Kentucky Asthma Surveillance Report 2009

Respiratory Disease Program
Kentucky Department for Public Health
Cabinet for Health and Family Services

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Asthma Surveillance Report 2009

Kentucky Department for Public Health
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Respiratory Disease Program
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Kentucky

Asthma Surveillance Report 2009

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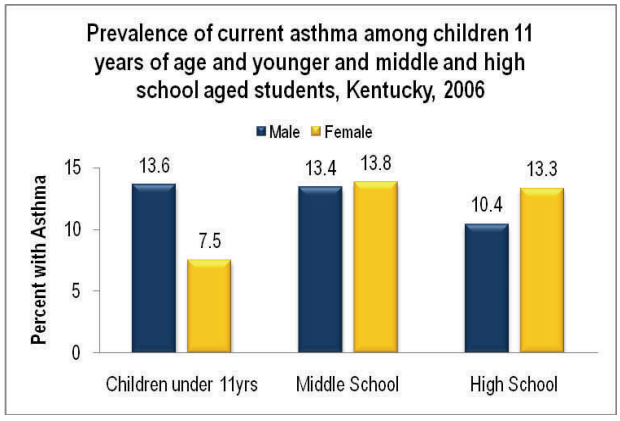
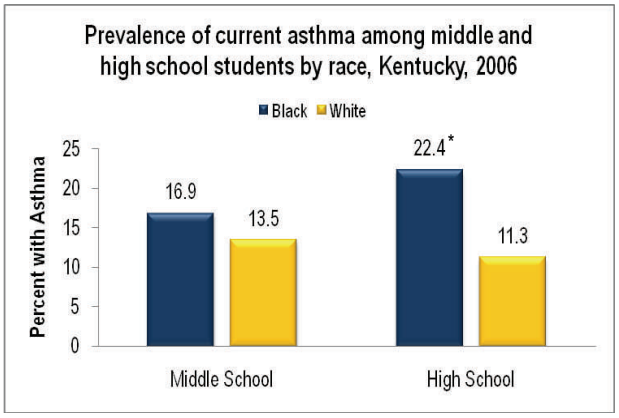
Key Findings

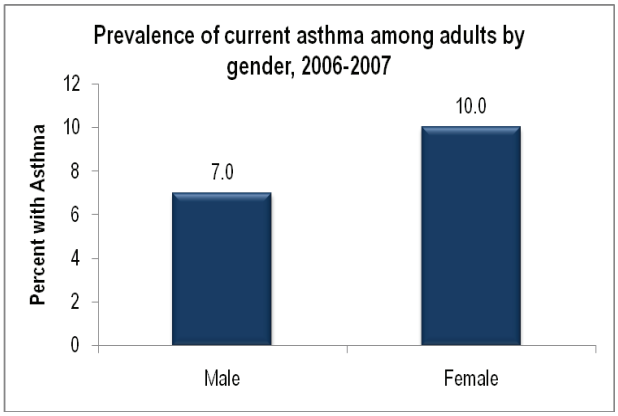
- Among children 11 years of age and younger, males have a higher* prevalence of asthma than females, whereas, among high school students, females have a higher prevalence than males.

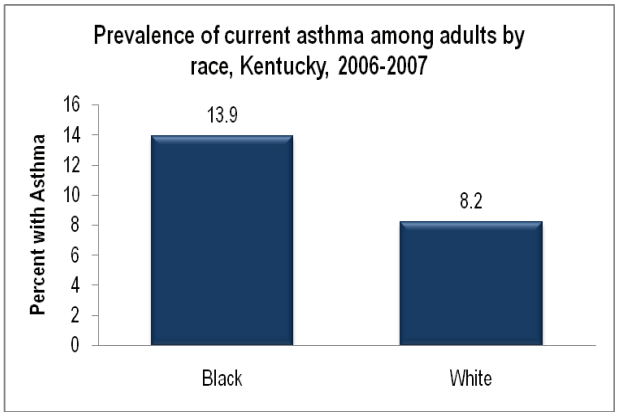




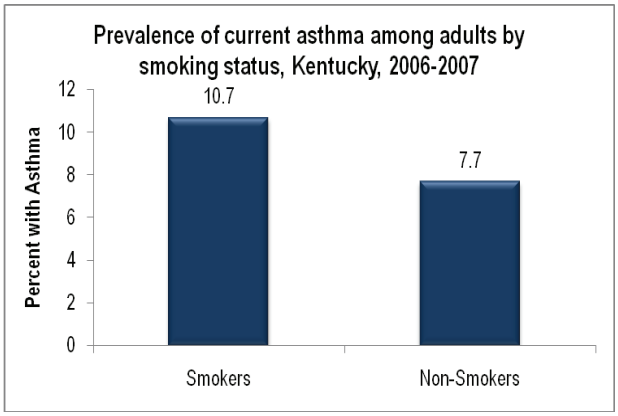
*Percent for black high school students is unreliable due to small sample size.

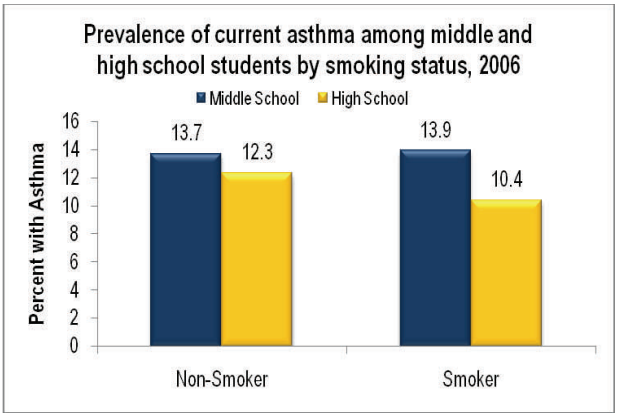
- Among adults, females have a higher prevalence of asthma than males, and blacks have a higher prevalence of asthma than whites.





- Among adults, smokers have a higher prevalence of asthma than non-smokers. Among middle and high school students, smokers and non-smokers have similar asthma prevalence.

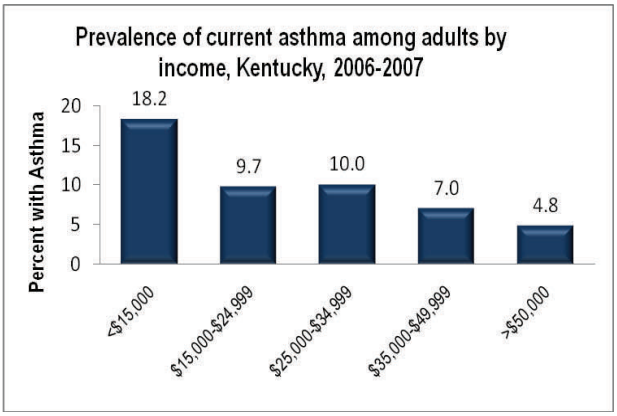


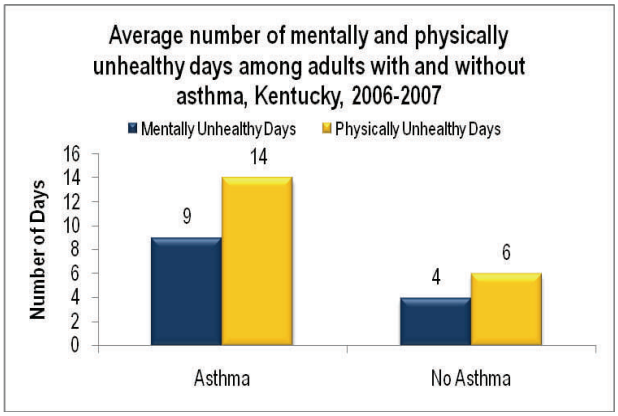


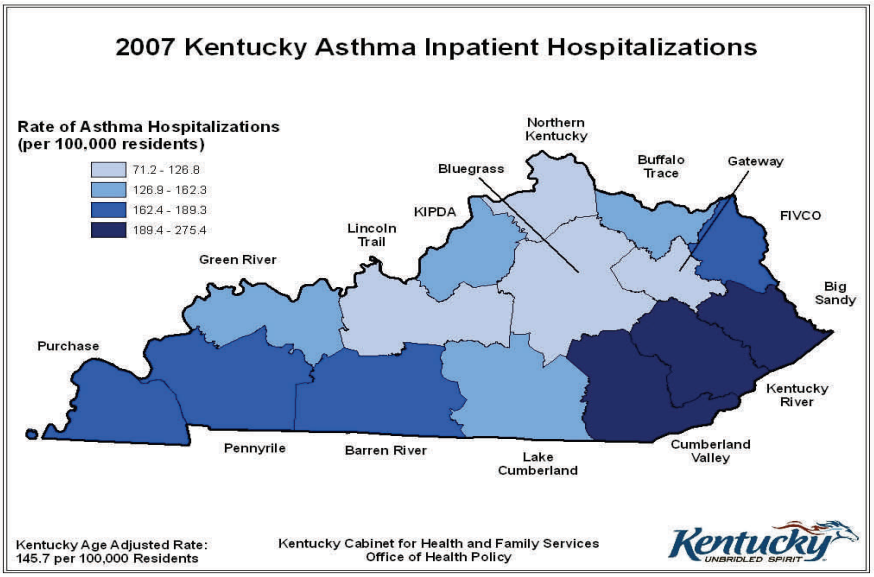
*Use of the terms "higher" and "lower" means that statistical testing was done on the findings and were found to be significant at the p< 0.05 level.

Key Findings

- Among adults, the prevalence of asthma is higher among those with family incomes of less than $15,000 annually, compared to those with higher family incomes.
- Adults with asthma report a higher number of mentally and physically unhealthy days (in the past 30 days) than adults without asthma.



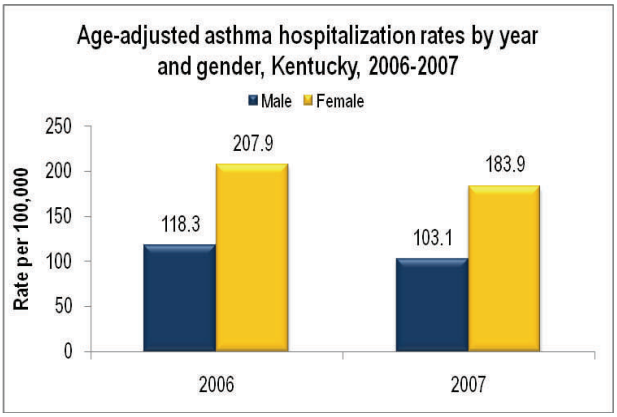


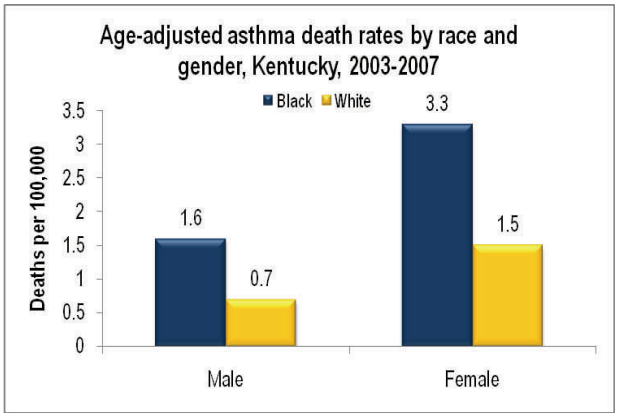


- The highest asthma hospitalization rates are in southeastern Kentucky.

District	Rate per 100,000
Kentucky	**145.7**
Big Sandy	225.0
Kentucky River	269.6
Cumberland Valley	275.4

- In 2007, Kentucky had 6,235 asthma hospitalizations with a cost of over $62 million.
- Females have a higher asthma hospitalization rate than males.
- Blacks have a higher asthma mortality rate than whites, and females have a higher mortality rate than males.





Introduction

Asthma is a chronic lung disease characterized by swelling of the inner lining of the airways, tightening of the muscles surrounding the airways, and increased mucus production within the airways. This response usually occurs from exposure to allergens or irritants that are inhaled, infections, strong emotions or exercise. The result of these exposures can be coughing, wheezing, shortness of breath, and chest tightness. The asthma attack can be mild, moderate or severe and can result in death if proper medications are not administered and symptoms are not monitored.

Asthma is one of the most common chronic diseases in the United States; it affects approximately 8.3% of adults and 10.9% of middle and high school students[1,2]. Annually, asthma accounts for 14.7 million missed school days for children and 24.5 million missed work days for adults.[3,4] Nationally, there are approximately 4,000 asthma related deaths every year, which are preventable with proper diagnosis, treatment and self-management.[4]

In Kentucky, 10.6% of children 11 years of age and younger, 13.6% of middle school students, 11.8% of high school students, and 8.6% of adults currently have asthma. There is a disparity that exists in the African-American population in Kentucky. Among middle school students, 16.9% of blacks currently have asthma compared to 13.5% of whites. Among high school students, 22.4% of blacks currently have asthma compared to 11.3% of whites. Among adults, 13.9% of blacks currently have asthma compared to 8.2% of whites. Nationally, statistics show that African-Americans are three times more likely to be hospitalized from asthma and are three times more likely to die from asthma.[5] Kentucky's annual cost of asthma is an estimated $62 million for asthma-related inpatient hospital admissions.

The mission of the Kentucky Respiratory Disease Program is to decrease the burden of asthma in Kentucky. One way to do this is to monitor trends in asthma prevalence, morbidity and mortality among Kentuckians and to recognize the impact it has on the health of the population. The ***Kentucky Asthma Surveillance Report 2009*** does just that by focusing on the prevalence of asthma in children, public middle and high school students and adults. It provides information on demographics, risk factors associated with asthma, hospitalizations from asthma and deaths due to asthma.

This report presents data from five sources:

- Behavioral Risk Factor Surveillance System, 2006 and 2007
- Kentucky Youth Tobacco Survey, 2006[6]
- Kentucky Office of Health Policy - Hospitalization data
- Kentucky Department for Medicaid Services - Medicaid data
- Kentucky Office of Vital Statistics - Mortality data

Prevalence of Asthma among Children 11 Years of Age and Younger - BRFSS, 2006

Prevalence is the proportion of people in a population who have a particular disease at a specific point in time or time period and estimates the burden of a disease for a given population. To determine the prevalence rates for asthma among children 11 years of age and younger, data is analyzed from the 2006 Behavioral Risk Factor Surveillance System (BRFSS). A detailed description of this data source can be found in Appendix 1A. Detailed tables for the following figures can be found in Appendix 2.

Among children in Kentucky 11 years of age and younger, 13.7% have ever been told by a doctor that they have asthma (lifetime asthma). Although lifetime asthma is important, it does not measure the current public health problem associated with asthma.[7] Among children 11 years of age and younger, 10.6% have ever been told by a doctor that they have asthma and still currently have asthma (current asthma).

