SEMIN PERINATOL 48 (2024) 151908

Contents lists available at ScienceDirect

Seminars in Perinatology

journal homepage: www.elsevier.com/locate/semperi

Using quality improvement to address social determinants of health needs in perinatal care

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ARTICLE INFO

Keywords:
Social determinants of health
Birth equity
Perinatal care
Quality improvement

ABSTRACT

There are unacceptable racial inequities in perinatal outcomes in the United States. Social determinants of health (SDOH) are associated with health outcomes and contribute to disparities in maternal and newborn health. In this article, we (1) review the literature on SDOH improvement in the perinatal space, (2) describe the SDOH work facilitated by the Illinois Perinatal Quality Collaborative (ILPQC) in the Birth Equity quality improvement initiative, (3) detail a hospital's experience with implementing strategies to improve SDOH screening and linkage to needed resources and services and (4) outline a framework for success for addressing SDOH locally. A state-based quality improvement initiative can facilitate implementation of strategies to increase screening for SDOH. Engaging patients and communities with specific actionable strategies is key to increase linkage to needed SDOH resources and services.

Introduction

In 2021, 1205 pregnant and birthing persons in the US died due to pregnancy complications.[1] Non-Hispanic Black and American Indian or Alaskan Native birthing persons are approximately 2.5 times more likely than their white counterparts to die during pregnancy or within 42 days of being pregnant.[2-3] Severe maternal morbidity (SMM) is higher among women insured by Medicaid than those commercially insured (2.8% vs. 2.0 %, $p<.001$) .[4] These unacceptable disparities in maternal morbidity and mortality are driven by structural racism and other social and economic inequities.[2,4]

Social determinants of health (SDOH) such as food, utilities, housing, childcare, financial resources, transportation, exposure to violence, education/health literacy, and legal status are associated with health outcomes and contribute to disparities in maternal health through multiple and interconnected pathways.[4-7] SDOH screening in health care settings and linking patients to needed services can be an effective strategy to address health disparities.[8-11] Health workers who feel at ease asking about SDOH are more likely to report having helped their patients in addressing these issues.[8] Universal screening for SDOH is recommended by The Joint Commission, Centers for Medicare and Medicaid Services and American College of Obstetricians and Gynecologists (ACOG)[12-14] and should include processes that integrate addressing maternal SDOH needs into clinical care.[14]

In this article, we (1) review the literature on maternal SDOH screening, linkage to resources, and improvement in the perinatal space, (2) describe the SDOH work facilitated by the Illinois Perinatal Quality Collaborative (ILPQC) in the Birth Equity quality improvement initiative, (3) detail a hospital's experience with implementing strategies to improve SDOH screening and linkage to resources and (4) outline a framework to locally address SDOH.

Social determinants of health improvement in the perinatal space

Tools for screening social determinants of health. The perinatal period requires unique considerations when screening for SDOH. ACOG doesn't recommend a specific screening tool but provides a sample tool[15] adapted from the Health Leads Screening Toolkit[16] and a structural vulnerability study.[17] Since ACOG's 2018 adaptation,[15] Health

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https://doi.org/10.1053/j.semperi.2024.151908

Available online 18 April 2024

Leads has expanded to include a Spanish translated questionnaire, questions on mental health challenges, and integration of the Protocol for Responding to and Assessing Patients' Assets, Risks, and Experiences (PRAPARE)[18] and Accountable Health Communities (AHC) Health-Related Social Needs (HRSN) Screening.[19, 20]

The Social Determinants of Health in Pregnancy Tool (SIPT) was created by an urban Federally Qualified Health Center (FQHC), combining multiple exiting and validated tools to create a screener specific to pregnancy.[21] Harriett et al. conducted a pilot study of SIPT at a single FQHC site finding that using validated screeners concurrently within domains relevant to pregnancy effectively identified stress and social needs: 91 % of patients scored positive on at least one screener and 54 % on three or more screeners.[21] The screening results were incorporated into the patients' EMR, and actionable maps were utilized to assist prenatal providers in scoring screeners and conducting referrals to local resources. This study found that screening for SDOH at the prenatal care setting can facilitate earlier connections to counseling, resources, and referrals.[21]

