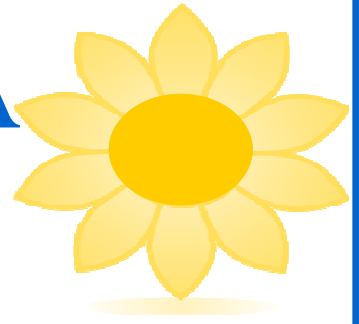
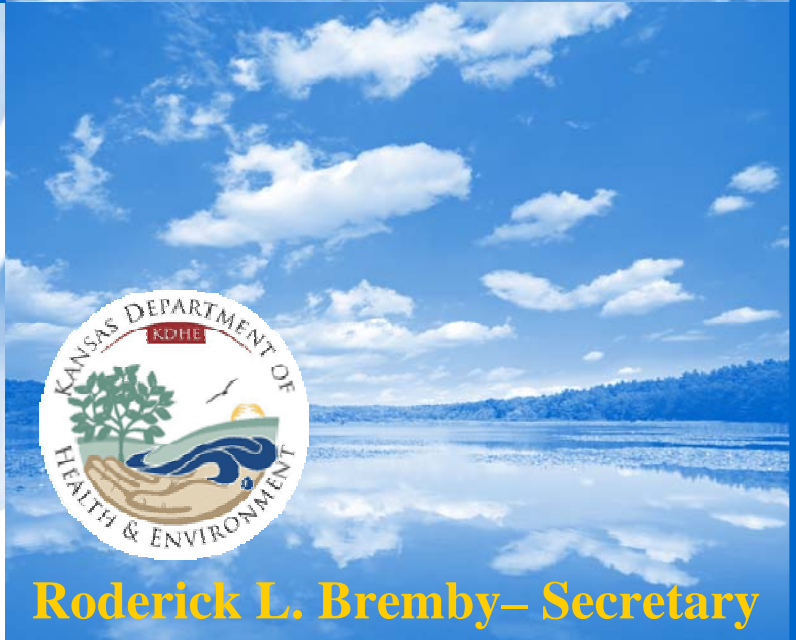


# KANSAS ASTHMA BURDEN REPORT



Kansas Department of Health & Environment  
2009



**Roderick L. Bremby – Secretary**

# **Burden of Asthma in Kansas**

**April 2009**

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## Introduction

### a. Importance of Asthma

Asthma is a chronic disease in which airways become blocked or narrowed leading to repeated episodes of wheezing, coughing and chest tightness, known as asthma attacks. Asthma attacks can occur upon exposure to certain environmental factors known as Asthma Triggers. Common asthma triggers include: environmental tobacco smoke, dust mites, outdoor air pollution, cockroach allergen, pets, mold and other triggers.

Asthma is a significant public health problem in the United States and in Kansas. The National Center for Health Statistics estimates that 16.2 million adults and 6.7 million children in the U.S. currently have asthma.<sup>1</sup> Nationally, asthma is responsible for 10.6 million visits to office-based physicians<sup>2</sup> and 444,000 inpatient hospital discharges<sup>3</sup> annually, according to most recent estimates.

In Kansas, an estimated 174,713 (8.4%) adult Kansans have asthma currently and an estimated 251,670 (12.1%) adults have had asthma in their lifetime.<sup>4</sup> Among children, about 11.3% have had asthma in their lifetime.<sup>5</sup> It accounts for about 300 deaths<sup>6</sup> and 3,000 inpatient hospital discharges<sup>7</sup> each year in Kansas. The burden of asthma falls disproportionately on some subpopulations.

Asthma is a primary component of the respiratory health focus area for Healthy Kansans 2010, a framework for improving public health in Kansas by increasing quality and years of health life and eliminating health disparities. These surveillance data presented in this burden report describe asthma prevalence, associated risk factors, patterns of hospitalization and mortality due to asthma. The data in reported here are important for monitoring asthma trends, documenting disparities and increasing knowledge of the impact asthma has on Kansans.



## b. Highlights of the Report

### Fast Facts about Asthma in Kansas, 2007

- The prevalence of lifetime asthma among adults was 12.1%.
- The prevalence of current asthma among adults was 8.4%.
- The prevalence of lifetime childhood asthma was 11.3%.
- The prevalence of current childhood asthma was 8.3%.
- The prevalence of current asthma was higher among adult females (10.0%) than males (6.7%).
- Non-Hispanic population showed higher prevalence of current asthma (8.7%) than Hispanics (4.4%).
- The prevalence of lifetime asthma among high school students was higher among African-Americans (31.0%) as compared to Whites (19.5%).
- The prevalence of current asthma among adults decreased with an increase in annual household income.
- The prevalence of current asthma was higher among obese (BMI  $\geq$  30) adults (12.3%) as compared to either normal/underweight (BMI  $<$  25) or overweight ( $\leq$  25 BMI  $<$ 30) adults.
- The prevalence of current asthma was higher among adults living with a disability (15.1%) as compared to adults living without a disability (6.7%).
- The prevalence of current asthma among adults was higher among adults who reported their general health as fair or poor (17.9%) as compared to adults who reported their general health from excellent to good (7.0%).
- The age-adjusted hospitalization rate was 10.5 per 10,000 residents.
- The asthma hospitalization rate is higher for women (13.2 per 10,000 women) than for men (8.8 per 10,000 men).
- The age-adjusted hospitalization rate among African-Americans was more than three times (25.2 per 10,000 residents) as compared to Whites (8 per 10,000 residents).
- The average length of stay for asthma hospitalizations increased with an increase in age.
- The age-adjusted mortality rate was 1.0 per 100,000 residents.



# Prevalence of Asthma in Kansas 2007 Kansas Behavioral Risk Factor Surveillance System

## II. Prevalence of Asthma (Kansas BRFSS)

### a. Introduction

Kansas Behavioral Risk Factor Surveillance System (BRFSS)<sup>4</sup> is a random digit dial telephone survey among non-institutionalized adults age 18 years and older. In addition, adult respondents provide limited data on a randomly selected child in the household via surrogate interview. The BRFSS is coordinated and partially funded by the Centers for Disease Control and Prevention and is the largest continuously conducted telephone survey in the world. It is conducted in every state, the District of Columbia and several United States territories. The first BRFSS survey in Kansas was conducted as a point-in-time survey in 1990 and since 1992 Kansas has conducted the BRFSS survey annually.

BRFSS data are used to monitor the leading contributors to morbidity and premature death, track health status and assess trends, measure knowledge, attitudes, and opinions, policy development, evaluation. It is also used in program planning in terms of needs assessment, development of goals and objectives and identification of target groups.

2007 Kansas BRFSS included two questions for assessing lifetime and current prevalence of asthma among adult Kansans. Lifetime asthma prevalence was determined based on response to the question: "Have you ever been told by a doctor, nurse or other health care professional that you have asthma?" Current asthma prevalence was determined based on response to the question: "Do you still have asthma?" Current asthma prevalence question was asked only to the respondents who answered 'yes' to the lifetime asthma prevalence question.

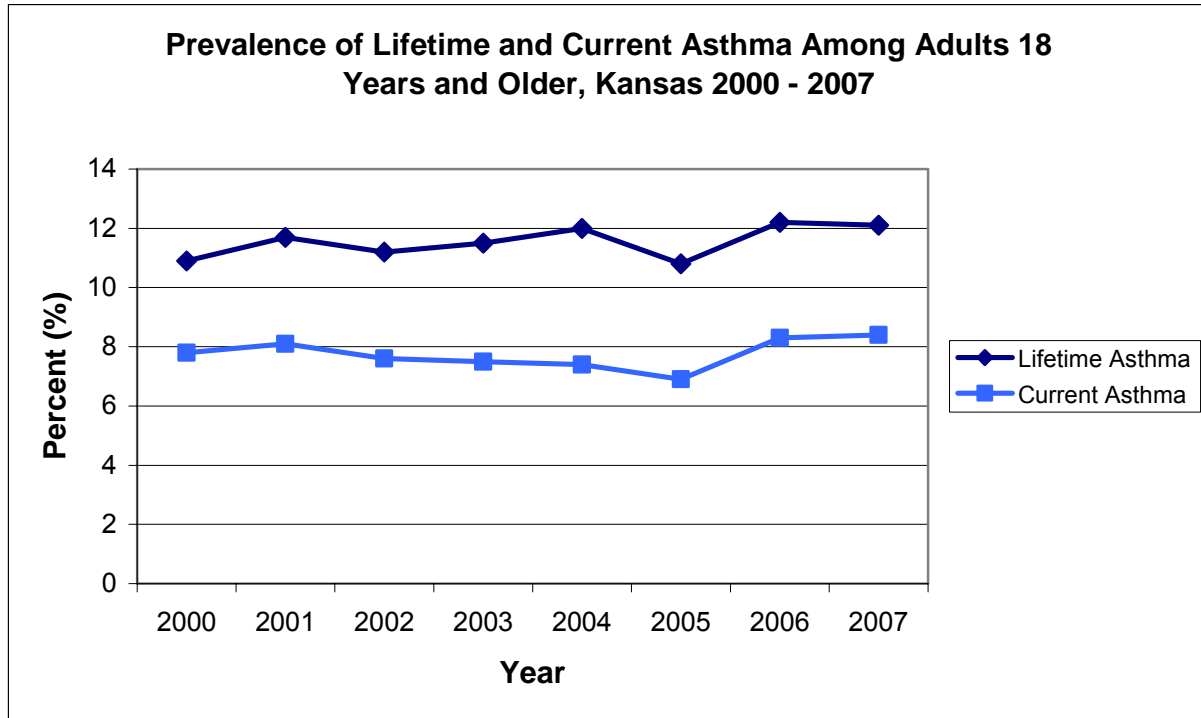
In addition to above questions, 2007 Kansas BRFSS also asked two questions to determine prevalence of asthma among children. The respondent living with child/children aged 17 or younger were asked to randomly select a child in their household and answer on behalf of the child. Lifetime childhood asthma prevalence was determined based on response to the question: "Has a doctor, nurse or other health professional ever said that the child has asthma?" Current childhood asthma prevalence was determined based on response to the question: "Does the child still have asthma?" Current childhood asthma prevalence question was asked only to the respondents who answered 'yes' to the lifetime childhood asthma prevalence question.

This report has detailed analyses and results for current asthma prevalence in Kansas among adults and children using 2007 Kansas BRFSS data by selected population subgroups.



**b. Figures**

**1. Prevalence of lifetime and current asthma among adults**

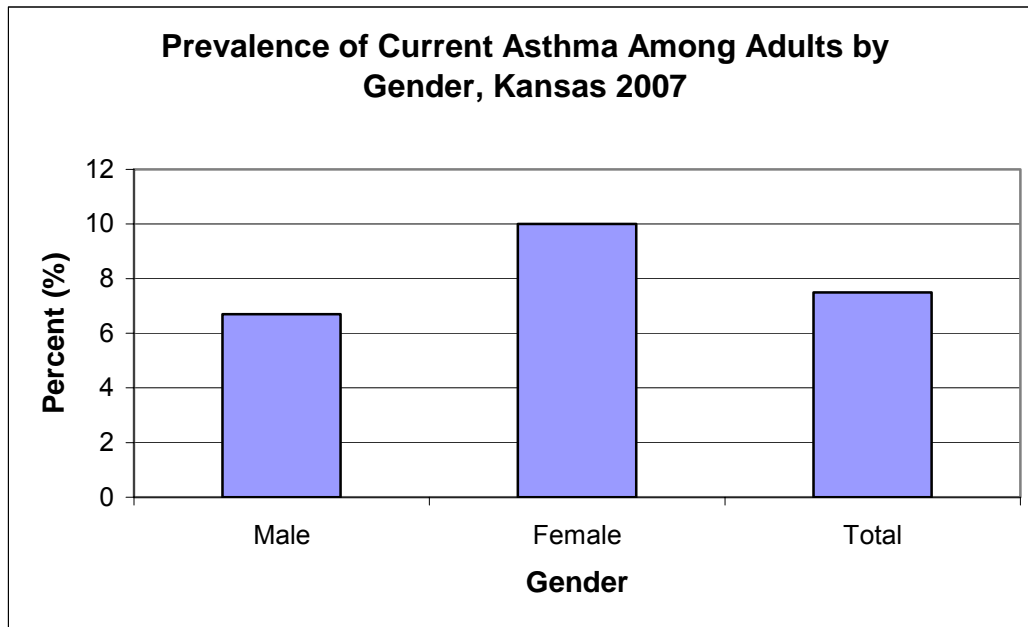


- The prevalence of lifetime asthma among adult Kansans slightly increased over a period of time with some fluctuations. The lifetime asthma prevalence was lowest (10.8%) in 2005 and highest (12.2%) in 2006.
- The prevalence of current asthma among adult Kansans remained almost steady though some fluctuations were observed. It was determined lowest (6.9%) in 2005 and highest (8.4%) in 2007.
- In 2007, the prevalence of lifetime asthma among adult Kansans was 12.1%.
- In 2007, the prevalence of current asthma among adult Kansans was 8.4%.





