

RESEARCH REPORT

# Hunger Pains

**How Food Insecurity Affects Oral Health**

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# Executive Summary



## Understanding the effects of food insecurity on oral and overall health is important to bridge the oral health equity gap.

Our 2023 State of Oral Health Equity in America (SOHEA) survey estimates approximately 23.7 million adults in the United States (US) experience food insecurity. Survey findings reveal varying demographic variables such as race, age, education, income, homeownership, and geography play a role in food insecurity outcomes. For example, individuals who identify as Black, Hispanic, or “other” report experiencing significantly more food insecurity than white and Asian individuals. Additionally, individuals aged between 18–44 report experiencing significantly more food insecurity than individuals aged 45 and older.

A bidirectional relationship exists between nutrition and oral health. Thus, evidence reveals food insecurity is linked to poorer oral health outcomes. For example, individuals with one or more oral health symptoms report experiencing significantly more food insecurity than those with no oral health symptoms. Additionally, whether one has dental insurance coverage also correlates with food insecurity outcomes, as those without dental insurance report experiencing significantly more food insecurity than those with dental insurance. Given the bidirectional relationship between nutrition and oral health, combating food insecurity and identifying the disparities in food insecurity outcomes is critical in the effort to improve oral and overall health equity.

## Key Takeaways

- An estimated 23.7 million adults, or 9.2% of the US adult population, experience food insecurity.
- Individuals who had their last dental visit more than one year ago have significantly greater odds of experiencing food insecurity than those with a dental visit within the past year.
- Individuals who rate their oral health as fair or poor have significantly greater odds of experiencing food insecurity than those who rate their oral health as excellent, very good, or good.
- Individuals with one or more oral health symptoms report experiencing significantly more food insecurity than those with no oral health symptoms.
- Individuals without dental insurance report experiencing significantly more food insecurity than those with dental insurance.
- Individuals who report they have experienced discrimination in the oral health care setting report experiencing significantly more food insecurity than those who have not experienced discrimination in the oral health care setting.
- Dentists and health care professionals are well equipped to make a difference in the effort to connect adults in the US to food, particularly healthy food options.



# Introduction

[Food insecurity](#) is defined by the United States Department of Agriculture (USDA) as a lack of consistent access to enough food to live a healthy life. Understanding food insecurity's effects on oral and overall health is important for bridging the oral health equity gap. [Nutrition and oral health are bidirectionally associated](#). According to the American Dental Association, our diet has a direct effect on our teeth and the tissues in our mouth. [A lack of nutritious foods can affect nearly every structure in the mouth](#), contributing to enamel loss and bad breath. Proper nutrients, such as vitamins A, C, and D, as well as calcium, fluoride, and protein, are [critical for healthy dentition and oral tissues](#). [High-sugar diets](#) pose a risk of dental caries and can lead to dental erosion and periodontal disease. Additionally, [a poor diet can result in diabetes](#), which is associated with periodontitis and oral candidiasis. Among those experiencing food insecurity, these issues arise more frequently and are unfortunately more likely to be [left untreated](#).

While the [causes of food insecurity](#) are complex, contributing factors include poverty, unemployment, lack of affordable housing, the presence of chronic health conditions, lack of access to health care, and racial discrimination. Food insecurity

can [greatly undermine an individual's or family's quality of life](#). For example, food insecurity can negatively influence a child's growth and development and can force parents and caregivers to make difficult decisions such as choosing between buying food and paying for rent, transportation, or other bills. Additionally, food insecurity can [increase the risk of chronic health conditions](#) such as diabetes, as mentioned above, as well as obesity, heart disease, and mental health disorders.

Living in a food desert is another cause of food insecurity. A [food desert](#) is defined as an area where most individuals live at or below the poverty line and lack access to fresh food sources or grocery stores. Approximately [2.3 million Americans](#) live more than a mile from a supermarket and do not have access to a vehicle — fitting the definition of an urban food desert. Rural food deserts occur where grocery stores with affordable and healthy food options are more than five miles away. Understanding these definitions is important for individuals to recognize when they are located in a food desert. Those in food deserts are often limited to certain food sources, such as convenience stores or fast-food chains. This often results in poor diets with higher fat, sugar, and sodium intake — all of which can lead to health problems, including tooth decay.

