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Social Interventions Research & Evaluation Network

Examining the Validity of Clinical Social Risk Screening Tools

SIREN Webinar

July 18, 2019

Examining the Validity of Clinical Social Risk Screening Tools



Moderator:

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(UCSF)

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Social Interventions Research & Evaluation Network

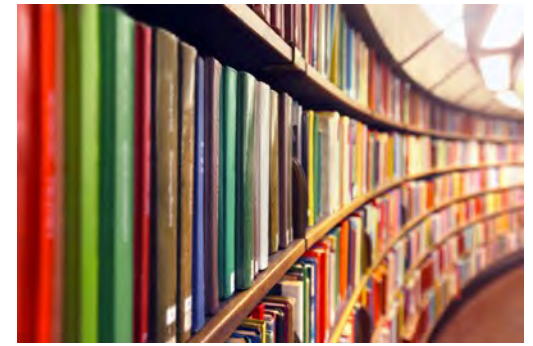
SIREN's mission is to catalyze and disseminate high quality research that advances health care sector efforts to improve health equity by addressing social risks.



Catalyze & conduct high quality research



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Today's speakers



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Assistant Investigator
Kaiser Permanente Washington
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Richard Sheward, MPP
Director of Innovative
Partnerships
Children's HealthWatch

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Evaluating multidomain tools for screening social risk in health care settings

Nora Henrikson PhD MPH

Kaiser Permanente Washington Health Research Institute

SIREN Webinar July 18 2019

Study team

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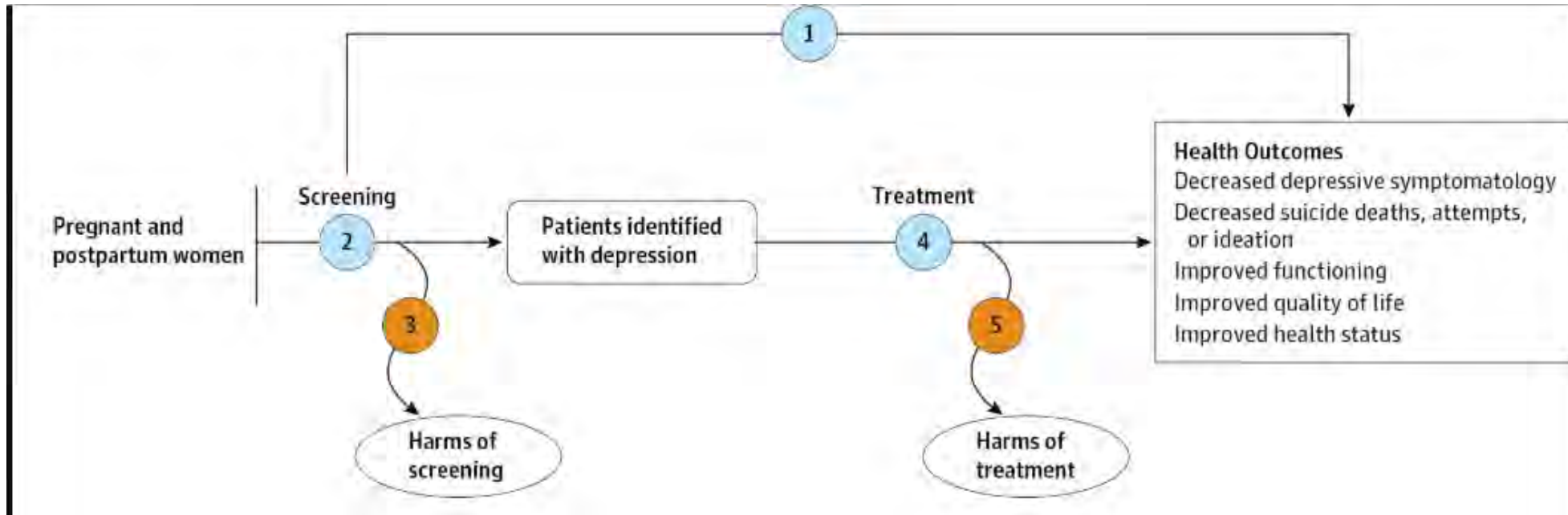
Cara C. Lewis, PhD



These authors attest they have no conflicts of interest to report.

Funding: KPWHRI Director Development Fund

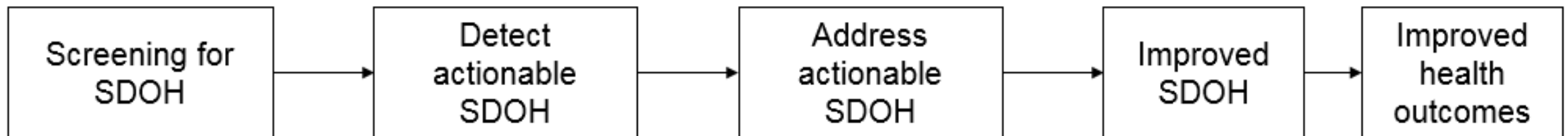
Benefits of screening: example



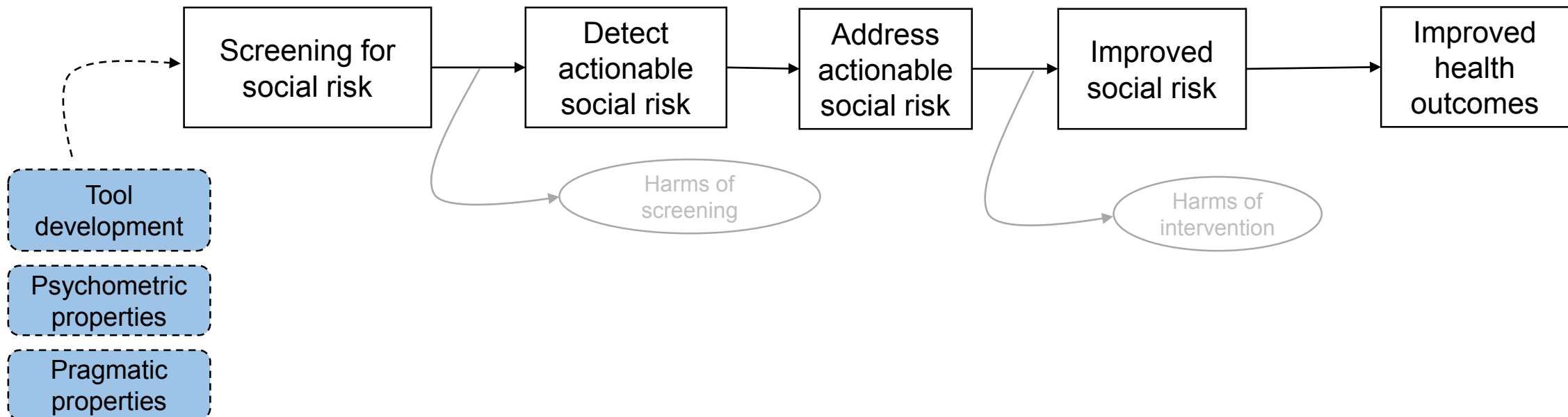
O'Connor et al *JAMA*. 2016;315(4):388-406.

Context

- Screening for social risk could improve health outcomes by identifying and intervening on risk
- Increasing interest in clinic-based screening
- Generating evidence for the impact of screening requires high-quality screening tools



High quality screening tools are needed to develop evidence on the benefits of screening for social risk



An ideal screening tool

Psychometrically strong

- Accurately and precisely measures social risk domains (validity)
- Measures changes in social risk over time and repeated measure (reliability)
- Developed using gold standard processes

Easy to use in practice (pragmatic)

- Brief
- Easy to administer and score
- Free or low cost

Objective: To evaluate the current state of multidomain tools intended for screening social risk in health care settings

Research questions

1. To what degree have gold standard methods been used to develop multidomain social risk screening tools?
2. What is the available psychometric evidence for social risk screening and tracking tools?
3. What is the available pragmatic evidence for social risk screening tools?
4. What is the relation between psychometric and pragmatic evidence?



