HungerCare Coalition – Scan of Relevant Literature
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Framing Food Insecurity
Food security means assured access to sufficient food for a healthy and active life. Food security includes at a minimum the ready availability of nutritionally adequate and safe foods and the assured ability to acquire acceptable foods in socially acceptable ways. Food Security in the U.S. is measured by the USDA utilizing an 18-question survey. Each question specifies the period (last 12 months) and specifies lack of resources for the behavior or experience.

U.S. prevalence of food insecurity is greater in households with:

- Children (19.5%)
- Children under age 6 (20.9%)
- Children headed by a single women (34.4%)
- Children headed by a single man (23.1%)
- Black, non-Hispanic households (26.1%)
- Hispanic households (23.7%)
- Low-income households with income below 185% of federal poverty level (34.8%)

USDA Economic Research Service Food Security in the U.S.

Moving Upstream – Addressing the Social Determinants of Health
Health inequities are avoidable inequalities in health between groups of people. Social and economic conditions and their effects on people's lives determine their risk of illness and the actions taken to prevent them from becoming ill or in treating illness when it occurs (WHO).
These social and economic conditions that influence health are known as the social determinants of health – where we are born, grow, live, learn, work, and age. The County Health Rankings Framework estimates that approximately 50% of health factors are attributed the social determinants of health. Given that health is transmitted by social factors across generations, to make the greatest impact on population health, we need to move upstream to close the gap on inequities and address the root causes of health.

Figure 11. Health is transmitted by social factors across lifetimes and generations
Prepared for the Robert Wood Johnson Foundation Commission to Build a Healthier America by the Center on Social Disparities in Health, University of California San Francisco

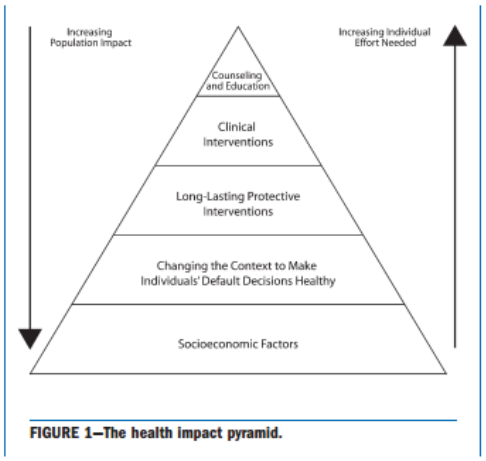
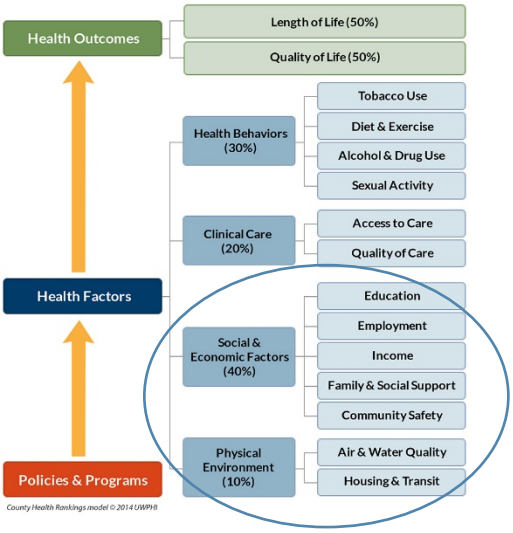


FIGURE 1—The health impact pyramid.



Key citations:

Braveman, Paula A., Susan A. Egerter, and Robin E. Mockenhaupt. "Broadening the Focus The Need to Address the Social Determinants of Health." *American Journal of Preventive Medicine* 40, no. 1 (January 2011): S4–18.

Braveman, Paula, Tabashir Sadegh-Nobari, and Susan Egerter. "Early Childhood Experiences: Laying the Foundation for Health across a Lifetime," 2008. https://folio.iupui.edu/handle/10244/613.

Frieden, Thomas R. "A Framework for Public Health Action: The Health Impact Pyramid." *American Journal of Public Health* 100, no. 4 (April 2010): 590–95.