Children 11 years of age and younger are broken down into two separate age groups, 5 years of age and younger and 6 to 11 years of age. Among those who are 5 years of age and younger, 11.1% currently have asthma. Among those who are between the ages of 6 and 11, 10.2% currently have asthma (Figure 1.). There is no statistically significant difference for current asthma between the two age groups.

Among males 11 years of age and younger, 13.6% currently have asthma, and among females 11 years of age and younger, 7.5% currently have asthma (Figure 2.). There is a statistically significant difference for current asthma between males and females.

Figure1.

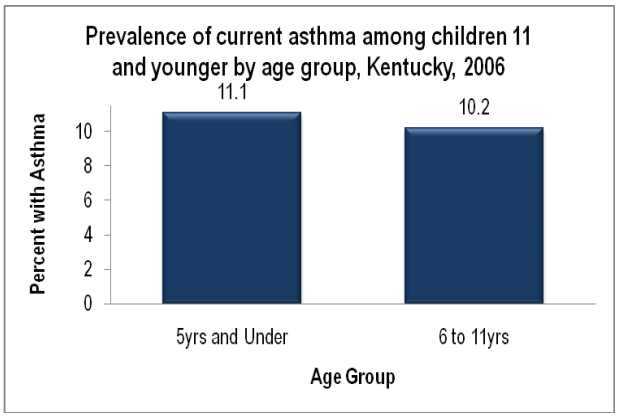
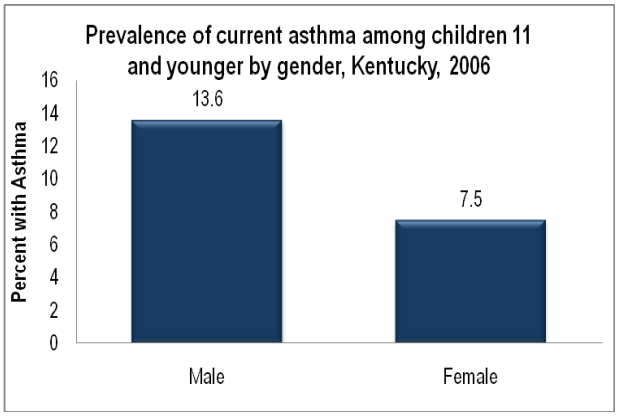


Figure 2.



Prevalence of Asthma among Middle School Students - KYTS, 2006

The following sections of this report contain results from the 2006 Kentucky Youth Tobacco Survey (KYTS). A detailed description of this data source can be found in Appendix 1B. Detailed tables for the following figures can be found in Appendix 3.

Among middle school students in Kentucky, 29.5% have ever been told by a doctor that they have asthma (lifetime asthma). Although lifetime asthma is important, it does not measure the current public health problem associated with asthma.[7] Among middle school students, 13.6% have ever been told by a doctor that they have asthma and still currently have asthma (current asthma).

Among male middle school students, 13.4% currently have asthma, and among females, 13.8% currently have asthma (Figure 3.). There is no statistically significant difference between males and females.

Among black middle school students, 16.9% currently have asthma. Among white middle school students, 13.5% currently have asthma (Figure 4.). When comparing race for middle school students, there is no statistically significant difference between blacks and whites.

The KYTS offers the option of an "11 years of age or younger" age classification. Since the KYTS surveys grades 6 through 12, it is possible that that specific age category may include a child under the age of 11 that would still be in sixth grade. Of those middle school students 11 years of age and younger, 12.0% currently have asthma. Of those middle school students between the ages of 12 and 14, 14.2% currently have asthma. Of those middle school students between the ages of 14 and 16, 13.0% currently have asthma (Figure 5.). There are no statistically significant differences among the different age groups.

Figure 3.

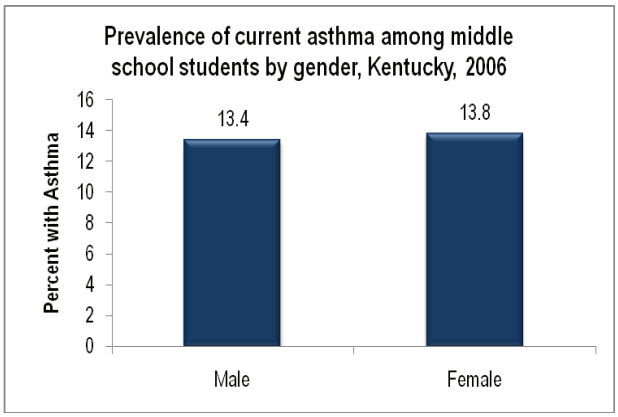


Figure 4.

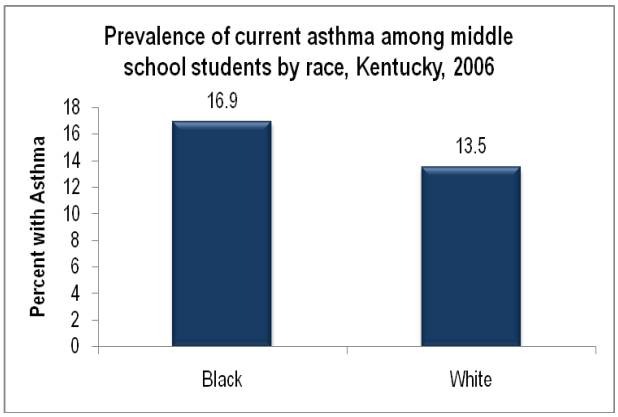
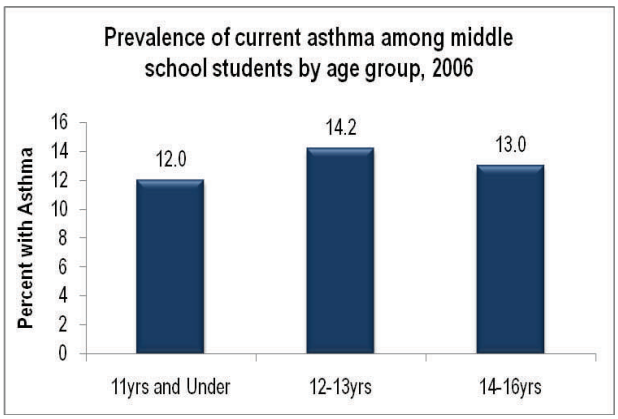


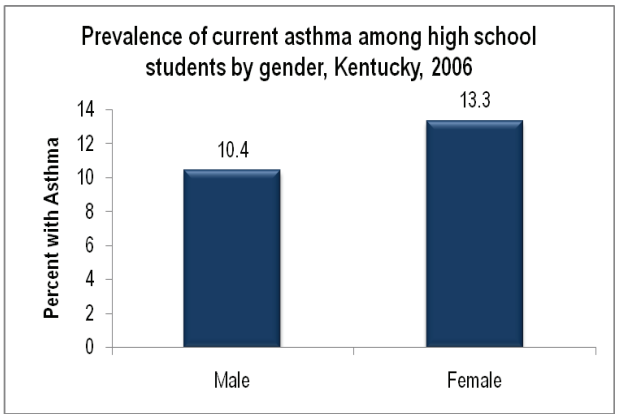
Figure 5.



Prevalence of Asthma among High School Students - KYTS, 2006

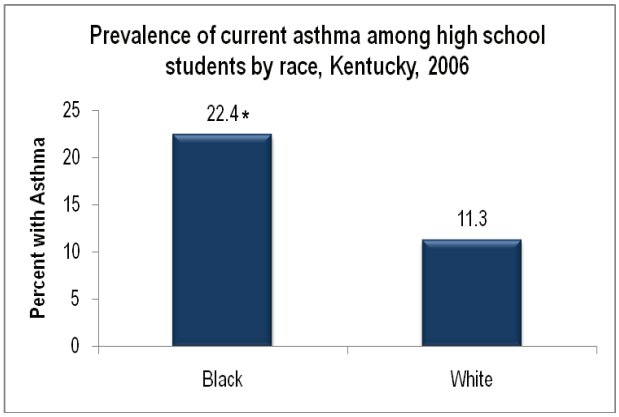
Among high school students in Kentucky, 31.4% have ever been told by a doctor that they have asthma (lifetime asthma). Although lifetime asthma is important, it does not measure the current public health problem associated with asthma.[7] Among high school students, 11.8% have ever been told by a doctor that they have asthma and still currently have asthma (current asthma).

Figure 6.



Among male high school students, 10.4% currently have asthma and among females, 13.3% currently have asthma (Figure 6.). There is a statistically significant difference for asthma between males and females.

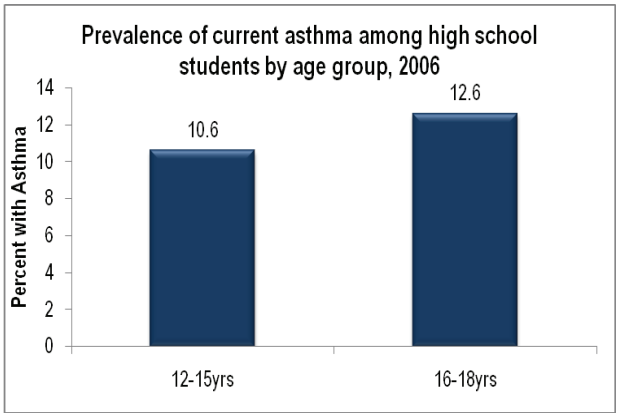
Figure 7.



*Percent for black high school students is unreliable due to a small sample size.

Among black high school students, 22.4% currently have asthma. Among white high schools students, 11.3% currently have asthma (Figure 7.). When comparing race, there is no statistically significant difference between black and white high school students.

Figure 8.

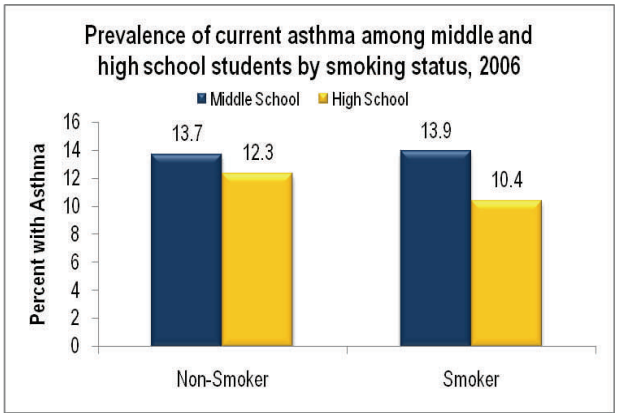


The percentage of high school students between the ages of 12 and 15 who currently have asthma is 10.6%. Among high school students between the ages of 16 and 18, 12.6% currently have asthma (Figure 8.) There is no statistically significant difference between the two age groups.

Risk Factors for Asthma among Middle and High School Students - KYTS, 2006

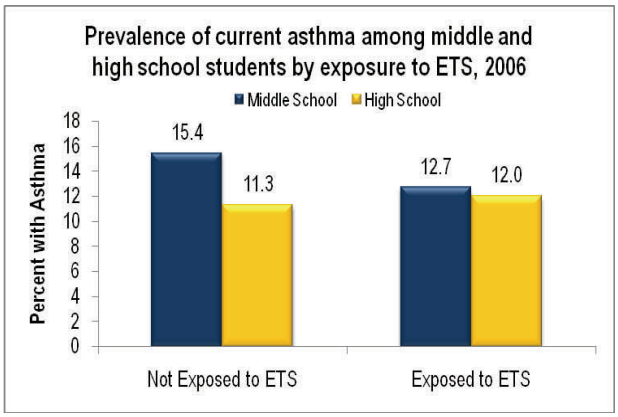
For this report, a smoker is defined as a survey respondent who has smoked a cigarette in the last 30 days. Although studies suggest that smoking affects asthma adversely, there is still a high percentage of students who currently have asthma and are smoking.[8] Among middle school students, 13.7% of non-smokers and 13.9% of smokers currently have asthma. Among high school students, 12.3% of non-smokers and 10.4% of smokers currently have asthma (Figure 9.). There is no statistically significant difference between the two groups.

Figure 9.



Environmental Tobacco Smoke (ETS), or second-hand smoke, is the combination of side-stream smoke (smoke that comes directly from the end of a cigarette, cigar or pipe) and mainstream smoke (smoke that is exhaled by the smoker).[9] ETS contains at least 250 chemicals that are known to be toxic and at least 50 that are known to cause cancer.[9] ETS exposure can increase the risk for current asthma and asthma symptoms.[10] ETS is responsible for 202,300 asthma attacks for U.S. children annually and may increase the severity of asthma.[11] Among middle school students, 15.4% of those who are not exposed to ETS and 12.7% of those who are exposed to ETS currently have asthma. Among high school students, 11.3% of those not exposed to ETS and 12.0% of those who are exposed to ETS currently have asthma (Figure 10.). There is no statistically significant difference between the two groups.

Figure 10.



Prevalence of Asthma among Adults - BRFSS, 2006-2007

The following sections of this report contain results from the 2006-2007 Behavioral Risk Factor Surveillance System (BRFSS). A detailed description of this data source can be found in Appendix 1A. Detailed tables for the following figures can be found in Appendix 4.

Of adults in Kentucky, approximately 10.7% of males and 13.5% of females report that they have ever been told by a doctor that they have asthma (lifetime asthma). Although lifetime asthma is important, it does not measure the current public health problem associated with asthma.[7] The prevalence of asthma among adults who have ever been told they have asthma and still currently have asthma (current asthma) is 7.0% for males and 10.0% for females (Figure 11.). There is a statistically significant difference for adults with current and lifetime asthma based on gender.

Among adults in Kentucky, 13.9% of blacks currently have asthma, compared to 8.2% of whites (Figure 12.). There is a statistically significant difference for adults with asthma based on race.

Among black males in Kentucky, 16.1% currently have asthma and among white males, 6.5% currently have asthma. Among black females, 11.9% currently have asthma and among white females, 9.8% currently have asthma (Figure 13.). Although there are no statistically significant differences among the race and gender groups, it is apparent that Kentucky has high asthma prevalence among the African-American population.

Figure 11.

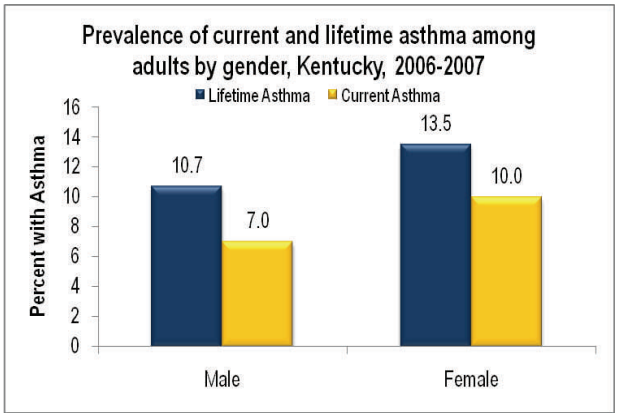


Figure 12.

