

# State of the Science on Social Screening in Healthcare Settings

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## State of the Science of Screening in Healthcare Settings

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## Introduction & Rationale

In response to a strong, consistent, and still growing body of evidence documenting the impacts of social factors (e.g., income and education) on health outcomes, healthcare organizations are increasingly considering their roles and responsibilities related to social determinants of health—the conditions in which people live, work, and play.<sup>1</sup>



These considerations include whether healthcare systems should undertake more systematic efforts to identify social and economic risk factors for poor health. Stakeholders have reported a wide range of motivations for screening for these risks in clinical settings, including:

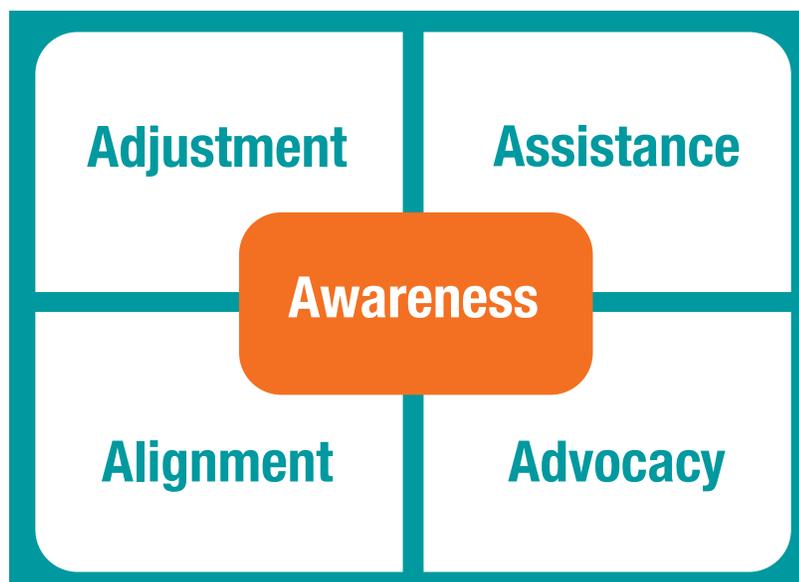
- Catalyzing efforts to routinely bridge patients to community or government social services;
- Informing point-of-care and population management decisions;
- Improving reimbursement and risk adjustment to better support systems serving socially marginalized populations;
- Expanding healthcare data metrics that can inform policy and systems change; and
- Strengthening the quality of research on social factors that affect health.

These motivations helped to inform the 2019 National Academy of Sciences, Engineering and Medicine (NASEM) report on *Integrating Social Care into the Delivery of Health Care to Improve the Nation's Health*, which placed efforts to identify patients' social risks and

assets (which the committee termed “Awareness”) at the center of multiple “action strategies” (including “Adjustment,” “Assistance,” “Alignment,” and “Advocacy”) that healthcare systems can take to either address or mitigate the impacts of social adversity with the intention of improving individual and population health. (See Figure 1.)<sup>‡</sup>

The NASEM report both catalyzed and reflected growing interest in Awareness activities, which include (though are not limited to) patient-facing, point-of-care screening to identify patients’ social risks and assets (“social screening”). The proliferation and adoption of social screening tools—including measure sets developed by NASEM,<sup>2</sup> the National Association of Community Health Centers and the Association of Asian Pacific Community Health Organizations,<sup>3</sup> and the Centers for Medicare and Medicaid Services (CMS)<sup>4</sup>—underscores the speed with which activities related to Awareness are evolving. Most recently, the enthusiasm for social screening also has come to the fore in discussions about social screening quality measure development at CMS,<sup>5</sup> the National Center for Quality Assurance,<sup>6</sup> and many state Medicaid agencies.<sup>7</sup>

<sup>‡</sup>Since the publication of the original NASEM 5A Framework, subsequent work has emphasized that activities in each category will need to be designed and/or tailored specifically to ensure that they contribute to racial health equity. In this report, we highlight evidence about social screening in racially and ethnically diverse populations. See Gottlieb, LM, Lindau, ST, & Peek, ME. Why add “abolition” to the National Academies of Sciences, Engineering, and Medicine’s Social Care Framework? *AMA Journal of Ethics*. 2022;24(3):E179-180.



**Figure 1. NASEM Social Care 5A Framework**

Adapted with permission from National Academies of Sciences, Engineering, and Medicine. 2019. Integrating Social Care into the Delivery of Health Care: Moving Upstream to Improve the Nation’s Health. Washington, DC: The National Academies Press.

# All that to say: Social screening has captured the nation's attention.

Although health services research on social screening (and related interventions) continues to increase, a sufficient body of evidence has been published to justify pausing to inventory, scrutinize, and synthesize what we already know. Though we recognize it can feel artificial to distinguish between screening and subsequent interventions, screening itself has become the focus of new policy decisions and there is sufficient research on screening to examine its implementation and effects on healthcare stakeholders. For instance, in the context of growing enthusiasm for screening from policymakers and payers, how are healthcare systems putting screening recommendations into practice? What do patients and healthcare providers think about these practices? Are social data being used to improve care? Is it possible that screening alone could inadvertently worsen patients' experiences with the healthcare system?

The dual goals of this report are to **synthesize and disseminate recent research** and **surface key knowledge gaps** that should be addressed to meaningfully inform efforts to implement and scale screening practices in the US healthcare system.

We start by looking carefully at the literature on social screening, highlighting the findings that we found most intriguing alongside the many unanswered questions. Findings are divided into sections, each of which can be read on its own, although certainly a committed reader is welcome to read the report cover to cover! The Executive Summary is also [available here](#).

Our hope is that this synthesis will spur a commitment to learning more about social screening and social care interventions in coming years, with the goal of ensuring that these activities not only aspire to improve health equity but also are designed and implemented in ways that achieve it.

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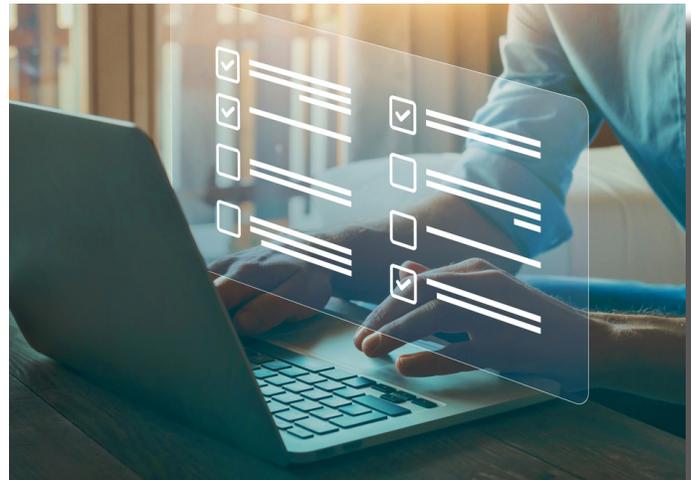
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## Overview of Social Screening Tools

Social screening tools are sets of standardized questions used to assess the social and economic risks/assets of patients and populations. In this report, we focus on social screening tools that have been used in healthcare settings and include assessments of two or more social domains (e.g., food security and housing stability) in contrast to measures of only a single domain (e.g., food security). A summary of relatively common multi-domain social screening tools used in both pediatric and adult medicine populations is maintained by [SIREN](#). Notably, many health systems also have customized tools based on provider and/or patient input so the tables do not reflect all the tools used across the US.



In reviewing the abbreviated table below and the materials on the SIREN website, it is readily apparent there is no clear consensus about which social domains should be universally included in standardized healthcare-based social screening tools, though many of the common tools currently include questions related to food security, housing stability, transportation security, and safety. Some tools center on a core set of social domains but can be lengthened to incorporate optional additional questions that cover other social domains (e.g., social isolation, history of incarceration). Even those tools that include the same domains rarely use the same measures to assess those domains. Assessments related to resilience, sources of pride/confidence, patient activation, and social supports, each of which may influence the impact of risks on health, are rarely

included in screening tools. Instead most tools use risk-based rather than asset-based framing. For example, food security screening is framed around how often a respondent worried about food and transportation screening around how often a respondent lacked transportation, but no data are available about how risk vs. asset framing affects patient experiences of screening.

It is important to note that the tools are likely to change over time. For instance, in the context of the COVID-19 pandemic, new attention has focused on screening for broadband access, digital literacy, and experiences of racism and discrimination.

More detail about the psychometric properties of existing multi-domain tools is available in [Section Two](#).

**Table 1. Social Screening Tool Examples**

	PRAPARE <sup>‡</sup>	Accountable Health Communities (AHC) <sup>§</sup>
# of Social Risk Questions	17	19
# of Non-Social Risk Questions	4	8
Patient or Clinic Population	Community Health Centers	Medicare & Medicaid
Reading Level*	8th grade	8th grade
Reported Completion Time	Not reported	Not reported
Languages	25 Languages	No CMS-endorsed translations available
Scoring	No	Yes
Cost	Free	Free
Number of Questions in Each Domain		
Benefits	-	-
Caregiver Responsibilities	-	-
Childcare Access & Affordability	1	-

<sup>‡</sup> For more information on the PRAPARE tool, visit [www.prapare.org](http://www.prapare.org).

<sup>§</sup> For more information on the AHC tool, visit <https://innovation.cms.gov/files/worksheets/ah-cm-screeningtool.pdf>

	PRAPARE <sup>‡</sup>	Accountable Health Communities (AHC) <sup>§</sup>
Civic Engagement	-	-
Clothing	1	0
Disabilities	-	2
Discrimination	-	-
Education	1	1
Employment	1	1
Financial Strain		1
Food Insecurity	1	2
Health Care/Medicine Access & Affordability	2	0
Housing Insecurity/Instability/Homelessness	2	1
Housing Quality	-	1
Immigration/Migrant Status/Refugee Status	2	-
Incarceration	1	-
Income	1	-
Interpersonal Violence (IPV)	1	1
Literacy	-	0
Neighborhood Safety	1	0
Power of Attorney/Guardianship	-	-
Social Support	1	2
Stress	1	1
Transportation	1	1
Utilities	2	1
Veteran Status	1	-
Workplace Safety	-	-
Desire for Assistance/Urgent Needs	-	Integrated into some domains
Health Behaviors/Behavioral Health/Health Status	-	Mental health; Physical activity; Substance use

**Social Risks Screening Tool Comparison Table**

**Pediatric Settings Social Risks Screening Tool Comparison Table**

## Research Methods

We set out to systematically review the literature published between 2011 and 2021 on social screening in US healthcare contexts. We grounded the overarching review by first updating our 2019 effort to assess the prevalence of social screening in healthcare settings. ([See Section One.](#)) All subsequent work on this project was informed by conversations with five stakeholder groups (including patients/consumer advocates, healthcare professional organizations, payers, policymakers, and community-based organizations), which together helped us to determine key review topics and to establish themes to guide study abstractions. Detailed methods/results of those stakeholder group conversations will be published elsewhere. In brief, stakeholders prioritized four topics:



- Psychometric properties/validity of screening tools;
- Patient and patient caregivers' perspectives on social screening;
- Healthcare providers' perspectives on social screening; and
- Strategies for implementing social screening in clinical settings.

In each of these content areas, the five stakeholder groups encouraged the research team to look specifically at how outcomes varied by patient race, ethnicity, and language.

On the two topics where there was not yet a published review (patient and patient caregivers' perspectives on social screening and implementation research) the team engaged in a new systematic scoping review process, including by developing search terms, establishing inclusion and exclusion criteria, abstracting data from the included articles, and synthesizing results. On topics where either a systematic review (psychometric properties of screening tools and healthcare providers' perspectives on social screening) or other summary of the evidence had already been published, the research team updated the most recent review.

**Table 2. Methodological Approach by Content Area**

Content Areas Prioritized by Five Stakeholder Groups	New Systematic Review	Updated Existing Review
Psychometric properties of screening tools		X
Patient and patient caregivers' perspectives on social screening	X	
Healthcare providers' perspectives on social screening		X
Implementation research	X	

As a bonus, we added brief synopses on two social screening “hot topics”: [Social Screening Versus Interest in Assistance \(p. 47\)](#) and [Can Area-Level Information Substitute for Patient-Level Social Screening? \(p. 49\)](#).

Details about methods are included at the beginning of each section when relevant to interpreting findings. Additional information about the scoping review methods is included in [the Data Sources and Search Tools Appendix](#).

# **Literature Review Findings**

## Section One

# Prevalence of Social Screening in US Healthcare Settings

A 2019 published literature review<sup>1</sup> synthesized data from 15 different cross-sectional surveys that assessed the prevalence of social screening in diverse US healthcare settings.<sup>2-16</sup> The authors concluded that caution is warranted when developing nationwide estimates for social screening both because point prevalence varied widely across studies and surveys were generally poorly designed.



Since the original review, new federal and state policy requirements and new health professional practice recommendations are likely to have led to an increase the prevalence of screening. As an example, the Kaiser Family Foundation's Survey of Medicaid Officials indicated that by 2021, almost half of state Medicaid agencies had established requirements for social needs screening in state Medicaid managed care contracts.<sup>17</sup> But understanding whether this policy enthusiasm has translated to changed practices and wider screening reach requires national data on the prevalence of screening, which includes both the prevalence across organizations (i.e., number of healthcare organizations reporting screening among all healthcare organizations) and the reach of screening within each organization (i.e., numbers of patients being screened among all

patients). To update the earlier work on estimating prevalence, we again turned to national surveys that collected information on either/both of these prevalence indicators, this time looking for surveys administered between mid-2018 through 2021.

In an earlier study, the SIREN team conducted a review of national surveys measuring the prevalence of social care activities in healthcare settings in the US. The original study used snowball sampling to solicit input from 29 expert informants; who were asked to share any knowledge about survey instruments that included questions on the prevalence of social care-related activities conducted in healthcare settings. Using the experts' input on specific survey initiatives, we ran web searches to identify surveys fielded with a national sample and conducted between Jan 1, 2007 and May 31, 2018.

In 2022, we updated the prior review by a) searching the websites of organizations that had fielded the original surveys; and b) running new web searches to identify other potentially relevant surveys that collected data between June 2018 and December 2021.

We found 11 new surveys that had collected data between 2018 and 2021 that we could use in our effort to update estimates on the national prevalence of social screening in healthcare payer and/or delivery organizations.<sup>18-27</sup> Two surveys asked about state Medicaid agencies' social screening requirements.<sup>17,20</sup> Two surveys included questions about social screening generally,<sup>19,26</sup> six about screening for specific social domains,<sup>18,21-25</sup> and one survey reported both general and specific results.<sup>27</sup> Among surveys that asked about social screening activity generally, the prevalence of screening ranged from 56-77%.<sup>19,26,27</sup> The highest estimate was reported among American Hospital Association member hospitals;<sup>27</sup> the lowest prevalence was reported in a survey of health IT professionals.<sup>26</sup> In surveys asking about the prevalence of screening for specific social screening domains, reported prevalence ranged

from 23-80% for educational attainment,<sup>18,21-23,25</sup> 49-73% for employment/income,<sup>21-25,27</sup> 25-100% for food security,<sup>18,21-25,27</sup> 37-100% for housing,<sup>18,21-25,27</sup> 58-84% for social isolation/belonging,<sup>18,21-23,27</sup> 41-90% for transportation,<sup>18,21-23,25-27</sup> 36-84% for utilities,<sup>18,21-23,27</sup> and 60-86% for violence.<sup>18,21-23</sup> From mid-2018-2021, the highest prevalence of screening in each of these domains was reported from surveys conducted with Medicaid managed care organizations.<sup>21-23</sup>

In the updated review, we faced limitations to deriving meaningful prevalence estimates and to assessing change over time. So while it generally appears screening is increasing, the data are not crystal clear. We found wide variation in prevalence estimates across surveys in both the initial and more recent searches. Other limitations of the data include that several surveys failed to report response rates; questions were worded differently across surveys (and sometimes across repeated survey administrations, i.e. when the same organization fielded a second survey); and the social domains assessed differed between surveys (e.g., one survey asked about housing stability

## Is the prevalence of screening changing?

Recent surveys indicate an overall increase in reported screening prevalence at the organizational level (low-end survey estimates have shifted from 15% of organizations surveyed reporting social screening in earlier studies to 56% by 2021). Reasons we lack confidence that this finding reflects a true change in prevalence:

- **Surveys do not include patient/member denominators.** Organizational survey respondents can endorse social screening even when screening programs are limited to one setting or even one group of patients, e.g., patients with diabetes that attend group visits, rather than available to the entire served population. The lack of a patient/member denominator makes it impossible to gauge the actual reach of screening. Recent national prevalence surveys have not been repeated with patient/member respondents. (Also see Section 5 Implementation Practices)
- **Survey response rates are typically low or not reported**, which elevates concerns re: response bias (i.e., those organizations responding to surveys are more likely to be involved in screening activities.)
- **Survey items have not been validated and rely on self-report.** Interpretation of “social screening” and familiarity with screening activities in institutional clinical settings are both likely to differ across survey respondents.

screening and another about interpersonal violence). See the [Section One Appendix Table](#) for detailed information about the 11 more recent surveys.

## Key Findings

- Eleven surveys fielded between mid-2018–2021 report on the prevalence of social screening in different patient populations and healthcare settings;
- Survey reports indicate that prevalence of social screening varies by social domain, setting, and respondent. Overall estimates range from 56-77%. By domain, estimates range from 23% (screening for education; sample of healthcare delivery executives) to 100% (screening for housing; sample of Medicaid managed care organizations);
- No survey assesses the prevalence of screening across all US healthcare settings, yet aggregation across sources is limited by differences in questions used in different surveys;
- Although it appears that screening prevalence may be increasing, it is difficult to assess changes in screening prevalence over time due to variability in survey questions and populations surveyed.

[See Section One references.](#)

## Section Two

# Psychometric and Pragmatic Properties of Social Screening Tools

In other areas of medicine, screening measures often are subject to rigorous measure development and testing before widespread adoption. For example, commonly-used depression screening questionnaires have undergone multiple forms of validity testing.<sup>1</sup> So as interest around social screening grows, important questions emerge about whether existing social screening tools reliably and accurately capture relevant information about social context. Assessing validity can involve many different approaches. See [Definitions: Types of Validity Testing on page 19](#) for definitions of validity.



A 2019 systematic review by Henrikson et al. described many psychometric and pragmatic properties of 21 social screening tools published in the peer reviewed literature between 2000 and 2018.<sup>2,3†</sup> The authors found that screening tools had rarely been tested using gold standard tools for assessing psychometric validity.<sup>2</sup> Eight studies reported that a specific tool had undergone some reliability or validity testing, but there were no available data regarding half

† More details about the screening tools evaluated by Henrikson et al. are available in a technical brief prepared for the USPSTF: <https://jamanetwork.com/journals/jama/fullarticle/2783975>

of the key validity topics (e.g., discriminant validity, known groups validity, structural validity, or responsiveness). Generally favorable pragmatic evidence was available for 20/21 tools (e.g., tools were highly readable, easily administrated, or low cost). However, the lack of psychometric evidence made it impossible to sufficiently explore the relationship between psychometric and pragmatic evidence. Based on the studies reviewed, there was no information provided regarding if or how validity measures varied by race, ethnicity, or language.

