

ASTHMA
BURDEN REPORT, GEORGIA,
2015

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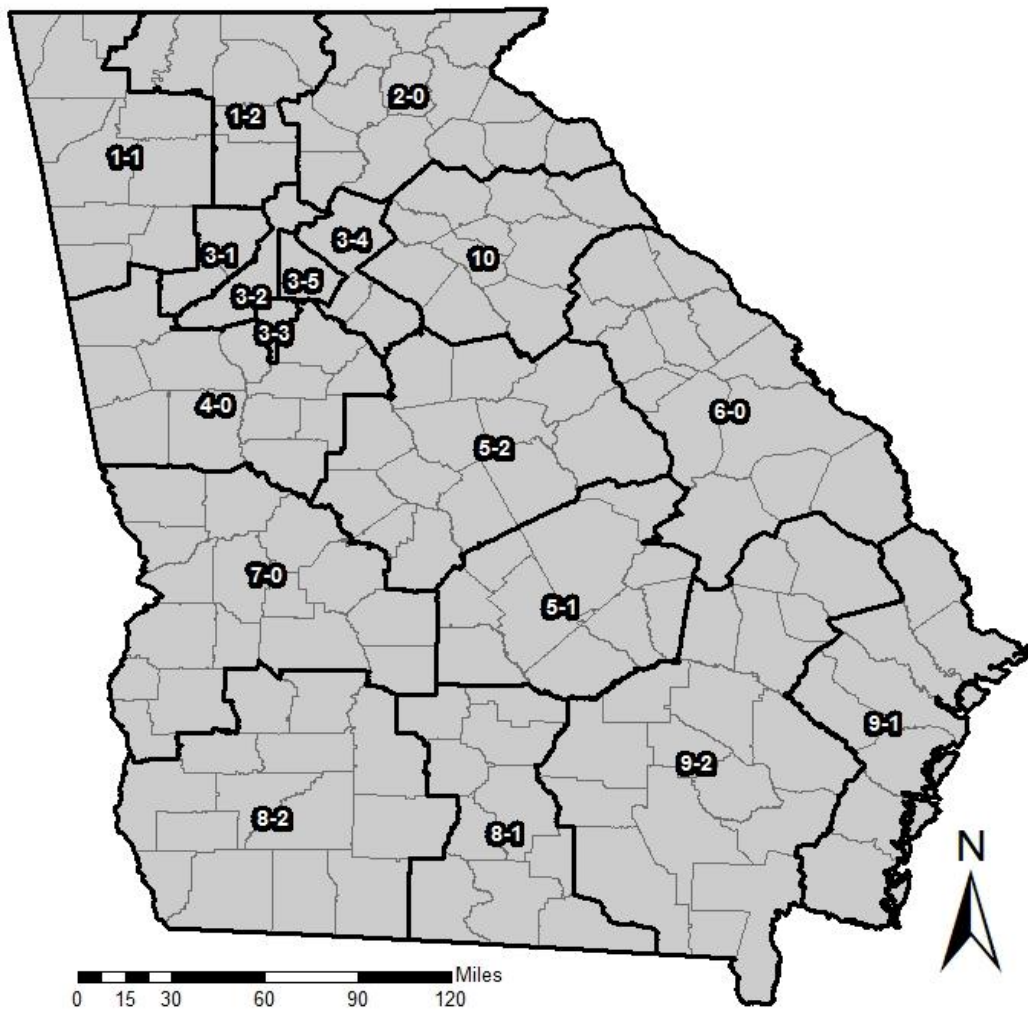
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Georgia Counties and Public Health Districts



1-1: Northwest Bartow Catoosa Chattooga Dade Floyd Gordon Haralson Paulding Polk Walker	1-2: North Georgia Cherokee Fannin Gilmer Murray Pickens Whitefield	2-0: North Banks Dowson Forsyth Franklin Habersham Hall Hart Lumpkin Rabun Stephens Towns Union White	3-1: Cobb/Douglas Cobb Douglas	3-2: Fulton Fulton	3-3: Clayton County Clayton	3-4: East Metro Gwinnett Newton Rockdale	3-5: DeKalb DeKalb	4-0: LaGrange Butts Carroll Coweta Fayette Henry Lamar Meriwether Pike Spalding Troup Upson
5-1: South Central Bleckley Dodge Johnson Laurens Montgomery Pulaski Telfair Treutlen Wheeler Wilcox	5-2: North Central Baldwin Bibb Crawford Hancock Houston Jasper Jones Monroe Peach Putnam Twiggs Washington Wilkinson	6-0: East Central Burke Columbia Emanuel Glascock Jefferson Jenkins Lincoln McDuffie Richmond Screven Taliaferro Warren Wilkes	7-0: West Central Chattahoochee Clay Crisp Dooly Harris Macon Marion Muscogee Quitman Randolph Schley Stewart Sumter Talbot Taylor Webster	8-1: South Ben Hill Berrien Brooks Cook Echols Irwin Lanier Lowndes Tift Turner	8-2: Southwest Baker Calhoun Colquitt Decatur Dougherty Early Grady Lee Miller Mitchell Seminole Terrell Thomas Worth	9-1: Southeast Appling Atkinson Bacon Brantley Bulloch Candler Charlton Clinch Coffee Evans Jeff Davis Pierce Tattnall Toombs Ware Wayne	9-2: Coastal Bryan Camden Chatham Effingham Glynn Liberty Long McIntosh	10-0: Northeast Barrow Clarke Elbert Greene Jackson Madison Morgan Oconee Oglethorpe Walton

PART A – ASTHMA IN CHILDREN

Asthma Emergency Room Visits and Hospitalizations among Georgia Children 0-17 years

Key Findings:

- An average of 27,000 asthma emergency room (ER) visits occurred annually among Georgia children aged 0-17 years during 2010-2012, an average rate of 1083/100,000 population.
- Three notable seasonal peaks were observed in the number of asthma emergency room visits among Georgia children - during spring, early fall and late fall seasons.
- The rate of asthma ER visits among Georgia children was highest among 0-4 year olds, blacks and boys.
- The rate of asthma ER visits among Georgia children was highest in the metro Atlanta and Augusta areas.
- The total charges for asthma ER visits among Georgia children increased from \$33.6 million in 2010 to \$44.2 million in 2012.
- Among Georgia children who had an asthma ER visit in 2012, 16% had repeat visits during the calendar year.
- On average, 3,000 asthma hospitalizations occurred annually among Georgia children during 2010-2012.
- Among Georgia children, the highest rate of asthma hospitalizations occurred among 0-4 year olds, blacks and boys.
- About 7% of children who were hospitalized for asthma during 2012 had repeat asthma hospitalizations during the calendar year.

A1. Emergency Room Visits

A1.1. Overall trends of asthma ER visits between 2010 and 2012, Georgia

Between 2010 and 2012, there was an average of 27,000 asthma Emergency Room (ER) visits annually among Georgia children aged 0-17 years.

In Georgia during 2010-2012:

- There were three notable periods in each calendar year when the number of asthma ER visits was highest among children- during spring, early fall and late fall seasons (Fig A1.1).
 - The number of asthma ER visits among children increased in early February and remained high until late May.
 - Then the number of visits dropped in early June to reach the lowest level for the year and remained low until early August.
 - After the first week in August, the number of visits increased to reach the highest peak in late August.
 - In early September, the number of visits dropped from the August peak but remained fairly high until the end of November compared to the number of visits observed in June (Fig A1.1).
- The number of asthma ER visits among children was highest during the weekend period- Saturdays to Mondays (Fig A1.2).
- The total charges for asthma ER visits among Georgia children aged 0-17 years increased from about \$33.6 million in 2010 to \$44.2 million in 2012 (Fig A1.3). The median charge per asthma ER visit also shifted upward from \$984 in 2010 to \$1,175 in 2012.

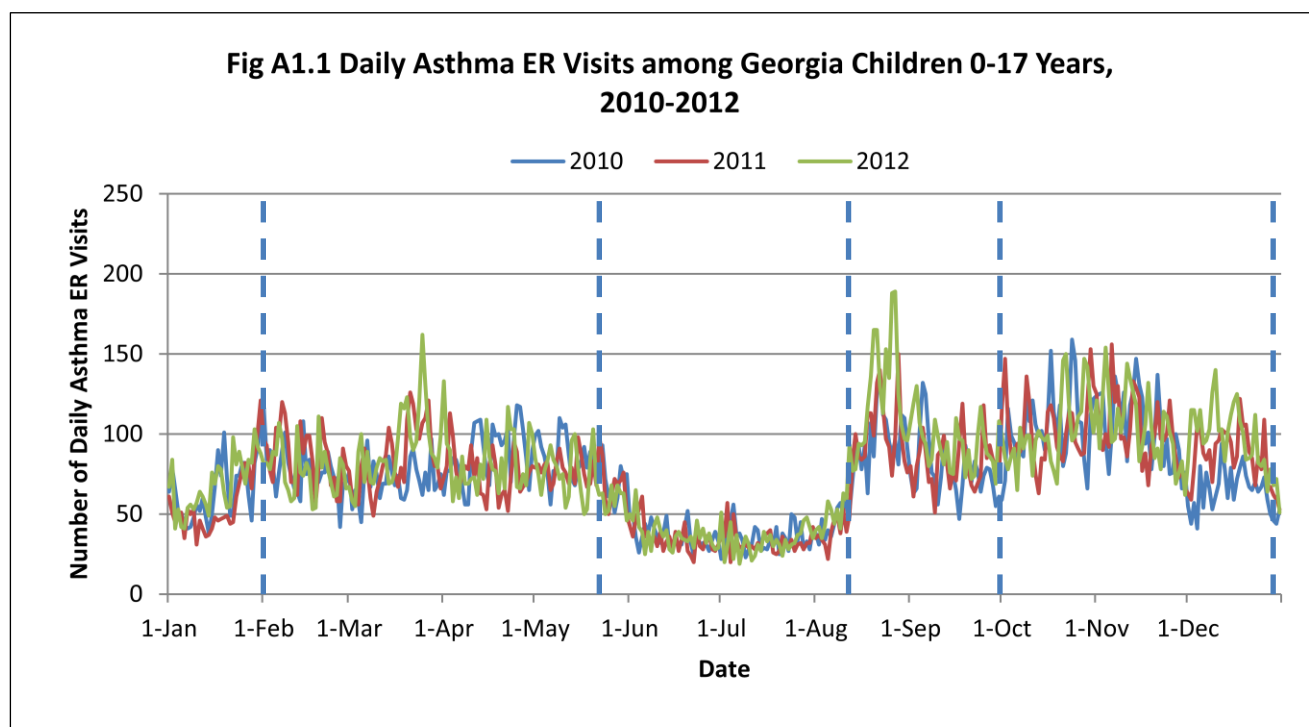


Fig A1.2. Asthma ER Visits among Georgia Children 0-17 Years, by Day of the Week, 2010-2012

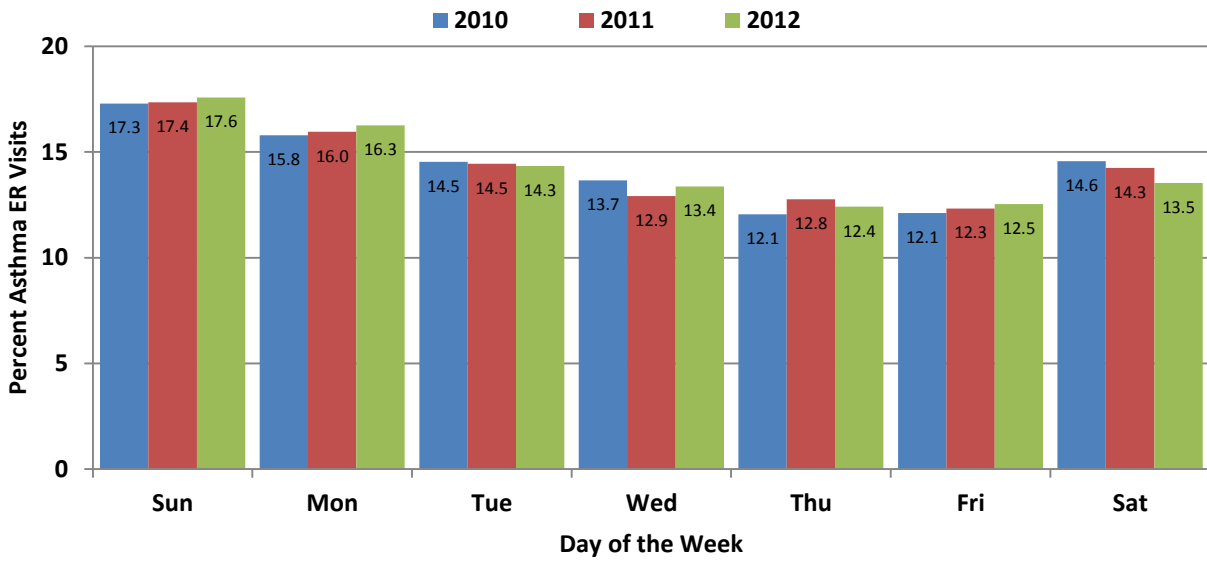
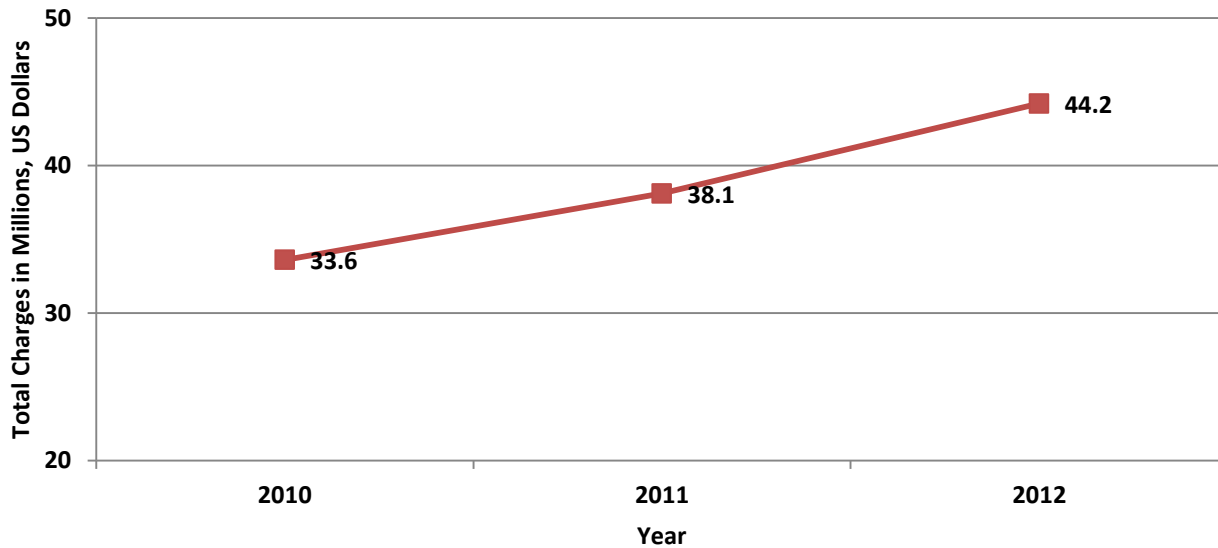


Fig A1.3. Total Charges for Asthma ER Visits among Georgia Children, by Year, 2010-2012



A1.2. Disparities in Asthma ER Visits among Georgia Children aged 0-17 Years

The rate of asthma ER visits among Georgia children was not randomly distributed. Children with specific demographic characteristics and in specified geographic locations had higher asthma ER visit rates than others. The overall asthma ER visit rate was highest among younger children (under 5 years), boys, blacks, and children living in urban areas.