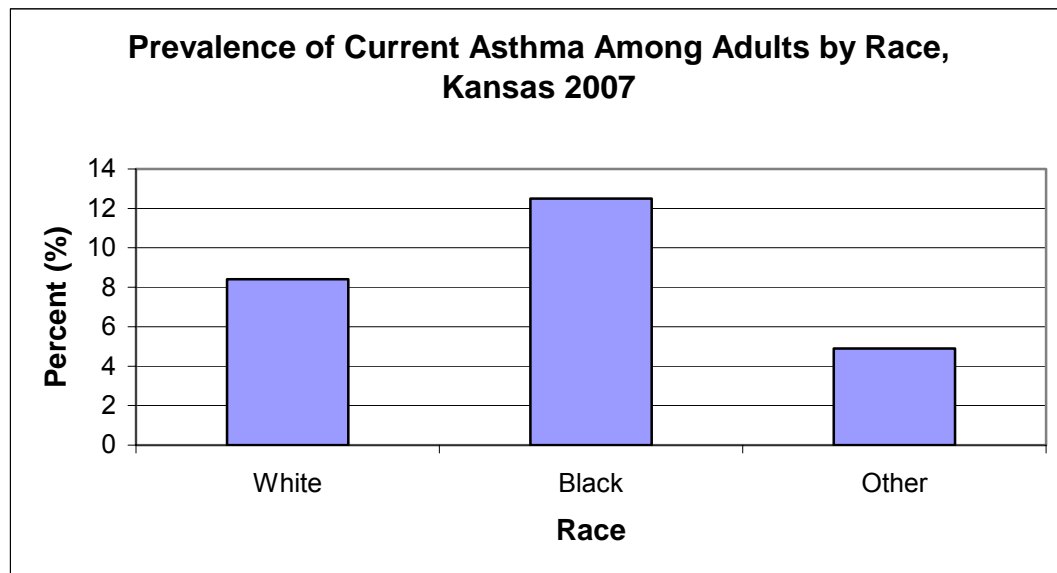
## 2. Prevalence of current asthma among adults by gender



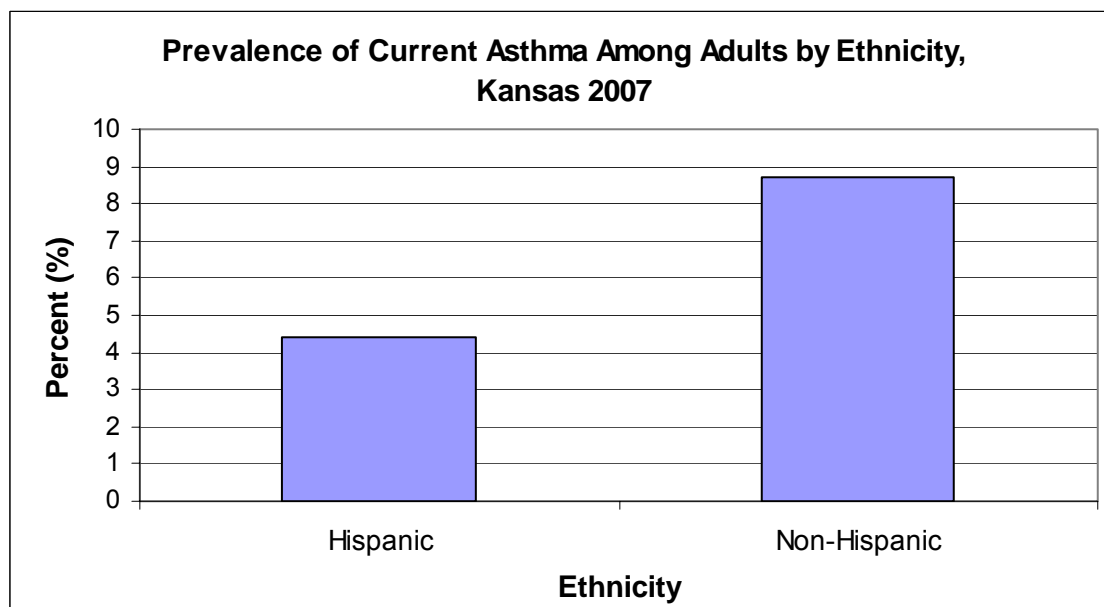
- The prevalence of current asthma was significantly higher (10.0%, 95% CI: 8.8%, 11.2%) among females than in males (6.7%, 95% CI: 5.5%, 8.0%).



### 3. Prevalence of current asthma among adults by race and ethnicity



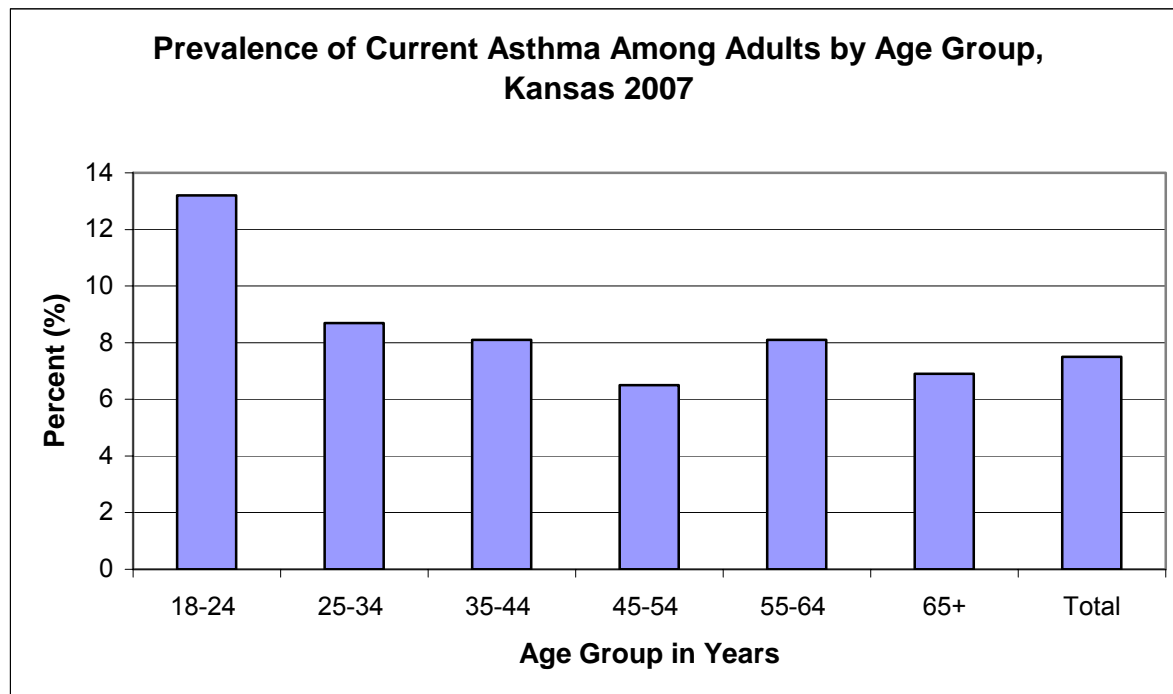
- Though the prevalence of current asthma was higher among African-American (12.5%, 95% CI: 7.4%, 17.6%) as compared to white population (8.4%, 95% CI: 7.5%, 9.3%), it was not statistically significant.
- The category of 'more than one race' did not have enough respondents to provide scientifically stable estimate and not reported above.



- The prevalence of current asthma was significantly higher among non-Hispanic population (8.7%, 95% CI: 7.8%, 9.6%) as compared to Hispanics (4.4%, 1.7%, 7.2%).



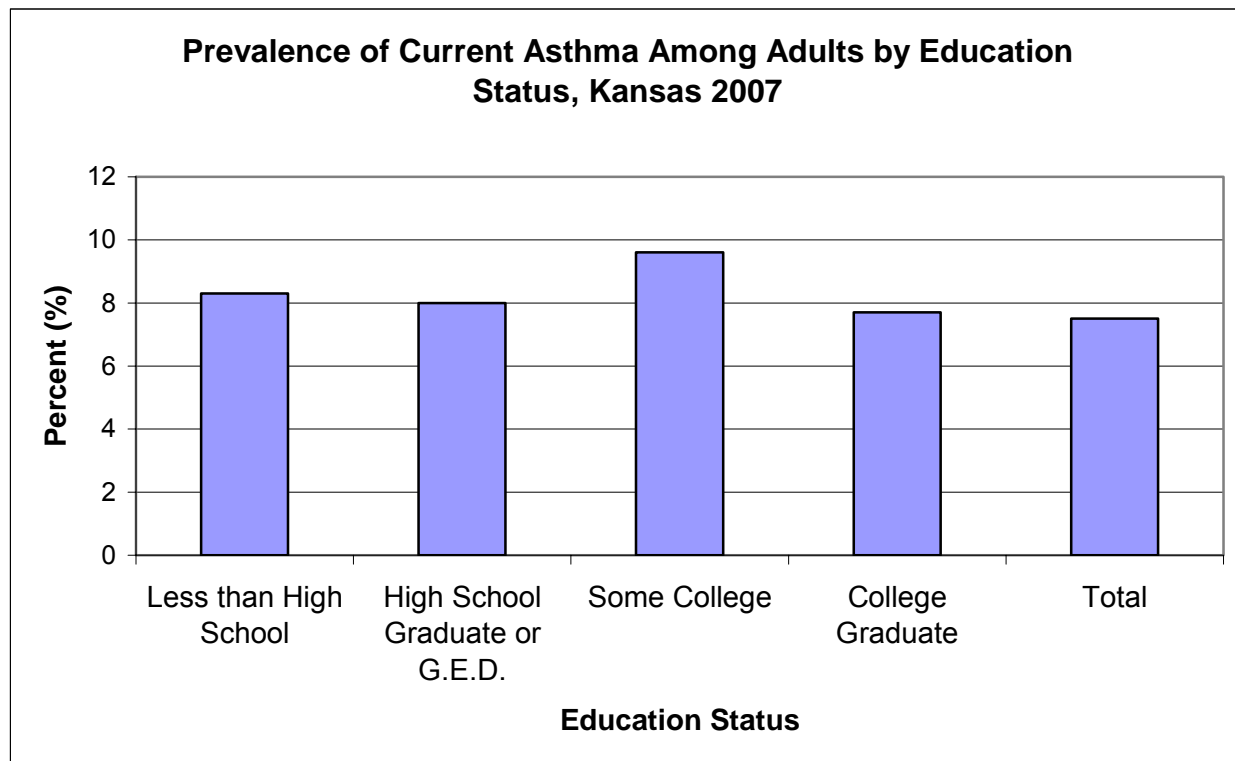
#### 4. Prevalence of current asthma among adults by age group



- The prevalence of current asthma was highest among age group 18-24 years (13.2%, 95% CI: 8.7%, 17.7%) and lowest among 45-54 years (6.5%, 95% CI: 5.3%, 7.7%).
- The prevalence of current asthma was significantly different only for age groups 18-24 years and 45-54 years.
- Overall, the prevalence of current asthma among adults decreased with an increase in age.



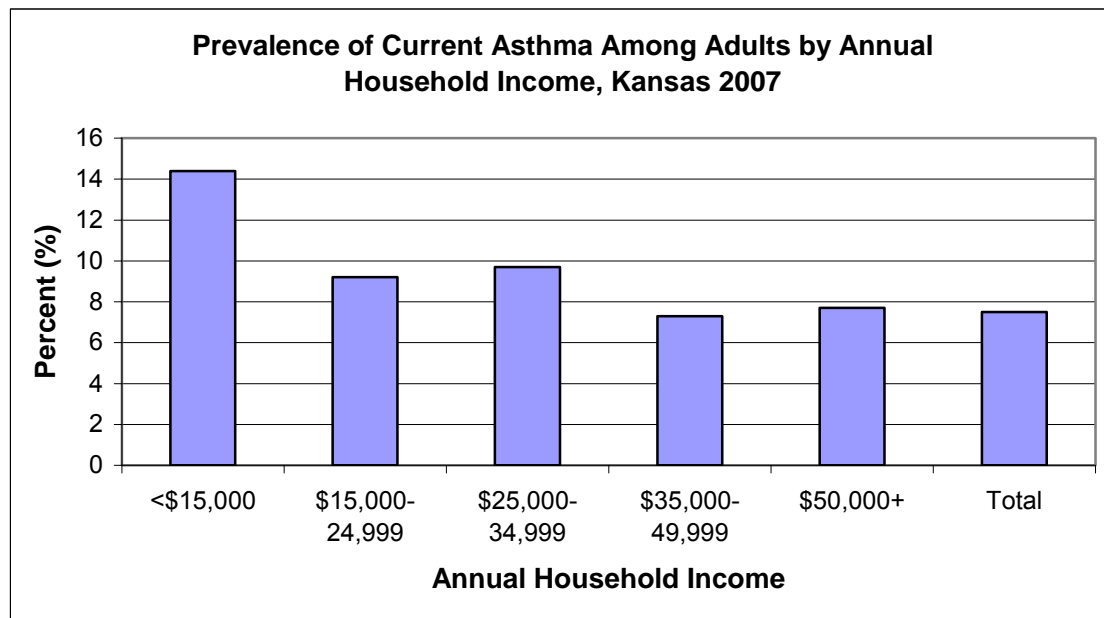
## 5. Prevalence of current asthma among adults by education status



- The prevalence of current asthma did not vary significantly with education status.
- The highest prevalence was observed among adults with some college education (9.6%, 95% CI: 7.9%, 11.3%).



