



# California Asthma Facts

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## Asthma and Obesity: Results from the *California Healthy Kids Survey, 2001-2003*

### Asthma and Obesity

As asthma rates have increased, so have obesity rates. The percentage of Americans who said they had asthma increased 74 percent from 1980-1996, according to the National Health Interview Survey.<sup>1</sup> While asthma prevalence\* increased across all ages, it was particularly high in children.<sup>2</sup> During the same time period, the prevalence of obesity in Americans rose.<sup>3</sup> Data from the National Health and Nutrition Survey show that the prevalence of obesity among 12-19 year olds increased from five percent in 1976-1980 to 16 percent in 1999-2002.<sup>4</sup> Several studies have reported a relationship between asthma and obesity<sup>5-8</sup>, but we do not know whether one causes the other, or whether there is a separate factor causing both.<sup>9</sup> Some reasons to explain this relationship could include biology, the environment, and genetics.<sup>10,11</sup>

Although the link between asthma and obesity is not fully understood, these are two important public health problems affecting many of the same children. This issue of *California Asthma Facts* uses data from the *California Healthy Kids Survey* to examine the relationship between asthma and obesity in adolescents in California.

### California Healthy Kids Survey

The *California Healthy Kids Survey* (CHKS) is an anonymous survey administered in California schools. The survey asks youth about their health risks and behaviors. In Fall 2001, questions to measure asthma prevalence were added to the survey.

\*Prevalence is the percentage of the population affected with a disease or condition at a given point in time.

This report includes results from surveys given to seventh, ninth, and eleventh grade students as well as those from nontraditional settings. More information on the survey can be found at: <http://www.wested.org/chks>.

### The Study Population

Among the students taking the CHKS, 143,642 reported complete height, weight, age, and gender information, which is used to calculate body mass index (BMI). (See page 2 for more information on BMI.) Forty-seven percent of these students were male, while 53 percent were female. About a third of the students were seventh graders, a third were ninth graders, 29 percent were eleventh graders, and four percent were from nontraditional school settings. The majority of students were White (37 percent) or Hispanic (28 percent). The other broad race/ethnicity groups included Asian/Pacific Islander (ten percent), Black (four percent), Native American (one percent), and Other (eight percent). Students who responded to more than one race/ethnicity item were classified as "Mixed." Students were categorized into weight categories based on their age and BMI percentiles.

Seventy-eight percent of the total study population were categorized as having normal weight. Three percent were categorized as underweight, while 19 percent were categorized as overweight or obese (Figure 1).

(Continued on Page 2)

This issue of *California Asthma Facts* focuses on the relationship between asthma and obesity in adolescents.



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## The Study Population (continued)

There was a greater prevalence of the two higher weight categories—overweight and obese—among males than among females. Hispanics had the highest prevalence of overweight/obesity at 27 percent, followed by Blacks and Native Americans. Asians/Pacific Islanders and Whites had the lowest prevalence of overweight/obesity at 15 percent and 14 percent, respectively (Figure 2).

## What is body mass index?

Body mass index (BMI) is a measurement used to determine the weight status of a person accounting for his or her height. The equation for calculating BMI using weight in pounds and height in inches is displayed below.

$$BMI = \left( \frac{\text{Weight in Pounds}}{(\text{Height in Inches}) \times (\text{Height in inches})} \right) \times 703$$

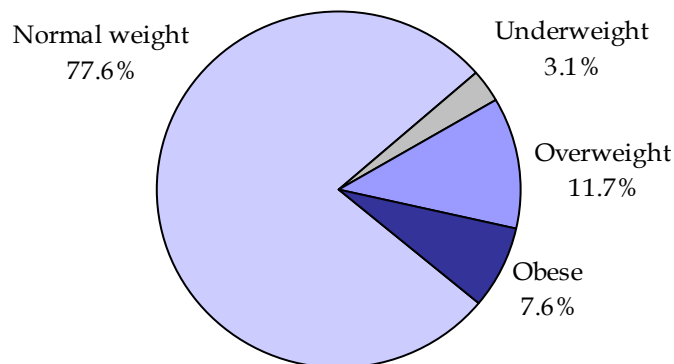
In children and adolescents, BMI can change with age and differ across genders. Therefore, we look at a youth's BMI relative to others in the same age and gender group. In this report, we define children as being "overweight" if their BMI is in the 85th-95th percentile and "obese" if their BMI is in the 95th percentile or higher (Table 1).