In Georgia during 2010-2012:

- The average age-specific asthma ER visits rates per 100,000 were: 1,434 for children aged 0-4 year olds; 1,325 for 5-9 year olds; 818 for 10-14 year olds; and 505 for 15-17 year olds (Fig A1.4).
- Boys (1,316/100,000) had higher asthma ER visits rate than girls (839/100,000) (Fig A1.5).
- The rate of asthma ER visits was four times higher for black children (2,050/100,000) than for white children (502/100,000), and eight times higher for black children than for Asian children (272/100,000) (Fig A1.6).
- Children living in non-rural counties (1,122/100,000) had higher asthma ER visit rates than those living in rural counties (887/100,000) (Fig A1.7).
- The rate of asthma ER visits was higher among children residing in the following Georgia Public Health Districts (PHD); DeKalb, Fulton, East Central, and Clayton (Map A1.1).

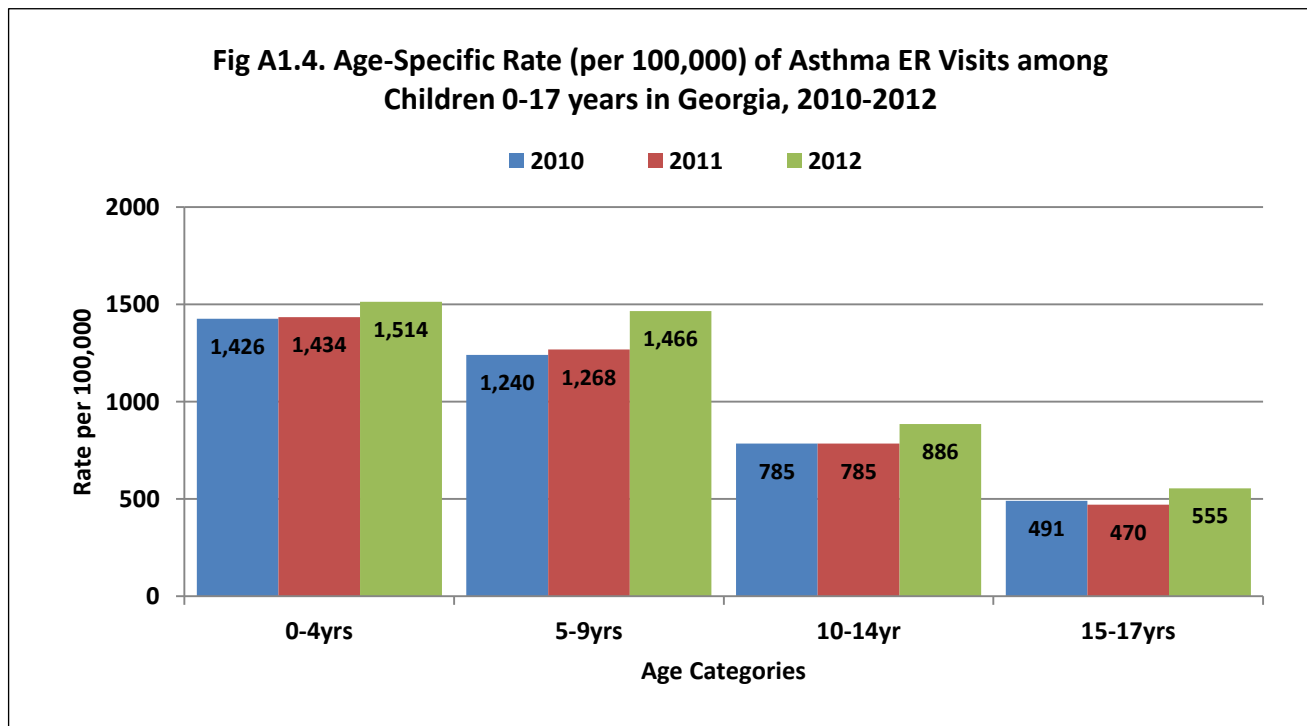


Fig A1.5. Rate of Asthma ER Visits among Children 0-17 years, by Gender, 2010-2012

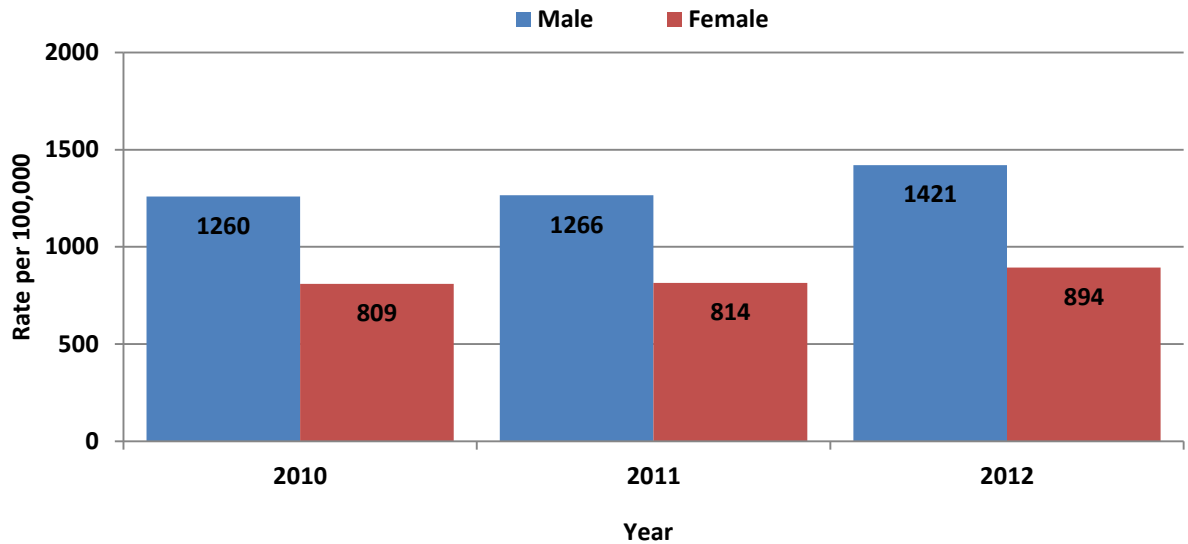
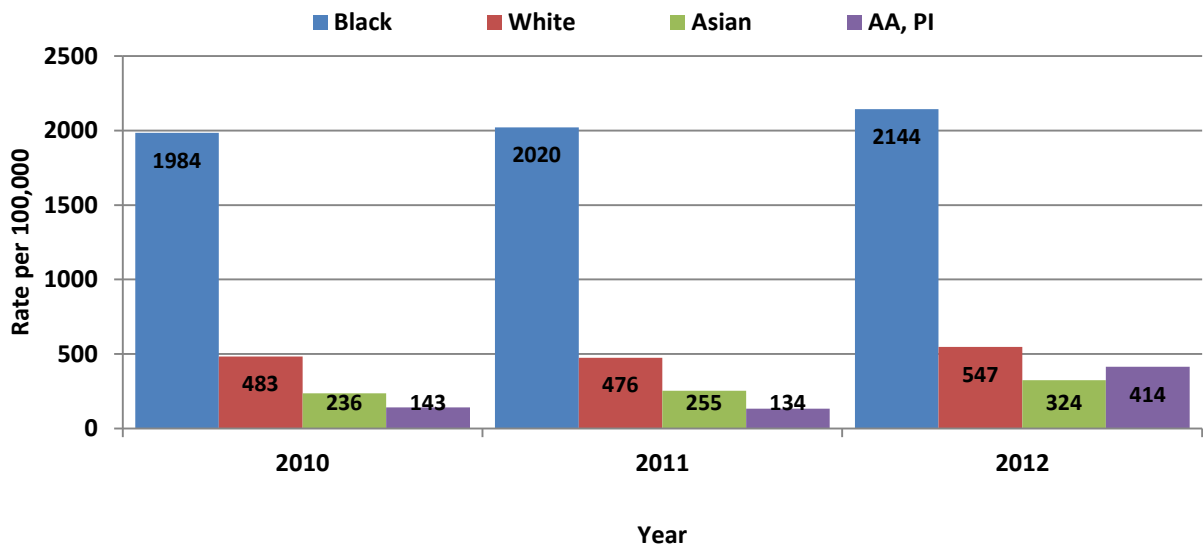


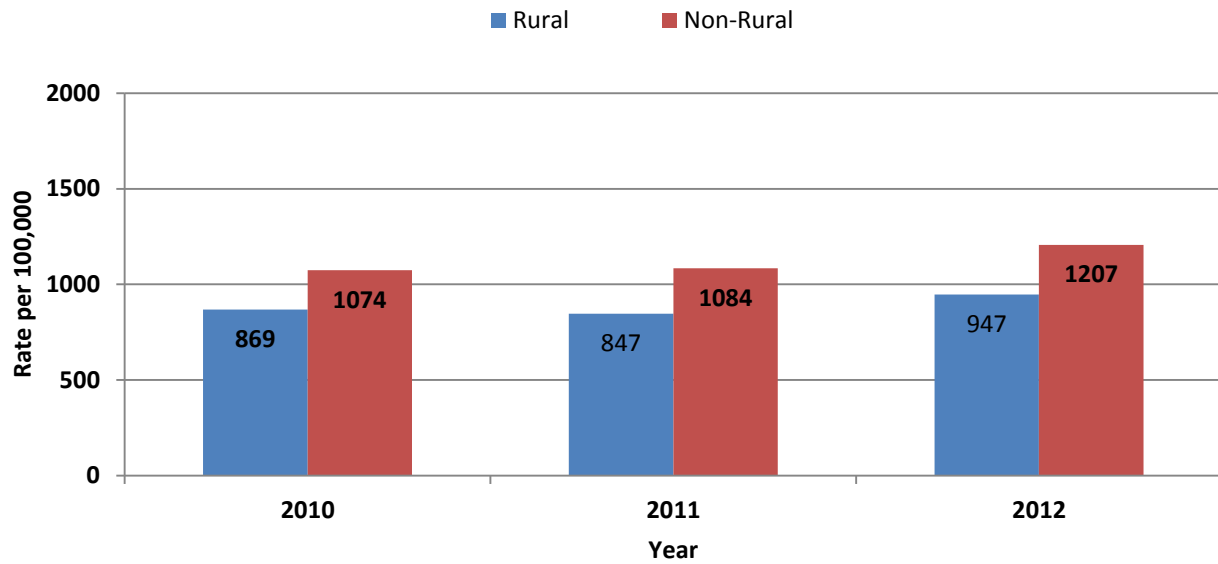
Fig A1.6. Rate of Asthma ER Visits among Children 0-17 years in Georgia, by Race, 2010-2012



Note: AA= American Indians or Alaska Natives, PI= Pacific Islanders

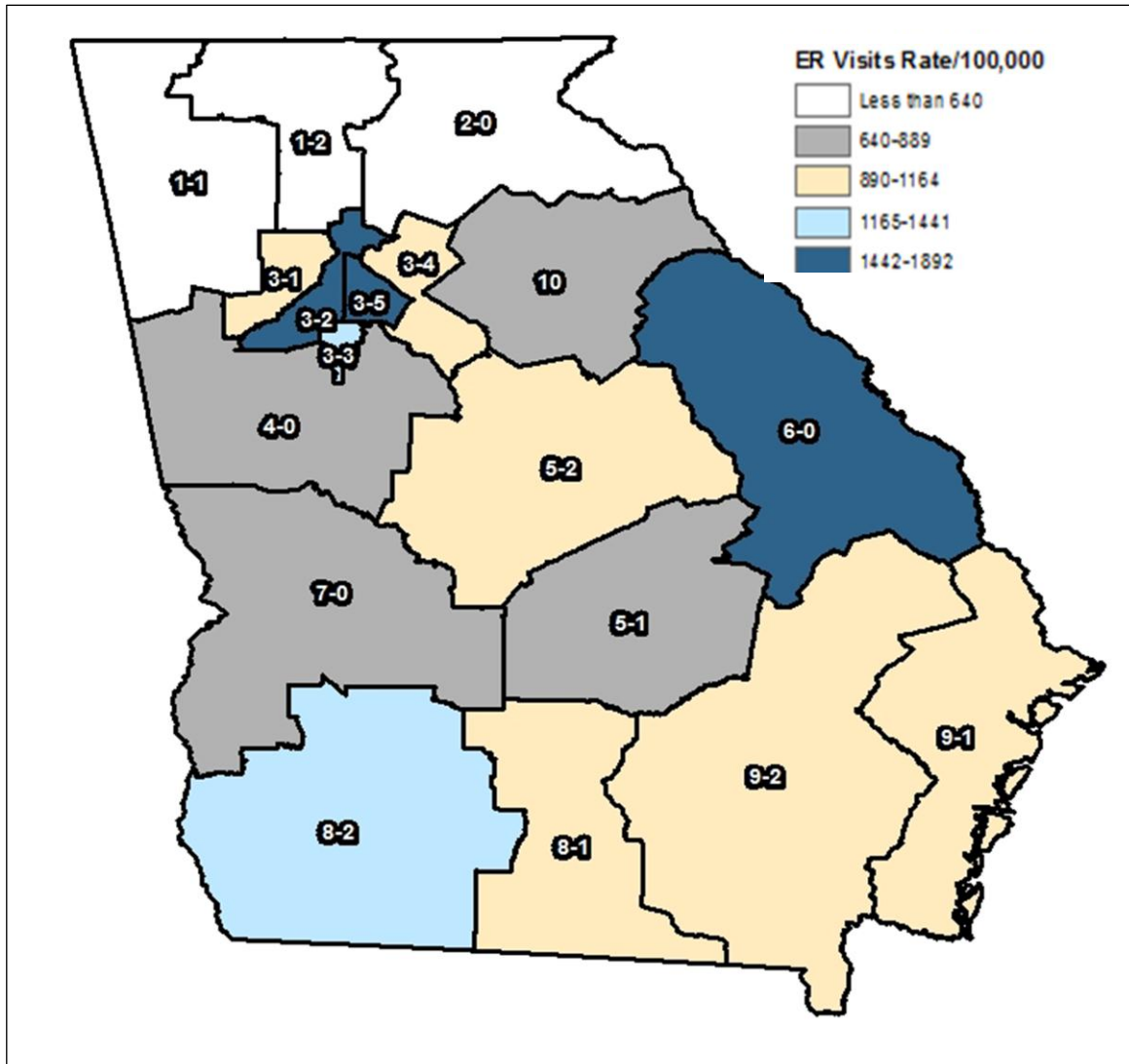
Asian is a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand and Vietnam.