To update the earlier work, we used the same search terms as used by Henrikson et al. with the goal of identifying more recently published research. We found five articles<sup>4-8</sup> published since the 2019 systematic review that met inclusion criteria (see Methods box below). Three articles described multiple psychometric properties of new tools (Duke Population Health Profile,<sup>5</sup> SINCERE,<sup>4</sup> and TLS-C<sup>7</sup>) or compared older tools that had been previously described by Henrikson et al. (WE CARE, AHC, YCLS, and the Children’s Health Watch Housing questions<sup>6,8</sup>).

We used search terms detailed in the 2019 systematic review conducted by Henrikson et al. that evaluated the psychometric and pragmatic properties of 21 social screening tools to identify articles published since the original review up until August 8, 2021.

Inclusion criteria:

- Articles published in the peer-reviewed literature;
- Studies had to examine the psychometric properties of multi-domain social screening tool(s) for 2+ types of validity and/or reliability (e.g., internal consistency [reliability]; construct validity [convergent, structural, discriminant]; and/or criterion validity [predictive, concurrent]).

Two reviewers abstracted articles for properties related both to psychometric and pragmatic validity (including cost, accessibility of language, ease of training, ease of interpretation, and tool length).

## Methods

**Psychometric validity:** Degree to which evidence and theory support the interpretations of test scores entailed by proposed uses of tests

**Internal consistency:** Degree to which different items that purport to measure the same construct produce similar scores in the same test

**Construct validity:** Degree to which a test or instrument can measure a concept, trait, or other theoretical entity. Types of construct validity include:

- *Convergent:* Degree to which two constructs that are theoretically related are in fact related
- *Discriminant:* Degree to which two constructs that are theoretically distinct are in fact distinct
- *Known groups:* Degree to which distinct groups with differing characteristics can be differentiated

**Criterion validity:** Degree to which a test correlates with an established standard of comparison

- *Predictive:* Degree to which a measure can predict or correlate with an outcome of interest measured at some point in the future
- *Concurrent:* Degree to which two measurements taken at the same time are correlated, and the measure under consideration is compared to an established measure of the same construct

**Structural validity:** Degree to which all test items rise and fall together, otherwise known as “test structure”

**Responsiveness:** Degree to which a measure can detect clinically important changes in the construct it measures over time

**Norms:** Degree to which a measure can be considered generalizable, as assessed by indicators such as sample size, means, and standard deviations

**Pragmatic properties:** Degree to which a measure can be sustainably adopted, implemented, and interpreted

**Length:** Number of items, ranging from poor (>200 items) to excellent (<10 items)

**Ease of interpretation:** Ease of interpreting/scoring findings from the tool, ranging from poor (requires an expert to score and interpret, though no entity to whom to send the measure is identified, and no information on handling missing data is provided) to excellent (includes clear cut-off scores with value labels, instructions for handling missing data are provided, and calculation of scores is automated or scores can be sent off to an identified entity for calculation with results returned)

**Cost per use:** Per-use cost of using tool, ranging from poor (>\$100 per use) to excellent (free)

**Accessibility:** Readability of the tool, ranging from poor (content-level expertise required) to excellent (below 8th grade reading level)

As in the prior review, we found that no tool development process followed every step of gold standard measure development, though all used at least one. The most commonly assessed validity constructs were internal consistency (N=4), structural validity (N=4), and concurrent validity (N=3). Most studies did not describe assessing pragmatic validity. Some authors provided information regarding tool length, but no studies included details regarding cost, language accessibility, or ease of training. Only Guo et al., who evaluated the SINCERE tool, described the ease of interpreting its score.<sup>4</sup> The authors were also the only ones to explore whether validity measures varied by race and ethnicity; they identified no statistically significant differences. None of the studies assessed whether there were any differences by language of administration.

A list of examined domains can be found below in the Outcomes Measured box. See the [Section Two Appendix Table](#) for detailed information about each of the five recently published studies.

## Outcomes measured

- Psychometric properties (N=5)
  - Internal consistency (N=4)
  - Construct validity (N=4)
    - Structural (N=4)
    - Convergent (N=1)
    - Discriminant (N=1)
  - Criterion validity (N=4)
    - Concurrent (N=3)
    - Predictive (N=3)
    - Responsiveness (N=0)
  - Known groups (N=0)
  - Norms (N=1)
- Pragmatic validity (N=4)
  - Length of time needed to complete (N=4)
  - Ease of interpretation (N=1 new tools)
  - Cost, accessibility (N=2)
- Association between psychometric and pragmatic evidence (N=0)

## Key Findings

- The very limited testing of the psychometric and pragmatic validity of different social screening tools has left important gaps in evidence to guide screening tool selection.
- Only one study provided information regarding how validity constructs varied by race and ethnicity (no differences were reported). None of the studies explored differences by language.

[See Section Two references.](#)

## Section Three

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# Patient and Patient Caregivers' Perspectives on Social Screening

We identified 18<sup>1-18</sup> studies published between 2012 and 2021 that explored patient and/or caregiver perspectives regarding multi-domain social screening in the US. These descriptive studies covered a range of patient/caregiver perspectives, including:

- Perceived rationale for social screening in healthcare settings;
- General acceptability of social screening;
- Factors that influence the acceptability of social screening;
- Perceptions regarding social screening context, administration, and domains; and
- Acceptability of social data documentation and data sharing.



Four articles assessed the perspectives of adolescent/young adults; 11 included adult patients. An overlapping nine articles assessed the perspectives of the adult caregivers of pediatric patients. Most studies sampled racially or ethnically diverse populations, although only two deliberately assessed a specific racial or ethnic group's perspectives on social screening. See the [Section Three Appendix Table](#) for detailed article information.

## Methods

- We developed search terms for a systematic scoping review of peer-reviewed literature published on multi-domain social screening tools;
- To be included, studies had to assess patient and/or caregiver perspectives about social screening in healthcare settings;
- Reviewers abstracted each included article to capture information on the following categories (and differences by patient characteristics):
  - Perceived rationale for social screening in healthcare settings; general acceptability of social screening;
  - Factors that influence acceptability of social screening; perceptions regarding social screening context, administration, and domains; and
  - Acceptability of social data documentation and data sharing.

Collectively the studies had important methodological limitations (e.g., small sample sizes and participant selection bias) and used a wide range of constructs (e.g., appropriateness, comfort, or acceptability) to measure similar concepts. Together, these factors limited our ability to compare and generalize the results of these studies. Findings are summarized below but should be interpreted in the context of these limitations.

Five [6.10.12.13.16](#) of the eight [1.6.7.10.12.13.16.18](#) studies exploring the rationale for screening in healthcare settings indicated that most patients believed their clinician or health system should use social needs information to improve care for patients. One of these studies found that patients who identified as Hispanic or Black were more likely than patients who identified as White or Asian or Pacific Islander to agree that social needs information should be used to improve care, and that females were more likely to agree than males.<sup>6</sup>

Among the 12 studies that assessed patient and patient caregivers' perspectives regarding the acceptability of social screening generally, [3-6,8,11-13,15,17,18](#) eight reported that most of their participants found social screening acceptable. [4-6,8,11-13,16](#)

Several factors affected acceptability:

**Setting:** One study found that patients recruited in EDs had lower odds of perceiving social screening to be appropriate than those recruited in primary care.<sup>5</sup> The authors also found that patients recruited from settings where



≥80% of the patient population was publicly insured or uninsured had higher odds of perceiving social screening to be appropriate relative to those recruited from settings where lower proportions (<80%) were publicly insured or uninsured.

**Trust/discrimination:** Seven studies suggested that patients' trust in their provider(s) influenced perceived acceptability of social screening. [5,10,12,15-17,18](#) One study found that patients who had experienced discrimination in a healthcare setting were less likely to find social screening acceptable.<sup>5</sup>

**Experience of social care:** Two studies indicated that prior experiences with social screening increased the odds of perceived acceptability.<sup>4,5</sup>

**Demographic factors:** Five studies examined differences in overall acceptability by select demographic factors,<sup>3-6,11</sup> including:

- **Race/ethnicity:** Three studies explored differences by race/ethnicity,<sup>3,5,6</sup> findings were not consistent across studies.
  - One found that the odds of social screening acceptability were lower among participants of Asian or Pacific Islander descent relative to white patients.<sup>6</sup> In contrast, another study that included Asian populations found no differences in acceptability.<sup>3</sup> None of the three studies found other differences in acceptability by race/ethnicity, including among patients who identified as Black, Hispanic, white, or other/multiple races.<sup>3,5,6</sup>
- **Gender:** Three studies explored differences by gender;<sup>3,5,6</sup> findings were not consistent across studies.
  - One study found that the odds of social screening acceptability were lower among males relative to females.<sup>6</sup> In contrast, the other two found no differences in acceptability by gender.<sup>3,5</sup>
- **Other sub-group demographics:** No differences were identified among studies that assessed acceptability by preferred language,<sup>5</sup> socioeconomic status,<sup>4,5</sup> age group,<sup>3,5,6</sup> education,<sup>4,5</sup> or high vs. low literacy status.<sup>11</sup>

Across the two studies in which most participants did not indicate that social screening was acceptable,<sup>3,15</sup> only one described specific elements of screening that participants described as concerning, including the potential for stigmatization and concerns about data documentation, storage, and privacy.<sup>15</sup>

One study described patient perspectives on ways to frame/introduce screening to increase patient comfort, including: messaging regarding the purpose of screening, including both patient and community benefits; normalizing the process to avoid making patients feel singled out; and ensuring data privacy.<sup>17</sup>

In one study predominantly comprised of Latinx caregivers, Spanish- and English-speaking participants noted that clinicians' linguistic and cultural incongruence gave rise to communication issues; some participants indicated that nurses and community health workers reduced those barriers.<sup>18</sup>



**Five studies narrowed questions about acceptability to specific screening domains:**<sup>1,2,7,12,13</sup> food security,<sup>1,13</sup> housing stability or quality,<sup>1,2,13</sup> social isolation,<sup>7,13</sup> transportation,<sup>13</sup> human trafficking,<sup>2</sup> financial constraints,<sup>3,4</sup> employment status,<sup>7</sup> and immigration.<sup>12</sup> Most participants found screening for these domains acceptable.

- **Human trafficking:**

- Black and Latinx patients were more likely to find screening for human trafficking acceptable than white patients.<sup>2</sup>
- Adolescents were less likely to find screening for human trafficking acceptable than adult caregivers of pediatric patients.<sup>2</sup>

**Social data documentation and sharing:** Nine studies assessed participants' perspectives about social data documentation and sharing, including privacy concerns.<sup>1,5,7,10,13,15-17,18</sup> In six of these studies, participants raised concerns about how social data would be documented, shared, updated, and/or used.<sup>1,10,13,15,17,18</sup>

Two studies explored adverse outcomes of social screening in patients who had experienced healthcare-based social screening.<sup>17,18</sup> One primarily sampled white patients and found that selectively screening individuals with public insurance made those patients feel stigmatized.<sup>17</sup> The other primarily sampled Latinx

caregivers and described: participants' discomfort with disclosing social factors without a subsequent conversation/follow-up, concerns regarding privacy and oversurveillance, and concerns regarding time lost for discussions about higher priority health issues.<sup>18</sup>

## Outcomes

- Rationale of social screening (N=8)
- General acceptability of social screening in healthcare settings (N=12)
  - Differences by demographic factors (N=5)
  - Differences by prior healthcare experiences (N=7)
- Perspectives on administration of screening (N=13)
- Perspectives on specific screening domains (N=6)
- Perspectives on data documentation and sharing (N=9)

## Key Findings

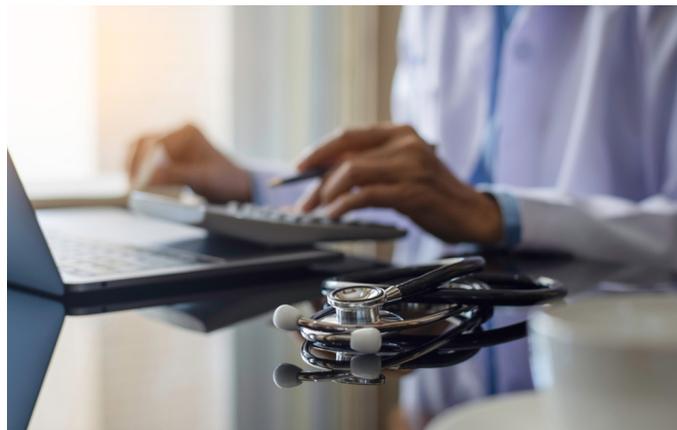
- The majority of patients/caregivers in 8/12 of studies where it was assessed thought social screening in healthcare settings was acceptable;
- Trust in providers and prior experience of social screening were associated with higher acceptability;
- There were no consistent differences in acceptability by race/ethnicity or gender across studies;
- Participants from 6/9 studies raised concerns about how social screening data would be documented, shared, updated, and/or used;
- The existing research on patient perspectives is qualitative, and much of it comes from studies with small sample sizes. Deeper and more rigorous research is needed to better inform patient-centered approaches to social screening.

[See Section Three references.](#)

## Section Four

# Healthcare Providers' Perspectives on Social Screening

A recent systematic scoping review examined the academic literature published through July 2019 that explored healthcare providers' knowledge, attitudes, beliefs, and behaviors (KABB) related to healthcare-based social screening and referral interventions.<sup>1</sup> "Healthcare providers" included:



- Physicians, residents, and medical students;
- Advanced practice providers (APP) and trainees;
- Nurses;
- Social workers, community health workers (CHWs), and case managers;
- Pharmacists; and
- Clinic/hospital staff, including leadership/administrators.

With the goal of updating that systematic review, we returned to the literature to find studies published after July 2019 (or studies missed in the original review) about healthcare providers' perspectives on social screening.

## Methods

- We updated an earlier systematic scoping review that examined provider perspectives of healthcare-based social screening and referral activities;
- The updated search captured studies that evaluated healthcare providers' (defined in text) perspectives on screening for two or more social domains in any healthcare setting;<sup>‡</sup>
- One reviewer abstracted new studies using the same abstraction table used in the original review, which included information on type of study, sample characteristics, study setting, key outcomes.

<sup>‡</sup> The original review did not exclude studies that only involved work on one social risk domain.

Below we summarize findings from a total of 73 studies that were either included in the original report or found in the more recently published literature with a particular focus on healthcare providers' attitudes and beliefs around the acceptability of social screening.

See the [Section Four Appendix Table](#) for additional information about each included study. Studies were categorized as “intervention studies” (N=43), which took place in the context of a specific social screening initiative or medical education or training program<sup>2-44</sup> or “non-intervention studies” (N=30), which presented findings from surveys, interviews, or focus groups more generally exploring providers' KABB of social screening in clinical settings outside the context of a clinical initiative.<sup>45-74</sup> Almost universally, studies were generally of low methodological quality and used a wide range of outcomes to assess provider perspectives about social screening initiatives, which makes it difficult to generalize findings. Taking those barriers into account, we briefly highlight findings from this overall body of work, emphasizing that findings from the 20 newer studies largely aligned with results of the original published review.

## Outcomes

- Acceptability of screening in health care (N=34)
- Comfort assessing/addressing identified social needs (N=24)
- Effects of screening on provider-patient relationship (N=18)
- Barriers to social screening in healthcare delivery (N=42)

Providers across a range of healthcare settings and roles generally reported believing that social screening was acceptable and appropriate in healthcare settings and had the potential to improve patient health outcomes. [2,3,6,13,20,37,43,50,53,55–58,60,62,67,69,70,72](#)

Providers perceived a range of benefits of collecting information on patients' social risks, including:

- Improving care delivery; [3,6,13,17,36,46,53,56,58,62](#)
- Improving patient health and well-being; [45,46,50,55,56](#) and
- Facilitating patient communication/trust. [11,13,17,25,26,29,40,43,50,53,56](#)

In several cases, study participants reported believing it was within their individual and/or collective scope of practice to help patients with their social needs. [3,13,17,20,28,47,48,53,55,57,58,62,63,65,70](#) Opinions differed across studies about the optimal workforce to conduct screening in clinical settings (e.g., ancillary staff, physicians, social workers). [11,27,35,42,51,53,56–59](#)

- Six studies assessed the perspectives of frontline staff—who were often tasked with administering social screening. Findings in these studies were mixed: [2,21,28,42,58,74](#)
  - **Emergency department (ED) settings:** In one ED-based study, frontline staff viewed screening across multiple domains as acceptable, [58](#) though a different study also indicated that ED registration staff were uncomfortable asking questions they believed could be stigmatizing. [42](#)

- **Primary care settings:**
  - In one study, staff emphasized the administrative burdens related to screening in primary care settings;<sup>21</sup> in contrast, another study reported that almost all staff involved in a pilot social screening initiative agreed that screening benefitted patients and was worth the additional work.<sup>3</sup>
  - In a third primary care-based study, staff responsible for screening described potential benefits of screening (both helping patients meet health goals and clarifying community needs) but that lack of community resources could simultaneously lead to feelings of frustration and futility among staff. Participants also emphasized that specific messaging around screening was likely to make patients more comfortable, e.g., messages to clarify the rationale for screening, normalize screening as something done for all patients, and ensure confidentiality of results.<sup>74</sup>

Health professional education and training about screening and referral programs improved physician trainees' comfort, confidence, and behaviors related to social screening.<sup>6,20,24,33,37</sup>

- Studies examining the impacts of provider education and training about social screening in both simulated and real-life settings showed improvements in both resident and advanced practice provider trainees' knowledge about socioeconomic needs generally and identifying and addressing those needs, specifically.<sup>6,12,19,20,33,36,37</sup>
- In one study, a majority of hospitalists and nurses surveyed expressed a desire for more training to improve their ability to screen for social risks and felt social determinants of health education should be provided during professional training; only one-third reported receiving such training.<sup>54</sup>

Despite these largely positive findings, providers participating in these studies raised important implementation concerns and noted structural limitations related to integrating social screening into busy clinical settings.

