Sixteen million US children (21%) live in households without consistent access to adequate food. After multiple risk factors are considered, children who live in households that are food insecure, even at the lowest levels, are likely to be sick more often, recover from illness more slowly, and be hospitalized more frequently. Lack of adequate healthy food can impair a child’s ability to concentrate and perform well in school and is linked to higher levels of behavioral and emotional problems from preschool through adolescence. Food insecurity can affect children in any community, not only traditionally underserved ones. Pediatricians can play a central role in screening and identifying children at risk for food insecurity and in connecting families with needed community resources. Pediatricians should also advocate for federal and local policies that support access to adequate healthy food for an active and healthy life for all children and their families.
often mistakenly thought to be
immune to this problem.3 Like
poverty, food insecurity is a dynamic,
intensely complex issue; the current
economic recovery has marginally
diminished food insecurity, but levels
remain near historic highs.4 For many
families, seemingly small changes in
income, expenses, or access to federal
or state assistance programs may
instantly reduce the ability to
purchase healthy food and result in
increased vulnerability to food
insecurity. Moreover, families and
children do not only feel the effects of
hunger just as missed or meager
meals; food insecurity manifests itself
in many other biopsychosocial
outcomes, including health,
education, and economic
prosperity.5–12 In fact, more than
30% of families who identified as
food insecure indicated that they had
to choose between paying for food
and paying for medicine or medical
care.13 Combined, these negative
effects can contribute to a less
competitive workforce for the nation
and higher health care costs borne by
the US government and employers.

Food insecurity is associated with
many factors in addition to poverty.
Unemployment and
underemployment are also strongly
associated with food insecurity.2
Certain populations, such as children
in immigrant families14 and large
families, families headed by single
women, families with less education,
and families experiencing parental
separation or divorce are at greater
risk.2,3 Families who are food
insecure usually have at least 1
parent who is working or has worked
for at least 6 months of the previous
year. Working poor families and
single-parent families are at
particular risk of food insecurity. In
low-income households with children
and food insecurity, 84% participated
in at least 1 federal food assistance
program, such as the Supplemental
Nutrition Assistance Program (SNAP)
or free or reduced-price school meals
in 2010 to 2011.2 Thus, 16% of
low-income, food-insecure households
with children do not receive federal
supports. Federal benefits can
attenuate the severity of food
insecurity but might not eliminate it,
particularly for children and in regions
with higher food costs.15,16

**EFFECTS OF FOOD INSECURITY ON
CHILD HEALTH AND DEVELOPMENTAL
OUTCOMES**

The inability to consistently provide
food creates stress in families,
contributing to depression, anxiety,
and toxic stress, which make optimal
parenting difficult regardless of social
class.12,17 Most parents strive to
protect their children as much as
possible from the physiologic
sensation of hunger and, ultimately,
nutritional deprivation. Studies on the
effects of food insecurity in
households demonstrate low dietary
quality in adults but slightly better
quality for the household’s children,18
and qualitative studies reveal how
parents strategically limit their own
intake in an effort to spare their
children.13

There are multiple adverse health
outcomes strongly correlated with
food insecurity. Children 36 months
old or younger who live in food-
insecure households have poorer
overall health and more
hospitalizations than do children who
live in food-secure households.7
Children with food insecurity are
more likely to be iron deficient, as are
adolescents with food insecurity.8,9
Food insecurity also is associated
with lower bone density in
preadolescent boys.19

Poverty is associated closely with the
development of obesity. Although not
directly linked to obesity, food
insecurity disproportionately
threatens certain populations at
highest risk of obesity, including
those from racial and ethnic minority
groups and the poor.20 Children in
food-insecure households generally
have limited access to high-quality
food. Environmental realities in
low-income neighborhoods, including
decreased presence of full-service
grocery stores and increased
availability of fast-food restaurants
and energy-dense, nutrient-poor
food,22 may create barriers for low-
income families trying to adopt
healthy behaviors. Adequate food
may be available only intermittently,
leading to unhealthy eating patterns
and increased stress that may make
weight loss difficult and facilitate
the development of obesity.20

Households with smokers are more likely to be
food insecure, perhaps because of the
diversion of money to tobacco in
these households.23 Among children of all ages, food
insecurity is linked with lower
neurotransmitter perturbations from poor diet and the
sensation of hunger and in part from
children’s emotional reactions to food
insecurity itself and its social
meaning.