Fig A1.7. Rate of Asthma ER Visits among Children 0-17 years in Georgia, by Rural/non-Rural Status, 2010-2012

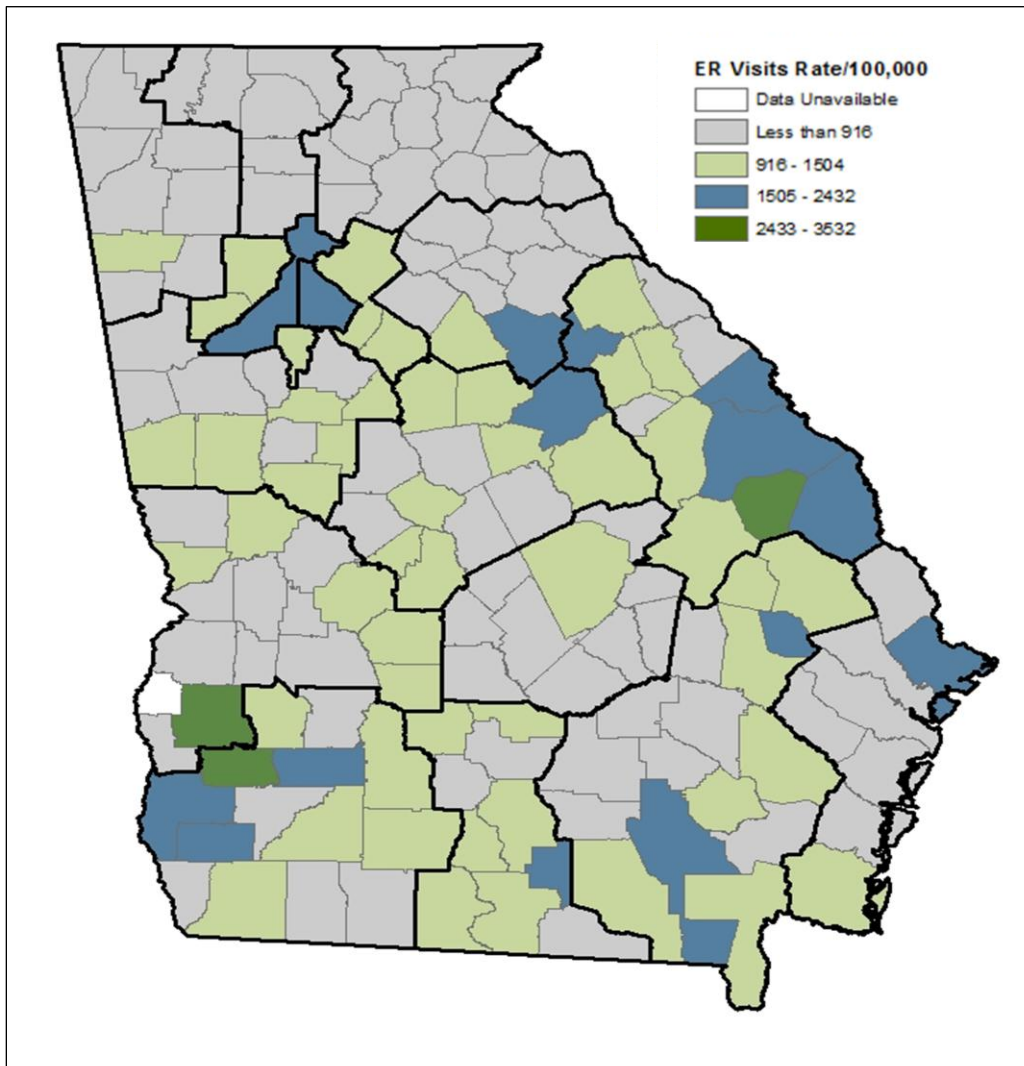


Non-Rural County: Any county with 35,000 or more total population per the 2000 Census.
Rural County: Any county with less than 35,000 total populations per the 2000 Census.

Map A1.1 – Rate of Asthma ER Visits among Georgia Children Aged 0-17 years, by Public Health Districts, 2010-2012



Map A1.2 – Rate of Asthma ER Visits among Georgia Children Aged 0-17 years, by County of Residence, 2010-2012



A1.3. Multiple Asthma ER Visits among Georgia Children aged 0-17 Years

Having more than one (or repeat) asthma ER visit within a calendar year may be an indication of uncontrolled asthma.

In Georgia during 2012:

- About 23,620 children aged 0-17 years had a total of 29,035 asthma ER visits.
- Of the children who had asthma ER visits, 3,854, representing about 16%, had a repeat asthma ER visits during the 2012 calendar year.
- Of those who had repeat asthma ER visits, 40% had 2 visits, 14% had three visits, 6% had four visits, and the remaining 39% had five or more visits during 2012.
- Among children 0-17 years, repeat asthma ER visits was more common in male, black, aged 5-11 years, and Medicaid, Medicare or Peachcare health insurers.
 - While 17% of boys had repeat asthma ER visits, 15% of girls did.
 - While 18% of African-American children had repeat asthma ER visits, 13.0% of white children did.
 - Whereas 18% of children aged 5-11 years had repeat asthma ER visits in 2012, 14% of children aged 0-4 years and 12-17 years each did.
 - Whereas 18% of Medicare, Medicaid, and Peachcare-insured children had repeat asthma ER visits, the number of repeat visits was lower among children covered by other payor types during 2012.

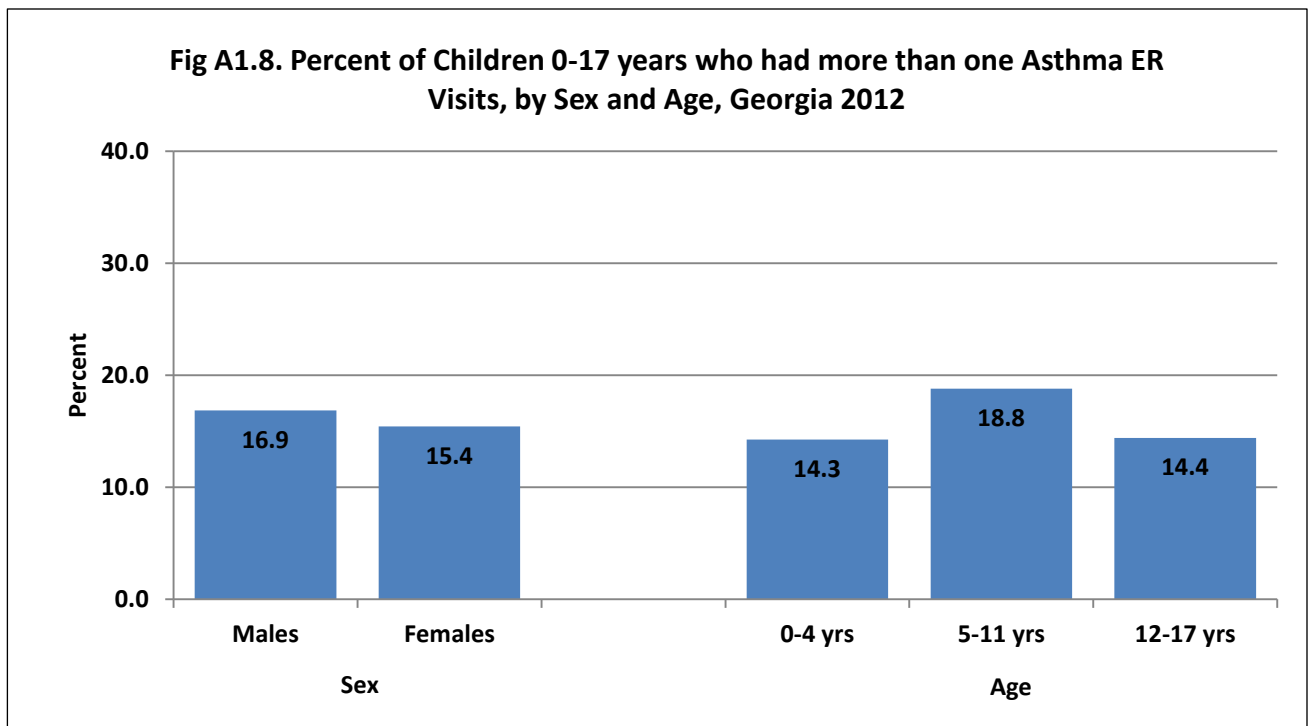
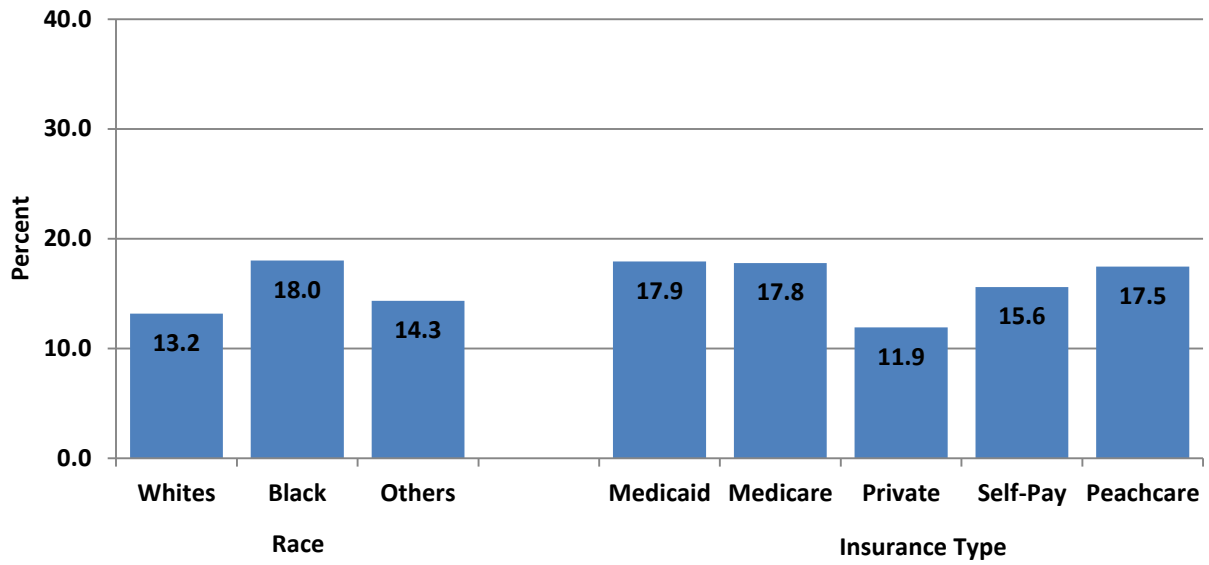


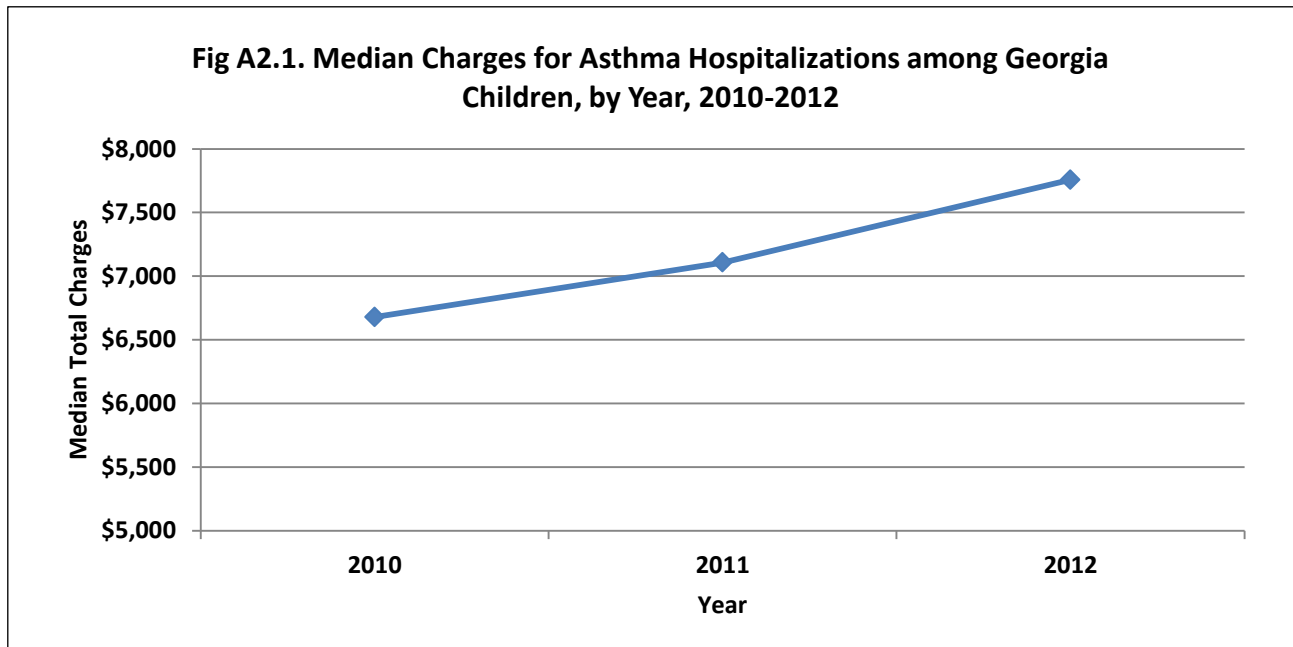
Fig A1.9. Percent of Children 0-17 who had more than one Asthma ER Visits, by Race and Payor Type, Georgia, 2012



A2. Hospitalizations

A2.1 Overall asthma hospitalizations among Georgia children

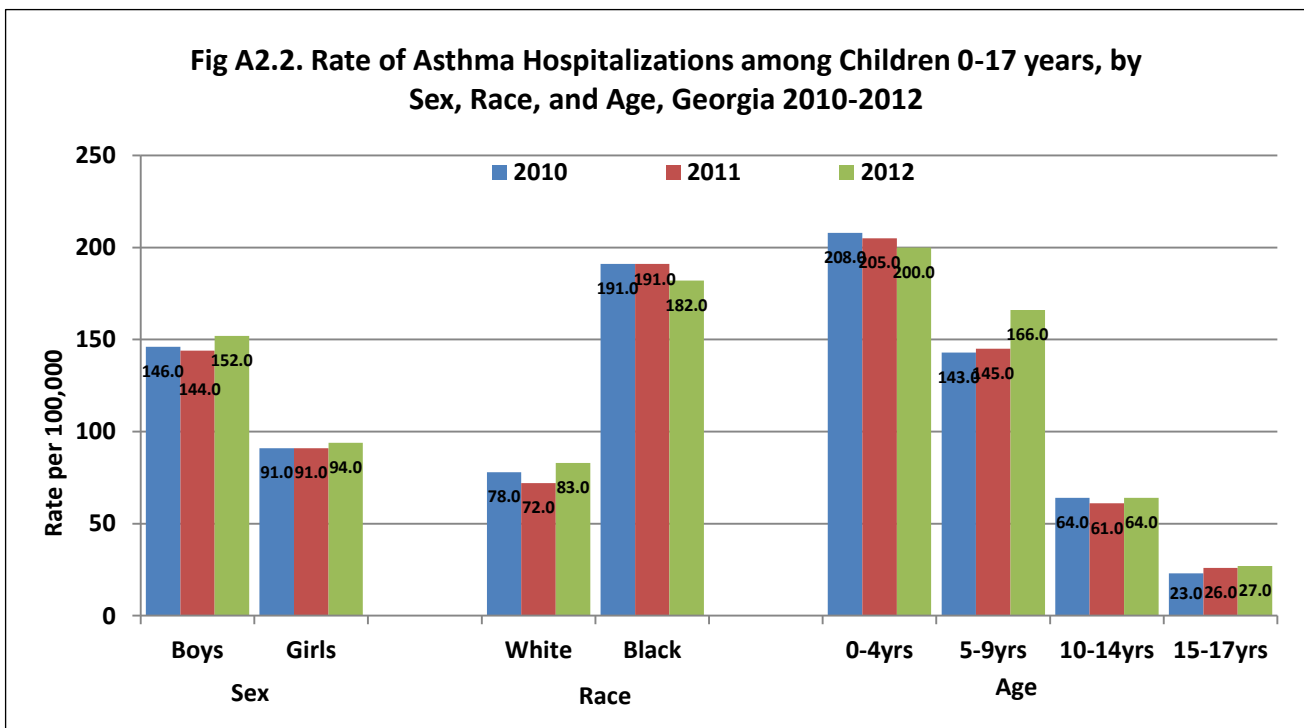
- Between 2010 and 2012, there were total of 8,987 hospitalizations among Georgia children aged 0-17 years, representing an overall hospitalization rate of 120 per 100,000. Specifically, there were: 2,965 (119/100,000) hospitalizations in 2010; 2,947 (118/100,000) hospitalizations in 2011; and 3,075 (123/100,000) hospitalizations in 2012.
- Two-thousand, seven hundred and fifty (2,750) children were hospitalized for asthma in Georgia during 2010, while 2,695 children and 2,881 children were hospitalized for asthma during 2011 and 2012 respectively.
- Children hospitalized for asthma in Georgia during 2012 spent an average of 2.2 days in the hospital.
- The total charges for asthma hospitalizations among children 0-17 years were approximately \$26.7 million, \$27.4 million and \$40 million for 2010, 2011 and 2012 respectively.
- The median total charges for asthma hospital admissions among children 0-17 years shifted upward from \$6,678 in 2010 to \$7,757 in 2012 (Fig A2.1).