The 21 item PRAPARE tool[18] was not created specifically for the perinatal patient population; however, it has been validated in digital short form (3 items) for peripartum patients.[22] The sensitivity and specificity were both high, and participants reported being supportive of and comfortable with sharing social needs with their providers.[22] Similarly, some screeners are created for broad patient populations, and then used in primary, family, and obstetrics care, such as the AHC HRSN Screening Tool.[19] Since AHC serves the US broadly, the HRSN tool and supplement were designed to be adaptable to many patient populations. Table 1 summarizes these screening tools and their domains.

While there is not one gold standard tool for SDOH screening during the perinatal period, there are methodical considerations to consider. In a mixed-methods validation study, peripartum participants had high acceptability of addressing social needs as part of pregnancy care, indicating a distinct opportunity for screening during routine prenatal care.[22] However, a qualitative study found confidentiality and stigma to be potential concerns; participants desired for health care providers to normalize seeking help for SDOH needs through transparency of use, protected patient information, and respectful, destigmatizing communication and care.[23] The literature highlights the importance of next steps after screening. Screening can be valuable for understanding perinatal patients' SDOH needs and requires a process to link patients that screen positive for SDOH to needed community resources and a plan for follow up.

Linkage to resources and services to address social determinants of health needs. While the literature addressing SDOH systematic screening and linkage strategies often does not directly speak to the perinatal period, systems used in adjacent pediatric and adult primary care settings provide insight. Studies have tested the efficacy of systematic screening and referral systems to address patient linkage to needed resources. In the pediatric setting, a cluster randomized trial in Boston, Massachusetts implemented the WE CARE (Well-Child Care, Evaluation, Community Resources, Advocacy, Referral, Education) screening and referral system in four community healthcare centers to address families' unmet needs.[24] Participating mothers self-reported on a screening tool that assessed childcare, food security, employment, and other needs. When a resource gap was identified, providers made referrals and clinic staff provided applications to services and followed up by phone within one month. Researchers found systematic screening for local basic needs during well-child visits lead to increased provider referrals and family enrollment in support services.[24] At a 12-month visit, more WE CARE families had enrolled in community resources, were employed, and had access to childcare. These findings support that systematic screening and referral for SDOH needs during well-child visits can lead to greater utilization of community resources among families.[24]

In the urban adult primary care setting, an electronic health record (EHR) based screening and referral system was implemented among its patients, adapted from the aforementioned WE CARE pediatrics model to evaluate the feasibility of systematic SDOH screening. The EHR technology recorded resource needs identified in patient charts through auto generated ICD-10 diagnosis codes, and printed language-congruent resource referral guides were available to patients upon request. Of the

Table 1
Select SDOH screening tools and domains.

Tool name	Tool Domains	Sources, Tool Creation
American College of Obstetrics and Gynecology (ACOG) Sample Tool (2018)	Food Utility Housing Child care Financial Resources Transportation Exposure to Violence Education and Health Literacy Legal Status Next Steps	10-item tool developed from: Health Leads Screening Toolkit
Social Determinants of Health in Pregnancy Tool (SIPT) (2023)	Psychological Stress Relationship and Family Stress Domestic Violence Substance Use Financial Stress	32-item tool developed from: Cohen's Perceived Stress Scale Curry's Prenatal Psychosocial Profile MacFarlane questionnaire The 5Ps Prenatal Substance Abuse Screen for Alcohol and Drugs Hager Hunger Screener
Health Leads (2018)	Food Insecurity Housing Instability Utility Needs Financial Resource Strain Transportation Challenges Exposure to Violence Socio-Demographic Information	10-item tool developed from: Health Leads Screening Toolkit Protocol for Responding to and Assessing Patients' Assets, Risks, and Experiences (PRAPARE) Accountable Health Communities (AHC) Health-Related Social Needs (HRSN) Screening Tool
Short-form PRAPARE social needs screening tool (2023)	Housing Instability Food Insecurity Utility Needs Healthcare access Communication access Newborn family supplies Financial stress Child/elder care Social isolation Physical/emotional safety	3-item short-form tool developed from the 21 item PRAPARE from National Association of Community Health Centers
Accountable Health Communities (AHC) Health-Related Social Needs (HRSN) Screening Tool (2017)	Core Domains: Housing Instability Food Insecurity Transportation Problems Utility Help Needs Interpersonal Safety Supplement Domains: Financial Strain Employment Family and Community Support Education Physical Activity Substance Use Mental Health Physical, mental or emotional impairment	10-item tool developed by Centers for Medicare & Medicaid Services Center for Medicare and Medicaid Innovation.