Concerns generally fell into four categories:

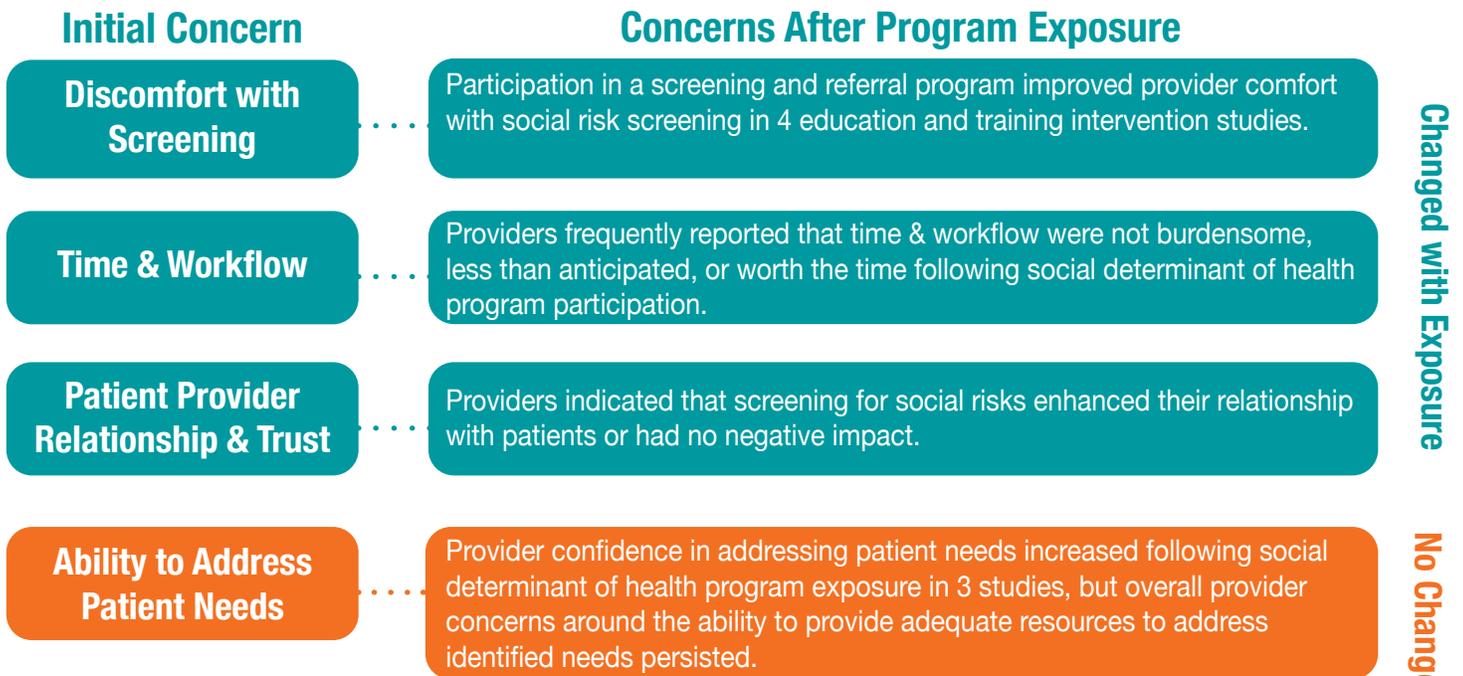
- **Insufficient time and workflow disruption.** [2-5,11,17,20,21,24,36,44,45,46,48,50-54,57,59,60,65,67,72,74](#) This category included worries that the time needed to address identified needs could contribute to provider burnout;<sup>53</sup>
- **Provider discomfort with screening.** [4,5,11,17,20,21,24,44,54](#) Discomfort was sometimes linked to lack of training<sup>54,56</sup> and sometimes related only to screening for specific social domains (e.g., income, crime, and violence);<sup>51,52</sup>
- **Patient discomfort/negative impacts on provider-patient relationship.** This included concerns that topics raised may cause patients to feel shame or stigma and damage patient-provider relationships. [4,7,11,21,29,39,43,67](#) The concern about relationships was raised particularly in settings where providers and patients did not have a pre-existing relationship (e.g., emergency departments or inpatient wards);<sup>56</sup>
- **Insufficient knowledge or resources to adequately address identified needs.** [5,11,17,20,21,25,29,40](#) These concerns typically revolved around providers' (a) desire for more knowledge/confidence to address socioeconomic needs; (b) uncertainty regarding the effectiveness of resource lists and referral networks in their interventions; and (c) interest in more systems-level logistical support and material resources. The most common knowledge gaps reported related to tools and resources needed to address patients' needs. This knowledge gap was not mentioned in studies conducted with social workers.

Among the 43 intervention studies, 25 examined the impacts of a social screening program and/or provider-focused education about social care on providers' perceptions of screening

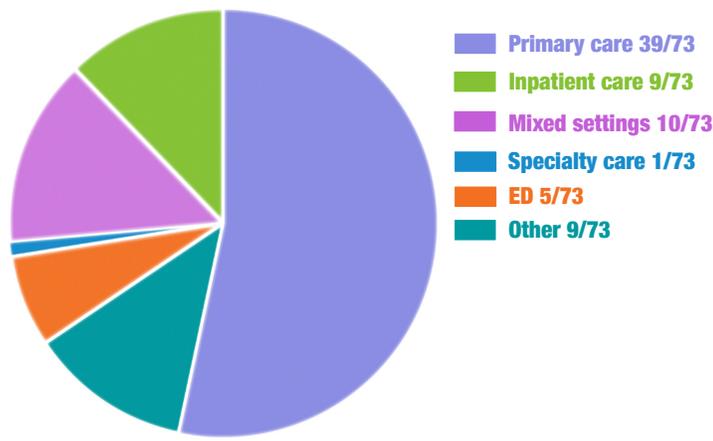
barriers. [2-5,7,8,11,13,15,17,20,21,24-29,33,36,37,39,40,42,43](#) Findings from these studies indicate that many, though not all, provider concerns appear to decrease following program exposure. With the caveat that many of these studies had small sample sizes and were not designed to rigorously assess causality, several interesting findings are described below with relevant references.

- Participation in screening and referral interventions with significant education and training components improved provider comfort, confidence, and behaviors related to social risk screening; [7,8,20,24,33,37](#)
- Providers frequently reported that time and workflow of screening were “not burdensome,” less than anticipated, or worth the time following participation in a social screening program; [3,4,11,15,24–27,29,39,43,46](#)
- After program exposure, providers indicated decreased concerns about patient discomfort and/or felt that social screening strengthened their relationships with patients or had no negative impact; [7,25,29,39,40](#)
- Providers’ concerns around the ability to provide adequate resources to address identified needs persisted post program-exposure. [5,11,17,21,25,29,40](#)

**Figure 2. Effects of Program Exposure on Provider Concerns**



**Figure 3. Number of Provider Studies in Select Practice Settings**



- Healthcare professionals and students—including social workers, nurses, advanced practice providers, and physicians—generally believed screening for social needs was acceptable and within their scope of practice.;
- In real world settings, providers reported that social screening strengthened or had no negative impact on patient-provider relationships;
- Few studies included frontline staff (e.g., front desk registration staff), though they were often tasked with administering social screening. Staff perceptions of screening acceptability were mixed;
- Participating in a social screening program reduced many perceived implementation barriers to screening, but concerns about the healthcare setting’s capacity to meaningfully address patients’ socioeconomic needs persisted after program exposure;
- Health professional education and training initiatives appear to positively impact provider attitudes and behaviors around social screening.

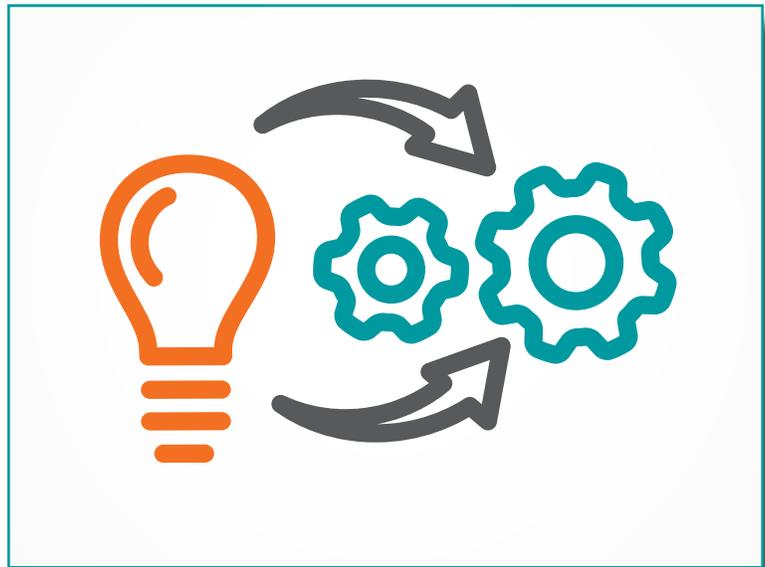
[See Section Four references.](#)

## Section Five

# Implementation Research on Social Screening

We conducted an original scoping review to find studies that explored the implementation of multi-domain social screening tools in both research and real-world settings. We excluded formative work that explored stakeholder perspectives on screening implementation without a trial of implementation, though these studies are described in other

sections of this report that describe patient/caregiver and provider perspectives on social screening. We found 42 articles that met inclusion criteria. See the [Section Five Appendix Table](#) for details about included articles. The majority (29/42) of the studies took place in pediatric primary care (N=17) or other primary care settings (N=12). Most studies described implementation outcomes but not factors that influenced those outcomes. As just one example, a New York study reported that adoption of screening was higher in pediatric than internal medicine and family medicine settings but did not explore the reasons why.<sup>1</sup> A synthesis of study findings by RE-AIM category is provided below, though since social screening implementation approaches were tailored to individual study setting and population, generalizability is limited.



- To be included, social screening studies had to include results related to one or more of the following constructs: comparative **Reach**, **Adoption**, **Implementation**, or **Maintenance**, as described in the RE-AIM framework, an evaluation framework used in implementation science.<sup>2</sup> (See Table 3 for details about how these domains were assessed in this report.)
  - We excluded studies that described the reach of a program (i.e. number of patients screened) without some comparator (e.g., change in reach subsequent to implementation of a particular strategy designed to influence screening uptake).
  - Though the RE-AIM framework includes a category on **Effectiveness**, for the purposes of this review, we did not examine effectiveness outcomes (e.g., impact of screening on social risk, health/wellness, healthcare utilization/cost) because studies that included **Effectiveness** outcomes did not distinguish between the impacts of screening alone versus screening plus subsequent intervention.
- Two reviewers abstracted data relevant to key study elements, including study sample, setting, and results on each of the included RE-AIM constructs.

**Reach (N=9):** Nine descriptive studies reported on implementation strategies that influenced comparative reach.<sup>1,3,4-10</sup> Two studies described how workforce affected screening reach.<sup>1,5</sup> One study compared reach by in-person vs. telephone screening in EDs; the authors reported that screening rates were similar before and after the start of the COVID-19 pandemic when screening transitioned from in-person to by telephone.<sup>10‡</sup>

‡ An interesting study that did not meet review inclusion criteria reported on the feasibility of having ED navigators contact patients with COVID-19 to screen for social risks post-discharge. Khidir H, DeLuca M, Macias-Konstantopoulos WL, et al. The health and social needs of patients discharged from the emergency department with suspected COVID-19. *Public Health Rep.* 2021 May;136(3):309-314.

**Table 3. Applying Relevant RE-AIM Categories to Social Screening Implementation<sup>‡</sup>**

Category	Definition <sup>§</sup>	Relevant Outcomes in Implementation Studies
Reach	The number or proportion of individuals who participate in an intervention (and who are the target of that intervention).	Comparative screening rates, including pre/post intervention, between clinical sites, or by sociodemographic characteristics.
Adoption	The number or proportion of individuals that deliver the intervention.	Rates of screening by workforce, specifically. These included rates of EHR-documented social screening results per encounter by type of clinician.
Implementation	The consistency with which an intervention is delivered, the time and cost of an intervention, and adaptations made to an intervention.	Time required for screening; comparative implementation approaches and program fidelity (e.g., across modality, workforce); and program costs.
Maintenance	The extent to which an intervention is sustained over time.	Rates of screening over time.

<sup>‡</sup> We did not include studies on Effectiveness in this review, (e.g., studies examining the impact of screening on social risk, health/wellness, healthcare utilization/cost) because studies that included Effectiveness outcomes did not distinguish between the impacts of screening itself versus screening plus subsequent interventions.

<sup>§</sup> Definitions from <https://re-aim.org/learn/what-is-re-aim/> and Glasgow RE, Harden SM, Gaglio B, Rabin B, Smith ML, Porter GC, Ory MG, Estabrooks PA. Front. RE-AIM Planning and Evaluation Framework: Adapting to New Science and Practice With a 20-Year Review. *Public Health*, 29 March 2019 | <https://doi.org/10.3389/fpubh.2019.00064>

While most articles reported on the race/ethnicity of the study population, only 5/9 reported on racial and/or ethnic differences in screening reach.<sup>3,4,6,9,10</sup> In these five studies, **there were no consistent differences found in screening reach by race/ethnicity**. Some individual study findings are presented below that highlight the inconsistencies across studies.

- A study describing social screening in over 100 community health centers (CHCs) found lower rates of screening in non-Hispanic white and Hispanic patients but higher rates of screening in non-Hispanic Black patients, as compared to the proportion of these groups in the overall patient population.<sup>9</sup>
- In contrast, a study in one academic primary care clinic found that Black patients were under-represented among screened patients and white patients were over-represented.<sup>6</sup>
- An ED-based study compared rates of screening before and after the start of the COVID-10 pandemic, which corresponded with a shift from in person (pre-pandemic) to telephone-based screening (pandemic period). Black and American Indian patients were screened at lower rates by telephone than they had been in-person; Hispanic and white patients were screened at higher rates by telephone than when screening was conducted in person.<sup>10</sup>
- A primary care-based study of screening in three CHCs found that in one CHC, a lower proportion of Asian patients were screened compared to the clinic's overall patient population demographics.<sup>4</sup>



Two of the five studies that looked at race/ethnicity differences in screening reach also looked at differences by language; both found **lower rates of screening among Spanish-speaking patients**.<sup>4,9</sup>

Several studies found that improving workflows and creating support systems for screening led to increases in screening reach.<sup>11–13</sup> Other major facilitators of increased reach included specific clinical staff approaches to screening, such as efforts to build trust, communicate empathy, and use motivational interviewing strategies.<sup>14,15</sup>

**Adoption (N=14):**<sup>‡§</sup> Fourteen studies reported on the uptake of screening by different clinical team members.<sup>1,5,8,12,13,15,17–24</sup> The majority of these studies listed rates of adoption among clinicians (e.g., physicians, nurse practitioners).<sup>1,5,13,15,17,19–22,24</sup> None of the 14 studies directly assessed factors influencing provider/staff adoption rates. There was substantial heterogeneity in implementation approaches (e.g., who conducted screening, and how screening was done) and in the studies describing these approaches (e.g., how adoption was measured). Studies that examined health professional education and training around screening<sup>19–21,24</sup> or continuous quality improvement interventions (e.g., plan-do-study-act cycles) showed these approaches can increase adoption of screening.<sup>8,12</sup> One of these studies attributed an increase in screening adoption to the fact that they switched responsibility for screening from clinicians to clinician assistants.<sup>8</sup>

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‡ We define the RE-AIM category ‘Adoption’ as provider uptake of screening. Measures used to assess uptake include the number or proportion of health care team members that conducted screening or the frequency with which they conducted screening. Studies included in this subsection of the review had to report some measure of Adoption in their results. See Section Four for studies that explored provider perspectives on screening, which are also likely to influence adoption.

§ In this review we look at clinic-level factors influencing screening activities. Other studies have examined organizational-level factors that influence adoption. For instance, in one study, hospital system ownership status, health information technology capacity, innovation culture, percentage of revenue from Medicaid, and patient engagement strategies were positively associated with organizations screening for more social domains; exposure to value-based payment methods was not associated.<sup>16</sup> Also see Frehn JL, Brewster AL, Shortell SM, Rodriguez HP. Comparing health care system and physician practice influences on social risk screening. *Health Care Manage Rev.* 2022;47(1):E1-E10.

**Implementation (N=30):** Thirty studies described factors affecting the implementation of social screening, including adaptations made to the screening process, screening modality, and the workforce conducting screening. Common facilitators to screening included: regularly communicating about screening progress and processes with the healthcare team,<sup>6,8,13,25</sup> clear communication with patients/caregivers about screening rationale and processes,<sup>25,26</sup> and training healthcare teams on empathic inquiry and trauma-informed care.<sup>25,27</sup> Common barriers reported by providers included staffing and time.<sup>8,22,25,27-31</sup>

**Screening fidelity (N=14):** There are no evidence-based guidelines for social screening “fidelity,” but 14 studies noted when screening processes deviated from the initial or intended implementation plan. Two of these studies reported that staff often altered how they asked screening questions and used their own judgement or “professional intuition” to determine when and whom to screen.<sup>32,33</sup> Twelve additional studies mentioned that implementation adaptations were made (e.g., any clinical team member could conduct screening, changes to screening tool were made, clinics standardized the introduction to the screening tool),<sup>13,30,34</sup> but few provided details on what was changed, why, or what effect either the tool or approach modifications had on screening reach/adoption/implementation. Five studies reported that having a standardized process for screening helped to normalize screening for patients and improved clinical integration.<sup>13,25,26,28,30</sup>

**Time to screen (N=5):** Five studies described the time it takes to conduct social screening.

- Screening took approximately five minutes using WE CARE or CMS’s Accountable Health Communities screening tools.<sup>35,36</sup>

### How long does screening take?

Health care professionals frequently cite time concerns as a barrier to screening. Implementation studies report a wide range in the time required for screening (1-9 minutes). Even on the low end, the additive effects of these screenings across a clinic day could be substantial for clinical team-administered surveys.

- One study compared time to complete screening by modality, reporting that it took just over nine minutes on average for ED patients to self-administer a screening tool by a ChatBot versus less than seven minutes when screening was completed as an online survey.<sup>37</sup> The ChatBot was preferred by low literacy patients and reduced personnel time.
- One study reported the time it took for staff to administer screening (80 seconds on a touch screen);<sup>32</sup> a second study reported it took 60 seconds for medical assistants to enter screening responses into the electronic health record (EHR) (time for screening completion was not reported).<sup>18</sup>
- One study found that the clinical team's perception of time as a significant barrier to screening decreased during the implementation pilot.<sup>6</sup>



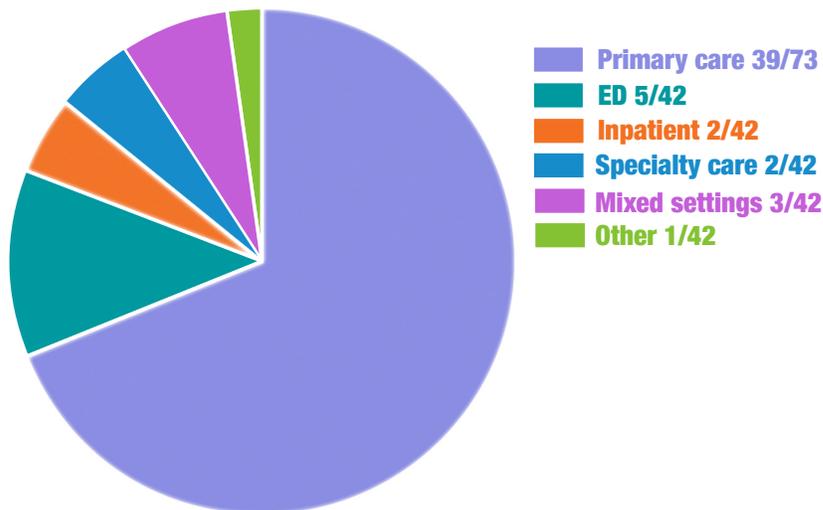
*Screening workforce comparisons (N=1):* One study directly compared disclosure of risk by screening workforce and found that patients were more likely to disclose social risk when screened by community health workers (CHWs) vs. nurses (RNs).<sup>40</sup>

*Screening modality comparisons (N=3):* Modality of screening varied both within and across studies. Only three studies (all based in ED settings) compared different screening modalities.<sup>10,37,38</sup> Findings included: a) tablet-based screening increased disclosure rates compared to face-to-face screening;<sup>38</sup> b) use of a ChatBot improved the screening experience in low literacy patients who needed additional assistance completing social screening;<sup>37</sup> and c) telephone-based screening reached as many patients as in-person screening, though findings differed by participant race/ethnicity (see Reach section above).<sup>10</sup>

*Cost of screening (N=2):* Two studies described the financial costs of screening. One estimated costs calculated based only on qualitative interviews with FQHCs leaders;<sup>39</sup> a second study reported that it was less expensive to have CHWs conduct social screening than RNs.<sup>40</sup>

**Maintenance/Sustainability (N=1):** One study examined screening maintenance over time.<sup>20</sup> The researchers found a significant drop in screening tool use 21 months following an educational intervention to increase social screening by pediatric residents.