Methods

- Systematic review
 - Manual searching to identify examples of empiric uses
- PubMed and CINAHL
 - 2000 to May 18, 2018
- Included:
 - U.S. based
 - Measured ≥ 2 social risk domains
 - Intended for use in clinical settings
- Data abstracted:
 - Study information
 - Steps in tool development
 - Psychometric properties
 - Pragmatic properties

We included these six social risk domains

Economic stability:

employment, income, expenses, debt, medical bills, support

Education:

early childhood education, high school graduation, higher education, language, literacy / health literacy, vocational training

Social & community context:

discrimination, incarceration, social integration, support systems / loneliness, community engagement, immigration/refugee status

Health & clinical care:

access to health care/primary care, health coverage, provider availability, provider linguistic & cultural competency, quality of care

Neighborhood & physical environment:

safety, crime, violence, environmental conditions, housing quality / stability, transportation, parks, playgrounds, walkability

Food:

Hunger/food insecurity, access to healthy options

We abstracted
evidence on use
of these gold
standard steps of
measure
development

- (1) defining the construct
- (2) generating initial questions using a group of experts
- (3) pilot testing with a representative sample
- (4) testing of validity and reliability based on pilot testing
- (5) refining of instrument based on pilot results
- (6) administration of refined instrument to target sample
- (7) performing of validity and reliability tests
- (8) reporting of psychometric properties

We rated the psychometric and pragmatic properties using the PAPERs scale (Lewis)

Psychometric properties

Possible overall score:

-9 (low) to 36 (high quality)

- internal consistency
- convergent validity
- discriminant validity
- known-groups validity
- predictive validity
- concurrent validity
- structural validity
- responsiveness
- norms

Pragmatic properties

Possible overall score:

-5 (least) to 20 (most) pragmatic

- cost
- accessibility of language
- assessor burden (training)
- assessor burden (interpretation)
- length

Psychometric properties

Construct	Definition
Reliability – internal consistency	Whether several items that purport to measure the same construct produce similar scores in the same test
Construct validity – convergent	Degree to which two constructs that are theoretically related are in fact related
Construct validity – discriminant	Degree to which two constructs that are theoretically distinct are in fact distinct
*Construct validity – known-groups	Distinct groups with differing characteristics can be differentiated
*Criterion validity – predictive	Refers to the degree to which a measure can predict or correlate with an outcome of interest measured at some point in the future
Criterion validity – concurrent	Whether two measurements taken at the same time are correlated, and how the measure under consideration compares to an established measure of the same construct
Dimensionality – structural validity	Degree to which all test items rise and fall together (aka “test structure”)
*Responsiveness	Measure’s ability to detect clinically important changes in the construct over time
Norms	Measured by sample size, means, and standard deviations of measures; meant to assess generalizability

We judged these three psychometric properties as particularly relevant to social risk

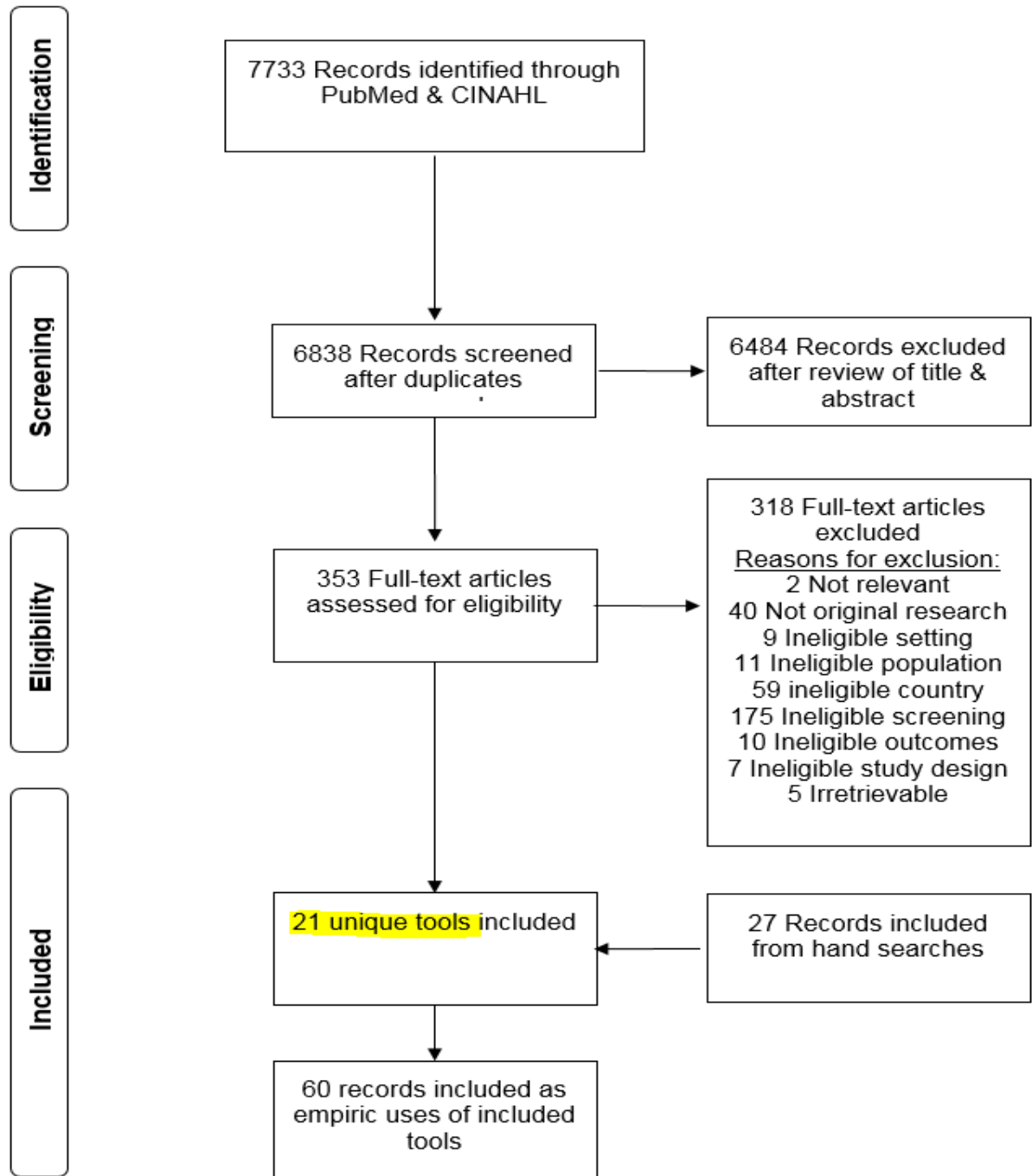
Construct	Definition
*Construct validity – known-groups	Distinct groups with differing characteristics can be differentiated
*Criterion validity – predictive	Degree to which a measure can predict or correlate with an outcome of interest measured at some point in the future
*Responsiveness	Detects clinically important changes in the construct over time

Psychometric properties (2)

Construct	Definition
Reliability – internal consistency	Whether several items that purport to measure the same construct produce similar scores in the same test
Construct validity – convergent	Degree to which two constructs that are theoretically related are in fact related
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Dimensionality – structural validity	Degree to which all test items rise and fall together (aka “test structure”)
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Results