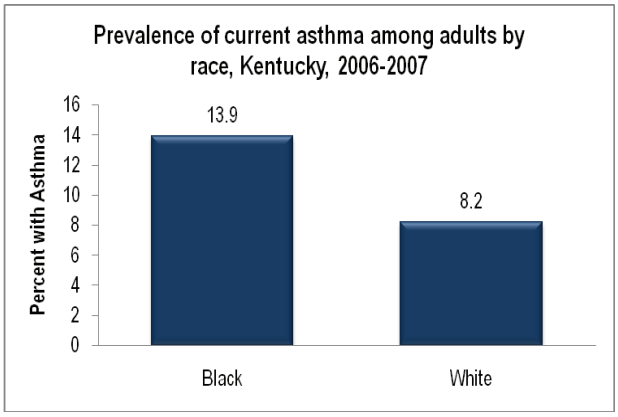
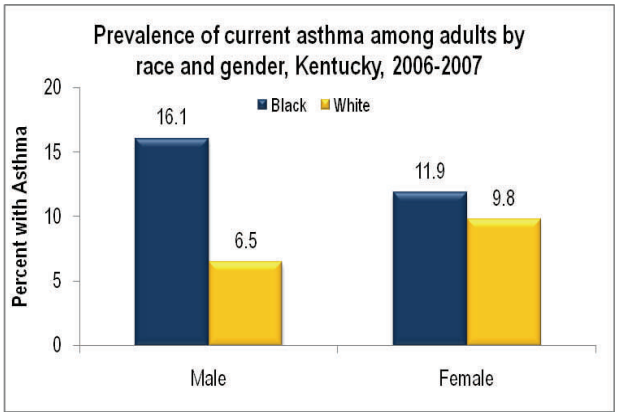


Figure 13.



Prevalence of Asthma in Kentucky *continued*. . .

Although there are no statistically significant differences among the different age groups, the 55-64 age group has the highest prevalence of asthma (9.9%), while those between the ages of 35 and 44 have the lowest prevalence (7.1%) (Figure 14).

The prevalence for current asthma among adults with less than a high school education is 15.1%. Among adults who have graduated from high school, 8.8% currently have asthma. Among those who have some college education or have graduated from college, 7.7% and 4.8% currently have asthma (Figure 15.). There is a statistically significant difference for adults with asthma based on level of education.

Among Kentuckians who currently have asthma, the prevalence is higher in adults with a household income of less than $15,000 (18.2%) compared to those with an income of more than $15,000 (Figure 16.). The general trend shows that as household income increases, asthma prevalence decreases. The variations in the prevalence of asthma by annual household income are statistically significant.

Among those who have health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicaid, 7.9% currently have asthma. Among those who have no health care coverage, 11.8% currently have asthma (Figure 17). There is a statistically significant difference for adults with asthma based on health care coverage.

Current asthma among adults in Kentucky in the 15 Area Development Districts ranges from 5.9% to 13.3% in 2006-2007 (Table 1.). For a visual representation of the prevalence of asthma among the Area Development Districts see Map 1.

Figure 14.

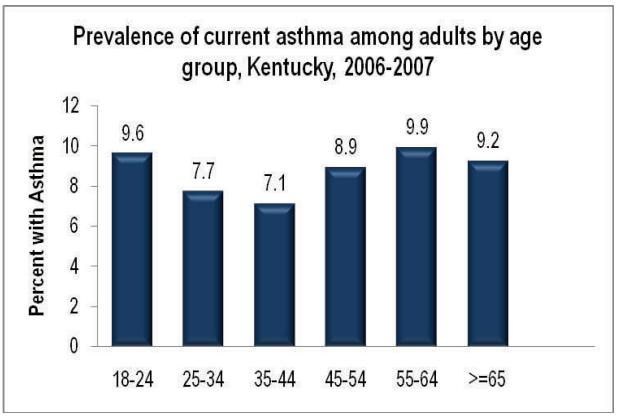


Figure 15.

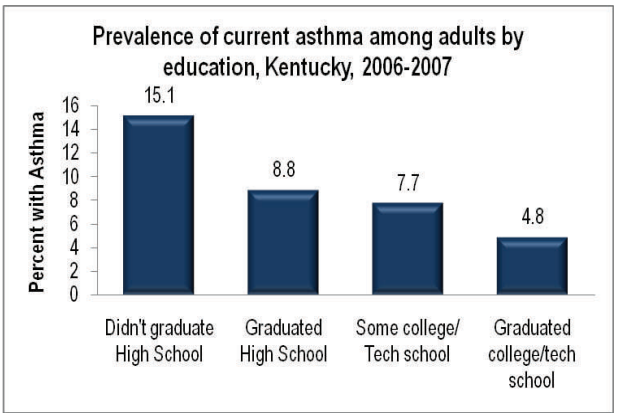


Figure 16.

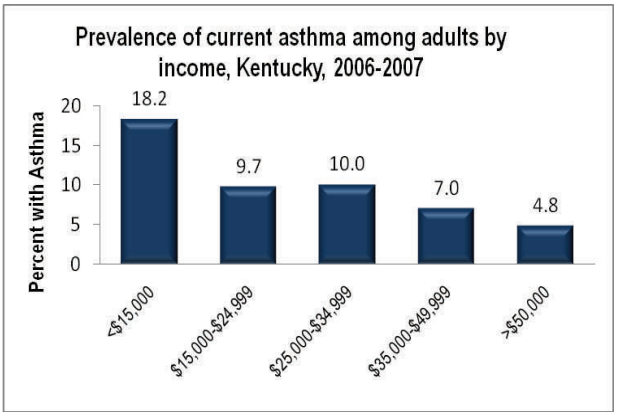
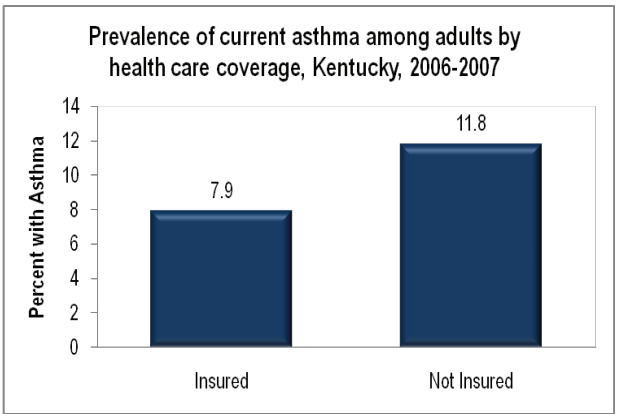


Figure 17.



Prevalence of Asthma among Adults by Area Development District

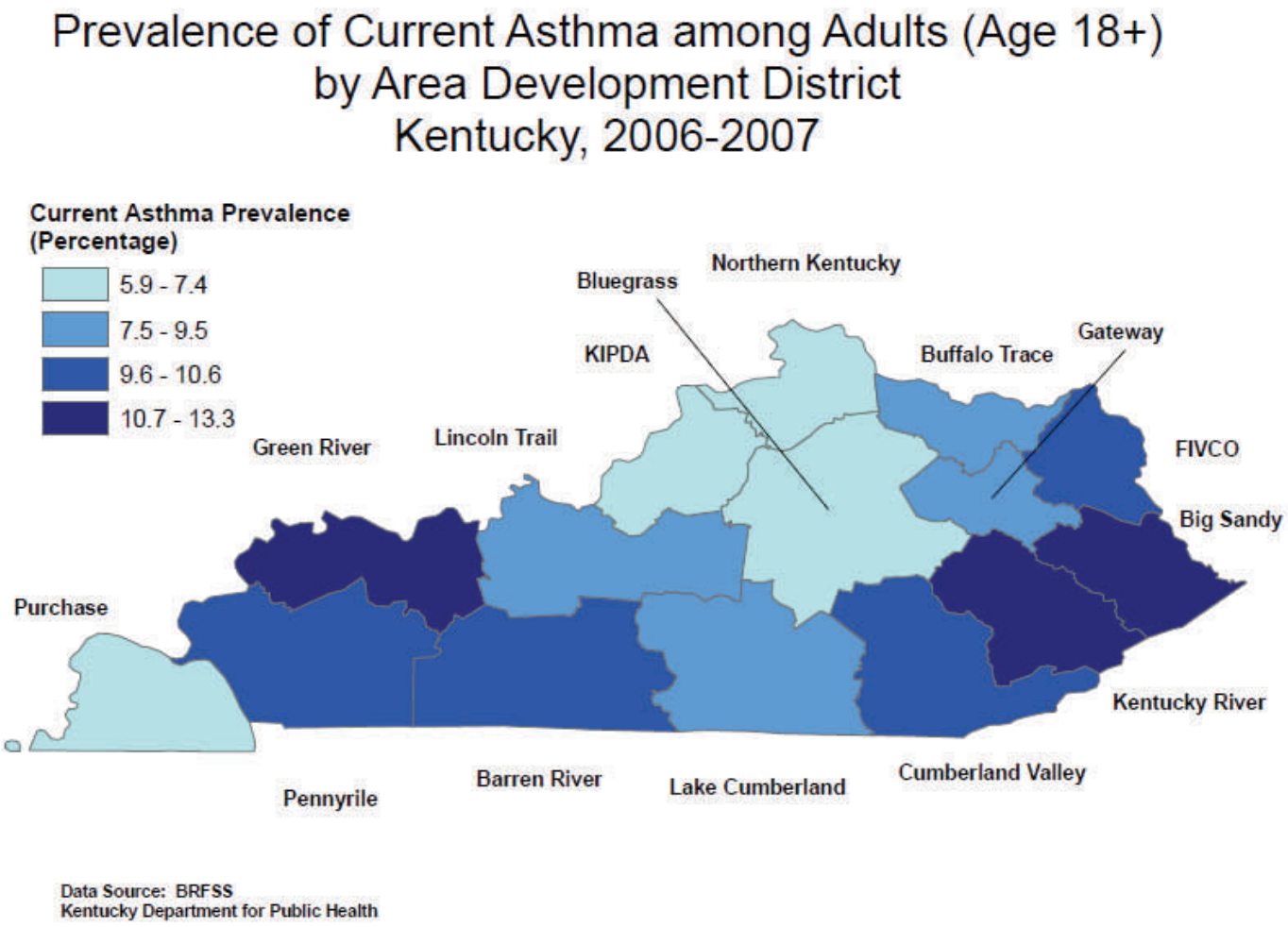
Table 1. Prevalence of asthma among adults by Area Development District, Kentucky, 2006-2007

District	Percent with Asthma
Kentucky	**8.6**
01 - Purchase	5.9
02 - Pennyrile	10.0
03 - Green River	10.7
04 - Barren River	10.1
05 - Lincoln Trail	8.6
06 - KIPDA	7.4
07 - Northern KY	6.3
08 - Buffalo Trace	7.7
09 - Gateway	8.1
10 - FIVCO	10.3
11 - Big Sandy	12.7
12 - KY River	13.3
13 - Cumberland Valley	10.6
14 - Lake Cumberland	9.5
15 - Bluegrass	7.2

Prevalence of Asthma in Kentucky *continued. . .*

Prevalence of Asthma among Adults by Area Development District

Map 1. Prevalence of asthma among adults by Area Development District, Kentucky, 2006-2007

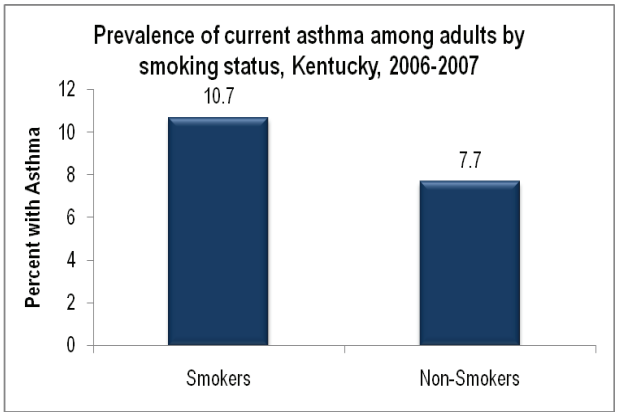


Risk Factors for Asthma Among Adults - BRFSS, 2006-2007

Risk factors are certain personal traits that increase the likelihood of developing a disease or condition.

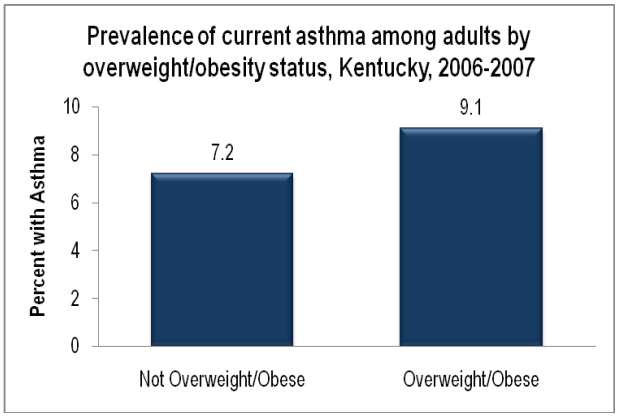
Tobacco smoke has a mixture of over 4,000 different chemicals, many of which may cause cancer.[12] Studies examining the relationship between smoking tobacco and asthma report that smoking increases and worsens the severity of asthma in adults and children.[13] Cigarette smoking can trigger or worsen asthma and asthma symptoms because of the effects it has on the lungs. Among adults, 10.7% of smokers and 7.7% of non-smokers currently have asthma (Figure 18). There is a statistically significant difference for asthma between smokers and non-smokers.

Figure 18.



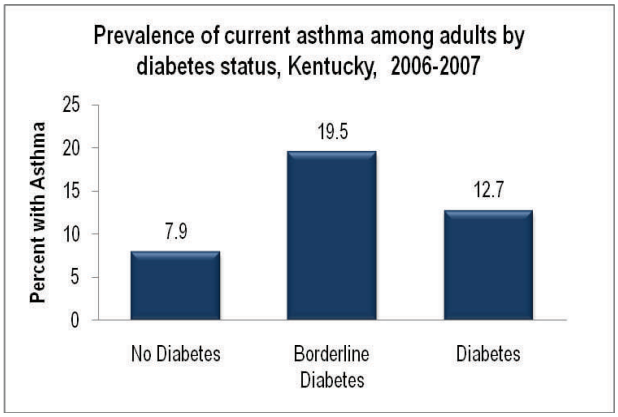
Body Mass Index (BMI) is used as an indicator of body fat in adults and children and is calculated using height and weight.[14] For adults, normal weight is defined as a BMI of less than 25, overweight is defined as a BMI between 25 and 29.9, and obesity is defined as a BMI greater than or equal to 30.[15] Among those who are not overweight/obese (BMI less than 25), 7.2% currently have asthma. Among those who are overweight/obese (a BMI of 25 or higher), 9.1% currently have asthma (Figure 19.). There is a statistically significant difference in asthma prevalence based on overweight/obesity status.

Figure 19.



Diabetes is defined as those who have ever been told by a doctor that they have diabetes. Borderline diabetes is defined as those who have ever been told by a doctor they are pre-diabetic or borderline diabetic. Among adults, 7.9% of those who do not have diabetes, 19.5% of those with borderline diabetes, and 12.7% of those with diabetes currently have asthma (Figure 20.). There is a statistically significant difference among those who have asthma and diabetes status.