# State of Oral Health Equity in America

In CareQuest Institute for Oral Health's 2023 State of Oral Health Equity in America (SOHEA) survey, adult respondents (N=5,240) were asked questions about their ability to access food, as well as their ability to afford healthy food options. The three survey items used to assess food insecurity asked respondents to indicate how often in the last 12 months each of the following statements have been true (often true, sometimes true, or never true): "My household was worried whether our food would run out before we got money to buy more," "The food we bought just didn't last, and we didn't have money to get more," and "My household couldn't afford to eat healthy, balanced meals." About 6% of all respondents (n=320) reported it was often true that

they were worried their food would run out; 6% (n=313) reported it was often true that their food did not last before being able to afford more; and 8% (n=438) reported it was often true that they could not afford to eat healthy, balanced meals. We created an additive scale of all three questions (range 3-9), in which a score of 3 indicated a high level of **food insecurity** and a score of 9 indicated a high level of **food security** (i.e., a lack of food insecurity). As the mean and median of the summed scores was 6, we determined that a score of 5 or below would indicate that a respondent was experiencing food insecurity. Findings derived from this survey confirm that demographics, social determinants of health, and oral hygiene are linked to food insecurity outcomes.

## Who Is Most Likely to Experience Food Insecurity

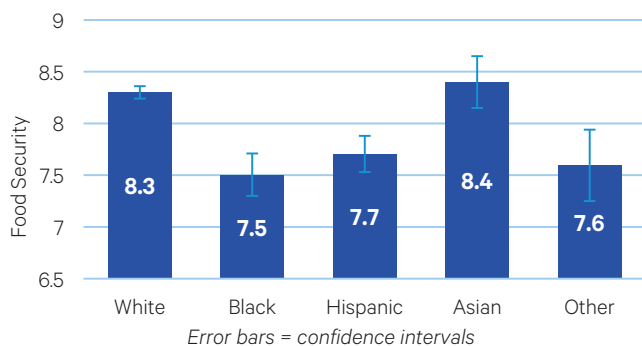
Based on the responses to the survey's food insecurity questions, an estimated 9.2% of adults in the US are experiencing food insecurity. This represents approximately 23.7 million adults in the US — consistent with [2021 estimates from the US Department of Agriculture](#). Our survey found no statistically significant differences between males and females in the prevalence of food insecurity.

### Food Insecurity and Race

Our 2023 survey data revealed that individuals who identified their race/ethnicity as Black, Hispanic, or "other" report experiencing significantly more food insecurity than white and Asian individuals.

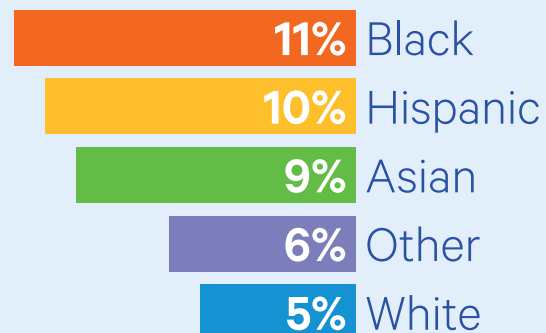
#### Mean Food Security Scores by Race

(Lower Scores = Less Food Security)



