

5. PERSISTENT HUNGER

The following section contains: definitions of food insecurity and hunger; prevalence, with a focus on disparities; the unmet need for services; and the learning consequences of food insecurity and hunger.



Definitions

From the 2014 Household Food Security report: Households are considered “food secure” when all members have access to enough food at all times for an active, healthy life. Thus, household food insecurity means that, at times, households were unable to acquire adequate food for one or more household members because they didn’t have enough money and other resources for food.¹⁷⁵

Similarly, chronic hunger is generally a result of the unavailability of the monetary or community resources needed to access adequate food.

And while hunger in the United States does not normally take the form of starvation, nonetheless its effects have been proven to jeopardize children’s chances to learn and thrive.¹⁷⁶ The concepts of food insecurity and hunger are thus correlated, with persistent hunger being a potential consequence of high levels of food insufficiency. The definition of hunger cited by the USDA is “a potential consequence of food insecurity that, because of prolonged, involuntary lack of food, results in discomfort, illness, weakness, or pain that goes beyond the usual uneasy sensation.”¹⁷⁷

Food security is routinely assessed by the FDA Economic Research Service, analyzing the CFSM data collected by the Current Population Survey of the Census Bureau. The scale explores a broad range of experiences of food insecurity, ranging from anxiety that the food would run out, to instances of reduced food intake by children.^{178,179}

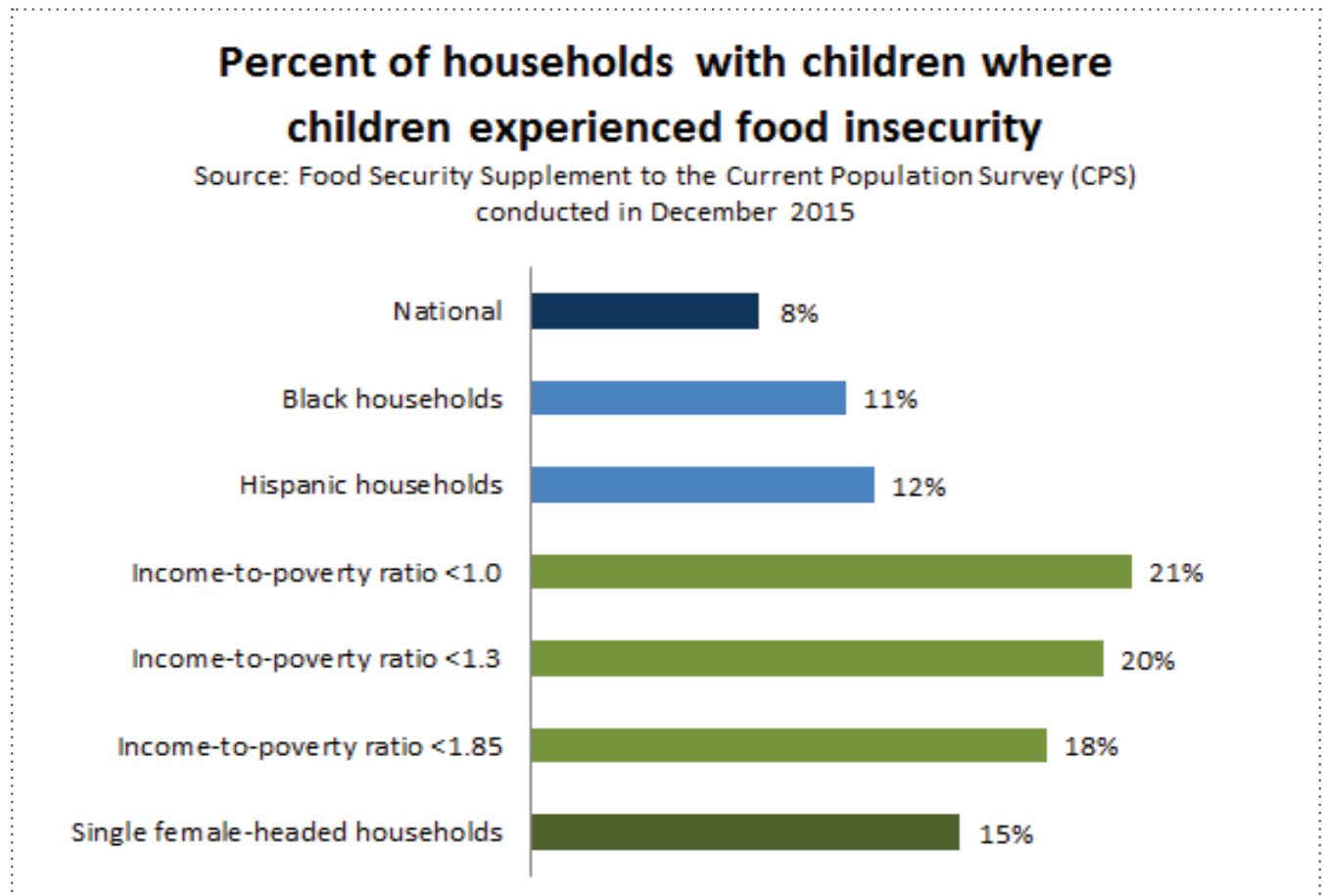
Food Insecurity is further divided into two categories:

