

Parental Report of Significant Head Injuries in Children Aged 3–17 Years: United States, 2016

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Key findings

Data from the National Health Interview Survey

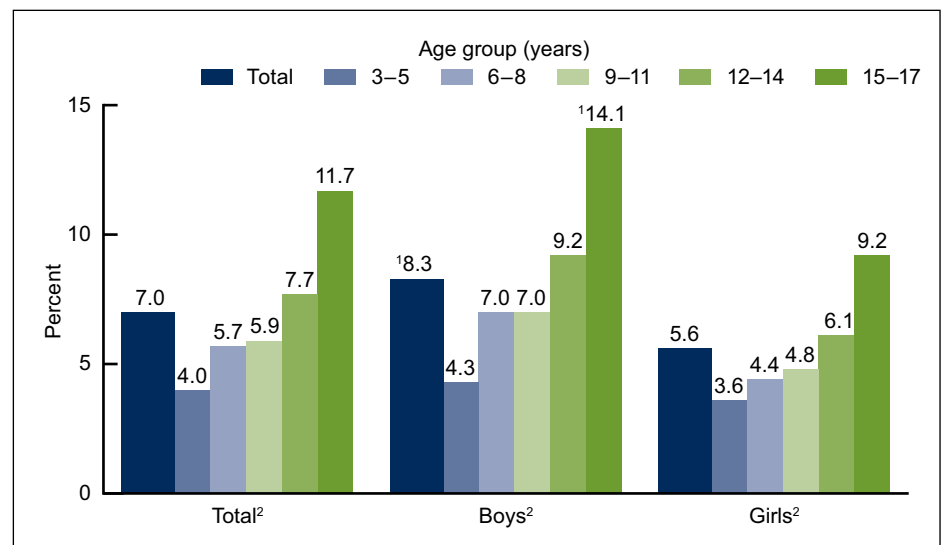
- In 2016, based on parental report, 8.3% of boys and 5.6% of girls aged 3–17 years have ever had a significant head injury in their lifetime.
- As age increased, the percentage of children who have ever had a significant head injury also increased, peaking at 11.7% among children aged 15–17 years.
- Non-Hispanic white children were more likely to have ever had a significant head injury compared with non-Hispanic black, Hispanic, and other non-Hispanic children.
- The percentage of children who have ever had a significant head injury was higher among those whose parents had more than a high school education compared with those whose parents had a high school education or less.
- Among children who have ever had a significant head injury, the majority have only had one such injury (81.3%).

In recent years, there has been increased awareness and prevention efforts toward reducing concussion incidence. Previous research has most often estimated the prevalence of concussions among youth using medical claims data (1–4). In the 2016 National Health Interview Survey (NHIS), parents or guardians answered questions about whether their children have ever had a significant head injury or concussion. This report presents estimates of parent-reported lifetime significant head injuries among children aged 3–17 years, providing information about head injuries beyond those that were medically attended.

Keywords: youth • injury • concussion • National Health Interview Survey

In 2016, 7.0% of children aged 3–17 years have ever had a significant head injury in their lifetime.

Figure 1. Percentage of children aged 3–17 years who have ever had a significant head injury, by age and sex: United States, 2016



¹Significantly different from girls ($p < 0.05$).

²Significant linear trend by age group ($p < 0.05$).

NOTE: Access data table for Figure 1 at: https://www.cdc.gov/nchs/data/databriefs/db302_table.pdf#1.

SOURCE: NCHS, National Health Interview Survey, 2016.

