2024

Maternal health matters: a needs and assets assessment to inform design of a maternal community health worker model in New York City

BOSTON UNIVERSITY

SCHOOL OF PUBLIC HEALTH

Dissertation

MATERNAL HEALTH MATTERS:

A NEEDS AND ASSETS ASSESSMENT TO INFORM DESIGN OF A MATERNAL COMMUNITY HEALTH WORKER MODEL IN NEW YORK CITY

by

BRETT L. IVES

B.A., Vassar College, 2000
M.S.N., Yale University, 2006

Submitted in partial fulfillment of the

requirements for the degree of

Doctor of Public Health

2024

Approved by

First Reader

Eugene R. Declercq, PhD
Professor of Community Health Sciences
Boston University, School of Public Health

Professor of Obstetrics & Gynecology
Boston University, Chobanian & Avedisian School of Medicine

Second Reader

Jacey A. Greece, DSc, MPH
Clinical Associate Professor of Community Health Sciences

Third Reader

Lisa J. Messersmith, PhD, MPH
Associate Professor of Global Health
Boston University, School of Public Health

Associate Professor of Anthropology
Boston University, College of Arts and Sciences

Fourth Reader

Omara Afzal, DO, MPH
Assistant Professor of Obstetrics, Gynecology and Reproductive Science
Icahn School of Medicine at Mount Sinai

Obstetrician and Gynecologist
Capital Health Medical Center

DEDICATION

This is dedicated to my husband Jay. I thank you and I love you.

ACKNOWLEDGEMENTS

I am very grateful for the support of many people who helped make this work possible. I want to first thank my wonderful dissertation committee, who helped me navigate this process every step of the way, including planning and data collection during the early pandemic period. Gene Declercq, I learned so much about maternal health from you and I can't thank you enough for your support through the years and more recently as Chair. Jacey Greece, thank you for sharing your expertise in applied research and intervention planning; your feedback elevated this project and your support propelled me through this process. Lisa Messersmith, thank you for your keen mentorship on qualitative methods and for providing meaningful feedback and guidance at each step. Omara Afzal, thank you for lending your highest expertise in obstetrics and public health, which made this project relevant and evidence-based. I am so grateful we connected through this project and I hope one day we can collaborate again. I also want to thank BUSPH Emeritus Professor Judith Bernstein for her teaching and mentorship in the areas of women's health and qualitative methods.

To my Maternal Health Matters project colleagues, Jamillah Hoy-Rosas, Omara Afzal, Leny Rivera, thank you for this collaboration. This dissertation could not have happened without you. I look forward to building a maternal health coaching program together in the future. Jamillah Hoy-Rosas, I am so glad we decided to embark on this project together and I greatly value our collaboration over many years. And many thanks to Tanjeena Patwary for the thoughtful and in-depth analysis of our participants' voices

and experiences.

To Trish Elliot, thank you for your support during these past few years in your role as DrPH Program Director. It has meant a lot to me. And to my DrPH colleagues, thank you for your friendship, support, inspiration, and laughter over the years. I am glad we all remain connected (with the help of WhatsApp). A special thanks to Aleefia Somji for the collaborative learning and support during coursework, and to Irini Albanti and Ann Peralta for encouraging me in these final steps of the program.

I want to give extra thanks to my family: my husband, my parents, Ryan, Shawna, Arthur, Aunt Mishy and Uncle Chris. You have all supported and cheered me on at points in this journey. To my husband Jay, I would not have gotten to this point without your many forms of support. My dear friend Toviah Narva, thank you for being there for all of it. Your weekly check-ins on my progress were so kind! To dear friends Mary Bresnan and Katelyn Milinowicz, thank you for believing in me!

To my colleague Manmeet Kaur, I am grateful for the opportunity to work with you on CHW / health coaching care models for many years. And to my colleague Hilda Mejias, I have learned so much from you about health coaching practice. Thank you for the encouragement during the dissertation writing phase.

Finally, I would like to thank the BUSPH MCH Center of Excellence for supporting my work early in the program and during dissertation phase. Also thanks to Robert Wood Johnson Clinical Scholars for supporting the Maternal Health Matters project as a whole.

MATERNAL HEALTH MATTERS:

A NEEDS AND ASSETS ASSESSMENT TO INFORM DESIGN

OF A MATERNAL COMMUNITY HEALTH WORKER MODEL

IN NEW YORK CITY

BRETT L. IVES

Boston University School of Public Health, 2024

Major Professor: Eugene R. Declercq, PhD, Professor of Community Health Sciences, Boston University, School of Public Health; Professor of Obstetrics & Gynecology, Boston University, Chobanian & Avedisian School of Medicine

ABSTRACT

Background: Rates of maternal mortality and severe maternal morbidity are higher in New York City (NYC) than nationally, with Black birthing people experiencing the worst maternal outcomes, followed by Latina/e and Asian/Pacific Islander birthing people. This study aimed to understand the barriers and facilitators to engaging in maternal self-care and maternal health care to support the design of a stakeholder-informed maternal community health worker (CHW) model in NYC. The study also identified key intervention components and strategies for adoption, implementation, and sustainability.

Methods: In-depth interviews were conducted with prenatal and postpartum people (N=38) from a large teaching hospital in Upper Manhattan serving a racially and ethnically diverse patient population and with a cross-section of professionals (N=15) delivering maternal health care. Interviews took place between November 2020 and August 2022. Thematic analyses were conducted to uncover findings to inform program

design, with the Intervention Mapping framework guiding this process.

Results: Findings reveal a range of barriers and facilitators to maternal self-care and health care engagement. Barriers included lack of transportation and childcare, delayed introduction of resources by the health care team, lack of care continuity, and experience with and concerns about disrespectful or discriminatory care. Additional barriers from the COVID-19 pandemic included disruptions to social support networks, childcare, and health care experience. Facilitators included information and advice from family, friends, and social media, positive coping skills, and trusted relationships with obstetric providers.

Prenatal and postpartum participants recommended program components that provide emotional and instrumental support, and viewed the CHW as a someone they can trust to provide support and advice. Maternal health professionals recommended patient education and skills-building, and a focus on patients with high-risk pregnancies and chronic conditions. Maternal health professionals also recommended early staff and patient buy-in, clear definition of the CHW role, strong supervisory structure, and external seed funding.

Conclusion: A needs and assets assessment using the Intervention Mapping framework was critical to design a stakeholder-informed and evidence-based maternal community health worker model. These findings include lessons learned for similar health systems seeking to develop community-based care models to address maternal health inequities and improve outcomes.

TABLE OF CONTENTS

LIST OF TABLES

Page

LIST OF FIGURES

Page

LIST OF ABBREVIATIONS

ACOG ..... American College of Obstetricians and Gynecologists

CDC ..... Centers for Disease Control and Prevention

CHW ..... Community Health Worker

NCQA ..... National Committee for Quality Assurance

NYC DOHMH ..... New York City Department of Health and Mental Hygiene

SMM ..... Severe Maternal Morbidity

WHO ..... World Health Organization

CHAPTER ONE: BACKGROUND AND LITERATURE REVIEW

1.1 Background and Significance

Maternal Mortality: A Global Problem and U.S. Context

Maternal mortality and morbidity are a world-wide problem. While some countries have made positive gains in recent years, maternal mortality is rising in the United States, more than the majority of high and middle income countries.[1] The U.S. has the highest rate of maternal mortality among high income countries, 84% of which is preventable with better access to and quality of prenatal, intrapartum and postpartum care and self-management of chronic diseases.[2] In 2017–2019, approximately 20% of U.S. maternal deaths occur during pregnancy, 13% on the day of delivery, and 65% in the postpartum period. Of all postpartum deaths, 12% happen 1–6 days postpartum, 23% occur 1–6 weeks postpartum, and 30% during the remaining portion of the postpartum year.[2] An analysis of 2007–2016 national data found that in the first week postpartum, severe bleeding, high blood pressure, and infection are the most common mortality causes, while cardiomyopathy is a main cause of later postpartum deaths.[1]

Researchers have highlighted that while the maternal mortality rate is elevated among all U.S. birthing people, Black American and American Indian mothers are at the highest risk of death in and after childbirth.[3–8] A recent study of 2016–2017 data found that leading causes of maternal mortality among non-Hispanic Black American mothers was cardiovascular conditions (pre-eclampsia and cardiomyopathy), at rates five times higher than non-Hispanic white American mothers.[9] Overall maternal mortality and the

racial and ethnic maternal mortality disparity have only worsened during the COVID-19 pandemic.[10] In 2021 during the COVID-19 pandemic, the U.S. had the highest maternal mortality rate in decades, at 45.5 per 100,000 births.[11] Factors leading to this increase in maternal mortality are unclear but could include co-existing COVID-19 illness,[12] health conditions exacerbated by COVID-19, strained social services, and care delivery distruption.[10]

Maternal Mortality and Severe Maternal Morbidity in New York City

In New York City (NYC) between 2011–2015, the number of pregnancy-associated deaths was 273, with 115 determined to be pregnancy-related (directly caused by pregnancy). The pregnancy-related mortality ratio (PRMR) was 18.9 per 10,000 in 2015.[13] Except for in 2013, the pregnancy-related mortality ratio in NYC was higher than the national average from 2001–2015.[13] The leading causes of pregnancy-related deaths in NYC from 2011 to 2015 were cardiovascular conditions (25.2%), embolism (21.7%), infection (13.0%), hemorrhage (12.2%) and pregnancy-induced hypertension (10.4%).[13]

Causes of pregnancy-related deaths in the years following 2015 are consistent with the 2011–2015 analysis, but mental health problems (suicide, substance overdose) were re-categorized as pregnancy-related by New York City Department of Health and Mental Hygiene (NYC DOHMH) in 2018. Mental health was a leading cause of the 2018 and 2019 deaths (17% of deaths both years).[14–16] Upcoming DOHMH analysis of 2016–2021 data will provide a more reliable picture of drivers of NYC maternal mortality during those years.

Similar to the US as a whole, racial and ethnic inequities in maternal health outcomes exist in New York City. From 2011–2015, the pregnancy-related mortality ratio was eight times higher for Black non-Latina/e birthing people than non-Latina/e white birthing people in NYC.[13] Latina/e and Asian / Pacific Islander pregnancy-related mortality was twice that of non-Latina/e white birthing people during the same time period.[13] There are similar trends in racial and ethnic inequities for NYC severe maternal morbidity (SMM), a composite of 21 indicators that represent either a serious diagnosis or complications of pregnancy, delivery, and post-delivery.[17]

The leading indicators of SMM in NYC are aligned with the leading causes of pregnancy-related mortality: hemorrhage, hypertension, and embolism.[18] For that reason, SMM is often considered a "near miss" event. Severe maternal morbidity has increased in NYC overall, with 195.4 per 10,000 births in 2008, 253.4 in 2010, 277.8 in 2014, and 283.7 in 2017.[18–20] In addition to racial and ethnic disparities, the severe maternal morbidity rate was highest in the lowest income zip codes in NYC, which include neighborhoods in Brooklyn, Bronx, and East Harlem in Manhattan.[18] Of note, these lower income zip codes are supported by New York City Department of Health and Mental Hygiene District Public Health Offices (DPHOs), yet still face challenges, as reflected by these place-based disparities.[18] In East Harlem, where Mount Sinai operates, severe maternal morbidity occurred in 327.9 per 10,000 births, compared with 141.1 in the neighboring high-income Upper East Side in 2013–2014.[18] The reasons for race and place disparities in maternal health outcomes are complex, and recent studies have attributed them to a high burden of pre-existing chronic illness, structural racism, and

discrimination and racial bias in health care.[18] Based on available data to date, in 2023 the NYC DOHMH provided recommendations based on leading causes of maternal mortality among NYC Black and Latina/e mothers: cardiovascular conditions, mental health conditions, and hemorrhage, with some recommendations focused on addressing discrimination in health care settings.[16]

A review of the most recent data regarding the burden of chronic conditions and psychosocial stressors among birthing people in New York City found that 15.3% were diagnosed with gestational diabetes and 13.4% with gestational hypertension; 27.5% experienced emotional distress in the 12 months before delivery; 48.9% experienced financial stress; and 6.4% experienced traumatic stress.[21] These data highlight the importance of comprehensive approaches and supports to improve maternal health outcomes in New York City.

Determinants of Severe Maternal Morbidity and Mortality

Structural racism is a critical societal determinant of severe maternal morbidity and mortality in the U.S. and NYC. In the U.S., structural racism shapes environments and social and economic opportunities, especially for lower-income Black birthing people.[22–23] On the community level, racist policies and institutions past and present, including redlining and residential segregation, policing and incarceration,[24] have decreased economic opportunity for communities and families and limited health-promoting resources such as housing quality and stability, food quality and security, transportation, safe and available physical activity spaces, and clean air and water.[25]

Along with material hardship, the chronic stress caused by covert and overt racism can also contribute to an allostatic load, or physiologic burden, that worsens health and leads to chronic conditions such as hypertension and diabetes, often with onset at younger ages.[26–28] In NYC, research by Howell et al. (2016, 2020) also suggests that differences in care quality by hospital site contribute to racial and ethnic disparities in severe maternal morbidity in the city, meaning that health systems in lower income communities of color lack adequate funding, resources, or processes.[17, 29–30] Lack of mental health services in these communities can also contribute to negative maternal health outcomes.[31]

Individual determinants of maternal health, often shaped by the social determinants, include underlying chronic conditions such as hypertension, diabetes or heart disease. Birthing New Yorkers with these conditions were three times as likely to have SMM as women with no chronic conditions.[18] Among NYC people with a pregnancy-related death, 59.0% had a pre-existing chronic condition.[18] Much of the chronic condition burden is driven by the social determinants discussed above. Alcohol and substance use are other key individual determinants of maternal health, and use of alcohol and drugs increased during the COVID-19 pandemic.[32]

Interpersonal determinants such as lack of social / partner / family support,[33–35] intimate partner violence,[36] and interpersonal trauma,[37] and implicit bias of health care providers,[38] all have a negative effect on maternal health outcomes. At the intersection of the interpersonal and institutional, discrimination and racism within health care are also driving poor maternal outcomes. Providers have been found to spend less time with African American patients,[39] downplay complaints, and undertreat pain.[40–41] High-profile

media case studies (Serena Williams) have highlighted how health care providers do not effectively listen to Black American pregnant, birthing, and postpartum people.[42–43] Quantitative studies have supported these individual experiences, where suboptimal communication and care are provided to Black American women even when controlled for other factors such as income.[44–47] Qualitative studies provided further insight about birthing people and women's perceived racial and ethnic discrimination during childbirth in NYC,[48–50] with one study noting negative provider communication attributes (impersonal, judgmental) and negative provider experience (not listened to, preferences not respected).[48] Another qualitative inquiry into birthing people's experiences with severe maternal morbidity in NYC found that participants who experienced disrespectful care in the midst of a SMM event reported feeling traumatized physically and emotionally.[49] The researchers also found that how providers interact with patients can profoundly impact experience and recovery from SMM, with participants preferring respectful engagement and a mutual respectful partnership with the provider.[49]

The U.S. has an overall system of care that does not optimally support maternal health, particularly when patients have chronic conditions. Postpartum people especially fall through the cracks in the system,[51] and preventable emergencies occur, such as hypertensive crisis, stroke, hemorrhage, ketoacidosis and worsening comorbid conditions. Few mothers with gestational diabetes return for the recommended postpartum glucose testing to make sure blood sugar has returned to normal.[52–55] Low-income mothers in particular have low rates of receiving critical postpartum blood pressure checks, depression screenings, and other support.[56–58] Using the example of postpartum women

with gestational diabetes (GDM), studies have described multiple system health care system-based barriers at every step of the maternal health journey that inhibit postpartum follow-up for GDM. They include lack of outreach and scheduling systems, competing priorities in the postpartum visit or simply not ordering the tests,[55] and lack of connection between obstetrics and primary care.[59–60] Postpartum people do not have adequate breastfeeding support, with disparities in breastfeeding initiation and maintenance by race and income.[61] Evidence-based programs like the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) fill gaps in breastfeeding support, depression screening,[62] social service referral, and nutrition education, but lack comprehensive chronic condition programming needed to prevent complications and maternal morbidity, which would include disease management education and an escalation process to the OB provider to address emerging risks.

Other institutions that contribute to poor maternal outcomes include workplaces with discriminatory or unsupportive policies and practices towards pregnant and postpartum people and new parents.[63–64] This includes lack of accommodations for any pregnant person (for example lifting heavy weights),[65] high risk pregnancies,[66] or for breastfeeding.[67] In addition to access to transportation and housing at the community level, the quality of these institutions also influence maternal health, including public transportation routes, cost, and seating,[68] and housing amenities, cost, and available space (square footage).[69–70]

Finally, policy, society, and cultural factors affect maternal health outcomes. Policies such as access to paid family leave and postpartum health insurance coverage,

ingested by political dynamics and priorities at local, state, and national levels, contribute to the health of mothers in the U.S.[71–72] The Family Medical Leave Act (FMLA) has historically provided unpaid leave; therefore, inequities exist in terms of who can take advantage of the benefit, with many lower income women returning to work very soon after birth.[73–74] Paid Family Leave, while passed into law by certain U.S. state legislatures, has yet to gain the bipartisan congressional support to be enacted on the national level.[75] In terms of insurance coverage, states that have opted in to Medicaid expansion often allow longer postpartum coverage, leading to increased postpartum visit attendance[76] and reduced postpartum hospitalizations.[77] In addition, affordable childcare policies, while not yet widespread, could support maternal well-being[78] and employment.[79] Society norms and culture can also influence maternal health experience and outcomes. Trust in women and their health care decisions can foster trust and maternal well-being, while stigma against mothers for their socioeconomic status,[80] health conditions,[81–83] health beliefs, health practices, or obstetrical care decisions[84] can create mistrust and maternal distress.

Finally, the global and local context of the COVID-19 pandemic was an important factor affecting maternal health. All of the determinants of poor maternal health outcomes presented above were exacerbated by the pandemic. Structural inequities by race and income widened;[10] individual factors such as someone's chronic condition status were worsened if sick with COVID-19; institutions were strained under the demands of carrying out policies to protect patients, members, and staff; and political priorities shifted starkly in response to the economic and public health demands of the pandemic.

Data collection for this study took place during the COVID-19 pandemic (2020–2022), with the majority of interviews conducted in 2021. Therefore, the pandemic was a major factor in this research inquiry and related findings, as will be discussed further in future chapters.