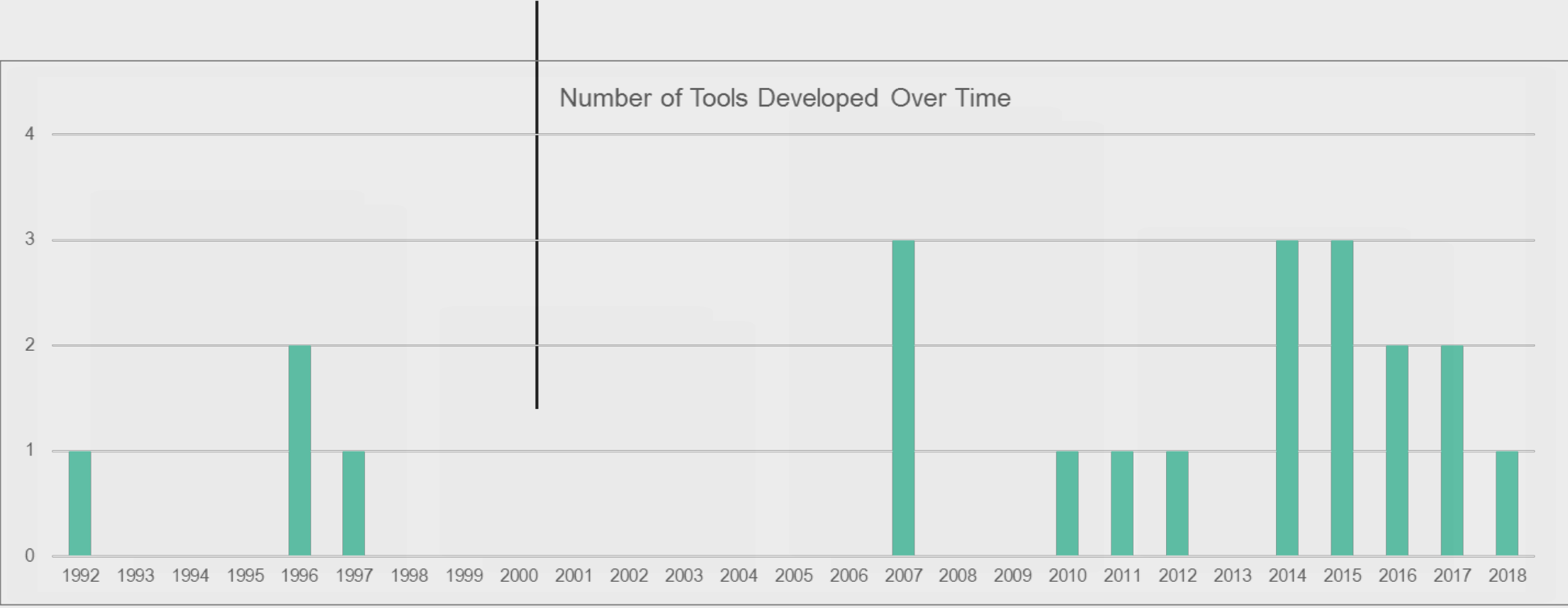
21 unique tools met inclusion criteria



Results – overview of included tools

- 3-6 domains assessed (median 4)
 - Neighborhood / physical environment (21/21)
 - Economic risk (19/21)
- Adult and pediatric populations
- Administered in ambulatory care (19/21)
- Median 3 empiric uses

Results – Increasing tools over time



Included tools (21)

Accountable Health Communities Health-Related Social Needs (AHC-HRSN)

Health Begins

Health Leads

HelpSteps (Online Advocate)

Income, Housing, Education, Legal Status, Literacy, Personal Safety (IHELLP) Questionnaire

Institute of Medicine (IOM)

Legal Checkup

Medical-Legal Partnership (MLP)

Partners in Health Survey

Protocol for Responding to and Assessing Patient Assets, Risks, and Experiences (PRAPARE)

Safe Environment for Every Kid (SEEK)

Social History Template

Social Needs Checklist

Structural Vulnerability Assessment Tool

Survey of Well-being of Young Children (SWYC)

Total Health Assessment Questionnaire for Medicare Members

Urban Life Stressors Scale (ULSS)

WeCare

Well Rx

Women's Health Questionnaire

Your Current Life Situation (YCLS)

1. To what degree have gold standard methods been used to develop multi-domain social risk assessment tools?

- No tool reported following all 8 steps of gold standard measure development.
- 18/21 used at least one step (median 2, range 0-7)
- 8/21 reported some reliability or validity testing
- 15/21 reported modifications from original
 - Dropping / adding / changing items; modifying response options

2. What is the available psychometric evidence for social risk screening tools?

- Very little psychometric evidence for the 21 included tools
- No data on discriminant validity, known-groups validity, structural validity, or responsiveness
- Most commonly available evidence was on norms (15/21 tools)
- PAPERS psychometric score -1 to 9 (mode: 2),
 - **all included tools in the lowest quartile of possible scores**

Psychometric properties

Known-groups validity (distinct groups with differing characteristics can be differentiated)	No data
Predictive validity (measure can predict or correlate with an outcome of interest)	3 studies reporting: all low
Responsiveness (measure's ability to detect clinically important changes in the construct it measures over time)	No data

3. What is the available pragmatic evidence for social risk screening tools?

- Pragmatic evidence available 20/21 tools
- 14/20 in public domain
- 14/20 written in accessible language (13 at 8th grade reading level)
- Limited evidence for ease of training (4/21) and scoring (7/21)
- 5/21 contained 1-10 items (median 21 items)
- PAPERS score range -1 to 20
 - **11/21 in top two quartiles**

4. What is the relation between psychometric and pragmatic evidence for social risk screening tools?

- Given the lack of psychometric evidence, it was not possible to sufficiently assess the relationship between pragmatic and psychometric evidence.

Discussion

- Many new multi-domain tools have been developed in the last 5 years
- Pragmatic assessments show that many tools have favorable readability, are low-cost and easily administered
- Very little psychometric information available
- Majority of tools modified from original
- At present, there appear to be no social risk screening tools designed to:
 - a) accurately and differentially identify risk between known groups in a clinical setting
 - b) accurately detect changes in risk over time
 - c) measure the impacts of an intervention
 - d) Measurement work may be underway

Limitations

- Focus on U.S. settings
- Focus on tools developed for clinical settings
- Intended as a single point in time review of already published work

Future work

- The lack of data about measure development or psychometric properties limits the utility of screening tools
- Research establishing tools' measurement properties could provide a strong foundation for observational and intervention research on identifying and responding to patients' social risks in clinical settings.
- Only adapt existing tools when necessary, provide documentation
- This review could be considered a benchmark for future progress

For more information

- View our results: <https://sdh-tools-review.kpwashingtonresearch.org/>
- SIREN <https://sirennetwork.ucsf.edu/>
- AJPM publication (under review)

Thank you

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CHILDREN'S
HealthWatch

20
YEARS

EXAMINING THE EVIDENCE: THE HUNGER VITAL SIGN™ AND THE HOUSING STABILITY VITAL SIGN™

Richard Sheward, MPP

Director of Innovative Partnerships

Children's HealthWatch

Disclosures

I have no relevant financial relationships to disclose or conflicts of interest to resolve.

Roadmap



About Children's HealthWatch

1. The Hunger Vital Sign™

- Validation study
- Subsequent studies and implementation

2. The Housing Stability Vital Sign™

- Conceptual definition
- Housing instability study and implementation



Founded: 1998

Non-partisan, pediatric research and policy network

Collect data in urban hospitals across the country on infants and toddlers from families facing economic hardships

Improve health & development of young children → alleviate economic hardships → inform public policies

Provide policy makers with evidence from the frontlines of health care to develop policies that protect young children's health and development



Improving the health and development of young children by informing policies that address and alleviate economic hardships

SINCE OUR LAUNCH IN 1998,

65K+ FAMILIES

We have interviewed more than 65,000 caregivers of young children under 4 years of age in pediatric emergency rooms and clinics



A nonpartisan network of pediatricians, public health researchers & policy experts, we bring data & analysis from the front lines of care in Boston, Baltimore, Philadelphia, Little Rock & Minneapolis

**PEER REVIEWED
JOURNAL ARTICLES**

43+

Our researchers have made landmark contributions to the understanding of how public policies and economic hardships impact children's health



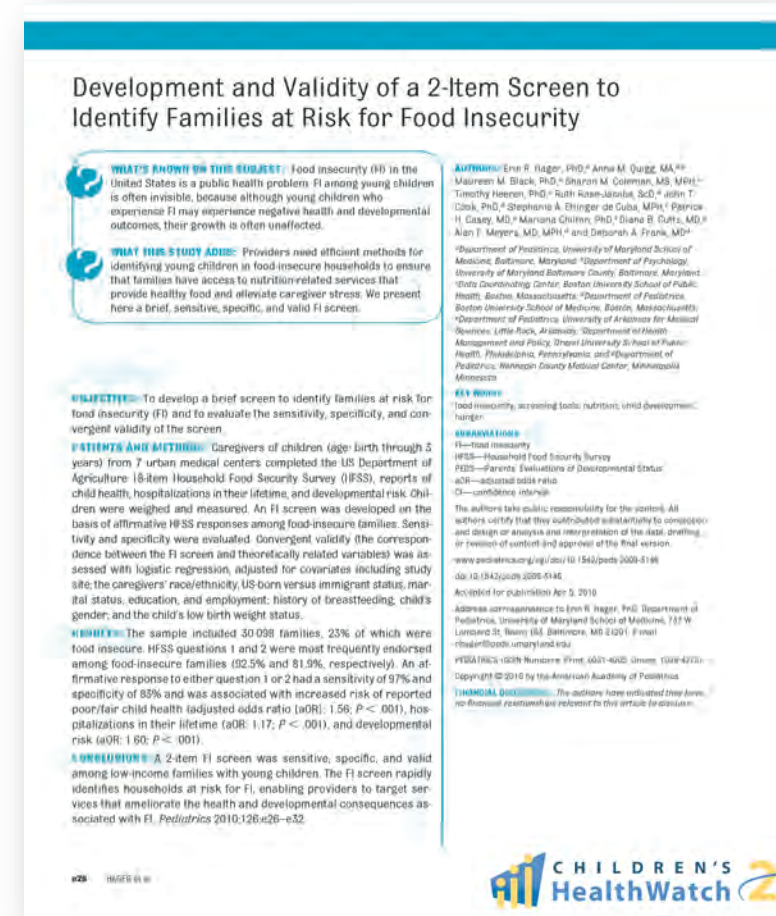
20 YEARS

Leveraging the perspective of pediatricians, our research and testimony has improved public policies (nutrition, housing, anti-poverty) and practices that give all children equal opportunities for healthy, successful lives



Development and Validity of a 2-Item Screen to Identify Families at Risk for Food Insecurity

Hager ER, Quigg AM, Black MM, Coleman SM, Heeren T, Rose-Jacobs R, Cook JT, Ettinger de Cuba S, Casey PH, Chilton M, Cutts DB, Meyers AF, Frank DA. Development and Validity of a 2-Item Screen to Identify Families at Risk for Food Insecurity. *Pediatrics*; 2010;126:e26–e32.