Figure 20.



Quality of Life among Adults with Asthma

Quality of Life among Adults with Asthma - BRFSS, 2006-2007

Health-related quality of life refers to the degree that a disease affects the social, physical and mental well-being of the individual, according to their own personal judgment.[16] An asthmatic's everyday surroundings can trigger an asthma attack, leading to an overall decrease in quality of life. Detailed tables for the following figures can be found in Appendix 5.

Satisfaction with life is measured by the response to the question, "In general, how satisfied are you with your life?" For Figure 21., dissatisfaction with life is determined by an individual responding that they are either "dissatisfied" or "very dissatisfied" with their life. Among adults who currently have asthma, 14.1% report being dissatisfied with life. Among those with no asthma, 6.1% report being dissatisfied with life. The prevalence of dissatisfaction with life is statistically significant based on asthma diagnosis.

Health status is measured by the response to the question, "Would you say that in general your health is excellent, very good, good, fair, or poor?" For Figure 22., fair or poor health is determined by an individual responding that their health is either "fair" or "poor." Among adults who currently have asthma, 47.5% report fair or poor health. Among those with no asthma, 20.6% report fair or poor health. The prevalence of fair or poor health is statistically significant based on asthma diagnosis.

Physical inactivity is measured by the response to the question, "During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening or walking for exercise?" For Figure 23., a respondent is physically inactive if they answered "no" to the above stated question. Among adults who currently have asthma, 43.9% are physically inactive and among those with no asthma, 29.1% are physically inactive. There is a statistically significant difference for asthma based on physical inactivity.

Figure 21.

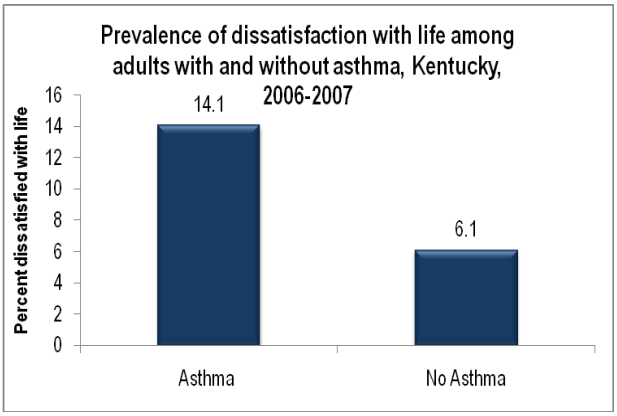


Figure 22.

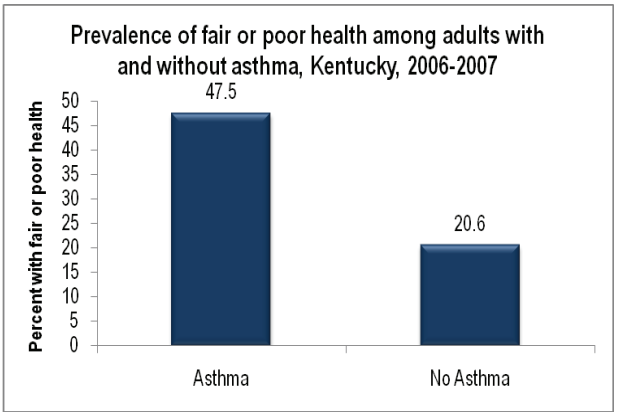
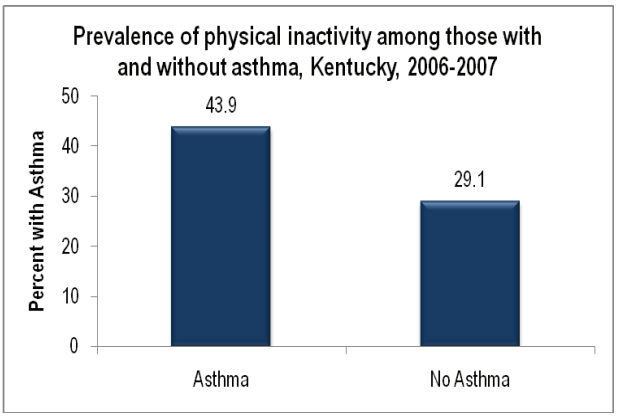


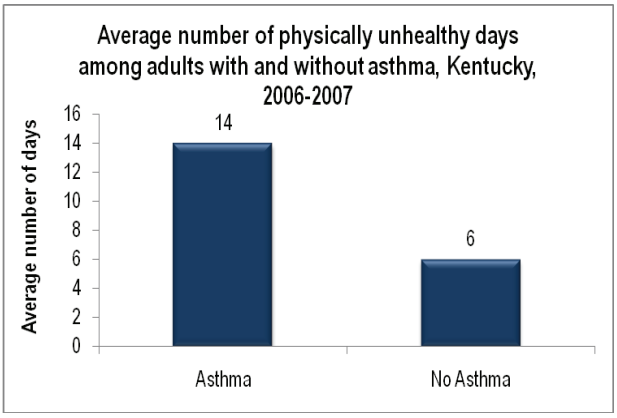
Figure 23.



Quality of Life among Adults with Asthma *continued*. . .

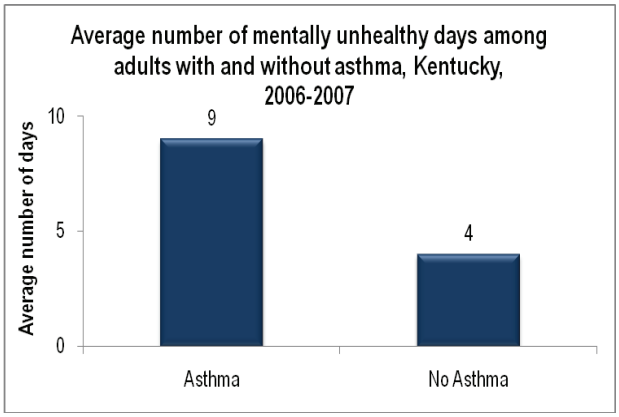
Average number of physically unhealthy days is measured by the response to the question, "Now thinking about your physical health, which includes physical illness or injury, for how many days during the past 30 days was your physical health not good?" Those who currently have asthma report an average of 14 physically unhealthy days and those who do not currently have asthma report an average of six physically unhealthy days (Figure 24.). There is a statistically significant difference based on asthma diagnosis and average number of physically unhealthy days.

Figure 24.



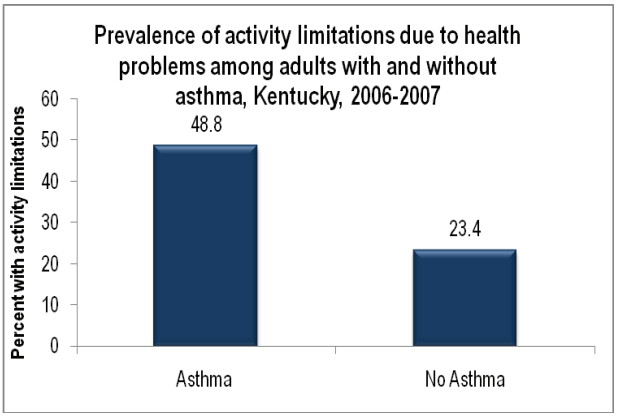
Average number of mentally unhealthy days is measured by the response to the question, "Now thinking about your mental health, which includes stress, depression and problems with emotions, for how many days during the past 30 days was your mental health not good?" Those who currently have asthma report an average of nine mentally unhealthy days and those who do not have asthma report an average of four mentally unhealthy days (Figure 25.). There is a statistically significant difference based on asthma diagnosis and average number of mentally unhealthy days.

Figure 25.



Activity limitation is measured by the response to the question, "Are you limited in any way in any activities because of physical, mental or emotional problems?" Among adults who currently have asthma, 48.8% feel their activity is limited due to health problems. Among adults with no asthma, 23.4% feel their activity is limited due to health problems (Figure 26.). The prevalence of activity limitations is statistically significant based on asthma diagnosis.

Figure 26.



Asthma Hospitalizations in Kentucky - Hospitalization Data, 2006-2007

The following sections of this report contain hospitalization data collected by the Kentucky Hospital Association through a contract with the Kentucky Office of Health Policy. A detailed description of this data source can be found in Appendix 1C. Detailed tables for the following figures can be found in Appendix 6.

In 2007, there were 146 inpatient hospitalizations for asthma as the primary diagnosis per 100,000 people in the state of Kentucky. That is equal to more than 6,000 hospitalizations with charges totaling approximately $62 million annually. Kentucky has increased hospitalization rates in the fall and winter (months October through March) (Figure 27.).

The asthma hospital admission rates in 2006 were 118.3 per 100,000 people for men and 207.9 per 100,000 people for women. These rates dropped in 2007 and the asthma hospital admission rate for men was 103.1 per 100,000 people and was 183.9 per 100,000 people for women (Figure 28.).

Kentucky's highest age-specific hospitalization rates for asthma are for children and infants less than 4 years of age (424 per 100,000 population). The rates for this age group are eight times higher than the age group with the lowest age-specific hospitalization rates (ages 15 to 24) (Figure 29.).

Forty percent of Kentucky's counties have hospitalization rates that are higher than the state rate of 145.7 per 100,000 in 2007 and are primarily located in southeast Kentucky (Map 1.).

Seven of Kentucky's 15 Area Development Districts have asthma hospitalization rates higher than the state rate (Map 2.).

Figure 27.

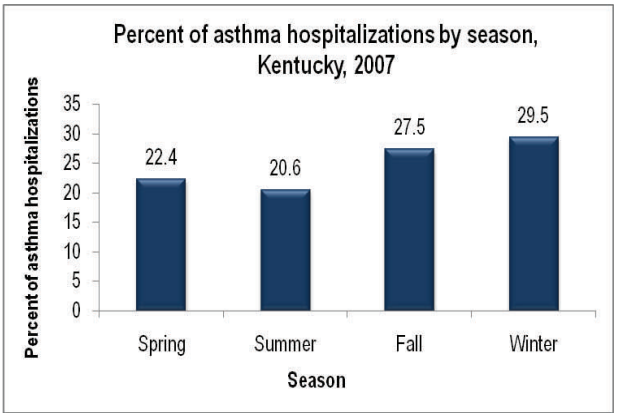


Figure 28.

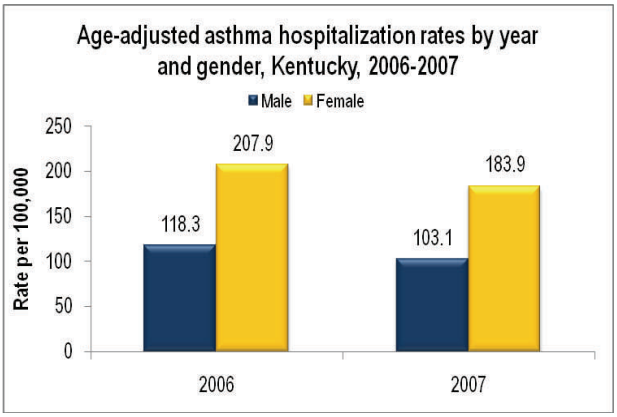
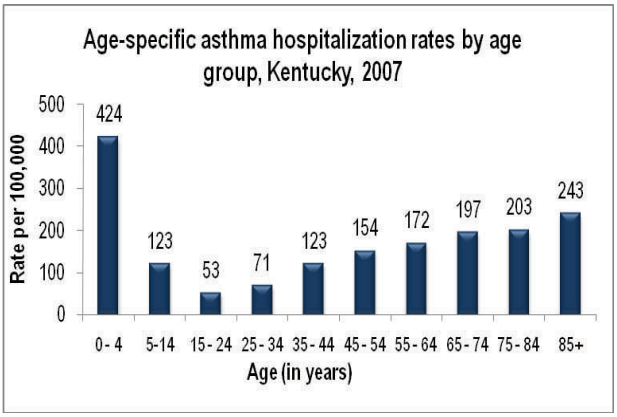
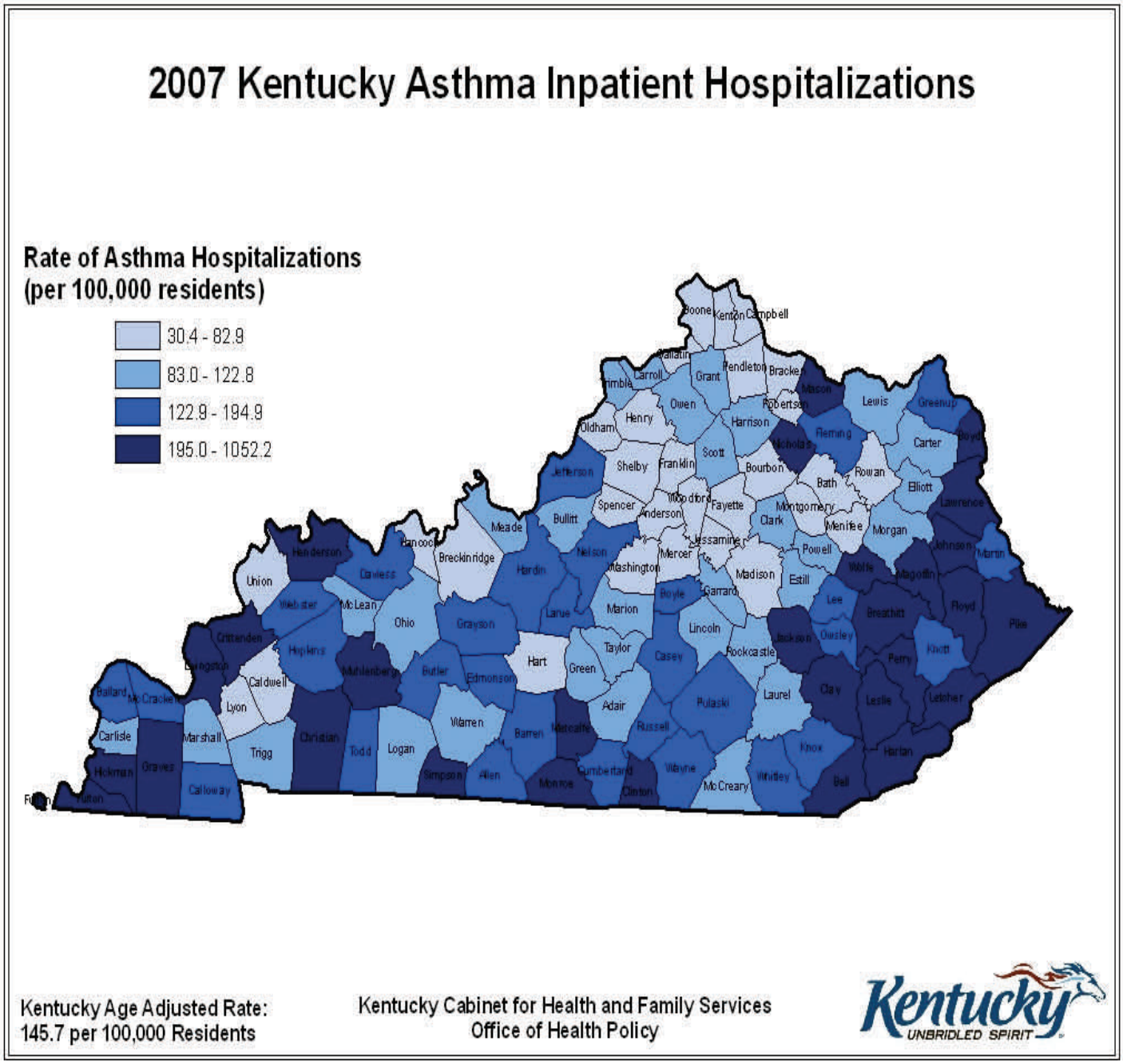


Figure 29.