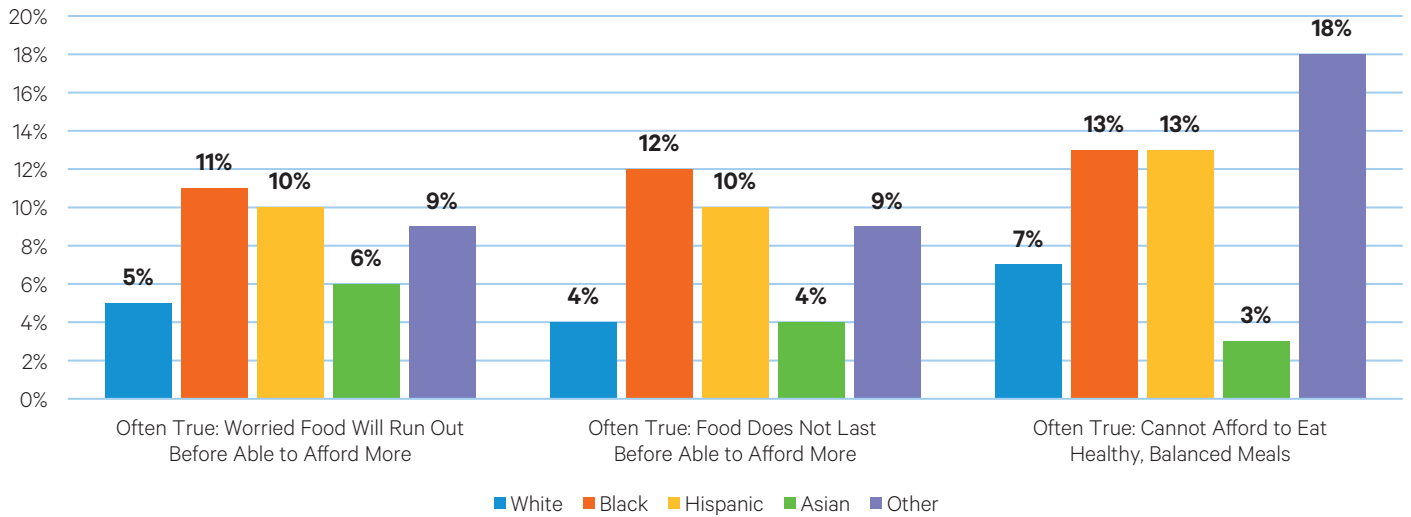
Specifically, 11% of Black participants, 10% of Hispanic participants, and 9% of participants who identified their race/ethnicity as "other" said it was often true that they were

Percent of participants who said it was often true that **they were worried their food would run out before being able to afford more.**



worried their food will run out before being able to afford more, compared with 6% of Asian participants and 5% of white participants. Additionally, 12% of Black participants, 10% of Hispanic participants, and 9% of participants who identify as "other" said it was often true that their food did not last before they were able to afford more, compared with 4% of Asian and 4% of white participants. Lastly, 13% of Black participants, 13% of Hispanic participants, and 18% of participants who identify as "other" said it was often true that they could not afford to eat healthy, balanced meals, compared with 7% of white participants and 3% of Asian participants.

## Race and Food Insecurity



These findings demonstrate that race and ethnicity are associated with food insecurity. While race and ethnicity often intersect with other social and economic determinants of health, evidence [suggests a higher risk of food insecurity](#) among people of color that is independent of other social and economic factors. To address the persistent racial disparities in food insecurity, advocates and researchers must also consider approaches that address structural racism and discrimination broadly.

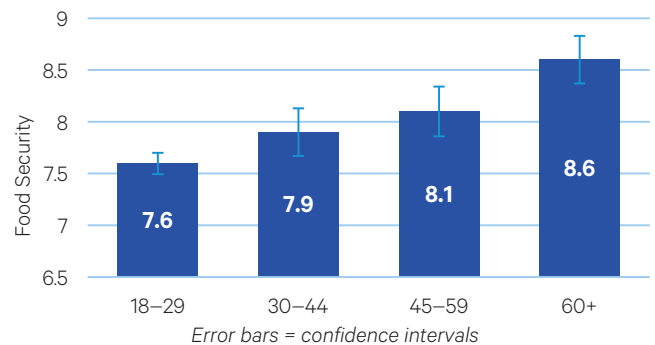
## Food Insecurity and Age

In reference to age, individuals aged 18–29 and 30–44 report experiencing significantly more food insecurity than individuals aged 45–59 and 60 years or older.