Maternal Perceived Barriers and Facilitators to Maternal Health Care and Self-Care

Birthing people's perceived barriers to maternal health care and self-care explored in the literature often focus on endpoints of breastfeeding and postpartum depression screening and care.[85–90] Maternal perceptions of barriers to health care and self-care include policy-level issues such as lack of insurance coverage and paid leave,[91] at the institutional / health systems-level such as poor care coordination and integration,[91–92] and at the interpersonal and individual levels such a psychosocial stressors and lack of support.[33, 93] Another interpersonal factor that mothers perceive as a potential barrier or facilitator is whether they have a trusting relationship with their OB provider.[94–95]

Maternal perceived barriers to a positive care experience for birthing people who had experienced a severe maternal morbidity (SMM) event included lack of continuity of care as well as poor communication and follow-up after the SMM event.[49] Birthing people's experience of bias and discrimination is another clear barrier to positive care experience and health care engagement. A 2021 study of maternal experience during the COVID-19 pandemic cited health care discrimination as a barrier to maternal well-being, with one or more discriminatory incidents associated with higher levels of postpartum stress and birth-related PTSD.[95]

Maternal perceived barriers to maternal self-care or health care engagement at the community level include stigma, especially among mothers with substance misuse,[96–98] overweight / obesity stigma,[99] or mental health conditions.[100–101] Lack of availability, access, or awareness about community resources (social services, community-based organizations, Women, Infants, and Children) can also affect maternal health self-care.[102–103] Maternal perceived community-level facilitators to maternal self-care and maternal health care engagement included resources such as doula programs[104–105] and WIC.[106]

Provider Perceived Barriers and Facilitators to Maternal Health Care and Self-Care

Studies have been conducted that explore physician perceptions on barriers and facilitators to maternal health care and self-care are available in multiple country contexts.[107–110] Similar to gaps in the maternal viewpoint, literature on U.S. provider perceptions of barriers and facilitators are mostly on depression care,[111–112] breastfeeding,[113–115] and prenatal or postpartum care.[57, 116–117] Health system- (lack of resources or organization), provider- (lack of expertise), and patient-level (lack of engagement) barriers are often named.[59,108–111] One U.S. study on community health worker-perceived barriers and facilitators to engaging with maternal mental health services for low-income urban women identified factors previously described in the literature: mental health stigma, racial discrimination in the health care system, lack of social support and transportation, and competing demands of parenting / care-giving.[118]

Very few studies look at provider perceptions of barriers and facilitators to

maternal self-care and self-management of chronic conditions. One study on provider perceived barriers and facilitators to diabetes care and self-care identified only barriers (and no facilitators) at all levels of the social ecological model, including overburdened clinics, low health literacy, and low patient motivation.[116]

Facilitators not covered by the provider literature but important to center in this study are community assets that can mitigate social and economic stressors and improve outcomes, including the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC),[119] the Supplemental Nutrition Assistance Program (SNAP, formerly the Food Stamp Program),[120] home visiting services,[121] and community-based organizations. Social network facilitators include family, friends, or professionals such as doulas, to provide social and emotional support.[122–123] Social support specifically from doulas,[124] peer support programs,[125–126] and online social support[127] are all documented facilitators of maternal health. Finally, there are individual facilitators that can support a healthy pregnancy, including a person's coping mechanisms for managing stressors.[128–129] These and other community, interpersonal, and individual assets were explored in depth in this study, along with institutional (health care) assets.

Due to the complexity of the problem, poor maternal health outcomes and maternal health disparities can and must be addressed from many angles, including on the policy, institutional, and community levels. One institutional-level approach is to improve health care quality and processes, such as with best practice maternal health safety "bundles" for training and supplies.[130] Policy approaches include addressing social determinants of health and improving access to equitable health care, continuous health

insurance coverage, WIC, and paid family / sick leave. An additional area of intervention at both the community and institutional levels is to work on developing systems of care outside of but in conjunction with the hospital.[131–132] Community health worker interventions are one such community-based system of care that can potentially improve maternal health through support of expectant people in their home communities.[133–134]

Evidence for Community Health Worker Interventions for Maternal Morbidity and Mortality

The community health worker, also known as health coach, peer mentor, or promotora/e de salud, are "frontline public health workers who are trusted members of and / or have an unusually close understanding of the community served."[135] Maternal health community health worker programs have improved outcomes for pre-eclampsia in India and Mozambique.[136–138] While these countries face a different set of contributing factors for poor maternal outcomes, the studies in India and Mozambique highlight the function of community health workers as early detectors of risk and emerging complications through their trusted relationships and community presence and network. Many cases of postpartum near-miss or fatal hypertension and pre-eclampsia in the U.S. could benefit from this function. Social support provided by lay health workers or nurses also reduced cesarian section rates across studies in middle- and high- income countries.[139]

In the U.S. and abroad, community health worker programs have improved prenatal and postpartum depression and stress, [140–143] breastfeeding practices,[144–145] and

infant care.[146–148] Community health workers / health coaches have improved weight and gestational blood sugar levels,[148–149] and can improve the rate of postpartum follow-up, a critical action for maternal well-being.[131,150–153] Finally, a few studies show promise that CHW interventions reduce maternal morbidity in the U.S.: a peer navigator pilot program in a New York health system reduced hospitalizations for pregnancy-related life threatening problems,[154] a Philadelphia based CHW program for pregnant people with chronic conditions reduced prenatal inpatient admissions,[155] and a home visiting program (by paraprofessionals or professionals) reduced pregnancy complications, maternal morbidity, and preterm birth among first-time mothers in Kentucky.[156] The New York program focused on education, motivational coaching, addressing social determinants, and proactive linkage of patients to specialists for emerging risks, such as cardiomyopathy.[154] The Philadelphia-based program focused on addressing social determinants and providing emotional support through the pregnancy and postpartum journey.[155] The Kentucky-based program's paraprofessionals focused on addressing social needs, problem solving, and skills building, while the quarterly visits with professionals provided education and referral to health screenings and care.[156]

Community health worker (CHW) interventions have also shown promise for numerous public health problems outside of maternal morbidity and mortality in the U.S., particularly among people who have been historically marginalized and have a higher burden of chronic illness. CHWs with rigorous training and supervision de-escalate emergent health problems and improve health outcomes in low income adults with chronic conditions in the U.S..[157–160] There is also a growing body of promising results

on the reduction in the cost of care from high quality CHW interventions.[161–166] CHW interventions like these, that provide motivational and supportive health coaching, self-management education, and early detection of risks, could be translated effectively to the maternal health context. Proposed mechanisms for success have been frequent check-ins,[157,159] a trusting relationship,[159, 167] and escalation pathways when emerging or urgent issues arise.[158] These interventions, while few in number, can serve as models and provide lessons learned for future intervention design, adoption, implementation, and sustainability.[158–161,167] CHW systems can intervene on critical inflection points in terms of severe maternal morbidity and mortality: hypertension / pre-eclampsia, other cardiovascular conditions, hemorrhage, and complicating issues such as diabetes and depression. Since few CHW models in the U.S. exist to address these key contributing factors to maternal morbidity and mortality, a needs and assets assessment is needed to develop the content and structure of a maternal health community health worker program.

Implementation, Adoption, and Sustainability Considerations for CHW Models in the U.S.

While there have been general guidelines on the scope of practice and competencies for community health workers published by academic coalitions, such as the CHW Core Consensus (C3) project,[168] other leaders have taken the next step to present a business case for CHW programs, with implementation and funding recommendations that include essential components of a CHW model, implementation, sustainability, and current opportunities for financing.[169]

Mehra et al. (2020) discuss considerations for building sustainable maternal health community health worker programs specifically, based on an evaluation of three such programs focused on pregnant, postpartum and reproductive age women with chronic conditions in Northeastern U.S. cities.[170] The three main findings were the importance of: 1) CHW support from supervisors, providers, and peers; 2) relationships with health care systems and insurers; and, 3) adequate and continuous funding.[170] Given this existing research, the current study will explore additional factors for successful adoption and operations for a maternal community health worker program, including role definition, team integration, and supervisory structure.

Community Health Worker Maternal Health Guidelines

Global

Numerous global, federal, and state level policies to address maternal health guide the work of community health workers and lay professionals.[171–172] The World Health Organization (WHO) recommends three home visits to postpartum women as standard of care to promote maternal health and safety,[132] yet this standard is rarely met in the U.S due to fragmentation of the health care landscape and lack of community health infrastructure.[173]

U.S. Federal

From rigorous review of the evidence, the Centers for Disease Control and Prevention (CDC) recommended community health worker systems, particularly in the

area of chronic disease, by acting as a cultural intermediary between health system and community, providing culturally-relevant education, connecting people to community resources, capacity building of the individual, and advocacy within health care as needed.[174–175] The CDC recommendations focus on management and early detection of risks from hypertension, diabetes and asthma, as well as cancer screening.[175]

The U.S. House of Representatives Congressional Black Maternal Health Caucus reintroduced legislation in 2021 (Black Maternal Health Momnibus Act of 2021) that includes: critical investments in social determinants of health such as housing, transportation, and nutrition; funding to community-based organizations that are working to improve maternal health outcomes for African American women; diversification of the perinatal workforce; and promotion of payment models that support high quality maternity care and non-clinical perinatal support.[176] This package of 13 bills was reintroduced to the Senate in May 2023.[177–178]

New York State

The New York State (NYS) Taskforce on Maternal Mortality and Disparate Racial Outcomes presented recommendations in March 2019 to reduce maternal deaths and improve outcomes of women and families of color in New York.[179] They presented ten policy and program recommendations that address the societal, institutional, and individual levels of the social ecological model. The fifth recommendation is for the state to enhance and expand community health worker programs to address prenatal and postpartum morbidity and mortality and the ninth is to optimize postpartum care through

a statewide expert work group.[179] The New York State Maternal and Infant Community Health Collaboratives (MICHC) Initiative aims to reduce maternal mortality and improve infant health outcomes through community health worker support, connection to resources, and education through local partner organizations.[180]

While the 2019 Taskforce recommendations have not been updated since the COVID-19 pandemic, a follow-up report was posted by the Taskforce in January 2021, addressing the tenth recommendation: to convene a state-wide expert workgroup to optimize postpartum care in New York State.[181] The report resulting from the state-wide postpartum workgroup presented four recommendations, most of which deal with payment and care delivery models. The second recommendation involves community health workers through establishment of maternal "Stress-Free Zones" by community-based organizations, which link together resources such as doulas, community health workers, lactation support, and family support services.[181] They also recommended a care coordinator (from the health system or payor) who provides ongoing assistance and support in the postpartum period to people who had high-risk or complicated pregnancies.[181]

Current CHW Maternal Health Initiatives in New York City

Maternal health initiatives in New York City are delivered through New York City Department of Health and Mental Hygiene (NYC DOHMH) and include severe maternal morbidity and mortality data surveillance and recommendation setting.[13,18] The NYC Maternal Mortality Review Committee in 2023 issued eight recommendations on

the health system, health facility, and community / individual levels that focus on mental health, cardiac conditions, hemorrhage, and discrimination / racism.[16]

In addition, NYC Mayor Eric Adams founded an initiative to reduce maternal and infant inequities through expansion of the Maternity Hospital Quality Improvement Network, doula workforce expansion, and research and public awareness raising about midwifery models of care in New York City.[182–183] All were codified into city-wide legislation later in 2022.[183]

The Nurse-Family Partnership (NFP) is an established evidence-based home visiting program for new NYC mothers. Originating in New York State and now scaled to 40 U.S. states, the NFP supports expectant and new mothers through the child's second birthday.[184] The New York NFP objectives are to 1) improve pregnancy outcomes through helping women engage in preventive care; 2) improve child health and development through helping parents provide competent care; and 3) improve the economic self-sufficiency of the family by helping first-time parents develop a vision for their future.[185] The NFP only provides services to first-time mothers.

WIC is another program available to low-income NYC prenatal and postpartum people that provides food, nutrition counseling, breastfeeding support, and referrals to other services.[186] WIC in NYC supports mothers with chronic conditions[187] and has been associated with improved birth outcomes and lower infant mortality,[188] as well as improved breastfeeding rates.[189–190] More research is needed on WIC's effects on maternal outcomes.[188,191]

The Northern Manhattan Perinatal Partnership is a valued community-based

organization in Upper Manhattan for prenatal, birthing, and postpartum people.[192] A member of the New York State Maternal and Infant Community Health Collaboratives, the Northern Manhattan Perinatal Partnership is an excellent resource for education and support; however, their service catchment area is limited to certain neighborhoods.

As it stands now, expert panels and authorities such as the NYS Taskforce and the WHO recommend CHW models, but difficulties with design and execution persist, usually due to problems with recruitment, training, and retention; lack of connection to clinical care; and poor technology and supervisory supports. Incorporating the findings from this study, the research team seeks to build upon previous community health worker systems in NYC with strong technology enablement, supervision, training, connection to clinical care, and a high recruitment and retention rate.[157–158, 160]

Current Research Fills Gaps in Knowledge and Evidence

Most maternal health needs and assets assessments focus on one particular aspect of maternal health (e.g., depression, breastfeeding, postpartum visit follow-up). There are also gaps in our understanding of barriers and facilitators to maternal self-care practices including self-management of chronic conditions, nutrition, stress reduction, and mental health strategies. Additionally, most studies exploring barriers and facilitators to engaging in maternal health care, researchers do not compare the perspectives of prenatal / postpartum people and providers. Finally, the literature focuses more on barriers and lacks robust study of facilitators to maternal self-care and health care engagement, especially from the provider perspective.

This dissertation looked at critical evidence-based drivers of both maternal self-care and health care engagement at nearly every level of the social ecological model, so that the understanding of barriers and facilitators is comprehensive. The study compared perspectives of prenatal and postpartum people and providers, to observe any differences in perceptions and to incorporate multiple stakeholder viewpoints. Finally, this study performed a deeper inquiry into the facilitators to engaging in self-care and health care, from both prenatal and postpartum people's and provider's perspectives.

In addition, this study belongs to a group of studies carried out during the COVID-19 pandemic, and findings could inform near- and long-term program and policy efforts, including for future pandemics. Finally, while there have been some promising U.S. community health worker models that have improved maternal depression and stress, few have published results on the effects on maternal morbidity such as preeclampsia, other cardiovascular conditions, and hemorrhage. This dissertation research will contribute to development and evaluation of CHW model(s) aimed at reducing maternal morbidity and mortality.

Relevance to Improving the Health of the Public

This study aimed to generate findings that can lead to action on severe maternal morbidity and mortality in New York City. Research in this area to date has largely been descriptive, with a focus on defining the problem of maternal mortality and morbidity disparities, and its potential drivers and sequelae. This dissertation aims to make steps towards practice, through informing the development of a care system that extends

beyond the hospital to support and improve community maternal health. Stakeholder perspectives are critical both for understanding the problem and designing solutions that are relevant, effective, and sustainable. This dissertation gleans important perspectives from the target populations to ensure the right focus, messaging, and adoption strategy. Furthermore, this study contributes an understanding of the needs and experiences of birthing people and maternal health providers during the COVID-19 pandemic, with lessons for further public health research and action.

The practice guide developed through this research will be a resource for U.S. health care and public health leaders to assess for and design a maternal health CHW layer of care at their sites of care. This could increase the feasibility of maternal CHW model adoption in health centers in other U.S. communities. Creating more evidence about CHW models will hopefully influence future policies at the state and national levels. For example, the New York State (NYS) Task Force to Reduce Maternal Mortality and Racial Disparities, strongly supporting CHW programs as a core strategy, could adopt the model in boroughs or counties with high levels of maternal morbidity and mortality. Given the research gaps and potential contribution to public health, the goal and specific aims of the study are presented below.

1.2 Study Purpose and Aims

The primary goal of this study is to gain extensive stakeholder insights and recommendations to inform the design of a relevant and effective maternal community health worker program. A second and equally important goal is to generate a guide for

assessment and design of a maternal community health worker intervention to be implemented in similar U.S. communities. Specific aims for the study are as follows.

Specific Aim 1: Describe barriers and facilitators to engaging in maternal self-care and maternal health care

1A. Describe how prenatal and postpartum people perceive barriers and facilitators to maternal self-care and maternal health care engagement

1B. Describe how maternal health professionals perceive barriers and facilitators to maternal self-care and maternal health care engagement

1C. Describe how maternal health professionals perceive barriers and facilitators to care delivery

This aim was approached via the four research questions presented in Chapter Two. The methods applied were literature review, followed by in-depth interviews with prenatal and postpartum people (1A) and 1B) and maternal health care professionals (1B and 1C)

Specific Aim 2: Determine the most important components of a maternal CHW / health coaching program

2A. Determine what supports would most ensure postpartum follow-up

2B. Determine what is most needed for women with diabetes and hypertension, other chronic conditions, and complications

2C. Describe the necessary workforce, training, management, and other organizational requirements for implementation and adoption of a maternal health

coaching program

This aim was approached via the four research questions presented in Chapter Two. Methods applied were in-depth interviews with prenatal and postpartum people (2A and 2B), and in-depth interviews with maternal health professionals (2C).

Specific Aim 3: Translate findings from the study into a practice product

3A. Develop a practice guide for the design of a maternal community health worker model

3A-1. Describe the process of a successful needs assessment and intervention design for use by like communities, using the Intervention Mapping Framework and referring to this NYC study as a case study

3A-2. Communicate lessons learned from the NYC case study and provide points of application of these lessons to other contexts

This aim was approached through a synthesis of needs assessment findings, followed by detailed work plans and execution of the practice product.

The terms community health worker and health coach are used interchangeably throughout the rest of the dissertation. This dissertation uses the CHW as the primary term because it is more widely used in public health and health care settings. A CHW is a locally-hired trusted member of the community who works with individuals to improve their health and well-being.[193] The practice of health coaching includes empowerment and motivational approaches focused on positive behavior change.[194] This health

coaching function is included in how this dissertation views the community health worker role.

CHAPTER TWO: RESEARCH DESIGN AND METHODS

The needs and assets assessment was conducted with focused research questions to explore the perspectives and insights from pregnant and postpartum people and maternal health care professionals.

2.1 Research Questions

Question 1. What are pregnant and postpartum people's perceived facilitators and barriers to engaging in self-care and maternal healthcare?

a. What are facilitators and barriers to engaging in maternal self-care and chronic condition self-management (where applicable)?
b. What are facilitators and barriers to engaging in prenatal and postpartum health care?

Question 2. What are maternal health professionals' perceived facilitators and barriers to engaging in self-care and maternal healthcare?

a. What are facilitators and barriers that providers perceive to maternal self-care and disease self-management?

b. What are facilitators and barriers that providers perceive to delivering optimal prenatal / postpartum care?

i. What are the organizational and management barriers and facilitators to care delivery?

Question 3. What are pregnant / postpartum people and provider recommendations for the design and implementation of a maternal CHW / health coaching program?

a. What do people and providers think are the most important components of a coaching program?
b. What are their suggestions on key components of a maternal health coaching program?
    i. For postpartum follow up
    ii. For those with chronic conditions (hypertension and diabetes)
c. What do providers think would be the workforce, management, and other institutional requirements to implementing and sustaining a maternal health coaching program?

