



NATIONAL
QUALITY FORUM

A Framework for State Medicaid Programs to Address Food Insecurity and Housing Instability

DRAFT REPORT

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Executive Summary

Social determinants of health (SDOH) are the most influential factors that determine the health outcomes of individuals.¹ Food insecurity and housing instability are two social determinants that are known to have a profound impact on health outcomes. However, the healthcare system does not routinely assess or employ interventions to address social needs. Consequently, there is no systematic approach to addressing these issues within the healthcare system at the local, state, or federal level. In collaboration with Centers for Medicare & Medicaid Services (CMS), the National Quality Forum (NQF) has developed a framework for state Medicaid programs to better assess and address social needs in healthcare, using food insecurity and housing instability as illustrative examples. To support this work, NQF convened a multistakeholder Expert Panel to:

- conduct environmental scan of measures that assess food insecurity and housing instability;
- develop a framework that illustrates the role of measurement and the healthcare system in addressing SDOH; and
- provide recommendations on how state Medicaid programs can support the role of healthcare organizations in addressing social risk factors.

The environmental scan and literature review revealed a wealth of measurement activities related to food insecurity and housing instability. The majority of measurement for both food insecurity and housing instability is conducted through national and state survey instruments. Several studies have used data collected with these instruments to assess the impact on health outcomes. Food insecurity is most assessed through the US Department of Agriculture's 18-item instrument, which captures about 45,000 households in the Current Population Survey (e.g. food insufficiency, anxiety, food quality). Measurement of housing instability generally clustered around measuring relative cost, homelessness, housing quality, and overcrowding. Some measures sought to address the relationship of housing instability to other social risk factors, including socioeconomic status, transportation access, and others, as well as links to mental health and healthy behaviors. There are many screening and assessment tools for providers, community health workers, case managers, etc. to assess both food insecurity and housing instability and several that have demonstrated high levels of reliability and validity.

Based on findings from the environmental scan, the Expert Panel developed a framework that articulates the role of the healthcare system addressing social risk. The framework builds on the hub-and-spoke model by Taylor et al. and work from the Social Interventions Research & Evaluation Network at the University of California San Francisco. It describes the utility of social needs data to assist in the delivery of "SDOH-informed healthcare" and "SDOH-targeted healthcare". SDOH-informed healthcare is the delivery of care that considers social needs in clinical decision-making (e.g., considering the availability of refrigeration). While SDOH-targeted healthcare refers to the implementation of interventions, which specifically address social needs (e.g., connecting a patient to community-based services). The framework also explicitly states the healthcare system's role as leader in the development of cross-sector collaboration and partnerships.

With additional input from key informant interviews, the Expert Panel provided a series of specific recommendations to support the framework. The Panel's recommendations were categorized into the

following areas: 1) Community and healthcare system linkages; 2) Information sharing and measurement; and 3) Payment methods and innovative use of resources. These recommendations, though generally directed at state Medicaid programs, are likely to be applicable to other entities. In an effort to offer further guidance to state Medicaid programs, a series of descriptive examples, known as use cases, are included in the report.

Background

Social determinants of health (SDOH) are some of the most critical factors that influence the health of individuals. The National Academy of Medicine describes these factors as the conditions, in which people are born, live, learn, work, play, worship, and age.² Economic stability, in particular, has a profound impact on health and healthcare outcomes due to its direct relationship with basic human needs. Among the primary issues of economic stability are food insecurity and housing instability. Food insecurity and housing instability are highly prevalent in the United States and influence variety of healthcare outcomes.

The United States Department of Agriculture (USDA) estimates that nearly 12 percent of U.S. households (7.4 percent low and 4.9 percent very low) were classified food insecure in 2016. The majority of food insecure households (31.6 percent) had children, and were headed by a single woman. Food insecure households had incomes 185 percent below the poverty threshold (poverty line was \$24,339 for a family of four in 2016).³ The majority of measures of food insecurity capture estimates at the national and state level. These measures frequently assess food insecurity in terms of household food access, acquisition, food consumption, and utilization.⁴ Beyond data collected by the federal government and others, *Feeding America*, a non-profit network of 200 food banks, regularly conducts and compiles research to understand the characteristics and lives of individuals who are food insecure.

Despite the high prevalence of food insecurity, relatively few studies have documented its effect on health and healthcare outcomes. A recent review of the literature repeatedly found food insecurity to lead to poorer health outcomes.⁵ These studies have examined the impact of food insecurity within children, non-adult seniors, and seniors. For example, among children, food insecurity is associated with birth defects, anemia, cognitive problems, aggression, and anxiety. Fewer studies have examined health outcomes among non-senior adults, but food insecurity has been associated with decreased nutrient intakes, mental health problems, diabetes, hypertension, and worst outcomes on health exams. Even fewer studies have examined health outcomes among seniors, but some have found food insecurity to increase seniors need for assistance with activities of daily living. Several recent studies have corroborated previous evidence.^{6,7} Food insecurity is highly correlated with housing instability, among several other social hardships (e.g., poverty and employment).

According to the US Department of Housing and Urban Development (HUD), 8.3 million renters were classified as worst-case needs or experience housing instability in 2015.⁸ Worst-case needs are defined as households who are renters, have very low annual incomes (\$17,050-\$28,400), have lack of housing assistance, and have severe rent burden and/or inadequate housing.⁹ Individuals who experience worst case needs may face homelessness. In 2016, individuals who experience homelessness were 22% children, 69% over the age of 24, and nine percent between the ages of 18 and 24 have experienced homelessness.¹⁰ Of those who were women and children, they stayed in emergency shelter, transitional housing programs, or safe havens. Similarly, to food insecurity, most housing instability measures are estimated at the state and national level.

The construct of housing instability is most commonly assessed through the concepts of housing quality, housing cost burden, homelessness, residential instability, neighborhood quality, and overcrowding.

Measures of housing instability are limited and vary in their degree of adoption as well as their intended use. The existing measures and indicators of housing instability, though not mutually exclusive, cluster around quantification of housing instability, the link between housing instability and health and wellbeing, and surveys to identify the impact on specific populations such as children or individuals with a specific health condition.