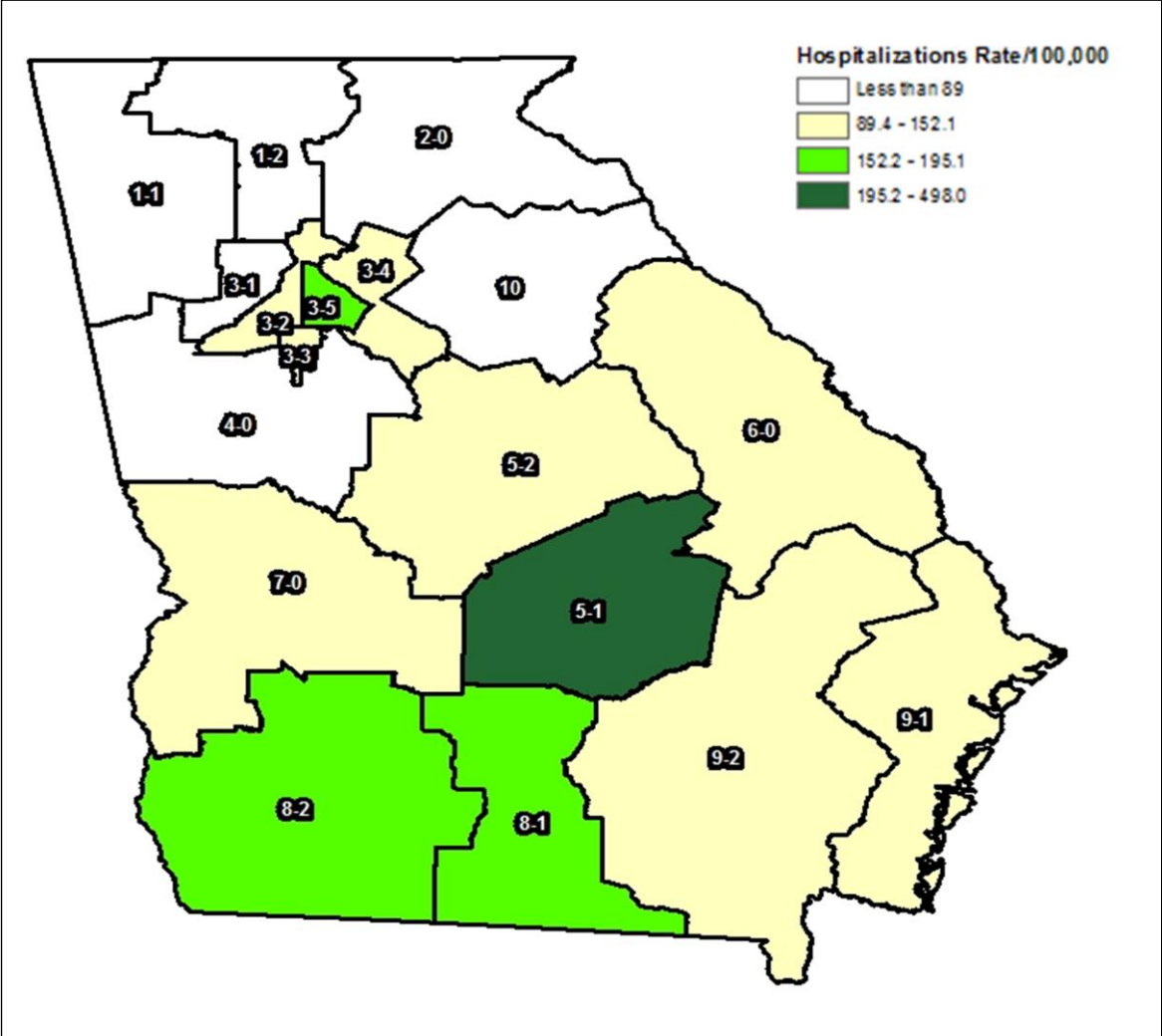
A2.2. Disparities in asthma hospitalizations among children

In Georgia during 2010-2012:

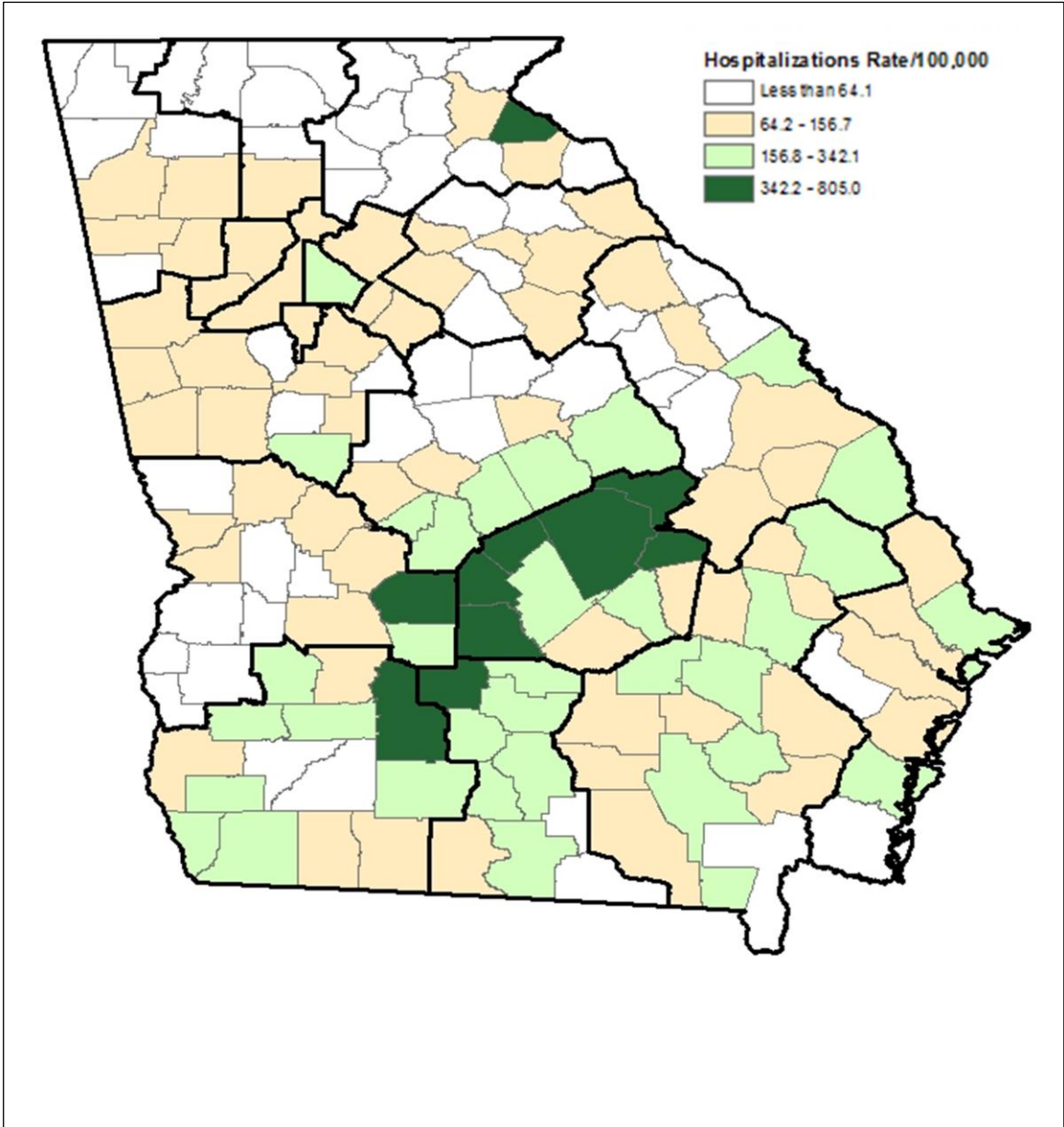
- The rate of asthma hospitalizations was higher among boys (average rate of 147/100,000) than girls (mean rate of 92/100,000) (Fig A2.2).
- The rate of asthma hospitalizations was higher among blacks and children 0-4 years of age (Fig A2.2).
- The South Central and DeKalb PHDs had the highest rates of asthma ER visits during 2010-2012 (Maps A2.1).



Map A2.1. Rate of Asthma Hospitalizations among Georgia Children Aged 0-17 years, by Public Health District, 2010-2012



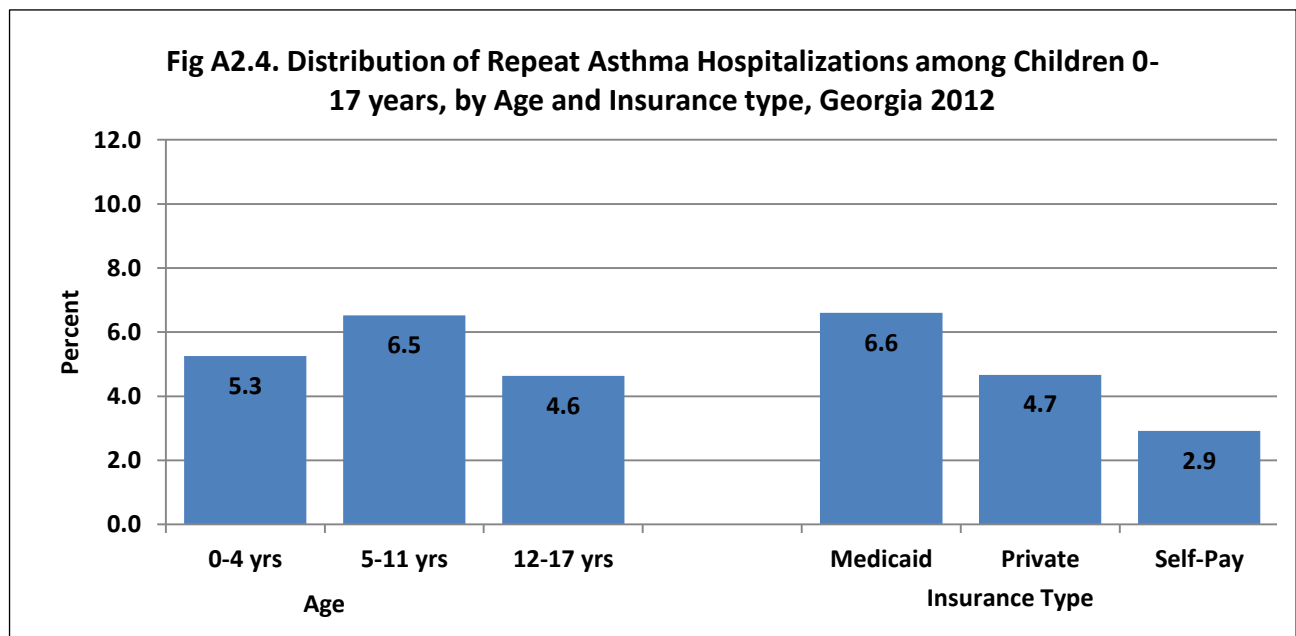
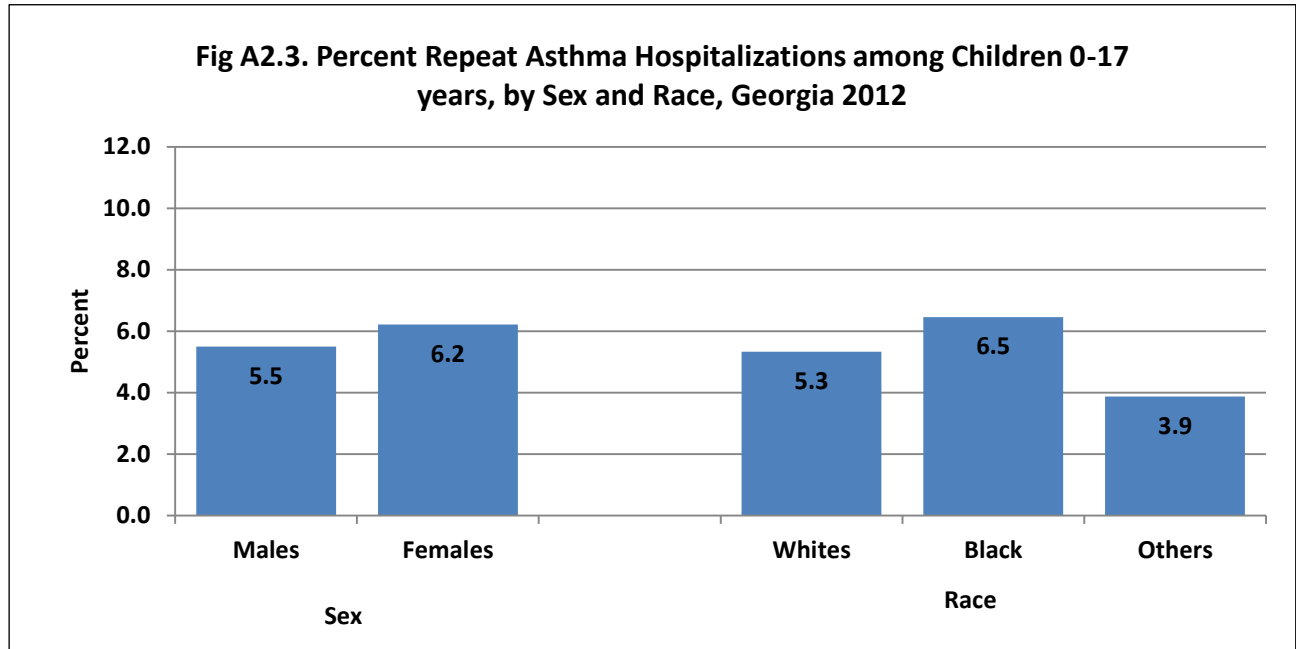
Map A2.2. Rate of Asthma Hospitalizations among Georgia Children Aged 0-17 years, by County of Residence, 2010-2012



A2.3. Repeat Asthma Hospitalizations among Georgia Children aged 0-17 years

In Georgia during 2012, 2,881 children aged 0-17 years were hospitalized 3,075 times for asthma during the calendar year.