1696 patients screened for SDOH, 445 patients (26 %) were identified with ≥1 resource need, and 367 of the 445 patients (82 %) had the appropriate ICD-10 codes added to their visit diagnoses.[25] In total, 86 % of patients who requested resources received a language-congruent resource referral guide that was pertinent to their needs, further supporting that systematic screening and referral using EHR technology effectively provides resource information to patients with SDOH needs.[25]

Studies that examine how to link patients most effectively to resources, including the individuals involved in successfully linking patients to resources in clinical settings and the frequency of their connections with patients, provide further insight. A large-scale social needs intervention study among multiple clinical settings throughout the US explored the relationship between the frequency of contact between patient and patient navigator and success of resource connections. The intervention utilized a case management approach to connect patients with resource needs and services in the community. This study found that higher contact between the patient and patient navigator was related to greater success of resource connections, and in-person direct contact, which was only received by 25 % of patients, had the highest probability of resource connection success.[26] In addition, a qualitative program evaluation of an SDOH screening and referral program in an academic primary care setting found that the use of trained patient navigators was instrumental to successful implementation of the program in clinics, providing patients with the appropriate time and attention.[27] These findings suggest that frequent, attentive contact with properly trained personnel is most effective in successfully linking patients to resources.

SDOH screening and referral has been described as feasible and a relatively low-resource and low-cost effective intervention in pediatric populations.[28,29] With high-quality written resource information, SDOH screening and referral interventions can also be successful in addressing patients' unmet needs regardless of the size and support staff available.[28] However, an SDOH screening and referral study in a large, urban academic healthcare system, resulted in only 25 % of adult primary care patients being linked to the proper care navigators with an increased likelihood of never connecting with resources among non-citizen and low-English proficiency patients.[30] These findings should be considered when implementing SDOH screening and referral interventions in the obstetric and perinatal settings, with an emphasis on building an equitable infrastructure that addresses the unmet resource needs of vulnerable pregnant patients and their communities.

Improvement work to increase social determinants of health screening and linkage. Connecting patients with unmet needs to appropriate resources is a challenge and focus of a growing body of literature on QI initiatives addressing SDOH. Several reports are highlighted in this section as examples of effective improvement initiatives. Fitzhugh et al. (2021) reported on a large, university-based, outpatient OBGYN clinic conducted a QI project to address food insecurity with 14 patients.[31] Patients experiencing food insecurity were referred to resources across the surrounding four counties and received on-site food packages. Structured feedback on the process from providers led to improving screening visibility during the health care visit to avoid delayed or missed referrals and reducing the amount of referral materials to avoid information overload. Most surveyed patients felt that their provider addressed their needs (85.7 %), felt listened to (71.4 %), and had an overall positive experience (78.6 %) while patient perceptions of patient-provider trust provided an opportunity for improvement. This study reflects the importance of thoughtful and site-specific attention to needs as it relates to SDOH screening implementation and referral.[31]

