Self-Reported Asthma Among High School Students — United States, 2003

Asthma is a leading chronic illness among children in the United States (1). To examine self-reported asthma and asthma attacks among U.S. high school students, CDC analyzed data from the 2003 national Youth Risk Behavior Survey (YRBS). This report summarizes the results of that analysis, which indicated that 18.9% of high school students had been told by a doctor or nurse that they had asthma, 16.1% had current asthma, and 37.9% of those with current asthma had had an episode of asthma or an asthma attack during the 12 months preceding the survey. These findings underscore the need for health-care providers, schools, families, and public health practitioners to be prepared to respond to asthma-related emergencies and to help students manage their asthma.

YRBS is a component of CDC’s Youth Risk Behavior Surveillance System and measures the prevalence of health risk behaviors among high school students through biennial national, state, and local surveys. The 2003 national survey used a three-stage cluster sample design to obtain cross-sectional data representative of public- and private-school students in grades 9–12 in the 50 states and the District of Columbia. The school response rate was 81%, the student response rate was 83%, and the overall response rate was 67%. Students completed an anonymous, self-administered questionnaire that included two questions about asthma. Question 1 was answered by 13,553 students and asked, “Has a doctor or nurse ever told you that you have asthma?” (response options were “yes,” “no,” and “not sure”). Question 2 was answered by 13,232 students and asked, “During the past 12 months, have you had an episode of asthma or an asthma attack?” (response options were “I do not have asthma;” “No, I have asthma, but I have not had an episode of asthma or an asthma attack during the past 12 months;” “Yes, I have had an episode of asthma or an asthma attack during the past 12 months;” and “not sure”). Each student was expected to respond to both questions, and 13,222 did so. “Lifetime asthma” was defined as ever having been told by a doctor or nurse that the student had asthma. “Current asthma” was defined as having lifetime asthma and, during the 12 months preceding the survey, reporting either having asthma but no episode or attack or having an asthma episode or attack. “Asthma episode or attack” was calculated among students with current asthma and was defined as having had an asthma episode or attack during the 12 months preceding the survey.

In this report, data are presented for black, white, and Hispanic* students; the numbers of students from other racial/ethnic populations were too small for meaningful analysis. Data were weighted to provide national estimates. Statistical software that takes into account the complex sampling design was used to calculate prevalence estimates and 95% confidence intervals and to conduct $t$ tests for subgroup comparisons.

Overall, 18.9% of high school students reported lifetime asthma (Table). Significantly fewer Hispanic (15.6%) than black (21.3%; $t = 4.0, p<0.01$) or white (19.3%; $t = 3.4, p<0.01$) students reported lifetime asthma. Approximately one in six students (16.1%) reported current asthma. Significantly fewer Hispanic (12.9%) than black (16.8%; $t = 3.0, p<0.01$) or white (17.0%; $t = 3.5, p<0.01$) students and significantly fewer 10th-grade (15.0%) than 9th-grade students (17.5%; $t = 2.2, p<0.05$) reported current asthma.

Among students with current asthma, 37.9% reported an asthma episode or attack during the 12 months preceding the survey. Significantly more female (44.5%) than male (31.1%; $t = 4.2, p<0.01$) students reported current asthma.

* Black and white students are all non-Hispanic. Students identified as Hispanic might be of any race.
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* Proposed.

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TABLE. Percentage of high school students reporting lifetime asthma, current asthma, and asthma episode or attack, by selected characteristics — Youth Risk Behavior Survey, United States, 2003

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Lifetime asthma*</th>
<th>Current asthma†</th>
<th>Asthma episode or attack§</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>19.0 (±1.7)</td>
<td>15.5 (±1.6)</td>
<td>31.1 (±3.9)</td>
</tr>
<tr>
<td>Female</td>
<td>18.7 (±1.1)</td>
<td>16.8 (±1.3)</td>
<td>44.5 (±3.9)</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>19.3 (±1.5)</td>
<td>17.0 (±1.5)</td>
<td>38.7 (±3.7)</td>
</tr>
<tr>
<td>Black</td>
<td>21.3 (±2.4)</td>
<td>16.8 (±2.2)</td>
<td>33.9 (±5.0)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>15.6 (±1.5)</td>
<td>12.9 (±1.6)</td>
<td>38.8 (±9.0)</td>
</tr>
<tr>
<td><strong>Grade</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9th</td>
<td>20.5 (±2.0)</td>
<td>17.5 (±1.7)</td>
<td>45.0 (±5.5)</td>
</tr>
<tr>
<td>10th</td>
<td>18.0 (±2.3)</td>
<td>15.0 (±1.8)</td>
<td>36.4 (±4.7)</td>
</tr>
<tr>
<td>11th</td>
<td>18.2 (±2.1)</td>
<td>15.9 (±2.1)</td>
<td>34.6 (±4.3)</td>
</tr>
<tr>
<td>12th</td>
<td>18.3 (±1.8)</td>
<td>15.5 (±2.1)</td>
<td>33.0 (±4.8)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>18.9 (±1.1)</td>
<td>16.1 (±1.2)</td>
<td>37.9 (±2.5)</td>
</tr>
</tbody>
</table>