A recent literature review of healthy housing intervention research found that housing environmental factors such as moisture management, pest management, lead control, and radon mitigation led to significant improvements in health outcomes, particularly for respiratory conditions.¹¹ A recent review of literature found homeless children generally were worse off than the general population, both in terms of access to care and health outcomes. Health outcomes with significant differences include early child development, and the rate of behavioral and mental health problems.¹² The quality and characteristics of housing have also been found to be linked to health conditions, including asthma, lead poisoning, and hypertension.¹³ Two studies of supportive housing programs found significantly better health outcomes (including mortality and mental health) for participants (in one student, a group of HIV-positive homeless patients).^{14,15}

Despite the prevalence of food insecurity and housing instability and growing evidence demonstrating their impact on health outcomes, the healthcare system does not routinely assess risk or employ interventions to address these social needs. State Medicaid programs are well suited to bridge the gap between healthcare and social services.¹⁶ First, Medicaid has the infrastructure to serve as a base to design an integrated health and social service system. Second, through state-federal partnership, Medicaid programs can be tailored to meet the needs of each state's unique populations and circumstances and can facilitate links between other state and federal agencies. Finally, Medicaid programs already are connected to and serve many of the individuals who experience food insecurity and housing instability. Therefore, a framework is needed to guide future efforts to build state Medicaid programs capacity for addressing social needs.

Project Overview

In collaboration with CMS, the NQF convened an Expert Panel to develop a framework for state Medicaid programs to better integrate health and social services, using food insecurity and housing instability as illustrative examples. The Expert Panel included clinicians, researchers, health plans, health systems, and consumer advocates ([Appendix A](#)). To support this work, the Expert Panel:

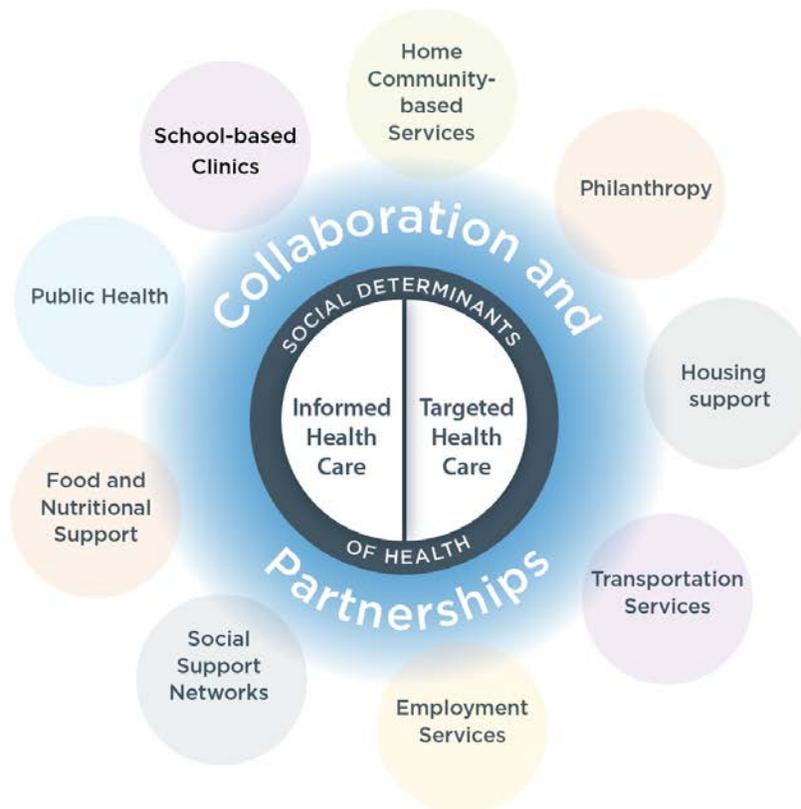
- directed a literature review and environmental scan of measures that assess food insecurity and housing instability ([Appendix B](#) and [Appendix C](#));
- developed a framework that illustrates the role the health care system in addressing social needs; and
- provided recommendations on how state Medicaid programs can support the role of healthcare organizations in addressing social risk factors.

In addition, NQF interviewed key informants as a supplement to the review of the literature and environmental scan. The interviews offered qualitative insight into the key research questions informing the project's research strategy. Key informants were selected on the basis of their role and expertise in either food insecurity, housing instability, or both. Key informants occupied leadership roles in organizations intervening to mitigate the incidence and impact of food insecurity and housing instability, including public health departments, associations, food banks, and clinics. These interviews provided important context for the Expert Panel's recommendations. The following sections describe the framework, the current state of measurement related to food insecurity and housing instability, the Expert Panel's recommendations, and examples of how state Medicaid programs have begun to integrate health and social services.

Framework for Addressing Social Needs in Healthcare

The Expert Panel created a framework based on the hub-and-spoke model by Taylor et al., and work from the Social Interventions Research & Evaluation Network at the University of California San Francisco (Figure 1). The framework positions the health care system as playing a central role in connecting individuals to social services. It illustrates the importance of collaboration and partnerships between health and non-health sectors and the utility of social needs data in healthcare delivery. It also builds on the work of NQF's Roadmap to Achieving Health Equity, which emphasizes the role of care that addresses SDOH, supporting social services needs within clinical visits, and community and health systems linkages.¹⁷

Figure 1: Framework of Health Care Systems Role in Addressing Social Needs



Social needs data can be used to deliver “informed healthcare” and “targeted healthcare”. **Informed healthcare** involves using information on social needs in clinical decision-making. For example, providers can dose medications around work schedules or the availability of refrigeration, connect patients with mobile health services that can improve access, and increase the flexibility of their hours of operation. In essence, providers can tweak the delivery of medical care to better meet social needs. Further,

providers can provide **targeted healthcare** by implementing interventions to address social needs like connecting individuals to organizations that can assess their eligibility for social service programs.

Recognizing that healthcare organizations are limited in what they can do to address social needs, the Expert Panel highlighted the role of the healthcare system as a convener of other sectors that are working or have the capacity to address social needs. The framework illustrates the healthcare system role as a hub for connecting individuals to social services. Healthcare organizations at the hub can “contract or manage health promotion activities and social service delivery, by purchasing services from community organizations”.¹⁸ Healthcare organizations are uniquely positioned to help to address social needs because far more dollars are invested in healthcare than social services, healthcare organizations are highly skilled in managing contractual relationships with vendors, and healthcare organizations are increasingly responsible for population health.