Effects of Food Insecurity on Child Health

Food insecurity in households with children has been associated with a number of negative effects on child's health:

Obesity

Several recent review studies analyzed associations between food insecurity and child weight status, finding inconclusive evidence of association. Important mediators of this relationship may be gender, maternal weight status, stressors, and federal food program participation.

Eisenmann, J. C., C. Gundersen, B. J. Lohman, S. Garasky, and S. D. Stewart. "Is Food Insecurity Related to Overweight and Obesity in Children and Adolescents? A Summary of Studies, 1995–2009." *Obesity Reviews* 12, no. 5 (May 1, 2011): e73–e83.

Franklin, Brandi, Ashley Jones, Dejuan Love, Stephane Puckett, Justin Macklin, and Shelley White-Means. "Exploring Mediators of Food Insecurity and Obesity: A Review of Recent Literature." *Journal of Community Health* 37, no. 1 (February 2012): 253–64.

Larson, Nicole I., and Mary T. Story. "Food Insecurity and Weight Status Among U.S. Children and Families." *American Journal of Preventive Medicine* 40, no. 2 (February 2011): 166–73.

Select findings of individual studies:

- Children in food insecure households had greater risk for overweight BMI for 12-17 y/o, girls, white, and in households with income <FPL. NHANES 99-02 (Casey et al., 2006)
- Among 3-10 y/o, food insecurity and maternal stressors significantly linked to probability of being overweight. No association from 11-17 y/o. NHANES 99-02 (Gunderson et al., 2008)
- Food insecurity indirectly influenced 2 y/o overweight through parenting practices and infant feeding (Bronte-Tinkew et al, 2007)
- No associations found (Bhargava et al., 2008; Bhattacharya, et al., 2004; Feinberg., 2008; Gunderson et al., 2008; Gunderson et al., 2009; Kaiser et al., 2002; Martin et al., 2007; Rose et al., 2006)

Relevant citations:

Bhargava, Alok, Dean Jolliffe, and Larry L. Howard. "Socio-Economic, Behavioural and Environmental Factors Predicted Body Weights and Household Food Insecurity Scores in the Early Childhood Longitudinal Study-Kindergarten." *British Journal of Nutrition* 100, no. 02 (2008): 438–44.

Bhattacharya, Jayanta, Janet Currie, and Steven Haider. "Poverty, Food Insecurity, and Nutritional Outcomes in Children and Adults." *Journal of Health Economics* 23, no. 4 (July 2004): 839–62.

Bronte-Tinkew, Jacinta, Martha Zaslow, Randolph Capps, Allison Horowitz, and Michelle McNamara. "Food Insecurity Works through Depression, Parenting, and Infant Feeding to Influence Overweight and Health in Toddlers." *The Journal of Nutrition* 137, no. 9 (September 1, 2007): 2160–65.

Casey, P. H., P. M. Simpson, J. M. Gossett, M. L. Bogle, C. M. Champagne, C. Connell, D. Harsha, et al. "The Association of Child and Household Food Insecurity With Childhood Overweight Status." *PEDIATRICS* 118, no. 5 (November 1, 2006): e1406–e1413.

Gundersen, C., B. J. Lohman, S. Garasky, S. Stewart, and J. Eisenmann. "Food Security, Maternal Stressors, and Overweight Among Low-Income US Children: Results From the National Health and Nutrition Examination Survey (1999-2002)." *PEDIATRICS* 122, no. 3 (September 1, 2008): e529–e540.

Gundersen, Craig, Steven Garasky, and Brenda J. Lohman. "Food Insecurity Is Not Associated with Childhood Obesity as Assessed Using Multiple Measures of Obesity." *The Journal of Nutrition* 139, no. 6 (June 1, 2009): 1173–78.

KAISER, LUCIA L., CATHI L. LAMP, MARGARET C. JOHNS, JEANETTE M. SUTHERLIN, JANICE O. HARWOOD, and HUGO R. MELGAR-QUIÑONEZ. "Food Security and Nutritional Outcomes of Preschool-Age Mexican-American Children." *Journal of the American Dietetic Association* 102, no. 7 (July 2002): 924–29.