- About 7% (194) of the children hospitalized for asthma in 2012 were hospitalized two or more times for asthma during the calendar year (repeat).
- A repeat asthma hospitalization was higher among girls, black children, Medicaid-insured and children 5-11 years of age (Figs A2.3 and A2.4).



PART B – ASTHMA IN ADULTS

Asthma Emergency Room Visits and Hospitalizations among Georgia Adults 18 years and older

Key Findings:

- Between 2010 and 2012, a total of 86,167 asthma-related ER visits occurred among Georgia adults, an average of 28,700 visits per year and at an average rate of 392/100,000 population.
- Total charges from adult asthma ER visits increased during 2010-2012, from \$49.5 million in 2010 to \$60.0 million in 2011 and to \$68.1 million in 2012.
- Among Georgia adults, the number of asthma-related ER visits was highest among blacks and females.
- Among adults who visited the ER for asthma in 2012, approximately 18% had two or more ER visits within the year.
- Between 2010 and 2012, there were total of 21,946 asthma-related hospitalizations among adults 18 years and older with asthma listed as the principal diagnosis: 7,436 in 2010; 7,344 in 2011; and 7,166 in 2012.
- The rate of asthma hospitalizations among adults was highest among blacks, women, and those aged 65 years and older.
- Of Georgia adults hospitalized for asthma in 2012, about 13% were hospitalized two or more times during the calendar year.

B1. Asthma ER Visits

B1.1 Overall asthma ER visit trends among Georgia Adults 18 years and older

- In Georgia during 2010-2012, there were three notable periods in each year when the number of asthma ER visits was high among adults- during April to early May, in mid-September, and during November through to December (Fig B1.1).
- The daily ER visit trend in adults seems to mimic that of children but the peaks were lower than those observed in children.
- The number of daily asthma ER visits among Georgia adults was higher during Sundays and Mondays (Fig B1.2).
- In Georgia during 2010 to 2012, the estimated total charges for asthma ER visits among adults 18 years and older was \$173.6 million; \$49.5 for 2010, \$60.0 million for 2011, and \$68.1 million for 2012.
- The median total charges per adult asthma ER visit shifted upward between 2010 and 2012; from \$1,344 in 2010 to \$1,491 in 2012 (Fig B1.3).

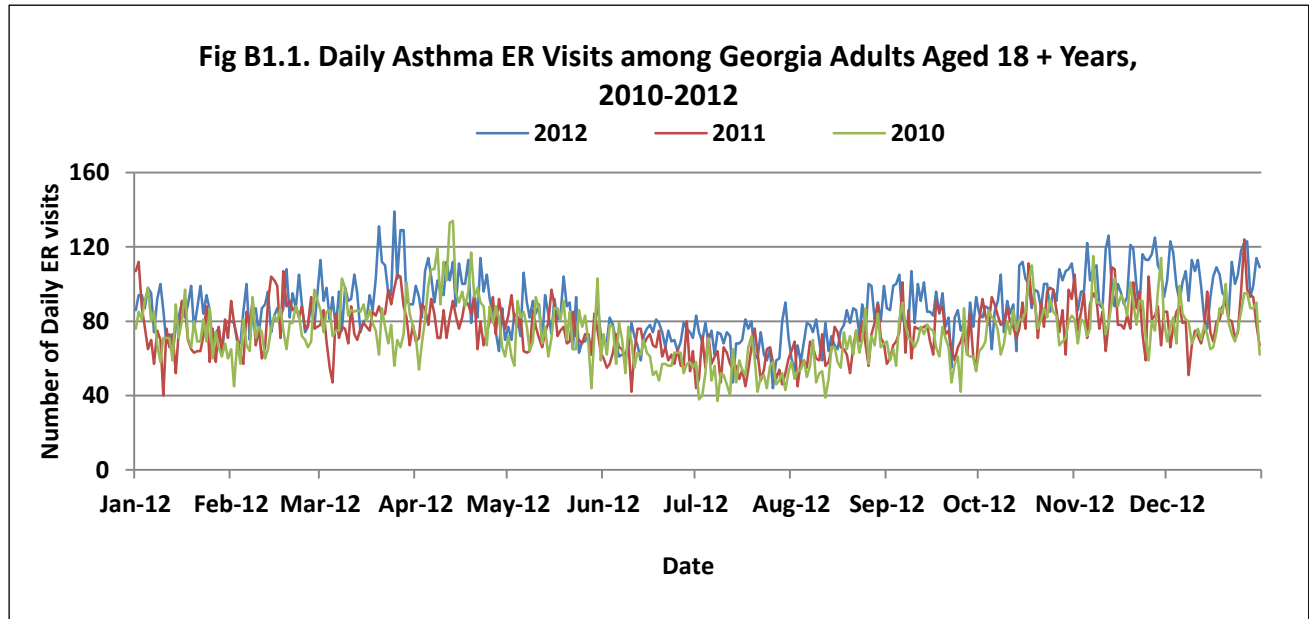


Fig B1.2. Percent Asthma ER Visits among Georgia Adults, 18+ Years, by Day of the Week, 2010-2012

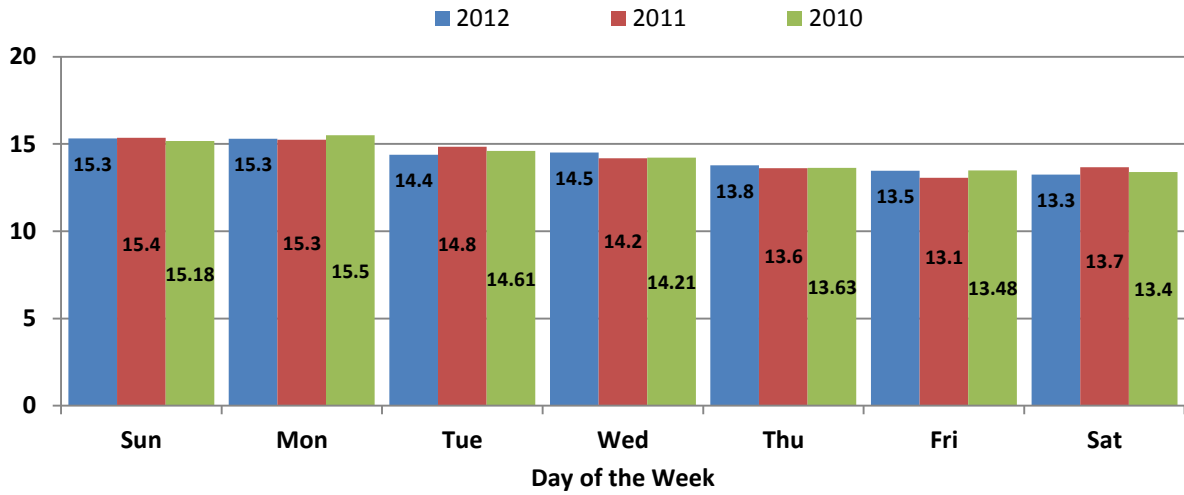
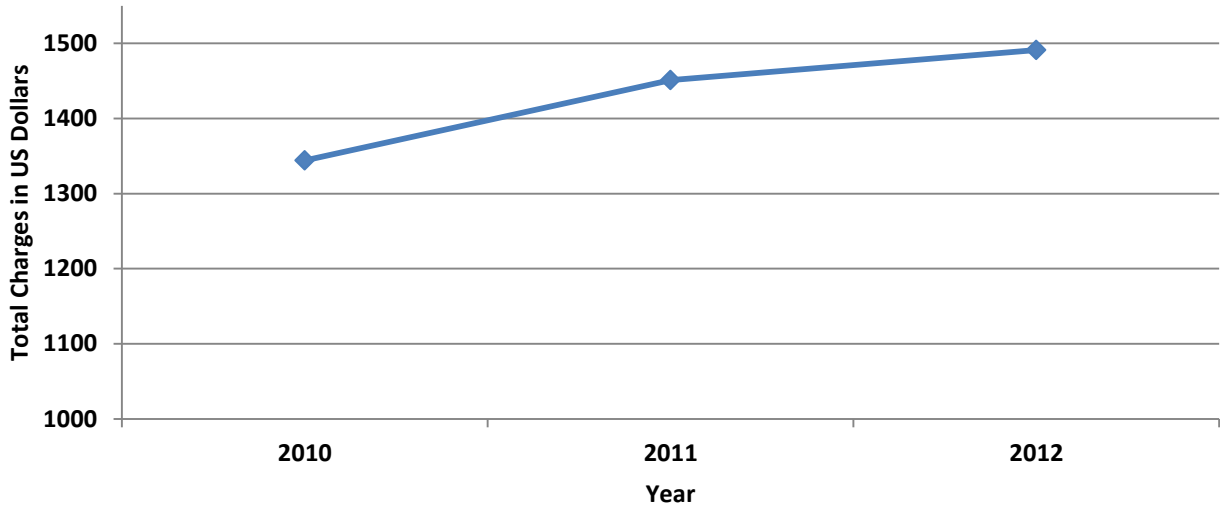
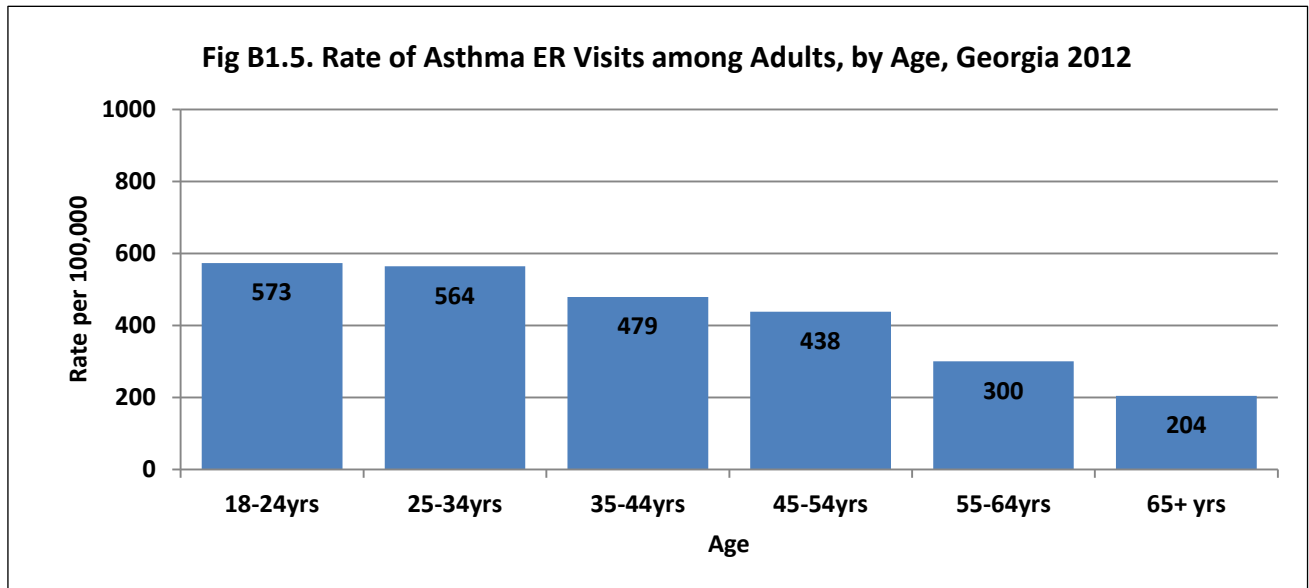
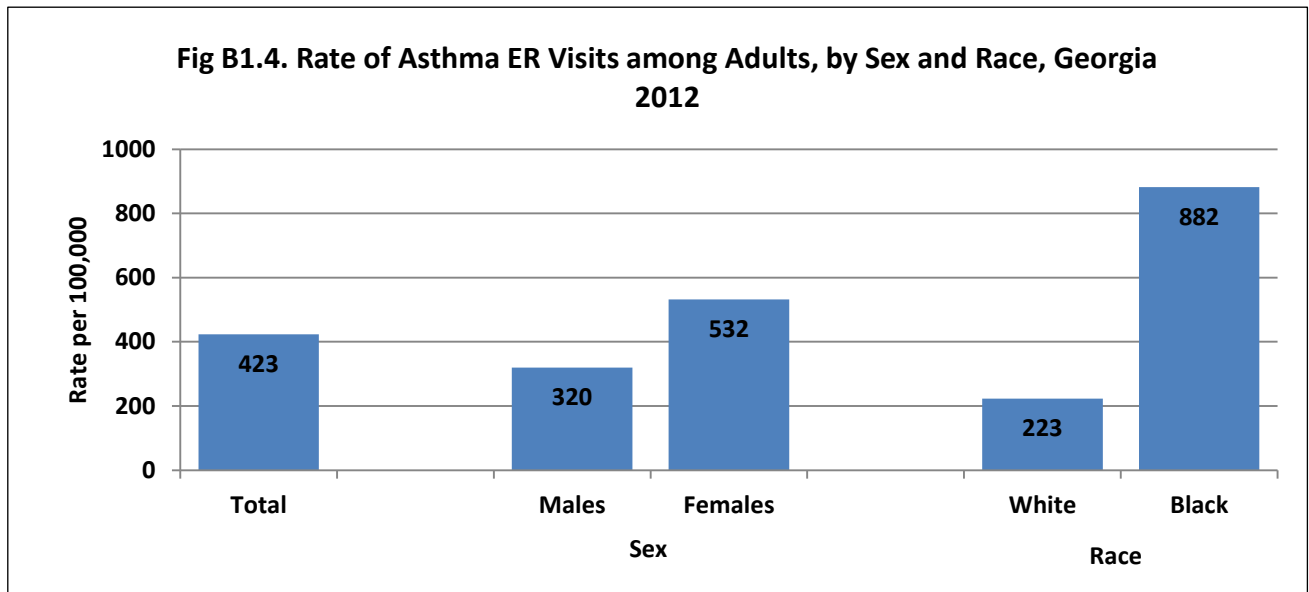


Fig B1.3. Median Total Charges Per Visit, Adult Asthma ER Visits, Georgia 2010-2012



B1.2. Disparities in Adult Asthma ER visits

- The total asthma ER visit rate among adults 18 years and older during 2012 was 430/100,000.
- The rate was higher among females (532/100,000) than males (320/100,000), which is in contrast to the results from children when comparing boys to girls (Fig B1.4).
- The rate was almost four times higher among blacks (882/100,000) than whites (223/100,000). (Fig B1.4).
- The rate of asthma ER visits decreased with increasing age among adults (Fig B1.5).



B1.3. Repeat Asthma ER Visits among Adults

In Georgia during 2012:

- Approximately 23,300 adults had 31,929 asthma ER visits.
- Of adults who visited the ER for asthma, 19,212 (82.5%) had one visit in the calendar year while the remaining 4,079 (17.5%) had two or more asthma ER visits.
- Of those who had repeat asthma ER visits, 39.2% had two visits, 20.5% had three visits, and 13.1% had four visits, while the remaining 27.6% had five or more visits during the calendar year (Fig B1.6).
- Having repeat asthma ER visits was more common among males, blacks and those 25-34 years of age (Fig B1.8).
- Having repeat asthma ER visits was higher among the Medicaid population and those who indicated as self-paying (Fig B1.9).