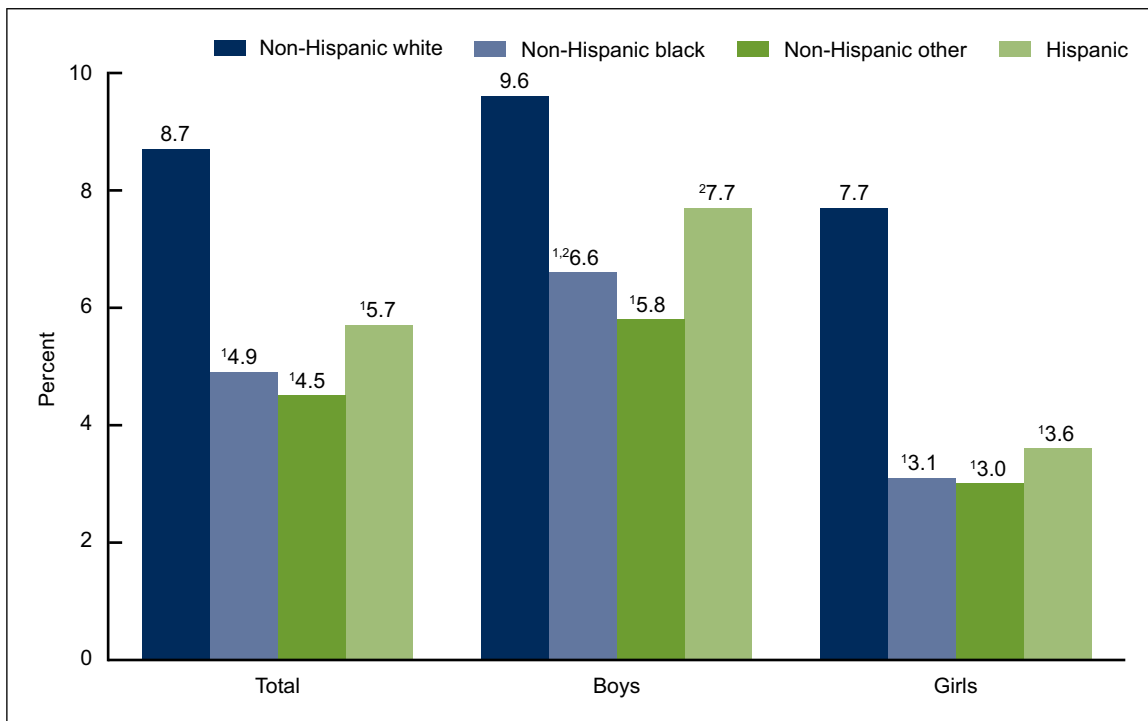


- The percentage of children who have ever had a significant head injury increased with age and was nearly three times higher among children aged 15–17 years (11.7%) compared with children aged 3–5 years (4.0%) (Figure 1).
- For both boys and girls, as age increased, the percentage of children who have ever had a significant head injury also increased.
- Overall, boys (8.3%) were more likely than girls (5.6%) to have ever had a significant head injury.
- Among those aged 15–17 years, boys (14.1%) were more likely than girls (9.2%) to have ever had a significant head injury. For every other age group, the percentage of boys who have ever had a significant head injury was also observed to be higher than the percentage of girls, though none of these differences were statistically significant.

Non-Hispanic white children were almost twice as likely to have ever had a significant head injury compared with non-Hispanic black and other non-Hispanic children.

- For both boys and girls, non-Hispanic white children had a higher percentage of lifetime significant head injuries compared with non-Hispanic black and other non-Hispanic children. Overall and among girls, non-Hispanic white children were more likely than Hispanic children to have ever had a significant head injury (Figure 2).

Figure 2. Percentage of children aged 3–17 years who have ever had a significant head injury, by race and Hispanic ethnicity and sex: United States, 2016



¹Significantly different from non-Hispanic white children ($p < 0.05$).

²Significantly different from girls ($p < 0.05$).

NOTE: Access data table for Figure 2 at: https://www.cdc.gov/nchs/data/databriefs/db302_table.pdf#2.