**Figure 4. Number of Studies by Patient Setting**



Implementation research on social screening is not robust. Studies typically are cross-sectional, descriptive, and involve small samples. Some preliminary takeaways and recommendations for future research are described below.

- **Equity:** Screening rates differed by patient demographic characteristics (in no consistent patterns), but no studies examined strategies to improve equity. Two studies reported on patient language and found lower rates of screening in Spanish-speaking patients. Future work should explore ways to increase equity in screening reach.
- **Health professional education:** Both health professional education/training and continuous quality improvement projects appear to positively impact clinician and staff adoption of screening practices.
- **Time:** The most frequently cited barrier to screening was time, though administration time differed by tool and screening modality. There are insufficient data on if/how time differs across diverse patient populations (e.g., non-English-speaking populations) or how to reduce the burden of screening administration time across patient populations.
- **Standardization vs. customization:** Use of standardized screening tools and approaches appeared to improve screening rates, but several studies also indicated that staff frequently adapted screening questions/approaches. Adaptations may introduce bias but also may increase likelihood of disclosure. More research is needed on the benefits and drawbacks of these approaches.
- **Workforce administering screening:** Only one study compared patient social risk disclosure rates across different health professional groups and found risk disclosure was higher when screening was conducted by CHWs than when conducted by nurses.
- **Modality:** Use of technology, e.g., digital device-assisted screening, warrant further study for patients with low literacy and/or in settings with limited staff capacity.

[See Section Five references.](#)

# Implementation Guidelines for Social Screening

Multiple social screening “best practice” guidelines have been developed on social screening implementation. We looked for these guidelines in the gray literature since they are not typically included in academic databases. Multiple guidelines summarize best practice recommendations for launching and sustaining screening programs. Common recommendations in these guidelines include:

- Advance preparation/planning that engages key internal and external stakeholders;
- Iterative evaluation and adaptation of screening programs (e.g., using continuous quality improvement projects) to overcome screening barriers; and
- Education, training, and regular feedback to staff and clinicians on screening progress/practices.

## Methods

- Using a two-concept search that included terms related to 1) screening tools; and 2) social factors, we downloaded the first 100 Google search results published between 1/1/2011-8/12/21.
- We reviewed search results looking for social screening guidelines published by healthcare or healthcare technical support organizations.
- We asked SIREN experts and other advisory committee members about additional guidelines on social screening.
- Two researchers reviewed and synthesized key recommendations from included guidelines.

## Social Screening Implementation Guidelines

**American Academy of Family Physicians**

[The EveryOne Project Toolkit](#)

**American Hospital Association**

[Screening for Social Needs: Guiding Care Teams to Engage Patients](#)

**Agency for Healthcare Research and Quality (AHRQ)**

[Identifying and Addressing Social Needs in Primary Care Settings](#)

**American Medical Association**

[Social Determinants of Health Improve Health Outcomes Beyond the Clinic Walls](#)

**BMC (Pediatrics, WE CARE)**

[The WE CARE Model](#)

**Center for Health Care Strategies, Inc.**

[Screening for Social Determinants of Health in Populations with Complex Needs: Implementation Considerations](#)

**Center for Medicare and Medicaid Innovation (HRSN screening tool)**

[A Guide to Using the Accountable Health Communities Health-Related Social Needs Screening Tool: Promising Practices and Key Insights](#)

**Children's Hospital Association**

[Screening for Social Determinants of Health: Children's Hospitals Respond](#)

**Children’s Hospital of Philadelphia (Pediatrics)**

[State Policy Considerations for Addressing Unmet Social Needs in the Pediatric Setting](#)

**Community Catalyst**

[Screening for Social Needs](#)

**Healthcare Information and Management Systems Society**

[Social Determinants of Health](#)

**Health Leads**

[The Health Leads Screening Toolkit \(Pediatrics; WE CARE\)](#)

**Kaiser Permanente Center for Health Research & OCHIN, Inc**

[A Guide to Implementing Social Risk Screening and Referral-making](#)

**National Association of Community Health Centers**

**Protocol for Responding to and Assessing Patients’ Assets, Risks, and Experiences**

[Implementation and Action Toolkit](#)

**NASDOH**

[National Alliance to impact the Social Determinants of Health](#)

**National Committee for Quality Assurance**

[Social Determinants of Health: Resource Guide](#)

**Texas Children’s Hospital (Pediatrics)**

[Social Determinants of Health: Screening in the Clinical Setting](#)

## Social Screening Versus Interest in Assistance

Not all patients who endorse social risk factors are interested in receiving assistance related to those risks from their healthcare teams.<sup>1-20</sup> Across studies that surface this difference, the range in assistance acceptance/uptake has ranged widely. For instance in one adult primary care clinic, no patients who reported financial strain expressed interest in assistance from their healthcare team;<sup>13</sup> in contrast, 91% of families reporting food needs in a pediatric primary care setting were interested in receiving either an informational handout or referral for food assistance.<sup>5</sup> SIREN researchers and collaborators found that interest in assistance may be higher if patients are asked about interest before they answer social screening questions.<sup>21</sup> [Appendix Table Six](#) provides additional details about studies that describe discordance between patients' screening results and interest in or uptake of assistance.



**Overall, the studies in this area expose the interesting gap between screening positive on a social screening tool and patient interest in/uptake of assistance.** Select findings described across other sections of this report surface factors that help to explain these gaps.

For instance:

- Lack of screening tool validity could lead to false positive results ([Section Two](#));
- Patient/caregiver stigma or discomfort could contribute to discomfort accepting assistance ([Section Three](#));
- Providers lack of confidence in the efficacy of community resources could influence how they present resource information ([Section Four](#)); and
- Implementation barriers such as lack of time and staffing could mean patients do not receive timely information ([Section Five](#)).

More work examining these factors, as well as intervention design, delivery, and effectiveness, is needed to better explain the discordance and identify potential solutions. Patient/caregiver preferences for social screening follow-up – including in racially/ethnically/linguistically diverse samples – should be at the center of future studies.

## Coming soon

With support from the Robert Wood Johnson Foundation, in 2019 SIREN funded six research studies to better understand what types of interventions may make people more likely to accept social care assistance (including social services referrals.) Findings from these studies will be published in a special issue of AJPM in September 2022.

The national evaluation of the CMS Accountable Health Communities demonstration will also add to the evidence on patient interest in these types of supports. The demonstration project is ending at many sites in 2022.

# Can Area-Level Information Substitute for Patient-Level Social Screening?

Though the focus of many healthcare-based social screening programs has been collecting patient-level data, both individual-level social risks and area or community-level risk are associated with health outcomes. An outstanding question relates to when and why to use one or both sources of data about patient circumstances to inform subsequent interventions.<sup>1</sup>



It is possible that publicly-available area-level data on both social needs and/or local resources could complement, target, and/or refine patient-level social screening efforts (and reduce the resources needed for universal screening). Ideally this would improve the quality of social care referrals for patients experiencing social hardships.<sup>2</sup> Despite the potential complementarity of patient-reported and area-level data, however, these data are not interchangeable in all populations. In one study, the authors demonstrated that using area-level data would miss 40% of patients self-reporting social deprivation.<sup>3</sup>

A previously published summary of strengths and limitations of using patient- vs. area-level data to inform interventions is presented below.

**Table 4. Strengths and Limitations of Patient- and Neighborhood-Level Data for Informing Interventions**

	<b>Patient-level Interventions</b>	<b>Neighborhood-level Interventions</b>
<b>Patient-level Data</b>	<b>Strengths</b> Screening data collected directly from patients are likely more sensitive and specific to condition. Screening and intervention are both in context of shared clinical decision making, so can more closely tie interventions to patients' priority needs.	Using a patient lens may increase the health care system's engagement in upstream activity. Data may be more quickly accessible and aggregated.
	<b>Limitations</b> Cost of screening entire clinical population. Sampling bias and social desirability bias may affect patients' responses to health care practitioners. High cost of intervening at individual level to address neighborhood-level issues (e.g., housing inadequacy, food deserts).	Sampling bias and social desirability bias may affect patients' responses to health care practitioners. Subject to "exception fallacy": Patients from health care system may not reflect neighborhood population adequately.
<b>Neighborhood-level Data</b>	<b>Strengths</b> Increases health care system's engagement in upstream-neighborhood-level activities. Potential to focus on entire population facing health consequences, which could enhance value of interventions.	Uses a population-level lens; may be more "objective." More capacity to affect population-level change.
	<b>Limitations</b> Subject to "ecological fallacy": Some patients in this neighborhood may not be at higher risk. Lack of timely and detailed data limits depth of understanding. Potential to increase stigma. Potential to reinforce inequity across factors other than neighborhood (i.e., easier to intervene on behalf of relatively healthier individuals in same neighborhood).	Can use only social determinants of health data that are available (practitioner has less control over how data are collected). May not have a direct impact on health system's catchment population. Lack of timely data limits ability to monitor and adjust interventions.

"Table 1, Gottlieb, LM, Francis, DE, Beck, AF. Uses and misuses of patient- and neighborhood-level social determinants of health data. *Perm J.* 2018;22:18-078. DOI: <https://doi.org/10.7812/TPP/18-078>. with permission from The Permanente Press."

# Discussion

## Where Do We Go From Here?

Ideally, collecting and making social data accessible will both facilitate actions to improve health and health equity and strengthen relationships between patients and their healthcare teams. As social screening initiatives spread, we should be able to measure our success at achieving those goals.

In this report, we look carefully at the existing literature on social screening in healthcare settings. Screening itself has become the focus of new policy decisions and there is sufficient research on screening to be critical about its implementation and effects on healthcare stakeholders. In looking across the expanse of primarily peer-reviewed literature in this field, we found that while the literature covers an impressively broad range of topics and settings, it is not yet impressively rigorous. Many of the studies on social screening are qualitative, include small sample sizes, and/or lack comparison groups. Heterogeneity in the programs themselves—including settings, target populations, and social screening/intervention

### Eager for More?

This report reflects research published before August 2021. Since new papers are regularly published on screening-related topics, those interested in this topic should seek out updated information. We try to make the research on screening more easily accessible via the [SIREN Evidence and Resource Library](#) by flagging it with the term “screening research.”

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activities—as well as in the study designs and outcomes examined make it additionally difficult to compare findings across studies and extract generalizable findings.

Though our findings must be taken in the context of these major limitations, there are nonetheless multiple interesting takeaways:

**Screening prevalence:** We know relatively little about the prevalence of social screening across US healthcare settings and there is not yet a clear strategy for improving national prevalence estimates. Without these, it will be difficult to understand the impacts of investments intended to increase screening. Future prevalence assessments will need to address the lack of both shared prevalence measures and denominator reporting.

**Measure validity:** The psychometric and pragmatic properties of comprehensive social screening tools, particularly in linguistically and culturally diverse populations, have not been adequately examined. Neighborhood and patient-level data on social risk are likely complementary rather than interchangeable for driving interventions.

**Patient perspectives on screening:** Patients and patient caregivers generally find social screening to be acceptable, though here, too, relatively little research has explored or compared the perspectives of racially, ethnically, and linguistically diverse patient populations. Several studies surface patients' concerns about the collection/storage/sharing of social data.

**Healthcare team perspectives on screening:** Healthcare professionals generally believe activities to identify and intervene on patients' social needs are within the scope of practice of health care and can strengthen relationships with patients. Education/training and screening program participation help to reduce many provider concerns about implementing social screening, with the exception of concerns about clinic workflow and the availability of social services.

**Implementation best practices:**

- In the published literature to date, there are no consistently reported differences in screening reach by race/ethnicity; two studies found lower reach in Spanish-language speaking patients.
- Few studies have rigorously examined differences across studies on screening disclosure by factors such as healthcare setting, workforce conducting screening, framing for screening, modality of screening (e.g., in-person interview, telehealth interview, tablet [including chatbot]). In the few studies comparing different settings, workforces, or screening modalities, risk disclosure appears higher when conducted by community health workers (CHW) or in digital formats. Telehealth did not substantively decrease screening reach.
- Very little research explores screening sustainability, including either actual or hypothetical opportunity costs.

Our hope is that this synthesis will inform the healthcare sector's growing efforts to identify and meaningfully address social needs as a core part of healthcare delivery. In parallel, we hope that surfacing the literature gaps will prompt a commitment to learning more about social screening and social care interventions in coming years. The 'thousand flowers blooming' approach that has heretofore characterized screening approaches, including around tool selection, workforce, and modality for screening, presents us with myriad opportunities to learn about what works and for whom. As those opportunities continue expanding, it is incumbent on healthcare stakeholders to learn from them, ensure they involve relevant data collection (including on race, ethnicity, and language of participants), invest in data analysis, and finally, share findings. Ultimately a clear understanding of the relatively early-stage studies that have been published in this field to date should accelerate more targeted and more rigorous research down the line.

Our results suggest especially salient research needed to inform practice and advance equity should focus on:

- The social screening experiences of historically disadvantaged and otherwise marginalized patients;
- The program design and/or tailoring that takes these experiences into account to improve both engagement and outcomes for these populations; and
- Resources (e.g., screening tools, workforce, education and training, information and technology capacity) needed to launch, sustain, and study social screening in clinical settings—and the comparative implementation impacts of different approaches.

Well-designed studies on these topics will tee-up a new phase of research on effectiveness that can deeply examine the impacts of social care programs on patient health and population health equity.

## Conclusion

The urgency of advancing health equity in the US has motivated increased attention to social drivers of health. Nowhere is this more apparent than in the recent surge of attention to social screening quality measures, where a national dialogue about the roles and responsibilities of healthcare systems around social needs is playing out in quality measure development, including decisions about which social domains to include in new quality measures, how to measure them, in what populations, and what actions health care systems should be held accountable for when social needs are identified. **If and when state and federal policymakers opt to promote social screening as one key component of a comprehensive, multi-faceted strategy for improving health equity, however, they ideally should be armed with evidence about the feasibility of screening in busy practice settings; the workforce, training, and tools needed to launch and sustain this work; and approaches to positively and meaningfully engage diverse populations.**

Our findings suggest we can do more and better to learn from the proliferation of naturally occurring experiments in this area in order to inform this important national conversation.

## Section One. Appendix: Surveys on Prevalence of Social Screening in US Healthcare Settings

Survey Name	Surveying Organization	Target Population	Survey Administrative & Sampling Frame	# of Respondents
2020 AHIMA Social Determinants of Health Survey <sup>26</sup>	American Health Information Management Association	Health IT professionals	Sample of 17,900 health information professionals	Not reported.
AHA 2018 Population Health, Equity, and Diversity in Health Care Survey (published 2019) <sup>27</sup>	American Hospital Association	Hospital executives	Mailed to 6281, fielded from March-Sept 2018	1039 hospitals (16.5%)
2019 Annual Medicaid Health Plan Survey <sup>21</sup>	Institute for Medicaid Innovation	Medicaid Managed Care Organizations	All Medicaid managed care organizations with membership in Medicaid Health Plans of America and/or the Association of Community Affiliated Plans, and large health plans (>500,000 covered lives), without affiliation.	Representation of 69% of covered lives in Medicaid managed care (N not reported)
2020 Annual Medicaid Health Plan Survey <sup>22</sup>	Institute for Medicaid Innovation	Medicaid Managed Care Organizations	All Medicaid managed care organizations with membership in Medicaid Health Plans of America and/or the Association of Community Affiliated Plans, and large health plans (>500,000 covered lives), without affiliation.	Representation of 67% of covered lives in Medicaid managed care (N not reported)

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## Section One. Appendix Table, continued

Survey Name	Surveying Organization	Target Population	Survey Administrative & Sampling Frame	# of Respondents
2020 Annual Medicaid Health Plan Survey <sup>22</sup>	Institute for Medicaid Innovation	Medicaid Managed Care Organizations	All Medicaid managed care organizations with membership in Medicaid Health Plans of America and/or the Association of Community Affiliated Plans, and large health plans (>500,000 covered lives), without affiliation.	Representation of 67% of covered lives in Medicaid managed care (N not reported)
2021 Annual Medicaid Health Plan Survey <sup>23</sup>	Institute for Medicaid Innovation	Medicaid Managed Care Organizations	All Medicaid managed care organizations with membership in Medicaid Health Plans of America and/or the Association of Community Affiliated Plans, and large health plans (>500,000 covered lives), without affiliation.	Representation of 67% of covered lives in Medicaid managed care (N not reported)
2021 Drivers of Health Survey <sup>18</sup>	Deloitte Center for Health Solutions	Healthcare executives (payers and health systems)	Fielded June and July 2021. No sampling frame reported.	N=49 health plan leaders and N=251 health system leaders. No response rate reported
2020 Industry Pulse <sup>25</sup>	Change Healthcare	Healthcare executives	Fielded online Oct-Dec 2019. No other information reported.	N=445, no response rate reported

## Section One. Appendix Table, continued

Survey Name	Surveying Organization	Target Population	Survey Administrative & Sampling Frame	# of Respondents
2019 IFDHE survey (published 2020) <sup>24</sup>	American Hospital Association Institute for Diversity and Health Equity	Hospitals and health systems	More than 6,000 U.S. hospitals.	N=600 (approx. 10%)
Medicaid Budget Survey for State Fiscal Years 2019 and 2020 (2019) <sup>20</sup>	Kaiser Family Foundation	State Medicaid medical directors	51 state (and DC) Medicaid medical directors	N=51 (100%)
Medicaid Budget Survey for State Fiscal Years 2021 and 2022 (2021) <sup>17</sup>	Kaiser Family Foundation	State Medicaid medical directors	51 state (and DC) Medicaid medical directors	N=47 (91.6%)
2020 Social Determinants of Health Survey <sup>19</sup>	Advis	Healthcare executives	No sampling frame reported.	N="over 200" but n=181 for the question about screening. No response rate reported.