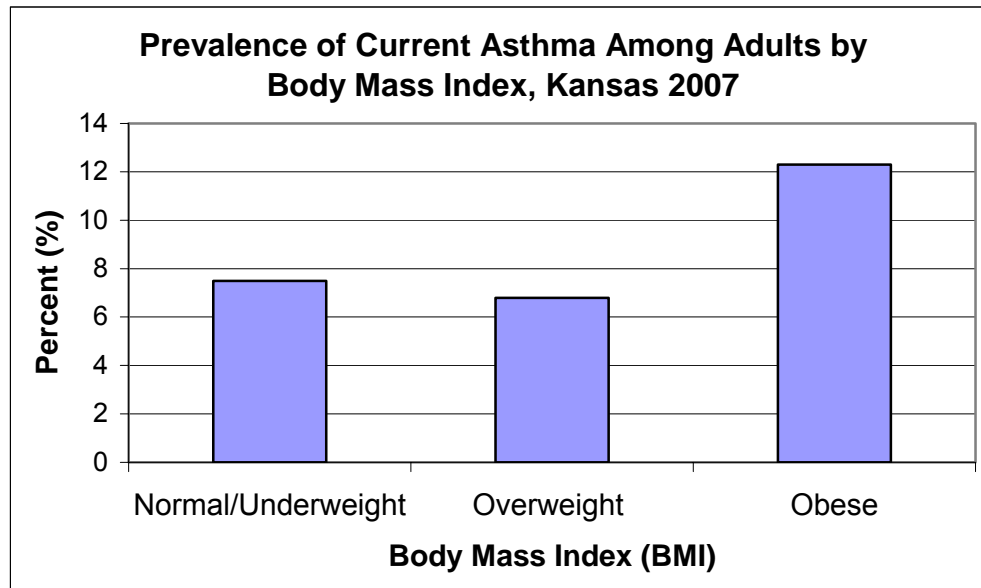
## 6. Prevalence of current asthma among adults by annual household income



- Overall, the prevalence of current asthma among adults decreased with an increase in annual household income.
- The prevalence of current asthma was significantly higher among adults with annual household income less than \$15,000 (14.4%, 95% CI: 10.3%, 18.6%) as compared to adults with annual household income between \$35,000 and \$49,999 (7.3%, 95%CI: 5.4%, 9.1%) and also adults with annual household income more than \$50,000 (7.7% 95% CI: 6.5%, 9.0%).



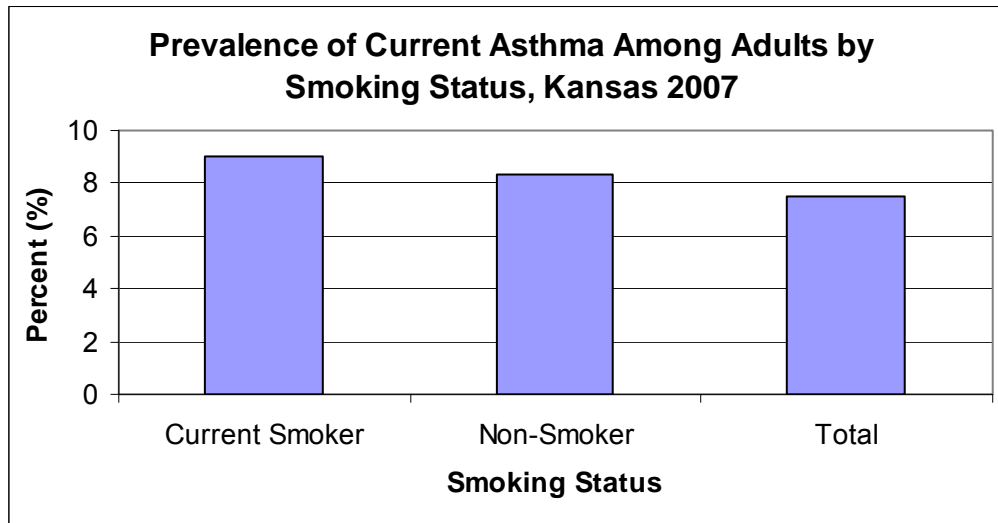
## 7. Prevalence of current asthma among adults by Body Mass Index (BMI)



- The prevalence of current asthma was the highest among obese (BMI  $\geq 30$ ) adults (12.3%, 95% CI: 10.4%, 14.1%).
- The prevalence of current asthma was significantly higher among obese adults as compared to either normal/underweight (BMI  $< 25$ ) or overweight ( $\leq 25$  BMI  $< 30$ ) adults.



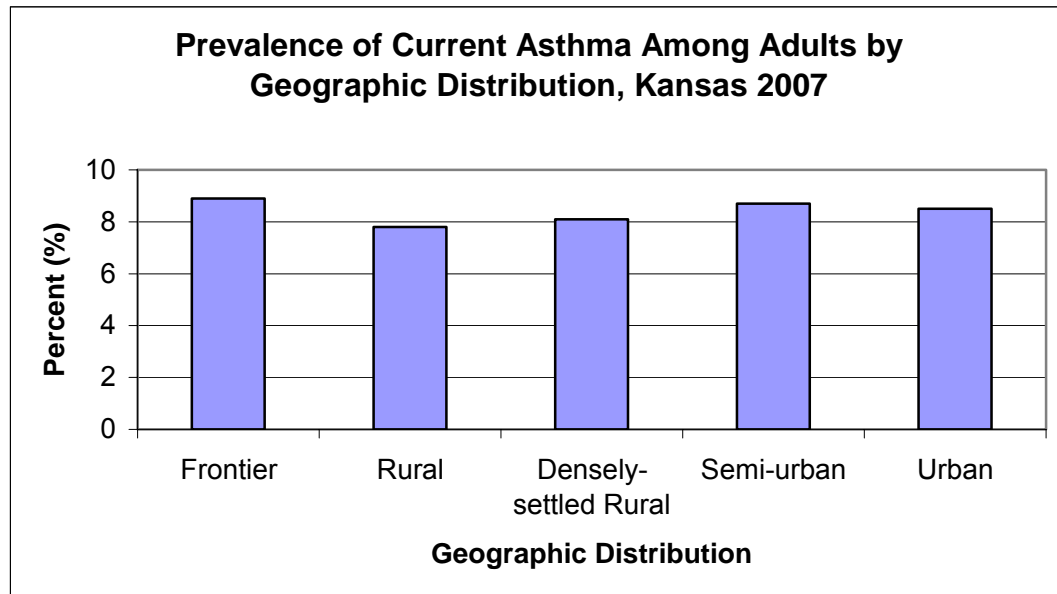
## 8. Prevalence of current asthma among adults by smoking status



- The prevalence of current asthma was slightly higher for current smokers (9.0%, 95% CI: 6.9%, 11.0%) than non-smokers (8.3%, 95% CI: 7.3%, 9.3%), but it was not statistically significant.



## 9. Prevalence of current asthma among adults by geographic distribution

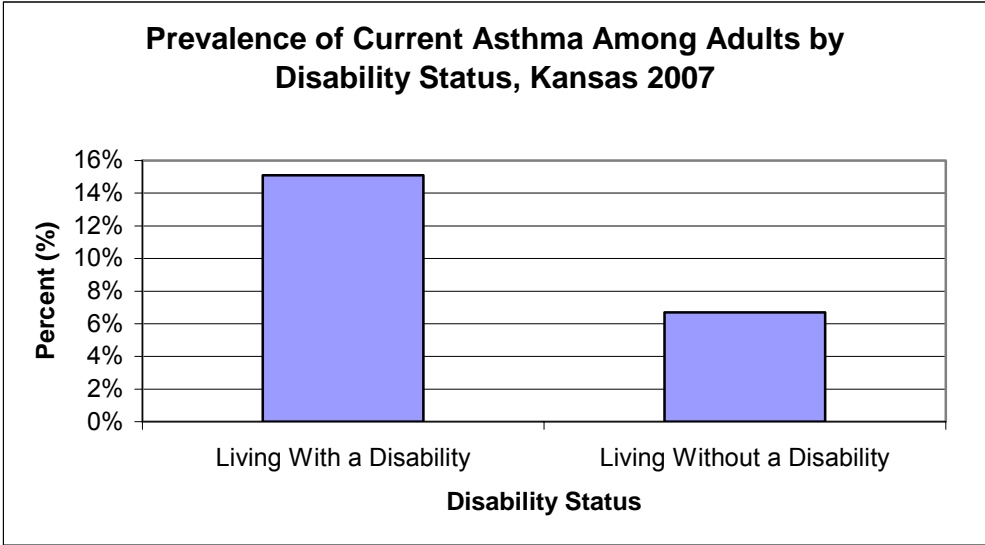


- The prevalence of current asthma among adults was fairly similar among different geographic areas.
- The prevalence of current asthma among adults ranged from 7.8% (95% CI: 5.5%, 10.1%) in rural to 8.9% (95% CI: 5.4%, 12.3%) in frontier area though there was no statistically significant difference observed.





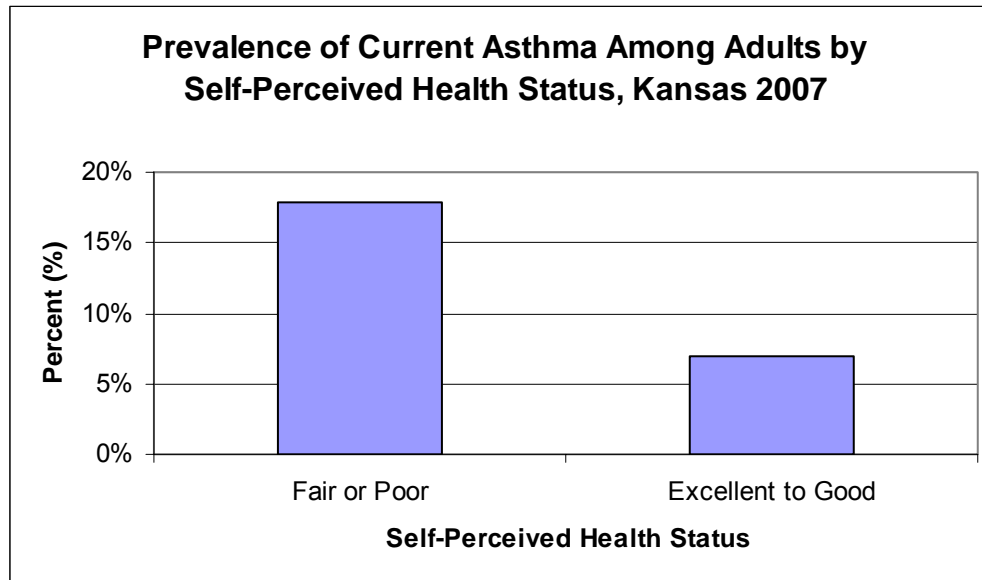
**10. Prevalence of current asthma among adults by disability status**



- The prevalence of current asthma was significantly higher among adults living with a disability (15.1%, 95% CI: 12.9%, 17.3%) as compared to adults living without a disability (6.7%, 95% CI: 5.8%, 7.6%).



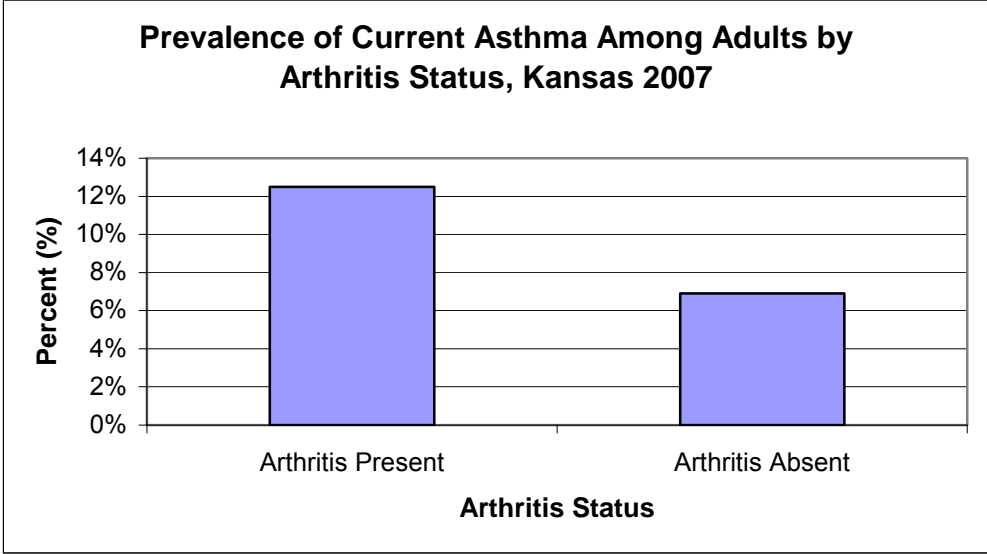
## 11. Prevalence of current asthma among adults by self-perceived health status



- The prevalence of current asthma among adults was significantly higher among adults who reported their general health as fair or poor (17.9%, 95% CI: 14.9%, 20.9%) as compared to adults who reported their general health from excellent to good (7.0%, 95% CI: 6.1%, 7.9%).



