade	8	47†	\$78,200
Appling	30	169	\$222,800	Dawson	11	54†	\$149,900
Atkinson	28	377*	\$274,500	Decatur	58	195*	\$8,465,300
Bacon	25	242*	\$126,800	DeKalb	925	145*	\$264,600
Baker	4	##	\$32,400	Dodge	48	241*	\$312,300
Baldwin	45	113	\$412,900	Dooly	37	309*	\$222,500
Banks	15	91	\$161,400	Dougherty	188	199*	\$2,032,200
Barrow	73	150	\$888,100	Douglas	171	171*	\$1,750,600
Bartow	97	116	\$965,600	Early	31	247*	\$182,900
Ben Hill	56	305*	\$387,600	Echols	9	240	\$46,300
Berrien	32	194	\$239,700	Effingham	39	97†	\$430,600
Bibb	274	178*	\$3,330,600	Elbert	29	136	\$227,300
Bleckley	27	224*	\$117,100	Emanuel	45	201*	\$337,500
Brantley	16	110	\$140,900	Evans	37	343*	\$241,100
Brooks	31	181	\$240,300	Fannin	21	85†	\$175,500
Bryan	34	138	\$438,600	Fayette	54	57†	\$536,500
Bulloch	74	140	\$874,800	Floyd	52	54†	\$485,100
Burke	41	177	\$248,700	Forsyth	113	95†	\$1,608,600
Butts	24	117	\$433,800	Franklin	22	103	\$189,100
Calhoun	10	183	\$35,400	Fulton	1213	159*	\$13,955,000
Camden	22	58†	\$232,100	Gilmer	45	167	\$385,200
Candler	27	258*	\$183,500	Glascocock	2	##	\$9,300
Carroll	133	144	\$983,100	Glynn	94	131	\$1,051,100
Catoosa	32	53†	\$271,900	Gordon	29	57†	\$315,200
Charlton	4	##	\$23,100	Grady	38	152	\$306,000
Chatham	380	158*	\$3,782,400	Greene	12	74†	\$63,000
Chattahoochee	11	109	\$292,500	Gwinnett	663	117†	\$6,812,800
Chattooga	13	49†	\$131,500	Habersham	29	75†	\$262,900
Cherokee	134	77†	\$1,217,000	Hall	155	107†	\$2,027,700
Clarke	126	161	\$1,148,000	Hancock	12	132	\$85,400
Clay	3	##	\$37,800	Haralson	36	132	\$383,900
Clayton	271	103†	\$2,475,900	Harris	28	110	\$242,400
Clinch	17	228	\$62,300	Hart	20	87†	\$145,200
Cobb	557	85†	\$5,073,100	Heard	14	131	\$117,000
Coffee	112	296*	\$1,030,300	Henry	137	89†	\$1,902,100
Colquitt	56	126	\$441,600	Houston	203	167*	\$1,092,600
Columbia	85	91†	\$855,300	Irwin	31	308*	\$202,500
Cook	49	305*	\$316,000	Jackson	41	84†	\$340,600
Coweta	86	91†	\$873,800	Jasper	11	85	\$57,900
Crawford	6	45†	\$41,800	Jeff Davis	48	350*	\$309,600
Crisp	67	301*	\$550,800	Jefferson	61	368*	\$317,600

Table 4 (continued): Annual number of hospitalizations for asthma, age-adjusted hospitalization rates, and hospital charges by county, Georgia, 2004