Fig B1.6. Percent of Adults with Repeat Asthma ER Visits and the Number of Times they visited the ER, Georgia, 2012

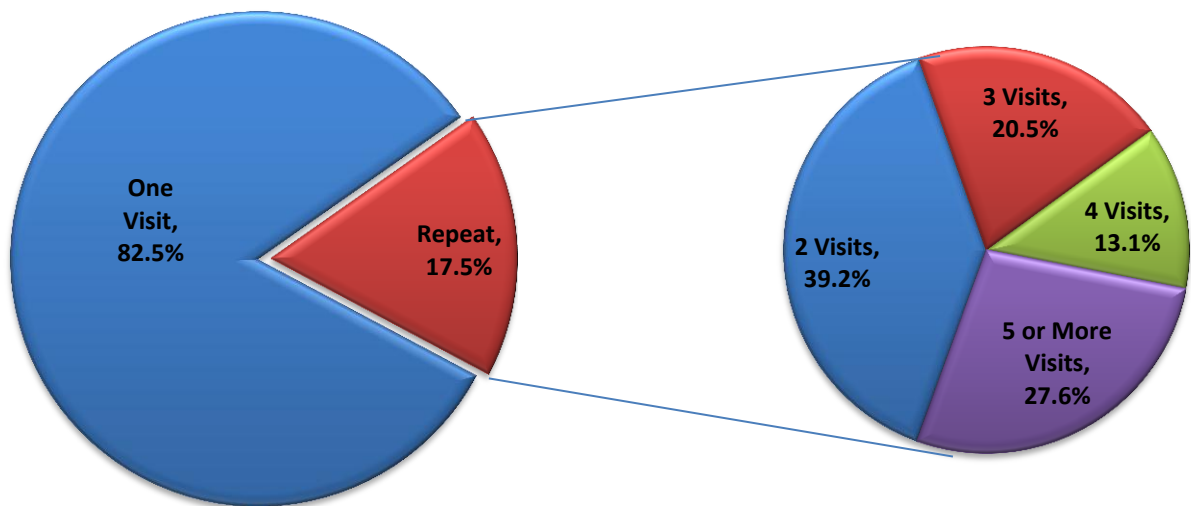


Fig B1.7. Percent Repeat Asthma ER Visits among Adults, by Sex and Race, Georgia, 2012

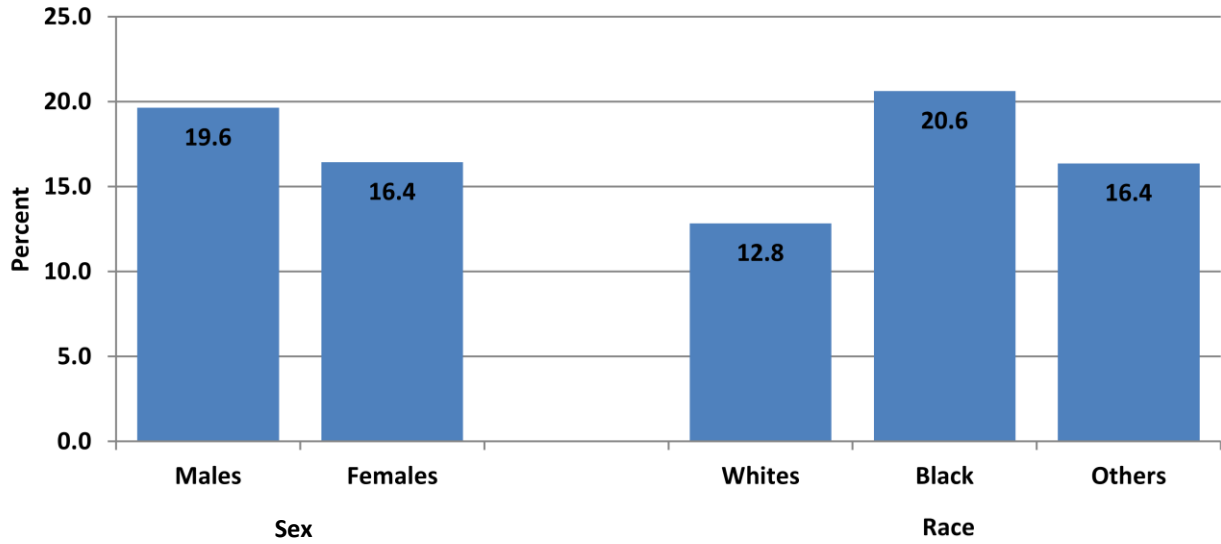
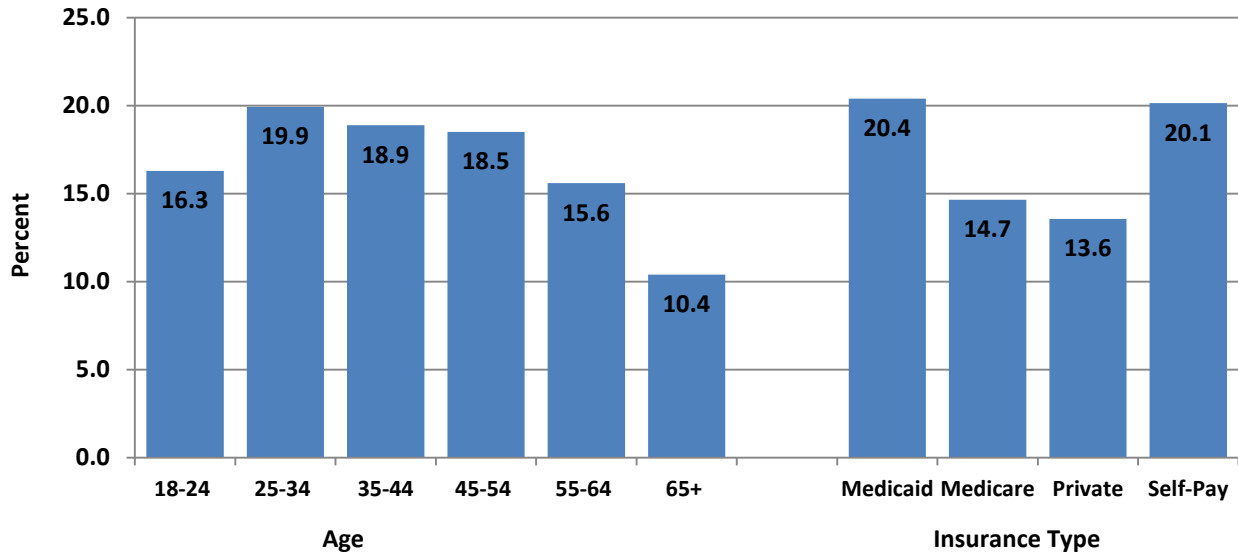
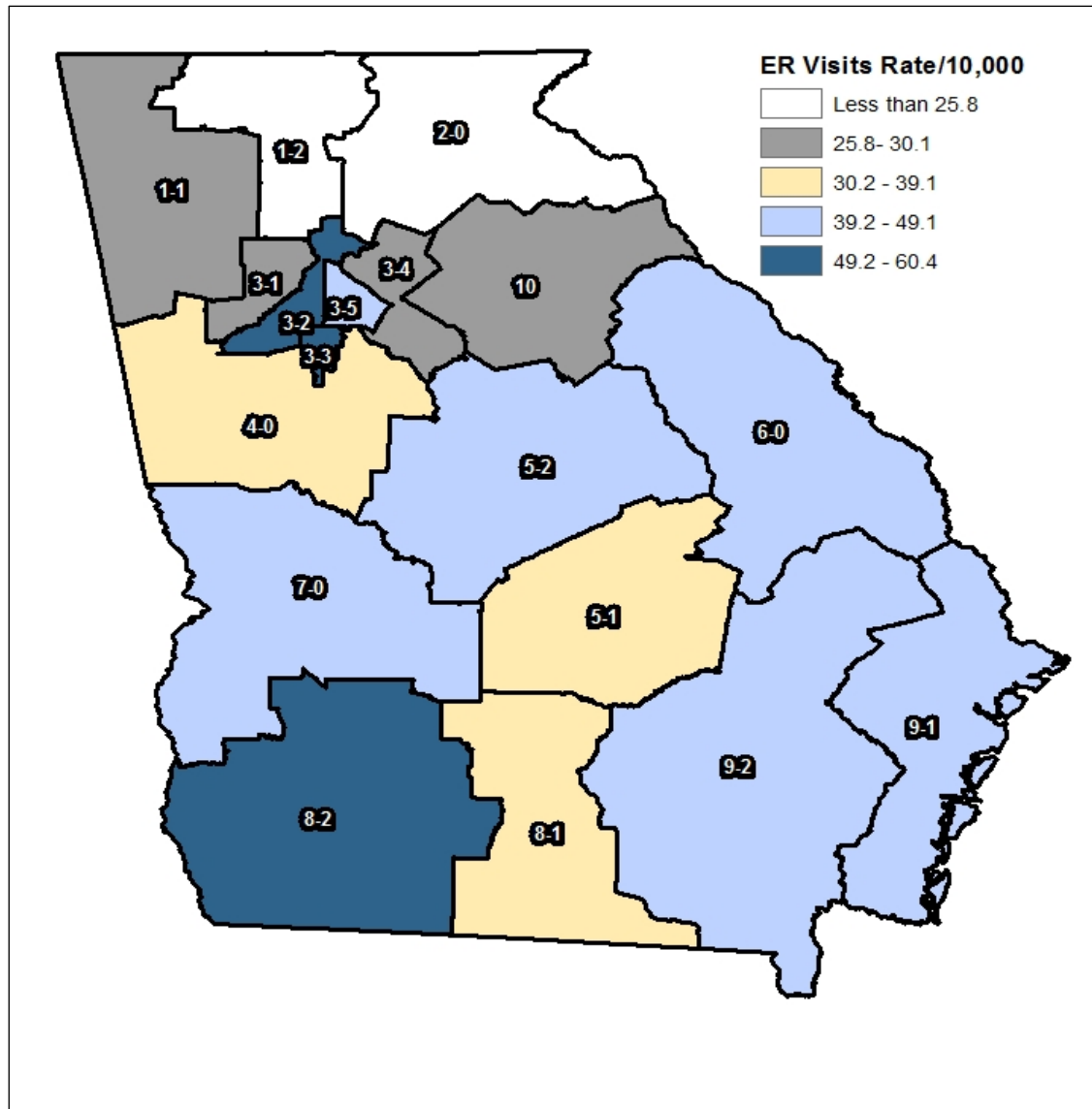


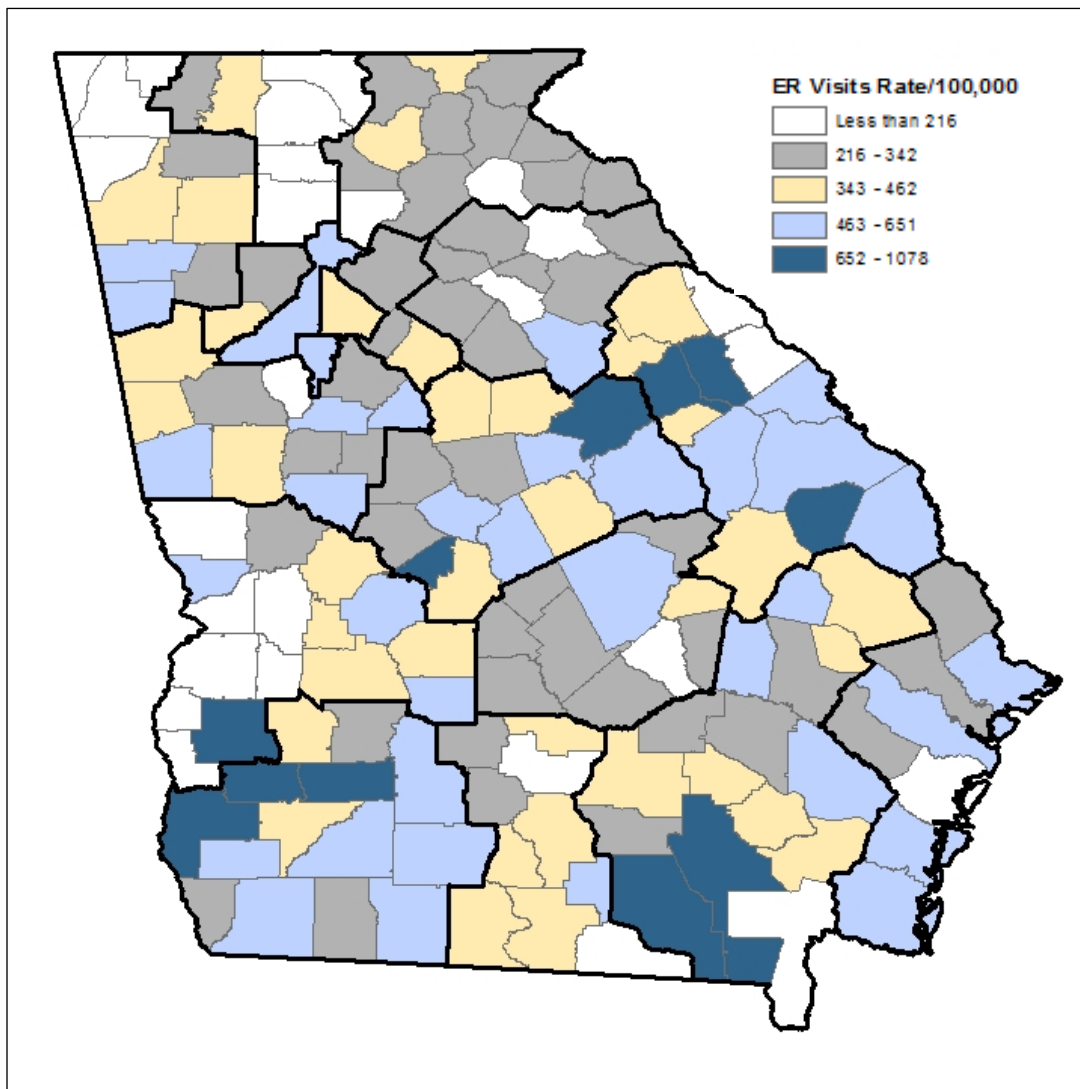
Fig B1.8. Percent Repeat Asthma ER Visits among Adults, by Age and Insurance Source, Georgia, 2012



Map B1.1 – Rate of Asthma ER Visits among Georgia Adults 18+ years, by Public Health District, 2010-2012



Map B1.2 – Rate of Asthma ER Visits among Georgia Adults 18+ years, by County of residence, 2010-2012



B2. Asthma Hospitalizations among Adults

B2.1. Overall trend of asthma hospitalizations among Georgia adults

- Between 2010 and 2012, there were a total of 21,946 hospitalizations among adults aged 18 years and older with asthma listed as the principal diagnosis: 7,436 in 2010; 7,344 in 2011; and 7,166 in 2012.
- The rate of asthma hospitalizations among adults during; 2010 was 103/100,000, in 2011, it was 100/100,000, and in 2012, it was 97/100,000.
- The asthma hospitalization rate was higher among males, blacks, adults aged 65 years and older, and residents of rural counties (Fig B2.1 and B2.2).
- The rate of asthma hospitalizations among adults was higher in the North Central, Southwest and Southeast Public Health Districts (Map B2.1).