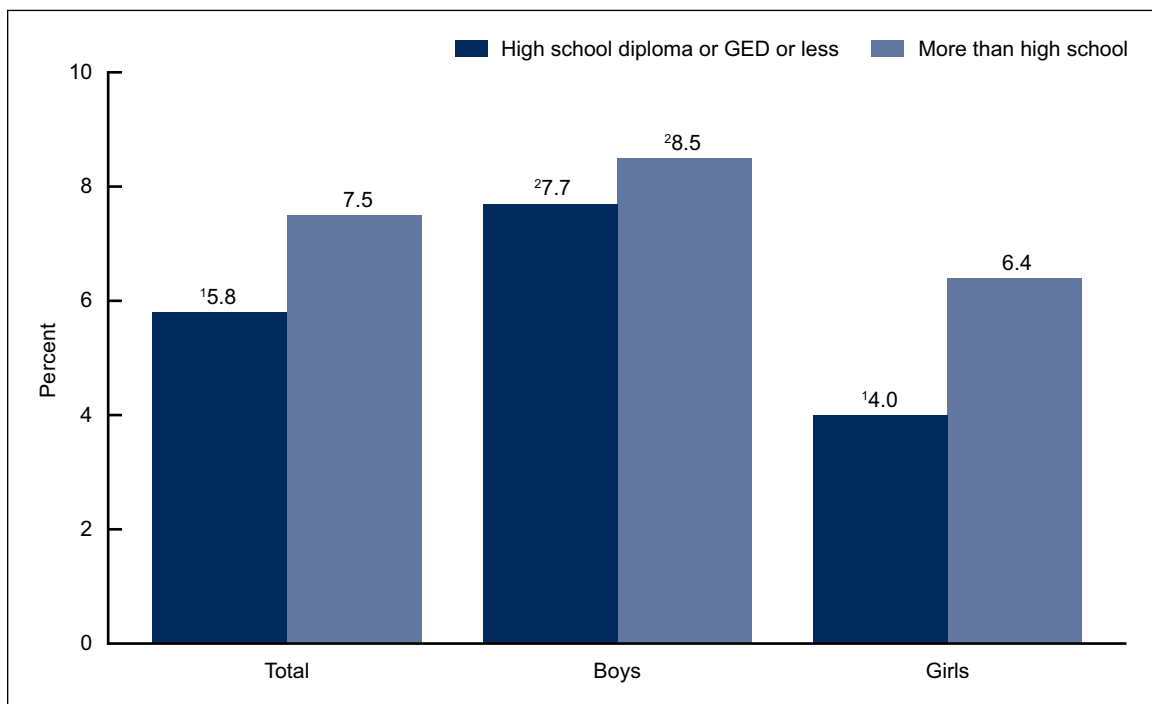
SOURCE: NCHS, National Health Interview Survey, 2016.

- Non-Hispanic black (6.6%) and Hispanic (7.7%) boys were more likely than girls of the same race and Hispanic ethnicity (3.1% and 3.6%, respectively) to have ever had a significant head injury.
- The percentage of non-Hispanic white and other non-Hispanic boys who had a lifetime significant head injury was observed to be higher than that among girls; however, these differences were not statistically significant.

Overall, children with parents who had more than a high school education were more likely than children with parents who had a high school diploma or GED or less to have ever had a significant head injury.

- Among girls, those with parents who had more than a high school education (6.4%) were more likely than those with parents who had a high school diploma or General Educational Development (GED) high school equivalency diploma or less (4.0%) to have ever had a significant head injury (Figure 3).
- Among boys, there was no significant difference between those with parents who had more than a high school education (8.5%) and those with parents who had a high school diploma or GED or less (7.7%) to have ever had a significant head injury.
- Regardless of parental educational attainment, boys were more likely than girls to have ever had a significant head injury.

Figure 3. Percentage of children aged 3–17 years who have ever had a significant head injury, by parental educational attainment and sex: United States, 2016



¹Significantly different from children with parents who have more than a high school education ($p < 0.05$).

²Significantly different from girls ($p < 0.05$).