* Student was ever told by a doctor or nurse that the student had asthma (n = 2,365).
† Student reported lifetime asthma and reported that during the 12 months preceding the survey, the student either had asthma but no episode or attack or had an asthma episode or attack (n = 1,943).
§ Among students with current asthma, had an asthma episode or attack during the 12 months preceding the survey (n = 710).
¶ Confidence interval.
** Black and white students are all non-Hispanic. Students identified as Hispanic might be of any race.

$t = 4.3, p<0.01$) students with current asthma and significantly more 9th-grade students (45.0%) than 10th- (36.4%; $t = 2.1, p<0.05$), 11th- (34.6%; $t = 3.0, p<0.01$), and 12th-grade (33.0%; $t = 2.9, p<0.01$) students with current asthma reported having an asthma episode or attack.

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Editorial Note: YRBS provides a national source for self-reported asthma prevalence among U.S. high school students. The findings in this report indicate that 18.9% of high school students reported lifetime asthma, and 16.1% had current asthma. Among students with current asthma, 37.9% reported having had an asthma episode or attack during the 12 months preceding the survey. In the 2003 National Health Interview Survey (NHIS), parents reported that 14.5% of their children aged 14–17 years had lifetime asthma, 8.9% had current asthma, and among students with current asthma, 57.0% had had an asthma episode or attack during the preceding year (CDC, unpublished data, 2005). The differences between the two surveys in estimates for lifetime asthma, current asthma, and asthma episode or attack might be attributable to differences in age (grades 9–12 versus ages 14–17 years), reporting...
source (self-report versus parent report), and question wording. Further research is needed to better understand the reasons for these differences and their implications for asthma management.

YRBS data indicate no significant difference between the percentages of black and white students reporting current asthma or having an asthma episode or attack during the preceding 12 months. Other national data sources have revealed higher asthma prevalence among black children than white children and have indicated that, compared with white children, black children were more than three times as likely to be hospitalized because of asthma and more than four times as likely to die from asthma (2).

Why significantly more female students than male students with asthma and significantly more 9th-grade students than 10th-, 11th-, or 12th-grade students with asthma reported having an asthma episode or attack during the preceding 12 months is not clear. Additional research might help explain sex and grade differences in asthma episodes.

The findings in this report are subject to at least three limitations. First, these data apply only to adolescents enrolled in high school. Nationwide, in 2001, among persons aged 16–17 years, approximately 5% were not enrolled in a high school program and had not completed high school (3). Second, the extent of underreporting or overreporting of asthma and asthma episodes or attacks cannot be determined. Asthma status was not confirmed by medical records, and asthma episode and attack were not defined. Third, data for Hispanic respondents represent responses from an unknown combination of Mexican-American, Puerto Rican, and other Hispanic students. Other reports have demonstrated variation in asthma prevalence among these subpopulations. According to NHIS data, Puerto Ricans have reported three times higher lifetime and current asthma prevalence than Mexican-Americans (4).

A primary prevention strategy for asthma does not exist, but asthma can be controlled (5). Schools can help improve asthma management among students whose asthma is not well-controlled by providing health services, education, and control of environmental triggers. CDC, other federal agencies, the National Asthma Education and Prevention Program, and national nongovernmental organizations have developed resources to support asthma management activities at schools (6). CDC’s Strategies for Addressing Asthma Within a Coordinated School Health Program (7) recommends research-based activities for schools to help students manage their asthma, such as obtaining a written asthma action plan for all students with asthma, ensuring that those with asthma receive education on asthma basics, asthma management, and emergency response, and prohibiting tobacco use at all times among students, staff, and visitors to schools. Students, families, schools, and health-care and public health practitioners working together can improve asthma management among students.

References