Complementary article: Are Food Insecurity's Health Impacts Underestimated in the U.S. Population? Marginal Food Security Also Predicts Adverse Health Outcomes in Young U.S. Children and Mothers. Cook, JT, Black, M, Chilton, M et al. *Advances in Nutrition*. 2013;4: 51-61.

Study design

We sought to develop a food insecurity screen from the “gold standard” USDA Household Food Security Survey (HFSS) with five specific characteristics:

- (1) applicable to families with young children
- (2) brief
- (3) highly sensitive (90%)
- (4) specific (80%)
- (5) valid (convergent validity)

Which questions?

Most common affirmatively answered questions with best sensitivity/specificity compared to “gold standard” (USDA HFSS)

- First two questions

The Hunger Vital Sign™ identifies individuals and families as being at risk for food insecurity if they answer that either or both of the following two statements is ‘often true’ or ‘sometimes true’ (vs. ‘never true’):

“ Within the past 12 months we worried whether our food would run out before we got money to buy more.”

“ Within the past 12 months the food we bought just didn’t last and we didn’t have money to get more.”

Why two questions and not one?

- Cross-tabulation tables were generated for combinations of the first two questions of the HFSS to examine sensitivity and specificity
- Four combinations were explored
- An affirmative response to question one only or question two only of the HFSS provided a sensitivity of 93% or 82% and a specificity of 85% or 95%, respectively
- Because an affirmative response to question one and/or question two of the HFSS provided the highest sensitivity (97%) and specificity (83%); these are the criteria that comprise the HVS

Analysis

Adjusted logistic regression models were conducted by using both the HFSS and the HVS (separately) to examine how FI status is related to child and caregiver health outcomes while controlling for covariates

TABLE 3 Relation Between FI Status on the HFSS and on the 2-Item FI Screen With Child and Caregiver Health Outcomes (*N* = 30 098)

	HFSS			FI Screen		
	Food Secure	Food Insecure		Food Secure	Food Insecure	
		aOR (95% CI)	<i>P</i>		aOR (95% CI)	<i>P</i>
Reported child health (fair/poor)	1.0	1.73 (1.59–1.88)	<.001	1.0	1.56 (1.44–1.68)	<.001
Number of lifetime hospitalizations	1.0	1.19 (1.11–1.28)	<.001	1.0	1.17 (1.10–1.24)	<.001
At risk for underweight	1.0	0.96 (0.88–1.05)	.36	1.0	0.94 (0.87–1.01)	.09
Overweight	1.0	1.03 (0.94–1.12)	.56	1.0	0.98 (0.91–1.06)	.59
Developmental risk ^a	1.0	1.72 (1.51–1.97)	<.001	1.0	1.60 (1.42–1.80)	<.001
Caregiver health (fair/poor)	1.0	2.29 (2.12–2.46)	<.001	1.0	1.99 (1.86–2.13)	<.001
Caregiver positive depression screen	1.0	3.13 (2.91–3.37)	<.001	1.0	2.76 (2.59–2.94)	<.001

Data were adjusted for site, race/ethnicity, US-born mother versus immigrant, marital status, education, child gender, caregiver employment, breastfeeding, low birth weight, and maternal age. The sample was limited to families that were uninsured or receiving public insurance.

^a Developmental risk was determined by the PEDS (≥ 1 concern) only for children older than 4 months, and data collection began in 2004 (*n* = 10 874).

Results

Caregivers

- Almost 2x as likely to be in fair/poor health
- Almost 3x as likely to report depressive symptoms

Young children

- 56% more likely to be in fair/poor health
 - 17% more likely to have been hospitalized
 - 60% more likely to be at risk for developmental delays
-
- These associations are similar to, although slightly weaker than, the corresponding associations with the 18-item HFSS, which demonstrates convergent validity of the HVS as a measure of food insecurity.

Further Analysis

To assess whether the households identified as food insecure by the HVS experienced risk despite classification as food secure by the 18-item HFSS, analyses were repeated among those who were classified as food secure on the basis of the 18-item HFSS

The HVS results show attenuated, but statistically significant, associations with poor child and caregiver health outcomes.

TABLE 4 Relation Between FI Status on the 2-Item FI Screen and Child and Caregiver Health Outcomes Among the Subset of Food-Secure Households on the HFSS (*N* = 23 256)

	FI Screen		
	Food Secure	Food Insecure	
		aOR (95% CI)	<i>P</i>
Reported child health (fair/poor)	1.0	1.26 (1.12–1.40)	<.001
Number of lifetime hospitalizations	1.0	1.11 (1.02–1.21)	.01
At risk for underweight	1.0	0.90 (0.81–1.00)	.05
Overweight	1.0	0.95 (0.85–1.05)	.31
Developmental risk ^a	1.0	1.36 (1.15–1.61)	<.001
Caregiver health (fair/poor)	1.0	1.41 (1.28–1.56)	<.001
Caregiver positive depression screen	1.0	1.88 (1.72–2.06)	<.001

Data were adjusted for site, race/ethnicity, US-born mother versus immigrant, marital status, education, child gender, caregiver employment, breastfeeding, low birth weight, and maternal age. The sample was limited to families that were uninsured or receiving public insurance.

^a Developmental risk was determined by the PEDS (≥ 1 concern) only for children older than 4 months, and data collection began in 2004 (*n* = 8497).

What's Happened Since?

REVIEWS FROM ASN EB 2012 SYMPOSIA

Are Food Insecurity's Health Impacts Underestimated in the U.S. Population? Marginal Food Security Also Predicts Adverse Health Outcomes in Young U.S. Children and Mothers¹⁻³

John T. Cook,^{4*} Maureen Black,⁵ Mariana Chilton,⁶ Diana Curtis,⁷ Stephanie Ettinger de Cuba,⁸ Timothy C. Heeren,⁹ Ruth Rose-Jacobs,¹⁰ Megan Sneed,¹¹ Patrick H. Casey,¹² Sharon Coleman,¹³ Ingrid Weeks,¹⁴ and Deborah A. Frank¹⁵
¹Department of Pediatrics, Boston University School of Medicine, Boston, MA; ²Department of Pediatrics, University of Maryland School of Medicine, Baltimore, MD; ³Department of Health Management and Policy, Drexel University School of Public Health, Philadelphia, PA; ⁴Department of Pediatrics, Hennepin County Medical Center, Minneapolis, MN; ⁵Tufts University School of Public Health, Data Coordinating Center, Boston, MA; and ⁶Department of Pediatrics, University of Arkansas for Medical Sciences, Little Rock, AR

ABSTRACT

This review addresses caregivers in the United States. Food Security Survey households than food and health risk. Studies developmental risks in health outcomes compared the US. Nonoverlapping depressive symptoms significantly and distal research presented in should be reported in outcomes associated with action and policies to

Introduction

"Food security—adequate access to food for an active, healthy life."

Presented at the symposium "Adolescent Health: 2012" sponsored by the American Academy on Child and Adolescent Health. Reprinted by the American Academy on Child and Adolescent Health. © 2012 American Academy on Child and Adolescent Health.

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Original Article

Food Insecurity and the Burden of Health-Related Social Problems in an Urban Youth Population

Tamara E. Baer, M.D., M.P.H.,^{1,2,3,4,5,6,7} Emily A. Scherer, Ph.D.,^{1,4} Eric W. Fleegler, M.D., M.P.H.,^{1,6,7,8,9,10} and Areej Hassan, M.D., M.P.H.,^{1,3,11}

¹Division of Adolescent/Young Adult Medicine, Boston Children's Hospital, Boston, Massachusetts; ²Department of Pediatrics, Harvard Medical School, Boston, Massachusetts; ³Department of Biomedical Data Science, Croft School of Medicine at Dartmouth, Hanover, New Hampshire; ⁴Department of Community and Family Medicine, Croft School of Medicine at Dartmouth, Hanover, New Hampshire; ⁵Division of Emergency Medicine, Boston Children's Hospital, Boston, Massachusetts

Article history: Received June 2, 2015; Accepted August 11, 2015

Keywords: Adolescents; Young adults; Food insecurity; Social determinants of health; Health-related social problems; Screening

ABSTRACT

Purpose: Our study objectives were to (1) determine the prevalence of food insecurity; (2) examine the association between presence and level of food insecurity with other health-related social problems; and (3) assess the predictive values of a two-item food insecurity screen in an urban youth population.