## Section Two. Appendix: Studies\* of Psychometric and Pragmatic Properties of Social Screening Tools

Author, Year	Sample Size	Type of Data	Study Population	Study Setting	Race/Ethnicity of Study Population*	Study Outcomes
Guo et al., 2021	5081	Quantitative	Adult	ED	81% Non-Hispanic 4% Black 2% Asian 13% Other	<p><b>Internal consistency:</b> Cronbach's <math>\alpha</math> and McDonald's <math>\omega</math> of 0.89.</p> <p><b>Construct validity:</b> Exploratory factor analysis and confirmatory factor analysis identified and verified one-factor structure, suggesting that SINCERE's 10-items are homogenous and measure one construct.</p> <p><b>Criterion validity:</b> Item Response Theory suggested SINCERE can effectively identify patients who want referrals or who have social needs</p>
Johnson et al., 2020	217	Quantitative	Adult	Student Health	54% Non-Hispanic white 20% Black 15% Other	<p><b>Internal consistency:</b> Scores and subscales compared for consistency; also looked at test-re-test reliability</p> <p><b>Structural validity:</b> Good dimensionality/ factor loading</p> <p><b>Concurrent validity:</b> Correlation with responses to general health question on self-reported health</p>
Lewis et al., 2020	450	Quantitative	Adult	Integrated care clinics (Kaiser SoCal)	44% White only 36% Hispanic or Latino	<p><b>Construct validity:</b> Agreement between the AHC and YCLS tools was substantial on all items (kappas &gt; 0.60) except for housing quality (kappa 0.52); looked at association between scores and receipt of flu shots and self-reported health</p>

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Section Two. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Study Population	Study Setting	Race/Ethnicity of Study Population <sup>+</sup>	Study Outcomes
Oldfield et al., 2021	154 (133 caregivers; 21 adolescents)	Quantitative	Adolescents, Adult caregivers	Primary care	<p><b>Caregivers:</b> 82% Hispanic 30% Non-Hispanic white 11% Black 50% Other</p> <p><b>Adolescents:</b> 95% Hispanic 19% White 5% Black 67% Other</p>	<p><b>Internal consistency:</b> 82% (WE CARE) and 85% inter-rater reliability among children and caregivers.</p> <p><b>Construct validity:</b> Compared the positive and negative screens for the 3 social domains that are common to both WE CARE and the AHC tools.</p>
Parkerson et al., 2019	450	Quantitative	Adult	Primary care	54% Black 29% Hispanic 14% Non-Hispanic White 4% Other	<p><b>Convergent &amp; item discriminant correlations</b></p> <p><b>Internal consistency:</b> Cronbach’s alphas of 0.63–0.73; test-retest correlations of 0.65–0.78.</p> <p><b>Construct validity:</b> Association between baseline subscale and scale mean scores for patients able to buy private insurance and patients unable to afford it.</p> <p><b>Criterion validity:</b> Regression analyses showed that baseline scale and subscale scores predicted both baseline morbidity and 6-month utilization.</p> <p><b>Feasibility:</b> Mean self-administration time of 3.9 min and mean interviewer administration time of 5.8 min.</p>

\*These are studies published after May 2018. For articles published before May 2018, see Henrikson NB, Blasi PR, Dorsey CN, Mettert KD, Nguyen MB, Walsh-Bailey C, Macuiba J, Gottlieb LM, Lewis CC. Psychometric and pragmatic properties of social risk screening tools: A systematic review. Am J Prev Med. 2019 Dec 1;57(6):S13-24.

<sup>+</sup>Race/ethnicity categories are as reported in the original article

**Section Three. Appendix: Studies on Patient & Caregiver Perceptions of Social Screening**

<b>Author, Year</b>	<b>Sample Size</b>	<b>Type of Data</b>	<b>Study Population</b>	<b>Study Setting</b>	<b>Race/Ethnicity of Study Population</b>	<b>Study Outcomes</b>
Broaddus-Shea et al., 2022	20	Qualitative	Adults	Primary care	25% Hispanic 5% Native American 80% White	<p>Many wanted to know the practice’s rationale for screening.</p> <p>Some found screening questions intrusive.</p> <p>Many interviewees believed that the practice should normalize screening, help to eliminate stigma, and build trust with patients before screening.</p> <p>Many expressed concerns regarding data privacy and the potential negative consequences of screening.</p>
Byhoff et al., 2019	50	Qualitative	Adults, adult caregivers	Primary care; ED	31% Hispanic 37% Non-Hispanic Black 29% Non-Hispanic White 4% Other	<p>Most believed social screening can be used to improve patient care, makes patients feel supported, and that healthcare is a safe place to discuss social needs.</p> <p>Many believed screening must be conducted with compassion and empathy.</p> <p>Trust influenced perception of screening; some worried about bias and/or privacy concerns.</p>
Byhoff et al., 2020	20	Qualitative	Adults	Primary care	100% Hispanic	<p>Some participants felt social screening helped to enhance whole-person care.</p> <p>Most found social screening acceptable.</p> <p>Many said having a strong relationship with their providers made them more comfortable sharing information regarding their social needs; trust was important.</p> <p>Most found immigration to be an acceptable screening domain.</p>

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**Section Three. Appendix Table, continued**

<b>Author, Year</b>	<b>Sample Size</b>	<b>Type of Data</b>	<b>Study Population</b>	<b>Study Setting</b>	<b>Race/Ethnicity of Study Population</b>	<b>Study Outcomes</b>
Careyva et al., 2018	115	Mixed methods	Adults	Primary care	68% Hispanic 32% Non-Hispanic	Most found self-administered screening easy. Few prioritized screening for social domains (education and employment, financial resources, legal services, family responsibilities or transportation) over healthcare access, health behaviors, and emotional distress; some differences by ethnicity and language identified.
Colvin et al., 2016	143	Quantitative	Adult caregivers	Inpatient	6% Hispanic 18% Black 71% White 12% Other	Most found screening appropriate; no demographic differences (SES) identified. Prior screening experiences increased odds of perceived general acceptability.
De Marchis et al., 2019	969	Quantitative	Adults, adult caregivers	Primary care; ED	33% Hispanic 22% Non-Hispanic Black 36% Non-Hispanic White 9% Other	Most found screening appropriate; no demographic differences (age, race/ethnicity, sex, education, preferred language) identified. Odds of perceived appropriateness of screening were higher in participants recruited from primary care settings (versus emergency departments) or sites with a high percentage of publicly insured or uninsured patients (versus low percentage), had been previously screened, or expressed trust in their clinicians; perceived appropriateness was lower among participants who had experienced discrimination in a healthcare setting. Most were comfortable with integrating social screening data into the electronic health record.

**Section Three. Appendix Table, continued**

Author, Year	Sample Size	Type of Data	Study Population	Study Setting	Race/Ethnicity of Study Population	Study Outcomes
Drake et al., 2021	10	Qualitative	Adults	Primary care	20% Hispanic 80% Non-Hispanic Black	<p>Most believed clinicians should use social needs information to improve care for patients.</p> <p>Most found social screening acceptable.</p> <p>Most said providers' empathetic approach to screening made them more comfortable sharing information regarding their social needs; trust was important.</p> <p>None indicated concerns about privacy or data sharing among healthcare team members.</p>
Emengo et al., 2020	7	Qualitative	Adult caregivers	Primary care	29% Hispanic 14% Non-Hispanic Black 29% Asian 29% n/a	<p>Many reported that screening made them feel supported, helped them prioritize their own health, and provided a safe space for expression.</p> <p>Most preferred allied health professionals to conduct screens over clinicians.</p> <p>Majority found housing, employment status, and social isolation acceptable screening domains.</p> <p>Few expressed privacy concerns.</p>
Hamity et al., 2018	68	Qualitative	Adults, adult caregivers	Primary care; specialty care; ED	Not reported	<p>Most believed social screening data can be used to improve patient care.</p> <p>Most found social screening acceptable.</p> <p>Most found food, housing, social isolation, transportation, financial constraints to be acceptable screening domains.</p> <p>Some expressed concerns about how their social screening information would be used, with whom it would be shared, and how it could be updated.</p>

## Section Three. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Study Population	Study Setting	Race/Ethnicity of Study Population	Study Outcomes
Hassan et al., 2013	401	Quantitative	Young adults	Primary care	29% Hispanic 54% Non-Hispanic Black 2% Asian 9% Non-Hispanic White 4% Other	Most did not welcome screening; no demographic differences (age, gender, race/ethnicity) identified.
Kocielnik et al., 2019	30	Mixed methods	Adults	Research setting	30% Hispanic 27% Non-Hispanic Black 20% Non-Hispanic White 20% Other 1% n/a	Most patients were comfortable with screening; no differences by literacy. Screening using a Chatbot was preferred to self-administration among low-literacy participants.
Langerman et al., 2019	516	Mixed methods	Young adults, adult caregivers	ED	<b>Caregivers:</b> 8% Hispanic 69% Non-Hispanic Black 14% Non-Hispanic White 9% Other  <b>Young adults:</b> 21% Hispanic 65% Non-Hispanic Black 7% Non-Hispanic White 6% Other	Most found screening for housing and sex trafficking acceptable; some demographic differences identified (caregivers vs. adolescents, race/ethnicity) for sex traffic screening.

Section Three. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Study Population	Study Setting	Race/Ethnicity of Study Population	Study Outcomes
Oldfield et al., 2021	154	Quantitative	Young adults, adult caregivers	Primary care	<p><b>Caregivers:</b> 85% Hispanic 31% White 58% Other</p> <p><b>Young adults:</b> 85% Hispanic 13% Black 1% Asian 27% White 55% Other</p>	Most found screening comfortable; comfort did not significantly vary between caregivers and young adult patients.
Palakshappa et al., 2021	103	Quantitative	Adults	Primary care	Not reported.	Most found self-administered screening to be acceptable.
Rogers et al., 2020	1161	Quantitative	Adults	Integrated health system clinics (details not specified)	50% Hispanic 6% Non-Hispanic Black 9% Asian 30% Non-Hispanic White 3% Other	<p>Most believed the health system should use social needs information to improve care for patients.</p> <p>Most believed health system should screen for social needs; women were more likely to report this than men; patients of Asian/Pacific Islander descent were less likely to report this than white patients.</p> <p>No additional demographic differences (by race/ethnicity, gender, age, education) were identified.</p>
Wylie et al., 2012	50	Qualitative	Young adults	Primary care	28% Hispanic 48% Non-Hispanic Black 14% Non-Hispanic White 10% Other	<p>Some said social screening had the potential to improve patient-provider relationships and served as a tool for self-reflection.</p> <p>Most perceived food, housing, financial constraints as acceptable screening domains.</p> <p>Most found self-administered screening acceptable.</p> <p>Few had privacy concerns regarding data sharing.</p>

**Section Three. Appendix Table, continued**

<b>Author, Year</b>	<b>Sample Size</b>	<b>Type of Data</b>	<b>Study Population</b>	<b>Study Setting</b>	<b>Race/Ethnicity of Study Population</b>	<b>Study Outcomes</b>
Spain et al., 2021	106	Qualitative	Adult care-givers	Primary care	Not reported.	<p>Many noted that the clinic was a convenient, non-stigmatizing place to discuss social needs.</p> <p>Many appreciated an empathetic and respectful approach to screening that centered on listening and follow-up; believed it brokered trust and improved patient/provider relationship.</p> <p>Many preferred to be screened by nurses and community health workers over clinicians; they helped to bridge linguistic and cultural communication gaps.</p> <p>Some perceived being asked to disclose personal circumstances without a subsequent conversation or follow through negatively, and expressed concerns about oversurveillance and privacy.</p>
Wallace et al., 2021	10	Qualitative*	Adults	ED	20% Hispanic 20% Black 10% Asian 40% White 10% Unknown	<p>Most did not find social screening acceptable.</p> <p>Most preferred allied health professionals to conduct screening over clinicians.</p> <p>Some expressed concerns that disclosing sensitive social information might bias providers against them.</p> <p>Many indicated they would feel comfortable disclosing information to providers who demonstrated that they genuinely cared for screened patients' wellbeing.</p> <p>Many did not want social needs documented.</p>

\* Race/ethnicity categories are as reported in the original article.

**Section Four. Appendix: Healthcare Providers’ Perspectives on Social Screening‡**

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
<b>Intervention Studies (N=43)</b>						
Adams et al., 2017	N/A	Qualitative	Residents	Pediatrics	Pediatric Primary care residency	Providers reported that food insecurity (FI) screening was acceptable and indicated that the screen/ intervene model fit well into clinic flow. Providers also noted that FI screening opened discussions around other social determinants of health (SDH). Providers raised concerns about adding FI status to problem lists and suggested shorter resource-lists.
Berry et al., 2020	28	Qualitative	Leadership personnel, frontline staff, volunteers, Primary care providers, central leadership	Adults	Primary care	Respondents generally supported the SDH screening and referral program and widely reported that the program had great value for their patients, and they wanted it to continue. Perceived challenges included Staff burden; lack of time to discuss screening results with patients; screening fatigue.

‡ Table adapted from Quiñones-Rivera A, Wing HE, Barr-Walker J, Yee M, Harrison JM, Gottlieb LM. Provider impacts of socioeconomic risk screening and referral programs: a scoping review. *J Am Board Fam Med.* 2021;34(4):820-831. doi:[10.3122/jabfm.2021.04.210039](https://doi.org/10.3122/jabfm.2021.04.210039).

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## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Bleacher, et al. 2019	N/A	Quantitative	Clinicians and staff	All ages	Primary care	Following a pilot screening initiative, 91% of staff and 92% percent of clinicians agreed that the screening benefitted patients; 91% of staff and 96% of clinicians felt that we should continue using the social needs screening questionnaire despite the additional work. 100% of respondents agreed it is a Primary care clinic's responsibility to help patients with their social needs and only 10% of staff and 21% of clinicians felt that the clinic was too busy to deal with patients' social needs vs at baseline, where 33% of staff and 58% of clinicians felt that the clinic was too busy.
Byhoff et al., 2019	26	Qualitative	Physicians, nurses (RNs), and medical assistants (MAs)	All ages	Primary care	Provider and staff experiences with the SDH screening/referral program and perceptions of facilitators and barriers to sustainable program implementation were mixed. Some raised concerns about negative patient reactions to the screening tool, additional time needed to screen, and referral workflow confusion. Others believed the tool facilitated important provider-patient conversations and did not add time to visits. Participants agreed that the addition of a patient navigator was positive. Additional perceived facilitators included previous experience with psychosocial screening, site resources to address identified needs, and EHR-integrated referral resources guides. Differences in barriers and facilitators were noted between clinical sites rather than providers and staff.

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Chhabra, et al., 2019	22	Qualitative	Physicians, nurse practitioners (NPs)	Adults	Primary care	Providers reported prioritizing medical over social care in brief clinical visits; highlighted both a sense of reward and futility in caring for vulnerable populations; and viewed the health system as having important role to play in addressing housing concerns. Providers expressed concern over lack of resources to address housing instability. Opinions were mixed about whether providers should administer social risk screening.
Cline et al., 2020	26	Mixed methods	Residents	Adults	Primary care home visits	Post-SDH screening, 93% of respondents highlighted the importance of screening; 79% of respondents felt at least moderately comfortable; 12% felt comfort positively influenced by prior good rapport with patient; 19% of respondents adjusted treatment/medication based on issues raised through SDH screening.
Cohen et al., 2010	N/A	Mixed methods	Residents, medical students, and allied health professionals	Pediatrics	Medical-Legal Partnership training (MLP) programs	MLP training programs increased resident knowledge of patient resources and helped residents understand poverty. The MLP training programs also reduced provider concern about making patients nervous with legal questions and improved resident capacity to screen for 2 unmet basic needs and increased screening for social needs, referrals to legal services, and assistance with obtaining government benefits.

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Coleman & Fromer, 2015	45	Quantitative	Physicians, non-physician staff	All ages	Primary care	Overall, participants reported an increase in self-perceived health literacy knowledge & skills. Physicians with more experience were more likely to report improved knowledge, including understanding what it means for patients to have low health literacy (6.83 versus 6.0, $P=.03$ ) and knowing the prevalence of low health literacy (6.83 versus 6.2, $P=.04$ .) More experienced physicians were more likely to report improved intended behaviors: paying attention to whether patients are understanding them (6.83 versus 6.2, $P=.03$ ) and creating a shame-free environment (6.8 versus 6.2, $P=.04$ ).
Colvin et al, 2016	106	Quantitative	Residents	Pediatrics	Inpatient	Over 80% of residents from the intervention team documented use of IHELP compared with 16.5% of comparison group; the intervention team's percentage of social work consults was nearly 3 times greater than on the comparison team's ( $P < .001$ ).
Dorr et al., 2007	120	Quantitative	Physicians	Adults	Primary care	Physician productivity significantly increased when more than 2% of patients were seen by the care management team.

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Eismann, et al., 2019	12	Qualitative	Physicians	All ages	Primary care	Providers felt better able to meet their families' needs and to provide whole-person care because they had a better understanding of their families' social situations. Providers generally endorsed the SEEK model as part of standard clinical care. Provider-identified implementation barriers included limited time during well-child visits, incomplete knowledge of resources, insufficient resources, and offending caregivers. Providers reported that on-site support staff to connect families with resources was the most important program facilitator. Time burden was less than anticipated pre-implementation.
Feigelman et al., 2011	95	Quantitative	Residents	Pediatric	Primary care	Residents participating in the Safe Environment for Every Kid (SEEK) model improved their knowledge in assessing 4 out of 6 risk areas and were more likely to screen for targeted risk factors than controls.
Freibott et al., 2021	5	Mixed methods	Hospital staff involved in screening	Adults, Geriatric	Primary care; Specialty care; ED	The majority of respondents reported learning about patients' social risks within their professional responsibility, social risk screening optimizes health care delivery and outcomes by supporting patient-clinician communication and decision-making and agreed that using the screening tool improved patient outcomes. The lack of a simple, standardized referral process made the screening results less actionable, causing screening staff to feel helpless or frustrated.

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Gabrielian et al., 2017	32	Quantitative	Physicians, RNs, social workers	Adults	ED	Acceptability was mixed. Most providers (20, 66.7%) strongly agreed or agreed that the intervention “is an effective way to improve the way that homeless Veterans use health services at the VA.” Nearly all participants strongly agreed or agreed that “I would like to see the ED-HPACT program continue and be expanded.” 42.0% of respondents strongly agreed or agreed with the statement: “Collocating HPACT within the ED works well.” 27.3% of nurses disagreed or strongly disagreed with: “Asking about homelessness during the triage process is the right time during the visit to ask patients about homelessness.”
Garg et al., 2007	45	Quantitative	Residents	Pediatrics	Primary care	Residents reported no discomfort receiving the WE-CARE social screening tool from parents. The majority of residents in the intervention group reported that the survey instrument did not slow the visit. Use of the tool increased parent-provider discussion of psychosocial topics and referrals for social needs.
Girotti et al., 2015	99	Quantitative	Medical students	N/A	Medical school curriculum	Trainees in an urban medicine program were more likely than non-participants to endorse that “Universal medical care is a right” [P = .01], “Access to basic medical care is a right” [P = .03], “Access is influenced by social determinants” [P = .03].