Question 4. How has the COVID-19 pandemic affected the health care experiences of prenatal / postpartum people and maternal health professionals?

a. How do prenatal and postpartum women describe their care experiences during the COVID-19 pandemic and how can this be applied to future contexts?
b. How do maternal health professionals describe their experiences delivering care during the COVID-19 pandemic?

Methods that will be employed for each research question are provided in Table 2-1.

Research Question	Data Collection Method	
	Interviews with prenatal/ postpartum people	Interviews with maternal health professionals
1. What are prenatal and postpartum people's perceived facilitators and barriers to engaging in maternal self-care and health care?		
What are facilitators and barriers to engaging in maternal self-care and chronic condition self-management?	x	
What are facilitators and barriers to engaging in prenatal/postpartum care?	x	
2. What are maternal health professionals' perceived facilitators and barriers to maternal self-care and health care engagement?		
What are facilitators and barriers to maternal self-care and health self-management?		x
What are facilitators and barriers to delivering optimal prenatal/postpartum care?		x
3. What are prenatal/postpartum people and professional recommendations for the design and implementation of a maternal health coaching program?		
What do people and professionals think would be the most important components of a coaching program?	x	x
What are their suggestions on key elements of a maternal health coaching program? Especially for postpartum follow up and those with chronic conditions (for example, hypertension and diabetes)	x	x
What do maternal health professionals think would be the workforce, management, and other institutional requirements to adopting, implementing, and sustaining a maternal health coaching program?		x
Question 4. How has the COVID-19 pandemic affected the health care experiences of prenatal/postpartum people and maternal health professionals?		
How do prenatal and postpartum people describe their experiences during the COVID-19 pandemic?	x	
How do maternal health professionals describe their experiences delivering care during the COVID-19 pandemic?		x

Table 2-1. Research Questions and Corresponding Methods

As reflected in the research questions, the study collected data from the following categories of study participants whose perspectives are critical in designing solutions that are closely tailored to the target populations. The first category of study participants was prenatal and postpartum people:

1) Prenatal people (second and third trimester) were interviewed about their experiences during their pregnancy; barriers and facilitators to optimal self-care and health care experience; and important components for a health coaching program for a supportive and optimally healthy pregnancy.
2) Postpartum people (up to three months postpartum) were interviewed about their experiences since giving birth; barriers and facilitators to optimal self-care and health care experience; and important components for a health coaching program for a supportive and optimally healthy pregnancy and postpartum.

The second category of study participants was maternal health professionals, which included any of the professionals listed below:

3) Obstetricians, Certified Nurse Midwives, Nurse Practitioners, and Physician Assistants from Mount Sinai Obstetrics and Gynecology Ambulatory Practice were interviewed about barriers and facilitators to delivering optimal care, care outcomes, and care experience from a medical, organizational, and management perspective.
4) Registered dieticians in the outpatient clinical setting who provide prenatal and postpartum care were interviewed about barriers and facilitators to optimal care,

care outcomes, and care experience from a nutrition (educational, behavioral) perspective, one that is critical for all prenatal and postpartum women and especially for those with chronic conditions.

5) Social Workers based in the outpatient clinical setting who provide social work support for prenatal and postpartum women were interviewed about barriers and facilitators to optimal care, care outcomes and care experience from a social work (mental health, psychosocial, and social determinants) and organizational perspective.

2.2 Conceptual Frameworks

Three conceptual frameworks guided this dissertation (Table 2-2). Intervention Mapping is the process framework for the entire study (needs and assets assessment and intervention design).[195–196] The Howell et al. (2018) maternal health social ecological model frames the needs and assets assessment.[197] Reproductive justice principles guide the assessment and intervention design; they provide a lens for the study throughout, and describe how it should be done.[198]

Framework	**Purpose**
Intervention Mapping implementation framework[140–141]	Explains **what** needs to be done for the overall process of the dissertation: needs assessment and subsequent intervention planning
Howell et al. (2018) social ecological model[142]	Provides a theoretical framework for studying the problem in the needs assessment: barriers, facilitators and intervention opportunities
Reproductive Justice principles[143]	Reproductive justice principles guide the assessment and intervention design. They describe **how** both need to be done.

Table 2-2. Description of Each Conceptual Framework

Intervention Mapping (IM) is the overarching process and implementation framework for this dissertation.[195–196] In order to design a novel CHW intervention to address maternal morbidity and mortality it is important to both understand the needs in the community as well as put measures in place to evaluate the process and impact of the intervention. Intervention Mapping provides health program planners with a framework for effective decision-making during intervention planning, implementation, and evaluation. Intervention Mapping encompasses three essential components of intervention design: existing literature, theory, and research data (data on the target population and on the organizational factors in which the intervention will be implemented). Intervention Mapping uses the social ecological model to address barriers at all levels of the social ecological model – individual, interpersonal, institutional, community, and society / policy.

Intervention Mapping is comprised of six steps, each of which has a variety of tasks necessary to complete the step and allow for an iterative process. This dissertation focused on all steps including Step 1 (needs assessment), Step 2 (performance objective setting), and Steps 3–6 (intervention plan; adoption, implementation, and sustainability plan; and evaluation plan).[195–196] Details on the six steps of Intervention Mapping[195] are as follows:

1) Conduct a needs assessment to understand the social, epidemiologic, political, and behavioral context of the community.
2) Develop performance and change objectives, based on findings from the needs assessment, to guide the intervention development.

3) Select theory-based methods and develop practical strategies to address the performance and change objectives.
4) Plan the intervention by weaving together the evidence, methods, and strategies into a feasible yet comprehensive intervention.
5) Develop an adoption, implementation, and sustainability plan to ensure the intervention is used and maintained over time.
6) Evaluate the intervention to determine the extent to which the performance and change objectives were addressed by the methods and strategies given the context of the community.

The needs assessment research (Step 1) is guided by an adaptation of the social ecological model by Howell et al. (2018) and is grounded in a reproductive justice approach.[197–198] The Howell maternal health social ecological model (previously only described but illustrated below) shows how barriers and facilitators exist at every level of the social ecological model as a birthing person moves through the pregnancy journey (Figure 2-1).[197] The focus areas for the study are highlighted in yellow and encompass the prenatal and postpartum periods at the individual, interpersonal, institutional, and community levels.[197] The red arrows represent barriers and the green arrows represent facilitators.

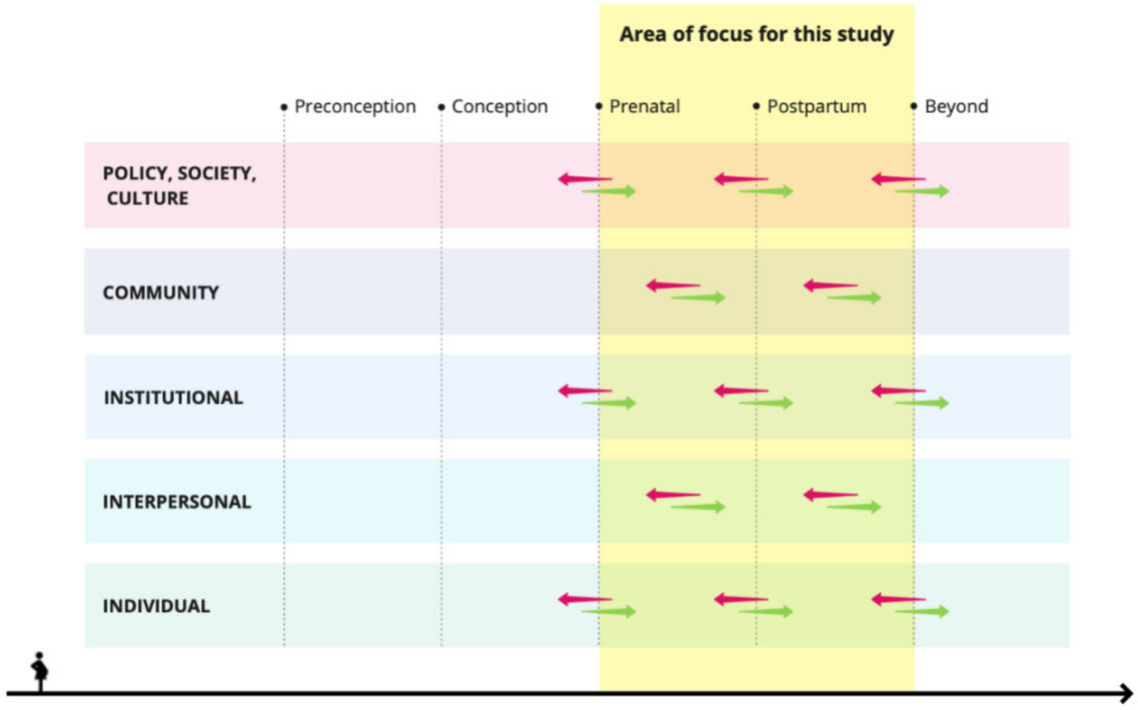

Figure 2-1. Maternal Health social ecological model (Howell et al., 2018)[190]

Details on the barriers and facilitators to maternal health in this model, and based in the literature, are included in Table 2-3. The study will explore many of these potential barriers and facilitators at four levels (individual, interpersonal, institutional, and community).

POLICY, SOCIETY, AND CULTURE
- Paid family/sick leave (70-71)
- Medicaid expansion (72-73)
- Other laws that promote maternal health
- Politics regarding maternal health and women's health
- Cultural norms and stigma regarding maternal health and childbirth

COMMUNITY
- Safe accessible spaces to move and connect, accessible food and other resources for baby
- Economic well-being of community (influenced by systemic racism) (24)
- Quality of health care institutions in the community (influenced by systemic racism) (16, 28, 45)

INSTITUTIONAL
- Access to equitable, respectful, anti-racist prenatal/postpartum care and full-spectrum birthing care (190)
  - Non-discrimination from providers or system
  - Respect in every interaction and relationship
  - Safe care including delivery
- Insurance provisions

INTERPERSONAL
- Social support, family support, partner/father of baby support (84)
- Emotional/physical stability/instability of relationships, level of respect in relationships
- Relationship with health care provider(s) (191, 193-194)
- Level of autonomy in decision making at home and in maternity care

INDIVIDUAL
- Income, education
- Emotional and physical stress/trauma from past obstetric or general personal history (17)
- Personal beliefs and goals about pregnancy, birth, parenting
- Level of autonomy in decision-making within the family
- Health status and health behaviors (including nutritional intake, +/-smoking, alcohol, other substances)

Table 2-3. Examples of Barriers and Facilitators to Maternal Self-Care and Healthcare

The study draws on organizing principles of reproductive justice by the Black Mamas Matter Alliance and Center for Reproductive Rights, that "every woman has the right to safe and respectful maternal health care."[198] Constructs regarding pregnancy and maternal care that will be explored in this research are the right to health, safety, respect, and non-discrimination.[198] These constructs are included throughout Table 2-3 and are described in detail as follows:

Right to health: The right to health can best be described as the right to access to high quality health care, as well as the right to self-care that enables health. For example, a pregnant person has the tools and resources she needs to take care of herself (safe spaces to relax, nutritious food, opportunities for rest) and to engage with high quality health care (evidence-based treatment, excellent communication and partnership with health care team).

Safety: Safety includes experiences of autonomy as well as security. A birthing person must feel safe in their body, safe from complications from pregnancy / birth / postpartum, safe in the health care system, and safe at home. For example, a birthing person feels safe in the course of their birth process and treatment decisions. A postpartum woman feels safe in the health provider guidance she receives during her recovery period, and safe in her community to take walks with her baby.

Respect: Respect is when a person feels listened to and valued for who they are from health care providers, from their families, and from society at large. For example, a prenatal person feels respected, that their identity and culture are valued by her care providers. She feels her dignity is maintained throughout all decisions made during the pregnancy.

Non-discrimination: Connected to respect, non-discrimination is to feel free of any feelings of ill will or differential treatment because of race, ethnicity, language, gender,

income, sexual orientation, or gender identity. For example, a prenatal person experiences equitable, anti-racist maternal health care.

These principles not only guide how we explore and describe prenatal and postpartum people's experiences, but also frame what we hope to achieve through the coaching program we design.

2.3 Sample (Recruitment, Sampling, and Participation)

This study used qualitative methods including in-depth interviews to answer the research questions. In-depth semi-structured interviews were conducted with 32 prenatal or postpartum people and 15 maternal health professionals (50% and 70% of those contacted, respectively).

Recruitment of pregnant and postpartum people took place at the Obstetrics and Gynecology Ambulatory Practice (OB/GYN Clinic) of Mount Sinai Hospital. Located in Upper Manhattan and serving nearby communities of East and Central Harlem as well as individuals from all boroughs, the practice sees over 1500 people for prenatal and postpartum care each year. The Practice provides comprehensive care for healthy patients and patients with at-risk pregnancies. The majority of patients are Black / African American (50%) and Latina/e (40%), followed by Asian / White/ Other (10%). The most common health insurance coverage for patients are Medicaid or Medicaid managed care.

Inclusion criteria for the interviews with patients included: pregnant in 2nd/3rd trimester or postpartum up to 12 weeks; English or Spanish speaking. Exclusion criteria included: non-pregnant people; people past 12 weeks postpartum. The medical director screened for eligibility, recruited, and consented participants for the interviews.

Purposive sampling was used to recruit prenatal and postpartum people. There was an attempt to have racial and ethnic representation proportional to the clinic population as a whole, and to balance the number of interviews between prenatal vs. postpartum women. Sixty-three pregnant people were invited to participate and 54 agreed to participate and were consented at point of care. Of those 54, 32 took part in interviews. The total sample of eligible birthing people for the interview in a year is 1200, with approximately 100 eligible patients seen in the practice for second / third trimester prenatal or postpartum care in any given month.

Twenty-one of the 32 women were prenatal. If a patient was interviewed in the prenatal period, participants were given the option of a second interview in the postpartum period. We estimated that 50% of prenatal participants would agree to and complete a second interview. Of the 21 prenatal participants asked, all agreed to a second interview in the postpartum period. Six of the 21 prenatal participants (28%) completed the second interview, likely due to the demands of a new baby and other responsibilities. Nevertheless, this completion rate is not seen as a limitation, and any second interviews only strengthen the analysis. The principal investigator recruited until saturation of themes was reached (at 38 interviews). Thirty women had their interviews in English and two preferred interviews in Spanish.

Recruitment of maternal health professionals took place at their place of employment, Obstetrics and Gynecology Ambulatory Practice (OB/GYN Clinic) of Mount Sinai Hospital. The clinic care teams are multi-disciplinary and include physicians, certified midwives, nurse practitioners, physician assistants, as well as social workers, registered nurses, and dietitians. Physicians, both resident physicians and attending physicians, see patients for prenatal and postpartum care, as do certified nurse midwives, physician assistants, and nurse practitioners. Maternal Fetal Medicine physicians see the higher risk patients. Physicians and certified nurse midwives attend deliveries. Physician assistants may be present at a delivery that a physician is attending.

Inclusion criteria for maternal health professionals included: current employment at Mount Sinai Obstetrics and Gynecology Ambulatory Practice as a doctor, certified nurse midwife, nurse, nurse practitioner, physician assistant, social worker, dietitian, or patient navigator. Exclusion criteria included any maternal health provider who does not see patients at an Ambulatory Practice location; any professional role other than doctor, nurse midwife, nurse, nurse practitioner, physician assistant, social worker, dietitian, or patient navigator.

Purposive sampling was used, with an attempt to recruit professional roles proportional to the role breakdown of the total staff. Of the 21 maternal health professionals contacted, 15 completed an interview.

2.4 Data Collection

Literature review

Coupled with content expertise and feedback from the research team, the literature helped define the problem, determine the conceptual frameworks for the study, and guide subsequent data collection and analysis approaches, including interview guide questions.

The literature review focused on peer-reviewed publications and grey literature such as policy documents and media articles. Literature was identified through PubMed, Google Scholar, and recommended publications from content experts. Search terms included: “community health worker maternal health”; “maternal community health worker”; “lay health workers maternal health”; “patient navigators maternal health”; “health coaches maternal”; “community health worker cost”; "barriers and facilitators maternal health”; “barriers and facilitators birthing person”; “barriers and facilitators maternal”; “barriers and facilitators provider”; “reproductive justice”; “maternal health disparities”; “racial discrimination maternal”; “postpartum follow up”; “postpartum visit attendance”; “postpartum glucose testing”; postpartum follow up hypertension”; “postpartum diabetes”; “postpartum blood pressure”; “postpartum care”; “postpartum glucose intervention”; “postpartum hypertension intervention”; “postpartum health policy”; “postpartum community health workers”; “postpartum glucose community health workers”; “postpartum blood pressure community health workers”; “postpartum hypertension community health workers”**; “**postpartum depression”; anxiety adverse child experiences (ACEs); “maternal mortality”; and “maternal morbidity.” Literature was summarized and organized by level of the Howell et al. (2018)-adapted social

ecological model.[197]

Prenatal / Postpartum People Interview Guide Construction

Interviews with pregnant and postpartum people explored research questions #1 (maternal perceived facilitators and barriers to maternal self-care and engagement with health care), #3 (recommendations for a maternal health coaching program), and #4 (COVID-19 experience), and covered the following topics: identified resource needs and assets; interpersonal and social support; experiences with care including possible discrimination; preferred components of a CHW / health coaching program; thoughts on ensuring postpartum follow-up; and chronic condition self-management.

The instrument is comprised of open-ended and closed-ended questions in an interview guide (Appendix A). Responses to the closed-ended questions provided some quantitative data to describe the study population and characterize the qualitative findings. The closed-ended questions, interspersed throughout the guide, were used for topics where quantitative data points are helpful such as basic demographics, perceptions of stress,[199] mental health state,[200–202] social support,[199] resources used, and recommended program components. Maternal health-specific closed-ended questions were taken from the Pregnancy Risk Assessment Monitoring System (PRAMS)[199] and wording of some of the interview probes were from Listening to Mothers CA.[203]

The interview guide was developed based on themes in the literature on the barriers and facilitators to maternal self-care and engagement in health care, as well as through informal interviews and work sessions with content experts on our research team,

including Jamillah Hoy-Rosas and Dr. Omara Afzal, as well as professors on the dissertation committee (Appendix A). The interview guide was pretested by conducting full interviews with two eligible people, and then revising the guide based on their feedback. Initial observations and themes from the pretest interviews included isolation and decreased social support during the pandemic, mental health needs, delivery trauma, and concerns about hypertension or prenatal complications. The interviews informed revision of the interview guide to contain more specific wording, for example, asking interviewees to refer to their most recent pregnancy only.