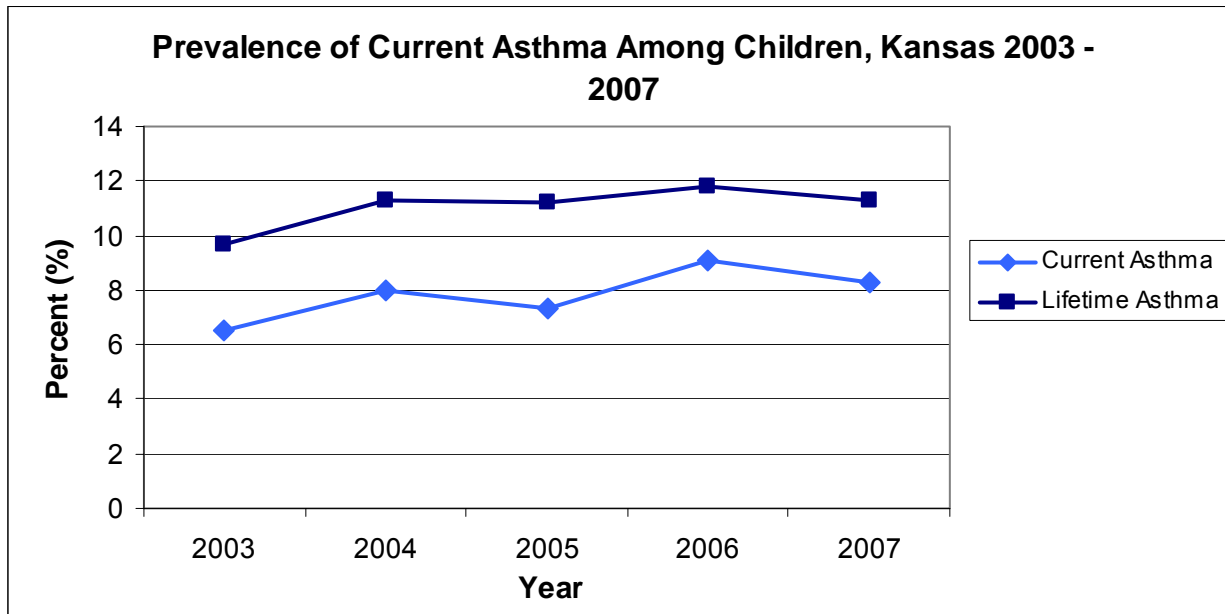
**12. Prevalence of current asthma among adults by arthritis status**



- The prevalence of current asthma among adults was significantly higher among adults who had arthritis (12.5%, 95% CI: 10.8%, 14.2%) as compared to adults who did not have arthritis (6.9%, 95% CI: 5.9%, 7.9%).



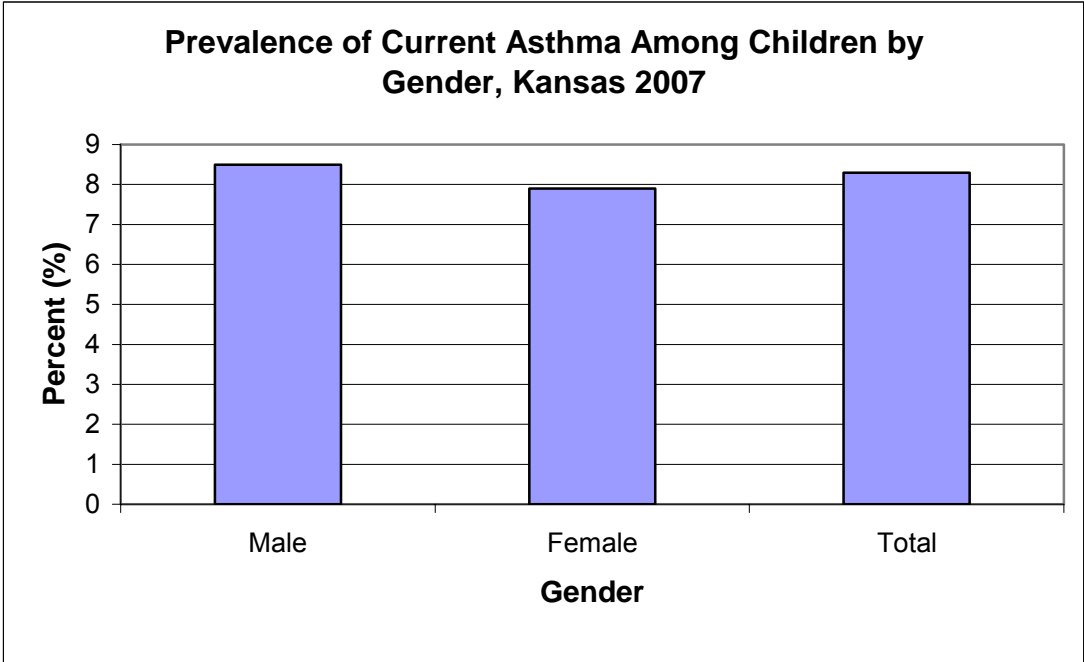
### 13. Prevalence of lifetime and current asthma among children



- Overall, the prevalence of both lifetime and current asthma among children increased during past few years with fluctuations.
- The prevalence of current childhood asthma was lowest (6.5%) in 2003 and highest (9.1%) in 2006.
- The lifetime prevalence of childhood asthma was lowest (9.3%) in 2003 and highest (11.8%) in 2006.
- In 2007, the prevalence of current childhood asthma was 8.3%.
- In 2007, the prevalence of lifetime childhood asthma was 11.3%.



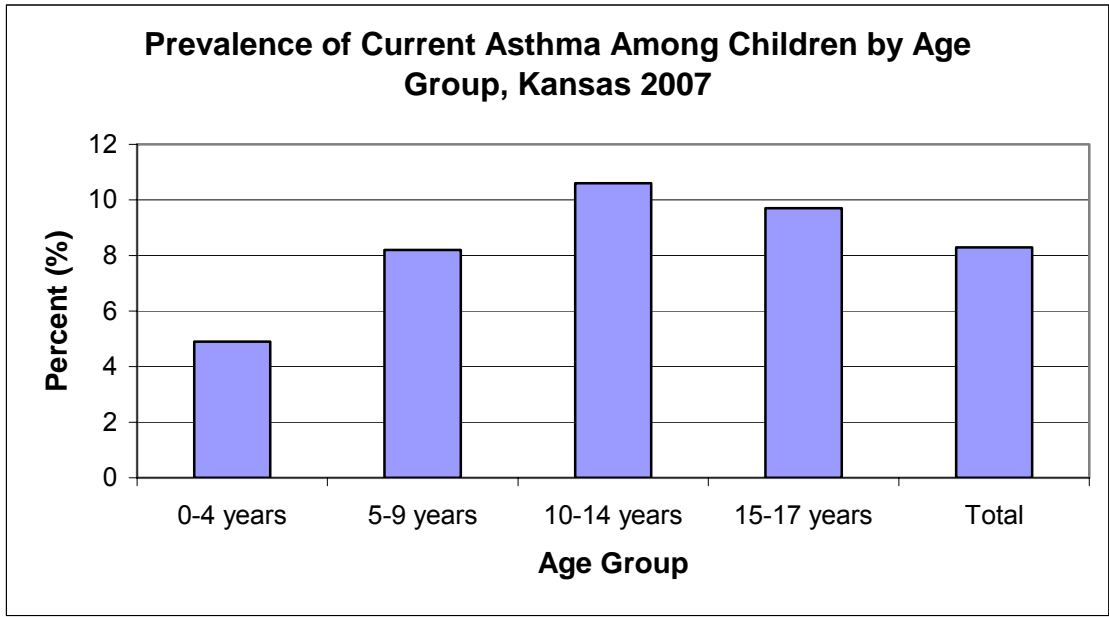
**14. Prevalence of current asthma among children by gender**



- The prevalence of current asthma among children was slightly higher among males (8.5%, 95% CI: 6.8%, 10.3%) as compared to females (7.9%, 95% CI: 6.3%, 9.6%) but it was not statistically significant.



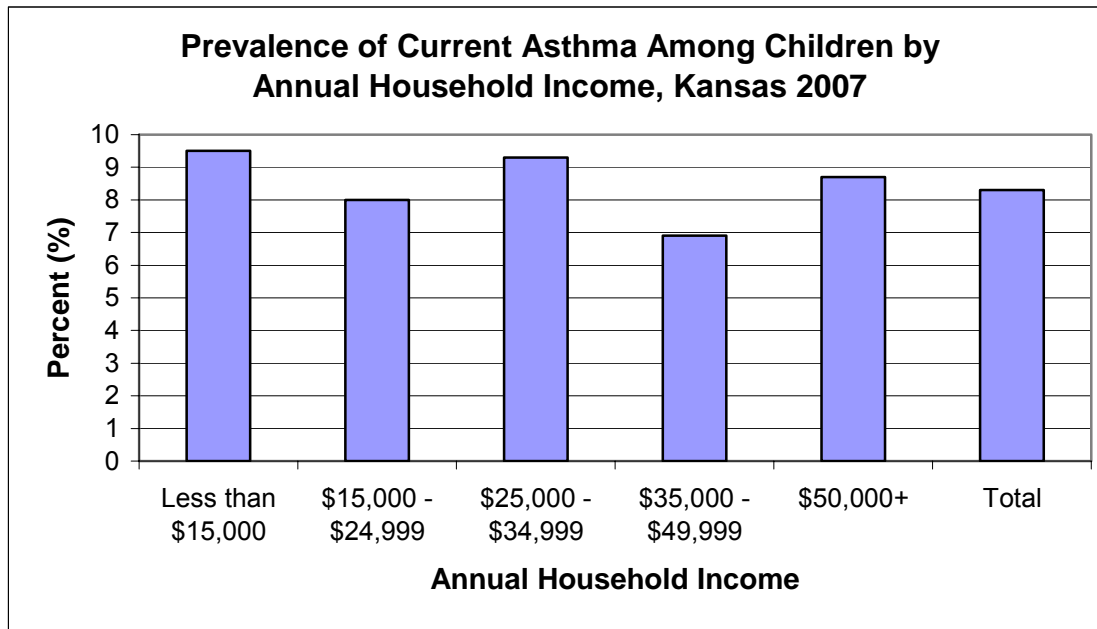
### 15. Prevalence of current asthma among children by age group



- The prevalence of asthma among children increased with age, followed by a decrease in age group 15 -17 years.
- The prevalence of asthma among children was significantly lower among age group 0-4 years (4.9%, 95% CI: 3.0%, 6.9%) as compared to age group 10-14 years (10.6%, 95% CI: 8.0%, 13.3%).
- Other age groups were not significantly different in relation to the prevalence of current asthma.



## 16. Prevalence of current asthma among children by annual household income



- The prevalence of current asthma among children did not vary significantly with annual household income level.
- Highest prevalence of current asthma was observed among children with annual household income less than \$15,000 (9.5%, 95% CI: 3.9%, 15.1%) and lowest prevalence of current asthma was observed among children with annual household income between \$35,000 and \$49,999 (6.9%, 95% CI: 4.2%, 10.4%).
- There was no specific trend observed in relation to prevalence of current childhood asthma among children with various annual household income levels.



## **Prevalence of Asthma in Kansas 2007 Kansas Youth Risk Behavior Surveillance System**

### **III. Prevalence of Asthma (Kansas YRBSS)**

#### **a. Introduction**

The Youth Risk Behavior Surveillance System (YRBSS) was developed in 1990.<sup>8</sup> It monitors priority health risk behaviors and the prevalence of obesity and asthma that contribute markedly to the leading causes of death, disability and social problems among youth and adults in the U.S.<sup>9</sup> The YRBSS was designed mainly to determine the prevalence of health risk behaviors, monitor the pattern of these behaviors over time, assess the co-occurrence with other health risk behaviors and allow comparison to national, state, and local data. It also allows comparisons among youth subpopulations and assists with monitoring progress toward program indicators and objectives. The Centers for Disease Control (CDC) oversees the YRBSS, which is conducted in odd number years (i.e. 2007, 2009 etc) from February through May. In Kansas, Kansas Coordinated School Health (KCSH) administers the survey. The survey is voluntary and anonymous. Students complete the questionnaire during one class period and record their responses directly in a computer scannable booklet or on an answer sheet.<sup>10</sup> This report focuses on the survey administered among high school students, grade 9-12.

2007 Kansas YRBSS included two questions for assessing lifetime and current prevalence of asthma among students in grades 9-12. Lifetime asthma prevalence was determined based on response to the question: "Has a doctor or nurse ever told you that you have asthma?" Current asthma prevalence was determined based on response to the question: "Do you still have asthma?"

