

Welcome to the Food Research & Action Center's summer issue of ResearchWire. This quarterly newsletter focuses on the latest research, reports, and resources from government agencies, academic researchers, think tanks, and elsewhere at the intersection of food insecurity, poverty, the federal nutrition programs, and health.



## IN FOCUS

### Food Insecurity Among College Students

In October 2014, the Food Research & Action Center and Children's HealthWatch [reviewed the research](#) on food insecurity among U.S. college students. While the prevalence of food insecurity and its negative outcomes among this population were issues of growing concern and research at the time, the review identified only a limited number of well-designed studies that had specifically investigated food insecurity among U.S. college students. The authors concluded that "continued investigation of the prevalence and impacts of food insecurity among college students is needed to enable policymakers and advocates to assess the scope of the problem and develop potential solutions."

Fast forward four years: almost two dozen new U.S. studies have since focused on college food insecurity and been published by researchers from think tanks and academia. Consistent with the earlier research, these studies overwhelmingly find high rates of food insecurity among college students, especially students of color and students at community colleges, and find as well harmful health and academic consequences.

This brief builds on the 2014 review by highlighting some of the latest research on food insecurity among U.S. college students, including the prevalence, risk factors, and consequences, then concluding with policy and programmatic recommendations to identify and address this problem.

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### Food Insecurity Prevalence and Trends

Food insecurity rates among U.S. college students vary considerably by study, due, in part, to differences in sample size, sample characteristics, institution type, and study design. Overall, most studies find rates of food insecurity that are higher than the national average for adults.

A literature review in the *Journal of the Academy of Nutrition and*

*Dietetics* identified nine peer-reviewed U.S. studies published between January 2001 and August 2016 that focused on food insecurity among undergraduate and graduate students at postsecondary institutions of higher education.<sup>1</sup> Most of the studies collected data between 2011 and 2015. Among the nine studies, rates of food insecurity for this population ranged from 14.1 to 58.8 percent and averaged 32.9 percent. Another literature

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review, published in the *Journal of Hunger and Environmental Nutrition*, estimated food insecurity rates at 43.5 percent, based on eight studies that represented data from 52,085 students in higher education.<sup>2</sup> Rates ranged from 21 to 58.8 percent across the studies. The eight studies in this review included three peer-reviewed studies, four reports, and one master's thesis, all of which collected data between 2006 and 2016 and used U.S. Department of Agriculture instruments to measure food insecurity. While these literature reviews used different inclusion criteria, both demonstrate high rates of food insecurity — nearly one-third to one-half of college students, on average — and wide variation in rates across studies.

**Overall, most studies find rates of food insecurity among college students are higher than the national average for adults.**

The vast majority of studies on college food insecurity focus on a single institution or several institutions within the same university system, which limits the generalizability of the findings to the broader college student population. There are a few exceptions: a series of studies from [Wisconsin HOPE Lab](#) explored food insecurity in large samples of students attending institutions from multiple states (some of which were included in the *Journal of Hunger and Environmental Nutrition* literature review above), and a 2017 study that used national data to examine food insecurity among

households with undergraduate college students. The research teams used different study designs, but the studies provide important evidence on the extent of the problem across the nation.

The Wisconsin HOPE Lab research, led by Sara Goldrick-Rab, has been critically important in identifying and elevating the issue of college food insecurity.<sup>3</sup> In April of this year, Goldrick-Rab and colleagues published their most recent results in the largest national assessment to date.<sup>4</sup> Based on a survey of 43,000 students at 66 institutions in 20 states and the District of Columbia, the research team found high rates of food insecurity among both two-year community college and four-year college/university students. Among four-year students, 36 percent were food insecure (22 percent reported very low food security and 14 percent reported low food security). Among two-year students, 42 percent were food insecure (27 percent reported very low food security and 15 percent reported low food security). The researchers also acknowledged the wide variation in food insecurity rates across institutions. Food insecurity estimates ranged from 30 to 60 percent among the two-year community colleges in the study, and from 15 to over 60 percent among the four-year colleges/universities.