Maternal Health Professional Interview Guide and Survey Construction

The maternal health professional interview addressed research questions #2 (maternal health professional perceived facilitators and barriers to maternal self-care and health care engagement), #3 (recommendations for maternal health coaching program components), and #4 (COVID-19 care delivery experience). The interview also asked maternal health professionals about their thoughts on improving postpartum follow-up and chronic condition self-management, institutional barriers and facilitators to developing a maternal health coaching program in the NYC context and Mount Sinai system, and recommendations for program adoption, implementation, and sustainability. The interview guide was developed based on barriers and facilitators to maternal self-care and engagement in health care found in the literature. The guide was also informed by through informal interviews and work sessions with content experts on our research team, including Dr. Omara Afzal, as well as professors on the dissertation committee

(Appendix B).

Pregnant / Postpartum People Interview Administration

All interviews were conducted by two trained members of the study team via Zoom (participants dialed in to Zoom by phone to lessen potential technology barriers).[204] English-speaking interviews were conducted by Co-Investigator Jamillah Hoy-Rosas, and research team member Leny Rivera for Spanish-speaking participants. Co-Investigator Brett Ives listened and took notes but was not heard or seen by the participant once the interview had started.

The interview guide had five questions, with multiple prompts for each. The interviewer took brief notes to help guide her in the interviewing process and highlight points of importance. I took more in-depth notes during the interview that contributed to the memoing process. I also logged answers to any closed-ended questions. At the end of the interview, the interviewer performed member checking, in which she summarized the main findings to obtain the participant's perspectives of our understanding.

Memoing took place throughout data collection and analysis to track development of ideas, make notes on the methodology used, and identify major themes through the process. Upon completion of each interview, the interviewer and I created memos that documented our observations, any trends, and conceptual understanding, all of which contributed to the later data analysis process.

Training of interviewers took place over five sessions with application (role play and other practice) in between. The training covered research ethics, background on

qualitative research methods, and interviewing techniques. The training curriculum (Appendix C) further details the learning objectives, content, and skills building for each interview training session. Both interviewers had years of experience working with people from the same communities as the study participants.

Provider Interview Administration

Interviews were conducted with maternal health providers via Zoom (participants dialed into Zoom by phone).[204] Principal Investigator Dr. Afzal facilitated introductions to the providers. Informed consent occurred verbally by phone at the start of the interview. I conducted the provider interviews and a memoing process at the end of each interview, in which I documented any observations or early themes noted. Co-Investigator Ives formally processed observations with Co-Investigator Hoy-Rosas after every few interviews.

2.5 Analysis

Coding of Interviews with Prenatal and Postpartum People and Maternal Health Professionals

The interviews with prenatal and postpartum people were transcribed via Rev[205] for English interviews and Happy Scribe for Spanish interviews.[206] The Spanish-speaking interviewer verified Spanish transcription. Thematic analysis of the interview data was performed.[207] Once data were collected, the research analyst and I underwent a thorough review of the audio recordings and transcripts over several weeks. The Howell et al.

social ecological model[197] and Reproductive Justice[198] guided development of initial coding frameworks. With the input of the interviewers and review of transcripts by me and the research analyst, we developed the codebook and then tested and refined it through many rounds of coding of randomly selected transcripts using Microsoft Word[208] and later with NVivo Release 1.[209] Once the codebook was final, the research analyst and I coded all prenatal and postpartum transcripts in the dataset using NVivo Release 1.[209] Deductive (structural) coding was used based on the constructs in the conceptual frameworks and the four subject areas posed by the research questions.[210] Inductive coding was used as well, to capture new codes and concepts.[207] Inter-rater reliability of the prenatal and postpartum interviews was calculated during the coding process using NVivo Release 1,[209] to enable formal discussion and improve conceptual alignment between coders.

The maternal health professional interviews were transcribed via Rev[205] and coded directly after the coding of the prenatal and postpartum interviews. The research analyst and I coded a selection of provider interviews in NVivo Release 1,[209] and refined the codebook multiple times in an iterative process. Once the codebook was final, I proceeded to code the rest of the provider dataset in NVivo Release 1.[209] The women's and provider's recommendations for components of the coaching program were qualitatively compared.

Coded transcript text was then aggregated into patterns of meaning through formation of categories using pattern coding.[203] From these categories, the research team developed themes through many work sessions using a visual matrix[207] in Miro.[211] A

summary of the coding process for this study was as follows:

1. Manage and organize data
    a. Prepare file system and database
    b. Create long-term file storage plan
2. Once all interviews are completed, transcribe, print and also upload into NVivo
3. Read and memo emergent ideas (carried over from data collection)
    a. Read transcripts several times
    b. Review field notes
    c. Continue memoing
    d. Select key text
    e. Naming of initial codes
    f. Identify codes
    g. Create finalized codebook with parent, child, and grandchild codes
    h. Test and refine codebook through coding a large selection of transcripts
4. Code text and develop categories
    a. Assign codes to units of text on all transcripts
    b. Group codes into categories
    c. From the categories, identify themes, patterns, and relationships between themes. Compared themes across transcripts.
5. Theme development and data displays
    a. Create matrix that conceptualizes findings, shows themes with supporting codes and quotes, and shows relationships between themes.

Calculation of Demographic and Survey Data

Responses to questions on demographics, mental health status, and coaching program preferences were calculated as sums, means, or percentages in Excel[212] to describe the sample. Likert scale questions were examined using proportions and continuous variables were examined using means. Statistical tests were not conducted due to small sample sizes.

2.6 Human Subjects Protection and Conflict of Interest

This study was approved by the Mount Sinai Icahn School of Medicine IRB and has exemption category 2 status by BUMC / BMC IRB. The informed consent process occurred at the point of care by research team member Dr. Afzal. The interviewers, Ms. Hoy-Rosas and Ms. Rivera, also provided a thorough review of informed consent principles and details related to the study before the start of all interviews with each prenatal and postpartum participant. The provider interview included a verbal consent process that took place at the start of each interview. A $50 gift card was provided to interview participants to compensate for their time.

The investigators for this study had no conflicts of interest regarding this study nor the subsequent intervention.

Funding Support

The larger Maternal Health Matters study, including the dissertation, was funded by Robert Wood Johnson Clinical Scholars. The dissertation was also supported by a

Boston University School of Public Health MCH Center of Excellence doctoral award.

2.7 Dissemination of Findings

Academic Products: Manuscripts for Publication

The team plans on three academic products resulting from this dissertation:

1. A manuscript for publication summarizing the needs / assets assessment methods and results (Chapter 3). The unique contributions to the field are: comparing intervention preferences of prenatal / postpartum people and maternal health providers who are part of the same care site / system; and advancing a conceptual framework that visually depicts Howell et al.'s (2018)[141] maternal health social ecological model and integrates reproductive justice principles.
2. A manuscript for publication summarizing results related to experiences of prenatal and postpartum people and providers in the COVID-19 pandemic context and care delivery implications for the future (Chapter 4).
3. A practice guide for publication that describes the process of assessing for and developing a maternal CHW program using the Intervention Mapping framework.[139] The brief will present this NYC-based study as a case study on needs assessment, intervention design, and adoption, implementation, and sustainability planning (Chapter 5).

Practice-Based Product: Practice Guide for Intervention Design

The practice guide (Chapter 5) used the Implementation Mapping[139] framework to provide health care leaders with the essential steps for designing a maternal health CHW / health coaching intervention. The guide is structured by the six Intervention Mapping steps and presents this Maternal Health Matters study as a case study with lessons learned, practice recommendations, and applications to other contexts.

2.8 Structure of Subsequent Chapters

The subsequent chapters are three separate manuscripts for submission for publication. Chapter 3 reports the results from the needs and assets assessment (Research Questions 1–3). Chapter 4 reports the COVID-19 context results from the needs and assets assessment (Research Question 4). Chapter 5 is the practice guide for U.S. health care and public health leaders designing a maternal CHW intervention in their local communities.

References

1. Maternal Mortality in the United States: A Primer. Commonwealth Fund. Issue Brief and Report. December 16, 2020. Available from: https://www.commonwealthfund.org/publications/issue-brief-report/2020/dec/maternal-mortality-united-states-primer

2. Trost, SL, Beauregard J, Nije F, et al. Pregnancy-Related Deaths: Data from Maternal Mortality Review Committees in 36 US States 2017-2019. Atlanta, GA: Centers for Disease Control and Prevention, US Department of Health and Human Services; 2022.

3. Huang RS, Spence AR, Abenhaim HA. Racial disparities in national maternal mortality trends in the United States from 2000 to 2019: a population-based study on 80 million live births. Arch Gynecol Obstet. 2023 Mar 18. doi: 10.1007/s00404-023-06999-6. Epub ahead of print. PMID: 36933039.

4. Louis JM, Menard MK, Gee RE. Racial and Ethnic Disparities in Maternal Morbidity and Mortality. Obstetrics and Gynecology 2015;125:690-4.

5. Sarto GE, Brasileiro J, Franklin DJ. Women's Health: Racial and Ethnic Health Inequities. Global Advances in Health and Medicine: Improving Healthcare Outcomes Worldwide 2013;2:50-3.

6. Ellison K and Martin N. Nearly Dying in Childbirth: Why Preventable Complications are Growing in U.S. NPR December 22 2017. Available from: https://www.npr.org/2017/12/22/572298802/nearly-dying-in-childbirth-why-preventable- complications-are-growing-in-u-s?utm_source=facebook.com&utm_medium=social&utm_campaign=npr&utm_term=nprnews&u tm_content=2051

7. Lockart PR. Too many Black Women like Erica Garner are Dying in America's Maternal Mortality Crisis. Vox. January 20 2018. Available from: https://www.vox.com/identities/2018/1/10/16865750/black-women-maternal-mortality-erica- garner

8. Winter M. A Matter of Life and Death: Why are Black Women in the U.S. More Likely to Die During or After Childbirth? Essence. September 26 2017. Available from: https://www.essence.com/news/black-women-mortality-rate-child-deaths-united-states

9. Marian F. MacDorman, Marie Thoma, Eugene Declcerq, Elizabeth A. Howell, "Racial and Ethnic Disparities in Maternal Mortality in the United States Using Enhanced Vital Records, 2016–2017", *American Journal of Public Health* 111, no. 9. September 1, 2021: pp. 1673-1681.

10. Thoma ME, Declercq ER. All-Cause Maternal Mortality in the US Before vs During the COVID-19 Pandemic. *JAMA Netw Open.* 2022;5(6):e2219133. doi:10.1001/jamanetworkopen.2022.19133

11. Thoma, Marie E. PhD, MHS; Declercq, Eugene R. PhD. Changes in Pregnancy-Related Mortality Associated With the Coronavirus Disease 2019 (COVID-19) Pandemic in the United States. Obstetrics & Gynecology ():10.1097/AOG.0000000000005182, March 16, 2023. | DOI: 10.1097/AOG.0000000000005182

12. Matsuo K, Green JM, Herrman SA, Mandelbaum RS, Ouzounian JG. Severe Maternal Morbidity and Mortality of Pregnant Patients With COVID-19 Infection During the Early Pandemic Period in the US. *JAMA Netw Open.* 2023;6(4):e237149. doi:10.1001/jamanetworkopen.2023.7149

13. New York City Department of Health and Mental Hygiene Bureau of Maternal and Child Health. Pregnancy-Associated Mortality NYC, 2011-2015. New York, NY. Available from: https://www1.nyc.gov/assets/doh/downloads/pdf/ms/pregnancy-associated-mortality-report-2011-2015.pdf

14. New York City Department of Health and Mental Hygiene. Pregnancy-Associated Mortality in York City: 2017. January 2021. Available from: https://www.nyc.gov/assets/doh/downloads/pdf/data/maternal-mortality-annual-report-2020.pdf

15. New York City Department of Health and Mental Hygiene. Pregnancy-Associated Mortality in York City: 2018. January 2022. Available from: https://www.nyc.gov/assets/doh/downloads/pdf/data/maternal-mortality-annual-report-2021.pdf

16. New York City Department of Health and Mental Hygiene. Pregnancy-Associated Mortality in New York City: 2019. January 2023. Available from: https://www.nyc.gov/assets/doh/downloads/pdf/data/maternal-mortality-annual-report-2022.pdf

17. Howell, Elizabeth A., Natalia Egorova, Amy Balbierz, Jennifer Zeitlin, and Paul L. Hebert. “Black-White Differences in Severe Maternal Morbidity and Site of Care.” American Journal of Obstetrics and Gynecology 214, no. 1. January 2016: 122.e1–122.e7. https://doi.org/10.1016/j.ajog.2015.08.019.

18. New York City Department of Health and Mental Hygiene (2016). Severe Maternal Morbidity in New York City, 2008–2012. New York, NY. Available from: https://www.nyc.gov/assets/doh/downloads/pdf/data/maternal-morbidity-report-08-12.pdf

19. New York City Department of Health and Mental Hygiene (2018). Severe Maternal Morbidity in New York City data 2013-2014. Available from: https://www.nyc.gov/assets/doh/downloads/pdf/data/severe-maternal-morbidity-data.pdf

20. New York City Department of Health and Mental Hygiene (2021). Maternal Mortality and Severe Maternal Morbidity in New York City, 2017. Available from: https://www.nyc.gov/assets/doh/downloads/pdf/data/maternal-mortality-annual-report-2020.pdf

21. New York State Pregnancy Risk Assessment Monitoring database. Available from: https://apps.health.ny.gov/public/tabvis/PHIG_Public/prams/reports/#annual

22. Came, Heather, and Derek Griffith. "Tackling Racism as a 'Wicked' Public Health Problem: Enabling Allies in Anti-Racism Praxis." *Social Science & Medicine* 199 (February 2018): 181–88. https://doi.org/10.1016/j.socscimed.2017.03.028.

23. Taylor, Jamila K. "Structural Racism and Maternal Health Among Black Women." *Journal of Law, Medicine & Ethics* 48, no. 3 (2020): 506–17. https://doi.org/10.1177/1073110520958875.

24. Bailey ZD, Feldman JM, Bassett MT. How Structural Racism Works - Racist Policies as a Root Cause of U.S. Racial Health Inequities. N Engl J Med. 2021 Feb 25;384(8):768-773. doi: 10.1056/NEJMms2025396. Epub 2020 Dec 16. PMID: 33326717.

25. Williams, David, and Lisa Cooper. "Reducing Racial Inequities in Health: Using What We Already Know to Take Action." *International Journal of Environmental Research and Public Health* 16, no. 4 (February 19, 2019): 606. https://doi.org/10.3390/ijerph16040606.

26. Crear-Perry J, Correa-de-Araujo R, Lewis Johnson T, McLemore MR, Neilson E, Wallace M. Social and Structural Determinants of Health Inequities in Maternal Health. J Womens Health (Larchmt). 2021 Feb;30(2):230-235. doi: 10.1089/jwh.2020.8882. Epub 2020 Nov 12. PMID: 33181043; PMCID: PMC8020519.

27. Geronimus, Arline T., Margaret Hicken, Danya Keene, and John Bound. "'Weathering' and Age Patterns of Allostatic Load Scores Among Blacks and Whites in the United States." *American Journal of Public Health* 96, no. 5 (May 2006): 826–33. https://doi.org/10.2105/AJPH.2004.060749.

28. Goldsmith, Rachel E., Christina Gamache Martin, and Carly Parnitzke Smith. "Systemic Trauma." *Journal of Trauma & Dissociation* 15, no. 2 (March 15, 2014): 117–32. https://doi.org/10.1080/15299732.2014.871666.

29. Howell, Elizabeth A., Teresa Janevic, James Blum, Jennifer Zeitlin, Natalia N. Egorova, Amy Balbierz, and Paul L. Hebert. “Double Disadvantage in Delivery Hospital for Black and Hispanic Women and High-Risk Infants.” *Maternal and Child Health Journal* 24, no. 6 (June 2020): 687–93. https://doi.org/10.1007/s10995-020-02911-9.

30. Janevic, Teresa, Jennifer Zeitlin, Natalia Egorova, Paul L. Hebert, Amy Balbierz, and Elizabeth A. Howell. “Neighborhood Racial And Economic Polarization, Hospital Of Delivery, And Severe Maternal Morbidity: An Examination of Whether Racial and Economic Neighborhood Polarization Is Associated with Severe Maternal Morbidity Rates and Whether the Delivery Hospital Partially Explains the Association.” *Health Affairs* 39, no. 5 (May 1, 2020): 768–76. https://doi.org/10.1377/hlthaff.2019.00735.

31. Hodgkinson S, Godoy L, Beers LS, Lewin A. Improving Mental Health Access for Low-Income Children and Families in the Primary Care Setting. Pediatrics. 2017 Jan;139(1):e20151175. doi: 10.1542/peds.2015-1175. Epub 2016 Dec 12. PMID: 27965378; PMCID: PMC5192088.

32. Roberts A, Rogers J, Mason R, Siriwardena AN, Hogue T, Whitley GA, Law GR. Alcohol and other substance use during the COVID-19 pandemic: A systematic review. Drug Alcohol Depend. 2021 Dec 1;229(Pt A):109150. doi: 10.1016/j.drugalcdep.2021.109150. Epub 2021 Oct 29. PMID: 34749198; PMCID: PMC8559994.

33. Negron, Rennie, Anika Martin, Meital Almog, Amy Balbierz, and Elizabeth A. Howell. “Social Support During the Postpartum Period: Mothers’ Views on Needs, Expectations, and Mobilization of Support.” *Maternal and Child Health Journal* 17, no. 4 (May 2013): 616–23. https://doi.org/10.1007/s10995-012-1037-4.

34. Bedaso A, Adams J, Peng W, Sibbritt D. The relationship between social support and mental health problems during pregnancy: a systematic review and meta-analysis. Reprod Health. 2021 Jul 28;18(1):162. doi: 10.1186/s12978-021-01209-5. PMID: 34321040; PMCID: PMC8320195.

35. Fry-Bowers EK, Maliski S, Lewis MA, Macabasco-O'Connell A, DiMatteo R. The association of health literacy, social support, self-efficacy and interpersonal interactions with health care providers in low-income Latina mothers. J Pediatr Nurs. 2014 Jul-Aug;29(4):309-20. doi: 10.1016/j.pedn.2014.01.006. Epub 2014 Jan 15. PMID: 24503164; PMCID: PMC4062609

36. Su Y, D'Arcy C. Interpersonal Violence Around Pregnancy Experienced by Rural and Urban Canadian Women: Correlates and Selected Health Outcomes. J Interpers Violence. 2022 Oct;37(19-20):NP19042-NP19065. doi:

10.1177/08862605211043576. Epub 2021 Sep 7. PMID: 34493096; PMCID: PMC9554279.