Methods: Patients aged 15–25 years completed a Web-based screening tool. Validated questions were used to identify problems in seven health-related social domains (food insecurity, health care access, education, housing, income insecurity, substance use, and intimate partner violence). Chi-square and Kruskal-Wallis tests and logistic regression models controlled for age, sex, and race/ethnicity assessed the association between food insecurity and health-related social problems. Predictive values of a two-item food insecurity screen compared with the United States Department of Agriculture Food Security Survey were calculated.

Results: Among 400 patients (mean age 18 years; 69.2% female; 54.6% black; 58.9% public insurance), 32.5% screened positive for food insecurity. Increasing food insecurity level was significantly associated with cumulative burden of social problems ($p < .001$). In adjusted analyses, food insecurity was associated with health care access (aOR = 2.6, 95% confidence interval [CI] 1.7–4.1), education (aOR = 2.8, 95% CI 1.6–5.1), housing (aOR = 2.8, 95% CI 1.8–4.4), income insecurity (aOR = 2.3, 95% CI 1.2–4.5), and substance use (aOR = 2.5, 95% CI 1.5–4.3). The two-item screen demonstrated sensitivity of 88.5% and specificity of 84.1%.

Conclusions: One-third of youth in sample experienced food insecurity, which was strongly associated with presence of other health-related social problems. The two-item screen effectively detected food insecurity. Food insecurity screening may lead to identification of other health-related social problems that when addressed early may improve adolescent health.

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Conflicts of Interest: The authors have no conflicts of interest relevant to this article to declare.

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Food insecurity, a serious public health problem, is defined by the US Department of Agriculture (USDA) as uncertainty of having or inability to acquire enough food to meet the requirements of all members of a household because of financial or resource constraint [1]. It affected 14.3% of all US households

Public Health Nutrition page 3 of 5

doi:10.1017/S136988017000180

Short Communication

Brief assessment of food insecurity accurately identifies high-risk US adults

Craig Gunderson¹, Emily E Engelhardt², Amy S Crumboaght² and Hilary K Seligman^{2,3,4*}

¹Department of Agricultural and Consumer Economics, University of Illinois, Urbana, IL, USA; ²Feeding America, Chicago, IL, USA; ³Division of General Internal Medicine, University of California San Francisco, and Center for Vulnerable Populations at San Francisco General Hospital, Box 1364, San Francisco, CA 94143, USA

Submitted 19 October 2016; final revision received 5 January 2017; accepted 18 January 2017

Abstract

Objective: To facilitate the introduction of food insecurity screening into clinical settings, we examined the test performance of two-item screening questions for food insecurity against the US Department of Agriculture's Core Food Security Module.

Design: We examined sensitivity, specificity and accuracy of various two-item combinations of questions assessing food insecurity in the general population and high-risk population subgroups.

Setting: 2015 Current Population Survey December Supplement, a population-based US survey.

Subjects: All survey participants from the general population and high-risk subgroups.

Results: The test characteristics of multiple two-item combinations of questions assessing food insecurity had adequate sensitivity (>97%) and specificity (>70%) for widespread adoption as clinical screening measures.

Conclusions: We recommend two specific items for clinical screening programmes based on their widespread current use and high sensitivity for detecting food insecurity. These items query how often the household 'worried whether food would run out before we got money to buy more' and how often 'the food that we bought just didn't last and we didn't have money to get more'. The recommended items have sensitivity across high-risk population subgroups of 297% and a specificity of 274% for food insecurity.

Keywords: Food insecurity; Health disparities; Social determinants of health

ad attention to the burden of food insecurity in the increased understanding of its adverse health impact

Food insecurity (defined as a household-level economic and social condition of limited access to food) has emerged as a leading health-care issue for two central reasons. First, food insecurity rates in the USA continue to be very high: in 2015, 12.7% of US households, comprising more than 42 million people, were food insecure^{1,2}.

Second, food insecurity is associated with higher health-care costs^{3,4} and poor health outcomes^{5,6} for both adults and children, suggesting it may be an important driver of worse health disparities.

Many food insecurity screening programmes have thus been recently implemented in clinical settings, under the assumption that provider recognition and action will

improved many health systems to initiate programmes for food insecurity. In October 2015, the Academy of Pediatrics issued a position statement

calling universal screening for food insecurity in the 'must'⁷. Soon afterwards, the American Diabetes

Association released its Standards of Medical Care in 2016, which for the first time recognized the

management challenges associated with food insecurity. The Center for Medicare & Medicaid Innovation launched a \$-year, \$15.17-million programme

to assess the impact of clinical screening for health-related risks, specifically including food insecurity. These

Health Commissions will test models for

Key author: Emily Hilary Seligman@ucsf.edu

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- Marginal food security matters!
- HVS validated for use in adolescent population
- HVS validated for use in US adult population

<http://bit.ly/Cook-2013>

<http://bit.ly/Baer-2015>

<http://bit.ly/Gunderson-2017>



What's Happened Since?

Questions have arisen...

- Why ask both HVS questions?
- Can question wording can be changed?
- Can response alternatives be “yes or no”?

Replacing the HFSS and HVS three response options with simplified “yes or no” options results in missing nearly 25% of food-insecure adults and lowers sensitivity from 94% to 76%

Diagnostic Accuracy of Two Food Insecurity Screeners Recommended for Use in Health Care Settings

Jennifer A. Makelarski, PhD, MPH, Emily Abramson, MPH, Janine H. Benjamin, MA, Secci Dai, BA, and Stacy Tesler Lindau, MD, MAPP

Objectives: To test the diagnostic accuracy of the American Academy of Pediatrics (AAP) recommended food insecurity screener.

Methods: We conducted prospective diagnostic accuracy studies between July and November 2016 in Chicago, Illinois. We recruited convenience samples of adults from adult and pediatric emergency departments (12-month recall study; n = 188; 30-day recall study; n = 154). A self-administered survey included the 6-item Household Food Security Screen (gold standard), the validated 2-item Hunger Vital Sign (HVS; often, sometimes, never response categories), and the 2-item AAP tool (yes-or-no response categories).

Results: Food insecurity was prevalent (12-month recall group: 46%; 30-day group: 39%). Sensitivity of the AAP tool using 12-month and 30-day recall was, respectively, 76% (95% confidence interval [CI] = 65%, 85%) and 72% (95% CI = 57%, 84%). The HVS sensitivity was significantly higher than the AAP tool (12-month: 94% [95% CI = 86%, 98%; P = .002]; 30-day: 92% [95% CI = 79%, 98%; P = .02]).

Conclusions: The AAP tool missed nearly a quarter of food-insecure adults screened in the hospital; the HVS screening tool was more sensitive.

Public health implications: Health care systems adopting food insecurity screening should optimize ease of administration and sensitivity of the screening tool. (Am J Public Health 2017;107:1812–1817. doi:10.2105/AJPH.2017.304033)

See also Cutts, p. 1699.

Population health management requires health care providers to address the social and self-care needs of the populations they serve. Food insecurity, a condition of “limited or uncertain availability of nutritionally adequate and safe foods,”^{1(p.1306)} has been widely identified as a modifiable health-related social need.² To address food insecurity in the health care setting, health care providers need an efficient and valid strategy to identify and support individuals living in food-insecure households.