Moreover, many healthcare organizations serve as anchor institutions in communities because of their large economic footprint (e.g., hiring, buying, and investing). They are able to leverage that position to act as a convener of community organizations (e.g., schools, law enforcement, and local government) that have a common interest in fostering collaboration and partnerships to improve the welfare of a community residents. Numerous healthcare organizations are beginning to reorganize their non-clinical practices and assets by changing supply chain procurement policies, hiring and workforce development, investment portfolio to focus on addressing issues that affect the communities they serve.¹⁹ For instance, Kaiser Permanente has made great strides in increasing access to healthy foods in thousands of schools.²⁰

Social needs data at the patient-level and population-level are essential to supporting the role of healthcare organization in addressing social needs. However, these data are not routinely collected in practice because of privacy concerns, resource limitations, and lack of connectivity between systems that could be used to coordinate services. Despite these challenges, several states have begun implementing initiatives to bridge the gap between healthcare and social services, foster cross-agency collaboration at the state-level, and the incentivize collection and sharing of data on social needs. The Expert Panel proposed measure concepts that state Medicaid programs can use to collect data related to SDOH informed Care, SDOH targeted Care, and SDOH collaboration and partnerships (Table 1). The following section describes measurement and interventions to address social needs, specifically related to food insecurity and housing instability.

Measures and Interventions

Common Measures to Assess Food Insecurity

The most common measure used to assess food insecurity is the USDA’s Household and Food Security Survey Module (FSSM). Variations of the FSSM (18-item, 10-item, and 6-item) are used in widely administered surveys including the Current Population Survey Food Security Supplement, American Housing Survey, National Health and Nutrition Examination Survey, National Health Interview Survey, and many others. The FSSM has been rigorously tested and validated through several studies. In addition, many screening tools have been developed for providers to begin assessing food insecurity in

health care. A commonly used measure is the American Academy of Pediatrics (AAP) two-question screening tool that allows clinicians to identify households at risk for food insecurity. The validity of the tool has been tested among low-income families where it was found to be sensitive, specific and valid.²¹ The AAP tool has been adapted and incorporated into several other tools including recently developed Accountable Health Communities Screening Tool.²² However, a recent study conducted in pediatric emergency departments found that the tool missed nearly a quarter of food insecure adults.^{23, 24, 25}

Key informants noted critical gap in existing tools-assessing nutritional adequacy. Although existing tools track affordability, access, variety, and preferences, tools do not adequately evaluate whether the food consumed by the respondent is nutritionally sufficient to encourage healthy living, particularly for those with conditions that require a more limited diet. Consequently, many who might benefit from referrals to healthier eating services are not identified.

Interventions to Address Food Insecurity

Numerous approaches have been developed to address food insecurity. Among them is the Supplemental Nutrition Assistance Program (SNAP), which offers nutrition assistance to eligible, low-income individuals and families. SNAP works with state agencies, nutrition educators, and neighborhood and faith-based organizations to help people assess their eligibility for the program. SNAP has been shown to reduce the likelihood of being food insecure in several studies (SNAP participants are less likely to be food insecure than nonparticipants who are eligible).²⁶ The healthcare system could play a role in connecting patients to SNAP and also a role in identifying patients who are food insecure. For instance, one study found that the use of quality improvement methods to increase identification of food insecurity through electronic screening, educational interventions, and empowerment exercises significantly increase the identification rate of households who were food insecure.²⁷

There are also several emerging strategies for addressing food insecurity and other social needs. For example, AARP recommends using the AAP 2-item screener to document food insecurity in electronic medical records (EMR) and the referral generated in the EMR. An outreach team then follows-up with the patient by phone, mail, or in-person. AARP has developed guidance for overcoming challenges in implementing food insecurity screening and referral in primary care practices in low-income communities.²⁸ The primary strategies involve linking primary practice with community partners. For instance, Maryland Hunger Solutions conducts on-site SNAP application screening and enrollment for food insecure patients at Chase Brexton Health in Baltimore. In addition, the Pathways Community HUB Model, which relies on community care coordinators (CCC) (i.e., community-health workers, nurses, social workers, etc.), helps reach out to at-risk individuals through home visits and community-based work. Once the at-risk individual is identified, a CCC connects them to resources to address their needs. The evidence-base for these strategies is still developing.

Common Measures to Assess Housing Instability

One commonly used national indicator of housing instability is assessed through the American Community Survey (ACS), which is conducted by the US Census Bureau.^{29, 30} This survey contains a diverse set of questions that asks about monthly house costs, housing units, and rental costs. Responses from this survey have been used to assess whether changes in housing costs have an association to

other SDOH and whether it effects specific subgroups (e.g., individuals who received housing subsidies). In addition to the ACS, HUD conducts an Annual Homeless Assessment investigating the extent and nature of homelessness in the United States.^{31,32,33} HUD provides counts of people experiencing homelessness and describes their demographic characteristics and service use patterns. The assessment is based on local data from Point-in-Time (PIT) counts, Housing Inventory Counts (HIC), and Homeless Management Information Systems (HMIS).

Few surveys and tools solely measure housing characteristics. Beyond the assessment of the degree of housing instability, several surveys and tools that seek to measure the relationship of housing instability to other social risk factors, health, and well-being. The Behavioral Risk Factor Surveillance Survey (BRFSS) is an example of a survey that assesses multiple aspects of housing instability including the ability to pay for housing and utilities, the frequency an individual moves, and the safety of the neighborhood. Other surveys are the Three City Study Survey, Fragile Families and Child Wellbeing Survey, National Survey of American Families, and the National Survey of Child and Adolescent Well-Being. These surveys aim to assess social determinants such as socioeconomic status, family background, access to transportation, and social support among adults, children, and adolescents. The information can be used to examine the link between housing instability to mental health, healthy behaviors, emotional well-being, and health outcomes. These data are able to demonstrate that stress, worry, self-efficacy, and the emotional/mental state of an individual related to housing instability may have an effect on an individual's health, which can lead to poorer health outcomes.^{34,35,36, 37, 38, 39}

Additionally, tools and surveys have been designed for anticipated use in healthcare. Common examples of these tools are: The Protocol for Responding to and Assessing Patients' Assets, Risks and Experiences (PRAPARE), Health Leads Social Need Screening Toolkit, HealthBegins Upstream Risk Screening Tool, and the CMS developed Accountable Health Communities Screening Tool are examples of efforts to provide social risk information to the healthcare community. These surveys and tools often contain implementation plans as well as specific guidance for integrating with other healthcare data. Beyond surveys and tools, there are limited performance measures that assess housing instability. However, there is a patient reported outcome measure from the AHRQ National Quality Measures Clearinghouse known as the Primary Care Quality-Homeless (PCQ-H) Survey. A patient survey (33-items) has four subscales that assess whether the primary care provider met the patient's homeless needs.