Cordova-Ramos et al. (2023) studied a QI project facilitated by a multidisciplinary QI team in a large safety net hospital.[32] The team implemented an SDOH screening tool, a 1-page resource guide for patients with identified needs, and a process flow for SDOH screening and linkage to needed resources. The SDOH screening was conducted by nurses during the NICU stay or at outpatient follow-up visit for infants discharged within a week. When patients screened positive for SDOH needs and desired assistance their nurse would generate the resource guide with an EHR smart phrase and page the social worker to notify them of the need for SDOH referral, linkage support and follow up. The QI team facilitated multiple Plan-Do-Study-Act cycles to train the clinical team and engage patient and community partners for resource linkages. The project resulted in improvement from 0 % to 49 % of families screened for SDOH with no disparities in screening rate by maternal race and 98 % of families who screened positive for SDOH needs and desired assistance received referrals. Linkage to resources improved from 21 % to 52 % over the course of implementation.

A large-scale QI collaborative formed through the American Academy of Pediatrics network included a variety of outpatient pediatric practices and community health centers working to increase early childhood screening of SDOH and other needs. Practices were referred to validated screening tools and were supported via learning sessions through the Improving Screening, Connections with Families, and Referral Networks (I-SCRN) collaborative. Practices developed and tested their processes for SDOH screening, discussion, and referral. Monthly chart reviews of 9, 18 and 30-month well child visits ($n = 756$) showed SDOH screening increased from 26 % to 76 % ($p < .001$) and referrals for SDOH increased from 19 % to 73 % ($p = .001$) over the course of 13 months.[33] Practices reported improved staff training on SDOH and decreased barriers of identifying appropriate screening tools, referral resources, and staff time. The quality collaborative helped practices facilitate sustainable system-level change supporting SDOH screening and referral.[33]

North Carolina offers an example of statewide infrastructure improvements to support sustainable SDOH screening and referral systems to decrease strain on individual hospitals and practices with perinatal implications. The state hospital association, medical society and Department of Health and Human Services developed four initiatives that together support addressing SDOH related to food, housing, transportation, employment, and interpersonal safety/toxic stress. First, they set financial incentives such that nonmedical interventions are counted under payer plans as direct health care expenses. Second, they developed a nine-question screener that mapped to five identified SDOH domains. Third, they developed NCCARE360, a statewide referral platform that facilitates communication between providers to identify community resources, make referrals and follow up.[34] Finally, the Healthy Opportunities Pilot, is ongoing (5 years, starting in 2021) and provides funding for CMS-approved interventions for food insecurity, housing insecurity, transportation needs, and interpersonal safety/toxic stress.[34] These efforts to build infrastructure for SDOH screening and linkage has increased community partnerships, led to efficiencies in referral acceptance,[35] and has benefited other states through the national Early Childhood Comprehensive Systems Collaborative Improvement and Innovation Network (COIIN) .[36]

Several lessons from these and other examples of SDOH improvement initiatives can be brought to efforts to achieve similar goals in the perinatal space. First, universal SDOH screening results in increased identification of SDOH needs. Second, systematic screening with a process flow for linkage to resources for identified needs leads to increased referrals. Finally, system improvements and incentives at the state can make it easier for clinicians to screen and link patients to resources for identified SDOH needs. These findings identify effective strategies and support for perinatal QI efforts to implement SDOH screening and linkage to community resources in various settings.

Social determinants of health work facilitated by the Illinois Perinatal Quality Collaborative in the birth equity initiative

In November 2018, current hospital teams participating in ILPQC QI initiatives as well as the ILPQC Obstetric Advisory Workgroup, made up of physicians, nurses, patients, and public health leaders, voted to

launch a Birth Equity Initiative to work on actionable strategies with birthing hospitals to address disparities in perinatal outcomes. ILPQC launched Wave 1 of the initiative in March 2021 among 16 hospitals of varied birthing volume, perinatal acuity, and geographic location. Wave 1 hospital teams reviewed the draft data collection form and process, collected pilot data, and provided feedback on key strategies during 3 monthly webinars to inform data collection strategies for the statewide QI initiative.