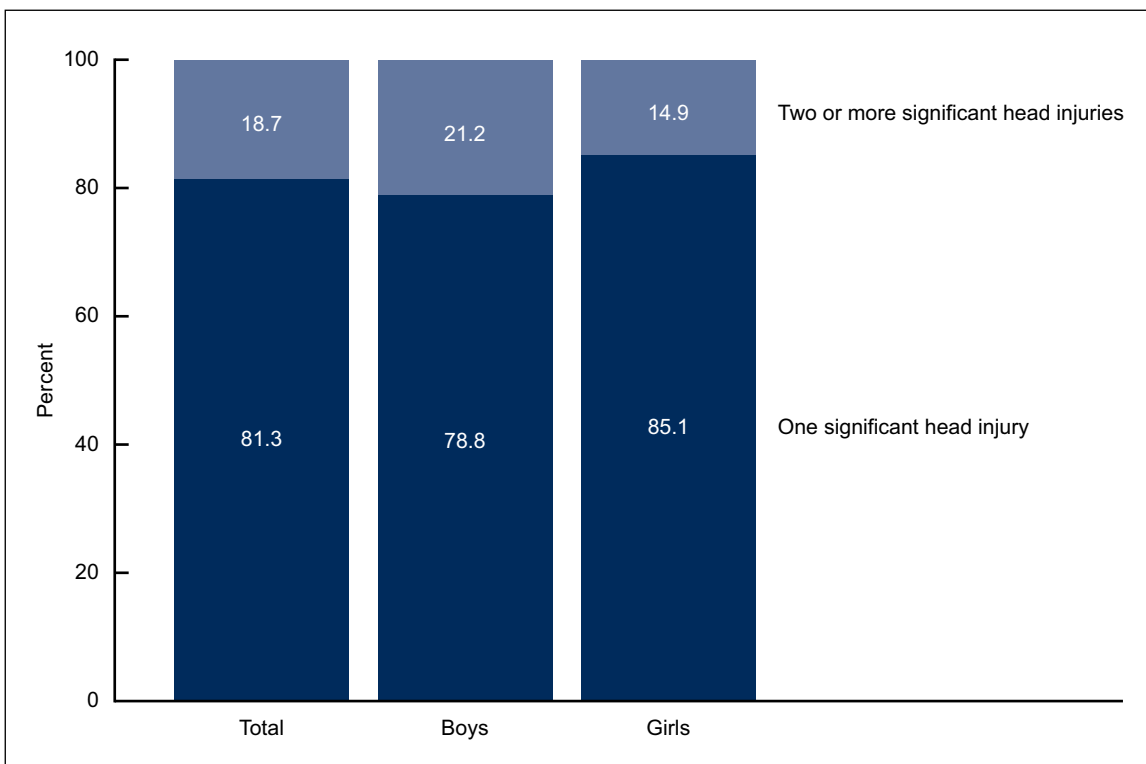
NOTES: Parental educational attainment is based on the highest educated parent living in the household. GED is General Educational Development high school equivalency diploma. Access data table for Figure 3 at: https://www.cdc.gov/nchs/data/databriefs/db302_table.pdf#3.

SOURCE: NCHS, National Health Interview Survey, 2016.

Most children who have ever had a significant head injury have only had one in their lifetime.

- Overall, 81.3% of children who have ever had a significant head injury have had one, and 18.7% have had two or more significant head injuries in their lifetime (Figure 4).
- There were no statistically significant differences between boys and girls in the distribution of the number of lifetime significant head injuries.
- Among children who have ever had a significant head injury, 78.8% of boys and 85.1% of girls have only had one in their lifetime.

Figure 4. Percent distribution of number of lifetime significant head injuries among children aged 3–17 years who have ever had a significant head injury, by sex: United States, 2016



NOTE: Access data table for Figure 4 at: https://www.cdc.gov/nchs/data/databriefs/db302_table.pdf#4.
 SOURCE: NCHS, National Health Interview Survey, 2016.