In a report released by the Urban Institute, researchers used national data to generate estimates of food insecurity among *households* with undergraduate college students.<sup>5</sup> In 2015, rates of food insecurity were 11.2 percent among households with students in four-year colleges, 13.3 percent among households with students in two-year colleges, and 13.5 percent among households with students in vocational education programs. These estimates were fairly similar to the food insecurity rate of

12.7 percent among all U.S. households in 2015. However, the researchers found that households with students at two-year colleges had “persistently” higher rates of food insecurity across most other years in the full study period (i.e., 2001 to 2015), especially after the Great Recession. According to the researchers, the “analysis shows that food insecurity is a concern for postsecondary students, particularly among students at two-year schools.” Food insecurity rates from these and other cross-sectional studies are cause for concern, and warrant further investigation given the wide variation in existing estimates and given refinements in research methods as the field evolves.

There also is emerging evidence that food insecurity rates worsen over the course of the academic year. In a study of 1,138 freshman students in Arizona, food insecurity was more prevalent at the end of the semester: rates of food insecurity were 28 percent at the start of the fall semester, and then rose to 35 percent and 36 percent at the end of the fall and spring semesters, respectively.<sup>6</sup> To our knowledge, this is the first and only published study to examine food insecurity among college students longitudinally (i.e., during multiple points over time), yet the findings are consistent with other research. For instance, food-insecure freshmen in one cross-sectional study reported that their food access worsened since starting college.<sup>7</sup> In another study, 23.5 percent of undergraduate students were food insecure, but only 96 percent of those students reported experiencing food insecurity prior to attending university.<sup>8</sup> More longitudinal research is needed to better understand how food insecurity status changes at college entry and throughout the duration of the college experience.

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## Risk Factors for Food Insecurity

Research shows that certain groups of college students are at higher risk of food insecurity, including<sup>9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19</sup>

- students of color;
- older students;
- students attending two-year colleges;
- parents;
- students who experienced childhood food insecurity;
- former foster youth;
- lower-income students;
- students receiving financial aid;
- employed students;
- students experiencing housing instability or living off-campus;
- students who do not own or have access to a vehicle;
- students with poor health status;
- first-generation college students; and
- students who are financially independent (e.g., financial independence from parents).

Many of these findings align with common risk factors for food insecurity among other populations and provide insight into which students might be targeted for outreach and assistance.

## Consequences of Student Food Insecurity

Multiple studies find associations between food insecurity and poor nutrition, health, and academic outcomes among college students. For example, food-insecure college students are less likely to regularly consume breakfast, consume a daily evening meal, have healthy eating habits on campus, and have healthy physical activity habits on campus.<sup>20</sup> Food insecurity also is linked to disordered eating behaviors in this population.<sup>21</sup> College students struggling with food insecurity engage in a variety of coping strategies that can contribute to poor dietary intake and habits as well, including stretching food to make it last longer, skipping meals, purchasing inexpensive processed foods, and eating less healthy meals to eat more.<sup>22,23,24</sup>

In terms of health and learning impacts, food-insecure students are more likely to experience stress, poor mental health and depression, poor/fair health status, poor sleep quality, fatigue and lack of energy, irritability, and headaches.<sup>25, 26, 27, 28, 29,30,31</sup>

Students struggling with food insecurity also are more likely to have a lower grade point average and other adverse academic outcomes, including difficulty concentrating or studying, failing courses, and withdrawing from a class or the institution.<sup>32, 33, 34, 35</sup> These harmful health and academic outcomes are not surprising given

some of the coping mechanisms reported by food-insecure students, such as holding down at least one part-time or full-time job, asking family or friends for money, and making trade-offs between food and other basic necessities (e.g., medicine, housing, educational expenses).<sup>36, 37</sup>

While the existing evidence points to serious consequences for health and well-being, more research is needed to identify more precisely the short- and long-term impacts of experiencing food insecurity during college.