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Hamity, et al., 2018	90	Mixed methods	Clinicians and staff	Adults	Primary care; Specialty care; ED	Clinicians believed social needs impact health outcomes and that equipping care teams with patients' social information could improve care and build trust. In discussion groups, staff and clinicians reported that assessing social needs was an opportunity to obtain valuable information to inform care decisions and improve communication with their patients. Clinicians highlighted concerns about having too much information and recommended simple screening formats, such as yes/no questions. Reasons for not assessing social needs included lack of time and available resources.
Kangovi, et al., 2018	20	Qualitative	Medical students; community health workers (CHWs)	N/A	Medical school	Students reported feeling more optimistic and began to view difficult psychosocial barriers as modifiable. The rotation enhanced students' cultural humility and confidence in addressing SDH.
Klein et al., 2011	38	Quantitative	Pediatric interns	Pediatrics	Primary care	Interns who participated in an innovative curriculum on SDH screening were more comfortable discussing SDH issues (100% vs. 71%; $P < .01$ ) and felt more knowledgeable regarding SDH issues (100% vs. 64%; $P = .005$ ), community resources (94% vs. 29%; $P < .001$ ), and housing (39% vs. 6%; $P = .04$ ) than control group interns ( $n = 18$ ).

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Klein et al., 2014	47	Quantitative	Pediatric residents	Pediatrics	Primary care	Residents identified time as the greatest barrier (>85%) to screening on both the pre-and post-intervention surveys. Compared to controls, residents in the intervention group reported decreases in concerns about lack of solutions (46% to 38%) and discomfort with screening (92 to 79%). None of the residents identified SDH screening as an inappropriate activity for physicians.
Knowles et al., 2018	11	Qualitative	Clinic staff (Physicians, administrative & clerical staff, social workers, research staff member)	Pediatrics	Primary care	Provider-identified barriers to screening and referral included complexity of administration, concerns about patient stigma and privacy, poor referral communication, and patients' enrollment or lack of eligibility for benefits. Administrative staff members described high administrative burden of paper screening.
Kuo et al., 2011	252	Quantitative	Residents	Pediatrics	Pediatric residency programs	Residents who participated in the Community Health and Advocacy Training (CHAT) curriculum sustained more positive attitudes toward community pediatrics, child advocacy, and caring for vulnerable populations than the categorical residents, whose attitudes significantly decreased. CHAT residents indicated that topics such as child welfare, community violence, accessing community resources for underserved children and children with special health care needs, and providing preventive health education to various community groups such as schools and childcare facilities were important to the Primary care of children.

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
O'Brien et al., 2014	12	Mixed methods	Medical and other health professional students	All ages	Primary care	Participants reported learning more about the health challenges facing vulnerable populations through a service learning course focused on SDH than through curricular efforts in their medical schools.
Onyekere et al., 2016	31	Mixed methods	Medical students	Adults	Primary care	Increased empathy toward patients and confidence entering third-year clerkships.
O'Toole et al., 2013	36	Quantitative	Residents	All ages	Pediatric and internal medicine training program	Residents participating in an innovative curriculum on SDH screening perceived fewer barriers to screening and were less likely to note barriers related to lack of knowledge, time, and comfort.
O'Toole et al., 2017	6 Veterans Administration Homeless Patient Aligned Care Teams (HPACT)	Mixed methods	Clinical care teams	Adults	Primary care	Care team members universally endorsed the screening and referral program. Staff members reported favorable feedback from patients and that screening strengthened patient connection with the health care teams. Care teams believed screening highlighted the need for a multidisciplinary approach. No team reported that screening was burdensome. Teams identified challenges with referrals.
Page-Reeves et al., 2016	5	Qualitative	Family medicine faculty and residents	All ages	Primary care	Providers believed that expanding the MA (Medical Assistant) role to identify patient social issues and the CHW intervention lightened their workloads and increased confidence in the quality of patient care.

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Palakshappa et al., 2017	18	Qualitative	Pediatricians, NPs, and RNs	Pediatrics	Primary care	Themes from focus groups suggest that clinicians do not see time and workflow as barriers to screening but do identify lack of adequate resources and concerns about embarrassing families as barriers. Clinicians report that parents felt screening showed caring and were also thankful to have been asked and to receive resources.
Palakshappa et al., 2021	27	Quantitative	Physicians, advanced practice practitioners, RNs, staff	Adults	Primary care	More than 80% of respondents agreed or strongly agreed that it is essential for the clinic to provide information about community resources.
Patel et al., 2018	332	Quantitative	Residents	Pediatrics	Primary care	A residency training module Increased resident documentation of family income and housing. Residents were also more likely to discuss and document WIC and SNAP benefits.
Pettignano et al., 2012	N/A	Quantitative	Physicians, RN case managers, social workers	Pediatrics	Primary care	70% of providers who referred patients to a medical legal partnership (HeLP) embedded in Primary care reported that they believed the services provided allowed them to reallocate time to other cases; 95% reported that working with HeLP positively impacted perceptions of working collaboratively with the legal community to serve patients. Compared to the previous fiscal year, 33.5% more providers indicated that they believed that HeLP services helped to decrease ED visits, 22.4% more believed that HeLP services helped to decrease readmissions, and 32.4% more felt that HeLP services helped to decrease inpatient length of stay.

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Primack et al, 2007	83	Quantitative	Medical students	N/A	Medical school	Participating in an educational intervention involving social marketing and health literacy improved medical students' knowledge of patient health literacy.
Real et al., 2016	37	Quantitative	Residents	Pediatrics	Pediatric residency programs	Completing a neighborhood-based curriculum led more residents to assess themselves as competent or better for locating safe places for children (from 43.2 to 75.7%; $p < 0.05$ ); and highly experienced or expert in the ability to advise families on safe play (from 10.8 to 32.4%; $p < 0.05$ ). Self-assessed competence for assisting families with transportation also significantly increased (from 59.5 to 83.8%; $p < 0.05$ ). In the post-curriculum period, 49% of residents reported always or frequently asking families about their neighborhood compared to 19% prior ( $p < 0.01$ ); and 97% reported being able to identify a relevant neighborhood resources website compared with 25% prior ( $p < 0.0001$ ).
Sand-Jecklin et al., 2017	115	Quantitative	RNs	Adults	Inpatient	Overall, nurses found HL screening acceptable and helpful for patient care. Narrative comments indicated that some RNs felt the questions were repetitive (N = 8) felt that at times patients did not understand the questions (N = 7) or were annoyed by them (N = 6), and felt that patients may not answer the questions honestly (N = 4).

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Seligman et al. 2005	63	Quantitative	Residents	Adults	Primary care	Physicians notified of patients' limited health literacy (HL) felt screening for HL was useful in 64% of visits and that increased access to allied health professionals (88%) and case management services (64%) would be useful. They also reported feeling less satisfied with their visits than physicians in a control group. Notified physicians were more likely than physicians in the control group to use recommended management strategies for patients with limited HL (OR 3.2, P=.04). Notified physicians engaged in discussions about HL screening results with 2% of patients and planned future discussions in 27%.
Sisler et al., 2019	36	Qualitative	NP trainees	Pediatric	School of Nursing	Participants exhibited a growing awareness of the importance of identifying and addressing SDH in understanding the root cause of patient health problems and being able to address effective solutions in partnership with the patient.
Smith, et al., 2017	85	Quantitative	Medical students, residents, and faculty members	All ages	Family medicine residency; Medical school	All participants endorsed the importance of assessing and referring patients for food resources pre-intervention. These scores increased post-intervention as well as willingness to ask patients about food insecurity.
Stikes et al., 2015	N/A	Mixed methods	RNs	Adults	Inpatient mother/baby unit	Participation in a leadership academy training Increased direct care nurses' knowledge of health literacy interventions, competency on use of updated patient education materials, and adoption of health literacy interventions.

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Sundar, 2018	6	Qualitative	Family medicine physician, clinic manager, researcher, behavioral health services manager, and community resource specialists	All ages	Primary care	Clinicians and MAs reported no disruption to clinic workflow and enthusiasm around social screening implementation. Patients' engagement in screening reduced medical teams' concerns.
Tong et al., 2018	17	Qualitative	Clinicians	Adults	Primary care	In 52% of encounters, clinicians reported that the social needs survey helped them to know and better understand their patients and identified value in improving interactions with patients through assessing social needs. Clinicians expressed concern about the difficulty of screening, being overwhelmed with too much information and administrative burden, insufficient resources to help patients with identified needs, and whether the health system was the right place to address social needs. For 23% of patients, clinicians reported changing care delivery in response to learning of patients' social needs.

Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Wahab et al., 2018	10	Quantitative	Residents	Adults	Primary care	Residents overestimated patients' health literacy (HL) both before and after a HL educational intervention paired with HL screening.
Wallace et al., 2020	N/A	Mixed methods	ED team members, registration staff	Adults	ED	Screening staff reported discomfort asking questions perceived to be stigmatizing; and recognized the importance of screening early in the visit to allow opportunity to address patient concerns that may be uncovered.
Zielinski et al. 2017	27 pre- & 19 post-social screening intervention	Quantitative	Physicians, residents, NPs	Pediatrics	Primary care	Provider comfort with screening for social risks increased over time. Most providers believed the WE-CARE screen was likely to disrupt clinic flow before the intervention; a majority reported minimal disruption after the intervention.
<b>Non-Intervention Studies (n=30)</b>						
Barnidge et al., 2017	67	Quantitative	Physicians	Pediatrics	Mixed pediatric settings	Most pediatricians were willing to screen patients for food insecurity (FI). Concerns included: uncertainty about how to handle a positive screen, lack of knowledge of community resource, that caregivers will feel judged, time needed to screen, comfort with screening, reduced patient satisfaction, and uncertainty about reimbursement for screening. Emergency and specialty providers felt ill equipped to respond to FI and that FI screening was not an appropriate use of time in these settings.

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Broaddus-Shea et al., 2022	10	Qualitative	Clinic staff	Adults	Primary care	Participating staff highlighted lack of framing/introduction of screening; lack of time to follow up with patients after positive screens; lack of resources to meet patients' needs; and concerns about patients feeling stigmatized as barriers to screening.
Cafiero, 2013	256	Quantitative	NPs	All ages	Outpatient care	The majority of NPs were aware of the consequences of health literacy and guidelines for written materials. Intention to use health literacy strategies in clinical practice with patients was high. NPs reported using few health literacy strategies in practice and rates of health literacy assessments varied.
De Marchis et al., 2019	1298	Quantitative	Physicians	All ages	Primary care	Physicians who perceived their clinic as having a high capacity to address patients' social needs were less likely to report burnout.
Garg et al., 2009	45	Quantitative	Residents	Pediatrics	Primary care	The majority of resident providers believed in the importance of addressing social needs and felt responsible for screening.
Garg et al., 2019	603	Quantitative	Physicians	Pediatrics	Mixed pediatric settings	Most pediatricians reported that social risk screening is important; fewer reported that screening is feasible or felt prepared addressing families' social needs.
Grindler et al., 2018	312	Quantitative	OBGYNs	N/A	National survey of practicing OBGYNs	Providers did not feel comfortable obtaining an environmental history.

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Hoisington et al., 2012	186	Quantitative	Family practice pediatric NPs and physicians	Pediatrics	Primary care	Most providers were willing to use a standardized screening question. Providers identified time constraints, lack of resources, inadequate knowledge, and concerns about question sensitivity as barriers to screening.
Jones et al., 2021	611	Quantitative	Physicians, NPs	Pediatrics	Primary care	Provider discomfort in responding to a positive screen and perceptions that community resources were limited was directly related to provider reports of reduced screening behaviors.
Kostelanetz et al., 2021	193 survey responses; 16 interviews	Mixed methods	Physicians, APPs, RNs, social workers, case managers, pharmacists, administrators	Adults	Inpatient; Primary care; Internal medicine	The majority of respondents believe information about patients' social needs could improve patient care, provider-patient communication, and trust with patients; support efforts to incorporate social needs into healthcare; and believe social needs screening should be a standard part of care.

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
LaForge et al., 2018	N/A	Qualitative	Representatives from 6 organizations that developed social screening tools for ambulatory care	All ages	Primary care; Other health care orgs	All interviewees reported concerns about care teams being unable to address positive social needs screenings due to limited staff time and lack of local resources. Screening tool developers believed that even if they could not address every identified social need, social data could help identify unmet community needs, thus supporting advocacy. Although one team had concerns that social screening would be burdensome, physicians reported that patients received more holistic care, lessening workloads, and improving care quality. Other concerns included how best to communicate with local agencies, track outcomes of past referrals, and, how to maintain resource lists.
Lax et al., 2021	85	Quantitative	Physicians	Pediatrics	Primary care; Inpatient care; Sub-specialty care	The majority of respondents in believe it is their job to refer patients to resources for financial hardships (76%, 65/85). Fewer reported comfort inquiring about (28%, 24/85) or referring for social needs (34%, 29/85). Most respondents reported it was not feasible to screen for financial needs (42 %, 36/85) and did not feel well prepared to address families financial or social needs (21%, 18/85).

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Leary et al., 2021	23	Qualitative	Pediatric hospitalists, residents, fellow, RNs, social workers, case managers	Pediatrics	Inpatient	All participants expressed that screening for social needs during healthcare visits was important, enabling clinicians to identify vulnerable patients. Participants reported that inpatient social screening could provide clinicians with a more comprehensive understanding of families' social context to improve quality of inpatient care, build trust and potentially impact long-term health. Nearly half reported they would not feel completely comfortable performing social screening with families, many citing lack of education.
Lewis et al., 2016	43	Mixed methods	N/A	All ages	Primary care	Providers agreed that SDH contribute to the health of their patients and were comfortable with identifying SDH at the point of care. Most providers were neutral on whether their CHC had adequate resources to address SDH.
Losonczy et al., 2015	432	Quantitative	Physicians & residents	All ages	Emergency medicine training programs	Fewer than 1% of respondents replied that addressing non-medical needs was not part of their job or that such needs were not relevant to patients' health. Reported barriers to screening included feeling unable to act, lack of time, and lack of knowledge.

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Nehme et al., 2021	9 leadership and staff across 3 orgs	Qualitative	Leadership and management staff	All ages	Primary care	Benefits of systematic data collection on social needs included the generation of data for community action. Drawbacks included concerns about data privacy. Community resource referral platforms were seen as valuable for creating accountability but required an influential community partner and adequate community resources. Concerns about disempowering clients and blurring roles were voiced, and potential to increase provider job satisfaction was identified.
Olayiwola et al., 2018	359	Quantitative	Physicians, Residents, APPs	All ages	Primary care	Providers reported it was important to address patient social needs in Primary care and high levels of confidence in asking patients about their social needs. Providers were less confident in their skills and available clinic resources to address social needs. Providers' strong beliefs in the importance of addressing social needs, higher comfort asking about social needs, and greater skills addressing social needs were significantly associated with lower reported levels of exhaustion and cynicism and higher levels of professional efficacy.

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
O'Toole et al., 2012	40	Quantitative	Residents	Pediatrics	Primary care	Residents from clinics with more social and legal resources reported feeling more confident in their knowledge about food security benefits, screened more frequently and spent more time taking social histories.
Palacio et al., 2018	240	Quantitative	Clinical faculty providers	N/A	Primary care; Specialty care	The majority of participants agreed that SDH are important predictors of health outcomes and care quality (83%). A greater number of females compared to males agreed that SDH collection would enable development of special programs for at-risk populations. 72% of participants agreed that collecting SDH information would put additional burden on providers; 58% thought the benefit of this information would outweigh the burden. Belonging to a racial ethnic minority group was associated with believing that benefits of collecting SDH outweigh the risks. The most common concern cited by providers was inadequate resources to address social needs. Among minority physicians, the second most common concern was liability related to not addressing a risk leading to an adverse outcome, whereas for nonminority faculty and specialists, it was not knowing how to use SDH data once they are available. More than half of participants thought PCPs should be responsible for managing social risk factors.

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Palakshappa et al., 2020	55 free and charitable clinics	Quantitative	Clinic leadership	All ages	Primary care	Of the 55 clinics that completed the survey, 34 (61.8%) reported always screening for at least one SDH. Over 90% of clinics either agreed or strongly agreed that the clinic should provide information about resources to address patients' unmet social needs. Over 80% either agreed or strongly agreed the clinic should directly connect or refer patients with these unmet social needs to resources in the community. The primary barriers clinics reported to addressing the SDH were a lack of specific personnel (40.7%), such as a social worker, or enough personnel (33.3%) to address patients' needs.
Pantell et al., 2019	890	Quantitative	Physicians	All ages	Primary care	Physicians who reported practicing in a clinic they felt was prepared to manage patients with social needs had higher job satisfaction; were more satisfied with amount of time spent with patients; and were more likely to think that the quality of medical care patients receive had improved.
Parker et al., 2021	29	Qualitative	Physicians, RNs, social workers, dietician	Pediatrics	Inpatient (NICU)	Providers felt a standardized screening and referral system would be very appropriate in the NICU setting and would help ensure that families would have their unmet basic needs assessed and addressed more consistently than the current practice. NICU providers felt that addressing families' unmet basic needs was a central part of care for preterm infants, though some community resources are increasingly scarce.

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Phillips et al., 2020	768	Quantitative	RNs	All ages	Inpatient	Participant confidence in discussing patients' social needs and screening behaviors varied by need.
Pooler et al. 2018	16	Qualitative	Physicians, APPs	N/A	Primary care	Providers supported implementing food security screening and referrals in their practices though expressed a variety of concerns and challenges including competing screenings, competing demands from a business perspective, and adequate time and resources available for referrals. Providers suggested support staff could screen and refer patients.
Purnell et al., 2018	1220	Quantitative	Attending, fellows, and resident physicians	All ages	Specialty care	Providers who perceived major structural problems within their own clinic's organizational climate felt less skilled in identifying patient mistrust, patients' English literacy, and socioeconomic barriers. Respondents reported poor access to interpreters and lack of time to address cultural barriers as challenges to care delivery.
Robinson et al., 2018	114	Quantitative	Physicians, RNs, other staff	Pediatrics	ED	Most ED staff felt knowing information about families' home social resources would help patient care and should be addressed. Significantly fewer nursing staff members compared with physicians felt comfortable asking patients about childcare needs. Screening for Food insecurity and transportation issues were the most widely accepted by staff, with 78.9% of staff feeling it was appropriate to ask families about these home resource issues. Staff were less comfortable with asking about financial or job security, with 57.9% agreeing with the appropriateness to screen.

## Section Four. Appendix Table, continued

Author, Year	Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Study Outcomes
Schickedanz et al., 2019	258	Quantitative	Physicians, non-physicians (e.g., social workers, RNs)	All ages	Inpatient, outpatient	Most health professionals surveyed agreed that social needs screening should be a standard part of clinical care. Barriers to screening included lack of time and lack of resources to address patients' needs. Less than half felt confident in their ability to address social needs. Social workers and case managers were most often identified as best suited to screen for and address social needs.
Schwartz et al., 2020	373	Quantitative	Hospitalists, RNs	Pediatrics	Inpatient	Only 34% of hospitalists and 32% of nurses reported feeling competent screening for patients' social needs. Lack of time, resources (including a social navigation team), and a standardized inpatient screening tool were reported as barriers to screening.
Sokol et al., 2021	13	Qualitative	Physicians, NPs	Pediatrics	Mixed pediatric settings	Themes highlighted by providers reflected value of screening in identifying vulnerable patients; lack of time to screen; structural limitations to address identified needs; and concerns about patient comfort.
Swamy et al., 2020	43	Quantitative	Residents, faculty, staff	Pediatrics	Primary care	The majority of respondents perceived social factors as affecting patients and that assessing patients' social needs can improve health. 50% staff/faculty vs 65% of residents agree that screening can be valuable to the provider-patient relationship. 85% of residents perceived social screening time consuming vs only 35% of staff/faculty.