- **Low food security:** reports of reduced quality, variety, or desirability of diet. Little or no indication of reduced food intake. Before the CNSTAT recommendations of 2006 this was labeled as food insecurity without hunger.
- **Very low food security:** Reports of multiple indications of disrupted eating patterns and reduced food intake. Before the CNSTAT recommendations of 2006 this was labeled as food insecurity with hunger.¹⁸⁰

Often, when a household is food insecure, parents give up their food so that their children don’t experience hunger. However, there are instances in which even that does not allow parents to provide adequate, nutritious food for their children. In instances of very low food insecurity in households with children, food insecurity can be so severe that children are hungry, or skip a meal, or cannot eat for a whole day. These households are described as having very low food security among children.¹⁸¹

Prevalence

According to recent national data, 13% (15.8 million households) of US households were food insecure in 2015. This includes about 5% of U.S. households (6.3 million households) with very low food security, i.e. households where one or more members experienced disrupted eating patterns and reduced food intake because they could not afford enough food. Among households with children, about 17% of households experienced food insecurity during the year. In about half of these food-insecure households (9%), only adults were food insecure, meaning they were able to maintain normal diets for their children. In the remaining half (8%, 3 million households), even children experienced food insecurity. This includes 274,000 households where food insecurity among children was so severe that caregivers reported that children were hungry, skipped a meal, or did not eat for a whole day because there was not enough money for food.¹⁸² Certain types of households have higher rates of food-insecure children than the national rate of 8% as shown in the following chart: single female-headed households (15%); black households (11%); Hispanic households (12%); and poor households with an income-to-poverty ratio of less than 1.00 (21%), less than 1.30 (20%) and less than 1.85 (18%).



Similar trends apply to households with very low food security among children.¹⁸³

Teachers in public schools also express concerns about children coming to school hungry. In a national survey commissioned by the No Kid Hungry campaign, 73% of teachers say they teach students who regularly come to school hungry because there isn't enough food at home.¹⁸⁴

HUNGER/FOOD INSECURITY AND IRON DEFICIENCY ANEMIA

Children and adolescents in food-insecure households are at greater risk of iron deficiency (including iron deficiency anemia), compared to those in food-secure households.¹⁸⁵ Anemia is a reduction in red blood cells below a normal level, the threshold of which varies by gender and age. Iron is a critical component in the production of red blood cells. Iron deficiency is a state in which there is insufficient iron to maintain normal physiologic functions. In children in the US, iron deficiency is among the most common nutritional deficiencies and a common cause of anemia.¹⁸⁶