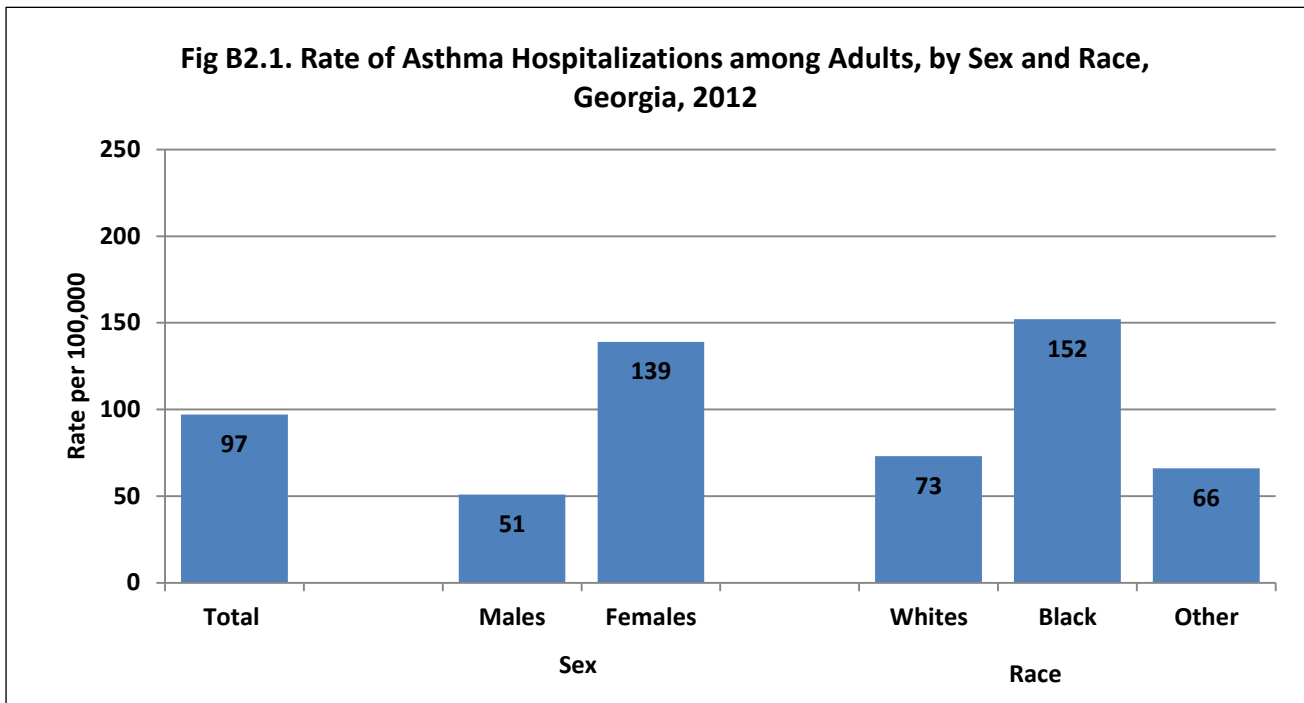
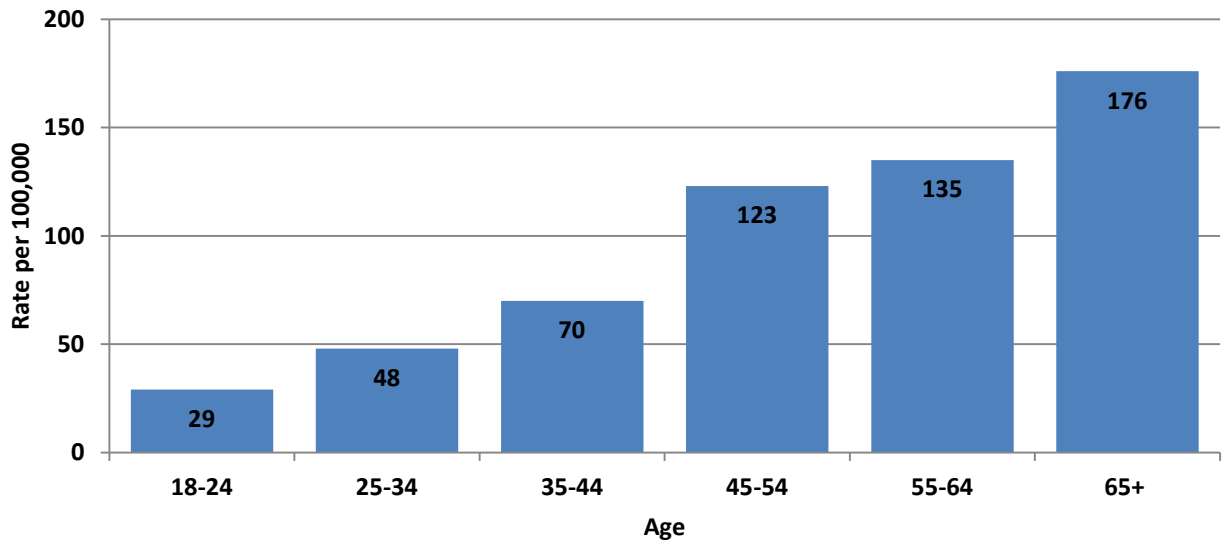


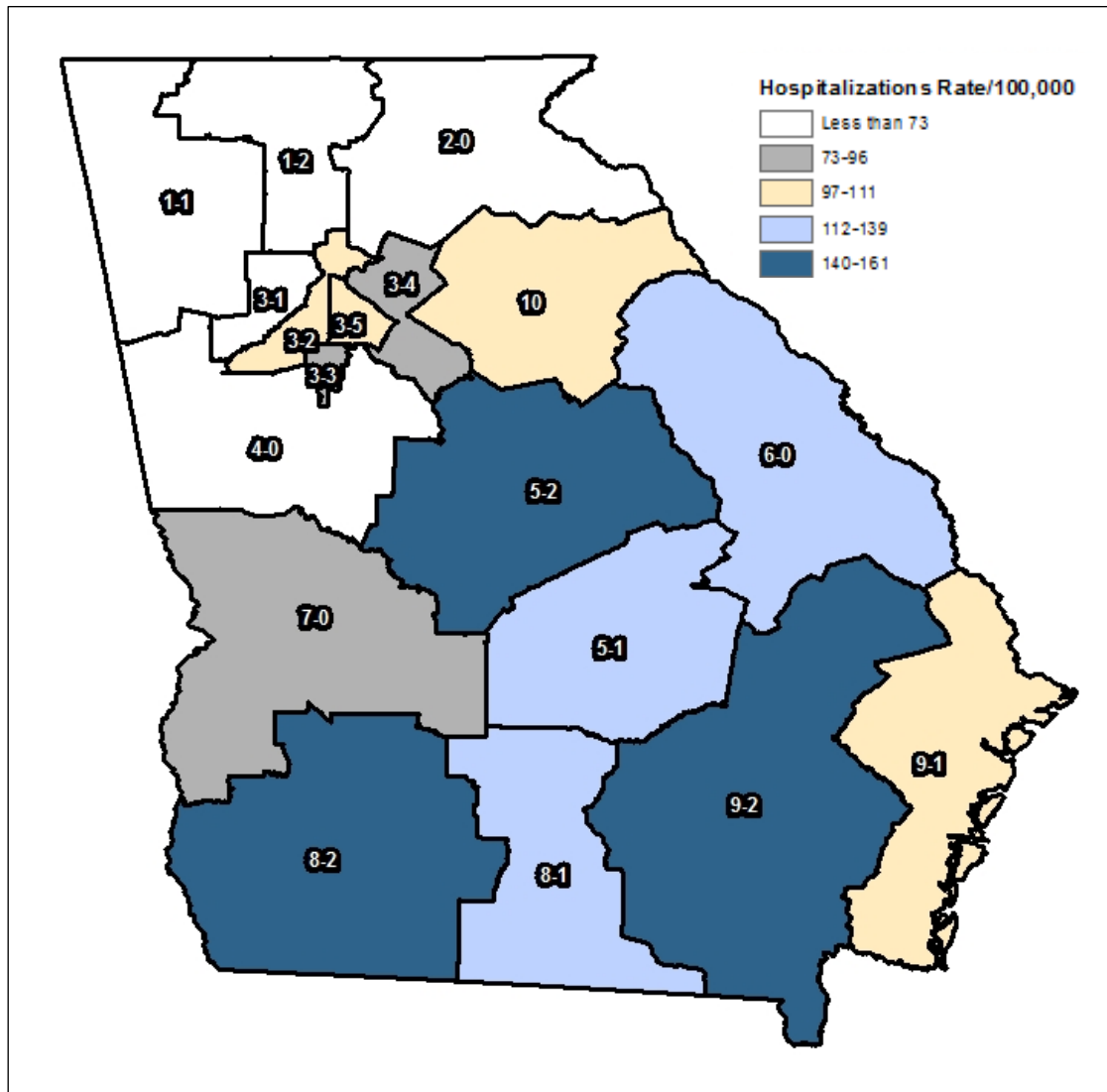
Fig B2.2. Rate of Asthma Hospitalizations among Adults, by Age, Georgia, 2012



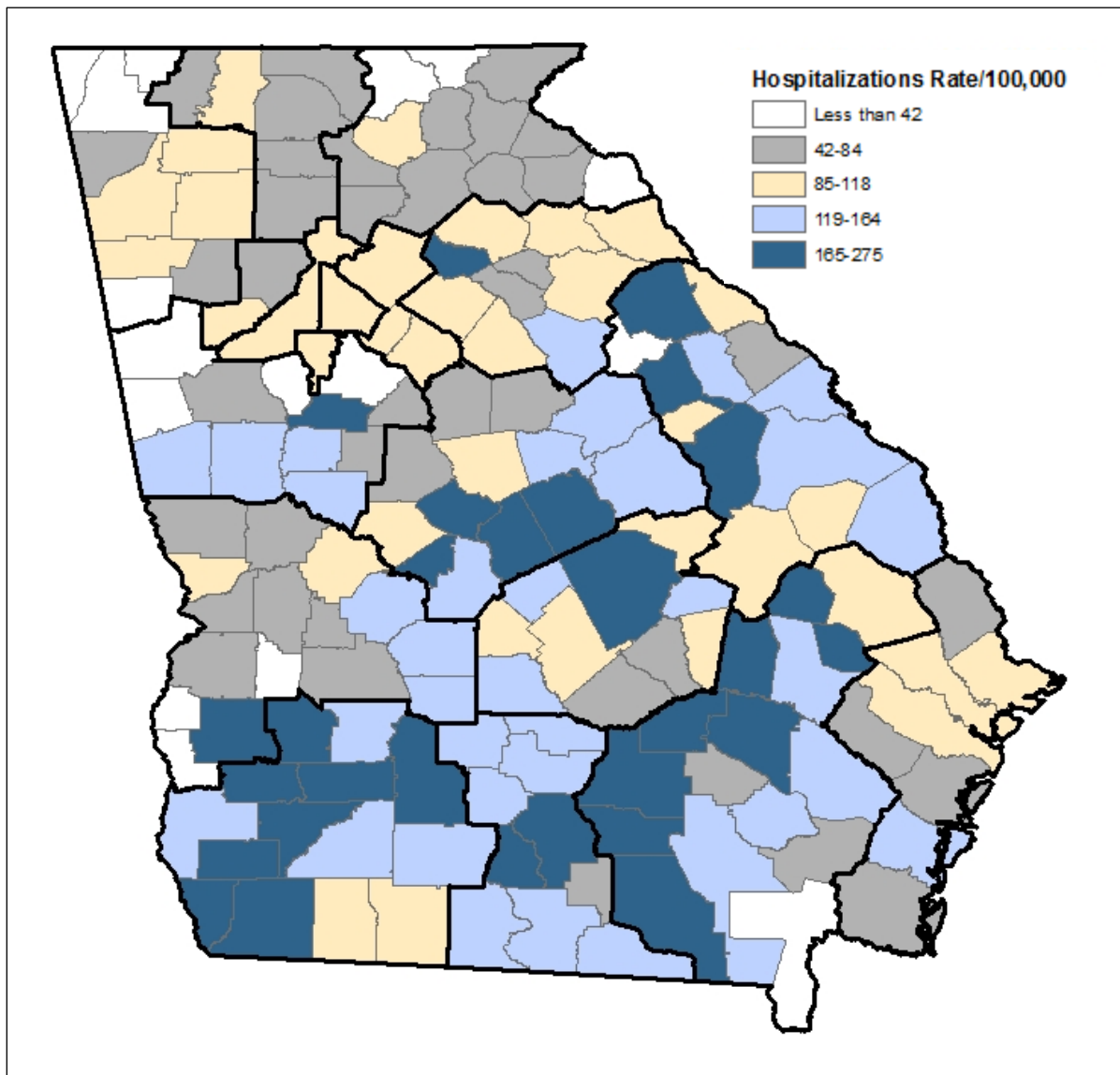
Non-Rural County: Any county with 35,000 or more total population per the 2000 Census.

Rural County: Any county with less than 35,000 total populations per the 2000 Census.

Map B2.1. Rate of Asthma Hospitalizations (per 100,000) among Georgia Adults Aged 18 years and older, by Public Health District, 2010-2012



Map B2.2. Rate of Asthma Hospitalizations (per 100,000) among Georgia Adults Aged 18+ years, by County of Residence, Georgia 2010-2012