Asthma Hospitalizations by County

Map 2. Age-adjusted inpatient hospitalization rates for asthma by county, Kentucky, 2007
** Age-adjusted inpatient hospitalization rates for asthma by county, 2006 (Appendix 8)*



Asthma Hospitalizations by Area Development District in Kentucky

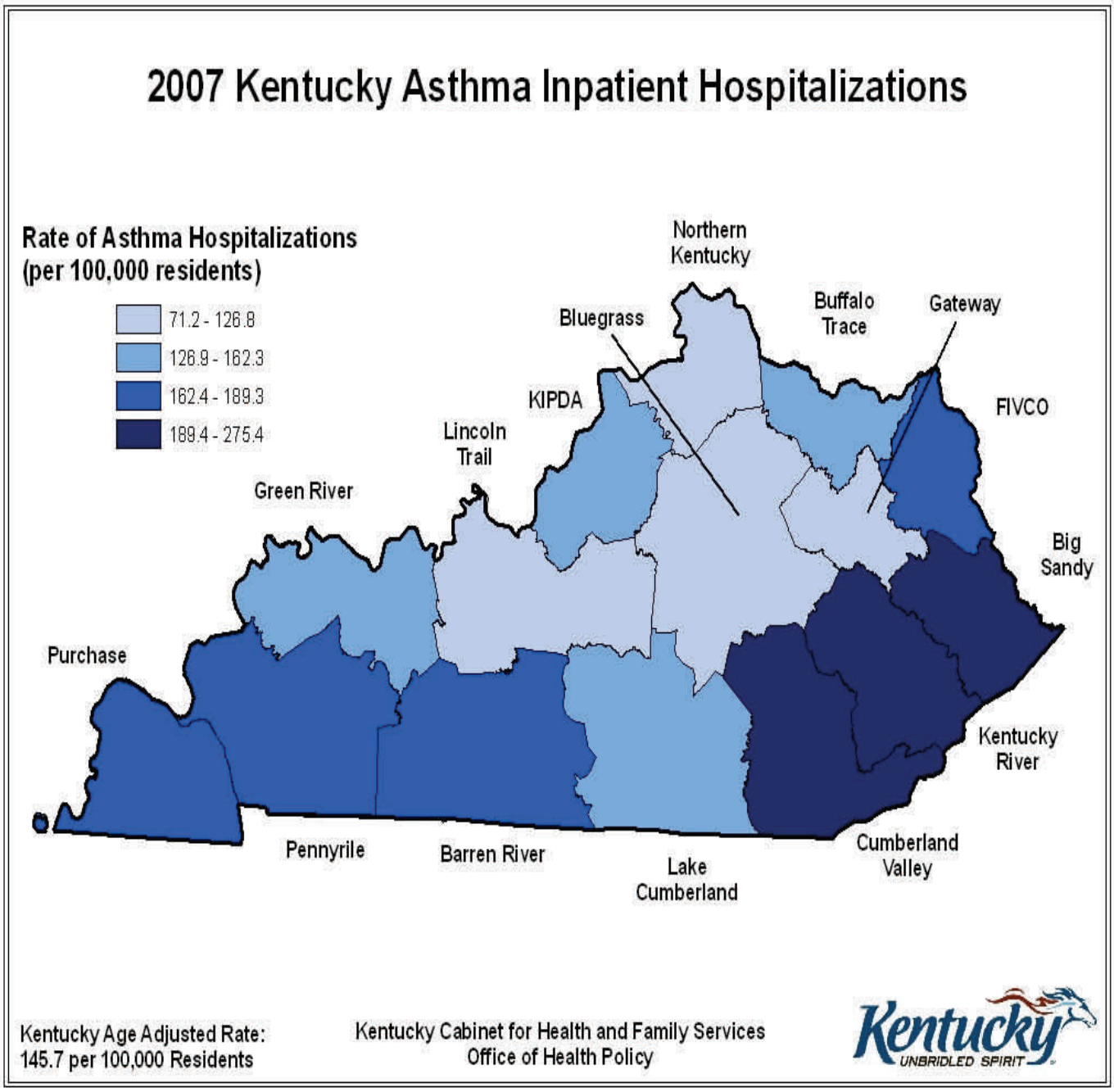
Table 2. Annual number of hospitalizations for asthma, age-adjusted asthma inpatient hospitalization rates and hospital charges by Area Development District, Kentucky, 2007

Hospitalizations			
District	**Number**	**Rate**	**Charges**
Kentucky	**6,235**	**145.7**	**$62,231,688.33**
01 - Purchase	368	189.3	$2,526,065.31
02 - Pennyrile	401	176.4	$3,317,744.47
03 - Green River	357	162.3	$3,166,521.69
04 - Barren River	470	170.4	$4,509,925.80
05 - Lincoln Trail	328	126.8	$2,740,226.86
06 - KIPDA	1,398	150.6	$20,128,590.64
07 - Northern KY	316	73.4	$3,042,603.45
08 - Buffalo Trace	85	151.9	$751,470.25
09 - Gateway	57	71.2	$375,349.39
10 - FIVCO	250	176.7	$2,564,921.97
11 - Big Sandy	336	225.0	$4,156,048.68
12 - KY River	314	269.6	$3,060,235.99
13 - Cumberland Valley	667	275.4	$4,881,310.02
14 - Lake Cumberland	309	151.1	$2,838,836.53
15 - Bluegrass	579	79.5	$4,171,837.28

*Age-adjusted rate is per 100,000

Asthma Hospitalizations by Area Development District in Kentucky

Map 3. Age-adjusted inpatient hospitalization rates for asthma by Area Development District, Kentucky, 2007
** Age-adjusted inpatient hospitalization rates for asthma by Area Development District, Kentucky, 2006 (Appendix 9)*



Asthma Morbidity in Kentucky *continued. . .*

Asthma among Medicaid Patients - Medicaid Data, 2006

The following section of this report contain Medicaid data collected by the Kentucky Department for Medicaid Services. This section may not represent the true burden of asthma among the Medicaid population because unspecified asthma was not included. A detailed description of this data source can be found in Appendix 1D. Detailed tables for the following figures can be found in Appendix 11.

In 2006, there were a total of 883,525 people enrolled in Medicaid services. Among those people, 81,431 people (9.2%) received asthma-related Medicaid services.

Among children 3 years of age and younger, 12.4% received asthma-related Medicaid services and among children between the ages of 4 and 10, 10.7% received asthma-related Medicaid services. Among children between the ages of 11 and 14, 8.4% received asthma-related Medicaid services and among children between the ages of 15 and 18, 7.6% received asthma-related Medicaid services (Figure 30.)

Among all Medicaid patients who received asthma-related services, 9.2% are male and 9.2% are female. Among Medicaid patients who received asthma-related services, 10.5% are black and 9.7% are white (Figure 31.).

Among all male Medicaid patients who received asthma-related services, 11.5% were black and 9.6% were white. Among all female Medicaid patients who received asthma-related services, 9.8% were black and 9.7% were white (Figure 32.).

Figure 30.

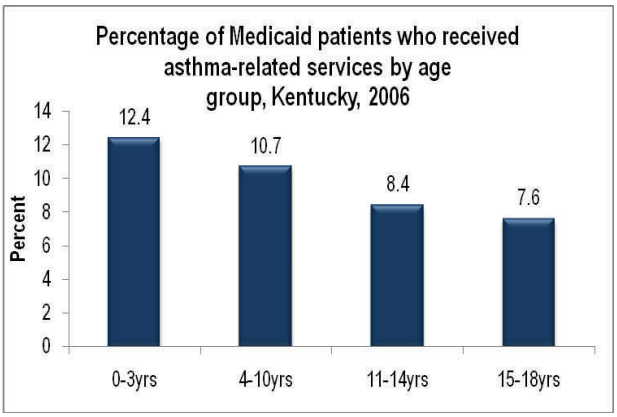


Figure 31.

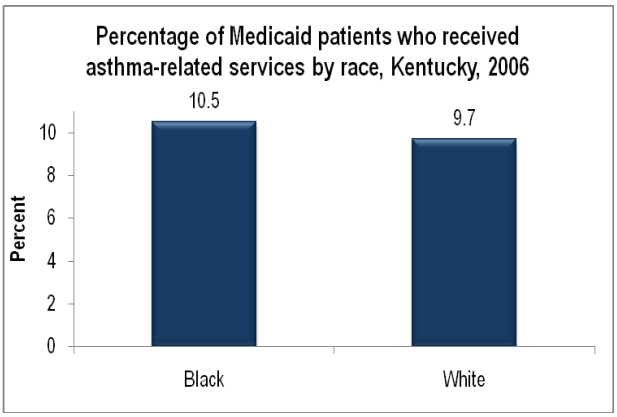
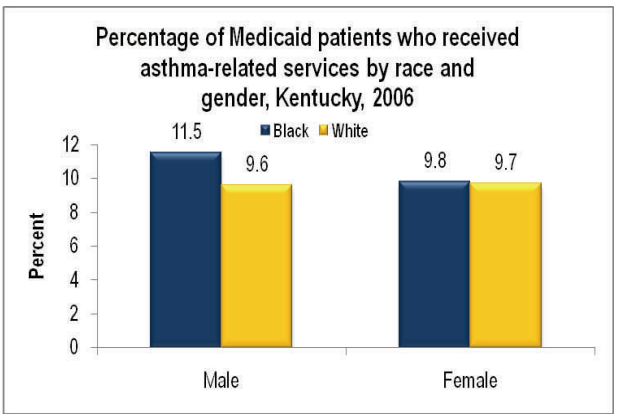


Figure 32.



Asthma Mortality in Kentucky - Mortality Data, 2006-2007

The following section of this report contains mortality data collected by the Kentucky Office of Vital Statistics. A detailed description of this data source can be found in Appendix 1E. Detailed tables for the following figures can be found in Appendix 12.

For Figure 33., CDC Wonder[17] data is used to determine the age-adjusted death rates for years 1979 through 1999 and Kentucky Vital Statistics data is used for years 2000 through 2007. In 1999, the classification system for cause of death coding changed from ICD-9 to ICD-10 making it difficult to interpret trends in asthma mortality. The rates for 2006 and 2007 are based on the preliminary number of deaths from asthma and are not the final death rate for those years. Since all deaths are not accounted for 2006 and 2007, this may explain the drastic decrease in the death rates especially for the year 2007 (.07 deaths per 100,000).

Each year in Kentucky there are an average of 50 deaths (1.2 per 100,000) with asthma listed as the primary cause of death (Figure 34.). The majority of these deaths occur in women and are consistent with the higher asthma prevalence rates and hospitalization rates that are seen among women compared to men (Figure 28.).

Asthma death rates affect all races and sexes. In Kentucky, the African-American population is greatly affected. Black males and females (1.6 per 100,000 and 3.3 per 100,000) are two times more likely to die from asthma compared to white males and females (0.7 per 100,000 and 1.5 per 100,000) (Figure 35.).

Deaths from asthma are more common among the elderly population (85+ years of age) (Figure 36.). Reasons for such a high age-specific death rate among the 85+ age group could be due to co-morbid conditions where a person has another disease existing with asthma.

Figure 33.

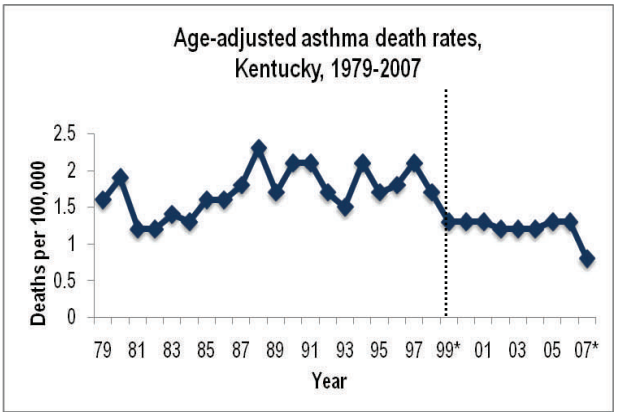


Figure 34.

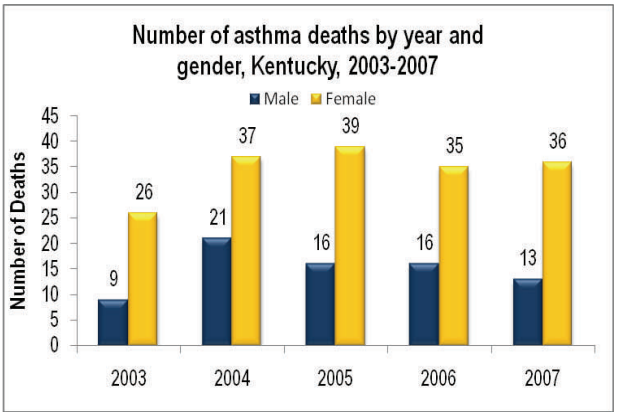


Figure 35.

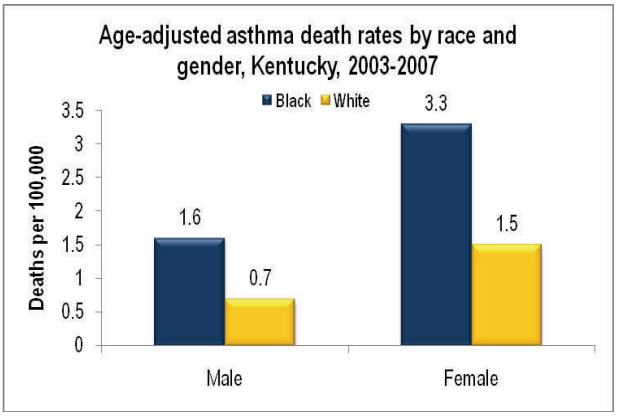
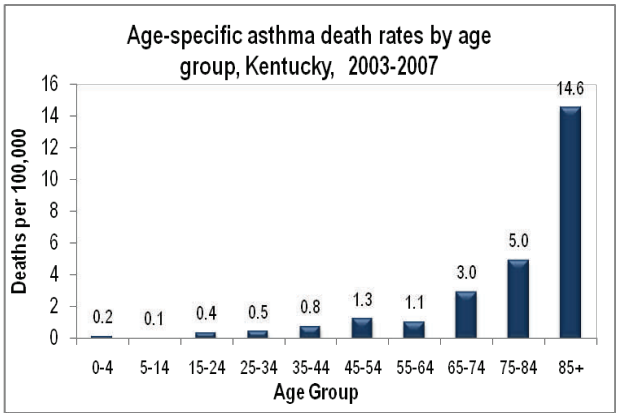


Figure 36.