## Programmatic Challenges and Solutions

Based on the existing research, food insecurity is a serious problem on college campuses, and is linked to harmful consequences for health and academic success. To make matters worse, food-insecure students face a number of barriers in accessing or receiving the food assistance they need, including stigma, lack of information on available resources, ineligibility for assistance, and barriers to seeking assistance even for those who are eligible. These barriers are particularly apparent in the low participation rates in the Supplemental Nutrition Assistance Program (SNAP). According to one large study, only 26 percent of food-insecure community college students and 12 percent of food-insecure university students received SNAP benefits.<sup>38</sup> And a study in California found that only 20 percent of SNAP-eligible students were currently participating in the program.<sup>39</sup>

States and institutions of higher learning can take steps to make sure that college students who are eligible for SNAP get connected with those benefits. In addition to meeting the income and other qualifications that SNAP applicants must satisfy, students attending college half-time or more





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also must overcome a general bar to SNAP eligibility that requires 20 hours or more per week of work. There are, however, important exemptions to the SNAP student rule based on work-study jobs, participation in an employment and training (E&T) program, receipt of a benefit funded by the Temporary Assistance for Needy Families (TANF) program, and caregiving responsibilities.

Improved state and county SNAP agency policies, application assistance partnerships, and caseworker trainings can help students navigate the eligibility rules and help SNAP agencies to implement these student rule exemptions appropriately. For instance, states can assess whether a particular program of study in a community college should count as a state or local E&T program for SNAP purposes. State agencies also can issue guidance documents to local SNAP agencies and provide refresher trainings on college student eligibility rules for local caseworkers. Finally, SNAP agencies can partner with institutions of higher learning and nonprofit groups to support education and application assistance projects on college campuses.

California, for example, has taken a number of steps to address college food insecurity through SNAP.<sup>40</sup> The state has issued policy guidance to county SNAP (CalFresh) agencies on how to identify and verify exemptions to the student exclusion rule, including which E&T programs count for eligibility, and on how to assess whether an individual is a student half-time or more (to prevent improper denials to those attending school less

than half-time). The state also requires the California Student Aid Commission to notify recipients of a TANF-funded Cal Grant award, so that it can be taken into account for SNAP eligibility determinations. Moreover, California uses a federal SNAP option to authorize certain restaurants to redeem SNAP benefits for prepared meals if the participant is homeless, is elderly, or has a disability; recently, California has extended the reach of its CalFresh Restaurant Meals Program (RMP) to allow homeless college students to use their SNAP EBT benefits to purchase meals at campus-based restaurants and dining halls.

Beyond SNAP, states and institutions of higher learning can assist college students who are pregnant or have young children in accessing Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) benefits. For college students with school-age children, states, colleges, school districts, and nonprofit partners can help get the students' children connected with free or reduced-price school meals, child care food program meals, summer meals, and afterschool meals. More also can be done to connect vulnerable Native American college students with food through the Food Distribution Program on Indian Reservations (FDPIR); currently, FDPIR reaches few post-secondary education students.<sup>41</sup> In addition, to mitigate college student hunger, states, colleges, and partners can promote college meal sharing plans and campus-based food pantries.

Beyond these nutrition- and food-related strategies, investments to increase the real value of grant and work-study programs are needed to help make the costs of college more affordable.<sup>42</sup> The current maximum federal Pell Grant covers a mere 28 percent of the cost of attending a

four-year public college.<sup>43</sup> Moreover, students who rely on Pell Grants for post-secondary education are more than twice as likely as others to borrow through student loans, and they are \$4,500 more in debt post-college than higher-income students. Increasing the maximum Pell Grant, indexing it annually for inflation, and extending the lifetime limit for Pell Grant eligibility are among improvements recommended by The Institute for College Access & Success.<sup>44</sup> Given the diversity of the student population, including older adults returning to school, more also can be done to ensure that state financial aid programs serve adult students.<sup>45</sup>

Economic insecurity and hunger among students are symptoms of broader problems than inadequate assistance with the costs of college. Most students bring their families' economic situation with them to college. Students from low-income families — regardless of age — struggle more than others and, as the research reviewed here shows, face a higher risk of food insecurity. To address college food insecurity, in addition to better college aid, broader strategies are needed to effectively address poverty and the related hardships faced by low-income families with members in college.