County	Hospitalizations			County	Hospitalizations		
	Number	Rate/100,000	Charges		Number	Rate/100,000	Charges
Jenkins	26	297*	\$104,600	Schley	5	116	\$36,200
Johnson	26	303*	\$154,400	Screven	29	193	\$201,600
Jones	25	97	\$258,500	Seminole	29	299*	\$240,700
Lamar	26	158	\$293,400	Spalding	115	192*	\$1,887,700
Lanier	12	169	\$95,800	Stephens	61	262*	\$434,300
Laurens	138	287*	\$929,600	Stewart	7	158	\$20,100
Lee	21	79†	\$228,000	Sumter	50	154	\$519,400
Liberty	83	134	\$574,600	Talbot	5	68†	\$32,400
Lincoln	7	86	\$50,600	Taliaferro	3	##	\$13,200
Long	13	109	\$67,300	Tattnall	68	320*	\$487,500
Lowndes	122	136	\$870,200	Taylor	15	159	\$90,700
Lumpkin	19	87†	\$145,600	Telfair	29	233*	\$195,300
McDuffie	40	183	\$253,300	Terrell	12	112	\$129,500
McIntosh	19	171	\$367,200	Thomas	74	163	\$583,000
Macon	36	260*	\$51,900	Tift	140	333*	\$818,600
Madison	31	116	\$284,000	Toombs	65	241*	\$494,300
Marion	8	109	\$268,100	Towns	3	##	\$9,400
Meriwether	29	124	\$175,700	Treutlen	18	254*	\$105,800
Miller	10	161	\$69,000	Troup	127	209*	\$607,700
Mitchell	58	243*	\$560,200	Turner	14	141	\$64,700
Monroe	15	69†	\$110,700	Twiggs	25	231*	\$326,300
Montgomery	20	236	\$190,500	Union	10	40†	\$84,100
Morgan	19	116	\$169,700	Upson	88	308*	\$705,200
Murray	74	194*	\$872,200	Walker	41	64†	\$500,600
Muscogee	244	130	\$2,339,100	Walton	98	140	\$980,500
Newton	83	103†	\$602,900	Ware	59	160	\$690,300
Oconee	17	67†	\$182,600	Warren	4	##	\$23,800
Oglethorpe	18	132	\$170,300	Washington	21	101	\$129,400
Paulding	101	102†	\$1,148,200	Wayne	44	159	\$296,200
Peach	43	187	\$240,700	Webster	4	##	\$35,800
Pickens	33	124	\$354,000	Wheeler	9	149	\$67,100
Pierce	30	177	\$313,100	White	19	79	\$418,700
Pike	18	113	\$201,000	Whitfield	125	143	\$1,281,400
Polk	26	60†	\$195,300	Wilcox	26	308*	\$121,300
Pulaski	42	431*	\$214,000	Wilkes	14	126	\$103,100
Putnam	31	149	\$134,800	Wilkinson	14	132	\$209,800
Quitman	0	##	\$0	Worth	27	123	\$173,500
Rabun	19	115	\$154,800				
Randolph	16	219	\$209,700				
Richmond	299	150	\$2,608,100				
Rockdale	63	87†	\$472,800				

* Hospitalization rates are significantly higher than the state rate
† Hospitalization rates are significantly lower than the state rate
Rate is not calculated for counties with <5 hospitalizations per year
Source: Georgia Hospital Association

Table 5: Annual number of hospitalizations for asthma, age-adjusted hospitalization rates, and hospital charges by public health district, Georgia, 2004

Hospitalizations			
District	Number	Rate/100,000	Charges
Georgia	11,404	133	\$107,523,000
(1-1) Northwest (Rome)	435	77 [†]	\$4,476,000
(1-2) North Georgia (Dalton)	432	117 [†]	\$4,285,000
(2-0) North (Gainesville)	496	94 [†]	\$5,792,000
(3-1) Cobb/Douglas (Marietta)	728	97 [†]	\$6,824,000
(3-2) Fulton (Atlanta)	1213	159*	\$13,955,000
(3-3) Clayton (Morrow)	271	103 [†]	\$2,476,000
(3-4) East Metro (Lawrenceville)	809	110 [†]	\$7,888,000
(3-5) DeKalb (Decatur)	925	145*	\$8,465,000
(4-0) LaGrange	851	126	\$8,717,000
(5-1) South Central (Dublin)	383	274*	\$5,792,000
(5-2) North Central (Macon)	725	148*	\$6,432,000
(6-0) East Central (Augusta)	656	151*	\$5,157,000
(7-0) West Central (Columbus)	536	151*	\$4,934,000
(8-1) South (Valdosta)	496	213*	\$3,282,000
(8-2) Southwest (Albany)	616	169*	\$5,279,000
(9-1) East/Coastal (Savannah/ Brunswick)	684	134	\$6,845,000
(9-2) Southeast (Waycross)	684	211*	\$5,279,000
(10-0) Northeast (Athens)	464	123	\$4,537,000