References

1) Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System (BRFSS). http://www.cdc.gov/brfss/
2) Centers for Disease Control and Prevention. Youth Risk Behavior Surveillance - United States, 2007. Surveillance Summaries, [June 6, 2008]. MMWR 2008; 57 (No.SS-4).
3) National Health Interview Survey, National Center for Health Statistics, Centers for Disease Control and Prevention.
4) Centers for Disease Control and Prevention. National Surveillance for Asthma – United States, 1980-2004. Surveillance Summaries, [October 19, 2007]. MMWR 2007; 56 (No. SS-8).
5) Asthma and African Americans. American Lung Association. http://www.lungusa.org/site/pp.asp?c=9oICLOOxGrF&b=1542651
6) Kentucky Youth Tobacco Survey (KYTS). http://chfs.ky.gov/dph/mch/cd/tobaccodata.htm
7) National Heart Lung and Blood Institute. Asthma: Frequently Asked Questions. http://www.nhlbi.nih.gov/health/prof/lung/asthma/surveil_faq.htm
8) Ulrik, CS, Lange, P. Cigarette Smoking and Asthma. Monaldi Arch Chest Dis. 2001,; 56, 349-353
9) Secondhand Smoke Fact Sheet. Department of Health and Human Services. Centers for Disease Control. http://www.cdc.gov/tobacco/data_statistics/fact_sheets/secondhandsmoke.htm Updated September 2006.
10) Mannino, David M; Moorman, Jeanne E.; Kingsley, Beverly; Rose, Deborah; Repace, James. Health Effects Related to Environmental Tobacco Smoke Exposure in Children in the United States. (Reprinted) Arch Pediatr Adolesc Med. 2001. 155; 36-41.
11) U.S. Department of Health and Human Services. *Children and Secondhand Smoke Exposure. Excerpts from the Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report from the Surgeon General.* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2007.
12) The health consequences of involuntary exposure to secondhand smoke: a report of the Surgeon General.— [Atlanta, GA] : U.S. Dept. of Health and Human Services, Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, [2006].
13) Siroux, V; Pin, I.; Oryszczyn, M.P.; Moua, N. Le; Kauffman, F. Relationships of active smoking to asthma and asthma severity in the EGEA study. European Respiratory Journal. 2000. 15: 470-477.
14) Healthy Weight- it's not a diet, its a lifestyle! Body Mass Index. Department of Health and Human Services. Centers for Disease Control. http://www.cdc.gov/healthyweight/assessing/bmi/index.html. January 27,2009
15) Defining Overweight and Obesity. Department of Health and Human Services. Centers for Disease Control. http://www.cdc.gov/nccdphp/dnpa/obesity/defining.htm. January 28,2009.
16) Making a Difference in the Management of Asthma: A Guide for Respiratory Therapists. U.S. Dept. of Health and Human Services, National Institutes of Health, National Health, Lung, and Blood Institute, May, 2003.
17) Centers for Disease Control and Prevention. CDC Wonder. http://wonder.cdc.gov
18) U.S. Census Bureau. Annual County Resident Population Estimates by Age, Sex, Race, and Hispanic Origin: April 1, 2000 to July 1, 2007. http://www.census.gov/popest/counties/asrh/files/cc-est2007-alldata-21.csv
19) Klein RJ, Schoenborn, CA. Age adjustment using the 2000 projected U.S. population. Healthy People Statistical Notes, no. 20. Hyattsville, Maryland: National Center for Health Statistics. January 2001.

Appendix

Appendix 1A: About the Data - Behavioral Risk Factor Surveillance System (BRFSS)

The BRFSS is designed to monitor the prevalence of health behaviors and risk factors for chronic diseases, injuries and infectious diseases among adults. It is conducted annually and includes all 50 states, three territories and the District of Columbia. Each year, 6,000-7,000 randomly selected adults ages 18 and older who live in Kentucky are selected to be interviewed by telephone using standardized methods and questionnaires set by the Centers for Disease Control and Prevention (CDC).

The BRFSS questionnaire has three parts: 1) the core component, 2) optional modules and 3) state-added questions. Traditionally, the BRFSS only asks questions pertaining to adults ages 18 and older but they offer optional childhood modules as well. The core set of questions that are asked by all states annually include two questions that allow for the calculation of adult asthma prevalence: lifetime asthma and current asthma. Lifetime asthma prevalence refers to the percentage of adults who answered yes to the question, "Have you ever been told by a doctor, nurse or other health professional that you have asthma?" Current asthma prevalence refers to the percentage of adults who answered yes to the previous question and to the question, "Do you still have asthma?"

During even years, the state of Kentucky includes the optional Childhood Asthma Prevalence module; the most recent data available for use is from 2006. This module collects information about asthma prevalence for children 17 years of age and younger by an adult respondent on behalf of the children and adolescents in their household. The questionnaire identifies all children in the home who are under the age of 17 by race and gender. Once the children are identified the interviewer asks two questions about asthma, "Has a doctor, nurse or health professional ever said that the child has asthma?" and "Does the child still have asthma?" To determine whether the child currently has asthma, the adult respondent must answer "yes" to both questions.

For the section, Asthma Prevalence among Children 11 Years of Age and Younger, data from the 2006 BRFSS were used. For the sections, Prevalence of Asthma among Adults, Risk Factors for Asthma among Adults, and Quality of Life among Adults with Asthma, data from the 2006 and 2007 Kentucky BRFSS were used. Two years of data were combined to allow for more stable estimates.

Statistical significance is noted throughout this report to state whether differences between groups reflect a true change in the behavior, attitude, or result being measured. A P-value of less than 0.05 is used to determine significance. Statistical analyses were performed using SAS 9.1 and SUDAAN 9.0. Detailed tables of the results where BRFSS data were used, including sample sizes, 95% confidence intervals and P-values can be found in Appendices 2, 4 and 5.

Appendix 1B: About the Data - Kentucky Youth Tobacco Survey (KYTS)

The KYTS is a survey used to measure awareness, attitudes and behaviors related to tobacco use among middle and high school students in Kentucky. The 2006 KYTS was conducted from February to May 2006 by local health department tobacco coordinators and the Kentucky Department for Public Health's Tobacco Prevention and Cessation Program. A total of 3,016 high school students and 3,745 middle school students were surveyed using a 67-item questionnaire that focuses on attitudes and behaviors related to tobacco. Unlike the BRFSS, the KYTS questions are answered directly by the students but are only representative of the public middle and high school student population in Kentucky.

To determine current asthma prevalence among middle and high school students, they had to answer "yes" to both of the following questions, "Has a doctor, nurse or health professional ever told you that you had asthma?" and "Do you still have asthma?" To determine whether the middle or high school students were smokers the question, "During the past 30 days, on how many days did you smoke cigarettes?" was used. If the student responded that they smoked zero days out of the past 30 days, then they were defined as a non-smoker. If the student responded that they had smoked anywhere between one day to 30 days, then they were defined as a smoker. To determine exposure to environmental tobacco smoke (ETS), the questions, "During the past 7 days, on how many days were you in the same room with someone who was smoking cigarettes?" and "During the past 7 days, on how many days did you ride in the car with someone who was smoking cigarettes?" were used. If the student reported that they were exposed to cigarette smoke zero days for both questions then they were classified as "not exposed to ETS." If the student reported that they were exposed to cigarette smoke, either in the same room or by riding in the car, between 1 and 7 days then they were classified as "exposed to ETS."

Statistical significance is noted throughout this report to state whether differences between groups reflect a true change in the behavior, attitude or result being measured. A P-value of less than 0.05 is used to determine significance. Statistical analyses were performed using SAS 9.1 and SUDAAN 9.0. Detailed tables of the results where KYTS data were used, including sample sizes, 95% confidence intervals and P-values can be found in Appendix 3.

Appendix 1C: About the Data - Hospitalization Data

Hospital discharge data are collected by the Kentucky Hospital Association through a contract with the Cabinet for Health and Family Services' Office of Health Policy. Hospitalization discharge data with an International Classification of Diseases Ninth Revision code 493.0—493.9 as the primary diagnosis are included in this report. The data presented in this report are from 2006 and 2007.

Rates for 2006 and 2007 are based on the U.S. Census Bureau's Annual County Resident Population Estimates by Age, Sex, Race and Hispanic Origin: April 1, 2000 to July 1, 2007.[18] The rates in this report are age-adjusted to the 2000 U.S. population adjustment weights so that comparisons can be made between populations of different age distributions.[19] Detailed tables of the results and county level information can be found in Appendices 6 and 7. Data regarding race and ethnicity were not collected during these two years but will be collected beginning in 2008 along with Emergency Department data.

Appendix 1D: About the Data - Medicaid Data

Medicaid data are collected by the Kentucky Department for Medicaid Services. Unduplicated Medicaid claims data with an International Classification of Diseases Ninth Revision code 493.0—493.2 are included in this report. This data may not represent the true burden of asthma among the Medicaid population because unspecified asthma (ICD– 9 code 493.9) was not included. The Medicaid claims data presented in this report are from Jan. 1, 2006 to Dec. 31, 2006. In the year 2006, there were a total of 883,525 total people enrolled in Medicaid. Of those, 81,431 received asthma-related Medicaid services.

Appendix 1E: About the Data - Mortality Data

For the purpose of this report, an asthma death is defined as any death in which asthma was listed as the primary cause of death according to the International Classification of Diseases (ICD) Tenth revision with ICD-10 codes of J45 and J46. Mortality data were obtained from the Kentucky Office of Vital Statistics, except in the case of Figure 34. where data from the years 1979 to 1999 were obtained from CDC Wonder (a web-based health data repository maintained by the Centers for Disease Control and Prevention). Data from CDC Wonder were queried using the ICD-9 codes 493.0-493.9.

Rates for 2003 to 2007 are based on the U.S. Census Bureau's Annual County Resident Population Estimates by Age, Sex, Race and Hispanic Origin: April 1, 2000 to July 1, 2007[18]. The rates in this report were age-adjusted to the 2000 U.S. population adjustment so that comparisons can be made between populations of different age distributions.[19] Rates from 2006 and 2007 are based on the estimated number of deaths from asthma and are not the final death rate for those years. Detailed tables of the results can be found in Appendix 11.

Appendix 2: 2006 BRFSS Detailed Tables for Children 11 Years of Age and Younger

Prevalence of current asthma among children 11 years of age and younger by age group, 2006							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Age	811	718	93	10.6	8.0	13.9	0.780
Under 5	321	294	27	11.1	6.8	17.7	
6-11	490	424	66	10.2	7.5	13.8	

Prevalence of current asthma among children 11 years of age and younger by gender, 2006							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Gender	811	718	93	10.6	8.0	13.9	0.042
Male	407	343	64	13.6	9.6	18.8	
Female	404	375	29	7.5	4.6	12.1	

Prevalence of lifetime asthma among children 11 years of age and younger by gender, 2006							
	Total N	N without Asthma	N with Lifetime Asthma	% with Lifetime Asthma	Lower CI	Upper CI	Chi-Square P-Value
Gender	817	692	123	13.7	10.8	17.2	0.02
Male	410	324	85	18.0	13.6	23.5	
Female	407	368	38	9.2	5.9	14.0	

*Don't know for asthma status (n= 2) were not included in the table or figures.

Appendix 3: 2006 KYTS Detailed Tables

Prevalence of current asthma among middle school students by gender, 2006							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Gender	3259	2854	405	13.6	11.3	16.3	0.819
Male	1642	1430	212	13.4	10.7	16.7	
Female	1617	1424	193	13.8	11.0	17.3	

Prevalence of lifetime asthma among middle school students by gender, 2006							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-Value
Gender	3456	2481	975	29.5	26.8	32.4	0.01
Male	1738	1195	543	32.0	28.8	35.3	
Female	1718	1286	432	26.9	23.5	30.5	

Prevalence of current asthma among middle school students by race, 2006							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Race	3254	2852	402	13.5	11.2	16.3	0.118
Black	277	230	47	16.9	11.2	24.8	
White	2724	2390	334	13.5	11.1	16.3	

*Other races (n= 253) were not included in the table or figures.

Prevalence of current asthma among middle school students by age group, 2006							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Age	3269	2863	406	13.6	11.3	16.3	0.484
Under 11	359	313	46	12.0	8.1	17.4	
12-13	1996	1747	249	14.2	11.6	17.3	
14-16	914	803	111	13.0	9.9	16.8	

Appendix 3: 2006 KYTS Detailed Tables *continued. . .*

Prevalence of current asthma among high school students by gender, 2006							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Gender	2667	2360	307	11.8	10.1	13.7	0.043
Male	1294	1166	128	10.4	8.3	13.1	
Female	1373	1194	179	13.3	11.3	15.7	

Prevalence of lifetime asthma among high school students by gender, 2006							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-Value
Gender	2822	1948	874	31.4	28.2	34.7	<0.001
Male	1365	905	460	34.3	30.7	38.1	
Female	1457	1043	414	28.1	24.9	31.5	

Prevalence of current asthma among high school students by race, 2006							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Race	2655	2353	302	11.8	10.1	13.8	0.060
Black	200	172	28	22.4	13.8	34.1	
White	2312	2050	262	11.3	9.3	13.6	

*Other races (n= 141) were not included in the table or figures.
*Percent for black high school students is unreliable due to a small sample size.

Prevalence of current asthma among high school students by age group, 2006							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Age	2671	2365	306	11.8	10.1	13.7	0.357
12-15	1285	1142	143	10.6	8.4	13.4	
16-18	1386	1223	163	12.6	9.9	15.8	

Appendix 3: 2006 KYTS Detailed Tables *continued. . .*

Prevalence of current asthma among middle school students by smoking status, 2006							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Smoking Status	3189	2789	400	13.7	11.4	16.5	0.959
Non-Smoker	2821	2462	359	13.7	11.3	16.6	
Smoker	368	327	41	13.9	9.4	19.95	

Prevalence of current asthma among high school students by smoking status, 2006							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Smoking Status	2597	2298	298	11.8	10.0	13.8	0.264
Non-Smoker	1933	1704	229	12.3	10.2	14.7	
Smoker	664	595	69	10.4	8.0	13.6	

Prevalence of current asthma among middle school students by exposure to ETS, 2006							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
ETS Exposure	3261	2858	403	13.4	11.2	16.1	0.094
Not Exposed	981	861	120	15.4	12.5	18.9	
Exposed	2280	1997	287	12.7	10.2	15.7	

Prevalence of current asthma among high school students by exposure to ETS, 2006							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
ETS Exposure	2249	1993	256	11.9	10.1	14.0	0.817
Not Exposed	483	430	53	11.3	7.7	16.3	
Exposed	1766	1563	203	12.0	9.5	15.2	

Appendix 4: 2006-2007 BRFSS Detailed Tables for Adults

Prevalence of current asthma among adults by gender, 2006-2007							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Gender (Total)	13082	11736	1293	8.6	7.9	9.3	<0.001
Male	4321	3969	336	7.0	6.0	8.2	
Female	8761	7767	957	10.0	9.1	11.0	

*Don't know for asthma status (n= 53) was not included in the table or figures.