**Table 1. Weight Status Indication by BMI**

Weight Status	Child/Adolescent BMI
Underweight	<5th percentile
Normal	5th to <85th percentile
Overweight	85th to <95th percentile
Obese	≥ 95th percentile

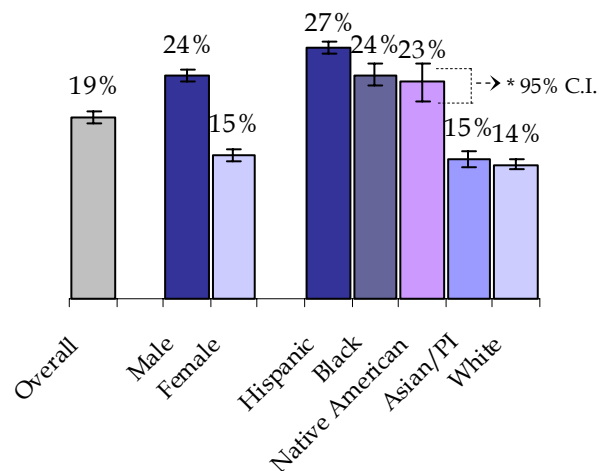
**Figure 1. Weight Status Distribution of Study Population**

California Healthy Kids Survey, 2001-2003



**Figure 2. Overweight/Obesity Prevalence**

California Healthy Kids Survey, 2001-2003



\* 95% Confidence Interval (C.I.) is a range that is likely to contain the true population prevalence estimate.

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### Lifetime Asthma Prevalence by Weight Status

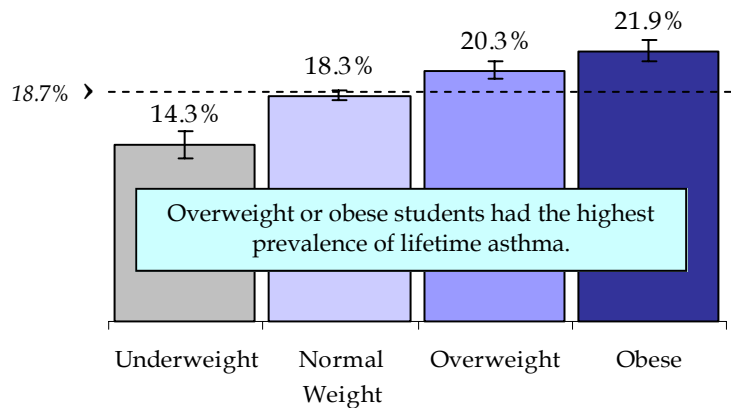
We defined lifetime asthma as an answer of “yes” to the question “Has a doctor ever told you or your parent/guardian that you have asthma?” We calculated the prevalence of lifetime asthma by dividing the number of “yes” responses (n=26,618) by the total number of responses to the question.

The prevalence of lifetime asthma for all the students was 18.7 percent. When students were categorized by weight status, the prevalence of lifetime asthma was greatest in the obese group at 21.9 percent and lowest in the underweight group at 14.3 percent. Across all weight categories, as weight category increased, the prevalence of asthma in each weight category also increased (Figure 3).

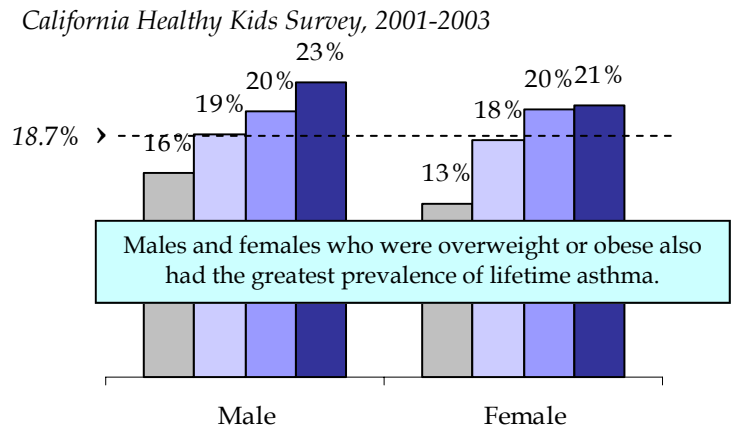
This trend existed among both male and female students. The greatest prevalence of lifetime asthma was in the obese group for both genders with males at 23 percent and females at 21 percent (Figure 4).

Among race/ethnicity groups, the same trend existed: as weight categories increased, so did the prevalence of lifetime asthma. However, in the obese category, Blacks had the highest prevalence of asthma at 33 percent compared to Hispanics who had the lowest prevalence at 17 percent (Figure 5).