## Conclusion

Far too many college students face food insecurity and its negative health and academic outcomes. More must be done to meaningfully address this problem so that adults seeking higher education at any age can be focused on and engaged in their academic pursuits, and prepare for productive work lives, rather than struggling with the heavy burden of food insecurity.

# Research Highlights

## Federal Nutrition Programs

### [Food instability and academic achievement: a quasi-experiment using SNAP benefit timing](#)

The exhaustion of Supplemental Nutrition Assistance Program (SNAP) benefits at the end of the benefit cycle may contribute to students' lower math and reading achievement test scores, according to research in the *American Educational Research Journal*.

Researchers explored the relationship between SNAP benefit transfer timing and end-of-grade math and reading achievement test scores using North Carolina administrative data from more than 148,000 SNAP-participating public school children in third to eighth grade.

Test scores rose shortly after SNAP benefit receipt, peaked at 17 days (for reading) and 19 days (for math), and then declined for the remainder of the benefit cycle. These effects were stronger in females for reading, i.e., the reading scores of females were more likely to be impacted by the SNAP benefit cycle. There also was evidence that students with

siblings under 2 years old were less likely to be impacted by the SNAP benefit cycle, possibly because of household participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). The study's authors write, "recent research suggests that, after the temporary boost in SNAP benefit amounts provided by the American Recovery and Reinvestment Act, families receiving SNAP were better able to smooth their food consumption throughout the month. Our findings suggest that increasing benefit amounts would also have the added benefit of improving school achievement outcomes for low-income children."

### [Eating school meals daily is associated with healthier dietary intakes: The Healthy Communities Study](#)

Students who ate school meals every day, especially school breakfast, had higher intakes of certain healthier foods and/or nutrients, based on a study in the *Journal of the Academy of Nutrition and Dietetics*. In this study of 5,106

elementary and middle school students, researchers examined the relationship between school meal frequency and dietary intake after accounting for child- and community-level factors (e.g., child's age and gender, household income, population below the poverty line). Students who ate school breakfast every day consumed more fruits and vegetables, whole grains, dairy, fiber, and calcium when compared to students who ate school breakfast less frequently (i.e., 0 to 4 days per week). Students who ate school lunch every day consumed more dairy and calcium compared to those who ate school lunch less frequently. School breakfast and lunch consumption were not associated with the intake of calorie-dense nutrient-poor foods, added sugar, or sugar from sugar-sweetened beverages. According to the authors, the nutritional benefits of the school meal programs may help stabilize and even reverse dietary disparities that have been observed in other studies of low-income children.

### [Predictors of nutrition quality in early child education settings in Connecticut](#)

Child care centers that participate in the Child and Adult Care Food Program (CACFP) have multiple nutritional advantages for preschool children, including positive feeding practices and the provision of healthy foods, according to research in the *Journal of Nutrition Education and Behavior*. Researchers compared the feeding practices and dietary intake of lunches for licensed child care centers that do and do not participate in CACFP. The study included 53 CACFP-participating centers and 44 non-CACFP centers





in Connecticut, representing 838 preschool-aged children. Data were collected in 2015, prior to implementation of the new CACFP meal patterns that went into effect starting in October 2017.

CACFP centers were significantly more likely to offer family-style meal service, have staff eat the same foods as children, provide both a fruit and a vegetable, and serve low-fat or skim milk. Children in CACFP centers consumed less saturated fat and total fat, likely a result of the provision of low-fat milk by the vast majority of CACFP-participating centers. About one-third of non-CACFP centers were not in compliance with the CACFP meal patterns in effect at the time of data collection, even though such compliance is required per state licensing regulations. (Only 6 percent of CACFP centers were in noncompliance.) In both groups, mean caloric intake and dietary fiber fell below recommended levels (i.e., children were consuming too few calories and too little fiber), which warrants further investigation in future studies.