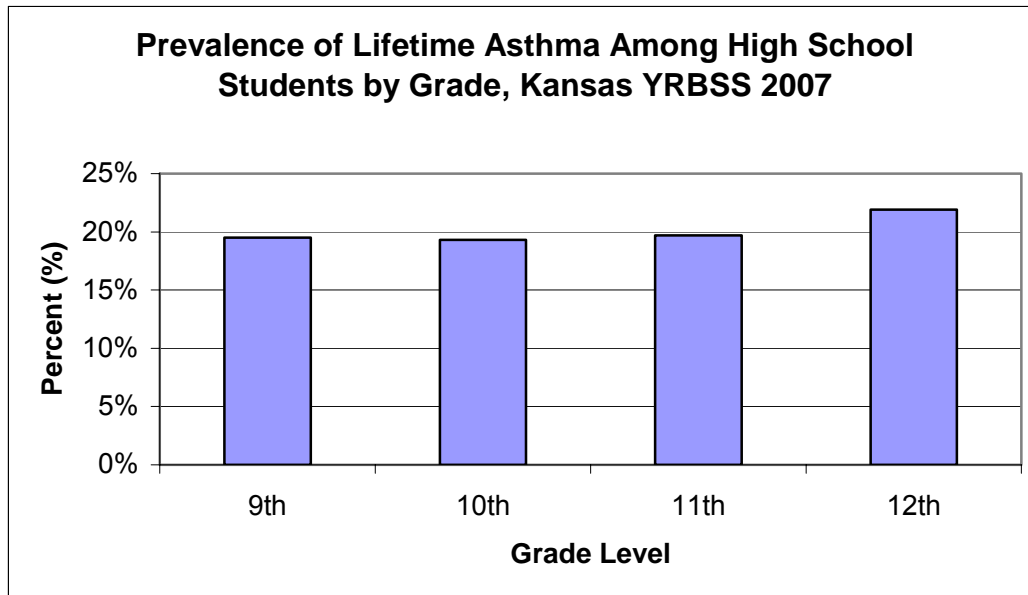
Following are the prevalence estimates obtained from 2007 Kansas YRBSS.





**b. Figures**

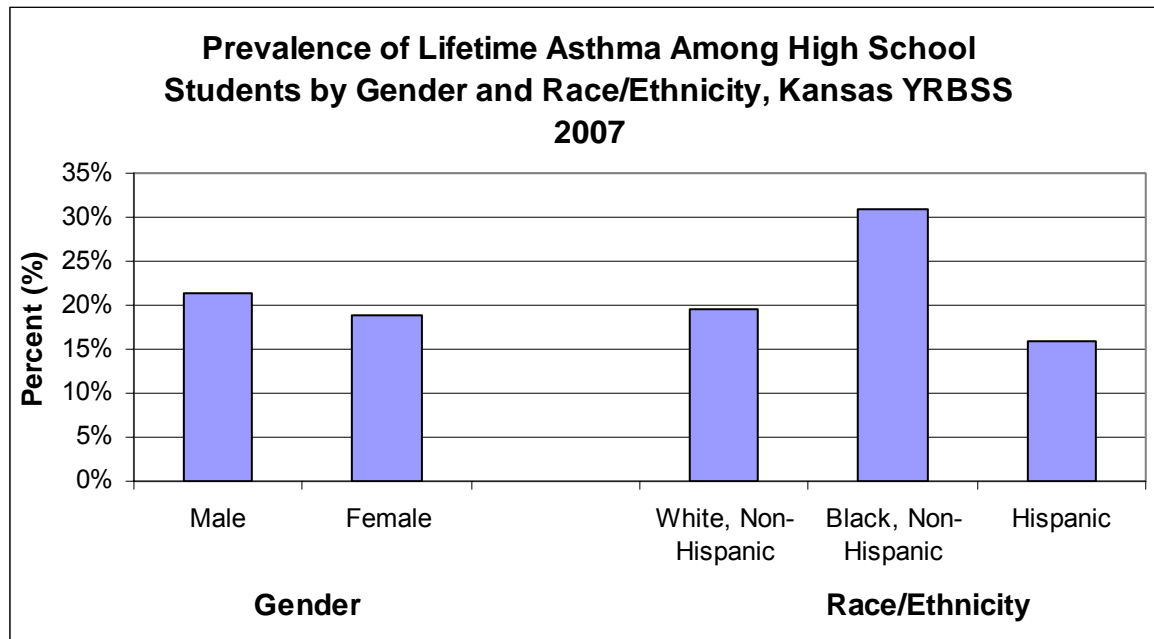
**1. Prevalence of lifetime asthma among high school students by grade**



- The prevalence of lifetime asthma among high school students was comparatively similar among grades 9 to 12.
- The highest prevalence of lifetime asthma was seen among 12<sup>th</sup> grade (21.9%) and lowest among 10<sup>th</sup> grade (19.3%).



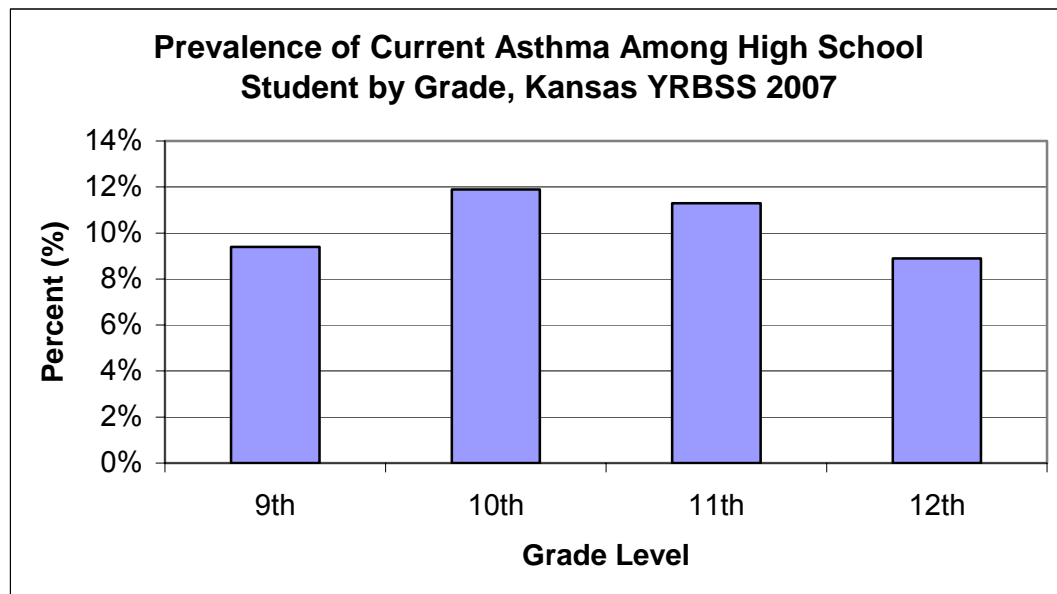
## 2. Prevalence of lifetime asthma among high school students by gender and race/ethnicity



- The prevalence of lifetime asthma among high school students was slightly higher among males (21.3%) as compared to females (18.9%).
- The prevalence of lifetime asthma among high school students was higher among African-Americans (31.0%) as compared to Whites (19.5%).
- The prevalence of lifetime asthma among Hispanic high school students was 16.0%.



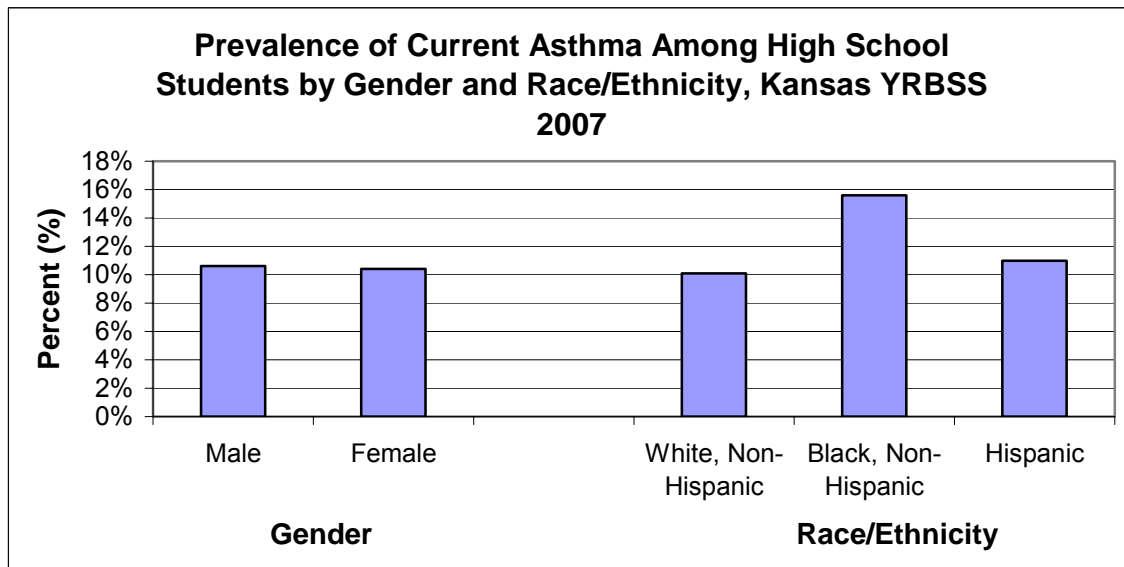
### 3. Prevalence of current asthma among high school students by grade



- The prevalence of current asthma among high school students showed an initial increase with grade level followed by a gradual decrease.
- The prevalence of current asthma among high school students was highest among grade 10<sup>th</sup> (11.9%) and lowest among grade 12<sup>th</sup> (8.9%).



#### 4. Prevalence of current asthma among high school students by gender and race/ethnicity



- The prevalence of current asthma among high school students was very similar among males (10.6%) and females (10.4%).
- The prevalence of current asthma among high school students was higher among African-Americans (15.6%) as compared to Whites (10.1%).
- The prevalence of current asthma among Hispanic high school students was 11.0%.



## **IV. Hospitalizations (Kansas Hospital Association Inpatient Database)**

### **a. Introduction**

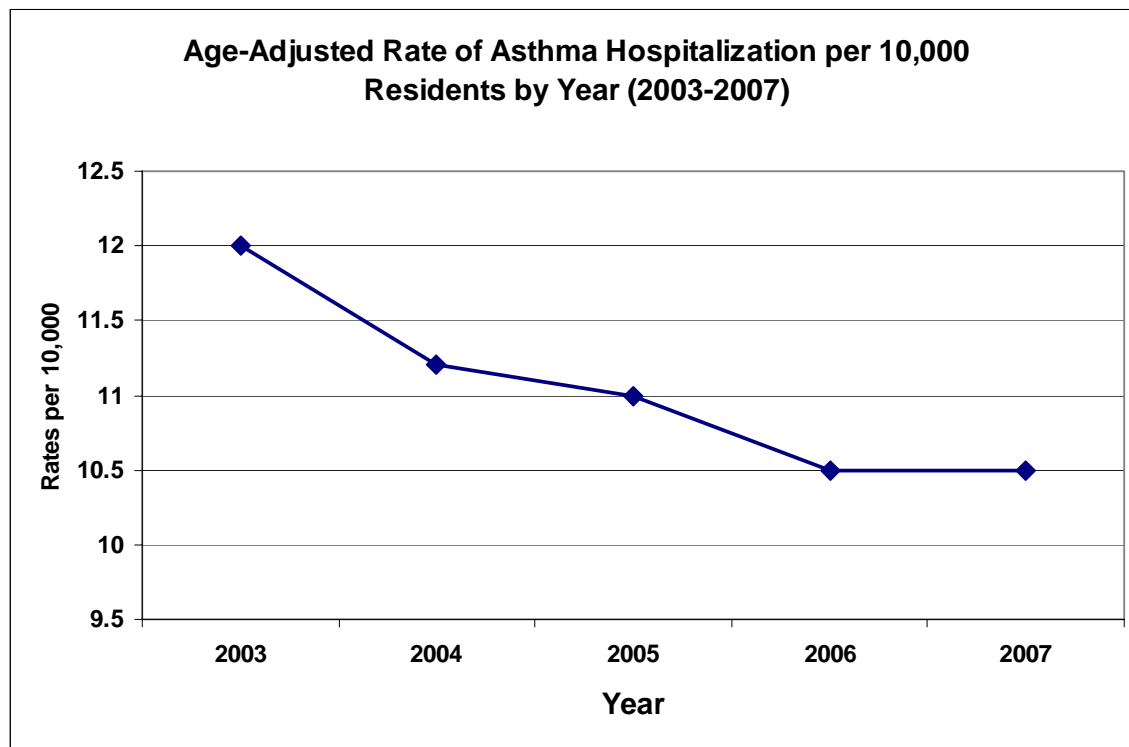
Data on asthma hospitalizations in Kansas are collected by the Kansas Hospital Association (KHA). Community hospitals are asked to submit data voluntarily to KHA which in turns compiles the dataset and provides it to the state of Kansas. The asthma statistics presented here represent hospitalizations with a primary diagnosis of asthma (ICD-9 493.0 through 493.9) during the period from 2003 to 2007. Where indicated, rates are reported as age-adjusted hospitalization rates. It is important to adjust for age so that valid comparisons can be made across years or among population subgroups with different age distributions.