Summary

In 2016, 7.0% of children aged 3–17 years have ever had a significant head injury based on parent- or guardian-reported data from NHIS. Boys were more likely than girls to have ever had a significant head injury. Non-Hispanic white children were nearly twice as likely to have ever had a significant head injury as non-Hispanic black and other non-Hispanic children. There were also differences based on parental educational attainment. The percentage of children who have ever had a significant head injury increased as age increased, with about 1 in 10 children aged 15–17 years having ever had a significant head injury. Among children who have ever had a significant head injury, the majority have only had one such injury (81.3%), while 18.7% have had two or more.

This report provides insight into the demographic differences in the prevalence of a lifetime significant head injury among children aged 3–17 years. The findings in this report are consistent with previous research and present new data, including the prevalence of multiple significant head injuries (5,6). Further, NHIS estimates are not based on the receipt of medical care and therefore provide a broader picture of the prevalence of serious head injuries in youth. This report's estimates are based on parent or guardian report and may be influenced by parental recall, parental awareness, social desirability to report such injuries, and interpretation of the terms "significant head injury" and "concussion." "Significant head injury" likely represents a range of severity, from superficial contusion to severe traumatic brain injury. Consequently, the results of this report should not be interpreted as describing the prevalence of physician-diagnosed traumatic brain injury or concussion.

Definitions

Significant head injury: Based on the survey question, "In (his/her) lifetime, has (sample child) ever had a significant head injury or concussion?"

Number of significant head injuries: Among those who have ever had a significant head injury or concussion, a follow-up question was asked: "In (his/her) lifetime, how many significant head injuries or concussions has (sample child) had?"

Parental educational attainment: Based on the education level of the parent with the highest level of education, regardless of that parent's age, and is based only on parents living in the child's household.

Race and ethnicity: Based on two separate questions that determine Hispanic or Latino origin and race. Persons of Hispanic or Latino origin may be of any race.

Data source and methods:

Data from the 2016 NHIS were used for this analysis. NHIS is a nationally representative survey of the civilian noninstitutionalized U.S. population. It is conducted continuously throughout the year by the National Center for Health Statistics (NCHS). NHIS is an in-person interview conducted in the respondent's home. In some instances, follow-up to complete the interview is conducted via telephone. The survey consists of (a) the Family Core component, with questions asked about all members of the family; (b) the Sample Adult component, which collects additional information from one randomly selected adult per family; and (c) the Sample Child component, which collects additional information about one randomly selected child per family. The Sample Child component is completed by a family respondent, usually a parent (91% of respondents for children aged 3–17 years were a parent in 2016). Data for this analysis come from the Sample Child and Family Core components of NHIS. For more information about NHIS, visit <https://www.cdc.gov/nchs/nhis.htm>.

Questions on significant head injuries were asked as part of a series of supplemental questions to the Sample Child component, which were sponsored and funded by the National Institute on Deafness and Other Communication Disorders. The text for these questions specified “significant head injury or concussion” but was simplified to “significant head injury” in this report. The child's respondent was not provided any additional definitions or context for these questions. Previous work has found that the prevalence of self-reported concussions among adult athletes increased after a definition of the condition was presented (7), though it is not known how this may affect how a parent or guardian reports about a child's injury. Parental report of a diagnosed concussion has been found to be reliable in cognitive testing, but other details were not recalled as definitively (8).

NHIS is designed to yield a nationally representative sample, and these analyses used weights to produce national estimates. The sample design is described in more detail elsewhere (9). Point estimates and the corresponding variances for this analysis were calculated using SUDAAN software (10) to account for the complex sample design of NHIS. Linear trends by age group and differences between percentages were evaluated using two-sided significance tests at the 0.05 level.

About the authors

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NCHS Data Brief ■ No. 302 ■ February 2018

Suggested citation

Black LI, Zammitti EP, Hoffman HJ, Li CM. Parental report of significant head injuries in children aged 3–17 years: United States, 2016. NCHS Data Brief, no 302. Hyattsville, MD: National Center for Health Statistics. 2018.

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ISSN 1941–4927 Print ed.
ISSN 1941–4935 Online ed.
DHHS Publication No. 2018–1209
CS289136