Food insecurity is a prevalent public health problem affecting 1 in 8 US households³ and is a highly stigmatized condition that is not commonly disclosed.⁴ Prevalence of food insecurity is highest among households with children: 1 in 5 of all households with children, 1 in 4 non-Hispanic Black households with children, and nearly 1 in 3 households with children headed by a single woman is food

insecure.⁵ Food insecurity has been associated with costly health consequences for adults and children, including poorer physical and mental health and more frequent hospitalizations.^{2,5–8} Documented consequences for children also include developmental problems and academic and social difficulty in school.^{2,9,10}

In 2014, the Institute of Medicine released recommendations for social domains that should be captured by electronic medical records, including food insecurity.¹¹ In 2015,

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doi:10.2105/AJPH.2017.304033](http://www.ajph.org by clicking the “Reprints” link.</p></div><div data-bbox=)

the American Academy of Pediatrics (AAP) recommended that health care providers screen all households with children for food insecurity.¹² Studies in both ambulatory and hospital settings have shown that the majority of caregivers of children believe that it is appropriate for health care practitioners to address food insecurity.^{2,13,14} Likewise, the majority of practitioners are willing to screen patients for food insecurity. Yet few practitioners actually do screen, citing a lack of valid tools and insufficient knowledge or resources to support families who screen positive.^{13,15,16}

The Household Food Security Survey (HFSS) is an 18-item, validated food security screening tool widely used in research (Table A, available as a supplement to the online version of this article at <http://www.ajph.org>).¹⁷ Although useful for research, the length and complex scoring algorithm limit routine use. The 6-item HFSS uses a subset of items from the 18-item HFSS and has high sensitivity and specificity (98% and 92%, respectively).¹⁷ Hager et al., in collaboration with Children’s HealthWatch, developed the Hunger Vital Sign (HVS), comprising 2 items from, and highly sensitive against, the 18-item HFSS (97% sensitive and 83% specific).¹⁸ The HVS was validated in urban emergency and primary care settings with predominantly non-Hispanic Black and Hispanic caregivers of children younger than 3 years. More recently, the HVS was tested for accuracy and performed well in a national population-based sample of adults that included multiple

<http://bit.ly/Makelarski-2017>

<http://bit.ly/Cutts-2017>

What's Happened Since?



Development and validity of a 2-item screen to identify families at risk for food insecurity

ER Hager, AM Quigg, MM Black, SM Coleman... - Pediatrics, 2010 - Am Acad Pediatrics

OBJECTIVES: To develop a brief screen to identify families at risk for food insecurity (FI) and to evaluate the sensitivity, specificity, and convergent validity of the screen. **PATIENTS AND METHODS:** Caregivers of children (age: birth through 3 years) from 7 urban medical centers completed the US Department of Agriculture 18-item Household Food Security Survey (HFSS), reports of child health, hospitalizations in their lifetime, and developmental risk. Children were weighed and measured. An FI screen was developed on the basis of ...

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How Hospitals Are Addressing Food Insecurity

Hospitals & Health Networks - May 1, 2017

The health system uses the Children's HealthWatch Hunger Vital Sign survey in its inpatient admission database and screened 57,224 patients ...

DISCUSSION PAPER

Standardized Screening for Health-Related Social Needs in Clinical Settings

The Accountable Health Communities Screening Tool

Alexander Billoux, MD, DPhil, Centers for Medicare & Medicaid Services;
Katherine Verlander, MPH, Centers for Medicare & Medicaid Services;
Susan Anthony, DrPH, Centers for Medicare & Medicaid Services;
Dawn Alley, PhD, Centers for Medicare & Medicaid Services

May 30, 2017

The impacts of unmet health-related social needs, such as homelessness, inconsistent access to food, and exposure to violence on health and health care utilization, are well-established. Growing evidence indicates that addressing these and other needs can help reverse their damaging health effects, but screening for social needs is not yet standard clinical practice. In many communities, the absence of established pathways and infrastructure and perceptions of inadequate time to make community referrals are barriers that seem to often keep clinicians and their staff from broaching the topic. The Centers for Medicare & Medicaid Services (CMS) Accountable Health Communities Model, tested by the Center for Medicare and Medicaid Innovation, addresses this critical gap between clinical care and community services in the current health care delivery system by testing whether systematically identifying and addressing the health-related social needs of Medicare and Medicaid beneficiaries impacts their total health care costs and improves health.

With input from a panel of national experts and after review of existing screening instruments, CMS developed a 10-item screening tool to identify patient needs in 5 different domains that can be addressed through community services (housing instability, food insecurity, transportation difficulties, utility assistance needs, and interpersonal safety). Clinicians and their staff can use this short tool across a spectrum of ages, backgrounds, and settings, and it is streamlined enough to be incorporated into busy clinical workflows. Just like with clinical assessment tools, results from this screening tool can be used to inform a patient's treatment plan as well as make referrals to community services.

Introduction

Evidence demonstrates that non-medical health-related social needs (HRSNs), such as housing instability, food insecurity, and exposure to interpersonal violence, drive health care utilization and impact health outcomes [1, 2, 3]. Clinicians routinely employ standardized questions and validated assessment tools to screen for clinical and behavioral drivers of poor health, such as alcohol dependency, decompensated heart failure, and depression, but screening for HRSNs is not yet standard clinical practice [4, 5, 6]. Standardized application of screening tools as a part of clinical routines allows provider teams to quickly and consistently identify possible health needs for further investigation and intervention. A variety of assessment tools have been developed to help health providers identify the presence of deleterious social circumstances, and a few recent studies have demonstrated the efficacy

Perspectives | Subject Topics in Primary & Health Care | NATIONAL ACADEMY OF MEDICINE

POLICY STATEMENT Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of All Children

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

Promoting Food Security for All Children

COUNCIL ON COMMUNITY PEDIATRICS, COMMITTEE ON NUTRITION

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.

abstract

INTRODUCTION

In 2013, 17.5 million US households, or 14.3% of all households and 21% of children, met the US Department of Agriculture (USDA) definition of a food-insecure household, one in which "access to adequate food is limited by a lack of money or other resources."^{1,2} Households with children are nearly twice as likely to be food insecure as households without children. In 2013, 7.5 million American families with children lacked consistent access to adequate, nutritious food. The crisis becomes even more pressing for families facing severe economic hardship. In 2013, almost 60% of all food-insecure households had incomes below 185% of the federal poverty thresholds, the income eligibility cutoff for many child nutrition programs. The federal poverty threshold for an average family of 4 people in 2013 was \$23 834; 185% of this threshold amount is \$44 093, but the federal poverty level is not a definition of economic hardship, and the amount to provide basic needs for a family of 4 often far exceeds this amount. Because 30% of food-insecure households have incomes above this level, it is clear the problem is not related solely to poverty.

The demographic of food-insecure Americans extends beyond the areas of concentrated urban poverty and into suburbs and rural America, areas

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PEDIATRICS Volume 136, number 5, December 2015

FROM THE AMERICAN ACADEMY OF PEDIATRICS



Stability: The Housing Iceberg



HOMELESS

HIDDEN HOMELESS:

HOUSING INSTABILITY

- behind on rent
- multiple moves

UNAFFORDABLE HOUSING

An Evolving Conceptual Definition of Housing Instability

RESEARCH AND PRACTICE

US Housing Insecurity and the Health of Very Young Children

Diana Becker Cutts, MD, Alan F. Meyers, MD, MPH, Maureen M. Black, PhD, Patrick H. Casey, MD, Melissa Chilton, PhD, MPH, John T. Cook, PhD, Joel Gasper, MPH, PhD, LM, Stephanie Ettinger de Cuba, MPH, Timothy Heernn, PhD, Sharon Coleman, MPH, MS, Ruth Rose-Jacobs, ScD, and Deborah A. Frank, MD

In the United States, as in other countries, housing is considered a strong social determinant of health. Poor housing conditions have been linked to multiple negative health outcomes in both children and adults. The Department of Health and Human Services has defined housing insecurity as high housing costs in proportion to income, poor housing quality, unstable neighborhoods, overcrowding, or homelessness.¹ Crowding in the home and multiple moves from home to home have clear negative associations for children. Crowding is negatively associated with mental health status,² ability to cope with stress,³ child and parent interaction,⁴ social relationships,⁵ and sleep.⁶ It also increases the risk for childhood injuries,⁷ elevated blood pressure,⁸ respiratory conditions,⁹ and exposure to infection.