37. Kolk TA, Nath S, Howard LM, Pawlby S, Lockwood-Estrin G, Trevillion K. The association between maternal lifetime interpersonal trauma experience and perceived mother-infant bonding. J Affect Disord. 2021 Nov 1;294:117-127. doi: 10.1016/j.jad.2021.06.069. Epub 2021 Jul 1. PMID: 34280788; PMCID: PMC8424749.

38. Noursi S, Saluja B, Richey L. Using the Ecological Systems Theory to Understand Black/White Disparities in Maternal Morbidity and Mortality in the United States. J Racial Ethn Health Disparities. 2021 Jun;8(3):661-669. doi: 10.1007/s40615-020-00825-4. Epub 2020 Jul 27. PMID: 32720294.

39. Penner, L. A., Phelan, S. M., Earnshaw, V., Albrecht, T. L., & Dovidio, J. F. (2017). Patient stigma, medical interactions, and health care disparities: A selective review. In *The Oxford Handbook of Stigma, Discrimination, and Health* (pp. 183-201). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780190243470.001.0001

40. Saluja, Bani, and Zenobia Bryant. "How Implicit Bias Contributes to Racial Disparities in Maternal Morbidity and Mortality in the United States." *Journal of Women's Health* 30, no. 2 (February 1, 2021): 270–73. https://doi.org/10.1089/jwh.2020.8874.

41. Hoffman, Kelly M., Sophie Trawalter, Jordan R. Axt, and M. Norman Oliver. "Racial Bias in Pain Assessment and Treatment Recommendations, and False Beliefs about Biological Differences between Blacks and Whites." *Proceedings of the National Academy of Sciences* 113, no. 16 (April 19, 2016): 4296–4301. https://doi.org/10.1073/pnas.1516047113.

42. Salam, Maya. For Serena Williams, Childbirth was a Harrowing Ordeal. She's not Alone. New York Times. January 11, 2018. Available from:https://www.nytimes.com/2018/01/11/sports/tennis/serena-williams-baby-vogue.html

43. Martin, Nina. Black Mothers Keep Dying After Giving Birth. Shalon Irving's Story Explains Why. NPR. December 7, 2017. Available from: https://www.npr.org/2017/12/07/568948782/black-mothers-keep-dying-after-giving-birth-shalon-irvings-story-explains-why

44. Attanasio, Laura, and Katy B. Kozhimannil. "Patient-Reported Communication Quality and Perceived Discrimination in Maternity Care." *Medical Care* 53, no. 10 (October 2015): 863–71. https://doi.org/10.1097/MLR.0000000000000411.

45. Slaughter-Acey, Jaime C., Devon Sneed, Lauren Parker, Verna M. Keith, Nora L. Lee, and Dawn P. Misra. "Skin Tone Matters: Racial Microaggressions and Delayed Prenatal Care." *American Journal of Preventive Medicine* 57, no. 3 (September 2019): 321–29. https://doi.org/10.1016/j.amepre.2019.04.014.

46. Robinson, Karen, Alissa Fial, and Lisa Hanson. "Racism, Bias, and Discrimination as Modifiable Barriers to Breastfeeding for African American Women: A Scoping Review of the Literature." *Journal of Midwifery & Women's Health* 64, no. 6 (November 2019): 734–42. https://doi.org/10.1111/jmwh.13058.

47. Vedam, S., Stoll, K., Taiwo, T.K. *et al.* The Giving Voice to Mothers study: inequity and mistreatment during pregnancy and childbirth in the United States. *Reprod Health* **16**, 77 (2019). https://doi.org/10.1186/s12978-019-0729-2

48. Janevic, Teresa, Naissa Piverger, Omara Afzal, and Elizabeth A. Howell. "Just Because You Have Ears Doesn't Mean You Can Hear'—Perception of Racial-Ethnic Discrimination During Childbirth." *Ethnicity & Disease* 30, no. 4 (September 24, 2020): 533–42. https://doi.org/10.18865/ed.30.4.533.

49. Wang, Eileen, Kimberly B. Glazer, Shoshanna Sofaer, Amy Balbierz, and Elizabeth A. Howell. "Racial and Ethnic Disparities in Severe Maternal Morbidity: A Qualitative Study of Women's Experiences of Peripartum Care." *Women's Health Issues* 31, no. 1 (January 2021): 75–81. https://doi.org/10.1016/j.whi.2020.09.002.

50. New York City Department of Health and Mental Hygiene. Women's Experiences with Severe Maternal Morbidity in New York City: a Qualitative Report. December 2020. Available from: https://www1.nyc.gov/assets/doh/downloads/pdf/csi/womens-experience-with-severe-maternal-morbidity-nyc-qualitative-report.pdf

51. Attanasio LB, Ranchoff BL, Cooper MI, Geissler KH. Postpartum Visit Attendance in the United States: A Systematic Review. Womens Health Issues. 2022 Jul-Aug;32(4):369-375. doi: 10.1016/j.whi.2022.02.002. Epub 2022 Mar 15. PMID: 35304034; PMCID: PMC9283204.

52. McCloskey, Lois, Judith Bernstein, Michael Winter, Ronald Iverson, and Aviva Lee-Parritz. "Follow-Up of Gestational Diabetes Mellitus in an Urban Safety Net Hospital: Missed Opportunities to Launch Preventive Care for Women." Journal of Women's Health 23, no. 4 (April 2014): 327–34. https://doi.org/10.1089/jwh.2013.4628.

53. Mathieu, Irène P., Yanna Song, and Shubhada M. Jagasia. "Disparities in Postpartum Follow-Up in Women With Gestational Diabetes Mellitus: Table 1." *Clinical Diabetes* 32, no. 4 (October 2014): 178–82. https://doi.org/10.2337/diaclin.32.4.178.

54. Hunt, Kelly J., and Deborah L. Conway. “Who Returns for Postpartum Glucose Screening Following Gestational Diabetes Mellitus?” *American Journal of Obstetrics and Gynecology* 198, no. 4 (April 2008): 404.e1-6. https://doi.org/10.1016/j.ajog.2007.09.015.

55. Almario, Christopher V., Teresa Ecker, Leslie A. Moroz, Lynne Bucovetsky, Vincenzo Berghella, and Jason K. Baxter. “Obstetricians Seldom Provide Postpartum Diabetes Screening for Women with Gestational Diabetes.” *American Journal of Obstetrics and Gynecology* 198, no. 5 (May 2008): 528.e1-528.e5. https://doi.org/10.1016/j.ajog.2007.11.001.

56. New York State Department of Health Office of Quality and Patient Safety. Medicaid Perinatal Study. March 2013.

57. Levine, L. D., C. Nkonde-Price, M. Limaye, and S. K. Srinivas. “Factors Associated with Postpartum Follow-up and Persistent Hypertension among Women with Severe Preeclampsia.” *Journal of Perinatology: Official Journal of the California Perinatal Association* 36, no. 12 (2016): 1079–82. https://doi.org/10.1038/jp.2016.137.

58. Bauer, Nerissa S., Susan Ofner, Amy Pottenger, Aaron E. Carroll, and Stephen M. Downs. “Follow-up of Mothers with Suspected Postpartum Depression from Pediatrics Clinics.” *Frontiers in Pediatrics* 5 (October 3, 2017): 212. https://doi.org/10.3389/fped.2017.00212

59. McCloskey, Lois, Marlena L. Sherman, Meryl St John, Hannah Siegel, Julie Whyte, Ronald Iverson, Aviva Lee-Parritz, and Judith Bernstein. “Navigating a ‘Perfect Storm’ on the Path to Prevention of Type 2 Diabetes Mellitus After Gestational Diabetes: Lessons from Patient and Provider Narratives.” *Maternal and Child Health Journal* 23, no. 5 (May 2019): 603–12. https://doi.org/10.1007/s10995-018-2649-0.

60. Bernstein, Judith Apt, Emily Quinn, Omid Ameli, Myrita Craig, Timothy Heeren, Aviva Lee-Parritz, Ronald Iverson, Brian Jack, and Lois McCloskey. “Follow-up after Gestational Diabetes: A Fixable Gap in Women’s Preventive Healthcare.” *BMJ Open Diabetes Research & Care* 5, no. 1 (September 2017): e000445. https://doi.org/10.1136/bmjdrc-2017-000445.

61. Anstey EH, Chen J, Elam-Evans LD, Perrine CG. Racial and Geographic Differences in Breastfeeding — United States, 2011–2015. MMWR Morb Mortal Wkly Rep 2017;66:723–727. DOI: http://dx.doi.org/10.15585/mmwr.mm6627a3

62. Coffman MJ, Scott VC, Schuch C, Mele C, Mayfield C, Balasubramanian V, Stevens A, Dulin M. Postpartum Depression Screening and Referrals in Special Supplemental Nutrition Program for Women, Infants, and Children Clinics. J Obstet

Gynecol Neonatal Nurs. 2020 Jan;49(1):27-40. doi: 10.1016/j.jogn.2019.10.007. Epub 2019 Nov 30. PMID: 31790646.

63. Salihu HM, Myers J, August EM. Pregnancy in the workplace. Occup Med (Lond). 2012 Mar;62(2):88-97. doi: 10.1093/occmed/kqr198. PMID: 22355087.

64. Perry-Jenkins M, Smith JZ, Wadsworth LP, Halpern HP. Workplace Policies and Mental Health among Working-Class, New Parents. Community Work Fam. 2017;20(2):226-249. doi: 10.1080/13668803.2016.1252721. Epub 2016 Nov 10. PMID: 29242705; PMCID: PMC5724788.

65. National Institute for Occupational Safety and Health (NIOSH). Physical Job Demands – Reproductive Health. Last reviewed May 1, 2023. Available from: https://www.cdc.gov/niosh/topics/repro/physicaldemands.html

66. Wheeler SM, Massengale KEC, Adewumi K, Fitzgerald TA, Dombeck CB, Swezey T, Swamy GK, Corneli A. Pregnancy vs. paycheck: a qualitative study of patient's experience with employment during pregnancy at high risk for preterm birth. BMC Pregnancy Childbirth. 2020 Sep 25;20(1):565. doi: 10.1186/s12884-020-03246-7. PMID: 32977746; PMCID: PMC7517633.

67. Salganicoff A. The Importance of Strengthening Workplace and Health Policies to Support Breastfeeding. Breastfeed Med. 2018 Oct;13(8):532-534. doi: 10.1089/bfm.2018.0122. PMID: 30335485.

68. Bloch JR, Cordivano S, Gardner M, Barkin J. Beyond bus fare: deconstructing prenatal care travel among low-income urban mothers through a mix methods GIS study. Contemp Nurse. 2018 Jun;54(3):233-245. doi: 10.1080/10376178.2018.1492349. Epub 2018 Jul 3. PMID: 29969975; PMCID: PMC6310900.

69. Reece J. More Than Shelter: Housing for Urban Maternal and Infant Health. Int J Environ Res Public Health. 2021 Mar 24;18(7):3331. doi: 10.3390/ijerph18073331. PMID: 33805125; PMCID: PMC8037986.

70. Suglia SF, Duarte CS, Sandel MT. Housing quality, housing instability, and maternal mental health. J Urban Health. 2011 Dec;88(6):1105-16. doi: 10.1007/s11524-011-9587-0. PMID: 21647798; PMCID: PMC3232414.

71. Eliason, Erica L. “Adoption of Medicaid Expansion Is Associated with Lower Maternal Mortality.” *Women’s Health Issues* 30, no. 3 (May 2020): 147–52. https://doi.org/10.1016/j.whi.2020.01.005.

72. Jou, Judy, Katy B. Kozhimannil, Jean M. Abraham, Lynn A. Blewett, and Patricia M. McGovern. “Paid Maternity Leave in the United States: Associations with Maternal

and Infant Health." *Maternal and Child Health Journal* 22, no. 2 (February 2018): 216–25. https://doi.org/10.1007/s10995-017-2393-x.

73. Lerner, S. The Real War on Families: Why the U.S. Needs Paid Leave Now. In These Times. August 18, 2015. Available from: https://inthesetimes.com/article/the-real-war-on-families

74. Abt Associates Inc. Family and Medical Leave in 2012: Detailed Results Appendix. Prepared for U.S. Department of Labor. September 6, 2012. Available from: https://www.dol.gov/sites/dolgov/files/OASP/legacy/files/FMLA-Detailed-Results-Appendix.pdf

75. Shumway, E. Beyond the FMLA: Will a Federal Paid Leave Law Ever Come to Pass? HR Drive. March 6, 2023. Available from: https://www.hrdive.com/news/beyond-fmla-will-federal-paid-leave-law-ever-come-to-pass/644239/#:~:text=While%20the%20Build%20Back%20Better,paid%20family%20and%20medical%20leave%3F

76. Hettinger K, Margerison C. Postpartum Medicaid Eligibility Expansions and Postpartum Health Measures. Popul Health Manag. 2023 Feb;26(1):53-59. doi: 10.1089/pop.2022.0183. Epub 2023 Jan 13. PMID: 36637879; PMCID: PMC9969880.

77. Steenland MW, Wherry LR. Medicaid Expansion Led To Reductions In Postpartum Hospitalizations. Health Aff (Millwood). 2023 Jan;42(1):18-25. doi:10.1377/hlthaff.2022.00819. PMID: 36623214.

78. Cardenas, J.F., Colwell, M.J. Maternal Well-Being and the Transition to Childcare: Impact of Caregiver Support. *IJEC* (2022). https://doi.org/10.1007/s13158-022-00339-6

79. Morrissey, T.W. Child care and parent labor force participation: a review of the research literature. *Rev Econ Household* **15**, 1–24 (2017). https://doi.org/10.1007/s11150-016-9331-3

80. Lapham J, Martinson ML. The intersection of welfare stigma, state contexts and health among mothers receiving public assistance benefits. SSM Popul Health. 2022 May 9;18:101117. doi: 10.1016/j.ssmph.2022.101117. PMID: 35620484; PMCID: PMC9127679.

81. Sun S, Pellowski J, Pisani C, Pandey D, Go M, Chu M, Ruan J, Werner EF. Experiences of stigma, psychological distress, and facilitative coping among pregnant people with gestational diabetes mellitus. BMC Pregnancy Childbirth. 2023 Sep 7;23(1):643. doi: 10.1186/s12884-023-05949-z. PMID: 37679726; PMCID: PMC10486063.

82. Weber A, Miskle B, Lynch A, Arndt S, Acion L. Substance Use in Pregnancy: Identifying Stigma and Improving Care. Subst Abuse Rehabil. 2021 Nov 23;12:105-121. doi: 10.2147/SAR.S319180. PMID: 34849047; PMCID: PMC8627324.

83. Moseson H, Mahanaimy M, Dehlendorf C, Gerdts C. "…Society is, at the end of the day, still going to stigmatize you no matter which way": A qualitative study of the impact of stigma on social support during unintended pregnancy in early adulthood. PLoS One. 2019 May 23;14(5):e0217308. doi: 10.1371/journal.pone.0217308. PMID: 31120984; PMCID: PMC6532899.

84. Ballesteros V. A stigmatizing dilemma in the labour room: Irrationality or selfishness? J Eval Clin Pract. 2022 Oct;28(5):875-882. doi: 10.1111/jep.13747. Epub 2022 Aug 1. PMID: 35913362; PMCID: PMC9796655.

85. Maxwell, December, Sarah R. Robinson, and Kelli Rogers. "'I Keep It to Myself': A Qualitative Meta-interpretive Synthesis of Experiences of Postpartum Depression among Marginalised Women." *Health & Social Care in the Community* 27, no. 3 (May 2019): e23–36. https://doi.org/10.1111/hsc.12645.

86. Hadfield, Holly, and Anja Wittkowski. "Women's Experiences of Seeking and Receiving Psychological and Psychosocial Interventions for Postpartum Depression: A Systematic Review and Thematic Synthesis of the Qualitative Literature." *Journal of Midwifery & Women's Health* 62, no. 6 (November 2017): 723–36. https://doi.org/10.1111/jmwh.12669.

87. Prevatt, Betty-Shannon, and Sarah L. Desmarais. "Facilitators and Barriers to Disclosure of Postpartum Mood Disorder Symptoms to a Healthcare Provider." *Maternal and Child Health Journal* 22, no. 1 (January 2018): 120–29. https://doi.org/10.1007/s10995-017-2361-5.

88. Walker, Lorraine O., Eun-Ok Im, and Diane O. Tyler. "Maternal Health Needs and Interest in Screening for Depression and Health Behaviors during Pediatric Visits." *Journal of Pediatric Health Care: Official Publication of National Association of Pediatric Nurse Associates & Practitioners* 27, no. 4 (August 2013): 267–77. https://doi.org/10.1016/j.pedhc.2011.11.008.

89. LoVerde, Bianca, Alison Falck, Pamela Donohue, and Brenda Hussey-Gardener. "Supports and Barriers to the Provision of Human Milk by Mothers of African American Preterm Infants:" *Advances in Neonatal Care* 18, no. 3 (June 2018): 179–88. https://doi.org/10.1097/ANC.0000000000000477.

90. Valizadeh, Sousan, Mina Hosseinzadeh, Eesa Mohammadi, Hadi Hassankhani, Marjaneh M. Fooladi, and Virginia Schmied. "Addressing Barriers to Health: Experiences of Breastfeeding Mothers after Returning to Work: Breastfeeding

Working Mothers' Health." *Nursing & Health Sciences* 19, no. 1 (March 2017): 105–11. https://doi.org/10.1111/nhs.12324.

91. Mazul, Mary C., Trina C. Salm Ward, and Emmanuel M. Ngui. "Anatomy of Good Prenatal Care: Perspectives of Low Income African-American Women on Barriers and Facilitators to Prenatal Care." *Journal of Racial and Ethnic Health Disparities* 4, no. 1 (February 2017): 79–86. https://doi.org/10.1007/s40615-015-0204-x.

92. Phillippi JC. Women's perceptions of access to prenatal care in the United States: a literature review. J Midwifery Womens Health. 2009 May-Jun;54(3):219-25. doi: 10.1016/j.jmwh.2009.01.002. PMID: 19410214.

93. Vanessa B Sheppard, Ruth E Zambrana, Ann S O'Malley, Providing health care to low-income women: a matter of trust, *Family Practice*, Volume 21, Issue 5, October 2004, Pages 484–491, https://doi.org/10.1093/fampra/cmh503

94. Jennifer Nicoloro-SantaBarbara, Lisa Rosenthal, Melissa V. Auerbach, Christina Kocis, Cheyanne Busso, Marci Lobel. Patient-provider communication, maternal anxiety, and self-care in pregnancy. Social Science & Medicine, Volume 190, 2017, Pages 133-140, ISSN 0277-9536, https://doi.org/10.1016/j.socscimed.2017.08.011.