Interventions to Address Housing Instability

Various programs that use surveys and tools also exist to identify and examine the impact of housing instability on specific populations. For example, the Veteran Transitional Housing Program uses survey to provide valuable insight on how community providers at the transitional housing help identify veterans who are at risk of becoming homeless due to a series of risk factors (e.g., substance abuse, psychiatric diagnoses, combat history).⁴⁰ Another example is the Transitional Age Youth Triage Tool (TAY), which asks six questions to assess and prioritize youth who need housing, particularly vulnerable youth. Similarly, data from the Hierarchical Resources Approach uses a survey that examined the connection between the competing demands of food insecurity and/or housing instability in the HIV population. This study found that housing instability can hinder access to interpersonal/personal

resources, which could affect self-efficacy (e.g., following doctor's orders on antiretroviral therapy (ART) adherence).⁴¹

Looking forward, there are promising practices that aim to leverage collaborations between the community and healthcare system. Recently, the Urban Institute has published a research paper that details the ability to draw common themes to building effective, sustainable partnerships around housing and health.⁴² The research leveraged existing literature, expert input, and six in-depth pilot studies throughout the United States. However, as with food insecurity, key informants noted that in many cases providers are reluctant to screen for social determinants when their ability to follow-up is limited, or they are not confident in the referral system.

Recommendations

The Expert Panel identified a set of recommendations, which builds on and affirms previous recommendations, to support the integration of health and social services. Several states have already made significant progress on each of the recommendations but continue to face many challenges in implementation. The recommendations support the framework by highlighting opportunities for better measurement and data sharing. The Expert Panel recommendations are classified in the following categories: 1) Community and healthcare system linkages; 2) Information sharing and measurement; and 3) Payment methods and innovative use of resources.

Community and Healthcare System Linkages

Recommendation: *Acknowledge that the healthcare system has a role in addressing social determinants of health*

The Expert Panel recommended the explicit acknowledgement that the healthcare system has a role to play in addressing SDOH. The Panel stated that healthcare organizations are often able to influence the communities in which they serve and many are anchor institutions within the community. The Expert Panel noted, however, that the healthcare system is only one participant in the larger effort to tackle these issues.

Recommendation: *Create a comprehensive and accessible list of community resources*

Multiple Panel members noted the need for a comprehensive list of specific local community services that could be accessed by members of the healthcare system. Data are important to understand the demand for services and the available supply of services to address them. The Panel recognized the challenges of keeping a catalogue updated, but recommended it as a key component of establishing the healthcare and community linkages. One example is the University of Chicago-led program, Community RX, which developed a real-time automated system that links patients to up-to-date information about community-based services and resources.⁴³ This recommendation is in line with findings from a recent study of Patient Centered Medical Home (PCMH) care coordinators. One finding of the study demonstrated that even with their specialized knowledge of care coordination, they might not be aware of all of the community resources.⁴⁴

Information Sharing and Measurement

Recommendation: *Harmonize tools that assess social needs*

Many data collection tools have been developed to assess social needs. The environmental scan revealed dozens of tools at the population-level and patient-level that assess food insecurity and housing instability. The Expert Panel recommended that stakeholders look for commonalities between these tools and identify best in class. The Panel acknowledged that the measures do not need to be the same, but there should be agreement on the type of information collected and documented for a given person. Medicaid programs and commercial health plans can collaborate to identify a common set of measures to address food insecurity and housing instability. The healthcare system needs to use similar measures to allow for comparability across health systems and reduce provider burden (i.e., reduce incidence of multiple reporting requirements for different measures that assess the same social needs).

Recommendation: *Create standards for inputting and extracting social needs data from electronic health records (EHR)*

EHRs are an important place to document patient-level information on social needs. However, there is no standardization on the data input fields for collecting information on social needs. The Expert Panel emphasized the need to create consensus on the inputs as well as the outputs for social needs data in EHRs. Standardizing these data fields will enable better sharing of information between health and non-health providers and programs. For example, ICD-10 uses “Z” codes (similar to the “V” and “E” codes used in ICD-9) to capture information like homelessness and lack of adequate food and safety drinking water. However, these codes are rarely used in practice and do not capture the multiple dimensions of food insecurity and housing instability. A comprehensive infrastructure for collecting social needs data would enable a provider to precisely link patients with the community resources based on their social need.

Recommendation: *Link data across state and local agencies*

Data sharing between government agencies is minimal. There are many barriers to sharing data, from privacy concerns to inadequate IT infrastructure. However, many states are collecting data on housing (e.g., KS, MA, MI, NY, OR, TN, VT, WA) and food security (e.g., MA, MI, OR, TN, VT, WA) and are beginning to link these datasets.⁴⁵ Massachusetts, Washington, and Vermont are linking existing state and federal data including hospitalization data, vital records, and household survey data.⁴⁶ For example, Massachusetts has linked over 300 data systems across state agencies. As states continue to build the infrastructure and partnerships to share data across agencies, there will be more opportunities to develop measures to track whether individuals are receiving services to address their social needs and how those services impact health outcomes.

Recommendation: *Increase information sharing between health and non-health sectors*

There are examples of Medicaid programs coordinating with social service programs to share information for the purpose of identifying individuals with social needs (e.g., KS, MA, MI, NY). Still, many meaningful connections have not yet been made. There are other data sources that can be used to determine an individual’s social needs, which have not been traditionally considered for informing

healthcare delivery. For example, knowing which patients are enrolled in the SNAP, their demographic characteristics, and if they are using their benefits could benefit a healthcare provider. Likewise, information on individuals enrolled in supportive housing programs or those who are on waiting lists could be potential indicators of housing instability.

Opportunities also exist to explore the use of data beyond those collected by government entities or in clinical encounters. However, there are fewer examples of this type of information sharing between the community and healthcare system. A potential example would be the use of passive forms of data collection such as information provided through medical devices or apps on smartphones to inform healthcare delivery.⁴⁷ Numerous technology and proprietary barriers make data sharing a challenge, but there are opportunities for the healthcare system to convene non-health sectors organizations, particularly at the community level.