While most of the state's hospitals are community hospitals that submit, facilities that are not included are: hospital units of institutions, long-term care hospitals, psychiatric hospitals, federal hospitals, and alcoholism and chemical dependency facilities. Emergency department data are not included. The number of hospitals that do submit varies from year to year. The KHA dataset may also contain discharge data on Kansas residents who were treated at community hospitals in adjacent states. The quantity of those records varies annually.



## b. Figures

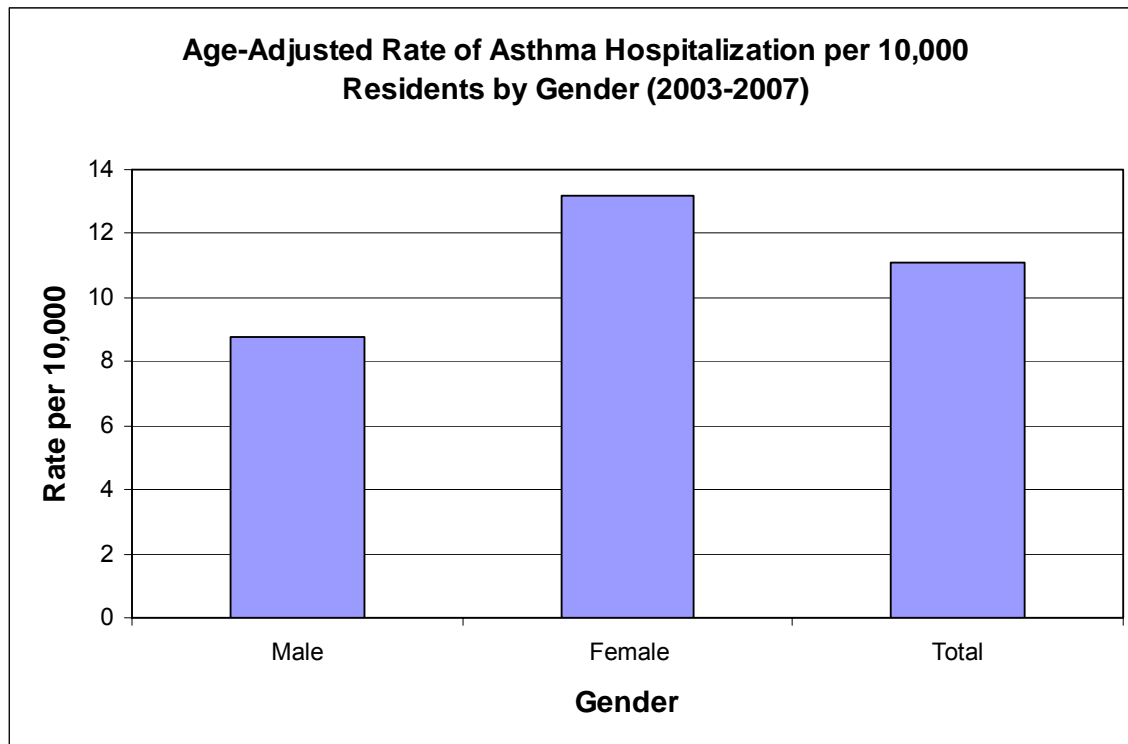
### 1. Age-Adjusted Rate of Asthma Hospitalization by Year



- The asthma hospitalization rate decreased moderately from 2003 to 2007.
- The age-adjusted hospitalization rate was highest in 2003 (12 per 10,000 residents) and lowest for 2006 and 2007 (10.5 per 10,000 residents).



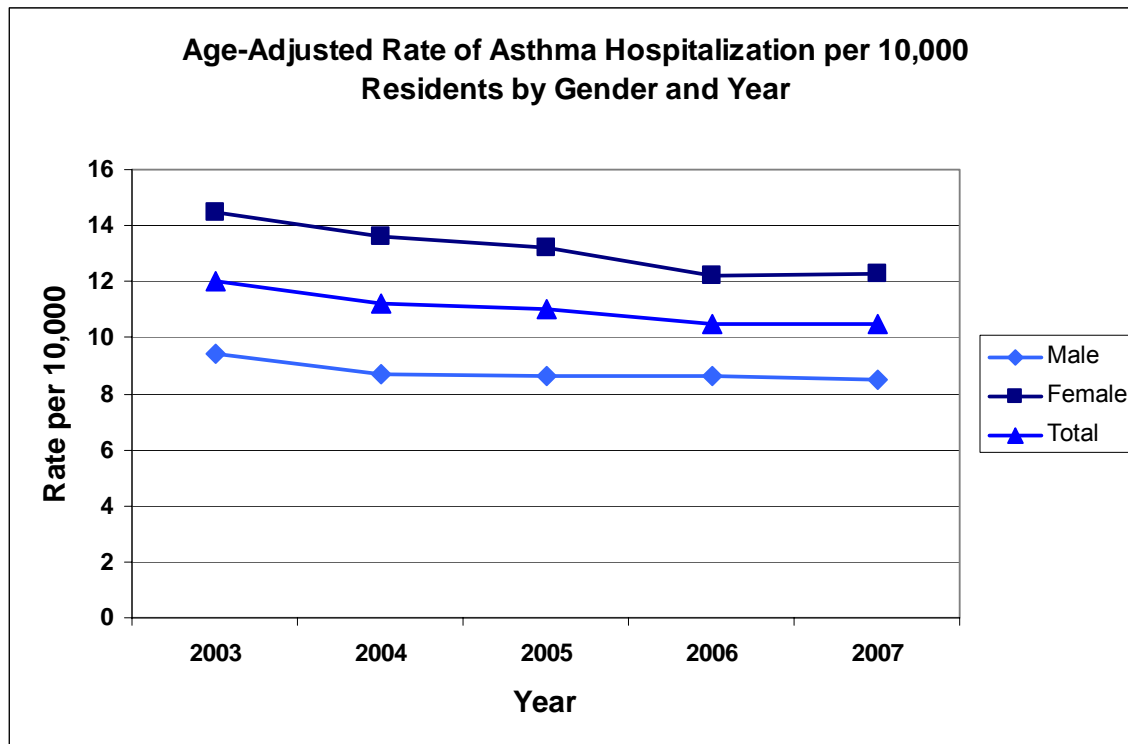
## 2. Age-Adjusted Rate of Asthma Hospitalization by Gender



- The asthma hospitalization rate is higher for women (13.2 per 10,000 women) than for men (8.8 per 10,000 men).



### 3. Age-Adjusted Rate of Asthma Hospitalization by Gender and Year

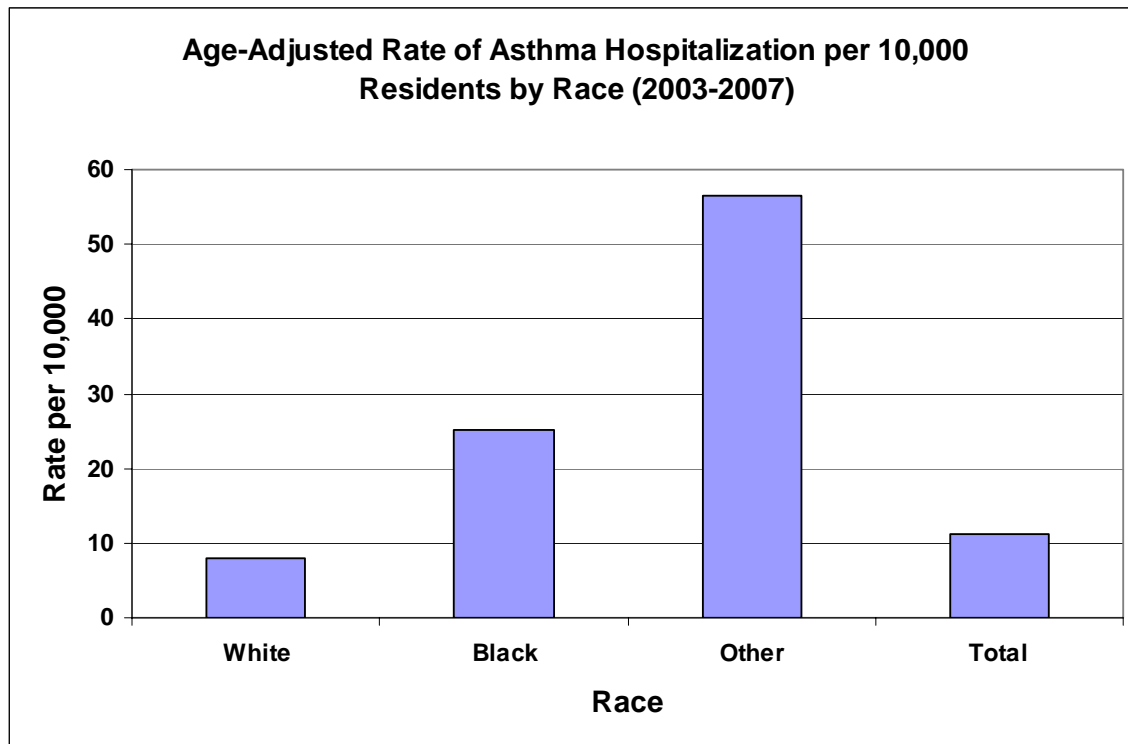


- Asthma hospitalization rates declined modestly from 2003 (9.4 per 10,000 residents) to 2007 (8.5 per 10,000 residents).





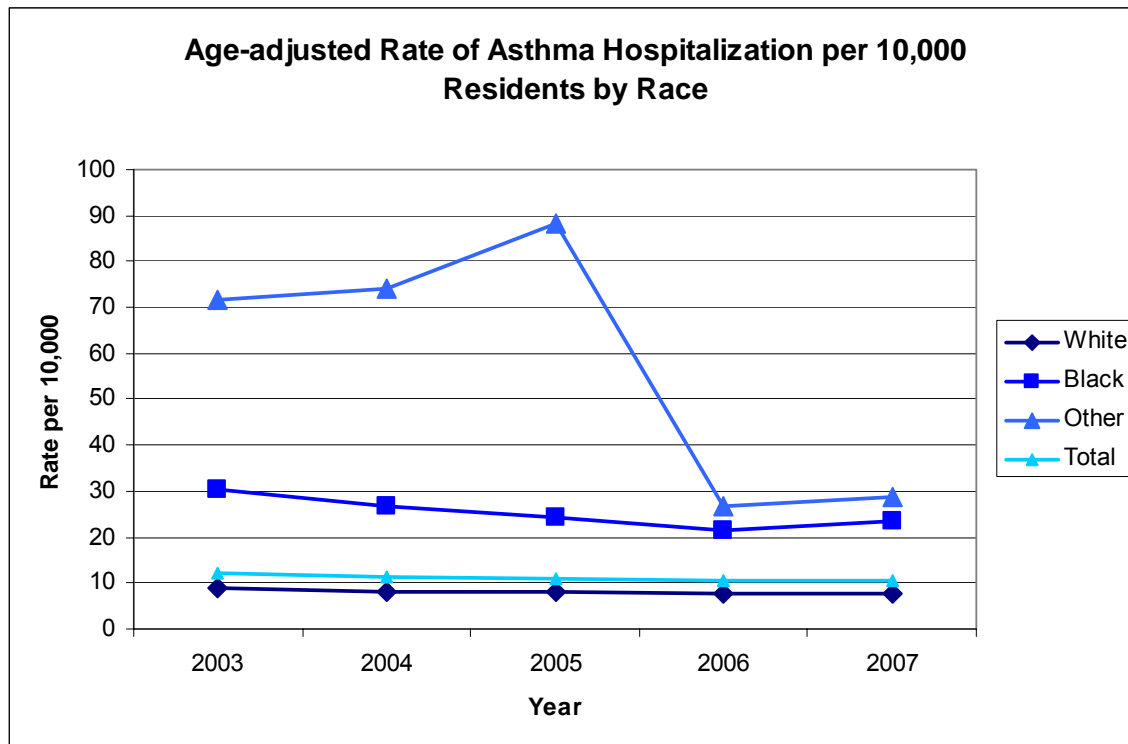
#### 4. Age-Adjusted Rate of Asthma Hospitalization by Race



- The age-adjusted hospitalization rate among blacks/African Americans (25.2 per 10,000 residents) was more than triple that for whites (8 per 10,000 residents).
- The highest age-adjusted hospitalization was observed in the “Other” race group (56.6 per 10,000 residents).