An article by the American Academy of Pediatrics Committee on Nutrition summarizes the prevalence of Iron Deficiency and Iron Deficiency Anemia in children aged 12 to 35 months using data from the 1999–2002 National Health and Nutrition Examination Survey. Iron Deficiency occurs in 9% of children aged 12 to 35 months, with higher rates among children enrolled in the Special Supplemental Program for Women, Infants, and Children (WIC) program (11%) and Mexican American children (14%). Rates of Iron Deficiency by poverty status were close to the national rate and were similar (8.6% for children from families below the poverty line versus 8.9% for children from families above the poverty line). Black children had an Iron Deficiency rate of 6.6%, which is lower than the national rate; however, black children had the highest rate of anemia (due to any cause, not just Iron Deficiency Anemia) among the different race and ethnicity groups (8% in black children versus the national rate of 5%). About 2% of children aged 12 to 35 months have Iron Deficiency Anemia. Estimates of Iron Deficiency Anemia by race, ethnicity and poverty status in this age group are statistically unreliable.¹⁸⁷

As stated by the American Academy of Pediatrics, research shows that Iron Deficiency Anemia and Iron Deficiency without anemia during infancy and childhood can have long lasting detrimental effects on neurodevelopment.¹⁸⁸ In fact, studies have shown an association between iron deficiency anemia in infants and later cognitive deficits,¹⁸⁹ and that iron deficiency without anemia may also adversely affect long term neurodevelopment and behavior, and some of these effects may be irreversible.¹⁹⁰ School aged children with iron deficiency were also found to have greater than twice the odds of scoring below average in math than did children with normal iron status.¹⁹¹

Unmet need for services

As described by The Aspen Institute's report "Advancing Health through Food Security: A Multi-Sector Approach to Address the Disease Burden and Costs of U.S. Food Insecurity on our Health System,"¹⁹² solutions to the problem of food insecurity require actions by policymakers, the food industry, healthcare organizations, nonprofit organizations and philanthropy, and food security researchers. In particular, pediatricians can play an important role in solving this problem. AAP's recent policy statement "Promoting Food Security for All Children" published in 2015 calls on pediatricians to identify children at risk of food insecurity, connect families in need to community resources and advocate for federal and local policies that support food security. Specifically, the AAP recommends that pediatricians incorporate the following into their practice: 1) systematically screen for food insecurity at scheduled health maintenance visits or sooner if needed; 2) know the community resources that are available (e.g. WIC, SNAP, school nutrition programs, local food pantries, summer and child care feeding programs) so that referral mechanisms can be put in place for families to be connected to these resources; 3) be aware of the nutritional content of the food offered by community resources; and 4) be aware of the factors that make food-insecure populations vulnerable to obesity and factors that disproportionately burden food-insecure families (cost of healthy food, media messaging promoting unhealthy food, stress of decision-making related to food), so that these issues can be addressed at clinic visits. While national data on the extent to which children are being screened and referred to resources is not currently available, the fact that children experienced food insecurity in an estimated 3 million households indicates a sizable unmet need.¹⁹³

Impact on learning

The impact of childhood food insecurity and hunger on children's health and social outcomes has been studied in depth by several reviews of the literature, including Feeding America and the ConAgra Foods Foundation in their report "Child Food Insecurity: The Economic Impact on our Nation."¹⁹⁴ Research on this topic suggests two main pathways for the association between food insecurity and hunger and negative developmental outcomes in children. Food insecurity may cause households to choose quantity over quality, thus leading to micronutrient deficiencies, which in turn affect the ability of a child to learn and thrive. Another pathway may be that the stress and anxiety that caregivers experience in situations of food insecurity negatively impact children's well being.