Payment Methods and Innovative Use of Resources

Recommendation: *Expand the use of waivers and demonstration projects to learn what works best for screening and addressing food insecurity and housing instability*

States continue to experiment with Medicaid waivers to address social needs (e.g. 1115 and 1915c). For example, Oregon Health Authority uses coordinated care organizations (CCO) through the 1115 Medicaid waiver authority to pay for services offered by a diverse group of stakeholders including community health workers, peer wellness specialists, and patient navigators. Oregon's CCO covers services that provide housing supports and assistance with food and other social resources. It not only expand access to social services, but also significantly reduced per-member per-month inpatient and outpatient spending.⁴⁸ Many other states such as Illinois, Louisiana, and Massachusetts have all used waivers to provide permanent supportive housing for high-risk populations (e.g. serious mental illness).⁴⁹ The Expert Panel recommended that states continue to expand the use of waivers as more and more states are demonstrating the positive effects of connecting social and health services.⁵⁰

Use Cases

State Medicaid programs have begun using SDOH data for both payment and performance improvement. For example, several states use SDOH data to adjust rates of payments to managed care organizations and accountable care organizations, structure performance measures to account for differences in patient populations, reduce health disparities, and determine additional supports and benefits for care coordination. Many states have already identified food insecurity and housing instability as priority domains of measurement for assessing social needs. There has also been efforts to link Medicaid data files with national surveys like the Current Population Survey and the National Health and Nutrition Examination Survey. However, these data are limited because they provide estimates that do not reflect the temporal patterns of social needs.⁵¹

One of the most promising data collection activities is the Accountable Health Communities Model (AHC), which aims to provide comprehensive screening of the social needs of community-dwelling Medicare and Medicaid beneficiaries. State Medicaid program, bridge organizations, community service providers, and clinical delivery sites are working together to screen and address housing instability and food insecurity among other social needs. Participating organizations are required to report information on both food insecurity and housing instability and how screening affects clinical workflows. If successful, the AHC model could serve as a foundation for future coordination and measurement efforts. In addition, the Medicaid Innovation Accelerator has also provided resources to several states (New Jersey, Oregon, Texas, and Virginia) and the District of Columbia to enhance their capacity to improve care coordination for complex care needs and high cost beneficiaries (BCNs).

Some examples of how states are beginning to collect and use data related to food insecurity and housing instability include:

- **Massachusetts**, under its recently renewed 1115 waiver, developed a “Social Determinant of Health Model” to allow the Medicaid program to risk adjust performance measures based on social risk factors. The state linked claims data, plan encounter data, and data from other state agencies as well as the U.S. Census Bureau to develop measures that assess factors like unstable housing and neighborhood stress.⁵²
- **Minnesota** has built a large SDOH data set by extracting elements from claims data, EHRs, state and federal databases, and patient self-reported instruments. Patient assessment instruments that assess food insecurity and housing instability at the patient-level include the AHC tool, Health Leads, and the PRAPARE tool.⁵³
- **New Jersey** recently received a five year extension on its 1115 Waiver that includes reinvestment dollars targeting housing support services to individuals who are homeless or at risk of being homeless. The program is also aiming to enhance population health partnerships with community and faith-based organizations, public health organizations, employers, and other stakeholders to improve outcomes for beneficiaries. Sharing beneficiary information across state agencies and implementing data use agreements that ensure confidentiality has supported and strengthened these initiatives.⁵⁴
- **Connecticut** has embedded several strategies to connect programs to address social factors. The agency has been able to integrate screening of housing stability and food security through

its Administrative Services Organization structure and Intensive Care Management. It has also increased SDOH targeted care through health homes, the Money Follows the Person “housing plus services” model, and development of an upside only shared savings initiative.

- **Pennsylvania** developed the COMPASS website, which allows individuals, and community-based organizations to screen, apply for and renew benefits across a range of programs. These programs include SNAP, free or reduced price school meals, home and community-based services, and the Low-Income Home Energy Assistance Program.⁵⁵
- **Oregon** developed a data inventory to help people find affordable housing more easily. The inventory provides a list of affordable properties in a user-friendly format and integrates data from Oregon Housing and Community Services, HUD, U.S. Department of Agriculture and Rural Development, and the Oregon Opportunity Network.⁵⁶ Oregon’s Health Authority has also developed a provider level food insecurity screening performance measure that CCOs can choose for reporting and accountability.
- **Illinois** has a long-standing integrated system, which determines eligibility for medical programs, SNAP, and Temporary Assistance for Needy Families.
- **Louisiana**, through its 1915c waiver, has integrate its Permanent Supportive Housing program (PSM) with its Home and Community-Based Services program (HCBS). HCBS providers, particularly those involved in health and housing services, assist in enrolling eligible patients with a focus on individuals who are homeless.

These are a few of many examples of how states are investing in community and healthcare system linkages, measuring and sharing data on social needs, and enhancing payment methods to account for social risk factors.

Conclusion

The NQF Health Equity Roadmap offers clear guidance on the next steps for exploring opportunities for collaboration between community organizations and the healthcare system, in order to address and reduce disparities, particularly those borne of SDOH. The environmental scan measures and the literature review reveals a clear link between food insecurity, housing instability, and a negative impact on health outcomes. The Expert Panel’s framework describes the unique opportunity confronting the health system – the opportunity to leverage its outsized influence to affect positive change in the health of the communities they serve beyond the walls of a healthcare organization. Numerous healthcare organizations are beginning to reorganize their practices to meet this new challenge.

However, there remains a major obstacle to achieving this goal– a rich source of data on SDOH that are not yet routinely collected in practice. State Medicaid programs can play a role in overcoming this barrier. If implemented, the recommendations of the Expert Panel will help strengthen linkages between the community and healthcare systems, facilitate the exchange of information and performance measurement data, and leverage payment methods and resource allocation to incentivize new innovations and adoption of best practices.

Looking forward, state Medicaid programs will play a vital role in the successful implementation of these recommendations. Many are already implementing some of these proposals. For example, some agencies use SDOH data to adjust payment rates to managed accountable care organizations. State Medicaid programs should leverage their role as a major payer of health services to coordinate partnerships between health systems and community service providers, incentivize data collection, and to link Medicaid data to other data sources that can be used to assess social needs like food insecurity and housing instability. Ultimately, these efforts will lead to more holistic approach to improving the health populations with the greatest need.

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Appendix A: Expert Panel and NQF Staff

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Appendix B: Methodology

The environmental scan portion comprises of a three step approach, which includes a literature review, measure review, and key informant interviews. NQF conducted a systematic review of the literature that included a search strategy with inclusion and exclusion criteria. NQF used the parameters defined in Table A1 shown below:

Table A1: Search Parameters

Included	Excluded
<ul style="list-style-type: none"> Developed or published after 2000 OR originally published prior to 2000 and still current Measures that include specifications that meet the operational definition of food and housing insecurity Instruments, scales, survey tools, and surveys 	<ul style="list-style-type: none"> Published before 2000 and not current Not available in English Published outside of the United States Does not include data required data elements

Information sources were identified through various resources such as PubMed, Academic Search Premier, as well as grey-literature and web searches through Google Scholar to identify reports, white papers, and other documentation related to food insecurity and/or housing instability. NQF used various combinations of key words such as: food insecurity, food secure, hunger, homeless, homelessness, housing instability, housing insecurity, housing, and assistance. These key words were combined with terms like review, assessment, measure, measurement, or screening.