Prevalence of lifetime asthma among adults by gender, 2006-2007							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-Value
Gender	13082	11322	1732	12.1	11.3	13.0	<0.001
Male	4321	3832	480	10.7	9.4	12.2	
Female	8761	7490	1252	13.5	12.4	14.6	

*Don't know for asthma status (n= 28) were not included in the table or figures.

Prevalence of current asthma among adults by race, 2006-2007							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Race (Total)	13012	11676	1283	8.5	7.9	9.3	0.007
Black	427	378	49	13.9	9.3	20.2	
White	12211	10977	1182	8.2	7.5	8.9	

*Don't know for asthma status (n= 53) and other races (n= 374) were not included in the table or figures.

Prevalence of current asthma among adults by race and gender, 2006-2007							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
White (Total)**	12211	10977	1182	8.2	7.5	8.9	<0.001
White Male	4028	3707	305	6.5	5.6	7.7	
White Female	8183	7270	877	9.8	8.9	10.8	
Black (Total)	427	378	49	13.9	9.3	20.2	0.466
Black Male*	146	130	16	16.1	8.5	28.2	
Black Female	281	248	33	11.9	7.6	18.2	

*The prevalence estimate for black males is not reliable due to a small sample size but was included in this report for completeness and consistency.
** Don't know for asthma status (n=53) was not included in the table or figures.

Appendix 4: 2006-2007 BRFSS Detailed Tables for Adults *continued. . .*

Prevalence of current asthma among adults by age group, 2006-2007							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Age (Total)	13082	11736	1293	8.6	7.9	9.3	0.263
18-24	481	427	53	9.6	7.0	13.1	
25-34	1315	1205	104	7.7	5.8	10.0	
35-44	2058	1875	177	7.1	5.6	8.9	
45-54	2613	2324	282	8.9	7.6	10.4	
55-64	2864	2525	329	9.9	8.6	11.4	
≥65	3751	3380	348	9.2	8.0	10.6	

*Don't know for asthma status (n= 53) was not included in the table or figures.

Prevalence of current asthma among adults by education, 2006-2007							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Education*	13082	11736	1293	8.6	7.9	9.3	<0.001
Did not graduate HS	2573	2152	403	15.1	13.0	17.5	
Graduated HS	4981	4508	457	8.8	7.7	10.1	
Attended college/tech. school	2913	2640	259	7.7	6.4	9.2	
Graduated college/tech. school	2560	2391	166	4.8	3.8	6.0	

*Don't know for asthma status (n= 53) and Don't know/Not sure/Missing (n=55) for education were not included in the table or Figures.

Prevalence of current asthma among adults by income, 2006-2007							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Income*	13082	11736	1293	8.6	7.9	9.3	<0.001
<$15,000	1812	1460	338	18.2	15.6	21.2	
$15,000-$24,999	2098	1864	229	9.7	8.0	11.6	
$25,000-$34,999	1395	1252	139	10.0	7.4	13.4	
$35,000-$49,999	1530	1421	103	7.0	5.3	9.2	
≥$50,000	2880	2721	154	4.8	3.8	5.9	

*Don't know for asthma status (n=53) and Don't know/not sure/missing (n=3367) for income were not include in the table or figures.

Appendix 4: 2006-2007 BRFSS Detailed Tables for Adults *continued. . .*

Prevalence of current asthma among adults by health coverage, 2006-2007							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Health Coverage*	13082	11736	1293	8.6	7.9	9.3	0.001
Insured	11245	10115	1088	7.9	7.3	8.6	
Not Insured	1807	1592	204	11.8	9.4	14.8	

*Don't know for asthma status (n=53) and Don't know/not sure/missing (n=30) for Health coverage were not included in the table or figures.

*Don't know for asthma status (n= 23) was not included in the table or figures.

Prevalence of current asthma among adults by smoking status, 2006-2007							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Smoking Status (Total)	13082	11736	1293	8.6	7.9	9.3	0.010
Smoker	3515	3049	453	10.7	9.3	12.3	
Non-Smoker	9540	8666	836	7.7	6.9	8.5	

*Don't know for asthma status (n= 53) and missing (n= 27) for smoking status were not included in the table or figures.

Prevalence of current asthma among adults by overweight/obesity, 2006-2007							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Weight (Total)	13082	11736	1293	8.6	7.9	9.3	0.031
Not Overweight/Obese	4169	3803	348	7.2	6.2	8.3	
Overweight/Obese	8351	7434	886	9.1	8.2	10.1	

*Don't know for asthma status (n= 53) and missing (n=562) for weight were not included in the table or figures.

Prevalence of current asthma among adults by diabetes status, 2006-2007							
	Total N	N without Asthma	N with Asthma	% with Asthma	Lower CI	Upper CI	Chi-Square P-value
Diabetes Diagnosis (Total)*	13082	11736	1293	8.6	7.9	9.3	0.001
No	10904	9881	981	7.9	7.1	8.7	
Borderline	294	233	60	19.5	14.3	26.0	
Yes	1752	1512	232	12.7	10.7	15.1	

*Don't know for asthma status (n=53), Gestational diabetes (n=123), and missing (n=9) were not included in the table or figures.

Appendix 5: Detailed Tables for Quality of Life among Adults with Asthma

Prevalence of dissatisfaction with life among adults with and without asthma, 2006-2007					
	Total N	% Dissatisfied with Life	Lower CI	Upper CI	Chi-Square P-value
Dissatisfied with Life (Total)*	890	6.81	6.12	7.57	<0.001
Asthma	158	14.1	11.1	17.7	
No Asthma	729	6.1	5.5	6.9	

*Don't know for asthma status (n= 3) was not included in the table or figures.

Prevalence of fair or poor health among adults with and without asthma,2006-2007					
	Total N	% Fair or Poor Health	Lower CI	Upper CI	Chi-Square P-value
Fair or Poor Health (Total)*	4195	23.1	22.1	24.1	<0.001
Asthma	783	47.5	43.2	51.8	
No Asthma	3378	20.6	19.6	21.6	

*Don't know for asthma status (n=34) was not included in the tables or figures.

Prevalence of physical inactivity among adults with and without asthma					
	Total N	% Inactivity	Lower CI	Upper CI	Chi-Square P-Value
Physical Inactivity	4896	30.3	29.2	31.5	<0.001
Asthma	684	43.9	39.7	48.1	
No Asthma	4187	29.1	27.8	30.3	

Average number of physically unhealthy days among adults with and without asthma, 2006-2007					
	Total N	Average physically unhealthy days	Lower CI	Upper CI	Chi-Square P-value
Asthma	1293	13.5	12.7	14.2	<0.001
No Asthma	11736	5.9	5.8	6.1	

*Don't know for asthma status (n= 53) and don't know/ missing (n=461) for physically unhealthy days was not included in the table or figures.

Appendix 5: Detailed Tables for Quality of Life among Adults with Asthma

Average number of mentally unhealthy days among adults with and without asthma, 2006-2007					
	Total N	Average mentally unhealthy days	Lower CI	Upper CI	Chi-Square P-value
Asthma	1293	8.6	8.0	9.3	<0.001
No Asthma	11736	4.2	4.1	4.4	

*Don't know for asthma status (n=53) and don't know/missing (n=357) for mentally unhealthy days was not included in the table or figures.

Prevalence of activity limitations due to health problems among adults with and without asthma, 2006-2007					
	Total N	% Activity Limitation	Lower CI	Upper CI	Chi-Square P-value
Activity Limitation (Total)*	4140	25.6	24.6	26.8	<0.001
Asthma	722	48.8	44.5	53.2	
No Asthma	3390	23.4	22.3	24.5	

*Don't know for asthma status (n= 28) was not included in the table or figures.

Appendix 6: 2007 Hospitalization Detailed Tables

Percent of asthma hospitalizations by season, 2007		
Season	Number	Percent
Spring	1,395	22.4
Summer	1,283	20.6
Fall	1,715	27.5
Winter	1,842	29.5

Age-adjusted hospitalization rates by year and gender, 2006- 2007				
	Male		Female	
	Number	Rate	Number	Rate
2006	2378	118.3	4629	207.9
2007	2100	103.1	4135	183.9

Age-specific asthma hospitalization rates by age group, 2007		
Age Group	Number	Rate
0 - 4	1,179	424
5 - 14	676	123
15 - 24	297	53
25 - 34	416	71
35 - 44	742	123
45 - 54	961	154
55 - 64	838	172
65 - 74	581	197
75 - 84	371	203
85+	174	243

Appendix 7: 2007 County Level Hospitalization Data

Table 3. Annual number of hospitalizations for asthma, age-adjusted asthma hospitalization rates and hospital charges by county, Kentucky, 2007

County	Cases	Rate	Total Charges
Kentucky	**6,235**	**145.7**	**$62,231,688.33**
Adair	20	118.8	$145,789.20
Allen	31	160.7	$298,562.96
Anderson	10	50.5	$92,257.22
Ballard	11	126.6	$88,852.52
Barren	68	159.4	$619,623.22
Bath	5	43.2	$24,337.53
Bell	266	931.0	$1,521,578.00
Boone	77	70.4	$764,298.25
Bourbon	15	80.0	$57,689.83
Boyd	111	217.8	$1,011,166.06
Boyle	43	153.4	$345,952.10
Bracken	6	71.7	$35,617.56
Breathitt	49	283.7	$664,406.00
Breckinridge	8	43.0	$62,637.24
Bullitt	61	88.3	$843,771.02
Butler	22	165.3	$249,097.56
Caldwell	9	63.5	$81,577.50
Calloway	41	131.3	$288,189.10
Campbell	53	59.9	$434,392.31
Carlisle	6	111.2	$38,824.32
Carroll	12	117.5	$158,038.19
Carter	24	86.0	$363,419.01
Casey	26	165.3	$164,369.41
Christian	165	229.6	$1,411,294.42
Clark	30	85.0	$185,329.31
Clay	56	253.5	$758,211.72
Clinton	38	343.4	$443,537.73
Crittenden	33	377.5	$171,472.71
Cumberland	9	140.4	$68,589.95
Daviess	143	146.1	$902,457.79
Edmonson	15	126.9	$146,415.06
Elliott	7	91.7	$56,783.69
Estill	14	96.5	$47,479.32
Fayette	172	64.0	$1,521,872.71
Fleming	29	194.1	$368,153.87
Floyd	79	197.7	$798,990.33
Franklin	40	79.7	$368,132.58
Fulton	49	827.5	$327,647.23
Gallatin	*	37.9	$28,114.33
Garrard	18	101.7	$111,159.73
Grant	27	116.6	$282,286.37
Graves	106	268.5	$602,036.66
Grayson	51	182.3	$529,173.53
Green	11	95.8	$91,938.10
Greenup	55	145.2	$508,919.85
Hancock	6	64.2	$31,060.41
Hardin	136	137.5	$987,474.57
Harlan	125	394.1	$898,888.72
Harrison	15	85.5	$93,065.86
Hart	14	76.4	$61,104.02
Henderson	135	285.9	$1,647,434.03
Henry	12	79.6	$122,823.36
Hickman	19	478.3	$130,312.11
Hopkins	59	124.1	$674,522.54
Jackson	39	282.6	$340,440.30
Jefferson	1,238	172.4	$18,100,904.50
Jessamine	33	77.0	$278,800.23
Johnson	69	309.0	$957,198.76
Kenton	124	77.1	$1,216,066.14
Knott	25	137.9	$344,519.87
Knox	51	146.2	$338,072.28
Larue	24	188.1	$163,695.79
Laurel	57	98.8	$487,656.94
Lawrence	53	319.7	$624,633.36
Lee	11	171.6	$196,747.64
Leslie	23	206.2	$127,730.16
Letcher	78	337.3	$651,194.36
Lewis	14	103.1	$61,003.52
Lincoln	30	120.9	$173,647.46