School-aged children are aware of
and distressed by food insecurity in
their household. They often try to
help manage food resources in the
family, either by supporting the
efforts of their parents or by initiating their own strategies for reducing food intake (including choosing to eat less than they want). Parents may be unaware of their child’s understanding of the family’s plight and may believe their child is unaware of the family’s lack of food.\textsuperscript{25,26} Adolescents describe food insecurity in terms of quantity (eating less than usual, eating more or faster when food is available), quality (having only a few low-cost foods), affective states (worry, anxiety, or sadness about the family’s food, shame or fear of being labeled “poor,” feelings of having no choice or of adults trying to shield them from food insecurity), and social dynamics (using social networks to get food or being socially excluded).\textsuperscript{27} As with many pediatric conditions, the health effects of food insecurity and associated malnutrition may persist beyond early life into adulthood. A substantial body of literature also links early childhood malnutrition to adult disease, including diabetes, hyperlipidemia, and cardiovascular disease.\textsuperscript{5,6} Studies of the outcomes of food insecurity in childhood suggest that it may be an example of ecologic context modifying individual physiologic function. Overall, the effects of food insecurity on the physical, mental, and emotional health of children and families are additive to the effects of low income alone.

**PROGRAMS TO MITIGATE FOOD INSECURITY**

Given the high prevalence of food insecurity among US families with children and given its potential health effects, pediatricians need to be aware of resources that can mitigate food insecurity and know how to refer eligible families. These programs serve as critical supports for the physical and mental health and academic competence of children (Table 1).

**WIC**

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), first established in the early 1970s, is a discretionary federal program for which Congress must appropriate funding each year. Its mission is “to safeguard the health of low-income women, infants and children up to age 5 who are at nutritional risk by providing nutritious foods to supplement diets, information on healthy eating, and referrals to healthcare.” WIC participants are pregnant women, breastfeeding women (up to the child’s first birthday), nonbreastfeeding postpartum women (up to 6 months postpartum), infants (up to their first birthday), and children up to their fifth birthday. Prenatal WIC participation has been consistently associated with higher birth weight and longer gestation, particularly among mothers at highest risk.\textsuperscript{28} Participation in WIC also is associated with more iron-dense diets and increased food and vegetable intake in preschoolers.\textsuperscript{28} WIC serves 53% of all infants younger than 1 year old in the United States. Most states provide vouchers or electronic benefits transfer cards for use in the purchase of eligible products and for nutrition counseling and connection to health and social services. In most states, WIC also has an associated program, the WIC Farmer’s Market Nutrition Program, which gives additional vouchers for the purchase of fresh, locally grown produce at farmers’ markets and roadside stands.

WIC is an effective evidence-based intervention for improving the health of low-income women and their children. WIC has a strong commitment to increase breastfeeding among its participants, providing counseling, peer support, enhanced food packages, and access to breast pumps to support the initiation and continuation of breastfeeding. WIC participation has been linked to better infant health and lower rates of overweight and underweight status among infants.\textsuperscript{29}

**SNAP**

SNAP is an entitlement program that provides nutrition assistance to low-income families and individuals. SNAP, piloted as the Food Stamp

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**TABLE 1 Web Sites With Nutritional Information on Programs to Mitigate Food Insecurity**

<table>
<thead>
<tr>
<th>Program</th>
<th>Information</th>
<th>Income Eligibility</th>
<th>Web Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIC</td>
<td>WIC food packages</td>
<td>(\geq 185)% of federal poverty level\textsuperscript{a}</td>
<td><a href="http://www.fns.usda.gov/wic/final-rule-revisions-wic-food-packages">http://www.fns.usda.gov/wic/final-rule-revisions-wic-food-packages</a></td>
</tr>
<tr>
<td>SNAP</td>
<td>Eligible food items</td>
<td>(&lt; 130)% of federal poverty level\textsuperscript{a}</td>
<td><a href="http://www.fns.usda.gov/snap/eligible-food-items">http://www.fns.usda.gov/snap/eligible-food-items</a></td>
</tr>
<tr>
<td>National School Lunch</td>
<td>Nutritional standards for school lunches and breakfasts</td>
<td>Reduced-cost meals: (\geq 185)% of federal poverty level\textsuperscript{a}, free meals: (\geq 130)% of federal poverty level\textsuperscript{a}</td>
<td><a href="http://www.fns.usda.gov/school-meals/nutrition-standards-school-meals">http://www.fns.usda.gov/school-meals/nutrition-standards-school-meals</a></td>
</tr>
<tr>
<td>and National School Breakfast Programs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food Programs</td>
<td>Finding summer meal programs in the community and meal content</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summer Food Service Program</td>
<td></td>
<td></td>
<td><a href="http://www.fns.usda.gov/sfsp/summer-food-service-program-sfsp">http://www.fns.usda.gov/sfsp/summer-food-service-program-sfsp</a></td>
</tr>
</tbody>
</table>