NQF initially reviewed over 150 abstracts and used a prioritization method to rank each information source on a scale of one to five (1=lowest and 5=highest) based on the operational definitions, research questions, and a set of three criteria (shown below). Sources that scored four or higher were included in the environmental scan findings and were determined to be highly relevant in measuring food insecurity and/or housing instability.

- *Food insecurity* (US Department of Agriculture (USDA)) is the limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.¹
- *Housing Instability* (US Department of Health and Human Services) is high housing costs in proportion to income, poor housing quality, unstable neighborhoods, overcrowding, or homelessness.²

¹Andersen, ed., Core Indicators of Nutritional State for Difficult to Sample Populations. *The Journal of Nutrition*. 1990; 120:1557S-1600S.

Research Questions:

- What are the most common concepts of food and housing insecurity measured in the literature?
- What measures that address food and housing insecurity currently exist?
- What are the key challenges to measuring food and housing insecurity?
- What are the opportunities for measurement of food and housing insecurity?

- *Criteria 1:* The information source is relevant to one of the four research questions.
- *Criteria 2:* The content of the information source addresses concepts of food insecurity and/or housing instability.
- *Criteria 3:* The content of the information source is derived from a sound approach and clearly describes measurement related to food insecurity and/or housing instability.

NQF identified over 80 key information sources. These sources aligned with the research question(s), had relevant findings, or described the use of a conceptual framework related to food insecurity and/or housing instability. Any source that did not meet criteria one was not included in the environmental scan findings. NQF staff then synthesized the sources and compiled a list of surveys and tools that measures food insecurity and/or housing instability.

Lastly, NQF interviewed key informants as a supplement to the review of the literature and environmental scan. The interviews offered qualitative insight into the key research questions informing the project’s research strategy. Key informants were selected on the basis of their role and expertise in either food insecurity, housing instability, or both. Key informants occupy leadership roles in organizations intervening to mitigate the incidence and impact of food insecurity and housing instability, including public health departments, food banks, and clinics. Key informants are experts in their fields, with background in epidemiology, medicine, public assistance programs, and health IT. In early November, NQF hosted a Key Informant Web Meeting and an interview call with experts on food insecurity and housing instability. These individuals were selected for their expertise outside of the healthcare system, bringing many years of experience in measurement, instrument development, and community-oriented development and interventions. The list of key informants are in Table A2.

Table A2: List of Key Informants

Informant	Relevant Experience	Organization
Philip Alberti, PhD	An epidemiologist with a research focus on efforts to build evidence-based programs, protocols, policies and partnerships effective at eliminating	Association of American Medical Colleges (AAMC)

² Johnson A, Meckstroth A. *Ancillary services to support welfare to work*. Washington, DC: US Dept of Health and Human Services; 1998. Available at: <http://aspe.hhs.gov/hsp/isp/ancillary/front.htm>. Last accessed October 2017.

Informant	Relevant Experience	Organization
	inequities in health and healthcare.	
Lindsey Browning, MPP	Experience in Medicaid programs, specifically delivery systems and payment reforms.	National Association of Medicaid Directors (NAMDM)
George Carter, PhD	Experience and expertise in housing, specifically worst case needs, subsidized housing, and elderly housing.	HUD
Peter Eckart, MA	Health information exchange with food insecurity and housing instability.	Illinois Public Health Institute (IPHI) Online
Craig Gundersen, PhD	Research focuses on the causes and consequences of food insecurity and evaluates food assistance programs, specifically SNAP.	University of Illinois at Urbana-Champaign
David Lee	Experience in community relations, public affairs, hunger relief and food systems programming along with advocacy in food.	Feeding Wisconsin
Stacy Lindau, MD, MA	Director of the South Side Health Vitality Studies that include studies such as the food pantry and food security projects. Dr. Lindau began a food program that addresses food insecurity among families and children.	University of Chicago
Matthew Rabbitt, PhD, MA	An economist with a research focus on food security measurement, food and nutrition assistance programs.	USDA
Bob Rauner, MD, MPH	Led community efforts to improve health by decreasing obesity rates and its association to food nutrition.	Partnership for a Healthy Lincoln
Barry Steffen, MS	Experience and expertise in housing affordability and housing insecurity issues.	HUD
Nicole Watson	Led HUD working groups on Housing Insecurity Survey Module.	HUD
Anita Yuskas	Experience working with CMS, specifically quality in home and community-based services.	Pennsylvania State University

Appendix C: List of Surveys and Tools

Food Insecurity: Common Measures of Surveys and Tools

Name	Description	Use	Service Setting	
18-item Household Food Insecurity Access Scale (HFIAS)	The questionnaire (18-items) consists of nine occurrence questions that represent a generally increasing level of severity of food insecurity (access), and nine “frequency-of-occurrence” questions that are asked as a follow-up to each occurrence question to determine how often the condition occurred. It asks about respondent perceptions of food vulnerability or stress and behavioral responses to insecurity. It focuses on food insecurity in terms of access.	Federal	USAID Title II and Child Survival and Health Grant programs	USAID
Addressing Food Insecurity: A Toolkit for Pediatricians	This toolkit was created to aid pediatricians in addressing patient food insecurity. It provides information about the prevalence of food insecurity, how food insecurity impacts children's health outcomes, how to screen for food insecurity, and interventions that help address food insecurity, including federal nutrition programs like SNAP, WIC and school and summer feeding programs.	State	Family medicine practice	American Academy of Pediatrics
U.S. Household Food Security Survey Module	They survey module (18-items, 10-items, and 6-items version) measures the severity of deprivation in basic food needs as experienced by U.S. Households. Extensive testing established the validity and reliability of the scale and its applicability across various household types in a broad national sample.	State and Federal	Personal and telephone interviews	USDA