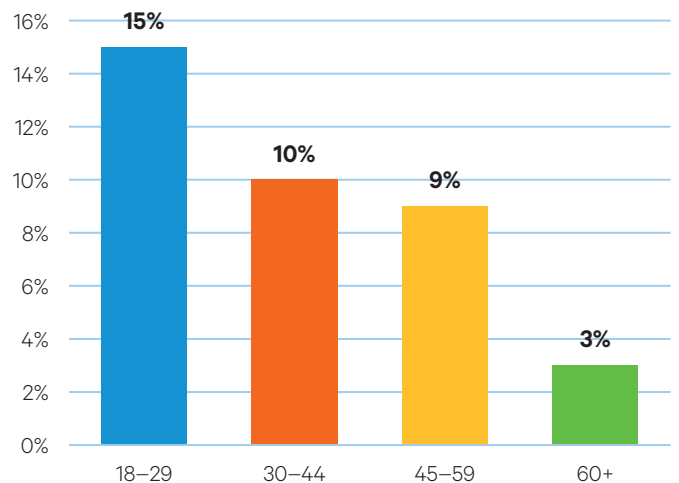
Our study reveals that 15% of respondents aged 18–29, 10% of those aged 30–44, and 9% of those aged 45–59 said it was often true that they could not afford to eat healthy, balanced meals, compared to 3% of participants aged 60 years or older. [A study from the University of California at San Francisco \(UCSF\)](#) reveals that young adults in the US who are food-insecure are slightly more likely to be obese. They are also significantly more likely to suffer from disorders associated with high body mass index, such as diabetes and high blood pressure, as well as obstructive airway diseases like asthma, compared to young adults without food insecurity. These findings indicate a lack of affordable healthy food options may be one of the potential reasons behind the greater risk of obesity, diabetes, and high blood pressure among young adults.

## Mean Food Security Scores by Age

(Lower Scores = Less Food Security)