Objectives. We investigated the association between housing insecurity and the health of very young children.
Methods. Between 1998 and 2007, we interviewed 22 069 low-income caregivers with children younger than 3 years who were seen in 7 US urban medical centers. We assessed food insecurity, child health status, developmental risk, weight, and housing insecurity for each child's household. Our indicators for housing insecurity were crowding (≥ 2 people/bedroom or > 1 family/bedroom) and multiple moves (≥ 2 moves within the previous year).
Results. After adjusting for covariates, crowding was associated with household food insecurity (adjusted odds ratio [AOR] = 1.30; 95% confidence interval [CI] = 1.10–1.56), child food insecurity (AOR = 1.09; 95% CI = 0.98–1.21), and multiple moves (AOR = 2.56; 95% CI = 1.91–3.44) or poor child health (AOR = 1.71; 95% CI = 1.33–2.21) ($P < .001$).
Conclusions. Housing insecurity

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Homelessness During Pregnancy: A Unique, Time-Risk Factor of Birth Outcomes

Diana B. Cutts · Sharon Coleman · Maureen M. Black · Marilena M. Chilton · John T. Cook · Stephanie Ettinger de Cuba · Timothy C. Heernn · Alan Meyers · Megan Sandel · Patrick H. Casey · Deborah A. Frank

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Abstract Evaluate homelessness during pregnancy as a unique, time-dependent risk factor for adverse birth outcomes. 9,995 mothers of children <18 months old surveyed at emergency departments and primary care clinics in five US cities. Mothers were classified as either homeless during pregnancy with the index child, homeless only after the index child's birth, or consistently housed. Outcomes included birth weight as a continuous variable, as well as categorical outcomes of low birth weight (LBW) <2,500 g and preterm delivery (<37 weeks). Multiple logistic regression and adjusted linear regression analyses were performed, comparing prenatal and postnatal homelessness with the referent group of consistently housed mothers, controlling for maternal demographic characteristics, smoking, and child

age at interview. Prenatal homelessness was associated with higher adjusted odds of LBW ($p < 0.01$) and preterm delivery ($p = 0.08$), at weight ($p = 0.08$). Postnatal homelessness was associated with these outcomes independent risk factor for adverse maternal and child health care. Timing and health care to homeless mothers may result in improved outcomes.

Keywords Pregnancy · Preterm delivery

Abbreviations
LBW Low birth weight
PRAMS Pregnancy Risk Assessment Monitoring System (PRAMS)
AOR Adjusted odds ratio
CI Confidence interval
WIC Special Supplemental Nutrition Program for Women, Infants,

Introduction

As many as 3.5 million yearly [1,2], children at 2007 to 2010 homeless 448,000–1.6 million children. Homeless children experience mental health issues, nutritional deficits, physical trauma, developmental

Homelessness During Infancy: Associations With Infant and Maternal Health and Hardship Outcomes

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What housing circumstances matter?

- 2011: multiple moves and overcrowding
- 2014: Homelessness during pregnancy (prenatal homelessness)
- 2018: Homelessness during infancy (postnatal homelessness)

<http://bit.ly/Cutts-2011>

<http://bit.ly/Cutts-2014>

<http://bit.ly/Cutts-2018>

An Evolving Conceptual Definition of Housing Instability

Timing and Duration of Pre- and Postnatal Homelessness and the Health of Young Children

Megan Sandel, MD, MPH,* Richard Sheward, MPH,* Stephanie Ittinger, Dr. Colin, MPH,* Sherry Galambos, MD, MPH,* Timothy Norman, PhD,* Maurice M. Black, PhD,* Patrick R. Casey, MD,* Mariana Olfson, PhD, MPH,* John Cook, PhD, MEd,* Stone Becker Curtis, MD,* Ruth Rose-Latham, ScD,* Barbara A. Prave, MD*

OBJECTIVE: Prenatal homelessness is associated with elevated risks of adverse neonatal outcomes. How the timing and duration of homelessness during pregnancy and/or a child's early life relate to postnatal child health is unclear.

DESIGN: We interviewed 20 571 low-income caregivers of children <4 years old in urban pediatric clinics and/or emergency departments in 5 US cities. Categories of homelessness timing were prenatal, neonatal, both, or never; postnatal duration was <6 months or >6 months.

RESULTS: A child born to a caregiver who was homeless at the time of birth had a 1.41x increased risk of being hospitalized in the first 12 months of life compared with children born to caregivers who were not homeless at the time of birth.

CONCLUSIONS: Homelessness during pregnancy and/or early childhood is associated with increased risks of adverse neonatal outcomes.

KEY WORDS: homelessness, pregnancy, child health, neonatal outcomes, pediatric.

INTRODUCTION: Homelessness is a public health problem that affects millions of people in the United States. It is associated with increased risks of adverse health outcomes, including poor mental health, substance use, and physical health problems.

OBJECTIVE: To evaluate how 2 forms of housing instability relate to caregiver and child health among low-income renter households.

DESIGN: Caregivers of children 0 to 48 months of age were interviewed in 5 urban medical centers from May 2009 to December 2015. Caregivers reported on the following: caregiver health, maternal depressive symptoms, child's health, lifetime hospitalizations, developmental risks, and 3 housing circumstances, which were categorized as being behind on rent in the past 12 months, multiple moves (≥ 2 in past 12 months), and child's lifetime history of homelessness. Associations with caregiver and child health outcomes were examined through multivariable logistic regression.

RESULTS: Of 22 124 families, 14% had at least 1 of the following adverse housing circumstances: 27% had been behind on rent, 8% had made multiple moves, and 12% had a history of being homeless. Overlap between these was limited: 80% experienced only 1 adverse housing circumstance. Each circumstance was individually associated with increased adjusted odds of adverse health and material hardship compared with stable housing. Households behind on rent had increased adjusted odds of fair and/or poor caregiver health (adjusted odds ratio [aOR]: 1.91; 95% confidence interval [CI]: 1.77-2.05), maternal depressive symptoms (aOR: 2.71; 95% CI: 2.53-2.90), child lifetime hospitalizations (aOR: 1.19; 95% CI: 1.10-1.27), fair and/or poor child health (aOR: 1.41; 95% CI: 1.28-1.54), and household material hardships. Families with multiple moves and history of homelessness had similar adverse caregiver, child, health, and hardship outcomes.

CONCLUSIONS: Three forms of housing instability were associated with adverse caregiver and child health among low-income renter households. The American Academy of Pediatrics recommends social screening within health care; providers could consider assessing for behind on rent, multiple moves, and homelessness in high-risk practices.

KEY WORDS: homelessness, caregiver health, child health, material hardship, housing instability, low-income, renter households.

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What housing circumstances matter?

- 2018: timing and duration of pre and postnatal homelessness
- 2018: Current understanding of housing instability

<http://bit.ly/Sandel-2018-2>

<http://bit.ly/Sandel-2018>

HOUSING STABILITY Vital Sign™

Since [current month] of last year,

1. Was there a time when you were not able to pay the mortgage or rent on time?

Answer is yes/no, positive screen if answer is yes

2. How many places have you lived?

Answer is # of places lived, positive screen if answer is 3 or more (i.e. multiple moves ≥ 2 in 12 mos.)

3. Was there a time when you did not have a steady place to sleep or slept in a shelter (including now)?

Answer is yes/no, positive screen if answer is yes

HOUSING STABILITY Vital Sign™

Unstable Housing and Caregiver and Child Health in Renter Families

Megan Sandel, MD, MPH¹; Richard Sheward, MPH²; Stephanie Ettinger de Cuba, MPH³; Sharon M. Coleman, MS, MPH⁴; Deborah A. Frank, MD⁵; Marlene Chilton, PhD, MPH⁶; Maureen Black, PhD⁷; Timothy Moore, PhD⁸; Justin Pasquarelli, MPA, MBA⁹; Patrick Casey, MD¹⁰; Eduardo Ochoa, MD¹¹; Diana Cutti, MD¹²

OBJECTIVES: To evaluate how 3 forms of housing instability relate to caregiver and child health among low-income renter households.

METHODS: Caregivers of children 0 to 48 months of age were interviewed in 5 urban medical centers from May 2009 to December 2015. Caregivers reported on the following: caregiver health, maternal depressive symptoms, child's health, lifetime hospitalizations, developmental risk, and 3 housing circumstances, which were categorized as being behind on rent in the past 12 months, multiple moves (≥ 2 in past 12 months), and child's lifetime history of homelessness. Associations with caregiver and child health outcomes were examined through multivariable logistic regression.

RESULTS: Of 22,324 families, 34% had at least 1 of the following adverse housing circumstances: 27% had been behind on rent, 8% had made multiple moves, and 12% had a history of being homeless. Overlap between these was limited; 86% experienced only 1 adverse housing circumstance. Each circumstance was individually associated with increased adjusted odds of adverse health and material hardship compared with stable housing. Households behind on rent had increased adjusted odds of fair and/or poor caregiver health (adjusted odds ratio [aOR]: 1.91; 95% confidence interval [CI]: 1.77–2.05), maternal depressive symptoms (aOR: 2.71; 95% CI: 2.51–2.93), child lifetime hospitalizations (aOR: 1.19; 95% CI: 1.10–1.27), fair and/or poor child health (aOR: 1.41; 95% CI: 1.28–1.56), and household material hardships. Families with multiple moves and history of homelessness had similar adverse caregiver, child, health, and hardship outcomes.