### Section Five. Appendix: Studies Evaluating the Reach, Adoption, Implementation, and Maintenance of Healthcare-Based Social Screening

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population <sup>‡</sup>	Study Outcomes
Beck et al., 2012	N/A	639	Quantitative	Clinicians	Pediatrics	Primary care	20% White 71% African American 9% other	<b>Adoption:</b> Indirectly evaluated clinician screening practices; 81% of caregivers had 1/7 social history questions documented; >50% had all 7 social history questions documented (mean 4.5 questions).
Berry et al., 2020	28	N/A	Qualitative	Leadership, frontline staff, volunteers, & primary care providers	Adults	Primary care	90% “patients of color”	<b>Implementation:</b> <b>Facilitators/Adaptations:</b> Screens increased after integrating screening into existing workflow. Each clinic modified a tool adapted to their workflow and patient population. <b>Barriers:</b> Staff burden (one site switched to using volunteers); lack of time to discuss screening results with patients; patient literacy, limited English proficiency, concerns about immigration status, screening fatigue.

<sup>‡</sup> Race/ethnicity categories are as reported in the original article

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Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population <sup>‡</sup>	Study Outcomes
Bittner et al., 2021	N/A	100,097	Quantitative	N/A	Pediatrics	Primary care	4% Asian 4% Non-Hispanic Black 9% Hispanic or Latino 60% White Non-Hispanic 22% Other/unknown	<b>Reach:</b> Patients who were identified as Non-Hispanic White had higher rates of completed screens; patients classified as “Other/unknown” race/ethnicity had lower rates of completed screens. Medicaid-insured patients with completed screens were more likely to be Hispanic/Latino or Non-Hispanic Black.
Bleacher et al., 2019	N/A	2,018	Quantitative	N/A	All ages	Primary care	60% White 13% AA	<b>Reach:</b> While patients identified as AA race made up 13% of patients eligible for screening, they made up only 11% of those screened; versus patients identified as White made up 60% of the screening eligible population but 62% of those screened.  <b>Implementation:</b>  <b>Facilitators:</b> Practice-wide data sharing on screening rates increased screening activities. Using multiple communication strategies (email, meetings daily huddles) helped to communicate about screening. A physician champion helped increase awareness about the importance of screening and progress screening efforts. Concerns about lack of time to screen declined during pilot screening implementation.

## Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population <sup>†</sup>	Study Outcomes
Broaddus-Shea et al., 2022	10	20	Qualitative	Clinic staff involved in social screening/navigation	Adults	Primary care	2.5% Hispanic 7% Non-Hispanic White 0.5% Native American	<p><b>Implementation:</b></p> <p><b>Barriers:</b> Lack of framing/introduction of screening; lack of time to follow up with patients after positive screens. Concerns about confidentiality.</p> <p><b>Facilitators:</b> Frame screening as standard and not singling out patients; normalize social needs; assure patients about privacy; clarify purpose of screening; describe relationship between social needs and health; emphasize benefits to the community; respect patient autonomy; build trusting relationships; treat screening as ongoing process; draw on trauma-informed care; offer resources first; understand and acknowledge social and structural barriers to assistance.</p>
Browne et al., 2021	15	N/A	Qualitative	Community resource staff, managers from CHCs & hospitals	Not specified	Primary care	N/A	<p><b>Implementation:</b></p> <p><b>Barriers:</b> Managers noted that patients had difficulty completing screening before their appointments due to discomfort with technology and lack of time.</p>

Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population <sup>†</sup>	Study Outcomes
Buitron de la Vega et al., 2019	N/A	1696	Quantitative	N/A	Adults	Primary care	32% Non-Hispanic White 40% Non-Hispanic Black/AA 4% Native American/ American Indian 24% Declined <1% Hispanic/Latinx, Native Hawaiian/ Pacific islander (PI)	<b>Adoption:</b> The electronic health record (EHR)-embedded tool linked positive screens with ICD-10 codes 82% of the time. <b>Implementation:</b> <b>Time:</b> Medical assistants (MAs) took an average of 1 minute to enter responses from screening into patients' EHR.
Byhoff et al., 2017	N/A	N/A	Qualitative	N/A	All ages	Primary care	56% Non-Hispanic White 27% Non-Hispanic Black/AA 16% Hispanic 13% Other	<b>Implementation:</b> <b>Adaptations:</b> 41% of health centers reported that screening was self-reported. Most commonly "other" staff were reported as screening patients (24%), followed by MAs (22%); social workers/ case managers (18%); providers (16%); front desk (12%); nurses (RNs) (10%). 40% of screening was conducted before, during, or after a visit; new patients were most frequently targeted; most health centers (63%) used the EHR to record social information directly.

Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population <sup>†</sup>	Study Outcomes
Chisolm et al., 2019	24 member states	N/A	Mixed methods	State Medicaid representatives	Medicaid population	State Medicaid medical directors	N/A	<b>Implementation:</b> <b>Adaptations:</b> Lack of social risk data standardization across clinics made it difficult to use it to evaluate for health disparities.
Colvin et al., 2016	87 (43 intervention interns and 44 comparison team interns)	N/A	Mixed methods	Pediatric & Med-Peds interns	Pediatrics	Inpatient	54% Non-Hispanic White 22% Non-Hispanic Black 15% Hispanic 22% Other 2% Asian/Pacific Islander (API)/Native American	<b>Adoption:</b> Intervention interns screened 82% of patients versus the control group 17%. <b>Maintenance:</b> 30/43 intervention interns (70%) stopped using the screening tool during the maintenance period, while 13 (30%) continued screening until the end of the 21-month post-intervention period.
Cottrell et al., 2019	N/A	31,549	Quantitative	N/A	All ages	Primary care	30% Non-Hispanic White 31% Non-Hispanic Black 25% Hispanic 11% Non-Hispanic Other 4% Missing	<b>Reach:</b> A greater proportion of Hispanic patients were screened for social risks (32% vs. 25% of patients not screened).

Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population <sup>†</sup>	Study Outcomes
Drake et al., 2021 (The Direct Clinic Level Cost.)	7+ (exact N unclear)	N/A	Qualitative	Clinical champions, administrators, and front line staff involved in social risk screening program	All ages	Primary care	N/A	<p><b>Implementation: Cost:</b> The study estimated costs of social care programs at 4 FQHCs; costs included referral and case management activities beyond screening. Variability in program costs between FQHCs was attributed to personnel cost.</p> <p><b>Adaptation:</b> There was variability in screening activates across FQHCs, including the use of customized EHR flowsheets.</p>
Drake et al., 2021 (Implementation of social needs screening in primary care)	5	10	Qualitative	Clinical case managers	Adults	Primary care	<p>Interviewees: 80% Non-Hispanic 20% Hispanic</p> <p>Screened patient population: 49% Non-Hispanic Black 35% Hispanic</p>	<p><b>Implementation: Facilitators:</b> Clinicians reported that specific, evidence-based patient engagement techniques, such as empathic communication and motivational interviewing, facilitated implementation and delivery of the screening assessment. Patients appreciated not feeling rushed and acknowledged the benefit of empathic communication with health care team.</p> <p><b>Barriers:</b> Clinicians noted that EHR documentation could be time consuming. It was unclear who should conduct screening. Time was a barrier to screening efforts.</p>

Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population <sup>‡</sup>	Study Outcomes
Emengo et al., 2020	N/A	7	Qualitative	N/A	Adult caregivers of pediatric patients	Primary Care	92% Non-white	<b>Implementation: Facilitators:</b> Caregivers preferred to receive the screening survey while waiting for a visit (to make best use of time); caregivers expressed a preference for trained navigators vs physician to screen due to a perception that navigators had more time. Caregivers appreciated when their clinicians were aware of the screening results.
Fiori et al., 2019	N/A	4,162	Mixed methods	Clinicians	Pediatrics	Primary Care	N/A	<b>Adoption:</b> On average, 76% of providers were engaged in screening over an 11 month period (engaged = screened >50% of eligible patients). <b>Implementation:</b> <b>Facilitators:</b> Developed a standardized process for screening during well-child visits. A ‘provider champion’--a designated clinician based at the health center who led ongoing program quality improvement--was used to coach community health workers (CHWs), and lead program adaptations. ‘Administrative liaisons’—clinical site leaders engaged with the program—provided overall leadership, direction, and supervision. Clinic met regularly to review progress and concerns, and make changes as needed.

Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population <sup>†</sup>	Study Outcomes
Fiori et al., 2021	694	53,093	Quantitative	Pediatric, family medicine, & internal medicine clinicians	All ages	Primary care	% of active patients (at least 1 visit during study period) screened by race/ethnicity: 15% Non-Hispanic White 21% Non-Hispanic Black 23% Hispanic 19% API 16% American Indian/Alaska Native (AIAN)	<p><b>Reach:</b> Patients who received care at a practice with a CHW focusing on social service support were more likely to be screened (29% vs 15%). 26% of active pediatrics patients, 20% of internal medicine patients and 19% of family medicine patients were screened.</p> <p><b>Adoption:</b> Screening frequency varied among providers: 13% conducting between 1-5 screenings during the study period. Pediatric providers were the largest proportion of active providers screening (55%), followed by internal medicine (49%) and family medicine providers (49%).</p>
Freibott et al., 2021	5	662	Mixed methods	Hospital staff involved in screening	Mixture, including adults, geriatric	Primary care, specialty, ED	Race: 62% White 11% Black 5% "Other" 22% Unknown Ethnicity: 26% Hispanic/Latinx	<p><b>Reach:</b> Hospital 1: 271/289 94% patients asked to participate were screened; 28/271 (11%) declined answer need-based questions; 100% of patients were screened at Hospital 2-4.</p> <p><b>Implementation: Facilitators:</b> Having a short, easy to use screening tool. <b>Barriers:</b> Lack of a standardized referral process made screening difficult to sustain or justify.</p> <p><b>Adaptations:</b> Hospitals were given flexibility regarding who/when/how to screen.</p>

Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population*	Study Outcomes
Garg et al., 2007	45	200	Quantitative	Pediatric residents	Adult caregivers of pediatric patients	Primary care	Caregivers: 91% Black	<p><b>Implementation:</b></p> <p><b>Facilitators:</b> Caregivers in intervention group (residents trained to screen caregivers) discussed a greater number of family psychosocial topics (2.9 vs. 1.8) with their resident clinician and had fewer unmet desires for discussion (0.46 vs. 1.41) compared to caregivers in control arm.</p> <p><b>Time:</b> 91% of residents reported screening added &lt;5 minutes to the visit and 55% of residents reported screening added &lt;2 minutes to their visits.</p>
Godecker et al., 2013	6	733	Quantitative	RNs and CHWs	Adults; Pregnant women	Specialty (OB-GYN)	4% Non-Hispanic White 70% Non-Hispanic Black 5% Hispanic 18% API	<p><b>Implementation:</b></p> <p><b>Facilitators/Workforce:</b> CHWs were able to capture more social risk information compared to RNs (patients disclosed more risks).</p> <p><b>Cost/Workforce:</b> CHWs were able to conduct screening at 56% reduced costs compared to RNs.</p>

Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population*	Study Outcomes
Gold et al., 2018	24	1,130	Mixed methods	Care team members	All ages	Primary care	<p>Patients screened by site:</p> <p>Site A: 90% White 7% Hispanic</p> <p>Site B: 85% White 20% Hispanic</p> <p>Site C: 71% White 15% Hispanic</p>	<p><b>Reach:</b> At one clinic site (B), a greater proportion of patients identified as Hispanic were screened, compared to the clinic patient population. At another (site C), a greater proportion of patients identified as Asian race were screened.</p> <p><b>Implementation: Facilitators:</b> Workflow customization, based on barriers encountered during implementation of screening/EHR documentation, facilitated expanding screening. Having an EHR-savvy clinic champion at each site facilitates screening/documentation efforts; served as a resource to screening implementation. Embedding social risk screening within the EHR facilitated screening. <b>Barriers:</b> Paper based screening created an extra step for staff to input screening. The EHR social risk tool was perceived by some as contributing to social risk data being in multiple places in EHR. Other barriers included: lack of staff EHR expertise/competencies, the tool needing to be customized at each site, differences in EHR security access by staff role.</p>

Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population*	Study Outcomes
Gottlieb et al., 2014	N/A	538	Quantitative	N/A	Adult caregivers of pediatric patients	ED	57% Hispanic 25% Non-Hispanic Black 5% Non-Hispanic White 13% Other/ Multiethnic	<b>Implementation:</b> Facilitators/Modality: Caregivers who responded to computer-based survey vs. face-to-face had higher disclosure of interpersonal violence/threats in the home, financial strain, child’s safety, lack of/inadequate health insurance, income, and overall number of positive social risk domains.
Greenwood-Ericksen et al., 2021	23	N/A	Qualitative	Medical directors, CHWs, and RN case managers across 5 CHCs	All ages	Primary care	N/A	<b>Implementation:</b> <b>Facilitators:</b> Standardized screening to avoid missing important needs and standardize comparisons across subgroups; CHW roles (patients more willing to talk to CHWs, but CHWs also had limited time). <b>Barriers:</b> Not using evidence to select tools; time constraints; inconsistencies in practices; having to add in paper screens to EHR. Funding often determined who was screened (i.e. what patients were targeted). <b>Adaptations:</b> All FQHCs tailored screenings for specific subgroups, but details not provided. There was significant variability within and across sites regarding who screened, how and when screening was done, whether screening tools with integrated within EHR.

Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population*	Study Outcomes
Higginbotham et al., 2019	N/A	53	Quantitative	N/A	Pediatrics	Primary care	Predominantly White (percentage not provided)	<p><b>Adoption:</b> Staff screening rate for administering screening was 63% overall; screening rate varied from 68% week 1, 45% week 2, 77% week 3);</p> <p><b>Implementation:</b>  <b>Facilitator:</b> Hypothesized facilitator to increasing adoption was having screening in brightly colored folders and easily accessible to staff.</p>
Jones et al., 2021	611	N/A	Quantitative	Physicians, NPs	Pediatrics	Primary care (Family Medicine and Pediatrics)	N/A	<p><b>Implementation:</b>  <b>Adaptation:</b> Highlighted variability in clinician screening practices. Over 1/3rd of providers noted using informal practices to screen for social risks, asking questions differently depending on the client and family. Close to 50% reported using paper or electronic self-complete screening tools; face-to-face screening was less common.</p>
Kim et al., 2021	61	327	Mixed methods	Staff involved with screening	Adults (Geriatric; aged 65+)	Primary care	Clinic A: not described Clinic B: 59% AA 3% Hispanic 3% Asian Clinic C: >60% Hispanic Non-White 24% AA	<p><b>Adoption:</b> Study defined adoption as whether the Primary care liaison (PCL) services screened at least one patient at each clinic.</p> <p><b>Implementation:</b>  <b>Facilitators:</b> PCL educated 61 interprofessional primary care providers/ staff on how to identify and refer patients to address unmet social needs. PCL provided way to screen patients for social needs after hospitalization.</p>

Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population <sup>†</sup>	Study Outcomes
Kocielnik et al., 2019	N/A	30	Mixed methods	N/A	Adults	ED	20% White 27% Black/AA 30% Hispanic 7% Multiple race 13% Other/decline to answer	<b>Implementation: Facilitators/Modality:</b> Low health literacy participants preferred using ChatBot over online version of survey (Chatbot was perceived as engaging and caring) vs. high literacy patients preferred online survey (Chatbot was perceived as robotic, disingenuous). Some participants reported being more comfortable disclosing social risks to a Chatbot vs. others felt more comfortable disclosing on online survey; not split by literacy level. <b>Time/Modality:</b> The Chatbot took longer to complete than the survey for both high and low literacy patients.
LaForge et al., 2018	N/A; 6 case studies	N/A	Qualitative	N/A	All ages	Primary care	N/A	<b>Implementation: Adaptations:</b> All organizations noted significant flexibility in who administered screening and when screening was done. Two organizations noted making changes to their tools after piloting; Kaiser’s YCLS tool was shortened and translated into different languages; Mosaic Medical discontinued using their own screening tool for OCHIN’s screening tool after 2 years.

Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population*	Study Outcomes
Morgenthaler et al., 2019	65	N/A	Quantitative	Clinic directors	Pediatrics	Primary care	Patients from participating clinics: 28% had 26-50% White patients 22% had 26-50% Black patients 26% had 26-50% Hispanic patients	<b>Implementation:</b> <b>Barriers:</b> Lack of time (68%), resources (50%), and training to administer and address positive screens (47%). 9% reported inadequate evidence as a barrier. <b>Adaptations:</b> Clinics used validated screening instruments (31%), instruments developed by the staff (28%), or adaptations of validated instruments (16%). Most surveys were administered by paper forms (55%), done at well visits (47%), and done by the primary care provider (51%).
Murray et al., 2022	N/A	1258	Quantitative	N/A	All ages	ED	Pre- vs. Post-COVID patient population screened: 43% vs. 47% White 29% vs. 18% Black 6% vs. 3% American Indian 13% vs. 16% Other 43% vs. 48% Hispanic	<b>Reach:</b> In the pre-COVID period, 666/16,674 potentially eligible patients were screened in person, and 592/11,309 potentially eligible patients were screened in ED by phone in the post-COVID period. Potentially eligible = patients with Medicaid/Medicare insurance (target population) who were seen in the ED during the study time period. <b>Implementation:</b> <b>Adaptations/Modality:</b> workflow adjusted in terms of modality and workflow of screening--but screening was still done during ED visit.

Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population <sup>†</sup>	Study Outcomes
Oldfield et al., 2021	N/A	175	Quantitative	N/A	Adult caregivers of pediatric patients; Adolescent patients	Primary care	82% Latinx caregivers 95% Latinx adolescents 49% Mixed Race/Other caregivers 62% Mixed Race/Other adolescents	<p><b>Implementation:</b></p> <p><b>Time:</b> Surveys were administered via tablet and took caregivers 5.6 minutes to complete vs. 3.9 minutes for adolescents.</p> <p><b>Adaptations:</b> Most screens took place during well-child preventive visits vs. follow-up or urgent visits.</p>
O’Toole et al., 2013	36	N/A	Mixed methods	Pediatric and Med-Peds residents	Pediatric patients; All ages	Primary care	N/A	<p><b>Adoption:</b> After intervention training, intervention residents screened more frequently for familial support, utility issues, and housing conditions.</p> <p><b>Implementation:</b></p> <p><b>Time:</b> Intervention residents spent more time screening for social risks (median increase of 165 seconds vs. control residents median increase of 30 seconds).</p>
Page-Reeves et al., 2016	N/A	3048	Quantitative	N/A	All ages	Primary care	N/A	<p><b>Implementation:</b></p> <p><b>Facilitators:</b> Patients who completed screen with MA face-to-face had higher rates of screening positive for social risks.</p>

Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population <sup>†</sup>	Study Outcomes
Palakshappa et al., 2021	27	219	Quantitative	Physicians, advanced practice practitioners, RNs, staff	Adults	Primary care	23% Non-Hispanic White 64% Non-Hispanic Black 13% Hispanic 1% Other	<p><b>Implementation:</b></p> <p><b>Facilitators:</b> Health care teams thought the mobile system aligned with how they thought screening should be done, and providers perceived the system as easy to use. Sent automated message in EHR to notify clinician seeing patient and clinic’s patient navigator if they screened positive.</p> <p><b>Barriers:</b> 43/219 (19.6%) patients required assistance with the tablet to complete tool; relied on study coordinator to assist patients if needed assistance completing screening.</p>
Patel et al., 2018	N/A	322	Qualitative	Resident Physicians	Pediatrics	Primary care	54% Not Hispanic/Latinx 8% Hispanic/Latinx 38% Unknown	<p><b>Adoption:</b> The intervention to increase resident screening (train residents on screening and local resources; included visual reminders to screen) increased screening for two domains, income and housing.</p>

## Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population <sup>‡</sup>	Study Outcomes
Power-Hays et al., 2020	N/A	132	Mixed methods	N/A	Pediatrics	Specialty clinic (hermatology)	N/A	<p><b>Reach:</b> The percentage of screening varied per month from 23% to 89% at its highest due to a quality improvement intervention.</p> <p><b>Adoption:</b> Rates of screening varied from a low of 23% (attributed to short staffing) to high of 89% (attributed to changing survey distribution responsibility from clinician to clinical assistant).</p> <p><b>Implementation:</b></p> <p><b>Facilitators:</b> Changing responsibility of survey distribution from physician to clinical assistants; sharing data at staff meetings on high patient needs and patient satisfaction; giving screener to all patients for non-sick/non-urgent visits; posting reminders in exam rooms.</p> <p><b>Barriers:</b> Temporary staff shortages.</p>
Sand et al., 2021	N/A	78 patients (36 pre & 42 post)	Quantitative	N/A	Adults	Primary care	62% White 13% Black 24% Hispanic 1% Asian	<p><b>Adoption:</b> An intervention to train clinicians increased the number of documentations of social risk screening post-intervention from 44% (N=16) to 93% (N=39) of new patient visits.</p>

## Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population <sup>‡</sup>	Study Outcomes
Schwartz et al., 2020	373	N/A	Quantitative	Hospitalists, nurses	Pediatrics	Inpatient	N/A	<p><b>Adoption:</b> 29% of hospitalists and 41% of RNs reported frequently screening hospitalized patients for 1+ social risk; 97% of hospitalists and 65% of nurses reported not using a specific screening tool.</p> <p><b>Implementation:</b></p> <p><b>Facilitators:</b> Hospitalists reported doing more screening if they felt that screening was clinically relevant (e.g. there were concerns about language barriers, access to health care, insurance, transportation barriers, abuse, parent education/literacy), and doing more screening if they felt more competent at it.</p> <p><b>Barriers:</b> Lack of time, resources, and a standardized inpatient social risk screening tool.</p>

## Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population <sup>‡</sup>	Study Outcomes
Silva et al., 2021	N/A	890	Quantitative	Faculty, Residents	Pediatrics	Primary care	N/A	<p><b>Reach:</b> Comparisons of screening percentages and patient populations between clinician groups: 91% of families seen by residents were screened for 1+ SDH (95% CI: 88.4% to 93.4%) vs. 96% of faculty patients (95% CI: 94.3% to 98.2%).</p> <p>Residents screened families less frequently than faculty for food insecurity (79.3% vs. 92.5%, <math>P&lt;0.05</math>) and financial insecurity (79.9% vs. 93.6%, <math>P&lt;0.05</math>). A similar percentage of residents and faculty screened families for school absence (83.9% and 86.1%, <math>P=0.78</math>).</p> <p><b>Adoption:</b> High rates of completed social risk questionnaires during clinician visits.</p>
Sokol et al., 2021	13	N/A	Qualitative	10 MDs, 3 NPs	Pediatrics	10 different pediatric settings	N/A	<p><b>Implementation:</b></p> <p><b>Facilitators:</b> Having systematic screening as part of workflow (e.g., through EHR checkbox); clinician involvement with screening process to build patient trust. Desire for explicit processes for screening frequency and screening rationale to provide transparency for families.</p> <p><b>Barriers:</b> Time.</p>

Section Five. Appendix Table, continued

Author, Year	Provider Sample Size	Patient Sample Size	Type of Data	Provider Population	Patient Population	Study Setting	Race/Ethnicity of Patient Population <sup>‡</sup>	Study Outcomes
Vasan et al., 2020	92	N/A	Quantitative	Residents	Pediatrics	Multiple settings	N/A	<b>Adoption:</b> More residents reported screening within outpatients settings compared with inpatient settings.
Wallace et al., 2020	N/A	210	Mixed methods	Staff	Adults	ED	N/A	<b>Implementation:</b> <b>Barriers:</b> Staff expressed discomfort asking questions they believe to be stigmatizing. <b>Fidelity:</b> Staff used their own judgement to determine who to screen and how (which could be based on patient appearance or insurance type).
Wallace et al., 2021	8	10 patients in focus group; 2,821 patients screened	Mixed methods	Registration staff	Adults	ED	Focus group patients: 40% White 20% Black 10% API 20% Hispanic/Latinx Patients screened: 79% White 14% Hispanic/Latinx 4% Black/AA 2% Asian 12% Other	<b>Implementation:</b> <b>Facilitators:</b> Patients noted that the perceived sincerity of screening staff impacted their receptivity to screening. <b>Barriers:</b> Staff noted discomfort with screening and perception of screening futility. Patients expressed concerns about stigma and privacy. <b>Fidelity:</b> Staff would tailor the screening using their “professional intuition;” decide how to frame screening/when to screen based on this intuition (including based on patient appearance).

**Appendix Table Six: Studies on Social Screening Versus Interest in Assistance (N=20)**

Author, Year	Sample Size	Type of Data	Study Population	Study Setting	Race/Ethnicity of Study Population <sup>‡</sup>	Study Outcomes
Bottino et al., 2017	340	Quantitative	Pediatric caregivers	Primary care	49% Black 33% Hispanic 6% White 13% Other	106/340 (31%) screened positive for food insecurity and 57/106 (54%) selected a referral for food resources; 50/234 (21%) of those food secure selected a referral.
Eismann et al., 2019	1072	Mixed methods	Pediatric caregivers	Primary care	FQHC (3 sites) Rural city: 97% White  Suburban: 48% Black, 46% White, 3% Multiracial, 3% Other  Urban: 72% Black, 25% White  Family medicine practice (1 site): 47% White, 30% Black, 18% Hispanic, and 6% Other	251/1072 (24%) screened positive for any risk factor and 142/251 (57%) endorsed a need. Of these, 6% refused help, 25% were already receiving help, and 99/251 (69%) accepted help.
Fiori et al., 2020	4948	Quantitative	Pediatric caregivers	Primary care	33% Hispanic 27% Non-Hispanic Black 8% Non-Hispanic Multiracial 32% Not disclosed	984/4948 (20%) households screened positive for 1+ social need; 320/984 (33%) were referred to CHWs; 287/948 (29%) requested CHW assistance; 124/287 (43%) had “successful” CHW referrals (successful referral defined as being successfully linked to services for social needs identified by the family).

<sup>‡</sup> Race/ethnicity categories are as reported in the original article.

[Back to Social Screening vs. Interest in Assistance section.](#)

Appendix Table Six, continued

Author, Year	Sample Size	Type of Data	Study Population	Study Setting	Race/Ethnicity of Study Population <sup>‡</sup>	Study Outcomes
Fox et al., 2016	116	Quantitative	Pediatric caregivers	Specialty (weight management)	47% White 6% Black 12% Hispanic 6% Asian 20% Other	28/116 (24%) screened positive for food insecurity; 40/116 (34%) of patients were eligible for referral to food bank; 30/40 (75%) of those eligible for referral to food bank agreed to referral; 15/30 (50%) responded to referral outreach; 3/40 (8%) of eligible patients enrolled in food bank.
Garg et al., 2010	59	Quantitative	Pediatric caregivers	Primary care	97% Black 3% Other	11% screened positive for food insecurity; 12% for housing instability, 7% for utilities instability; 64% of 59 contacted a community resource or service; 19/59 (32%) enrolled in at least 1 community program.
Gold et al., 2018	1130	Mixed methods	Adults	Primary care	86% White 3% Multiracial 5% Unknown Ethnicity: 7% Hispanic	97% to 99% of patients screened positive for 1+ social need; N=211 (19%) with 1+ social need received a related referral; at follow up, N=62, 15% and N=178, 21% of patients at 2 CHCs with 1+ social need were interested in assistance.
Gruß et al., 2021	32865	Quantitative	Adults	Multiple settings (Inpatient, outpatient)	82% White 4% Black 3% Asian 7% Hispanic	7,807 (24%) screened positive for 1+ social need; all 32,865 patients screened were offered assistance; 14% requested assistance with medical financial hardship, 9% housing, 6% food, and 6% transportation.

Appendix Table Six, continued

Author, Year	Sample Size	Type of Data	Study Population	Study Setting	Race/Ethnicity of Study Population <sup>‡</sup>	Study Outcomes
Hassan et al., 2015	401	Quantitative	Adolescents	Primary care	54% Black 29% Hispanic 9% White	304 patients screened positive for major problems in: 10% financial strain; 29% food insecurity; 34% housing instability; 16% safety concern; 313/401 (78%) of patients (regardless of screening results) wanted to address 1+ social risk. By domain: 83% financial strain, 38% food insecurity, 37% housing instability, 16% safety concerns. 259/313 (83%) reached for follow up at 1-2 months; 104/259 (40%) had contacted an agency; 52/104 (50%) reported their social need resolved vs. 70/155 (45%) who had not contacted an agency.
Kelly et al., 2020	15296	Quantitative	Adults	Primary care	N/A	2,767/9,393 (30%) screened positive for food insecurity; 613/2,767 (22%) interested in SNAP; 22% of food insecure patients enrolled in SNAP.
Knowles et al., 2018	7284	Mixed methods	Pediatric caregivers	Primary care	N/A	1,133/7,284 (16%) screened positive for food insecurity; 790/1,133 (70%) of patients were reached by phone to consent to referral; 630/1,133 (56%) of food insecure consented to a referral (630/790, 80% of those reached by phone).

Appendix Table Six, continued

Author, Year	Sample Size	Type of Data	Study Population	Study Setting	Race/Ethnicity of Study Population <sup>‡</sup>	Study Outcomes
Martel et al., 2018	Unclear	Quantitative	N/A	ED	N/A	1,519 referrals to a food bank were made for patients who screened positive for food insecurity; 1,129/1,519 (74%) of referrals were successfully contacted by food bank; 4 to 88% of patients were eligible for food resources after referral, depending on resource/assistance type; 954/1,519 (63%) of referred patients were both interested in and received assistance from food bank.
Rowe et al., 2021	223	Quantitative	Adults	Primary care	57% Hispanic/Latino 39% White	146 (66.4%) screened positive for social risks; all 146 patients who screened positive for social risks were referred to social work services; 6/146 (4%) used social work services.
Schickedanz et al., 2019	3721	Quantitative	Adults	Multiple settings (Inpatient, specialty, outpatient)	23% Hispanic 50% White 9% Asian 15% Black 3% Other	1,984 (53%) screened positive for 1+ social risk; 29% financial strain, 29% food insecurity; N=1,984, 39% with 1+ social need were interested in assistance
Sokol et al., 2021	39251	Quantitative	Pediatric caregivers or pediatric patients	Primary care	81% White 11% Black 8% Asian Ethnicity: 3% Hispanic/Latino	8% screened positive for 1+ social risk; 2% requested a referral for identified needs. 14% of those that indicated a social need on the screener requested a referral for their needs vs. 1% requested a referral among those who did not screen positive on the social risk screener.

**Appendix Table Six, continued**

<b>Author, Year</b>	<b>Sample Size</b>	<b>Type of Data</b>	<b>Study Population</b>	<b>Study Setting</b>	<b>Race/Ethnicity of Study Population<sup>†</sup></b>	<b>Study Outcomes</b>
Swavely et al., 2019	3655	Mixed methods	Adults	Other (discharge follow-up calls)	52% African American 30% Hispanic 11% Non-Hispanic White 4% Other	987 (27%) screened positive for food insecurity; all 987 patients identified as food insecure were referred to a food resource; 750/987 (76%) of food insecure patients accepted information on food resources; 91/474 (19%) and 30/276 (11%) of those referred to two different food resources connected with those resources.
Tong et al., 2018	123	Mixed methods	Adults	Primary care	N/A	123 patients screened positive for social risk(s): 11% financial strain, 7% food insecurity, 4% housing instability, 2% safety concerns; N=123 wanted assistance with social risk domain (0% financial strain; 1.6% food insecurity [22% of those who screened positive]; 0.8% housing instability [20% of those who screened positive]; 2.4% safety concerns [100% of those who screened positive]).
Tuzzio et al., 2022	438	Quantitative	Adults	Other (Kaiser members on subsidized exchange health insurance plans)	46% Non-Hispanic White 32% Hispanic 16% Asian/Pacific Islander 18% Missing 4% Non-Hispanic Black	48% of respondents reported 1+ social risk factor. Among those with 1-2 social risks, 27% desired assistance; among those with 3-4 risks, 51% desired assistance. Non-Hispanic Black patients who reported a social risk were more likely to desire assistance than Non-Hispanic White patients who reported a risk. Participants with social risks who reported that screening was inappropriate were less likely to desire assistance than patients who reported a social risk and thought screening was appropriate.

Appendix Table Six, continued

Author, Year	Sample Size	Type of Data	Study Population	Study Setting	Race/Ethnicity of Study Population <sup>‡</sup>	Study Outcomes
Uwemedimo et al., 2018	703	Quantitative	Pediatric caregivers	Primary care	50% Hispanic 12% White 44% Black 38% Other	299 (43%) screened positive for 1+ social risk factor; 148/299 (49%) accepted navigation assistance for referrals; 31% of those who accepted assistance successfully used resources.
Vais et al., 2020	86	Quantitative	Pediatrics (unclear who completed forms)	Specialty (hematology)	72% African American 6% Hispanic 2% Afro-Latino 20% Other/NA	32 (37%) screened positive for transportation insecurity; all 32 patients were offered rides on a rideshare service, all accepted rides, and all used the rides.
Wallace et al., 2021	2821	Mixed methods	Adults	ED	79% White 4% Black 2% Asian 12% Others Ethnicity: 14% Hispanic/Latinx	1324 (47%) patients screened positive for 1+ social risk factor; all patients screened were offered assistance. 453/1324 (34%) of those with 1+ social need and 29/1497 (2%) with no reported needs requested referral to 211. 29% requested utilities services assistance, 27% rent payment assistance, 25% food pantries. 98/482 (20%) contacted 211 and were given referrals to community resources.

## Data Sources and Search Terms Appendix

To identify articles included under [Section Two](#) (Psychometric and Pragmatic Properties of Social Screening Tools; articles published after 5/18/2018);<sup>1</sup> [Section Three](#) (Patient and Patient Caregivers' Perspectives on Social Screening; articles published after 6/15/2019);<sup>2</sup> [Section Four](#) (Healthcare Providers' Perspectives on Social Screening); and [Section Five](#) (Implementation Research on Social Screening), we developed a two-concept search of 1) screening and 2) social risk factors. This search was developed based on a previous systematic review on the psychometric properties of social screening tools.<sup>1</sup> The search was refined by three study team members (VL, EB, ED) in consultation with an experienced university librarian. The final search strategy was adapted for all databases searched. We searched peer-reviewed literature databases (PubMed and Embase) for healthcare-based evaluations of social screening. Expert referral: we conducted searches within the [SIREN Evidence & Resource Library](#) to help build our original search criteria for the review and stay up to date on articles published after our literature review search was performed. We also had a PubMed alert from our original search from which we pulled relevant articles as they were published.

**Inclusion and Exclusion Criteria.** Articles were included if they described studies to evaluate the following aspects of multi-domain health care-based social screening:

- Psychometric testing (at least two types of reliability and/or validity testing [construct, criterion, content validity or internal consistency]) of screening tools;
- Provider perspectives on screening;
- Patient and/or caregiver perspectives on screening; and/or
- The comparative reach, adoption, implementation and/or maintenance of screening (aspects of reach/adoption/implementation/maintenance needed to be evaluated in the results, not just listed in methods; needed to evaluate

comparative reach [i.e. comparing approaches to screening, e.g., by modality/workforce], adoption of screening by health care workforce implementing screening in real world settings, implementation facilitators/barriers based on real world experience and/or evaluation of screening program workforce, workflow, costs, time to screen, adaptations, feasibility, fidelity; and/or evaluate whether screening was maintained over time.

Due to the unique features of the US healthcare system, including healthcare access, financing and reimbursement, we excluded studies conducted outside of the US. Articles had to be available in English-language and published between January 1, 2011 through August 8, 2021. We added 45 articles to Covidence at the full text review stage based on the SIREN Evidence & Resource Library and a PubMed alert through 12/31/2021. Multi-domain social screening tools was defined as screening tools covering two or more social risk domains. Social risk domains included housing, food, utilities, transportation, finances, employment, social isolation, and legal problems. Excluded domains included violence or safety concerns and adverse childhood events, given the robust existing literature on these domains.<sup>3</sup>

#### Exclusion criteria:

- Full text irretrievable;
- Not-US based;
- Not available in English;
- Perspective/commentary pieces;
- Review article;
- Study done outside of a healthcare setting or without intention to screen within a healthcare setting;
- Inadequate details in the results on screening outcomes of interest to report on screening outcomes of interest;
- Screening tools not multi-domain;
- The article collected social risk data as a covariate for another

- research purpose and did not discuss the implementation or impact of screening itself (e.g. to look at relationship between food insecurity and diabetes outcomes); and
- Articles that covered both screening and intervening on social risks where it was not possible to separate outcomes related to screening itself.

For review articles, if a review was found to be relevant to screening outcomes of interest for social risks, the original full text articles were reviewed for inclusion.

Two study team members (ED, EB, VL, MM, LG, HA, BF) initially reviewed each title abstract. We met weekly to resolve discrepancies. At our first meeting we had discrepancy on 4.1% of articles reviewed (41/1003). By our second meeting we had discrepancies on only 0.8% (13/1550). The remainder of the title/abstracts were subsequently reviewed by one reviewer. At the full text stage, we started with two reviewers (ED, EB, VL, BA, LG) reviewing each full text, and met weekly to resolve discrepancies. We found inclusion/exclusion discrepancies on 7% of the articles reviewed at our first meeting, 16% at our second meeting, and 14% at our third meeting and discussed until consensus was reached. After the third round, each reviewer went back to re-review any articles that they had reviewed without a second reviewer (45), and we subsequently began reviewing remaining full text articles with a single reviewer.

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## Section Five: Implementation Research on Social Screening

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## Appendix Seven: Data Sources and Search Terms

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