In June 2021, all 100 birthing hospitals in the state of Illinois as well as those in the St. Louis, Missouri metropolitan area, which serve pregnant persons in southern Illinois, were invited to participate in the initiative. Eighty-six hospitals, representing about 90 % of Illinois-resident births, elected to participate by submitting QI team rosters and obtaining access to the ILPQC data system. Due to closures in birthing hospitals, 75 hospital teams are now actively participating in the ILPQC Birth Equity Initiative.

Intervention. The overarching aims of the ILPQC Birth Equity Initiative are: (1) By December 2023, more than 75 % of Illinois birthing hospitals will be participating in the Birth Equity Initiative and (2) by May 2024, more than 70 % of participating hospitals will have all six key strategies (Table 2) in place. To achieve the second aim, participating hospitals focused on implementing the six key strategies outlined in the ILPQC Birth Equity Toolkit.[37] The key strategies and toolkit were based on evidence-based practices found in national guidelines from ACOG, Society for Maternal Fetal Medicine (SMFM), and Alliance for Innovation on Maternal Health (AIM),[15,38,39] recommendations from the Illinois Maternal Mortality Review Committee,[40] and input from patient focus groups and community stakeholders. This paper focuses on key strategy 1, to implement universal SDOH screening prenatally and during delivery admission and connect patients to needed resources and services.

ILPQC used a systematic framework for QI grounded in the Institute for Healthcare Improvement (IHI) Model for Improvement that facilitated strategies to increase the QI capacity of participating Illinois hospital teams. ILPQC provided opportunities for collaborative learning across hospital teams, access to the ILPQC data system to track progress over time and in comparison to other hospitals, and QI support with one-on-one calls from ILPQC staff, small group QI topic calls and key players meetings at hospitals.

ILPQC developed specific QI tools to support hospital implementation of screening for SDOH and linkage to needed services and community resources prenatally and on labor and delivery. Universal screening for SDOH is necessary to have conversations about SDOH needs. ILPQC identified SDOH screening tools that had been used in obstetric settings and provided hospital teams with a table comparing the screening tools with links to each tool. ILPQC also identified resources and services for SDOH needs, including a hospital resource mapping tool worksheet, lists of community doula programs, resources to identify near-by home visiting programs, and tip sheets with statewide resources to address SDOH needs. Additionally, teams were provided access to electronic web-based search engines (NowPow and FindHelp.org) to support identification of local community resources across Illinois. In addition, ILPQC provided SDOH folders for hospital teams which included SDOH resources for providers and staff as well as patient resources,

Table 2
ILPQC birth equity key strategies.

Strategy 1	Implement universal social determinants of health screening prenatally and during delivery admission and connect patients to needed resources and services
Strategy 2	Review hospital-level maternal health quality data by race, ethnicity, and Medicaid status to identify disparities and opportunities for improvement
Strategy 3	Engage patients and community members to provide input on quality improvement efforts
Strategy 4	Implement a strategy for sharing expected respectful care practices during delivery admission with patients, labor support persons, and obstetric staff; and survey patients before discharge on their care experience to obtain feedback
Strategy 5	Standardize postpartum patient safety education prior to hospital discharge on urgent warning signs, how to call and healthcare providers and scheduled early follow-up
Strategy 6	Implement patient-centered staff and provider training to promote respectful care and address implicit bias

Measures. Hospitals reported monthly progress on the following structure measures related to SDOH: (1) implementation of standardized SDOH screening tools for screening all birthing people during delivery admission to link patients to needed resources and services and (2) provision of affiliated prenatal care sites options for standardized SDOH screening to screen pregnant patients early in pregnancy and link to needed resources and services. Each measure was reported as in place, in progress, or not started. For process and outcome measures related to SDOH, hospital teams reviewed a random sample of 10 records of patients delivered at their hospital per month. The sampled records drew from birthing people who identified as Black or Hispanic; if there were an insufficient number of Black or Hispanic patients, then patients receiving public insurance or patients without insurance were sampled. Process measures were: (1) the percent of patients with SDOH screening documented prenatally, (2) the percent of patients with SDOH screening documented during delivery admission. The outcome measure was: (3) the percent of patients who screened positive for SDOH that had documentation of linkage to needed resources prenatally or during delivery admission.