\textsuperscript{a} Available at [http://familiesusa.org/product/federal-poverty-guidelines](http://familiesusa.org/product/federal-poverty-guidelines).
Program in 1961 and confirmed with the Food Stamp Act in 1964 (Pub L No. 88-525), is the largest food and nutrition program of the USDA. It serves 47 million Americans, 72% of whom are in families with children. Like WIC, it is a federal program, administered through state agencies. Although SNAP application and eligibility rules can be complex, the program has been shown to be effective in reducing food insecurity and negative health and developmental outcomes among recipients. SNAP provides monthly benefits (usually via electronic benefit transfer cards) to purchase eligible food items at retailers participating in the program. SNAP allotment is calculated as 30% of the net monthly household income, capped by number of members of the household (eg, the maximum monthly allotment for a family of 4 is currently $649, or a maximum of $1.80 per person per meal). A pilot program to increase monthly family SNAP allotments by $60 was successful in reducing very low food security among children by 30%. A subsequent pilot program found that a $30 per month allotment reduced very low food security among children as well as the higher benefit but produced smaller reductions in food insecurity among adults and the full household.

**National School Lunch and National School Breakfast Programs**

The National School Lunch Program was established in 1946, although the USDA had provided funds and food to schools for many years before that. More than 32 million children annually are provided with a nutritionally balanced, low-cost or free lunch in over 100 000 public and nonprofit private schools and residential child care institutions. The School Breakfast Program was started as a pilot program in 1966 and was made permanent in 1975. It provides 13 million children each year with a free, nutritionally balanced breakfast in more than 89 000 schools. In 1998, Congress expanded the National School Lunch Program to include coverage for snacks served to children in after-school educational and enrichment programs. In 2010, the Healthy, Hunger-Free Kids Act (Pub L No. 111-296) established the Community Eligibility Provision, which allows schools in areas of high poverty to offer both breakfast and lunch at no charge to all students while eliminating the stigmatizing school meal application process, which burdens both parents and school personnel. Notable savings in administrative costs also have been attributed to the Community Eligibility Provision.

The Healthy, Hunger-Free Kids Act required the USDA to update the meal pattern and nutrition standards for school meals and foods sold in schools during school hours based on the latest Dietary Guidelines for Americans. Some of the recent positive changes to the meal patterns included more whole grains offered, 0 grams of trans fat per portion, appropriate calories by age, more fruit offered, and reduction of sodium content. Although all meals must meet federal meal requirements, local food authorities make the decisions about which specific foods to serve and how they are prepared. Implementation of these changes has increased fruit consumption and decreased wasted food among students participating in the National School Lunch Program.

**Child and Adult Care Food Program**

The Child and Adult Care Food Program, administered by the USDA, provides cash assistance to states to assist child and adult care institutions and family or group child care homes in providing nutritious foods that contribute to the wellness, healthy growth, and development of children. In fiscal year 2013, the program served more than 3 million children. In the Child and Adult Care Food Program, the USDA establishes meal patterns with minimum food component and quantity requirements; these requirements are currently under revision to make them more consistent with the Dietary Guidelines for Americans.

**Summer Food Service Program**

The Summer Food Service Program (SFSP) began as a pilot program, the Special Food Service Program, in 1968, serving children during the summer and in child care. In 1975, the programs split and the SFSP came to stand on its own. The SFSP ensures that low-income children continue to receive nutritious meals when school is not in session and sustains children's physical and social development, helping them return to school ready to learn. Children 18 years old and younger can receive free meals and snacks at approved community sites, which may include health care institutions.

