determinants research[6] and simulations can be used to explore how multilevel factors that interact with and feed back on each other influence outcomes at the population level.[7] The ADDM prevalence data reaffirm that, as with many other health outcomes in the United States, we observe distinct patterning on the basis of race, ethnicity, and SES. To understand more fully the interplay of these factors and to inform our public health response, ASD research should boldly follow other fields into the challenging analytic landscape of social determinants. AJPH

Craig J. Newschaffer, PhD

ACKNOWLEDGMENTS

The author would like to thank Editor-in-Chief Alfredo Morabia, MD, PhD, for his helpful suggestions.

REFERENCES

1. Sun X, Allison C, Auyeung B, Baron-Cohen S, Brayne C. Parental concerns, socioeconomic status, and the risk of autism spectrum conditions in a population-based study. *Res Dev Disabil*. 2014;35(12):3678–3688.

2. Khowaja MK, Hazzard AP, Robins D. Sociodemographic barriers to early detection of autism: screening and evaluation using the M-CHAT, M-CHAT-R, and follow-up. *J Autism Dev Disord*. 2015;45(6):1797–1808.

3. Kalb LG, Freedman B, Foster C. Determinants of appointment absenteeism at an outpatient pediatric autism clinic. *J Dev Behav Pediatr*. 2012;33(9):685–697.

4. Sagiv SK, Kalkbrenner AE, Bellinger DC. Of decrements and disorders: assessing impairments in neurodevelopment in prospective studies of environmental toxicant exposures. *Environ Health*. 2015;14:8.

5. Cheng TL, Goodman E; The Committee on Pediatric Research. Race, ethnicity, and socioeconomic status in research on child health. *Pediatrics*. 2015;135(1):e225–e237.

6. VanderWeele TJ, Robinson WR. On causal interpretation of race in regressions adjusting for confounding and mediating variables. *Epidemiology*. 2014;25(4):473–484.

7. Speybroeck N, Van Malderen CV, Harper S, Muller B, Devleesschauwer B. Simulation models for socioeconomic inequalities in health: a systematic review. *Int J Environ Res Public Health*. 2013;10(11):5750–5780.

Screening for Food Insecurity: Short-Term Alleviation and Long-Term Prevention

See also Makelarski et al., p. 1812.

Food insecurity, defined by the US Department of Agriculture as "lack of consistent access to enough healthy food for an active healthy life," is related to many adverse physical and mental health outcomes in adults and children. Twenty years of food insecurity research shows us that this is often a hidden condition that lacks physical or laboratory signs, is associated with tremendous social stigma and personal shame, and will not be revealed unless asked about directly.

SCREENING

Screening for food insecurity meets the well-established criteria for adoption of any screening procedure in health care: the condition is prevalent and correlated with health outcomes, the screening questions are valid and reliable, and there are interventions available if the screen is positive. But what is the best way to screen for food insecurity? The gold-standard 18-item US Food Security Scale (USFSS) was developed after five years of extensive testing, consultation, and expert review, with the first national food insecurity prevalence estimates derived from the scale published in 1997. The 18-item USFSS and companion USFSS Six-Item Short Form has since been refined through cooperative activities involving US Department of Agriculture agencies, the National Center for Health Statistics, and two consulting firms. In 2003 to 2006, a panel convened by the Committee on National Statistics of the National Academies conducted the 10-year review required of all new government data collection activities. The scale was found to be valid, reliable, robust, and stable. Its use in most clinical settings, however, is admittedly impractical because of its length.

THE HUNGER VITAL SIGN

The first two questions in the USFSS, commonly known as the Hunger Vital Sign, ascertains how often within the past 12 months "we worried whether our food would run out before we got money to buy more," and "the food we bought just didn't last and we didn't have money to get more." As part of the validation process of this two-item screening tool, Hager et al.[1] found that asking both of the first two questions and categorizing respondents who affirmed either one or both of the questions as screening positive yielded the best combination of sensitivity (97%: probability of screening positive if their household is food-insecure; higher sensitivity implies lower numbers of false negatives) and specificity (83%: probability of screening negative if their household is food-secure; higher specificity implies lower numbers of false positives). The goal of screening for food insecurity is to identify patients living in food-insecure households and to minimize false negatives. Thus, higher sensitivity is desirable while maintaining specificity at acceptable levels.

The Hunger Vital Sign has been shown to be sensitive and specific with multiple different patient populations: sensitivity of 97% among young children and adults,[1,2] and 88% among adolescents.[3] Ratings of specificity range from 74% among adults[2] to 83% and 84% among households with young children[1] and adolescents,[3] respectively. Whereas Hager et al.[1] validated the Hunger Vital Sign with data from low-income urban households with mothers of young children as respondents, Gundersen et al.[2] recently validated the two

ABOUT THE AUTHORS

Diana Cutts is with the Department of Pediatrics, Hennepin County Medical Center and University of Minnesota, Minneapolis. John Cook is with the Department of Pediatrics at Boston University School of Medicine, Boston, MA.