The section below describes a number of studies that Feeding America and The ConAgra Foods Foundation highlighted in their report published in 2009, the 2012 review by Perez-Escamilla et al. from the Yale School of Public Health,¹⁹⁵ and a 2012 study on the mental health impact of food insecurity on adolescents.¹⁹⁶ Review of these sources suggests that while there is strong evidence of the impact of hunger and food insecurity on a variety of child emotional and behavioral outcomes, the impact of hunger and food insecurity on educational outcomes varies largely by child characteristics, outcomes measured, level of food insecurity, and study design. Other important factors that play a role in the association between hunger and negative childhood outcomes are the influence of poverty and the role of caregivers. This field is still under study; so far, evidence suggests that household material (income) and non-material (maternal personality, household organizations) indicators may—to varying degrees—confound or mediate the effects of household food insecurity on child outcomes.¹⁹⁷

Emotions and behavior

A cross-sectional study of the Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K)¹⁹⁸ conducted by the Institute for Research on Poverty indicated that, after controlling for potential confounders, household food insecurity negatively impacted the emotional state of the child, as described by measures of self-control, sadness, loneliness, impulsivity and over-activeness, as evaluated by parents. Household food insecurity also negatively impacted children's interactive abilities and social skills, as rated by both parents and teachers. The authors of the study add that the cross-sectional nature of this analysis is a major limitation to the interpretation of the results, given that such study methodology can infer association, but not causation. The results are nonetheless consistent with the author's hypothesis as well as prior data exploring the association of household food insecurity with emotional and social functioning in children.¹⁹⁹

Similarly, a small study group of 328 parents and children from a Community Childhood Hunger Identification Project (CCHIP) study explored the connection between hunger and behavioral outcomes for children aged 6 to 12 years in households with income at or below the 185% of poverty living in the city of Pittsburgh and in the surrounding Allegheny County. Hunger status and child mental health status were reported by the parents, and measured respectively with the 8 food-insufficiency questions of the CCHIP hunger scale, and the Pediatric Symptoms Checklist (PSC), a screening questionnaire used to identify cognitive, emotional, and behavioral problems in children. Higher scores indicate higher risk of cognitive, emotional and behavioral problems. The study found that hunger status was significantly related to PSC score, with the mean PSC score being 18.0 for hungry children, 13.4 for children who were at-risk for hunger, and 8.4 for not-hungry children. Of the children in the hungry category, 21% were classified as dysfunctional by the PSC (score 28 or above) compared with 6% of at risk children and 3% of not-hungry children. Hungry children were also significantly more likely to have a history of past or current mental health counseling. Hungry children were 7 to 12 times more likely to have symptoms of conduct disorders than their not-hungry counterparts.²⁰⁰

A study of school and pre-school children of homeless and low-income housed mothers in Massachusetts explored the relationship between childhood hunger and internalizing behavior problems which cover symptoms of withdrawn behavior, somatic complaints, depression, and anxiety. For both school-aged and preschool-aged children severe child hunger was a moderate predictor of internalizing problems, after controlling for potential covariates in the model. School-aged children with severe child hunger (having multiple signs of child hunger) had parent-reported anxiety scores that were double the scores of children with no hunger. They also had significantly higher internalizing behavior problems than children with no hunger. Preschool children in the study also had significantly higher levels of internalizing behavior problems than their counterparts with no hunger, though depression/anxiety scores were not measured for this group of children.²⁰¹

Finally, a study of a representative sample of US adolescents (aged 13 to 17 years) explored the association between food insecurity (as measured by the USDA Scale) and mental health disorders, grouped into four classes: mood, anxiety, behavior, and substance disorders. The study found that, after controlling for numerous indicators of socioeconomic status, food insecurity was associated with all four categories of disorders. Food insecurity was furthermore even more strongly related to mental health disorders than traditional socioeconomic indicators such as parental education and income. Finally, controlling the analysis for extreme poverty did not decrease the strength of the associations between food insecurity and mental health disorders, thus suggesting that food insecurity reflects a form of economic strain that has more negative effects on adolescents' mental health than living in a family with very low-income.²⁰²

Learning

A number of studies have found significant associations between hunger and food insecurity and academic outcomes such as test scores, school engagement, and enrollment in special education.