The SFSP serves approximately 2 million children each summer. Despite its importance, participation in SFSP is far below the number of children eligible for the program and also below the number participating in school meals during the school year. In part, this reflects the challenge of reaching some populations of children during the summer, particularly children in rural areas, with dangerous levels of summer heat, or very urban areas where transportation or safety may be a challenge. Within communities, advocacy by pediatricians is especially important during the summer, when school nutrition programs may be insufficient or inaccessible for many children and families.

**Food Pantries and Soup Kitchens**

Food pantries and soup kitchens are often available in local areas and serve as another vital piece of the safety net for children and families struggling with food insecurity. These resources usually are funded by a combination of local philanthropic...
organizations, faith-based communities, and government resources. Knowing what is available in the community can help support improved nutrition and reduce food insecurity among families served by pediatricians. However, many charitable food providers are not consistently able to provide healthful food in general, nutritional items appropriate for infants and toddlers, or amounts adequate to protect families from food insecurity for more than a few days. Realizing the limited capacity of existing community resources is essential to tailoring referrals for families facing food insecurity.

**SCREENING TOOLS FOR PEDIATRICIANS**

Pediatricians can better assess the stress of food insecurity in individual families by incorporating a screening tool into their practice. The USDA uses an 18-item measure to assess food insecurity with the Household Food Security Scale, which is the standard tool for research. A more practical in-office tool is the 2-item screen designed by Hager et al (Table 2), which uses a subset of 2 questions from the Household Food Security Scale. Affirmative answers to either of these 2 questions identified food insecurity with a sensitivity of 97% and a specificity of 83% (as compared with the full 18-item Household Food Security Scale). These screens are designed to identify food insecurity in a family as a whole. In some cases, a single child in a family may be more or less affected by food insecurity that the others; this difference will not be detected by these screens. Some resources to address food insecurity when discovered at a clinic visit are listed in Table 3.

**ADVOCACY AND EDUCATION**

At the federal level, pediatricians have historically advocated in support of expanded funding for and access to key nutritional assistance programs such as WIC, SNAP, and the school nutrition programs. It is critical to maintain strong, evidence-based nutrition guidelines for all public programs that support childhood nutrition, including school lunches. Because Congress is scheduled to reauthorize many of the aforementioned child nutrition programs in the near future, attempts to weaken nutrition standards in school meals and other children’s programs are anticipated. Advocacy by the American Academy of Pediatrics is crucial to ensure that nutrition standards remain in place and that access to effective assistance programs is expanded rather than reduced.

Advocacy efforts at the federal, state, and community levels must incorporate both obesity prevention and expanded nutritional access at the federal, state, and local levels to promote children’s health. Engagement of community residents in understanding local context and establishment of interdisciplinary collaboration are key elements of advocacy efforts that address food insecurity in communities.

Medical education offers a natural opportunity to teach students and residents to screen for food insecurity regularly as a part of pediatric care. National initiatives such as the Community Pediatrics Training Initiative increasingly emphasize community- and population-based objectives throughout residency training, and evidence suggests that formal training in community health is associated with community child health involvement among pediatricians. The following approaches enhance training about food insecurity within community pediatrics: engaging on-site social and legal resources to emphasize screening and management of food insecurity; using quality improvement methods to improve screening and evaluate efforts, including obtaining data on the impact of community-based initiatives such as farmers’ markets and food pantries on food insecurity; establishing curriculum-based community site visits that expose medical students and residents to successful federal programs, such as WIC; and encouraging medical students and residents to participate in local, regional, and federal advocacy efforts. More data are needed to elucidate how curriculum

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**TABLE 2 Screening for Food Insecurity**

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Within the past 12 mo, we worried whether our food would run out before we got money to buy more. (Yes or No)</td>
<td></td>
</tr>
<tr>
<td>2. Within the past 12 mo, the food we bought just didn’t last and we didn’t have money to get more. (Yes or No)</td>
<td></td>
</tr>
</tbody>
</table>

Adapted from Hager et al. Although an affirmative response to both questions increases the likelihood of food insecurity existing in the household, an affirmative response to only 1 question is often an indication of food insecurity and should prompt additional questioning.