## Cannot Afford to Eat Healthy, Balanced Meals by Age

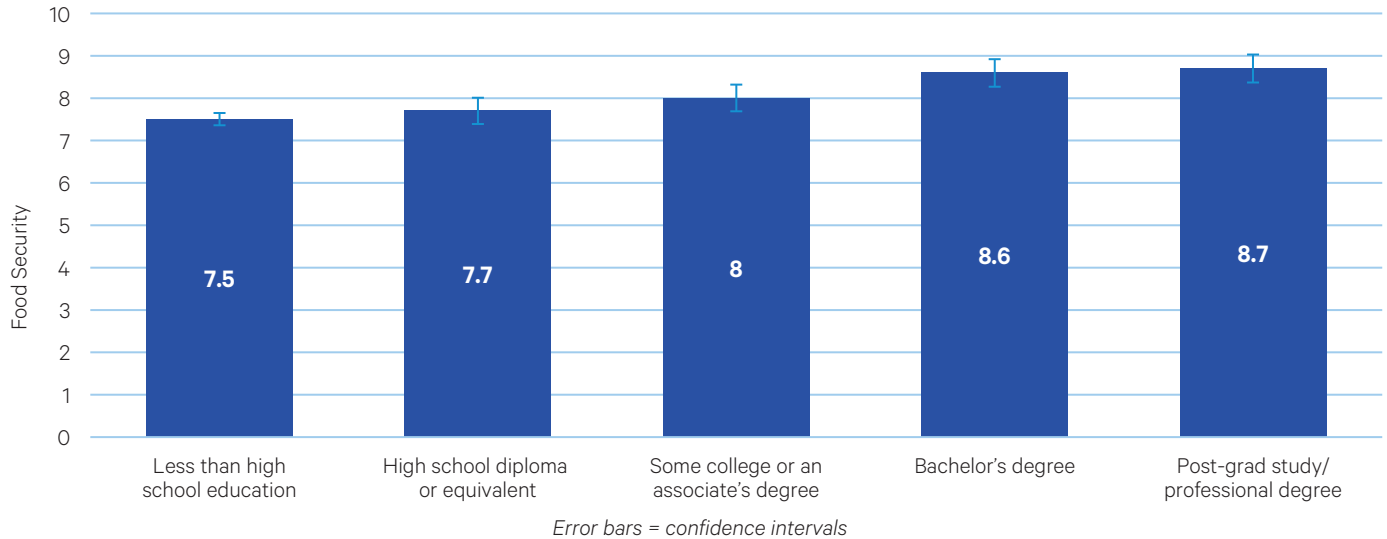


## Connecting Food Insecurity with Income, Education, and Housing

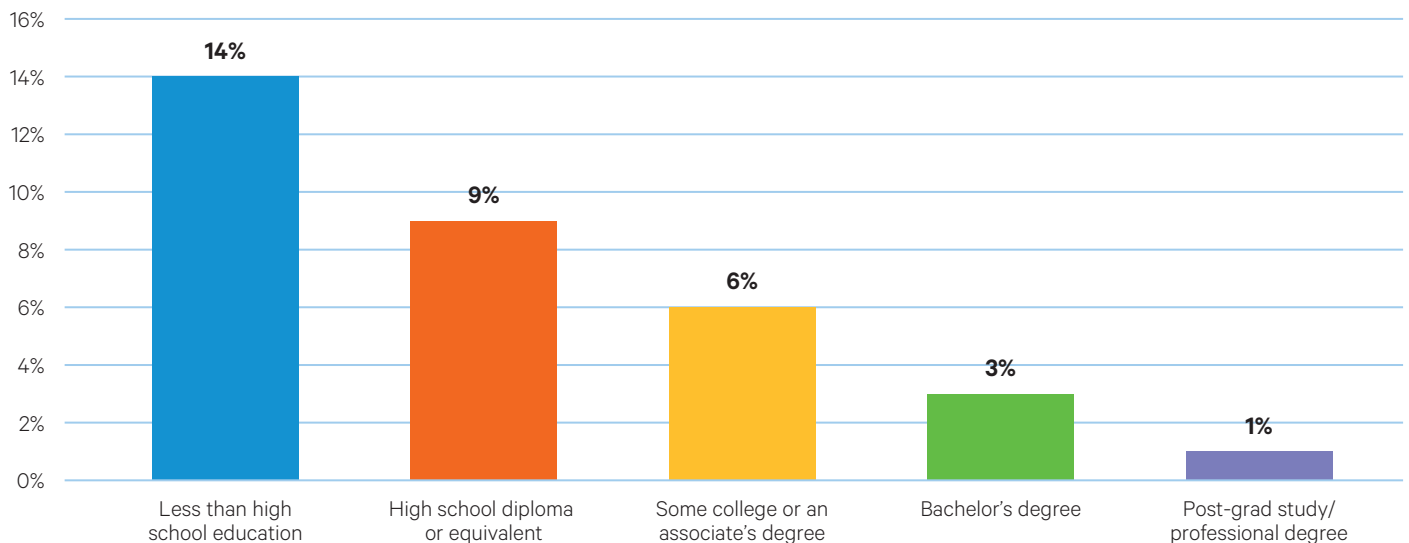
In addition to race and age, education and income level play a role in food insecurity outcomes. Adults with more years of education report less food insecurity.

### Mean Food Security Scores by Education

(Lower Scores = Less Food Security)



### Adults Who Said Food Did Not Last Before They Could Afford to Get More by Education



Our survey reveals that 14% of respondents with less than a high school education, 9% of those with a high school diploma or equivalent, and 6% of those with some college or an associate's degree said it was often true that their food did not last before they could get more. In contrast, only 3% of those with a bachelor's degree and 1% of those with post-grad study or a professional degree said it was often true that their food did not last before they could afford more. In short, fewer years of schooling for adults in a household is [strongly associated](#) with food insecurity. Additionally, studies reveal that food insecurity

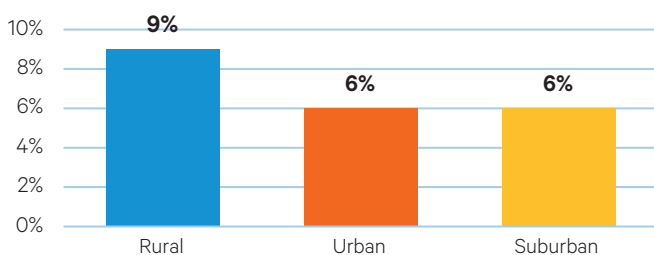
among children is 6.5 times as prevalent for households headed by an adult with less than a high school diploma than households headed by an adult holding at least a four-year college degree. This finding is noteworthy in that food security is particularly important for children — the food they eat or do not eat affects not only their current health but future health and development. Evidence shows that [nutritional deficiencies can directly undermine](#) a student's cognitive capacities. Specifically, [iron deficiency](#) is associated with delays in socioemotional, cognitive, motor, and neurophysical development.

Similar to education level, as income level increases, the proportion of adults reporting food insecurity decreases. Those with an income of less than \$60,000 report experiencing significantly more food insecurity than those with an income of \$60,000 or more. Our survey finds that 15% of adults with an annual income of less than \$30,000 report it is often true that they were worried their food would run out before they were able to afford more; only 1% of those earning \$100,000 or more reported the same concern. In 2020, [28.6% of low-income households were food-insecure](#), in comparison with the national average of 10.5%. Unfortunately, high unemployment rates exist among low-income populations, increasing the difficulty of meeting basic household food needs.