Hunger and food insecurity are associated with a child's cognitive development. A study investigated the relationship between caregiver reported food insecurity and developmental risk in a sample of an urban clinical population of children aged less than 36 months from low-income families. Children in food insecure households had higher odds of being at developmental risk, and the association was significant even after controlling for a series of confounding factors—including previous hospitalizations, low birth weight, and current weight-for-age—that usually would be identified by clinicians as markers of physiologic risk. A statistically significant relationship of nearly identical magnitude was observed when households that reported having food insecurity with hunger (defined as households that reported reducing their food intake three or more times over the past 12 months) were removed from the analysis, suggesting that developmental risk is also present with low food security (i.e. food insecurity without hunger).²⁰³

Data from the NHANES 1988-1994 was analyzed by a study that investigated the relationship between food insufficiency and school-aged children's cognitive, academic, and psychological development. A child was classified as food insufficient if the respondent reported that the family either sometimes or often did not have enough food to eat. After adjusting for potential confounders, children aged 6 to 11 years who were classified as food insufficient had significantly poorer math scores and higher chances of having repeated a grade and having seen a psychologist. They were not found to be at higher risk of poorer cognitive outcomes, reading scores, school days lost, or other psychological outcomes.²⁰⁴

A study of a nationally representative sample of children aged 6 to 11 years from the National Survey of American Families found a negative association between food insecurity and school engagement, among other outcomes, after adjusting for covariates. School engagement is a measure of participation in classroom and school activities and the child's feeling that he or she belongs to the school setting and values school-relevant outcomes. Receiving public assistance for the purchase of food was used as a measure of food insecurity.²⁰⁵

A study of data from the ECLS-K analyzed the impact of food insecurity on academic performance in kindergartners. This study found that, after adjusting for potential socioeconomic confounding factors, food insecurity affects children's math scores, both at the beginning of the school year and throughout the year.²⁰⁶ The Pittsburgh CCHIP study that found association between hunger and emotional/behavioral problems, revealed also that children who are hungry are at double the risk of being enrolled in special education and are more likely to repeat a grade, although the association with grade retention was only marginally significant.²⁰⁷ Some studies, however, found less evidence of association between food insecurity and hunger and similar academic outcomes, or found that the association was only true for certain subgroups of children.

An ECLS-K study by Jyoti et al. of food insecurity and its impact on kindergartener's academic performance and social skills among other outcomes found less conclusive evidence on the impact of food insecurity on these outcomes, finding statistically significant associations between food insecurity and math and social skills among girls at third grade only. Likewise, girls from households who were food insecure at both measurement times had smaller increases in reading score than those who were persistently food secure.²⁰⁸

The Massachusetts study referred to earlier in this section, which looked at childhood hunger as measured by the CCHIP measures, and internalizing behavior problems and anxiety/depression as measured by the Child Behavior Checklist (after adjusting for relevant correlates), found no association between hunger and academic achievement as directly assessed by a reading, spelling, and math test.²⁰⁹

Similarly, the study by the ECLS-K by the Institute for Research on Poverty referred to earlier in this section, which found significant association between food insecurity and social outcomes in kindergartners, found no association between food insecurity and cognition as measured directly by math, reading, and general knowledge competence, or teachers' assessed children's cognition.²¹⁰

Conclusions

Key points:

- Amongst the households with children, the percentage of households with food insecure children was considerably higher than the national rate in single-headed households, black households and Hispanic households, households in poverty, and households in Southern states.
- These disadvantaged groups of children are therefore vulnerable to the learning-related consequences of hunger and food insecurity. While there is strong evidence of their impact on a variety of child emotional and behavioral outcomes, the impact of hunger and food insecurity on educational outcomes vary largely by child characteristics, outcomes, level of food insecurity, and study design.
- Collectively, these findings clearly show the need for disadvantaged children and their families to access programs that will increase their access to adequate food, so that food insecurity and/or hunger don't impede their ability to learn.