**TABLE 3 Resources for Pediatricians Dealing With Food-Insecure Families**

<table>
<thead>
<tr>
<th>Program</th>
<th>Web Site</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-1-1</td>
<td>211.org, then access by ZIP code or city</td>
<td>Access to information on school lunch programs, summer food programs for children, and other government-sponsored programs (eg, SNAP, WIC) as well as soup kitchens and community gardens</td>
</tr>
<tr>
<td>Healthy Food Bank Hub</td>
<td>Healthyfoodbankhub.feedingamerica.org</td>
<td>Includes a food bank locator and other tools and resources for food-insecure households</td>
</tr>
<tr>
<td>MyPlate</td>
<td><a href="http://www.choosemyplate.gov/budget/downloads/MeetingYourMyPlateGoalsOnABudget.pdf">http://www.choosemyplate.gov/budget/downloads/MeetingYourMyPlateGoalsOnABudget.pdf</a></td>
<td>Recipes and tip sheets for low-cost healthy eating</td>
</tr>
</tbody>
</table>
elements can most effectively teach trainees to assess food insecurity and advocate for programs that mitigate food insecurity.

RECOMMENDATIONS

The American Academy of Pediatrics recommends that pediatricians engage in efforts to mitigate food insecurity at the practice level and beyond. The following recommendations offer practice-level strategies for pediatricians.

- A 2-question validated screening tool (Table 2) is recommended for pediatricians screening for food insecurity at scheduled health maintenance visits or sooner, if indicated.

- It is beneficial for pediatricians to familiarize themselves with community resources so that when children screen positively for food insecurity, referral mechanisms to WIC, SNAP, school nutrition programs, local food pantries, summer and child care feeding programs, and other relevant resources are accessible and expedient. This information is particularly important for new mothers. New mothers in food-insecure households can be connected to WIC and other community resources during pregnancy and early in the postpartum period to encourage breastfeeding.

- When advocating for programs targeted at families with food insecurity, it is important that pediatricians be aware of the nutritional content of food offered in supplemental programs (Table 3).

- In the office setting, pediatricians who are aware of the factors that may increase vulnerability of food-insecure populations to obesity and factors that disproportionately burden food-insecure households may address these issues at clinic visits. These factors include lack of access to healthy and affordable foods, cost of healthy food (and the low cost of many unhealthy foods), media messaging that promotes nonnutritious foods and beverages, and the role of stress in decision-making related to food.

At a system level, pediatricians can advocate for the needs of children and families facing food insecurity.

- Food insecurity, including screening tools and community-specific resource guides, can be incorporated into education of medical students and residents to prepare future generations of physicians to universally screen for and address food insecurity.

- Pediatricians can advocate for protecting and increasing access to and funding for SNAP, WIC, school nutrition programs, and summer feeding programs at the local, state, and national levels. Advocacy must also include keeping the food offered in these programs high in nutrient quality and based on sound nutritional science. Pediatricians can promote access to nutritious foods in out-of-school settings, particularly in child care, in preschool, and during the summer. Advocacy for “express lane eligibility” (adjunctive eligibility), which permits a state to use findings from enrollment in 1 program to enroll the family in other programs for which they qualify, also will increase access to food and nutrition assistance programs.

- Pediatricians can strongly support interdisciplinary research that elucidates the relationship between stress, food insecurity, and adverse health consequences; the barriers to breastfeeding for women under stress in food-insecure households; and evidence-based strategies that optimize access to high-quality, nutritious food for families facing food insecurity.

CONCLUSIONS

Food insecurity is a complex issue that presents profound challenges for children and families. Pediatricians play an essential role in recognition of food insecurity, practice-level intervention, and advocacy to mitigate food insecurity within our communities.

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ABBREVIATIONS

SFSP: Summer Food Service Program
SNAP: Supplemental Nutrition Assistance Program
USDA: US Department of Agriculture
WIC: Special Supplemental Nutrition Program for Women, Infants, and Children

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17. Shonkoff JP, Garner AS; Committee on Psychosocial Aspects of Child and Family Health; Committee on Early Childhood, Adoption, and Dependent Care; Section on Developmental and Behavioral Pediatrics. The lifelong effects of early childhood adversity and toxic stress. Pediatrics. 2012;129(1). Available at: www.pediatrics.org/cgi/content/full/129/1/e232


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