Where one lives, both in reference to housing status and geographic location, plays a role in food insecurity outcomes. Those who occupy a home without paying and those renting a home report experiencing significantly more food insecurity than those who own a home. About 15% of those who occupy a home without paying and 14% of those who rent a home said it was often true that they were worried their food would run out before they were able to afford more, compared with 3% of homeowners. Evidence reveals a bidirectional relation between housing status and food insecurity — families who experience food insecurity are at increased risk of housing instability and vice versa. [The inability to obtain adequate nutritious food and decent, affordable housing](#) has been linked to negative effects on families and individuals, including poor physical and mental health of both adults and children and specifically, adverse developmental outcomes for children.

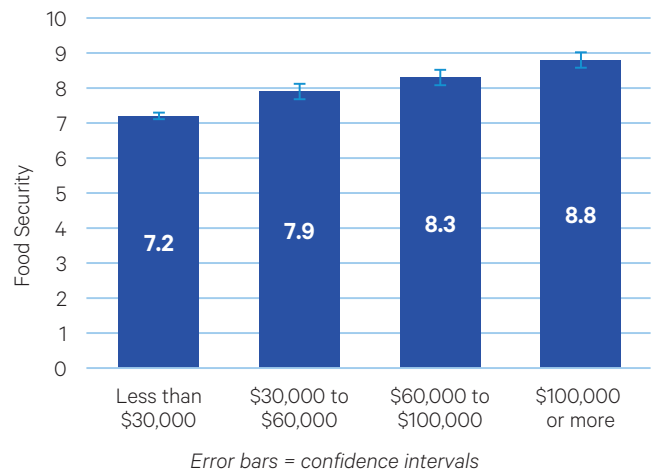
Additionally, those living in rural areas report experiencing significantly more food insecurity than those living in suburban environments. For example, 9% of those living in rural environments said it was often true that they were worried their food would run out before they were able to afford more, compared with 6% living in urban environments and 6% of those in suburban. Rural communities present [unique challenges](#), such as lack of transportation, low-paying jobs, and underemployment, that affect the ability to afford food. Additionally, many rural areas lack food retailers and are therefore [considered food deserts](#) — i.e., areas with limited access to fresh, affordable food.

**Adults Worried Their Food Would Run Out Before They Could Afford to Buy More By Location**



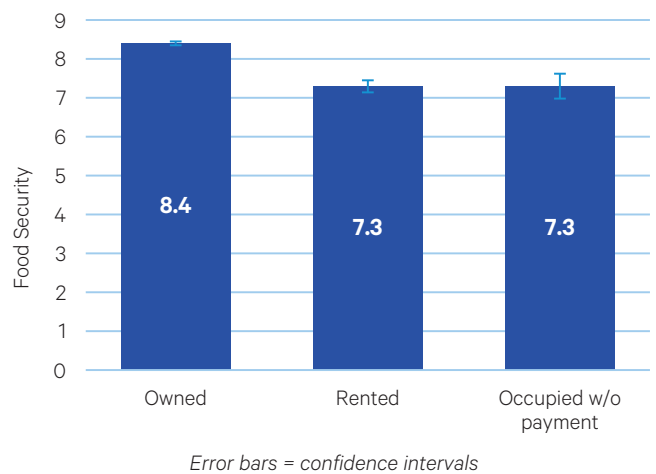
**Mean Food Security Scores by Income**

(Lower Scores = Less Food Security)



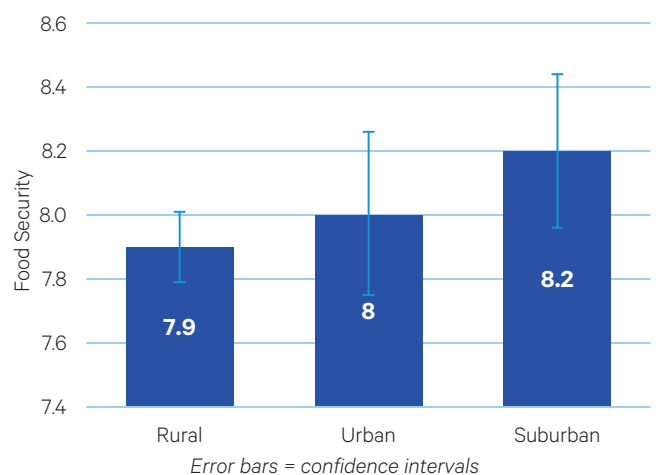
**Mean Food Security Scores by Homeownership**