Kohn, M. J., J. F. Bell, H. M. G. Grow, and G. Chan. "Food Insecurity, Food Assistance and Weight Status in US Youth: New Evidence from NHANES 2007–08." *Pediatric Obesity* 9, no. 2 (April 1, 2014): 155–66.

Lohman, Brenda J., Susan Stewart, Craig Gundersen, Steven Garasky, and Joey C. Eisenmann. "Adolescent Overweight and Obesity: Links to Food Insecurity and Individual, Maternal, and Family Stressors." *Journal of Adolescent Health* 45, no. 3 (September 2009): 230–37.

Martin, Katie S., and Ann M. Ferris. "Food Insecurity and Gender Are Risk Factors for Obesity." *Journal of Nutrition Education and Behavior* 39, no. 1 (January 1, 2007): 31–36.

Metallinos-Katsaras, Elizabeth, Aviva Must, and Kathleen Gorman. "A Longitudinal Study of Food Insecurity on Obesity in Preschool Children." *Journal of the Academy of Nutrition and Dietetics* 112, no. 12 (December 2012): 1949–58.

Metallinos-Katsaras, Elizabeth, Bettylou Sherry, and Jan Kallio. "Food Insecurity Is Associated with Overweight in Children Younger than 5 Years of Age." *Journal of the American Dietetic Association* 109, no. 10 (October 2009): 1790–94.

Rose, D. "Household Food Insecurity and Overweight Status in Young School Children: Results From the Early Childhood Longitudinal Study." *PEDIATRICS* 117, no. 2 (February 1, 2006): 464–73.

The Food Research Action Center has conducted an extensive review of the linkages of food insecurity, poverty, and obesity. Read more at: http://frac.org/initiatives/hunger-and-obesity/are-hunger-and-obesity-related/

Asthma

There is limited research to study the relationship between food insecurity in households with children to asthma – the one cited study was conducted in Brazil. A more popular area of research, and yet limited, appears to be looking at the effect on asthma as a result of nutrient deficiencies (a possible health outcome of food insecurity), in particular, Vitamin D. The broader context around asthma morbidity as it relates to food insecurity is likely tied to other shared risk factors such as socioeconomic status, and race/ethnicity, which may in turn influence where people live, learn, work and play.

Relevant citations:

Ribeiro-Silva, Rita de Cássia, Ana Marlúcia Oliveira-Assis, Samuel Badaró Junqueira, Rosemeire Leovigildo Fiaccone, Sandra Maria Chaves dos Santos, Maurício Lima Barreto, Elizabete de Jesus Pinto, Luce Alves da Silva, Laura Cunha Rodrigues, and Neuza Maria Alcantara-Neves. "Food and Nutrition Insecurity: A Marker of Vulnerability to Asthma Symptoms." *Public Health Nutrition* 17, no. 01 (January 2014): 14–19.

Wright, Rosalind J., and S.V. Subramanian. "ADvancing a Multilevel Framework for Epidemiologic Research on Asthma Disparities*." *Chest* 132, no. 5_suppl (November 1, 2007): 757S – 769S.

Allan, Keith, and Graham Devereux. "Diet and Asthma: Nutrition Implications from Prevention to Treatment." *Journal of the American Dietetic Association* 111, no. 2 (February 1, 2011): 258–68.

Hendrickson, Marissa A., Mary Ann O'Riordan, Joyce C. Arpilleda, and Amy M. Heneghan. "Effects of Food Insecurity on Asthma Outcomes in the Pediatric Emergency Department." *Pediatric Emergency Care* 26, no. 11 (November 2010): 823–29.

Mental Health

Food insecurity in households with children is associated with mental health outcomes in children. Associations between child hunger and mental health include increased reports of anxiety/depression, higher levels of internalizing behavior problems, and hyperactivity/inattention. Some studies have also found increased risk for thoughts of death (dysthymia) and suicide attempts among food insufficient adolescents.

Relevant citations:

Alaimo, Katherine, Christine M. Olson, and Edward A. Frongillo. "Family Food Insufficiency, but Not Low Family Income, Is Positively Associated with Dysthymia and Suicide Symptoms in Adolescents." *The Journal of Nutrition* 132, no. 4 (April 1, 2002): 719–25.