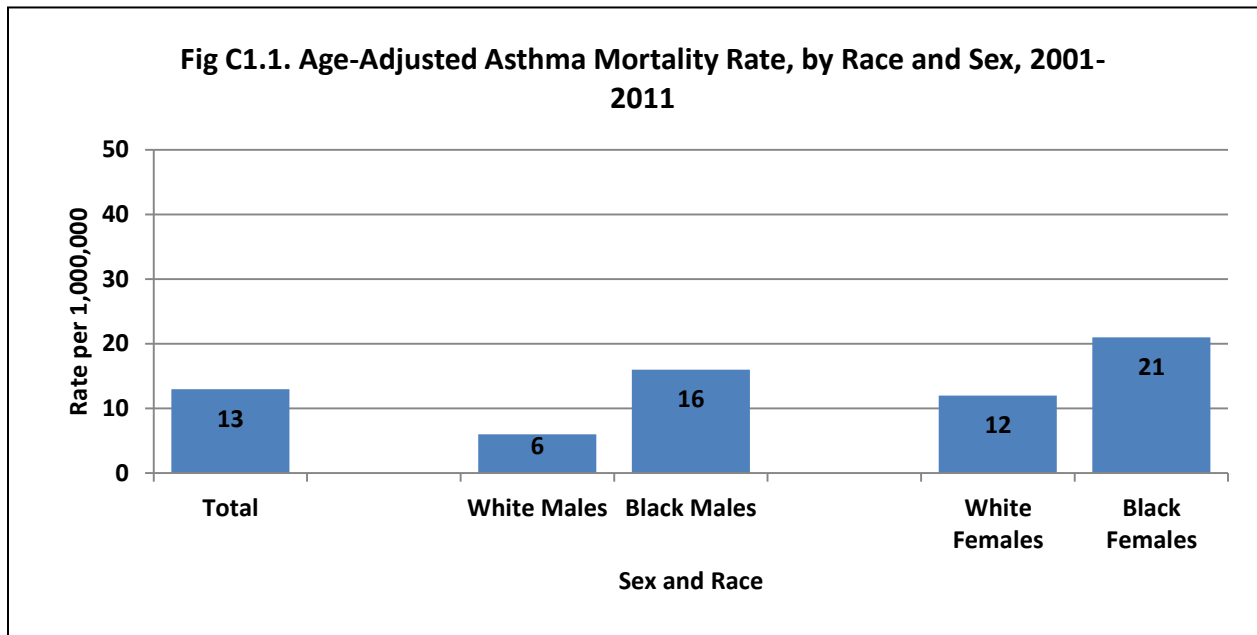
PART C – ASTHMA MORTALITY

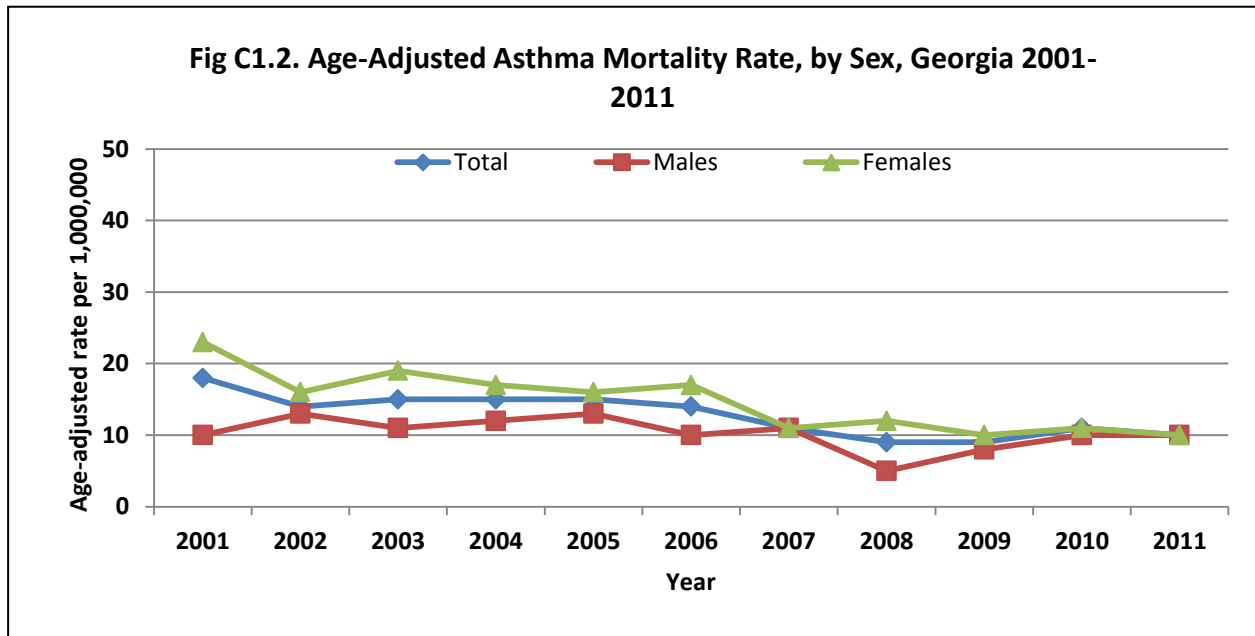
Key findings

- Between 2001 and 2011, there were 1,145 asthma-related deaths in Georgia, representing an age-adjusted asthma mortality rate of 13.0 per 1,000,000 deaths.
- Overall, the age-adjusted asthma mortality rate significantly declined between 2001 and 2011 in Georgia.
- The age-adjusted asthma mortality rate was significantly higher among blacks than whites and among females than in males.

C1.1. Overall age-adjusted asthma mortality rate in Georgia between 2001 and 2011

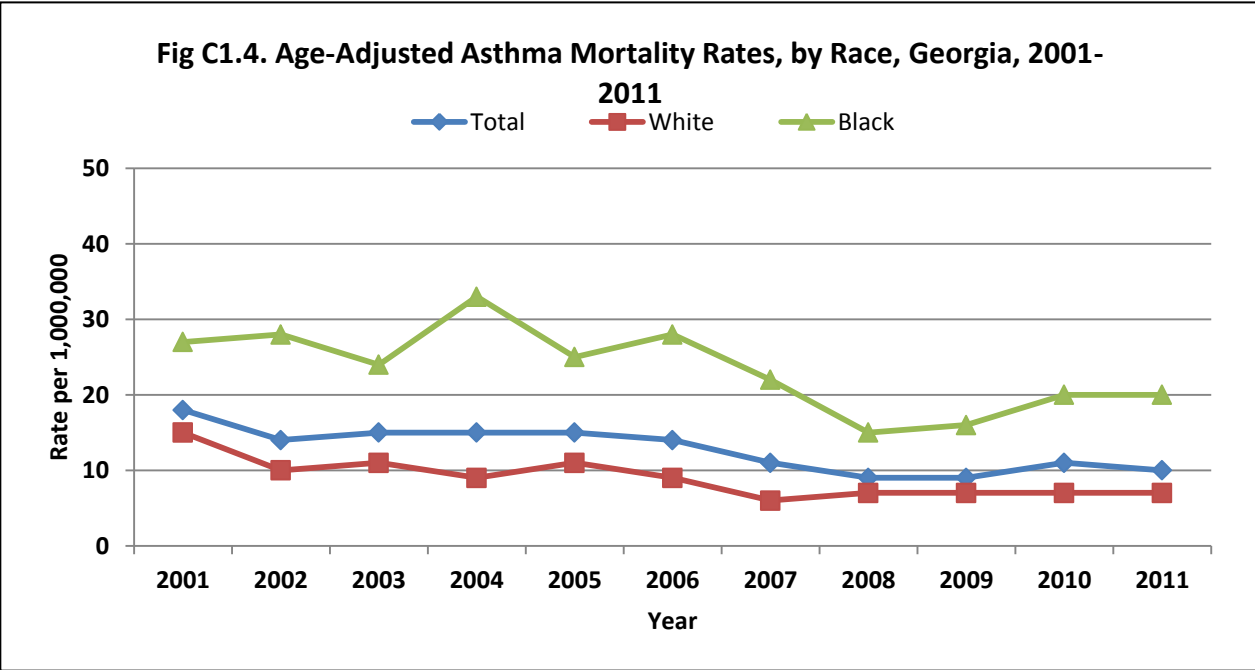
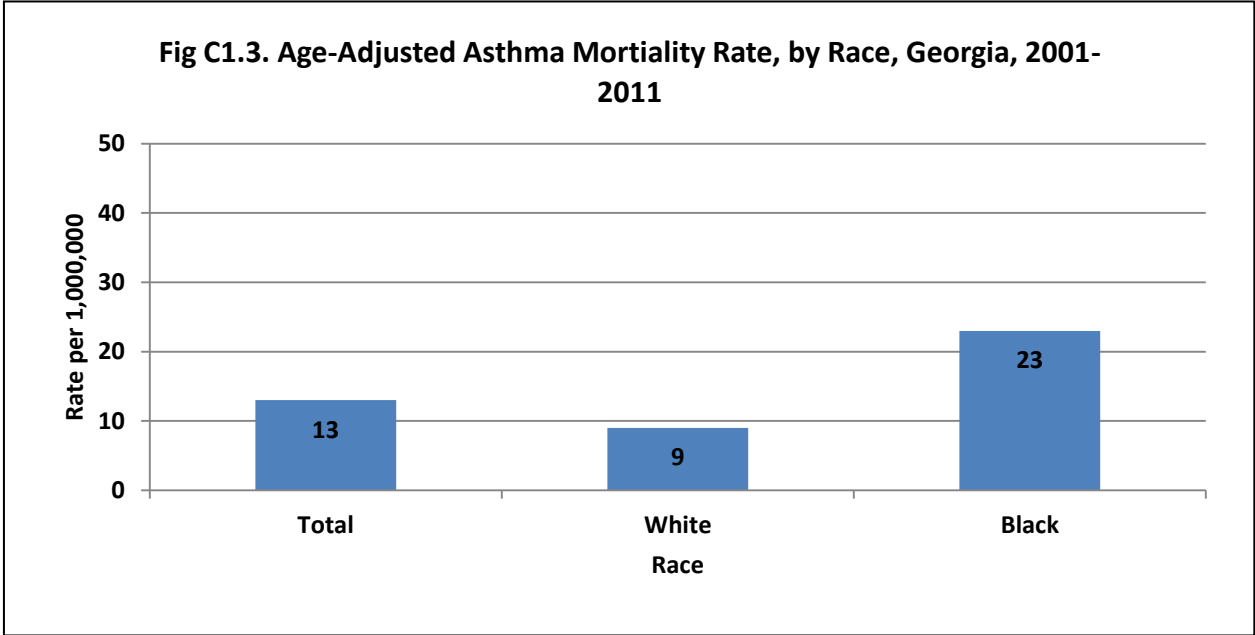
- Between 2001 and 2011, there were 1,145 asthma deaths (60 in children and 1,085 in adults) in Georgia, representing an age-adjusted asthma mortality rate of 13 per 1,000,000 deaths.
- Among children, the annual number of asthma deaths ranged between 1 (in 2004) and 9 (2002 and 2006).
- Among adults, the annual number of asthma deaths in Georgia ranged between 79 (in 2009) and 121 (2001).
- The age-adjusted asthma mortality rate was significantly higher among females (14.0/1,000,000; 95% CI=13.0-15.0) than males (10.0/1,000,000; 95% 9.0-10.9).
- The overall age-adjusted asthma mortality rate decreased from 18.0 per 1,000,000 in 2001 to 10.0 per 1,000,000 in 2011.
- Between 2001 and 2011, the age-adjusted asthma mortality rate for females declined from 23.0/1,000,000 (95% CI=18.3-27.7) to 10.0 per 1,000,000 (95% CI=7.2-12.8) in 2011. The rate decline was statistically significant.
- Among males, the age-adjusted asthma mortality rate remained fairly stable during this period.





C1.2. Age-adjusted asthma mortality rates by race

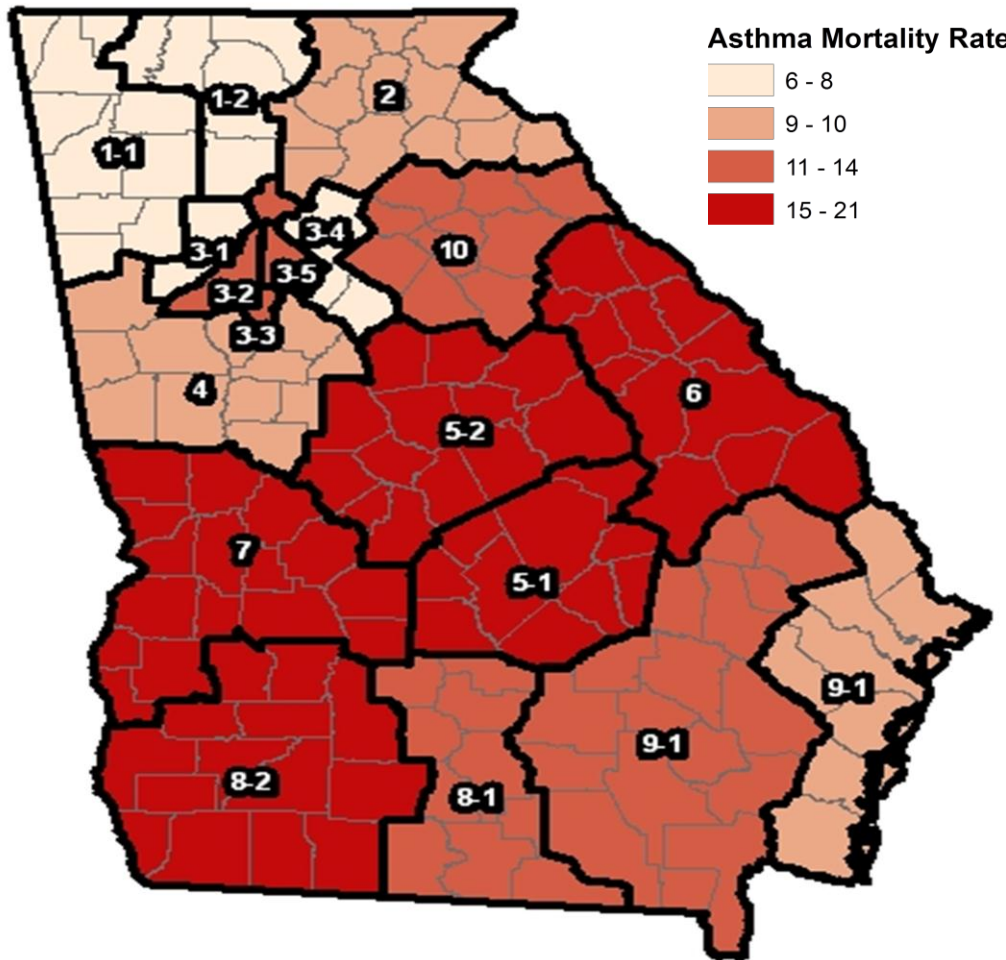
- Between 2001 and 2011 in Georgia, there were 570 deaths from asthma among whites and 555 asthma deaths among blacks, representing an age-adjusted rate of 9/1,000,000 (95% CI= 8.3-9.7) and 23.0/1,000,000 (95% CI=21.1-24.9), respectively (Fig C1.3).
- The age-adjusted asthma mortality rate among blacks was significantly higher than whites.
- Between 2001 and 2011, the age-adjusted asthma mortality rate for both blacks and whites significantly decreased. Among whites, the age-adjusted asthma mortality rate of 7/1,000,000 (95% CI=4.9-9.1) in 2011 was significantly lower than the age-adjusted asthma mortality rate of 15.0/1,000,000 (95% CI=11.6-18.3) in 2001. Among blacks, the age-adjusted asthma mortality rate significantly declined between 2004 (33.0/1,000,000; 95% CI=24.9-41.1) and 2008 (15.0/1,000,000; 95% CI=10.2-19.8).



Asthma age-adjusted mortality rates by Health District, 2001-2011

- The overall age-adjusted asthma mortality rates during the period from 2001 to 2011 was highest for residents in the Southwest Public District (8-2) at 21 deaths per 100,000, while the lowest overall age-adjusted rate was seen in the North Georgia Health District (1-2) at a rate of 6 deaths per 1,000,000.

Map C1. Asthma Mortality Rate (per 1, 000,000 deaths), by Health Districts, Georgia 2001-2011



Data Sources:

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 with asthma as the primary diagnosis. The ICD-9 codes (493.0-493.9) used to select ER visits. Data included in this report were based on ER visits at 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 on the total charges reported by the hospital. The amount a hospital is reimbursed is usually less than what is charged.

Hospital Inpatient Discharge Data

Hospitalization data in this report are based on hospital discharge data for Georgia residents who were hospitalized for asthma as the primary cause. The ICD-9 codes (493.0-493.9) used to select hospitalizations due to asthma. We only included 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 on the total charges reported by the hospital. The amount a hospital is reimbursed is usually less than what is charged.

Georgia Vital Records Death Data

Mortality data are based on deaths of Georgia residents whose underlying cause of death was asthma. Deaths from 2001-2011 with ICD-10 codes J45-J46 were selected. Death rates were age-adjusted to the 2000 US standard population via the direct method.

Methods and Technical Notes

Age-Adjusted Rates

A weighted average of the age-specific rates (death, ER visits, or hospitalizations) where the weights are the proportions of persons in the corresponding age groups of a standard population. The calculation of an Age-Adjusted Rate uses the year 2000 U.S. standard million. Using age-adjusted rates controls for differences in age structure between population at different geographic locations or at a specified time so that observed differences in rates across areas over time is not due solely to differences in the proportion of people in different age groups in different areas.

Age-Specific Rates

[Number of death, hospitalizations, or ER visits in a specific age group / Population of same age group] * 100,000.

Statistical significance

In this report, a result was considered statistically significant if there was no overlap in the 95% confidence intervals (95% CI) of the percentages being compared.