(Lower Scores = Less Food Security)



**Mean Food Security Scores by Geographic Location**

(Lower Scores = Less Food Security)



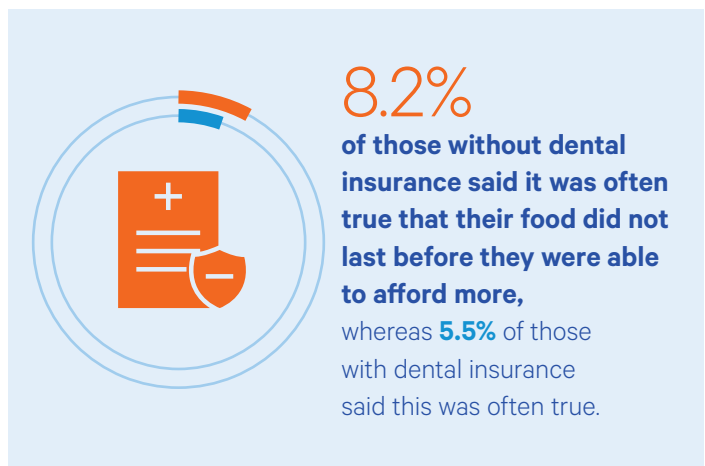
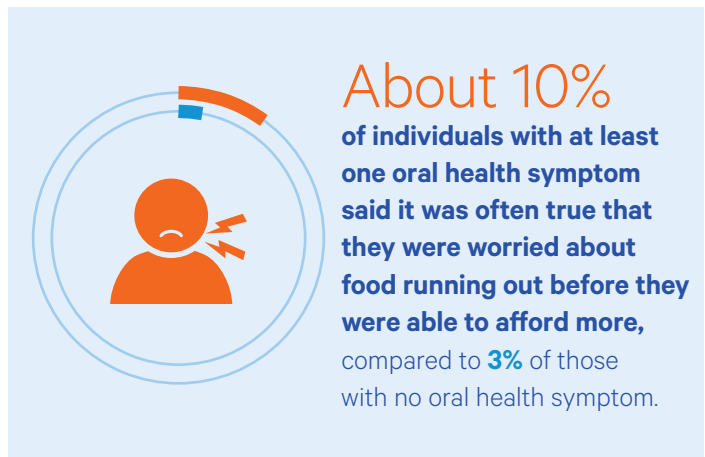


# Food Insecurity and Oral Health

Food insecurity is linked to poorer oral health outcomes. Adults who had their last dental visit more than one year ago have significantly greater odds of experiencing food insecurity than those with a dental visit within the past year. Additionally, those who rate their oral health as fair or poor have significantly greater odds of experiencing food insecurity than those who rate their oral health as excellent, very good, or good. Among those who report fair or poor oral health, 12% report it was often true that they were worried food would run out before they were able to afford more, compared with 4.4% who reported excellent/very good/good oral health. Additionally, 16% of those with self-reported fair or poor oral health said it was often true that they could not afford to eat healthy, balanced meals, compared to 6% of those with self-reported excellent, very good, or good oral health. These findings indicate the relationship between poorer oral health and access to healthy food and food in general.

Moreover, those with one or more oral health symptoms report experiencing significantly more food insecurity than those with no oral health symptoms. Specifically, about 10% of those with at least one oral health symptom said it was often true that they were worried their food would run out before they were able to afford more, compared to 3% of those with no oral health symptoms.

Whether one has dental insurance coverage or not also correlates with food insecurity outcomes. Those without dental insurance report experiencing significantly more food insecurity than those with dental insurance. For example, 8.3% of those without dental insurance said it was often true that they were worried their food will run out before they were able to afford more, whereas 5.7% of those with dental insurance were often worried. Additionally, 8.2% of those without dental insurance said it was often true that their food did not last before they were able to afford more, whereas 5.5% of those with dental insurance said this was often true. Lastly, 12% of those without dental insurance said it was often true that they could not afford to eat healthy, balanced meals, whereas 7.6% of those with dental insurance said this was often true. These findings reiterate the impact of social factors, such as access to healthy and nutritious food options, on oral health outcomes. For example, individuals living with food insecurity are [more likely to develop dental caries](#) than those without food insecurity.