### [The quality of nutrition and physical activity environments of child care centers across three states in the southern U.S.](#)

In *Preventive Medicine*, child care centers participating in the Child and Adult Care Food Program (CACFP) had higher-quality nutrition and physical activity environments than non-participating centers. In this three-state study of 354 centers enrolling children 2 to 5 years old, researchers assessed nutrition and physical activity environments using a tool that included best practices in six nutrition domains (e.g., feeding practices, foods provided at lunch) and six physical activity domains (e.g., indoor play environment, active play and screen time provided). Higher scores indicate compliance with more best practices and, therefore, higher-quality environments. Overall scores for nutrition and physical activity environments were low across the centers in the sample (i.e., 20 out of 36 points), and did not vary by urban or rural location. However, CACFP-participating centers had significantly

higher scores than non-participating centers. According to the authors, “this study highlights the vital role that well-regulated, federally funded programs (i.e., CACFP, Head Start) can play in supporting higher-quality environments that promote healthy diet and physical activity behaviors in children. While these programs provide a valuable contribution to improving child care environments, the findings of this study also demonstrate that more comprehensive efforts are still needed.”

## Special Populations

### [Food acquisition methods and correlates of food insecurity in adults on probation in Rhode Island](#)

According to a study in *PLOS ONE*, approximately 70 percent of adults on probation in Rhode Island were food insecure, with a greater risk for those experiencing homelessness or depression. The study, based on a survey of 304 probationers in Rhode Island, is among the first to examine food insecurity and food acquisition strategies among adults on probation. Nearly three-quarters (70 percent) of participants were food insecure, and almost half (48 percent) were very low food secure — substantially higher rates compared to the general adult population in the state. Being homeless or depressed increased the likelihood of being food insecure, whereas having more social support around meal preparation reduced the likelihood of food insecurity. The authors conclude that “strategies to improve food insecurity need to confront the root causes of social determinants, such as improving affordable access to healthier foods, and structural





determinants, such as addressing barriers to gainful employment, safe housing, and treatment for depression, in order to reduce the criminogenic risk factors for people on probation.”

### Health and Well-Being

#### [Food insecurity and family well-being outcomes among households with young children](#)

A study in *The Journal of Pediatrics* found that household food insecurity during early childhood was associated with decreases in family health and well-being, especially among households with preschool-aged children. In a nationally representative sample of low-income children born in the U.S., researchers explored the relationship between household food insecurity during three developmental stages of early childhood (i.e., infancy, toddlerhood, and preschool) and a number of factors known to impact development during early childhood

(e.g., maternal physical and mental health, positive parenting practices). The study also explored changes in food insecurity status during the early childhood period.

Household food insecurity in all three stages of early childhood was associated with increased maternal depressive symptoms and parental arguing. Food insecurity among households with preschool-aged children was linked to increased use of harsh discipline strategies and greater negativity of conflict between parents. These associations were larger at more severe levels of food insecurity.

Becoming food insecure or being consistently food insecure between any two developmental periods was linked to several unfavorable outcomes, particularly maternal depression. Unfavorable outcomes were stronger and more consistent for households that transitioned into food insecurity between the toddler and preschool years. This transition was associated with poor maternal

physical health, maternal depressive symptoms, harsh discipline strategies, and greater frequency and negativity of parental conflict. The study’s authors write, “if pediatricians and family doctors can screen and identify families experiencing or at risk for food insecurity and help connect these otherwise hard-to-reach families with food assistance and other supportive community resources, this may be an effective way to support family and child well-being.”