* Age-adjusted hospitalization rates are significantly higher than the state rate

† Age-adjusted hospitalization rates are significantly lower than the state rate

Source: Georgia Hospital Association

Appendix II: Data Sources for Asthma

The Georgia Childhood Asthma Survey

The Georgia Childhood Asthma Survey was a random digit-dial telephone survey of households in Georgia. A parent or caregiver in households with at least one child aged less than 18 years reported on all children residing in the home. The survey was conducted from October 2002 through February 2003. The data were collected by the University of Georgia Survey Research Center in Athens, GA. Asthma was defined according to the standard case definition for probable asthma: the child was ever diagnosed with asthma, and 1) has been told by a physician that the child still has asthma, 2) takes prescription medicine for asthma, or 3) has had an asthma attack in past twelve months. Household and caretaker data were weighted according to the number of telephone lines in the household. Child data were weighted according to the number of telephone lines in the household and to the 2000 Georgia Census population.

The Georgia Youth Tobacco Survey

The Georgia Youth Tobacco Survey is a self-administered pencil and paper survey given to Georgia's middle and high school students. The main focus of this survey is tobacco use. This survey was last conducted in 2005. Two questions about asthma were added 1) "Has a doctor or nurse ever told you that you have asthma?" 2) "During the past 12 months have you had an episode or an asthma attack?" Other information included height and weight to calculate BMI. For both middle school and high school the data weight variable was calculated for each record to reflect the likelihood of sampling each student and to reduce bias by compensating for differing patterns of non-response. SUDAAN was used to compute the 95% confidence intervals, which were used to determine the differences between subgroups. Differences between prevalence estimates were considered statistically significant if the 95% confidence intervals did not overlap. This survey does not include students who do not attend public middle school and high school, were home schooled, or those who do not attend school at all.

The Behavioral Risk Factor Surveillance System (BRFSS)

The Behavioral Risk Factor Surveillance System (BRFSS) is stratified random digit dial telephone interview survey conducted in cooperation with the Centers for Disease Control and Prevention (CDC). Georgia residents 18 years and older are interviewed annually about their health conditions, behaviors, and the use of preventive services. Asthma was one of the topics included in the 2002-2006 core section. The questions were 1) "Have you ever been told by a doctor, nurse, or other health professional that you had asthma?" 2) "Do you still have asthma?" In addition, the adult asthma history module, which consists of nine questions related to asthma history, healthcare utilization, and asthma medication use were included in 2003-2005 modules. In 2005 the state of Georgia added two questions concerning work-related asthma. 1) "Were you ever told by a doctor or other medical person that your asthma was related to any job you ever had?" 2) "Did you ever tell a doctor or other medical person that your asthma was related to any job you ever had?" Prevalences for 2004-2005 combined were estimated using SAS and SUDAAN, which take into account the stratified sample design of the BRFSS. People without a telephone are not included in the survey.

Georgia Emergency Room (ER) Visit Data

Emergency room (ER) visit data in this report are based on ER visit data by Georgia residents who were seen in the ER in 2004 with asthma as the primary diagnosis. The ICD-9 codes used to select hospitalizations were 493.0-493.9. ER visit data included only information reported by non-federal acute care hospitals in Georgia. Rates were age-adjusted to the 2000 US standard population via the direct method. ER visit charges may differ from costs. Charges are based upon the hospital's full-established rates. The amount a hospital is reimbursed is usually less than what is charged.