Food Insecurity: Interventions with Tools and Surveys

Name	Description	Use	Service Setting	Source
Connecting Those at Risk to Care: The Quick Start Guide to Developing Community Care Coordination Pathways	The Pathway tool is used to confirm that interventions have been received by the individual and that identified risk factors have been successfully addressed. Once a community care coordinator (CCC) completes a comprehensive assessment of health, social, behavioral health, economic, and other factors that place the individual at increased risk. The Pathway tool also serves as the quality assurance and payment tool, and it is used by the CCC to ensure that each risk factor is addressed and that outcomes have improved.	Local and State	Home visits and community-based	Agency for Healthcare Research and Quality (AHRQ); January 2016
Hunger Vital Sign	Two-question screening tool, suitable for clinical or community outreach use, that identifies families with young children as being at risk for food insecurity if they answer that either or both of the following two statements* is ‘often true’ or ‘sometimes true’ (vs. ‘never true’) : <ul style="list-style-type: none"> • “ Within the past 12 months we worried whether our food would run out before we got money to buy more.” • “ Within the past 12 months the food we bought just didn’t last and we didn’t have money to get more.” 	Local and State	Community clinics Health departments Hospitals Community health center	Children’s Health Watch
Implementing Food Security Screening and Referral for Older Patients in Primary Care: A Resource Guide and Toolkit	This resource guide from the AARP Foundation and IMPAQ International seeks to address some of the challenges of incorporating food security screening and referrals in primary care settings serving individuals aged 50 and older. The information provided is specific to that population wherever possible; when research is cited that only applies to specific age groups that is noted in the text. Intended for use by health care systems, clinics, and accountable care organizations, the content of the guide synthesizes findings from case studies conducted with health systems that have incorporated food security screening and referral and an environment scan identifying implementation strategies and methods for screening and referral.	Local and State	Intended for use by healthcare systems, clinics, and accountable care organizations	AARP

Housing Instability: Common Measures of Surveys and Tools

Name	Description	Use	Service Setting	Source
American Community Survey	A 24 questionnaire household survey with a diverse set of questions that asked monthly house costs, housing units, and rental costs. A couple of questions from this survey are used in a study to assess whether changes in housing costs have an association to increased food insecurity in low-income households with children and whether it effects specific subgroups (e.g., individuals who received housing subsidies).	State and Federal	Interviews	United States Census Bureau; Fletcher JM, Andreyeva T, Busch SH. Assessing the effect of changes in housing costs on food insecurity. <i>J Child Poverty</i> . 2009;15(2):79-93.
Annual Homeless Assessment	The Annual Homeless Assessment is on the extent and nature of homelessness in the United States. It provides counts of people experiencing homelessness and describes their demographic characteristics and service use patterns. The assessment is based on local data from Point-in-Time (PIT) counts, Housing Inventory Counts (HIC), and Homeless Management Information Systems (HMIS).	State and Federal	Community, Provider	United States Department of Housing and Urban Development (HUD)
Behavioral Risk Factor Surveillance System (BRFFS) Survey	A survey that have questions to assess the frequency of housing insecurity when respondents answered “always”, “usually”, “sometimes” to the question “How often in the past 12 months would you say you were worried or stressed about having enough money to pay your rent/mortgage?”. The exact same question was asked about buying nutritious meals. The survey also asked questions about socioeconomic status and demographics.	State	Telephone interviews	Centers for Disease Control and Prevention (CDC)
Fragile Families and Child Wellbeing Survey	The survey module (13-items) that covers demographics, medical records, family background characteristics, socioeconomic status, and housing attributes. This survey may help inform whether the child and its family may have the increase likelihood of housing instability, particularly overcrowding and homelessness.	Local and State	Personal interviews, Hospitals	Princeton University; Columbia University; Curtis MA,

Name	Description	Use	Service Setting	Source
				Corman Noon K, et al. Effects of child health on housing in the urban U.S. <i>Soc Sci Med.</i> 2010;71(12):2049-2056.
National Survey of American Families	A household survey that looks at quantitative measures of children, adults, and their families usually at the state level who are low-income. One study used this survey as a secondary data analysis to determine its effect on healthcare access and healthcare outcomes.	Federal	Personal and telephone interviews	Urban Institute; Child Trends; Kushel MB, Gupta R, Gee L, et al. Housing instability and food insecurity as barriers to health care among low-income Americans. <i>J Gen Intern Med.</i> 2006;21(1):71-77.
National Survey of Child and Adolescent Well-Being II (Second Cohort) (NASCAW II)	The survey comes from a national sample that measure child's well-being. The child's caregiver and caseworker responses were mainly used to measure housing instability. For instance, these responses were used as housing insecurity indicators (i.e., doubled up, emergency housing, homelessness).	Federal	Personal interviews	United State Department of Health and Human Services; Font SA, Warren EJ. Inadequate housing and the child protection system response. <i>Child</i>

Name	Description	Use	Service Setting	Source
				Youth Serv Rev. 2013;35(11):1809-1815.
Primary Care Quality-Homeless (PCQ-H) Survey	<p>A 33-item survey that have four subscales that assess whether the primary care provider met the patient’s homeless needs.</p> <p>Overall Score Measure: This patient reported outcome measure is used to assess the overall mean score for the Primary Care Quality-Homeless (PCQ-H) instrument subscales. The four subscales are: patient-clinician relationship, cooperation among clinician, access/coordination, and homeless-specific needs.</p> <ul style="list-style-type: none"> • Numerator: The sum of patients' responses ("Strongly Disagree," "Disagree," "Agree," "Strongly Agree" and "I Don't Know") to items on the Primary Care Quality-Homeless (PCQ-H) instrument. • Denominator: Number of items responded to by homeless patients on the Primary Care Quality-Homeless (PCQ-H) instrument. 	Local and State	Provider, Community Health Center	AHRQ National Quality Measures Clearinghouse
Person-Per-Room (PPR) Measure	<p>A measure that is most commonly studied in literature reviews about overcrowding in housing. Overcrowding is defined as more than one-person-per room. In other words, when more than one individual resides in a room that does not follow housing standards size/capacity for an individual, which results in unsafe and unhealthy conditions.</p>	State and Federal	Case-study	U.S. Department of Housing and Urban Development; Blake KS, Kellerson RL, Simic A. <i>Measuring Overcrowding in Housing</i> . Washington, DC; Housing & Urban Development; 2007.
Three-City Study Survey	<p>A survey that questions the well-being of low-income children and families residing in Boston, Chicago, and San Antonio. A study used this survey as a</p>	Local and State	Personal interviews	Coley RL, Leventhal T,

Name	Description	Use	Service Setting	Source
	<p>baseline and added four-item questions to assess the association of low-income children's and adolescent's housing and its effects to their emotional, behavioral, and developmental well-being . The additional questions were on: physical quality (8-items self-report, plus Home Observation for Measurement of the Environment Short Form), cost burden (total cost/income), instability (move in prior year), and type (assisted, rent, own).</p>			<p>Lynch A, et al. Relations between housing characteristics and the well-being of low-income children and adolescents. <i>Dev Psychol.</i> 2013;49(9):1775-1789.</p>