Appendix 7: 2007 County Level Hospitalization Data *continued. . .*

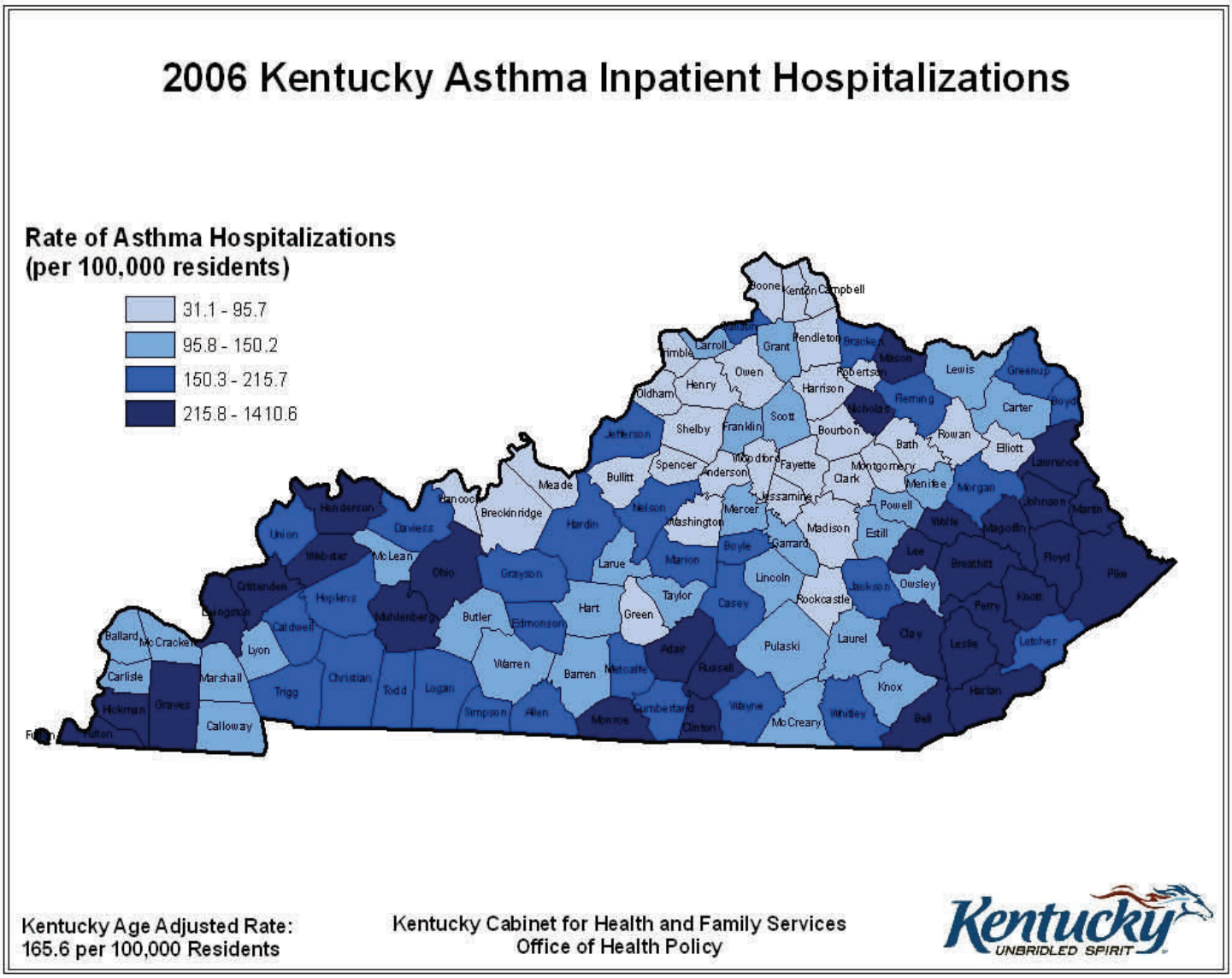
Table 3. ***continued. . .***

County	Cases	Rate	Total Charges
Livingston	21	211.0	$141,782.11
Logan	26	87.1	$267,130.46
Lyon	*	30.4	$7,843.46
Madison	53	70.6	$284,631.30
Magoffin	35	268.6	$656,941.60
Marion	18	93.9	$127,841.42
Marshall	31	87.1	$245,098.17
Martin	16	137.8	$229,608.83
Mason	35	207.4	$284,902.30
McCracken	105	152.1	$805,105.20
McCreary	17	98.7	$232,270.00
McLean	10	90.2	$57,248.70
Meade	23	98.4	$204,980.06
Menifee	6	79.2	$48,086.15
Mercer	18	81.0	$119,239.52
Metcalfe	23	212.1	$126,354.35
Monroe	127	1052.1	$924,383.84
Montgomery	22	82.9	$118,105.66
Morgan	16	122.8	$121,648.89
Muhlenberg	71	225.8	$551,391.85
Nelson	59	137.4	$586,446.50
Nicholas	24	322.6	$109,507.14
Ohio	32	119.4	$192,283.67
Oldham	39	78.3	$474,969.42
Owen	11	85.2	$79,893.46
Owsley	7	163.1	$63,025.85
Pendleton	9	57.6	$79,514.40
Perry	105	367.6	$817,806.89
Pike	137	213.2	$1,513,309.16
Powell	14	93.1	$69,635.24
Pulaski	100	160.6	$1,153,585.15
Robertson	*	56.0	$1,793.00
Rockcastle	20	118.3	$90,759.12
Rowan	8	41.0	$63,171.16
Russell	34	194.9	$253,715.05
Scott	42	102.8	$247,158.44
Shelby	26	63.1	$253,850.99
Simpson	37	217.8	$314,291.16
Spencer	11	73.7	$197,152.35
Taylor	18	83.9	$90,702.75
Todd	25	189.4	$209,152.46
Trigg	16	115.0	$68,707.42
Trimble	11	122.8	$135,119.00
Union	11	73.2	$134,505.51
Warren	107	105.5	$1,502,963.17
Washington	9	80.2	$77,977.75
Wayne	36	172.7	$194,339.19
Webster	20	135.2	$201,531.58
Whitley	53	141.2	$445,702.94
Wolfe	16	216.8	$194,805.22
Woodford	8	34.2	$66,279.29

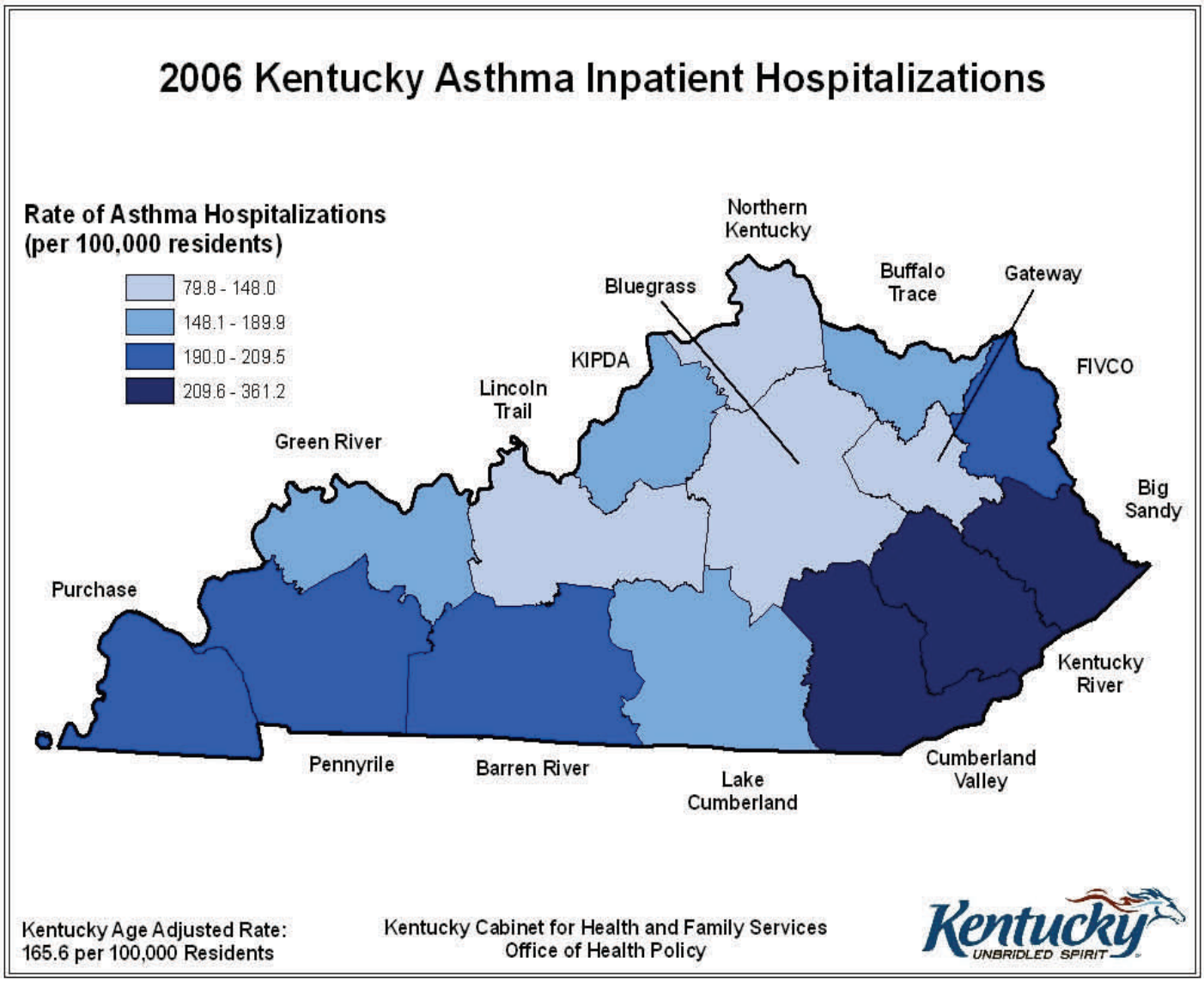
* Cases not listed for counties with < 5 hospitalizations per year.

Note: Rates based on < 20 hospitalizations may be unstable and should be interpreted with caution.

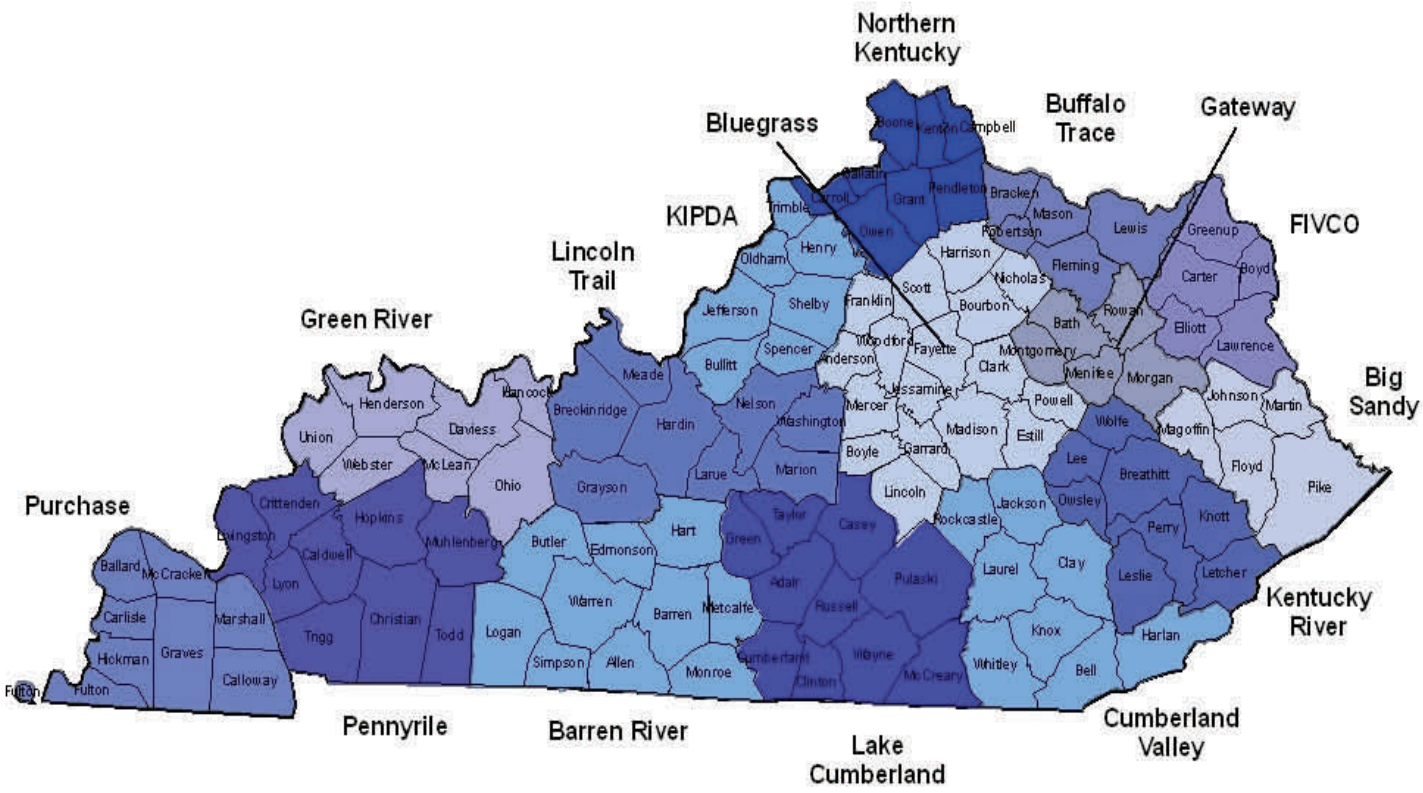
Appendix 8: Map 4. Age-adjusted inpatient hospitalization rates for asthma by county, Kentucky, 2006



Appendix 9: Map 5. Age-adjusted inpatient hospitalization rates for asthma by Area Development District, Kentucky, 2006



Appendix 10: Map 6. Area Development Districts, Kentucky



Appendix 11: Medicaid Detailed Tables

Percentage of Medicaid patients who received asthma-related services by age group, 2006

Age Group	Asthma Count	Medicaid Count	Percent
0-3	15,340	123,370	12.4
4-10	18,545	173,691	10.7
11-14	7,280	86,811	8.4
15-18	6,325	83,619	7.6

Percentage of Medicaid patients who received asthma-related services by gender, 2006

	Asthma Count	Medicaid Count	Rate
Male	34,651	375,324	9.2
Female	46,780	508,200	9.2

Percentage of Medicaid patients who received asthma-related services by race, 2006

	Asthma Count	Medicaid Count	Percent
Black	11,490	109,168	10.5
White	69,793	723,059	9.7

Percentage of Medicaid patients who received asthma-related services by race and gender, 2006

	Black		White	
	Male	Female	Male	Female
Asthma Count	5,206	6,284	40,423	29,370
Medicaid Count	45,097	64,071	306,978	416,081
Percent	11.5	9.8	9.6	9.7

Appendix 12: Mortality Detailed Tables

Age-adjusted asthma death rates, Kentucky 1979-2007

Year	Count	Rate
1979*	49	1.6
1980*	59	1.9
1981*	40	1.2
1982*	41	1.2
1983*	48	1.4
1984*	44	1.3
1985*	56	1.6
1986*	55	1.6
1987*	60	1.8
1988*	80	2.3
1989*	59	1.7
1990*	75	2.1
1991*	76	2.1
1992*	59	1.7
1993*	57	1.5
1994*	77	2.1
1995*	66	1.7
1996*	70	1.8
1997*	81	2.1
1998*	68	1.7
1999*	52	1.2
2000	52	1.3
2001	53	1.3
2002	50	1.2
2003	49	1.2
2004	51	1.2
2005	55	1.3
2006**	58	1.3
2007**	35	0.8

Rate per 100,000

* Rates and counts were obtained from CDC Wonder with asthma as the primary cause of death.

** Rates and counts are not final, they are based on preliminary number of deaths from asthma.

Age-adjusted death rate by race and gender, 2003-2007

	Black		White	
	Male	Female	Male	Female
Rate	1.6	3.3	0.7	1.5
Count	13	24	62	149

* Rate per 100,000

Age-specific death rates by age group, 2003-2007

	Count	Rate
00-04	3	0.2
05 - 14	3	0.1
15 - 24	10	0.4
25 - 34	14	0.5
35 - 44	23	0.8
45 - 54	39	1.3
55 - 64	25	1.1
65 - 74	38	3
75 - 84	45	5
85+	48	14.6

*Rate per 100,000

Kentucky Demographic Profile—2007

Gender	Number	Percent
Male	2,078,507	49.0%
Female	2,162,967	51.0%
Total	4,241,474	100%

Race	Number	Percent
White	3,816,958	90.0%
Black	326,930	7.7%
Other	97,586	2.3%
Total	4,241,474	100%

Age Group	Number	Percent
0 - 4	278,330	6.6%
5 - 14	549,827	13.0%
15 - 24	559,766	13.2%
25 - 34	587,896	13.9%
35 - 44	602,893	14.2%
45 - 54	625,262	14.7%
55 - 64	487,996	11.5%
65 - 74	295,345	7.0%
75 - 84	182,415	4.3%
85+	71,744	1.7%
Total	4,241,474	100.0%

Source: Population Division, U.S. Census Bureau, 7/1/2007 County Characteristics Resident Population Estimates File

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