Georgia Hospital Inpatient Discharge Data

Hospitalization data in the report are based on hospital discharge data for Georgia residents who were hospitalized in 2004 with asthma as the primary diagnosis. The ICD-9 codes used to select hospitalizations were 493.0-493.9. Hospitalization data included only information reported by non-federal acute care hospitals in Georgia. Rates were age-adjusted to the 2000 US standard population via the direct method. Hospitalization charges may differ from costs. Charges are based upon the hospital's full-established rates. The amount a hospital is reimbursed is usually less than what is charged.

Georgia Vital Statistics Death Data

Mortality data are based on deaths of Georgia residents whose underlying cause of death was asthma. Deaths from 1999-2004 with ICD-10 codes J45-J46 were selected. Death rates were age-adjusted to the 2000 US standard population via the direct method. Recent trends suggest that mortality rates are decreasing; one factor may be the change from ICD-9 to ICD-10 coding of deaths in 1999.

Death and hospitalization rates are expressed per 100,000 population throughout the report.

APPENDIX III: Definitions and Abbreviations

Age-adjusted rate: A rate calculated in a manner that allows comparison of populations with different age structures

Control Medicine: medicine designed to control airway inflammation and prevent attacks from occurring

Current Smoking (Adults): Smoked at least 100 cigarettes in their lifetime and who currently smoke

Current Smoking (Students): Smoked cigarettes on one or more days of the past 30 days

Exposure to environmental tobacco smoke (Children): Exposure to tobacco smoke in the house and away from the house.

Exposure to environmental tobacco smoke (Middle and High School): Exposure to tobacco smoke at home in a room, in a car and through friends who smoke.

Fair or Poor Health: Self-reported health status as fair or poor

Flu Shot: Flu shot received in the past twelve months

Income: Annual household income from all sources

Mental Distress: Mental health not good on 14 or more of the past 30 days. Mental health might not be good because of stress, depression, or problems with emotions

Mild Intermittent: Patients with daytime asthma symptoms ≤ 2 days/week and night time asthma symptoms ≤ 2 nights/month with no activity limitation

Mild Persistent: Patients with daytime asthma symptoms >2 days/week but $< 1x/day$ and night time asthma symptoms > 2 nights/month

Moderate Persistent: Patients with daily asthma symptoms and nighttime symptoms > 1 night/week

Obese (Adults): A body mass index (BMI) equal to or greater than 25.0. BMI is weight in kilograms divided by height in meters squared

Obese (Students): BMI for age $\geq 95^{\text{th}}$ percentile based on the CDC's growth chart for BMI determined by age and sex

Prevalence: the percentage of persons who have a disease or a risk factor at a given time

Quick-relief medicine: medicine designed to provide quick relief of asthma symptoms during an attack or exacerbation

Risk Factor: a habit, characteristic, or finding on clinical examination that is associated with an increased probability of disease

Seasons: Winter = Dec-Feb, spring = March-May, summer = June-Aug, and fall = Sept-Nov

Severe persistent: Patients with daytime asthma symptoms continual and nighttime asthma symptoms frequently

Statistically Significant: In this report a p-value <0.05 was considered statistically significant, showing that the observed results are probably different from what might have occurred as a result of chance alone.

Work-related asthma: Includes respondents who answered yes to, “Were you ever told by a doctor or other medical person that your asthma was related to any job you ever had?”, or answering yes to, “Did you ever tell a doctor or other medical person that your asthma was related to any job you ever had?”.

Abbreviations:

ALA: American Lung Association

BMI: Body Mass Index

BRFSS: Behavioral Risk Factor Surveillance System

CDC: Centers for Disease Control and Prevention

DHR: Georgia Department of Human Resources

ER: Emergency Room

ETS: Environmental Tobacco Smoke

ICD-9: International Classification of Diseases. 9th Revision

ICD-10: International Classification of Diseases. 10th Revision

NHLBI: National Heart, Lung, and Blood Institute



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