**Figure 3. Lifetime Asthma Prevalence by Weight Category**  
California Healthy Kids Survey, 2001-2003



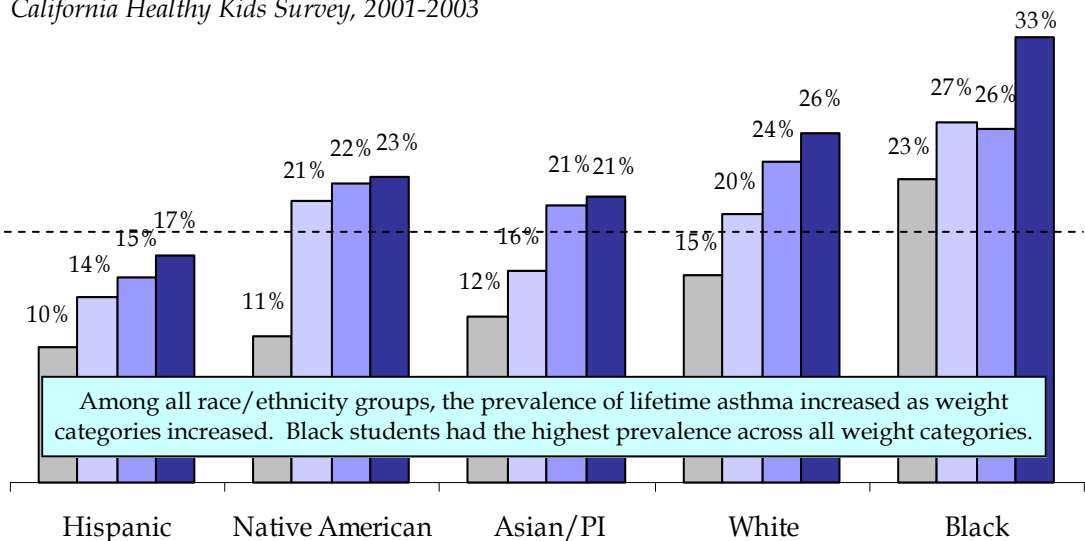
**Figure 4. Lifetime Asthma Prevalence by Weight Category for Males and Females**  
California Healthy Kids Survey, 2001-2003



**Figure 5. Lifetime Asthma Prevalence by Weight Category for Race/Ethnicity Groups**  
California Healthy Kids Survey, 2001-2003

- Underweight
- Normal Weight
- Overweight
- Obese

The overall lifetime adolescent asthma prevalence in California was 18.7% (18.3-19.0).



## California Asthma Facts

### Conclusions

These results show an association between obesity and lifetime asthma prevalence in adolescents in California. Among students categorized as overweight or obese, there is an increased prevalence of lifetime asthma. This association is present in both males and females and across all broad race/ethnicity groups.

Although the association between asthma and obesity is supported by this analysis, this study cannot make any conclusions as to whether one condition causes the other or whether there are other factors that cause both. This issue continues to be the subject of much interest and debate in the research field.

### Directions for future research:

- ◆ More prospective studies are needed to look at this trend over time and help explain whether asthma causes obesity, obesity causes asthma, or whether there is a third factor contributing to both.
- ◆ More research is needed that looks at the association between asthma and obesity in adolescents across the different sub-ethnic groups within the broader Asian/Pacific Islander and Hispanic groups.
- ◆ This report showed a difference in asthma prevalence by weight status for both boys and girls, suggesting we take a closer look at the role that gender plays.
- ◆ Physical activity and smoking among this population should also be explored to see how it affects the prevalence of asthma and obesity.

### What can be done?

Childhood asthma and childhood obesity are critical issues that can be influenced by parents, schools, health care providers, and the greater community. To find strategies and resources to help children with asthma and to prevent obesity among children with asthma, see *California Asthma Quick Facts*, a supplement to this report. *California Asthma Quick Facts* can be found at: [www.californiabreathing.org/files/california\\_asthma\\_quick\\_facts\\_obesity.pdf](http://www.californiabreathing.org/files/california_asthma_quick_facts_obesity.pdf)

The California Department of Health Services has worked with leading asthma organizations, agencies, and public interest groups throughout the state to develop an integrated plan, *The Strategic Plan for Asthma in California*, to address the asthma epidemic in California. Please visit the *California Breathing* website for more information: [www.californiabreathing.org](http://www.californiabreathing.org)

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