95. Janevic T, Maru S, Nowlin S, McCarthy K, Bergink V, Stone J, Dias J, Wu S, Howell EA. Pandemic Birthing: Childbirth Satisfaction, Perceived Health Care Bias, and Postpartum Health During the COVID-19 Pandemic. Matern Child Health J. 2021 Jun;25(6):860-869. doi: 10.1007/s10995-021-03158-8. Epub 2021 Apr 28. PMID: 33909205; PMCID: PMC8079857.

96. Eggertson L. Stigma a major barrier to treatment for pregnant women with addictions. CMAJ. 2013 Dec 10;185(18):1562. doi: 10.1503/cmaj.109-4653. Epub 2013 Nov 11. PMID: 24218532; PMCID: PMC3855110.

97. Morton J, Vignato J, Anbari AB. Stigma Experienced by Perinatal Women with Opioid Dependency in the United States: A Qualitative Meta-Synthesis. West J Nurs Res. 2023 Jun 29:1939459231182495. doi: 10.1177/01939459231182495. Epub ahead of print. PMID: 37382361.

98. Lyall V, Wolfson L, Reid N, Poole N, Moritz KM, Egert S, Browne AJ, Askew DA. "The Problem Is that We Hear a Bit of Everything…": A Qualitative Systematic Review of Factors Associated with Alcohol Use, Reduction, and Abstinence in Pregnancy. Int J Environ Res Public Health. 2021 Mar 26;18(7):3445. doi: 10.3390/ijerph18073445. PMID: 33810338; PMCID: PMC8037183.

99. Nagpal TS, Liu RH, Myre M, Gaudet L, Cook J, da Silva DF, Adamo KB. Weight stigma and prenatal physical activity: Exploring the perspectives of pregnant

women living with obesity. Midwifery. 2022 Jan;104:103186. doi: 10.1016/j.midw.2021.103186. Epub 2021 Oct 28. PMID: 34788725.

100. Gennaro S, O'Connor C, McKay EA, Gibeau A, Aviles M, Hoying J, Melnyk BM. Perinatal Anxiety and Depression in Minority Women. MCN Am J Matern Child Nurs. 2020 May/Jun;45(3):138-144. doi: 10.1097/NMC.0000000000000611. PMID: 31977497; PMCID: PMC8011863.

101. Byatt N, Simas TA, Lundquist RS, Johnson JV, Ziedonis DM. Strategies for improving perinatal depression treatment in North American outpatient obstetric settings. J Psychosom Obstet Gynaecol. 2012 Dec;33(4):143-61. doi: 10.3109/0167482X.2012.728649. PMID: 23194018.

102. Yu, S.M., Huang, Z.J., Schwalberg, R.H. *et al.* Parental Awareness of Health and Community Resources among Immigrant Families. *Matern Child Health J* **9**, 27–34 (2005). https://doi.org/10.1007/s10995-005-2547-0

103. Torres Sanchez A, Park AL, Chu W, Letamendi A, Stanick C, Regan J, Perez G, Manners D, Oh G, Chorpita BF. Supporting the mental health needs of underserved communities: A qualitative study of barriers to accessing community resources. J Community Psychol. 2022 Jan;50(1):541-552. doi: 10.1002/jcop.22633. Epub 2021 Jun 7. PMID: 34096626.

104. Attanasio LB, DaCosta M, Kleppel R, Govantes T, Sankey HZ, Goff SL. Community Perspectives on the Creation of a Hospital-Based Doula Program. Health Equity. 2021 Sep 3;5(1):545-553. doi: 10.1089/heq.2020.0096. PMID: 34909521; PMCID: PMC8665817.

105. Arteaga S, Hubbard E, Arcara J, Cuentos A, Armstead M, Jackson A, Gomez AM, Marshall C. "They're gonna be there to advocate for me so I'm not by myself": A qualitative analysis of Black women's motivations for seeking and experiences with community doula care. Women Birth. 2023 May;36(3):257-263. doi: 10.1016/j.wombi.2022.08.007. Epub 2022 Sep 9. PMID: 36089498; PMCID: PMC10321332.

106. Medley N and Strope A. Missouri Department of Health and Senior Services, Bureau of WIC and Nutrition Services. Participant Satisfaction Survey: Summary Report. 2021-2022. Available from: https://health.mo.gov/living/families/wic/pdf/customer-satisfaction-survey-report.pdf

107. Ballantyne, M., K. Benzies, P. Rosenbaum, and A. Lodha. "Mothers' and Health Care Providers' Perspectives of the Barriers and Facilitators to Attendance at Canadian Neonatal Follow-up Programs." *Child: Care, Health and Development* 41, no. 5 (September 2015): 722–33. https://doi.org/10.1111/cch.12202.

108. Heaman, Maureen I, Wendy Sword, Lawrence Elliott, Michael Moffatt, Michael E Helewa, Heather Morris, Patricia Gregory, Lynda Tjaden, and Catherine Cook. "Barriers and Facilitators Related to Use of Prenatal Care by Inner-City Women: Perceptions of Health Care Providers." *BMC Pregnancy and Childbirth* 15, no. 1 (December 2015): 2. https://doi.org/10.1186/s12884-015-0431-5.

109. Mugo, Ngatho S., Michael J. Dibley, Eliaba Yona Damundu, and Ashraful Alam. "Correction to: Barriers Faced by the Health Workers to Deliver Maternal Care Services and Their Perceptions of the Factors Preventing Their Clients from Receiving the Services: A Qualitative Study in South Sudan." *Maternal and Child Health Journal* 22, no. 12 (December 2018): 1834–1834. https://doi.org/10.1007/s10995-018-2574-2.

110. Graner, Sophie, Ingrid Mogren, Le Q Duong, Gunilla Krantz, and Marie Klingberg-Allvin. "Maternal Health Care Professionals' Perspectives on the Provision and Use of Antenatal and Delivery Care: A Qualitative Descriptive Study in Rural Vietnam." *BMC Public Health* 10, no. 1 (December 2010): 608. https://doi.org/10.1186/1471-2458-10-608.

111. Byatt, Nancy, Kathleen Biebel, Rebecca S. Lundquist, Tiffany A. Moore Simas, Gifty Debordes-Jackson, Jeroan Allison, and Douglas Ziedonis. "Patient, Provider, and System-Level Barriers and Facilitators to Addressing Perinatal Depression." *Journal of Reproductive and Infant Psychology* 30, no. 5 (November 2012): 436–49. https://doi.org/10.1080/02646838.2012.743000.

112. Leiferman, Jenn A., Sarah E. Dauber, Kurt Heisler, and James F. Paulson. "Primary Care Physicians' Beliefs and Practices toward Maternal Depression." *Journal of Women's Health (2002)* 17, no. 7 (September 2008): 1143–50. https://doi.org/10.1089/jwh.2007.0543.

113. Alakaam, Amir, Jennifer Lemacks, Kathleen Yadrick, Carol Connell, Hwanseok Winston Choi, and Ray G. Newman. "Maternity Nurses' Knowledge and Practice of Breastfeeding in Mississippi:" *MCN, The American Journal of Maternal/Child Nursing* 43, no. 4 (2018): 225–30. https://doi.org/10.1097/NMC.0000000000000437.

114. Cunningham, Emilie M., Eva I. Doyle, and Rodney G. Bowden. "Maternity Nurses' Perceptions of Implementation of the Ten Steps to Successful Breastfeeding." *MCN. The American Journal of Maternal Child Nursing* 43, no. 1 (February 2018): 38–43. https://doi.org/10.1097/NMC.0000000000000392.

115. Laanterä, Sari, Tarja Pölkki, and Anna-Maija Pietilä. "A Descriptive Qualitative Review of the Barriers Relating to Breast-Feeding Counselling: Barriers in Breast-Feeding Counselling." *International Journal of Nursing Practice* 17, no. 1 (February 2011): 72–84. https://doi.org/10.1111/j.1440-172X.2010.01909.x.

116. Yee, Lynn M., Karolina Leziak, Jenise Jackson, Charlotte M. Niznik, and Melissa A. Simon. “Health Care Providers’ Perspectives on Barriers and Facilitators to Care for Low-Income Pregnant Women With Diabetes.” *Diabetes Spectrum: A Publication of the American Diabetes Association* 33, no. 2 (May 2020): 190–200. https://doi.org/10.2337/ds19-0044.

117. Sword W, Heaman MI, Brooks S, Tough S, Janssen PA, Young D, Kingston D, Helewa ME, Akhtar-Danesh N, Hutton E. Women's and care providers' perspectives of quality prenatal care: a qualitative descriptive study. BMC Pregnancy Childbirth. 2012 Apr 13;12:29. doi: 10.1186/1471-2393-12-29. PMID: 22502640; PMCID: PMC3352181.

118. Boyd, Rhonda C., Marjie Mogul, Deena Newman, and James C. Coyne. “Screening and Referral for Postpartum Depression among Low-Income Women: A Qualitative Perspective from Community Health Workers.” *Depression Research and Treatment* 2011 (2011): 1–7. https://doi.org/10.1155/2011/320605.

119. Venkataramani M, Ogunwole SM, Caulfield LE, Sharma R, Zhang A, Gross SM, Hurley KM, Lerman JL, Bass EB, Bennett WL. Maternal, Infant, and Child Health Outcomes Associated With the Special Supplemental Nutrition Program for Women, Infants, and Children : A Systematic Review. Ann Intern Med. 2022 Oct;175(10):1411-1422. doi: 10.7326/M22-0604. Epub 2022 Sep 6. PMID: 36063550.

120. Munger AL, Hofferth SL, Grutzmacher SK. The Role of the Supplemental Nutrition Assistance Program in the Relationship between Food Insecurity and Probability of Maternal Depression. J Hunger Environ Nutr. 2016;11(2):147-161. doi: 10.1080/19320248.2015.1045672. Epub 2016 Apr 22. PMID: 27482302; PMCID: PMC4962864.

121. Goldfeld S, Bryson H, Mensah F, Gold L, Orsini F, Perlen S, Price A, Hiscock H, Grobler A, Dakin P, Bruce T, Harris D, Kemp L. Nurse Home Visiting and Maternal Mental Health: 3-Year Follow-Up of a Randomized Trial. Pediatrics. 2021 Feb;147(2):e2020025361. doi: 10.1542/peds.2020-025361. PMID: 33483450.

122. Bedaso A, Adams J, Peng W, Sibbritt D. The relationship between social support and mental health problems during pregnancy: a systematic review and meta-analysis. Reprod Health. 2021 Jul 28;18(1):162. doi: 10.1186/s12978-021-01209-5. PMID: 34321040; PMCID: PMC8320195.

123. Zephyrin L et al. Community-Based Models to Improve Maternal Health Outcomes and Promote Health Equity. Commonwealth Fund. Mar 2021. https://doi.org/10.26099/6s6k-5330

124. Ramey-Collier K, Jackson M, Malloy A, McMillan C, Scraders-Pyatt A, Wheeler SM. Doula Care: A Review of Outcomes and Impact on Birth Experience. Obstet Gynecol Surv. 2023 Feb;78(2):124-127. doi: 10.1097/OGX.0000000000001103. PMID: 36786720.

125. Lutenbacher M, Elkins T, Dietrich MS, Riggs A. The Efficacy of Using Peer Mentors to Improve Maternal and Infant Health Outcomes in Hispanic Families: Findings from a Randomized Clinical Trial. Matern Child Health J. 2018 Oct;22(Suppl 1):92-104. doi: 10.1007/s10995-018-2532-z. Erratum in: Matern Child Health J. 2018 Aug 22;: PMID: 29855840; PMCID: PMC6153763.

126. Shorey S, Chee CYI, Ng ED, Lau Y, Dennis CL, Chan YH. Evaluation of a Technology-Based Peer-Support Intervention Program for Preventing Postnatal Depression (Part 1): Randomized Controlled Trial. J Med Internet Res. 2019 Aug 29;21(8):e12410. doi: 10.2196/12410. PMID: 31469084; PMCID: PMC6744221.

127. Jiang L, Zhu Z. Maternal mental health and social support from online communities during pregnancy. Health Soc Care Community. 2022 Nov;30(6):e6332-e6344. doi: 10.1111/hsc.14075. Epub 2022 Oct 18. PMID: 36256486; PMCID: PMC10092248.

128. Razurel C, Kaiser B, Sellenet C, Epiney M. Relation between perceived stress, social support, and coping strategies and maternal well-being: a review of the literature. Women Health. 2013;53(1):74-99. doi: 10.1080/03630242.2012.732681. PMID: 23421340

129. Guardino CM, Schetter CD. Coping during pregnancy: a systematic review and recommendations. Health Psychol Rev. 2014;8(1):70-94. doi: 10.1080/17437199.2012.752659. Epub 2014 Jan 8. PMID: 24489596; PMCID: PMC3904449.

130. Slomski, Anita. “Why Do Hundreds of US Women Die Annually in Childbirth?” *JAMA* 321, no. 13 (April 2, 2019): 1239. https://doi.org/10.1001/jama.2019.0714.

131. Howell, Elizabeth A., Norma A. Padrón, Susan J. Beane, Joanne Stone, Virginia Walther, Amy Balbierz, Rashi Kumar, and José A. Pagán. “Delivery and Payment Redesign to Reduce Disparities in High Risk Postpartum Care.” Maternal and Child Health Journal 21, no. 3 (March 2017): 432–38. https://doi.org/10.1007/s10995-016-2221-8.

132. World Health Organization. Recommendations on Postnatal Care of the Mother and Newborn. WHO 2014. Available from: http://apps.who.int/iris/bitstream/10665/97603/1/9789241506649eng.pdf

133. Bakst, Carol, Moore, Jennifer, George, Karen, Shea, Karen. Community-Based Maternal Support Services: the Role of Doulas and Community Health Workers.

Institute for Medicaid Innovation. May 2020. https://www.medicaidinnovation.org/_images/content/2020-IMI-Community_Based_Maternal_Support_Services-Report.pdf

134. VanderZanden A,et al. What does Community-Oriented Primary Care Look Like? Lessons from Costa Rica. Commonwealth Fund. Mar 2021. https://doi.org/10.26099/ehbv-g283

135. APHA. Support for Community Health Workers to Increase Health Access and Reduce Health Inequities. November 2009. Available from: https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/09/14/19/support-for-community-health-workers-to-increase-health-access-and-to-reduce-health-inequities

136. Charanthimath, Umesh, Marianne Vidler, Geetanjali Katageri, Umesh Ramadurg, Chandrashekhar Karadiguddi, Avinash Kavi, Anjali Joshi, et al. "The Feasibility of Task-Sharing the Identification, Emergency Treatment, and Referral for Women with Pre-Eclampsia by Community Health Workers in India." *Reproductive Health* 15, no. Suppl 1 (June 22, 2018): 101. https://doi.org/10.1186/s12978-018-0532-5.

137. Ramadurg, Umesh, Marianne Vidler, Umesh Charanthimath, Geetanjali Katageri, Mrutyunjaya Bellad, Ashalata Mallapur, Shivaprasad Goudar, et al. "Community Health Worker Knowledge and Management of Pre-Eclampsia in Rural Karnataka State, India." *Reproductive Health* 13, no. Suppl 2 (September 30, 2016): 113. https://doi.org/10.1186/s12978-016-0219-8.

138. The CLIP Working Group, Salésio Macuácua, Raquel Catalão, Sumedha Sharma, Anifa Valá, Marianne Vidler, Eusébio Macete, et al. "Policy Review on the Management of Pre-Eclampsia and Eclampsia by Community Health Workers in Mozambique." *Human Resources for Health* 17, no. 1 (December 2019): 15. https://doi.org/10.1186/s12960-019-0353-9.

139. Hodnett, Ellen D, and Suzanne Fredericks. "Support during Pregnancy for Women at Increased Risk of Low Birthweight Babies." In *Cochrane Database of Systematic Reviews*, edited by The Cochrane Collaboration, CD000198. Chichester, UK: John Wiley & Sons, Ltd, 2003. https://doi.org/10.1002/14651858.CD000198.

140. Chowdhary, Neerja, Siham Sikander, Najia Atif, Neha Singh, Ikhlaq Ahmad, Daniela C. Fuhr, Atif Rahman, and Vikram Patel. "The Content and Delivery of Psychological Interventions for Perinatal Depression by Non-Specialist Health Workers in Low and Middle Income Countries: A Systematic Review." *Best Practice & Research. Clinical Obstetrics & Gynaecology* 28, no. 1 (January 2014): 113–33. https://doi.org/10.1016/j.bpobgyn.2013.08.013.

141. Mundorf, Christopher, Arti Shankar, Tracy Moran, Sherry Heller, Anna Hassan, Emily Harville, and Maureen Lichtveld. “Reducing the Risk of Postpartum Depression in a Low-Income Community Through a Community Health Worker Intervention.” *Maternal and Child Health Journal* 22, no. 4 (April 2018): 520–28. https://doi.org/10.1007/s10995-017-2419-4.

142. Roman, Lee Anne, Joseph C. Gardiner, Judith K. Lindsay, Joseph S. Moore, Zhehui Luo, Lawrence J. Baer, John H. Goddeeris, et al. “Alleviating Perinatal Depressive Symptoms and Stress: A Nurse-Community Health Worker Randomized Trial.” *Archives of Women’s Mental Health* 12, no. 6 (December 2009): 379–91. https://doi.org/10.1007/s00737-009-0083-4.

143. Roman, Lee Anne, Jennifer E. Raffo, and Cristian I. Meghea. “Maternal Perceptions of Help From Home Visits by Nurse–Community Health Worker Teams.” *American Journal of Public Health* 102, no. 4 (April 2012): 643–45. https://doi.org/10.2105/AJPH.2011.300455.

144. Furman, Lydia M., and Catherine Dickinson. “Community Health Workers: Collaborating to Support Breastfeeding among High-Risk Inner-City Mothers.” *Breastfeeding Medicine: The Official Journal of the Academy of Breastfeeding Medicine* 8, no. 1 (February 2013): 73–78. https://doi.org/10.1089/bfm.2012.0027.

145. Mannan, I., S. M. Rahman, A. Sania, H. R. Seraji, S. E. Arifeen, P. J. Winch, G. L. Darmstadt, A. Baqui, and Bangladesh Projahnmo Study Group. “Can Early Postpartum Home Visits by Trained Community Health Workers Improve Breastfeeding of Newborns?” *Journal of Perinatology: Official Journal of the California Perinatal Association* 28, no. 9 (September 2008): 632–40. https://doi.org/10.1038/jp.2008.64.