#### [Food insecurity and perceived anxiety among adolescents: an analysis of data from the 2009–2010 National Health and Nutrition Examination Survey \(NHANES\)](#)

In the *Journal of Hunger and Environmental Nutrition*, household food insecurity was associated with high perceived anxiety among female (but not male) adolescents. The study of 935 U.S. adolescents classified a household as food insecure if it was marginally food secure, low food secure, or very low food secure. Anxiety was based on the adolescent’s response to, “during the last 30 days, for about how many days have you felt worried, tense, or anxious?” After accounting for race-ethnicity, age, household size, parental education, and household family-to-poverty ratio, living in a food-insecure household was associated with a greater likelihood of high anxiety among female (but not male) adolescents. More research is needed to better understand the relationship between food insecurity, gender, and mental health.

### [Housing and food insecurity, care access, and health status among the chronically ill: an analysis of the Behavioral Risk Factor Surveillance System](#)

New research in the *Journal of General Internal Medicine* found high rates of food and housing insecurity among chronically ill adults, with certain chronic conditions putting individuals at greater risk. Researchers examined housing insecurity, food insecurity, four chronic conditions (i.e., stroke, cancer, cardiovascular disease, and chronic lung disease), and health care access using data from 11 states and one territory. Approximately 37 percent of chronically ill adults in this sample were housing insecure and 31 percent were food insecure (compared to 33 percent and 24 percent for those without a chronic condition). Cardiovascular disease, chronic lung disease, and cancer increased the risk for food insecurity, and cardiovascular disease and chronic lung disease also increased the risk for housing insecurity. Housing insecurity and food insecurity increased the risk of health care access hardship, and housing insecurity (but not food insecurity) increased the risk of poorer health status in this study. These effects were observed when accounting for sociodemographic characteristics, such as age, gender, marital status, health insurance status, and percentage of the federal poverty line. Overall, the research findings demonstrate the harmful consequences of food insecurity and housing insecurity, especially in terms of health care access hardship.

### [Senior Hunger and Health](#)

#### [The State of Senior Hunger in America 2016: An Annual Report](#)

A report prepared for Feeding America and the National Foundation to End Senior Hunger found that 4.9 million seniors (7.7 percent of seniors) in the U.S. were food insecure in 2016. This figure includes 1.8 million seniors (2.9 percent of seniors) who struggled with the most severe level of food insecurity, i.e., “very low food security.” The report used national- and state-level data on seniors aged 60 and older.

The report’s authors also examined food insecurity trends among seniors from 2001 through 2016. The food insecurity rate was 6.3 percent in 2007 (just before the Great Recession), peaked at 8.9 percent in 2014, and then declined in 2015 and 2016. While the recent decline is promising, the 2016 rate was still higher than before the recession and, looking at the longer term, fully 45 percent higher than the rate in 2001. Between 2001 and 2016,

there also was a 200 percent increase in the number of seniors experiencing very low food security.

In addition to these national rates and trends, the report identified certain groups at higher risk of food insecurity. Food insecurity rates were higher among racial or ethnic minorities, those with lower incomes, divorced or separated seniors, those with a disability, unemployed seniors, seniors with a grandchild present, and “younger” older adults (ages 60 to 69). In addition, state-level estimates showed higher rates of food insecurity in states located in the South and Southwest. Overall, the report offers a number of useful tables and figures for those seeking a better understanding of senior hunger prevalence and trends.

#### [Chronic disease burden predicts food insecurity among older adults](#)

According to research published in *Public Health Nutrition*, lower-income older adults with multiple chronic





conditions are at higher risk for food insecurity. Researchers explored the relationship between food insecurity and chronic disease burden (e.g., hypertension, diabetes, heart disease, depression, arthritis) among 3,552 adults aged 50 years or older with household income under 300 percent of the federal poverty line. Approximately 28 percent of the study participants were food insecure.

After accounting for demographic and health factors (e.g., age, gender, smoking status), older adults with two to four chronic conditions and five or more chronic conditions were 2.12 and 3.64 times as likely to be food insecure, respectively, than older adults with no or one chronic condition. In addition, older adults engaging in cost-related medication non-adherence (i.e., taking less medication than prescribed due to cost) were 1.9 times as likely to be food insecure than those not reporting such practices. The researchers recommend screening older adults for food insecurity in primary care settings and connecting at-risk patients to nutrition resources that could improve their food access and health, particularly the Supplemental Nutrition Assistance Program, which is currently underutilized among this population.