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Drs Cutti and Sandel supervised data collection at their respective research sites, conceptualized and designed the study, interpreted the analyses, and reviewed and revised the manuscript. Mr. Sheward helped conceptualize and design the study and drafted and revised the manuscript. Ms. Ettinger de Cuba and Drs. Frank, Chilton, Black, Casey, and Ochoa supervised data collection at their sites, helped conceptualize and design the study, and reviewed and revised the manuscript. Ms. Coleman conducted the analysis, provided statistical expertise, and critically reviewed the manuscript.

WHAT'S KNOWN ON THIS SUBJECT: Unstable housing circumstances, including homelessness, are critical social determinants of adult and child health. However, many housing instability definitions are limited to only homelessness or multiple moves and do not include rent strain.

WHAT THIS STUDY ADDS: Rent strain, defined as "behind on rent," is the most prevalent form of housing instability with little overlap with multiple moves or homelessness. All 3 forms were associated with adverse health outcomes for caregivers and young children.

Key words: Sandel M, Sheward R, Ettinger de Cuba S, et al. Unstable Housing and Caregiver and Child Health in Renter Families. *Pediatrics*. 2018;141(2):e20172189

PEDIATRICS Volume 141, number 2, February 2018, pp e20172189–e20172199. DOI: 10.1542/peds.20172189

ARTICLE

- Among 22,234 families, 34% had at least one adverse housing circumstance:
 - 27% behind on rent
 - 8% multiple moves
 - 12% history of homelessness
- Each circumstance individually associated with adverse health and material hardship compared to stable housing

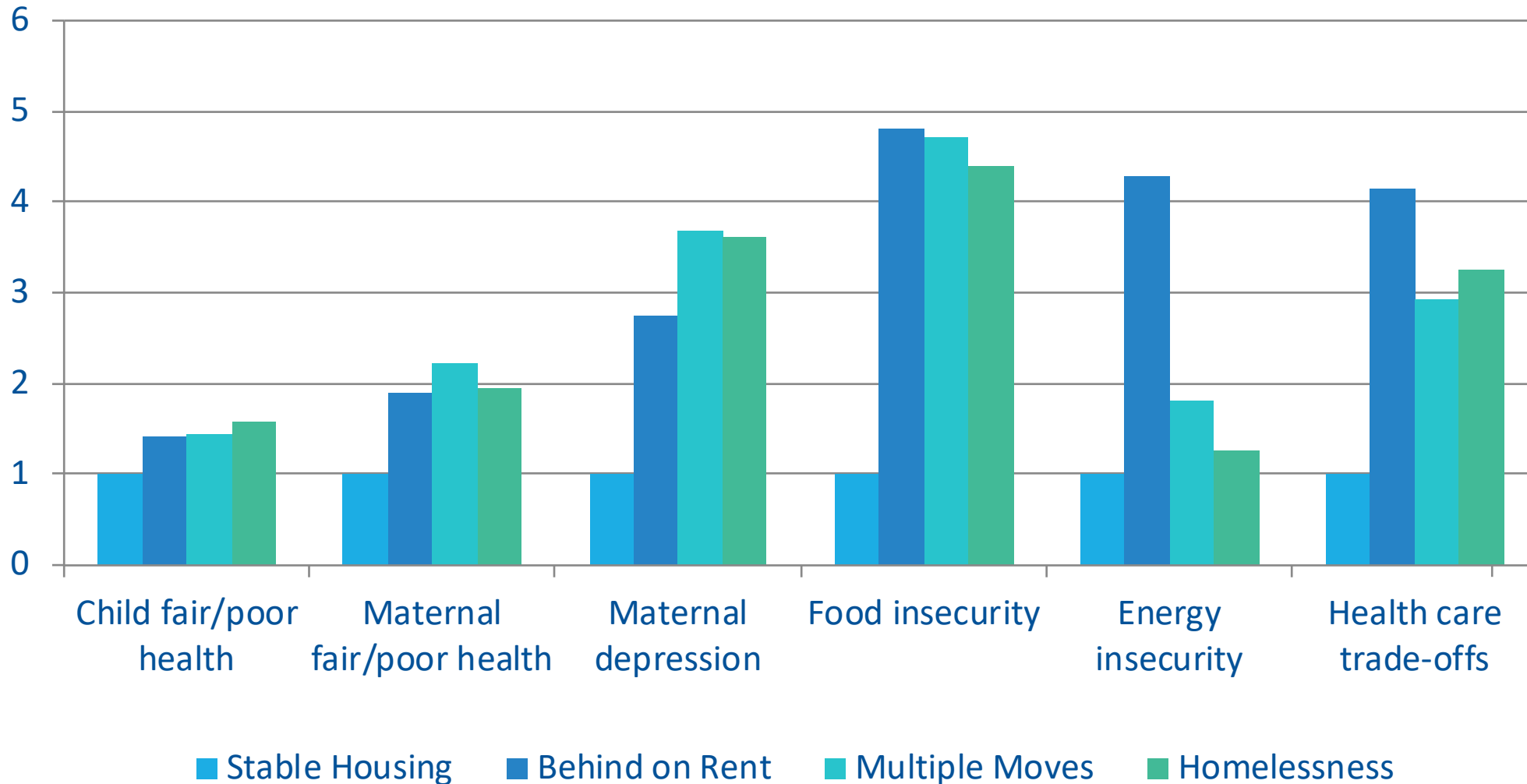
Number of adverse housing conditions

HOUSING STABILITY Vital Sign™



**Little overlap among
three adverse housing
conditions**

Outcomes of unstable housing with health and material hardship outcomes



Limitations & Next Steps

- There is no agreed upon definition of circumstances that define housing instability
- There is no gold standard housing stability measure against which the Housing Stability Vital Sign can be compared
- Investments in future research to create robust standard testing of a diagnostic tool, such as sensitivity and specificity analysis is warranted

Housing Instability Screening

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Promoting Caregiver and Child Health Through Housing Stability Screening in Clinical Settings

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Abstract

Within the health care sector, researchers, clinicians, and payers increasingly recognize the importance of the social determinants of health for improving maternal and child health. This article focuses on existing and emerging approaches to screening families for unstable housing circumstances. The authors describe how housing stability screening helps health care providers to better understand risks for caregiver and child health and wellness. They urge clinicians to screen more actively for housing stability, not just homelessness, hospitals to pursue incentive payments and alternative financial models to address housing instability, and policymakers to expand investments in housing as a health-promoting policy opportunity.

Unstable housing circumstances have been associated with a wide range of negative health outcomes, including lead exposure and toxic effects, asthma, and depression (Shaw, 2004). Housing instability is a social determinant of health variably defined by high housing costs relative to income, poor housing

quality, unstable neighborhoods, overcrowding, and homelessness (Johnson & Meckstroth, 1998; Satcher, 2010). Additional metrics have included multiple moves; eviction; and difficulty paying rent, mortgage, or utilities (Geller & Curtis, 2010; Cutts et al., 2011; Gilman, Kawachi, Fitzmaurice, & Buka, 2003; Kushel, Gupta, Gee, & Haas, 2006; Pavao, Alvarez, Baumrind, Induni, & Kimerling, 2007; Stahre, VanEemwyk, Siegel, & Njai, 2015; Suglia, Duarte, Chambers, & Boynton-Jarrett, 2013). Children's HealthWatch has previously examined health, developmental, and anthropometric correlates of housing insecurity among children younger than 3 years using crowding > 2

Competencies for Prenatal to 5 (P-5) Professionals™

[P-5.1](#) [P-5.2](#) [P-5.3](#) [P-5.4](#) [P-5.5](#)
For more information see page 4, or visit www.zerotothree.org/p-5

Why Should Health Care Screen for Housing Stability and Other Social Determinants of Health?



How Should Health Care Providers Screen for Housing Stability in Clinical Settings?

While there is no agreed upon standard for screening for and assessing housing stability, previous research and current pilot projects have indicated the need to include questions that not only identify patients currently experiencing the most severe form of housing instability—homelessness—but also to identify patients and families experiencing instability that puts their health and well-being at risk.

<http://bit.ly/Sheward-2019>

Closing Thoughts

FIND YOUR WHY



Clarity (your why)

Why am I screening for social risk?

Begets confidence (your how)

Am I using the right tool?

Followed by action (your what)

The work I do everyday!

Thank You!

The mission of Children's HealthWatch is
*to improve the health and development of young children by
informing policies that address and alleviate economic hardships.*



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- The webinar recording and slides will both be available on the SIREN website (sirennetwork.ucsf.edu) next week.
- Please give us feedback on this webinar by filling out the evaluation survey: <http://bit.ly/SIRENJuly18>