146. Popo, Emma, Sara Kenyon, Sophie-Anna Dann, Christine MacArthur, and Jacqueline Blissett. “Effects of Lay Support for Pregnant Women with Social Risk Factors on Infant Development and Maternal Psychological Health at 12 Months Postpartum.” Edited by Jacobus P. van Wouwe. *PLOS ONE* 12, no. 8 (August 28, 2017): e0182544. https://doi.org/10.1371/journal.pone.0182544.

147. Lutenbacher, Melanie, Tonya Elkins, Mary S. Dietrich, and Anais Riggs. “The Efficacy of Using Peer Mentors to Improve Maternal and Infant Health Outcomes in Hispanic Families: Findings from a Randomized Clinical Trial.” *Maternal and Child Health Journal* 22, no. S1 (October 2018): 92–104. https://doi.org/10.1007/s10995-018-2532-z.

148. Elkins, Tonya, Maria Del Pilar Aguinaga, Caitlin Clinton-Selin, Barbara Clinton, and Gerald Gotterer. “The Maternal Infant Health Outreach Worker Program in Low-Income Families.” *Journal of Health Care for the Poor and Underserved* 24, no. 3 (August 2013): 995–1001. https://doi.org/10.1353/hpu.2013.0143.

149. Philis-Tsimikas, Athena, Addie L. Fortmann, Sapna Dharkar-Surber, Johanna A. Euyoque, Monica Ruiz, James Schultz, and Linda C. Gallo. “Dulce Mothers: An Intervention to Reduce Diabetes and Cardiovascular Risk in Latinas after Gestational Diabetes.” *Translational Behavioral Medicine* 4, no. 1 (March 2014): 18–25. https://doi.org/10.1007/s13142-014-0253-4.

150. Kenyon, Sara, Kate Jolly, Karla Hemming, Lucy Hope, Jackie Blissett, Sophie-Anna Dann, Richard Lilford, and Christine MacArthur. “Lay Support for Pregnant Women with Social Risk: A Randomised Controlled Trial.” *BMJ Open* 6, no. 3 (March 2016): e009203. https://doi.org/10.1136/bmjopen-2015-009203.

151. Howell, Elizabeth A., Amy Balbierz, Susan Beane, Rashi Kumar, Tom Wang, Kezhen Fei, Zainab Ahmed, and José A. Pagán. “Timely Postpartum Visits for Low-Income Women: A Health System and Medicaid Payer Partnership.” *American Journal of Public Health* 110, no. S2 (July 2020): S215–18. https://doi.org/10.2105/AJPH.2020.305689.

152. Rodin D, Silow-Carroll S, Cross-Barnet C, Courtot B, Hill I. Strategies to Promote Postpartum Visit Attendance Among Medicaid Participants. J Womens Health (Larchmt). 2019 Sep;28(9):1246-1253. doi: 10.1089/jwh.2018.7568. Epub 2019 Jun 28. PMID: 31259648.

153. Pan Z, Veazie P, Sandler M, Dozier A, Molongo M, Pulcino T, Parisi W, Eisenberg KW. Perinatal Health Outcomes Following a Community Health Worker-Supported Home-Visiting Program in Rochester, New York, 2015-2018. Am J Public Health. 2020 Jul;110(7):1031-1033. doi: 10.2105/AJPH.2020.305655. Epub 2020 May 21. PMID: 32437282; PMCID: PMC7287532.

154. Population Health Approach is Pivotal in Lowering Maternal Mortality in U.S. Northwell Health. October 2022. Available from: https://www.northwell.edu/news/insights/population-health-approach-lowering-maternal-mortality-rate

155. Cunningham SD, Riis V, Line L, Patti M, Bucher M, Durnwald C, Srinivas SK. Safe Start Community Health Worker Program: A Multisector Partnership to Improve Perinatal Outcomes Among Low-Income Pregnant Women With Chronic Health Conditions. Am J Public Health. 2020 Jun;110(6):836-839. doi: 10.2105/AJPH.2020.305630. Epub 2020 Apr 16. PMID: 32298174; PMCID: PMC7204480.

156. Williams, Corrine M., Sarah Cprek, Ibitola Asaolu, Brenda English, Tracey Jewell, Kylen Smith, and Joyce Robl. “Kentucky Health Access Nurturing Development Services Home Visiting Program Improves Maternal and Child Health.” *Maternal and Child Health Journal* 21, no. 5 (May 2017): 1166–74. https://doi.org/10.1007/s10995-016-2215-6.

157. Federman, Alex D., Rachel O'Conor, Irina Mindlis, Jamillah Hoy-Rosas, Diane Hauser, Joseph Lurio, Nandini Shroff, et al. "Effect of a Self-Management Support Intervention on Asthma Outcomes in Older Adults: The SAMBA Study Randomized Clinical Trial." *JAMA Internal Medicine* 179, no. 8 (August 1, 2019): 1113. https://doi.org/10.1001/jamainternmed.2019.1201.

158. Waxman E, Thompson M, Aron L, Hoy-Rosas J, Haag E, Improving Chronic Illness Management in Harlem: Leveraging Community Health Coaches to Address the Challenge of Medication Management. Urban Institute. October 24, 2019. Available from: https://www.urban.org/research/publication/improving-chronic-illness-management-harlem

159. Burton R and Thompson M. What Do Patients with Diabetes Think about Health Coaching? Urban Institute. February 5, 2018. Available from: https://www.urban.org/sites/default/files/publication/96336/2001692_chw_client_interviews_brief_finalized_2.pdf

160. Kangovi S, Mitra N, Grande D, Huo H, Smith RA, Long JA. Community Health Worker Support for Disadvantaged Patients With Multiple Chronic Diseases: A Randomized Clinical Trial. Am J Public Health. 2017 Oct;107(10):1660-1667. doi: 10.2105/AJPH.2017.303985. Epub 2017 Aug 17. PMID: 28817334; PMCID: PMC5607679.

161. Johnson, D., Saavedra, P., Sun, E. *et al.* Community Health Workers and Medicaid Managed Care in New Mexico. *J Community Health* **37**, 563–571 (2012). https://doi.org/10.1007/s10900-011-9484-1

162. Vaughan K, Kok MC, Witter S, Dieleman M. Costs and cost-effectiveness of community health workers: evidence from a literature review. Hum Resour Health. 2015 Sep 1;13:71. doi: 10.1186/s12960-015-0070-y. PMID: 26329455; PMCID: PMC4557864.

162. Jack HE, Arabadjis SD, Sun L, Sullivan EE, Phillips RS. Impact of Community Health Workers on Use of Healthcare Services in the United States: A Systematic Review. J Gen Intern Med. 2017 Mar;32(3):325-344. doi: 10.1007/s11606-016-3922-9. Epub 2016 Dec 5. PMID: 27921257; PMCID: PMC5331010.

164. Kangovi S, Mitra N, Grande D, Long JA, Asch DA. Evidence-Based Community Health Worker Program Addresses Unmet Social Needs And Generates Positive Return On Investment. Health Aff (Millwood). 2020 Feb;39(2):207-213. doi: 10.1377/hlthaff.2019.00981. PMID: 32011942; PMCID: PMC8564553.

165. Thompson MP, Podila PSB, Clay C, Sharp J, Bailey-DeLeeuw S, Berkley AJ, Baker BG, Waters TM. Community navigators reduce hospital utilization in super-utilizers. Am J Manag Care. 2018 Feb;24(2):70-76. PMID: 29461853.

166. Powers BW, Modarai F, Palakodeti S, Sharma M, Mehta N, Jain SH, Garg V. Impact of complex care management on spending and utilization for high-need, high-cost Medicaid patients. Am J Manag Care. 2020 Feb 1;26(2):e57-e63. doi: 10.37765/ajmc.2020.42402. Erratum in: Am J Manag Care. 2020 Mar;26(3):132. PMID: 32059101.

167. Boyd LM, Mehra R, Thomas J, Lewis JB, Cunningham SD. Features and Impact of Trust-Based Relationships Between Community Health Workers and Low-Resource Perinatal Women with Chronic Health Conditions. Matern Child Health J. 2021 Dec;25(12):1866-1874. doi: 10.1007/s10995-021-03242-z. Epub 2021 Oct 21. PMID: 34674101.

168. C3; Rosenthal, EL, Rush, CH, Allen, CG. Understanding scope and competencies: a contemporary look at the United States community health worker field. Progress Report of the Community Health Worker (CHW) Core Consensus (C3) Project: Building National Consensus on CHW Core Roles, Skills, and Qualities, 2016.

169. UN Secretary General Special Envoy and Mount Sinai Arnhold Institute for Global Health. Closing the Gap: Applying Global Lessons Towards Sustainable Community Health Worker Models in the U.S. December 2016. Available from: http://www.healthenvoy.org/wp-content/uploads/2014/05/Closing-the-Gap-Applying-Global-Lessons-Toward-Sustainable-Community-Health-Models-in-the-U.S..pdf

170. Mehra, Renee, Lisa M. Boyd, Jessica B. Lewis, and Shayna D. Cunningham. "Considerations for Building Sustainable Community Health Worker Programs to Improve Maternal Health." *Journal of Primary Care & Community Health* 11 (January 2020): 215013272095367. https://doi.org/10.1177/2150132720953673.

171. Ejembi, Clara Ladi, Pamela Norick, Ann Starrs, and Kusum Thapa. "New Global Guidance Supports Community and Lay Health Workers in Postpartum Hemorrhage Prevention." *International Journal of Gynaecology and Obstetrics: The Official Organ of the International Federation of Gynaecology and Obstetrics* 122, no. 3 (September 2013): 187–89. https://doi.org/10.1016/j.ijgo.2013.05.001.

172. Global expert panel 2017 Black, Robert E, Carl E Taylor, Shobha Arole, Abhay Bang, Zulfiqar A Bhutta, A Mushtaque R Chowdhury, Betty R Kirkwood, et al. "Comprehensive Review of the Evidence Regarding the Effectiveness of Community–Based Primary Health Care in Improving Maternal, Neonatal and Child Health: 8. Summary and Recommendations of the Expert Panel." *Journal of Global Health* 7, no. 1 (June 2017): 010908. https://doi.org/10.7189/jogh.07.010908.

173. Trust for America's Health. The Impact of Chronic Underfunding on America's Public Health System: Trends, Risks, Recommendations, 2022. Trust for America's

Health. July 2022. Available from: https://www.tfah.org/wp-content/uploads/2022/07/2022PublicHealthFundingFINAL.pdf

174. Centers for Disease Control. Addressing Chronic Disease through Community Health Workers: A Policy Brief. 2015. Available from: https://www.cdc.gov/dhdsp/docs/chw_brief.pdf

175. Centers for Disease Control. States Implementing Community Health Worker Strategies: A Technical Assistance Guide. Available from: https://www.cdc.gov/dhdsp/programs/spha/docs/1305_ta_guide_chws.pdf

176. U.S. House of Representatives Black Maternal Health Caucus. Momnibus Act of 2021. Available from:https://blackmaternalhealthcaucus-underwood.house.gov/Momnibus

177. S.1606 Black Maternal Health Momnibus Act. May 15, 2023. Available from: https://www.congress.gov/bill/118th-congress/senate-bill/1606

178. Taylor J and Bernstein A. Tracking Progress of the Black Maternal Health Momnibus. The Century Foundation. May 26, 2023. Available from: https://tcf.org/content/data/black-maternal-health-momnibus-tracker/

179. New York State Taskforce on Maternal Mortality and Disparate Racial Outcomes. Recommendations to the Governor to Reduce Maternal Mortality and Racial Disparities. March 2019. Available from: https://www.governor.ny.gov/sites/governor.ny.gov/files/atoms/files/maternal_mortality_Mar12.pdf

180. New York State Maternal and Infant Community Health Collaboratives (MICHC) Initiative. Revised January 2023. Available from: https://www.health.ny.gov/community/adults/women/maternal_and_infant_comm_health_collaboratives.htm

181. New York State Task Force on Maternal Mortality and Disparate Outcomes. Panel on Postpartum Care: Report. January 2021. Available from: https://www.health.ny.gov/community/adults/women/task_force_maternal_mortality/docs/2021-01_expert_panel_on_postpartum_care_final_report.pdf

182. Mayor Adams Takes Action to Reduce Maternal and Infant Health Inequities by Expanding Access to Doulas and Midwives March 23 2022. Available from: https://www.nyc.gov/office-of-the-mayor/news/149-22/mayor-adams-takes-action-reduce-maternal-infant-health-inequities-expanding-access-to#/0

183. Mayor Adams Signs Legislation Providing Doula Services Across Five Boroughs, Strengthen Maternal Health. NYC Health and Hospitals. September 7 2022.

Available from: https://www.nychealthandhospitals.org/pressrelease/mayor-adams-signs-legislation-providing-doula-services-across-five-boroughs-strengthen-maternal-health/

184. Nurse-Family Partnership. Research Trials and Outcomes. 2022. Available from: https://www.nursefamilypartnership.org/wp-content/uploads/2022/03/NFP-Research-Trials-and-Outcomes.pdf

185. Nurse-Family Partnership: New York State profile. 2022. Available from: https://www.nursefamilypartnership.org/wp-content/uploads/2017/07/NY_2022-State-Profile.pdf

186. Access NYC. Health Food for Families. Available from: https://access.nyc.gov/programs/women-infants-and-children-wic/

187. Currie J, Rajani I. Within-Mother Estimates of the Effects of WIC on Birth Outcomes in New York City. Econ Inq. 2015 Oct;53(4):1691-1701. doi: 10.1111/ecin.12219. Epub 2015 Apr 23. PMID: 28503006; PMCID: PMC5425167.

188. Caulfield LE, Bennett WL, Gross SM, Hurley KM, Ogunwole SM, Venkataramani M, Lerman JL, Zhang A, Sharma R, Bass EB. Maternal and Child Outcomes Associated With the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2022 Apr. Report No.: 22-EHC019. PMID: 35503870.

189. Gleason S, Wilkin MK, Sallack L, Whaley SE, Martinez C, Paolicelli C. Breastfeeding Duration Is Associated With WIC Site-Level Breastfeeding Support Practices. J Nutr Educ Behav. 2020 Jul;52(7):680-687. doi: 10.1016/j.jneb.2020.01.014. Epub 2020 Mar 11. PMID: 32171671

190. Metallinos-Katsaras E, Brown L, Colchamiro R. Maternal WIC participation improves breastfeeding rates: a statewide analysis of WIC participants. Matern Child Health J. 2015 Jan;19(1):136-43. doi: 10.1007/s10995-014-1504-1. PMID: 24777674.

191. Yan J. Is WIC effective in improving pregnancy-related outcomes? An empirical reassessment. Econ Hum Biol. 2022 Dec;47:101197. doi: 10.1016/j.ehb.2022.101197. Epub 2022 Nov 5. PMID: 36427408.

192. Northern Manhattan Perinatal Partnership website. Available from: https://nmppcares.org/node/5

193. Centers for Disease Control and Prevention. Community Health Worker Resources. February 28, 2023. Available from:

https://www.cdc.gov/chronicdisease/center/community-health-worker-resources.html

194. National Board for Health and Wellness Coaching (NBHWC). What is a Board-Certified Health Coach? NBHWC website. Available from: https://nbhwc.org/what-is-a-health-coach/

195. Bartholomew Eldrigde, L. K., Markham, C. M., Ruiter, R. A. C., Fernàndez, M. E., Kok, G., & Parcel, G. S. (2016). Planning health promotion programs: An Intervention Mapping approach (4th ed.). Hoboken, NJ: Wiley.

196. Fernandez, Maria E., Robert A. C. Ruiter, Christine M. Markham, and Gerjo Kok. "Intervention Mapping: Theory- and Evidence-Based Health Promotion Program Planning: Perspective and Examples." *Frontiers in Public Health* 7 (August 14, 2019): 209. https://doi.org/10.3389/fpubh.2019.00209.

197. Howell, Elizabeth A., Haywood Brown, Jessica Brumley, Allison S. Bryant, Aaron B. Caughey, Andria M. Cornell, Jacqueline H. Grant, et al. "Reduction of Peripartum Racial and Ethnic Disparities: A Conceptual Framework and Maternal Safety Consensus Bundle." *Journal of Obstetric, Gynecologic & Neonatal Nursing* 47, no. 3 (May 2018): 275–89. https://doi.org/10.1016/j.jogn.2018.03.004.

198. Black Mamas Matter Alliance and Center for Reproductive Rights. Black Mamas Matter: Advancing the Human Right to Safe and Respectful Maternal Health Care. Center for Reproductive Rights (2018). Available from: http://blackmamasmatter.org/wp-content/uploads/2018/05/USPA_BMMA_Toolkit_Booklet-Final-Update_Web-Pages-1.pdf

199. Pregnancy Risk Assessment Monitoring Survey. Phase 8 (2016-Present) questionnaire. Available from: https://www.cdc.gov/prams/questionnaire.htm

200. Kroenke K, Spitzer RL, Williams JB. The Patient Health Questionnaire-2: validity of a two-item depression screener. Med Care. 2003 Nov;41(11):1284-92. doi: 10.1097/01.MLR.0000093487.78664.3C. PMID: 14583691.

201. Gjerdingen D, Crow S, McGovern P, Miner M, Center B. Postpartum depression screening at well-child visits: validity of a 2-question screen and the PHQ-9. Ann Fam Med. 2009 Jan-Feb;7(1):63-70. doi: 10.1370/afm.933. PMID: 19139451; PMCID: PMC2625843.

202. Staples LG, Dear BF, Gandy M, Fogliati V, Fogliati R, Karin E, Nielssen O, Titov N. Psychometric properties and clinical utility of brief measures of depression, anxiety, and general distress: The PHQ-2, GAD-2, and K-6. Gen Hosp Psychiatry.

2019 Jan-Feb;56:13-18. doi: 10.1016/j.genhosppsych.2018.11.003. Epub 2018 Nov 22. PMID: 30508772.

203. National Partnership for Women and Families. Listening to Mothers in California 2018 survey. Available from: https://www.chcf.org/wp-content/uploads/2018/09/ListeningMothersQuestionnaire2018.pdf

204. Zoom encrypted telecommunications Software. Available from: https://zoom.us/

205. REV Transcription Services. Available from: https://www.rev.com/

206. Happy Scribe Transcription services. Available from: https://www.happyscribe.com

207. Braun V and Clarke V. Thematic Analysis: a Practical Guide. 1st Edition. Sage Publications, December 6 2021.

208. Microsoft Word Software. Available from: https://www.microsoft.com/en-us/microsoft-365/word?ms.officeurl=word&rtc=1&activetab=tabs%3afaqheaderregion3

209. NVivo Release 1 Qualitative Data Analysis Software. Available from: https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home

210. Saldaña J. The Coding Manual for Qualitative Researchers. Sage Publications, 2016.

211. Miro Visual Collaboration Platform. Available from: https://miro.com/app/dashboard/

212. Microsoft Excel 2023. Available from: https://www.microsoft.com/en-us/microsoft-365/excel?ms.officeurl=excel&rtc=1

CHAPTER THREE: RESULTS

Needs and Assets Assessment to Design a Maternal Community Health Worker Model in Upper Manhattan, New York City

Brett Ives, MSN, CDCES, Jamillah Hoy-Rosas, MPH, RD, CDCES, Tanjeena Patwary, MPH, Leny Rivera, Hilda Mejias, Destini Belton, Omara Afzal, DO, MPH, Lisa Messersmith, PhD, Jacey Greece, DSc, Eugene DeClercq, PhD

Abstract

Background: Rates of maternal mortality and severe maternal morbidity are higher in New York City (NYC) than nationally, with Black birthing people experiencing the worst maternal outcomes, followed by Latina/e and Asian / Pacific Islander birthing people. Community health worker models hold promise as one of many solutions needed to address the maternal health crisis in NYC. More research is needed on how to design a CHW model for maternal health and tailor it to local NYC contexts.