One hospital's experience with implementing strategies to improve SDOH screening and linkage. St. Mary's Hospital Family Birthplace (SMHC) is an urban Level 3 Administrative Perinatal Center for Southern Illinois, with approximately 2600 deliveries per year. The SMHC birthing population is diverse with 60 % of patients who identify as Black and about 66 % of patients who are insured by Medicaid. In July of 2021, SMHC commenced work on ILPQC's Birth Equity Initiative, incorporating universal screening of all perinatal patients for SDOH needs using standardized screening and subsequent connection to resources.

The Birth Equity team created a basic screening process for SDOH. Patients seen in the Women's Evaluation Unit for OB triage and on admission to antepartum or labor units were identified as the focus population for the initial pilot. A graduate student collaborated with the social work department to collate community resources, verify their availability, and create a community resource list that was added to the hospital website with live links as an interactive tool for patients, in addition to a printed resource list. The Birth Equity team facilitated a staff education campaign to promote familiarity and usage of the resource guide prior to screening.

The Birth Equity team also reviewed standardized SDOH screening tools. Frontline nurses were consulted for input on screening methods. The electronic health record (EHR) was selected for ease of integration of questions into the normal admission process, while saving nursing time and redundancy with data entry. The screening tools chosen were already built into the EHR, however, were not live at the time, therefore the QI team petitioned and received permission to pilot the SDOH screening tools in the EHR.

All inpatient admissions and OB Triage patients were screened for SDOH. Positive screening results for inpatients were referred to social work for consultation increasing demand for social work consultations. To accommodate the increased caseload and improve follow-up capability, patients with positive screening results were given a resource guide in OB triage and social work consults were reserved for emergencies.

The initial pilot found that linkage to resources required OB staff to provide warm handoffs to community organizations, document referral and implement follow-up. Additional social work staff were hired to cover the newly identified need to link patients who screened positive for SDOH needs to resources. In addition, SMHC partnered with a local

community organization providing nurse home visiting services and up to 2-year follow-up for identified patients with highest SDOH needs admitted on antepartum or postpartum to ensure warm handoffs. SMHC continues to partner with additional community organizations in the inpatient and community settings to link patients to needed resources. The clinical team also rounded daily on patients with substance use disorder for more detailed care coordination planning.

A year into the initiative, a new operating system was implemented for referral to resources in clinics for more efficient use of staff time. When a positive SDOH screen is obtained a referral is entered and a nurse navigator enters a referral call for a network of organizations to respond. Once the referral organization responds and contacts the referred patient, the nurse navigator documents the resources provided to close the loop. In addition, SMHC launched a doula pilot program to support the SDOH needs of 40 families in the Women and Infants Substance Help program (WISH) that is currently in process of expansion to patients receiving care at the clinics that feed into SMHC. Ongoing assessment of the impact of screening, linkage to services and follow-up has been integrated into SMHC's recurring multidisciplinary review of SMM cases with identification of SDOH risk factors and potential impact on care. The QI review process promotes identification of opportunities for improvement in addition to observing gaps and trends among patients.

Key findings after two years of project implementation emphasize: 1) Use available resources to begin where you are, evaluate needs, and adapt to cover gaps; 2) Community partnerships with follow-up and home visiting resources are critical to create a bridge into outpatient care; and 3) Increased care collaboration is needed to improve health outcomes.