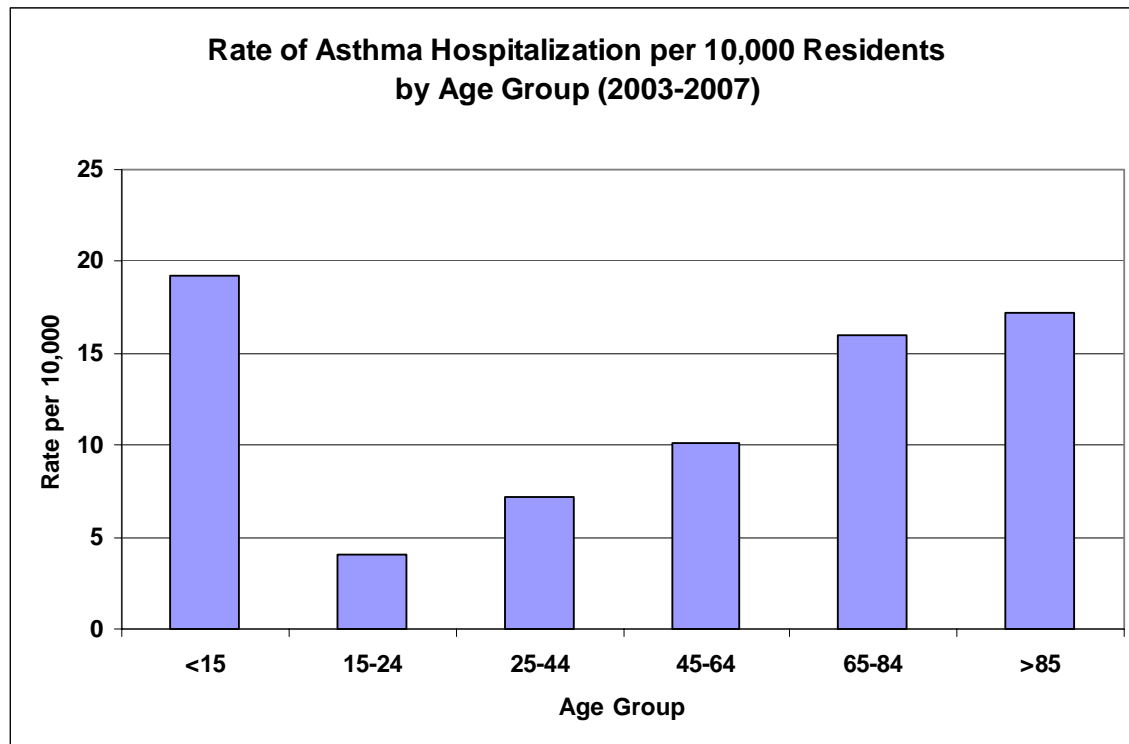
## 5. Age-Adjusted Rate of Asthma Hospitalization by Race and Year



- The asthma hospitalization rate decreased only slightly from 2003 to 2007 among white and black/African American population subgroups.
- There is a dramatic drop in hospitalizations in the “Other” race category from 2005 to 2006.



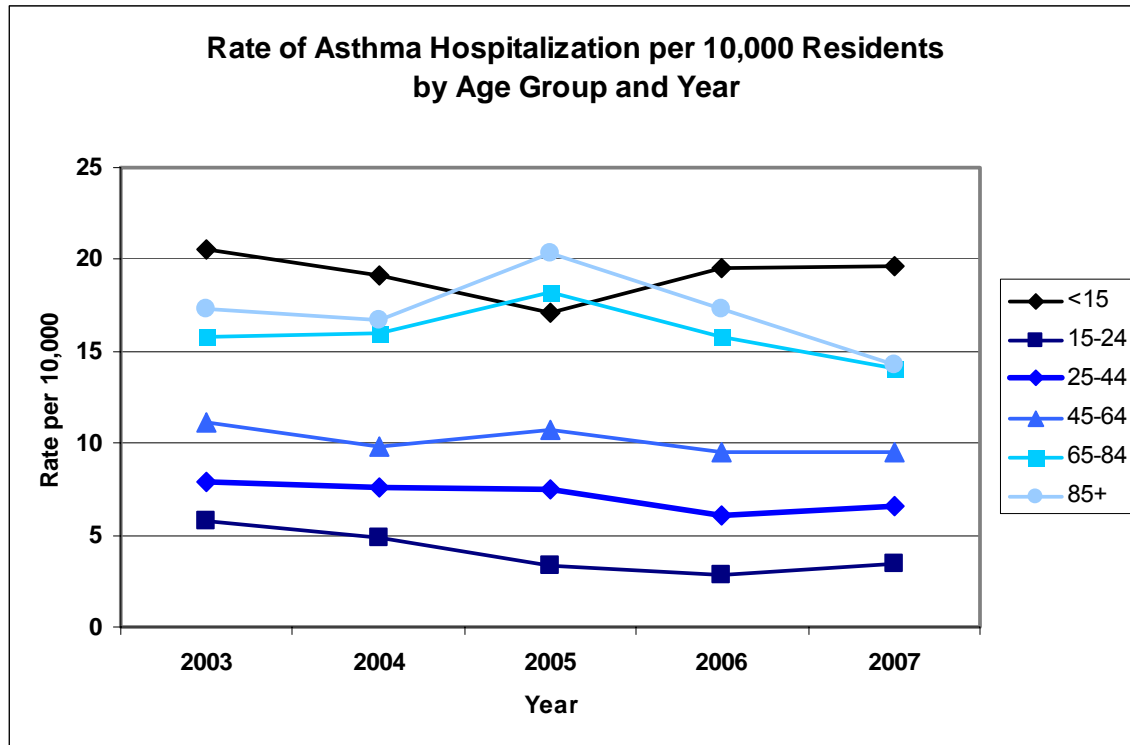
## 6. Rates of Asthma Hospitalization by Age Group



- Asthma hospitalization rates are highest among children 14 and younger (19.2 per 10,000 residents) and lowest in the 15 to 24 age group.
- Among age groups older than 15, hospitalization rates increase with increasing age.



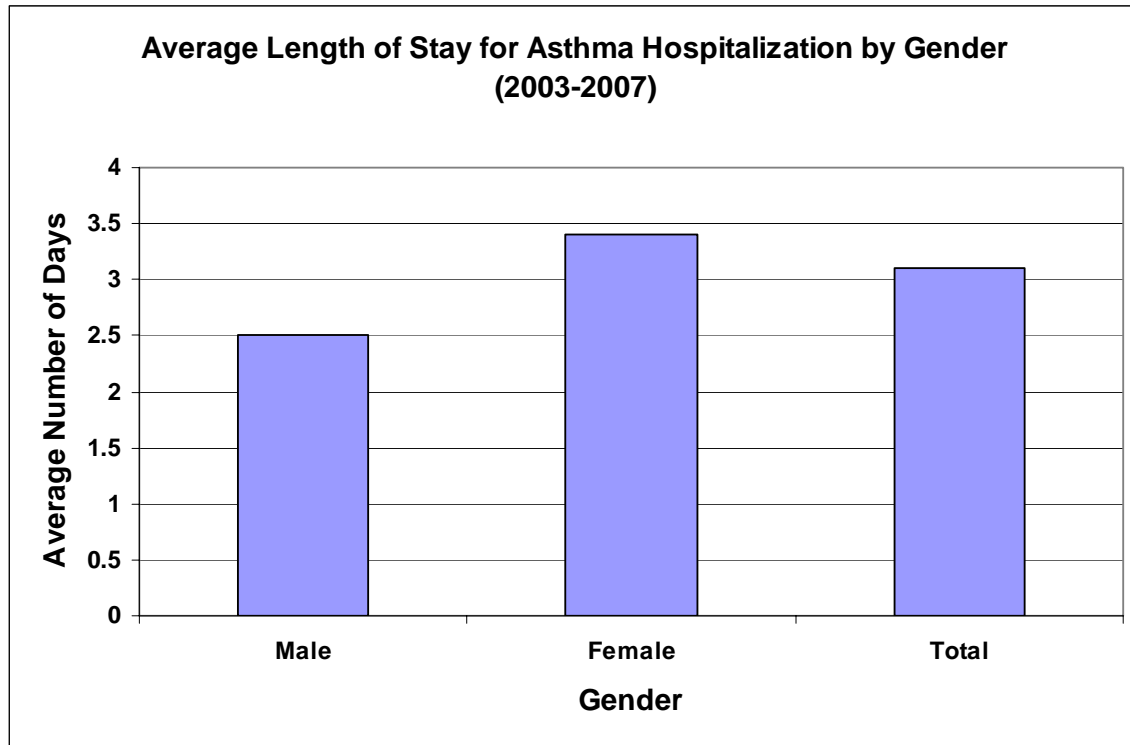
## 7. Rate of Asthma Hospitalization by Age Group and Year



- Within each age group, the asthma hospitalization rate is fairly constant over the period from 2003 to 2007.



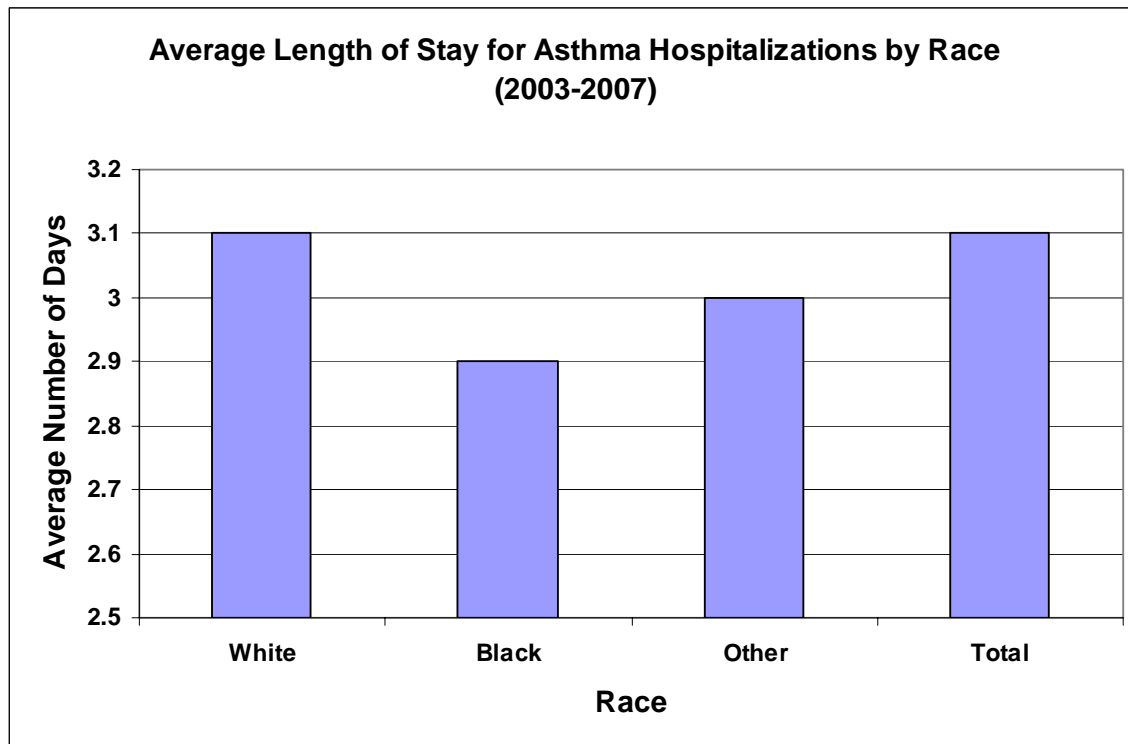
## 8. Average Length of Stay for Asthma Hospitalization by Gender



- The average length of stay for asthma hospitalizations was longer for women (3.4 days) than for men (2.5 days).



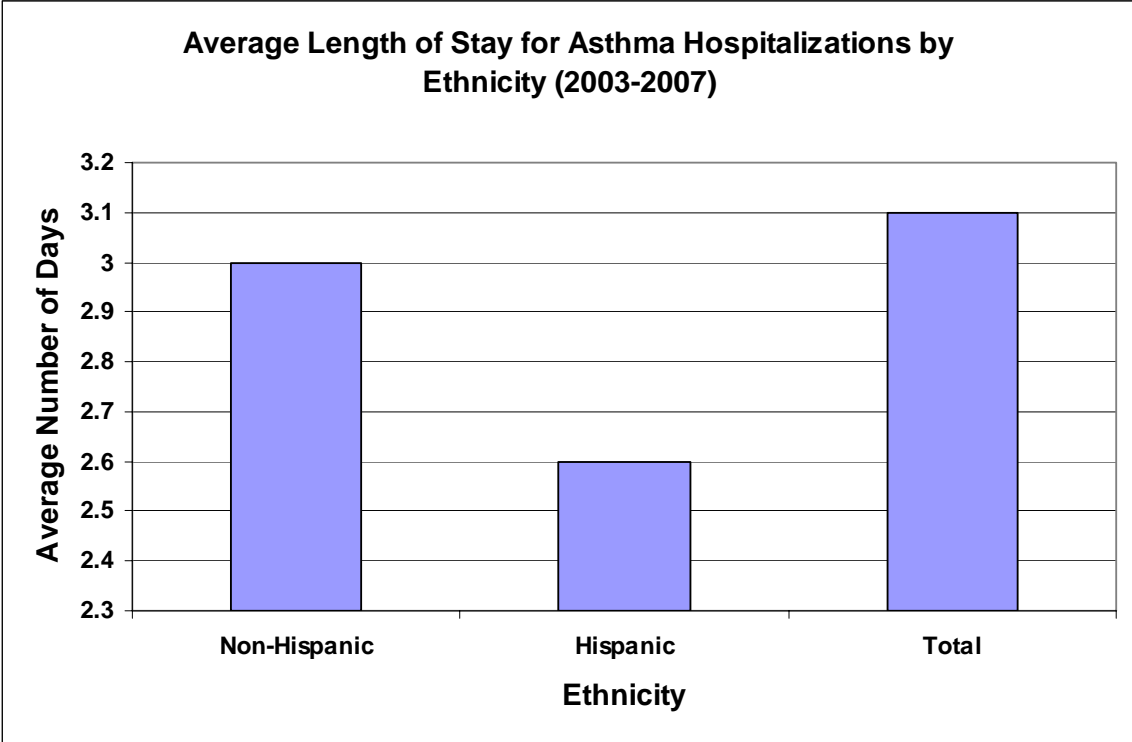
## 9. Average Length of Stay for Asthma Hospitalization by Race



- The average length of stay for asthma hospitalizations was longest for whites (3.1 days) and shortest for blacks (2.9 days).