McIntyre, Lynn, Jeanne V. A. Williams, Dina H. Lavorato, and Scott Patten. "Depression and Suicide Ideation in Late Adolescence and Early Adulthood Are an Outcome of Child Hunger." *Journal of Affective Disorders* 150, no. 1 (August 15, 2013): 123–29.

Melchior, Maria, Avshalom Caspi, Louise M. Howard, Antony P. Ambler, Heather Bolton, Nicky Mountain, and Terrie E. Moffitt. "Mental Health Context of Food Insecurity: A Representative Cohort of Families With Young Children." *Pediatrics* 124, no. 4 (October 1, 2009): e564–72.

Melchior, Maria, Jean-François Chastang, Bruno Falissard, Cédric Galéra, Richard E. Tremblay, Sylvana M. Côté, and Michel Boivin. "Food Insecurity and Children's Mental Health: A Prospective Birth Cohort Study." *PLoS ONE* 7, no. 12 (December 26, 2012): e52615.

MURPHY, J. MICHAEL, CHERYL A. WEHLER, MARIA E. PAGANO, MICHELLE LITTLE, RONALD E. KLEINMAN, and MICHAEL S. JELLINEK. "Relationship Between Hunger and Psychosocial Functioning in Low-Income American Children." *Journal of the American Academy of Child & Adolescent Psychiatry* 37, no. 2 (February 1998): 163–70.

Slopen, Natalie, Garrett Fitzmaurice, David R. Williams, and Stephen E. Gilman. "Poverty, Food Insecurity, and the Behavior for Childhood Internalizing and Externalizing Disorders." *Journal of the American Academy of Child & Adolescent Psychiatry* 49, no. 5 (May 2010): 444–52.

Addressing Food Insecurity and the Social Determinants of Health in the Clinic Setting

Increasingly the medical community is recognizing the need to address the broader social determinants of health at well childcare visits and other preventative health visits. Summarized below are several studies that provide rationale for screening for social determinants of health, such as food insecurity and describe and test the process for implementation of screening and intervention implementation in the clinic setting. Also referenced are examples of provider education efforts.

Screening

Schor, Edward L., and American Academy of Pediatrics Task Force on the Family. "Family Pediatrics: Report of the Task Force on the Family." *Pediatrics* 111, no. 6 Pt 2 (June 2003): 1541–71.

The American Academy of Pediatrics Task Force on the Family in 2003 recommended extending the responsibilities of the pediatric provider to include screening, assessment, and referral of parents for social problems that "can adversely affect the health and emotional or social well-being of their child."

Garg, Arvin, Sarah Toy, Yorghos Tripodis, Michael Silverstein, and Elmer Freeman. "Addressing Social Determinants of Health at Well Child Care Visits: A Cluster RCT." *Pediatrics*, January 5, 2015, peds.2014–2888.

Cross-sectional study with goals to: describe prevalence of 5 basic social needs of parents with children ages 2-10 years attending urban hospital-based pediatric clinic (Baltimore); assess parental attitudes toward seeking assistance from child's provider; examine resident providers' attitudes and behaviors toward addressing those needs. Most common reported needs among parents (n=100) were: employment (52%), education (34%), childcare (19%), food (16%), and housing (10). Sixty-seven percent of parents expressed positive attitudes toward requesting assistance from their child's pediatrician.

Garg, Arvin, Sarah Toy, Yorghos Tripodis, Michael Silverstein, and Elmer Freeman. "Addressing Social Determinants of Health at Well Child Care Visits: A Cluster RCT." *Pediatrics*, January 5, 2015, peds.2014–2888.

Randomized controlled trial at 8 urban community health centers to evaluate effectiveness of clinic-based screening and referral system on families' receipt of community-based resources for unmet basic needs. Families receiving screening and referral were more likely to receive referral for support and to enroll in community resource.

Gottlieb, Laura M., Karen J. Tirozzi, Rishi Manchanda, Abby R. Burns, and Megan T. Sandel. "Moving Electronic Medical Records Upstream: Incorporating Social Determinants of Health." *American Journal of Preventive Medicine* 48, no. 2 (February 2015): 215–18.