Next steps for the birth equity initiative in Illinois. In 2024, ILPQC will continue to support Obstetric Birth Equity teams to build the infrastructure to sustain birth equity work. Birth Equity hospital teams will continue to work on building relationships with community organizations, such as community doula groups and home visiting programs, to improve their knowledge of the local resources and services available and identify how best to access these services for their patients. ILPQC is also building on the foundation of the Obstetric Birth Equity Initiative to support our Neonatal hospital teams in identification of SDOH and linkage to needed services and resources through the Equity and Safe Sleep for Infants Initiative in 2024. Hospital teams will implement universal screening for SDOH and linkage to needed resources and services, adding additional screening items relevant to newborn care and safe sleep support, and building relationships and referral connections with related community-based services and resources and coordination of family care plan with outpatient pediatric providers to support patients and their families in their transition home.

Framework for success to address social determinants of health locally

The literature on SDOH screening and linkage, published SDOH QI work and the work of obstetric hospital QI teams in Illinois highlights the need for systems changes and support to facilitate implementation of SDOH screening and linkage to needed resources and services in the perinatal health care setting (Table 3). Hospital teams have worked to develop and implement process flows that facilitate the integration of SDOH screening and linkage to needed services within obstetric care processes including identifying hospital staff such as social workers, patient navigators and/or bedside nurses to help facilitate linking patients to community resources.

This work also highlights the importance of engaging patients and communities to increase linkage to needed SDOH resources, including receiving input from patient and community partners on SDOH work through Community Advisory Boards, Regional Community Engagement Meetings, and patient/community focus groups, as well as building relationships with community partners to better link patients to needed local resources. Hospital teams found that they needed specific strategies and tools to support implementing universal screening for SDOH and linkage to needed resources, including example screening / linkage process flow and help with identification of community resources. ILPQC offered collaborative infrastructure to support hospital implementation through identifying actionable strategies, developing tools and templates for hospital teams, and facilitating collaborative learning through monthly all team webinars, focused small group support on QI topic calls related to SDOH, and one-on-one QI support outreach and calls to individual hospital teams. ILPQC's statewide network also facilitates identification and access to patient and community organizations to identify services and resources to support patients with identified SDOH needs.

Perinatal Quality Collaboratives (PQCs) can implement QI efforts to improve screening for SDOH and linkage to resources. These efforts should engage patient and community input and support systems to link patients to needed community resources by expanding collaboration with community partners. Addressing SDOH needs is a key strategy to improve birth equity and reduce maternal disparities, ongoing work

Table 3
Framework for success to address social determinants of health.

Level	Strategy
Hospital	Implementation of universal screening with a process to link patients who screen positive to needed resources increases identification of SDOH, referral and connection with needed resources Staff education on SDOH and value of screening and linkage as well as orientation to SDOH screening and linkage to resources and process flow High quality digital or printed materials with local resources may facilitate referrals Integrate screening tools into the EHR and use smartphrases to simplify processes Triage SDOH need urgency in the process flow to effectively use case management, patient navigation or social work support resources Engage patients, families and communities in the process of identifying SDOH needs and community resources and services
Providers	Practice respectful care and listening to patients to support respectful, destigmatizing communication and care Collaborate across inpatient and outpatient providers for early identification of SDOH needs and effective facilitation of successful linkage to resources after discharge Follow up to confirm linkage to needed resources and evaluate for ongoing needs during clinical visits
Social work, case management and patient navigation	Direct contact with case managers, patient navigators, social workers facilitates patient connection with needed resources Linkage support in patient language of preference and with awareness to immigration status improves linkage
Patients, families and community members	Partner with hospitals and providers to optimize the process of supporting patient linkage to community resources and services
State Perinatal Quality Collaborative	Collaborative learning infrastructure supports implementation of systems and culture change for sustainable change QI structure, process and outcome measures and regular reports inform and drive site implementation efforts
State government	Financial incentives such as reimbursement for SDOH screening and linkage may support hospital and provider efforts Statewide referral platforms may facilitate communication between providers to identify resources, make referrals and follow up

should continue to evaluate the success of QI initiatives to improve perinatal SDOH screening and linkage to community resources and evaluate effects on patient experience and pregnancy outcomes.

Declaration of competing interest

The authors report no potential conflicts of interest.

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