Correspondence should be sent to Diana Cutts, Associate Professor, University of Minnesota, Department of Pediatrics, Hennepin County Medical Center, 701 Park Ave S, Minneapolis, MN 55415 (e-mail: diana.cutts@hcmed.org). Reprints can be ordered at http://www.ajph.org by clicking the "Reprints" link.

This editorial was accepted August 14, 2017.

doi: 10.2105/AJPH.2017.304082

questions for use among patients of all ages (>97% sensitive; >74% specific). Thus, health care providers, whether in accountable care organizations, accountable health communities, hospitals, private practices, or other services, can use the Hunger Vital Sign to screen for food insecurity with confidence.

Questions have arisen regarding the necessity of asking both Hunger Vital Sign questions when one might suffice, whether question wording can be changed, or why response alternatives must include "often true, sometimes true, or never true" instead of "yes or no." In this issue of *AJPH*, Makelarski et al. (p. 1812) provide a cautionary tale as to why such seemingly negligible alterations are ill-advised. Their finding that replacing the USFSS and Hunger Vital Sign's three response options with the simplified "yes or no" options results in missing nearly 25% of food-insecure adults and lowers sensitivity from 94% to 76% serves to remind us of the dangers associated with tampering with the screen as used in previous validation studies.

WHERE AND HOW TO SCREEN

Beyond the question of what screening tool to use, additional questions of where and how to screen deserve further attention. As screening is adopted by health care systems, consideration should also be given to screening in other sites and contexts. Educational settings across all years from infant care to graduate school, mental health and chemical dependency programs, home visiting programs, youth and senior centers, and places of work and worship are all potential Hunger Vital Sign venues. Screening can be delivered in a variety of forms—via paper survey, touchscreen pads, recorded voice response systems, or person-to-person interaction. Work is needed to clarify whether differences in rates of disclosure are related to form or venue of delivery. There is suggestive evidence that affirmative responses may be more readily given when questions can be answered privately, in a manner removed from personal interactions, as has been found in studies examining disclosure rates for domestic violence. Furthermore, we must recognize the potential for inflicting trauma when parents are asked to verbally respond to sensitive questions in the presence of their children.

WHY SCREEN?

Finally, but most compelling, is the question, "Why screen?" Certainly, identifying household food insecurity by using a validated screening tool such as the Hunger Vital Sign allows development and implementation of evidence-based household-level interventions that can alleviate the condition. Patients screening positive on the Hunger Vital Sign can be connected to public food assistance programs including the Special Supplemental Nutrition Program for Women, Infants, and Children; the Supplemental Nutrition Assistance Program, school meal programs, the Child and Adult Care Feeding Program, the Summer Food Service Program, and others. They can also be connected to a national private food assistance network including more than 200 food banks and thousands of food pantries, food shelves, and other agencies that provide food to households in need. These connections are most successful when well-trained care navigators are available to help patients successfully access services and resources.

PREVENTION

On a larger scale, remediating food insecurity is cost savings amplified over years and over lifetimes because it enables children to develop necessary human capital more effectively. Children's HealthWatch has estimated that child health care and education costs associated with food insecurity among families with young children were more than $1.2 billion in 2015.[4] With innovation and experience, one hopes it is possible to move from food insecurity detection and intervention to its prevention. Widespread use of food insecurity screening with the validated Hunger Vital Sign is a step toward a more promising future for us all. AJPH

Diana Cutts, MD
John Cook, PhD, MAEd

CONTRIBUTORS
Both authors contributed equally to this editorial.

ACKNOWLEDGMENTS
We thank Richard Sheward, Ana Poblacion, and Megan Sandel of Boston Medical Center for careful editing and Editor-in-Chief Alfredo Morabia, MD, PhD, for encouraging us to write this editorial.

REFERENCES

1. Hager ER, Quigg AM, Black MM, et al. Development and validity of a 2-item screen to identify families at risk for food insecurity. *Pediatrics*. 2010;126(1):e26–e32.

2. Gundersen C, Engelhard EE, Crumbaugh AS, Seligman HK. Brief assessment of food insecurity accurately identifies high-risk US adults. *Public Health Nutr*. 2017;20(8):1367–1371.

3. Baer TE, Scherer EA, Fleegler EW, Hassan A. Food insecurity and the burden of health-related social problems in an urban youth population. *J Adolesc Health*. 2015;57(6):601–607.

4. Cook J, Bovell A, Poblacion A, et al. The $1.2 billion child health dividend. Children's HealthWatch. 2016. Available at: http://childrenshealthwatch.org/the-1-2-billion-child-health-dividend. Accessed August 14, 2017.