Housing Instability: Interventions with Tools and Surveys

Name	Description	Use	Service Setting	Source
Hierarchical Resources Approach Survey	<p>A survey that assessed housing instability (one question), food insecurity (three questions), transportation access, ability to access services, social support (14 items), and self-efficacy (12 items) along with demographic information. This survey assessed whether the competing demands of food insecurity and/or housing instability would hinder access to interpersonal/personal resources which could affect self-efficacy (e.g., following doctor’s orders on antiretroviral therapy (ART) adherence).</p>	Local and State	Personal interviews, Community and Social Service Agencies, Infectious Disease Clinics	Cornelius T, Jones M, Merly C, et al. Impact of food, housing and transportation insecurity on ART adherence: a hierarchical resources approach. <i>AIDS Care</i> . 2017;29(4):449-457.
TAY (Transition Age Youth) Triage Tool	<p>A screening tool with six items questions. The tool assess and prioritize youth who need housing, particularly vulnerable youth. Vulnerable youth are identified as individuals who encounter traumatic experiences in life such as domestic violence, physical/sexual abuse, and/or substance abuse. Providers believed the tool is useful in case management since it identifies vulnerable youth who need housing interventions/support immediately.</p>	Local and State	Health systems, Community, Provider	Eric Rice; Rice E. <i>The TAY Triage Tool: A Tool to Identify Homeless Transition Age Youth Most in Need of Permanent Supportive Housing</i> . New York, NY: Cooperation for Supportive Housing (CSH); 2013.
Veterans Transitional	<p>A survey conducted before veteran entered transitional housing, after admission to transitional housing, and follow-up interviews after program</p>	Local and State	Personal interviews,	Tsai J, Rosenheck R,

Name	Description	Use	Service Setting	Source
Housing Program Survey	discharge (at 6 and 12 months). A structured form of questions were asked about their sociodemographic characteristics, combat exposure, housing, work history, psychiatric diagnoses, a brief hospitalization history, and an assessment of mental and physical health status. Specific housing questions to veterans include the number of days in the last month they had slept in nine different types of places (e.g., housed-apartment, home, institution, or homeless).		Community, Provider	Mcguire J. Comparison of outcomes of homeless female and male veterans in transitional housing. <i>Comm Ment Health J.</i> 2012;48(6):705-710.

Food Insecurity and Housing Instability: Common Measures of Surveys and Tools

Name	Description	Use	Service Setting	Source
Accountable Health Communities Screening Tool	A 10-item screening tool to identify patient needs in 5 different domains that can be addressed through community services (housing instability, food insecurity, transportation difficulties, utility assistance needs, and interpersonal safety). Clinicians and their staff can use this short tool across a spectrum of ages, backgrounds, and settings, and it is streamlined enough to be incorporated into busy clinical workflows. Just like with clinical assessment tools, results from this screening tool can be used to inform a patient's treatment plan as well as make referrals to community services."	Local and State	Community service provider	Centers for Medicare & Medicaid Services (CMS)
Health Leads Social Needs Screening Toolkit	This toolkit provides screening best practices, a questions library, and a sample recommended screening tool for some of the most common unmet social needs: food insecurity, housing instability, utility needs, financial resource strain, transportation, exposure to violence, and socio-demographic information.	Adaptable to Local, State, and Federal	Adaptable to all populations, scope, and settings	Health Leads
HealthBegins Upstream Risk Screening Tool	This social needs screening survey contains questions on: education, employment, social support, immigration, financial strain, housing insecurity and quality, food insecurity, transportation, violence exposure, stress, and civic engagement. The survey also includes recommended	Local	Clinic Community health center	Health Begins

Name	Description	Use	Service Setting	Source
	screening frequency for each question and a scoring system to calculate an overall upstream risk score. The tool incorporates measures from the Institute of Medicine’s recommended social and behavioral domains and measures for electronic health records.			
IHELP Pediatric Social History Tool	IHELP is a screening tool initially presented by Kenyon et. al. in 2007 as a tool for collecting pediatric social histories. As a result, it includes both household needs (financial strain, insurance, hunger, domestic violence, housing stability and housing conditions) and several child-specific domains (child educational needs, child legal status, and power of attorney/guardianship).The tool uses similarly to the Hunger Vital Sign questions to assess food insecurity.	Local	Healthcare settings	Kenyon et al. Revisiting the social history for child health. Pediatrics. 2007
iScreen	iScreen is a social screening instrument used in one randomized controlled trial on screening validity, acceptability, and modality. The instruments includes 23 questions covering 16 psychosocial domains, including health insurance, health care access, behavioral and mental health, educational resources, housing quality and insecurity, financial strain, food insecurity, public benefits, child care, transportation, employment, safety issues, incarceration, child support, and immigration.	Local and State	Emergency Department	Gottlieb et al. randomized trial on screening for social determinants of health: the iScreen study. Pediatrics.
PRAPARE: Protocol for Responding to and Assessing Patients’ Assets, Risks and Experiences	The Protocol for Responding to and Assessing Patients’ Assets, Risks, and Experiences (PRAPARE) is a national effort to help health centers and other providers collect the data needed to better understand and act on their patients’ social determinants of health. As providers are increasingly held accountable for reaching population health goals while reducing costs, it is important that they have tools and strategies to identify the upstream socioeconomic drivers of poor outcomes and higher costs. With data on the social determinants of health, health centers and other providers can define and document the increased complexity of their patients, transform care with integrated services and community partnerships to meet the needs of their patients, advocate for change in their communities, and demonstrate the value they bring to patients, communities, and payers.	Local and State	Health Centers	National Association of Community Health Centers
WE CARE Screening and	WE CARE (Well Child Care, Evaluation, Community Resources, Advocacy, Referral, Education) is a clinic-based screening and referral system	Local and State	Hospital-based pediatric clinic	Garg et al. Improving the

Name	Description	Use	Service Setting	Source
Referral System	developed for pediatric settings. The 12-question WE CARE screening tool assesses needs in 6 domains: parental educational attainment, employment, child care, risk of homelessness, food security, and household heat and electricity. If parents say that they have a need they are then asked if they would like help with that need and, for food, homelessness and household utilities, if they are in need of immediate assistance.			management of family psychosocial problems at low-income children's well-child care visits: The WE CARE Project. Pediatrics.
WellRx ToolKit	A validated 11-item questionnaire designed to be utilized at every patient visit, covering the domains of food insecurity, housing, utilities, income, employment, transportation, education, substance abuse, childcare, safety, and abuse. Questions conform to "low literacy".	Local	Family medicine practice	Page-Reeves J, Kaufman W, Bleecker M, et al. Addressing social determinants of health in a clinic setting: The WellRx pilot in Albuquerque, New Mexico. J Am Board Fam Med. 2016