Lastly, those who report they have experienced discrimination in the oral health setting report experiencing significantly more food insecurity than those who have not experienced discrimination in the oral health setting. Almost a quarter of those who report experiencing discrimination (24%) in an oral health setting said it was often true that they were worried their food will run out before they were able to afford more, compared with those who have not experienced discrimination (7%) in an oral health setting. Similarly, about a quarter (24%) of those who report experiencing discrimination in an oral health setting said it was often true that their food did not last before they were able to afford more, compared with 7% of those who have not experienced discrimination in an oral health setting.



# Combat Food Insecurity and Improve Oral and Overall Health

Findings from the 2023 SOHEA survey suggest that an estimated 23.7 million adults in the US, or 9.2%, experience food insecurity. This striking statistic calls attention to the prevalence of food insecurity in the country and the detrimental health consequences that can arise from lack of adequate food access. We are calling on health care professionals, educators, administrators and advocates to help connect adults in the US to food, particularly healthy food options. Dentists and other health care professionals are well equipped to make a difference in this effort:

- Dental and health care professionals can integrate routine questions regarding food intake with all patients and remain aware of available quality outreach programs and resources for food-insecure adults.
- The [screen, educate, adjust, recognize, connect, and help](#) (SEARCH) approach developed by the American Academy of Family Physicians can be used by dentists and other health care professionals to improve the health of patients experiencing food insecurity.

- Clinicians [can address screening-identified food insecurity](#) through provision of transportation supports and linkages to other social services, and collaborate on community initiatives to promote accessibility to healthy foods.
- Connecting patients with food assistance programs (Appendix A) and encouraging patients with food insecurity to utilize food banks is also important.
- Dentists and other health care professionals can do their part in understanding the culture and community constructs that may place an individual at a higher risk of food insecurity. For example, many [American Indian and Alaska Native reservations](#) overlap with food deserts where healthy and affordable foods are inaccessible.

To improve oral and overall health outcomes and advance oral health equity, combating food insecurity is essential.

# Appendix

## Programs

- [Child and Adult Care Food Program](#)
- [Expanded Food and Nutrition Education Program](#)
- [Food distribution programs: governmental, volunteer, and emergency assistance](#)
- [Meals on Wheels America Foundation](#)
- [National School Lunch Program](#) and [School Breakfast Program](#)
- [Senior Farmers Market Nutrition Program](#)
- [Special Supplemental Nutrition Program for Women, Infants and Children](#)
- [Summer Food Service Program](#)
- [Supplemental Nutrition Assistance Program](#)

# Methodology

The State of Oral Health Equity in America survey is a nationally representative survey of consumer attitudes, experiences, and behaviors related to oral health. The study was designed by CareQuest Institute for Oral Health, Inc. Results were collected by NORC at the University of Chicago in January–February 2021, January–February 2022, and January–February 2023 from adults 18 and older on the AmeriSpeak panel. AmeriSpeak is a probability-based panel designed to be representative of the United States (US) household population. Randomly selected US households were sampled using area probability and address-based sampling, with a known, non-zero probability of selection from the NORC National Sample Frame. Sampled households were contacted by US mail, telephone, and field interviewers. In 2023, a sampling unit of 18,521 was used, with a final sample size of 5,240 and a final weighted cumulative response rate of 4.4%. All data presented account for appropriate sample weights. The margin of error for the survey is 1.83%. Statistical analyses completed included crosstabs and chi-square analyses, analyses of variance (ANOVAs), and logistic regression, controlling for age, gender, education, income, use of emergency department for dental care, last dental visit, self-rated oral health, and urbanicity. All results presented are statistically significant at the  $p < 0.05$  unless otherwise noted. While the cross-sectional nature of these data does not allow for causal conclusions to be drawn, future research should focus on examining underlying factors (e.g., stigma, discrimination, other socioeconomic factors) that may help further explain these findings.

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## CareQuest Institute for Oral Health

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