A case study summary of three approaches to using electronic medical records to address the social determinants of health in clinical settings. Multiple functions that electronic medical records can play to integrate social determinants of health into healthcare delivery settings were identified and include: screening, triaging, referring, tracking, and data sharing.

Hager, Erin R., Anna M. Quigg, Maureen M. Black, Sharon M. Coleman, Timothy Heeren, Ruth Rose-Jacobs, John T. Cook, et al. "Development and Validity of a 2-Item Screen to Identify Families at Risk for Food Insecurity." *Pediatrics* 126, no. 1 (July 1, 2010): e26–32.

A 2-question screening tool for food insecurity was developed and has shown to be sensitive, specific and valid among low-income families with young children. Additional testing across socioeconomic levels and rural populations is suggested.

Clinic-based interventions

"Health Care's Blind Side." *RWJF*. Accessed December 18, 2014. http://www.rwjf.org/en/research-publications/find-rwjf-research/2011/12/health-care-s-blind-side.html.

In this national survey of primary care providers and pediatricians, 85 percent believe that unmet social needs—things like access to nutritious food, reliable transportation and adequate housing—are leading directly to worse health for all Americans. Furthermore, 4 in 5 physicians do not feel confident in their capacity to meet their patients' social needs, and they believe this impedes their ability to provide quality care. **"Within the current health care system, physicians do not have the time or sufficient staff support to address patients' social needs."**

Beck, Andrew F., Adrienne W. Henize, Robert S. Kahn, Kurt L. Reiber, John J. Young, and Melissa D. Klein. "Forging a Pediatric Primary Care–Community Partnership to Support Food-Insecure Families." *Pediatrics* 134, no. 2 (August 1, 2014): e564–71.

Pediatricians at an academic primary care clinic worked with community partners to link food insecure families with infants to supplementary infant formula, educational materials, and clinic and community resources and referrals. Families that received services and information were more likely to have completed a lead test and developmental screen; more likely to have

received a full set of well infant visits by 14 months; and more likely to have been referred to social work.

> Garg, Arvin, Sonia Sarkar, Mark Marino, Rebecca Onie, and Barry S. Solomon. "Linking Urban Families to Community Resources in the Context of Pediatric Primary Care." *Patient Education and Counseling* 79, no. 2 (May 2010): 251–54.

Small pilot in urban academic-based clinic in Baltimore, MD to assist healthcare providers in educating families about available community-based resources. The pilot took place over the course of 6 weeks. At-risk families were connected to a Family Help Desk and subsequently referred to community resources. Only 6% (n=59) of parents accessed the help desk. Social needs reported included afterschool programs and childcare (29%), employment (13%), housing (12%) and food (11%). Most parents utilizing the help desk contacted a community resource within 6 months of their visit - 32% enrolled in community programs.

Provider education

> Klein, Melissa D., Alicia M. Alcamo, Andrew F. Beck, Jennifer K. O'Toole, Daniel McLinden, Adrienne Henize, and Robert S. Kahn. "Can a Video Curriculum on the Social Determinants of Health Affect Residents' Practice and Families' Perceptions of Care?" *Academic Pediatrics* 14, no. 2 (March 2014): 159–66.

Assessment of impact of training for pediatric residents on implementation of screening and referral intervention for addressing patient social needs. Training curriculum included videotaped vignettes of screening for social determinants of health and a "day in the life" series of families describing the impact of intervention on their lives. Residents completed pre-post self-assessments measure their perceptions of competence and resource knowledge. Patients also assessed provider level of trust and respect for the resident and the number of social determinants screen for. Referral rates and resource distribution was measured. Training increased competence of providers and significantly increased screening for social determinants of health as well as referral rates compared to control group.

> O'Toole, Jennifer K., Lauren G. Solan, Mary Carol Burkhardt, and Melissa D. Klein. "Watch and Learn An Innovative Video Trigger Curriculum to Increase Resident Screening for Social Determinants of Health." *Clinical Pediatrics* 52, no. 4 (April 1, 2013): 344–50.