### [Food insecurity and perceived diet quality among low-income older Americans with functional limitations](#)

Low-income older adults with functional limitations are at higher risk for food insecurity and poor dietary quality, especially if they live alone, based on a study in the *Journal of Nutrition Education and Behavior*. Using national survey data from 1,323 low-income adults aged 65 years or older, researchers explored the relationship between functional limitation, food insecurity, and perceived dietary quality. Functional limitation classification was based on reports of being unable to perform or having difficulty with certain activities, such as walking without special equipment, lifting or carrying something that weighs 10 pounds, doing chores

around the house, and pushing or pulling large objects.

When accounting for living arrangements, health care costs, and socioeconomic factors, low-income older adults with functional limitations had 69 percent higher odds of food insecurity and 65 percent higher odds of poor dietary quality. These associations were even greater for those living alone: the odds of food insecurity and poor dietary quality both exceeded 200 percent. The authors conclude that, “the findings from this study support the expansion of nutritional policies and programs such as the *Older Americans Act Nutrition Program*, which address the unique needs of low-income elderly people who have difficulty accessing and consuming foods owing to their functional limitations.

# Household Food Insecurity is Associated With Increased Hospitalizations and Health Care Expenditures Among Infants



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**H**ousehold food insecurity (HFI) has been shown to predict significantly increased health care utilization (including hospitalizations) and costs.<sup>46</sup> For example, a 2018 study found that food-insecure U.S. adults averaged an extra \$1,863 in health care expenditures per year compared to food-secure adults, for a total of \$77.5 billion in additional health care expenditures annually.<sup>47</sup>

A new Children's HealthWatch study provides the first evidence that HFI is associated with increased costs for infant hospitalizations and with increased number and longer duration of hospital stays. That study will be available on the [Journal of Applied Research on Children's website](#) in mid- to late-August. The study compared hospitalizations, mean days hospitalized per year, charges per day, and total charges per year among 793 infants (<12 months old) from food-secure and food-insecure households, and accounted for a variety of demographic and health characteristics (e.g., race/ethnicity, education, employment, breastfeeding history).

Of infant hospitalizations with at least one diagnosis related to food insecurity (e.g., respiratory or intestinal infections on the basis of their plausible relationship to immune function and nutrition), 20 percent of infants lived in food-insecure households. Among all infants, 24 percent of those from food-insecure households (versus 16 percent from food-secure households) had two or more hospitalizations over the 12 months studied. Infants exposed to HFI had an average of 4.79 hospital days per year, compared to 4.03 days for infants from food-secure households. Average annual charges for infants exposed to HFI were significantly higher than charges for infants not exposed to HFI; adjusted for inflation, these annual charges reflect \$13,382 and \$11,442 in 2017 dollars, respectively.<sup>48</sup>

Infants from food-insecure households were likely sicker upon admission and had to stay in the hospital longer, or were admitted to the hospital more frequently, or both, than infants from food-secure households. The findings demonstrate the importance of [addressing food insecurity in clinical pediatric settings](#) to improve patient health. Several health care systems across the nation have incorporated a brief, validated screener for food insecurity into routine care, recognized as a best practice by the American Academy of Pediatrics.<sup>49, 50, 51</sup> Treating food insecurity as a vital sign (using the [Hunger Vital Sign™](#) screening tool), and recording the results in the patients' Electronic Health Records, facilitates appropriate referrals for immediate assistance from the private food assistance system, and applications for public food assistance.<sup>52</sup>

## Endnotes

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- <sup>3</sup> Wisconsin HOPE Lab college food insecurity publications are available at: <http://wihopelab.com/publications/>. The research team also authored a Medium blog, [Who's Hungry? Making Sense of Campus Food Insecurity Estimates](#).
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