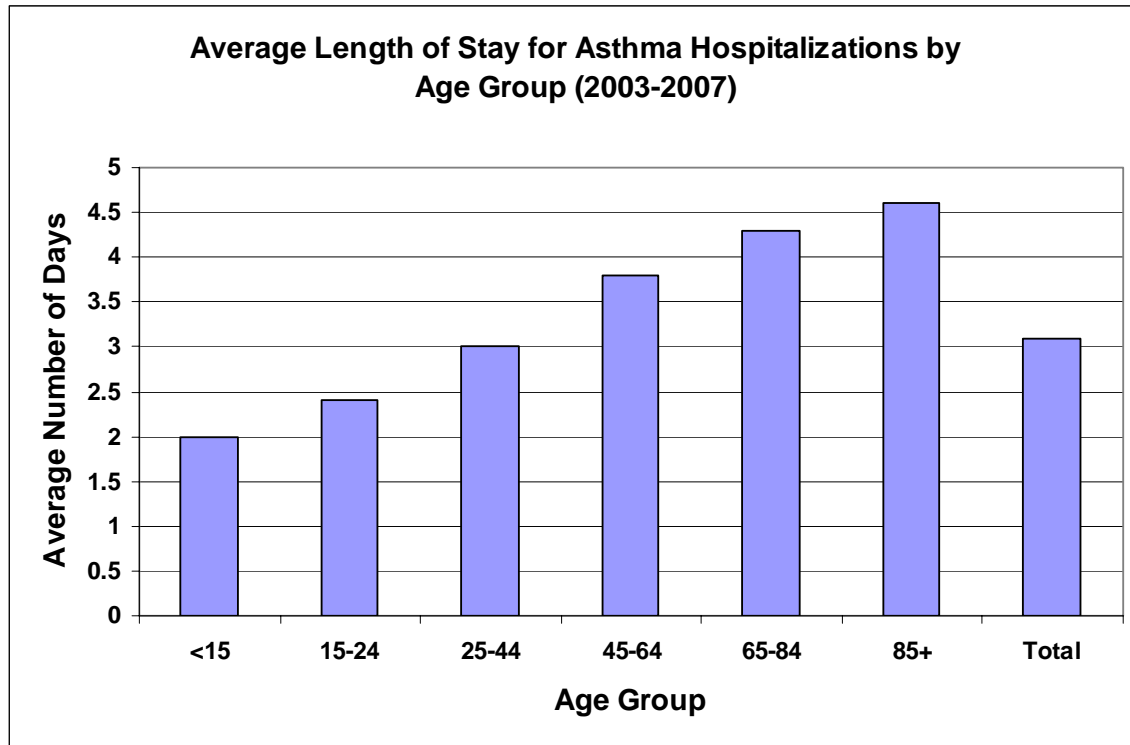
**10. Average Length of Stay for Asthma Hospitalization by Ethnicity**



- The average length of stay for asthma hospitalizations was shorter for patients of Hispanic origin (2.6 days) than for non-Hispanics (3 days).



## 11. Average Length of Stay for Asthma Hospitalization by Age Group



- The average length of stay for asthma hospitalizations increases with increasing age.
- The longest average length of stay was observed among patients 85 and older (4.6 days) and the shortest among children 14 and younger (2 days).





## **V. Mortality (Vital Statistics)**

### **a. Introduction**

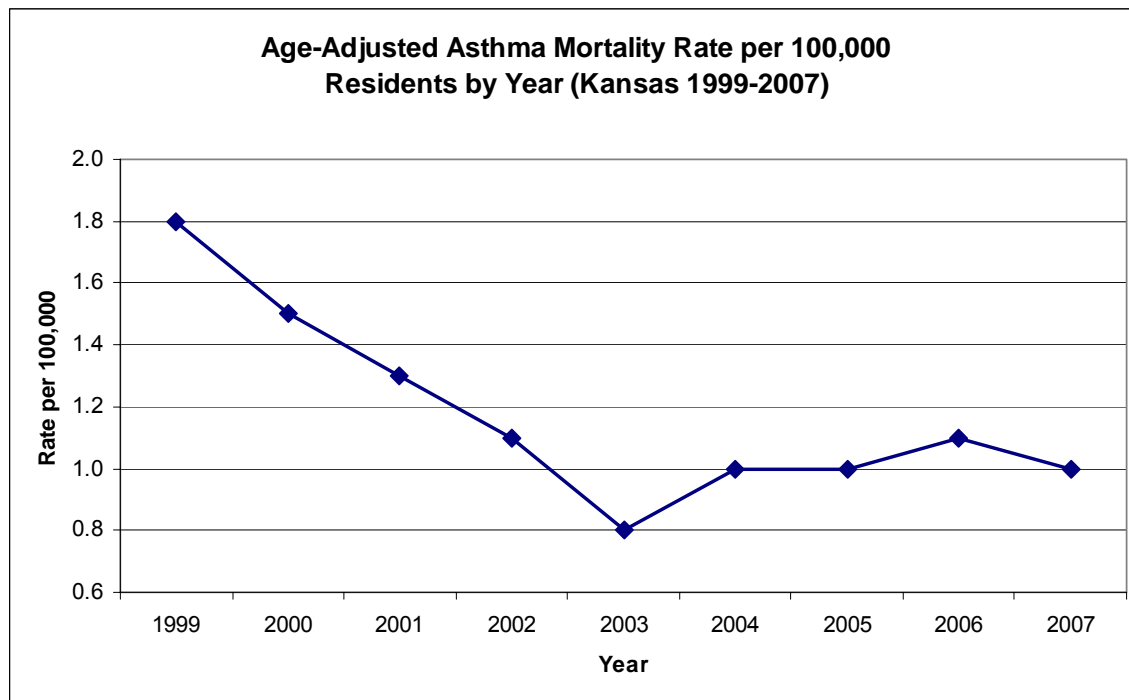
Death statistics are compiled from death certificates which are filed by state law with the Center for Health and Environmental Statistics at the Kansas Department of Health and Environment. This report summarizes deaths for Kansas residents for the period from 1999 to 2007 with asthma listed as the underlying cause (ICD-10 codes J45 and J46). The underlying cause of death is defined as the disease or injury which initiated the chain of events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury.

Where indicated, rates are reported as age-adjusted mortality rates. It is important to adjust for age so that valid comparisons can be made across years or among population subgroups with different age distributions.



## b. Figures

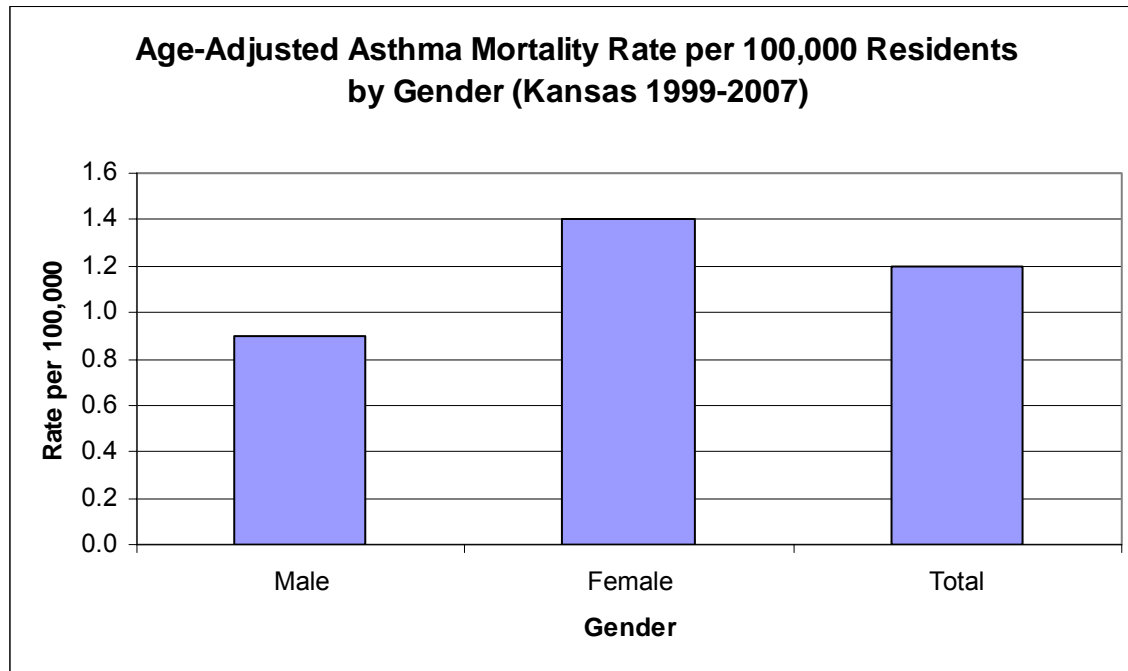
### 1. Age-Adjusted Asthma Mortality Rate by Year



- Age-adjusted asthma mortality rates in Kansas decreased each year during the period from 1999 to 2003. Since 2003 the rate has increase slightly.
- The age-adjusted mortality rate was highest in 1999 (1.8 per 100,000 residents) and lowest in 2003 (0.8 per 100,000 residents).
- The age-adjusted asthma mortality rate has increased slightly since 2003.



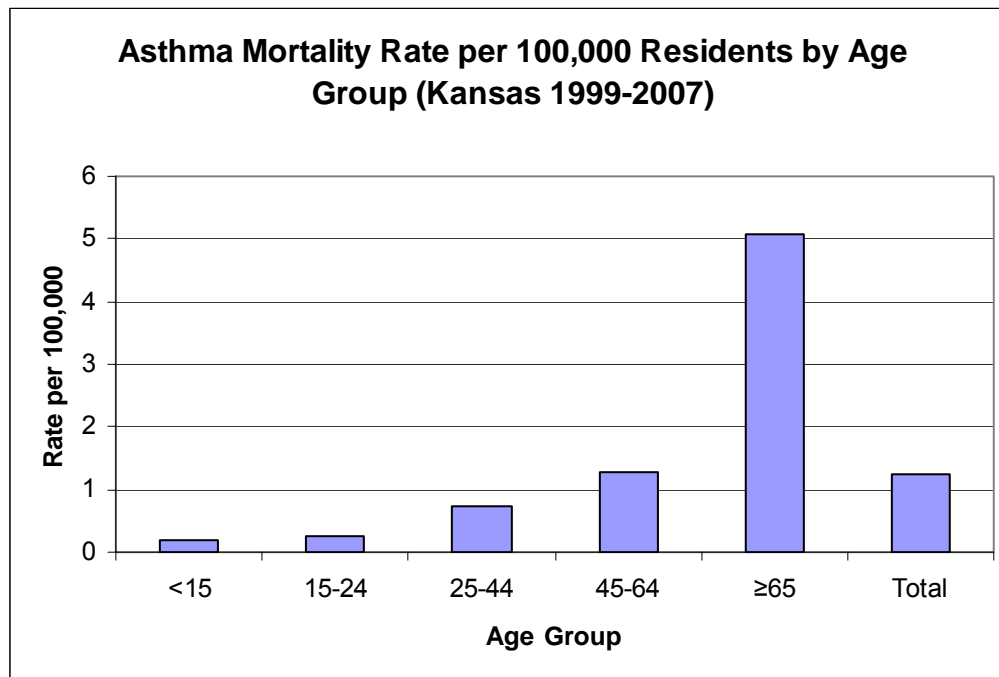
## 2. Age-Adjusted Asthma Mortality Rate by Gender



- The age-adjusted asthma mortality rate in Kansas during this period was higher for women (1.4 per 100,000) than for men (0.9 per 100,000).



### 3. Asthma Mortality Rate by Age Group



- Asthma mortality rates in Kansas increased with increasing age during the time period.
- The highest asthma mortality rate was observed among adults 65 years of age or older (5.1 per 100,000).



## References:

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2. Pitts, S.R., Niska, R.W., Xu, J. & Burt, C.W. (2008). National Hospital Ambulatory Medical Care Survey: 2006 emergency department summary. *National Health Statistics Report*, 7, 1-38.
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7. 2007 Kansas Inpatient Database. Kansas Hospital Association. <http://kic.kdhe.state.ks.us/kic/discharge.html>
8. [http://www.kshealthykids.org/CSHP/KCSH\\_Menu/KCSH\\_YRBSS.htm](http://www.kshealthykids.org/CSHP/KCSH_Menu/KCSH_YRBSS.htm)
9. <http://www.cdc.gov/HealthyYouth/yrbs/brief.htm>
10. <http://www.cdc.gov/mmwr/PDF/rr/rr5312.pdf>