Objectives: The goals of this study were to understand barriers and facilitators to maternal self-care and engaging in maternal health care. The study also sought to document the key components to include in a maternal health community health worker (CHW) program.

Methods: In this qualitative study, in-depth interviews were conducted with a racially and ethnically diverse sample of prenatal and postpartum people (N=38) from a large teaching hospital in Upper Manhattan, New York City. In-depth interviews were also conducted with a cross-section of maternal health professionals delivering maternal health care at the same site (N=15). Interviews took place November 2020 and August 2022. Data were analyzed using thematic analysis.

Results: Participants highlighted a range of barriers (social determinants, delayed or no resource introduction, lack of care continuity, concerns of racial/ethnic discrimination in health care) and facilitators (advice from family, friends, providers, and through social media, positive coping, trusting relationships with health care providers). Prenatal and postpartum people recommended instrumental (transportation, childcare) and emotional support, and reported an interest in the CHW as a trusted person for their pregnancy and postpartum period. Providers prioritized skills building (childbirth education, breastfeeding support, chronic condition self-management), and reported that a CHW would be particularly helpful for patients with chronic conditions and high-risk pregnancies. To ensure successful program adoption, implementation, and sustainability, providers recommended early staff and patient buy-in, strong supervisory structure, clear definition of the CHW role, and external seed funding before program launch.

Conclusions: In-depth stakeholder input is critical to understand barriers and facilitators faced by pregnant and postpartum people and to design a stakeholder-informed,

evidence-based maternal CHW model. The findings can be used as lessons learned for similar health systems and communities that seek to build this layer of care.

Key Words: community health worker, health coaching, maternal health, barriers and facilitators, severe maternal morbidity, maternal mortality, racial and ethnic disparities

3.1 Introduction and Objectives

Maternal mortality in the United States is higher than all other high-income countries,[1] 84% of which is preventable with better access to and quality of prenatal, intrapartum and postpartum care and self-management of chronic diseases.[2] While the maternal mortality rate is elevated among all U.S. birthing people, Black American and American Indian mothers are at the highest risk of death in and after childbirth.[3] In New York City, similar to the U.S. as a whole, African American birthing people experience worse maternal health outcomes, followed by Native American and Latina/e birthing people.[3,4] Racial and ethnic disparities have widened further on a national level during the COVID-19 pandemic.[5]

Another key measure of maternal health is severe maternal morbidity (SMM), a composite of 21 indicators that represent either a serious diagnosis or complications of pregnancy, delivery, and post-delivery.[6] The severe maternal morbidity rate for non-Latina/e Black birthing people in NYC was three times that of non-Latina/e white birthing people, and SMM was also highest in the lowest income zip codes in NYC.[4] In Harlem, severe maternal morbidity occurred in 236.2 per 10,000 births, compared with

125.9 in the neighboring Upper East Side.[4] Drivers of race- and place-based disparities in maternal mortality and severe maternal morbidity are complex and include social determinants and discriminatory policies,[7–9] as well as racial bias within health care systems.[10–11]

The social determinants of maternal health that have been widely reported in the literature as barriers or facilitators to maternal self-care and maternal health care engagement include access to transportation, affordable childcare, employment, healthy food, and high quality health care.[12–13] Among prenatal and postpartum people with social and economic vulnerability, key community assets can mitigate stressors and improve outcomes, including WIC,[14] SNAP (food stamps),[15] and visiting nurses.[16] Institutional factors include quality of health care, including the presence or absence of discrimination,[17–18] the quality of care delivery systems,[19] as well as workplace policies and practices.[20] Critical interpersonal barriers or facilitators include family, friends, and / or professionals to withhold or provide needed social and emotional support.[21–22] Finally, there are individual assets that can support a healthy pregnancy journey, including a person's coping mechanisms to manage stress,[23–24] while individual-level barriers include emotional trauma(s)[25–26] or mental health challenges.[27–28] These community, institutional, interpersonal, and individual assets were explored in this study.

Maternal community health worker interventions have been found to improve key health outcomes for prenatal and postpartum people, [29–38] including improving postpartum visit attendance,[30–31] depression rates,[32] and maternal morbidity.[33–38]

Community health workers also improve health outcomes and reduce the cost of care in many U.S. adults with chronic conditions such as diabetes and high blood pressure.[39–48]

This objective of this study was to understand the factors that challenge and support prenatal and postpartum people in their self-care and engagement in health care. The study also sought to understand the most important components to include in a maternal health coaching program. The study findings will inform the development of a theory- and evidence-based maternal community health worker (CHW) / health coaching intervention in Upper Manhattan, New York City.

3.2 Methods

Conceptual Framework

The needs and assets assessment was guided by an adaptation of the maternal health social ecological model by Howell et al. (2018) and was grounded in a reproductive justice approach.[49–50] The Howell model describes how barriers and facilitators exist at every level of the social ecological model as a person navigates the prenatal to postpartum periods.[49] The organizing principles of reproductive justice, advanced by the Black Mamas Matter Alliance and Center for Reproductive Rights, are derived from the belief that "every woman has the right to safe and respectful maternal health care."[50] Constructs regarding maternal care that were explored in this research are the rights to health, safety, respect, and non-discrimination.[50] The Intervention Mapping framework aided the team in applying findings to the intervention design process.[51–52]

Human Subjects Protection

The study was approved by the Program for the Protection of Human Subjects at the Mount Sinai School of Medicine (HS#: 19-00183) and exemption category 2 status by Boston Medical Center / Boston University Medical Campus IRB.

Data Collection and Analysis

Methods included a review of the literature and in-depth interviews with prenatal or postpartum people and with maternal health professionals. Eligibility criteria for the interviews with prenatal / postpartum people included: pregnant in 2nd/3rd trimester or postpartum up to 12 weeks; English or Spanish speaking. Eligibility for the maternal health professional interviews included current employment at the study site as a doctor, certified nurse midwife, registered nurse, nurse practitioner, physician assistant, social worker, dietitian, or patient navigator. "Provider" in this paper is defined as doctor, nurse midwife, nurse practitioner, or physician assistant.

We used purposive sampling to recruit prenatal and postpartum people for interviews between November 2020 and August 2022 at an ambulatory obstetrics and gynecology practice at an academic medical center in Upper Manhattan. The principal investigator contacted eligible prenatal and postpartum people and maternal health professionals at the point of care, briefly discussed the study, and conducted informed consent with anyone who was interested. Prenatal and postpartum people provided written consent. Maternal health professionals gave verbal consent as written consent was waived by the IRB. Participants were assigned to an English speaking or Spanish

speaking interviewer depending on their preferences. All interviews were conducted via Zoom (participants dialed in to Zoom by phone).[53] Both interviewers were intensively trained in and used qualitative interviewing techniques, including active listening and probing / prompting.[54] A $50 gift card was provided for their time.

The prenatal / postpartum participant interview guide included open-ended questions along with some closed-ended multiple choice items. Closed-ended questions included depression and anxiety scales,[55–58] pregnancy stress measure,[59] social support measure,[59] resources used, and demographics. Maternal health-specific questions were taken from Pregnancy Risk Assessment Monitoring System,[59] and wording for some of the interview probes were from the Listening to Mothers survey.[60] The maternal health professionals were also interviewed with an open- and closed-question interview guide. Both groups of participants were asked about barriers and facilitators to self-care, barriers and facilitators to engaging in health care, and preferred components of a maternal health CHW / coaching program. The maternal health professionals were also asked about how to best ensure adoption, implementation, and sustainability of a maternal health CHW / coaching program at their practice.

Memoing for analytical observations or emerging trends took place after each interview. Interviews were audio recorded and then transcribed via Rev (English interviews)[61] and Happy Scribe (Spanish interviews).[62] The Spanish-speaking research team member (interviewer) verified Spanish transcription. Thematic analysis of the data sets was performed.[63] The prenatal and postpartum people data were coded using parent, child, and grandchild codes by two coders in NVivo Release 1,[64] and inter-rater reliability

was calculated during the coding process using NVivo Release 1, to ensure strong conceptual alignment between coders. Disagreements on codes were discussed and resolved. The codebook from the prenatal / postpartum dataset was tested and refined to code the maternal health professional interviews. Two authors, different than the interviewers, coded a selection of manuscripts, discussed their coding, and revised the codebook. Then one author coded the remainder of the maternal health professional interviews. These two authors reviewed the coded data and developed categories and themes, and a third author (the primary interviewer) reviewed, discussed, and refined preliminary themes. The preliminary themes were mapped to a matrix, similar to a coding tree, and then refined through multiple review iterations among team members.[63] For the closed-ended demographic, health status, and preferences measures, the team calculated descriptive statistics such as sums, means, or percentages.

Study Sample

Sixty-three pregnant or postpartum people were approached and 54 agreed to participate and were consented at point of care. Of those 54, 32 prenatal or postpartum people completed an interview. Of the 21 who were prenatal, six completed a second interview in the postpartum period. Thirty women had their interviews in English and two preferred interviews in Spanish. Twenty-one maternal health professionals expressed interest in participating and of those, fifteen were interviewed, all in English.

Demographics and Resources Used

Participants were between 20 weeks' gestation and six months postpartum. Twenty-one were prenatal and eleven were postpartum (the team conducted 21 prenatal interviews and 17 postpartum interviews). The majority of people were in the age range of 21–30 (56%) (Table 3-1). Participants self-identified as Black / African American (34%), other (43%), or white (16%). Overall, 66% identified as Latina/e. All participants identified their gender as women. All had Medicaid insurance coverage. Approximately half of the women were first-time mothers. Nearly 20% of the sample had diabetes and / or hypertension during the current / recent pregnancy. In their interviews, many participants reported worries about finances; a few had worries about having enough food; and a few were experiencing housing instability (three women had a recent or current stay in a shelter). When asked to describe perceived stress during their recent pregnancy ("How would you describe the time during their recent pregnancy?"), 20% of postpartum respondents reported having "a moderately hard time" or "very hard time".[47]

Characteristic	Number	Percent of sample
Age	**N=32**	
15–20	2	6%
21–30	18	56%
31–40	9	28%
41+	3	10%
Race	**N=32**	
African American / Black	11	34%
Other	14	44%
White	5	16%
Multiple races	1	3%
Prefer not to say	1	3%
Ethnicity	**N=32**	
Latina/e	21	66%
Gender identity	**N=32**	
Woman	32	100%
Man	0	
Non-binary	0	
Sexual orientation	**N=25**	
Straight / heterosexual	23	92%
Gay	0	0%
Bisexual	2	8%
Marital Status	**N=32**	
Single	16	50%
Married	8	25%
Living with partner	5	16%
Engaged	1	3%
Divorced	1	3%
Widowed	1	3%
Highest Level of Education	**N=23**	
Some high school (9–11)	3	13%

High school / GED	7	31%
College 1–3 years or technical school	9	39%
College grad 4 years	4	17%
Employment Status	**N=24**	
Unemployed	13	54%
Full-time work	7	29%
Part-time work	0	0%
Homemaker	3	13%
Disabled	0	0%
Other	1	4%
Number of children (not including current / recent pregnancy)	**N=32**	
0 (First time mom)	15	47%
1	12	38%
2	4	12%
3	0	0
4	1	3%
Chronic / emergent conditions: diabetes or hypertension diagnosis	**N=32**	
Yes	7	22%
No	25	78%
Pregnancy stress	**N=27**	
Happiest time	10	37%
Happy time with a few problems	12	44%
Moderately hard time	4	15%
Very hard time	1	4%
One of the worst times of my life	0	0%

Table 3-1. Sociodemographic Characteristics of Prenatal and Postpartum Participants (N=23–32)

In terms of community- and clinic-based resources used, most (80%) of participants were using the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and 28% were using SNAP (food stamps). One in five women had taken childbirth education. Only two had used a doula (only one during labor and delivery), though many reported that they would have liked to. One in five received some type of counseling or mental health therapy during pregnancy or postpartum. Nurse-Family Partnership, a nurse home visiting program for first time mothers, was used by 12% of the women (Table 3-2).

Community resources used (select all that apply)	**Number of participants using the resource**	**Percent of participants using the resource**
WIC	26	81%
Food stamps (SNAP)	9	28%
Food pantry	2	6%
Childbirth education	6	19%
Breastfeeding counseling	6	19%
Doula	2	6%
Counseling for personal problems	6	19%
Church program	2	6%
Nurse-Family Partnership home visiting program for first-time moms	4	12.5%

Table 3-2. Community- and Clinic-Based Resources used by Prenatal and Postpartum Participants (N=32)

The maternal health professional sample represented a cross section of professionals including social workers, a dietitian, nurse practitioner, physician assistants, certified nurse midwives, resident physicians, and attending physicians, one of whom was

a maternal fetal medicine (high risk) specialist (Table 3-3).

Profession	Number (Percent of sample)
Social worker	3 (20%)
Dietitian	1 (7%)
Nurse practitioner / Physician assistant	2 (13%)
Nurse midwife	2 (13%)
Resident physician	3 (20%)
Attending physician	4 (27%)

Table 3-3. Characteristics of Maternal Health Professionals (N=15)

3.3 Results

The following major themes related to barriers and facilitators to maternal self-care and health care engagement, as well as participant recommendations, were generated from the analysis. Major barrier themes include: 1) Transportation and lack of childcare, and feeling unsafe in one's neighborhood are barriers to engaging in self-care or with health care;

2) Resources are delayed for prenatal and postpartum people on their pregnancy journey; 3) Continuity of care is lacking for people prenatal and postpartum people; 4) A few prenatal and postpartum people's experiences or fear of discrimination, general disrespect, and stressful birth break trust with providers and the health system.

Major facilitator themes include: 1) Families, mom friends, the OB provider, and social media and other web applications are trusted sources of advice for prenatal and postpartum people; 2) Prenatal and postpartum people use diverse healthy coping strategies to manage emotional stress; and 3) Prenatal and postpartum people need to

trust their providers in order to have a positive care experience**.**

Participant recommendations for a maternal health coaching program resulted in the following major themes: 1) Postpartum engagement requires many levels of support; 2) Community health workers can provide emotional, instrumental, and skills-building support to prenatal and postpartum people***;*** 3) Community health workers can support prenatal and postpartum people with chronic conditions and high-risk pregnancies through check-ins and self-management skills training; and 4) Adoption, management, and sustainability of a maternal community health worker program is possible through stakeholder engagement, thoughtful implementation, and seed funding.

Barriers to Self-Care and Health Care Engagement

Transportation and lack of childcare, and feeling unsafe in one's neighborhood are barriers to engaging in self-care or with health care

Transportation acted as a barrier and stressor to engaging with care, both in the prenatal and postpartum period. The long travel distances of public transportation and the expense of taxis were major barriers to attending care visits. The physical demands of late pregnancy and early postpartum made NYC public transportation all the more difficult, if not impossible. Women reported that their struggles with transportation were worth it to them to receive care at the study site. Still, transportation was a concern and problem for the women to solve through most stages of pregnancy and postpartum.

So, I live in Queens. I live very far actually from where I was going. I had to take the train and it got very, very difficult. But towards the end, I had to take Uber and it got very expensive. Very, very expensive. – Postpartum woman

I find it challenging since my hospital is far away, so I will have to go with my baby right away since she gets an appointment three days after me giving birth, and since I can't be able to carry heavy, it will be challenging for me to go. – Postpartum woman

Lack of childcare was a barrier to engaging with care. Participants emphasized the importance of childcare for attending prenatal and especially postpartum care visits, as well as labor and delivery. Some women reported limited social support for childcare, with very few people they could rely on, while others felt they could not depend on family members for regular childcare due to their own work and family schedules. Childcare, the cost of childcare or lack of available support system, were also cited as barriers to re-entering the workforce.

I think it would've been nice if the hospital had some sort of daycare so you can leave your child in there while you're being treated. That' something [that] would've changed my experience because not only I was worried about me going into labor but also about leaving my child behind with a neighbor. But what were the choices? None, really, for me. So I think that is something that we could've got help with. – Postpartum woman

It takes a lot for childcare 'cause a lot of families don't really have a sup'ort system to help them so a lot of people might have to just stop working because they can't find anybody to [baby]sit. 'Cause even if you're working, you're

making money, you have to pay somebody. It's not really like you're making your money. – Prenatal woman

Some women (one in five) reported feeling unsafe in their neighborhoods. A few women said they preferred to stay in their homes both due to neighborhood safety and risks of exposure during the early COVID-19 pandemic (discussed in Chapter 4). This highlighted the way that perceived safety influenced women's outlook and mental health, and in turn their quality of life for social connection, exercise, and recreation.

We live in the South Bronx, and there's a lot of violence going on around here, so definitely don't feel safe, but I feel safe in my house, not in the neighborhood. – Prenatal woman

In summary, social determinants of health such as accessible transportation, affordable childcare, and neighborhood safety all posed barriers for participants both engaging in self-care and in health care. These stressors can affect overall health and well-being, as well as the extent to which people can engage in self-care strategies or access health care.

Resources are delayed for prenatal and postpartum people on their pregnancy journey

There was variable awareness of community- and clinic-based resources and services among prenatal and postpartum participants, with only 50% of participants voicing some form of awareness of the resources available to them. These participants viewed the health care team as a key source to access resources, especially those

provided by the clinic. They highlighted the ways in which key resources (childbirth education, nutrition education, WIC, other food resources) were delayed or never introduced by clinic providers and staff in their pregnancy journey.

> *I was just saying that I found out about it [childbirth classes and postpartum classes] in my ninth month. So, I only have a few weeks until I give birth. I would've much rather enjoyed the information earlier to … prepare myself.*
> *– Postpartum woman*

> *Like for example, I started getting WIC the last month I was pregnant ... like I've heard about the program, but since they never mentioned it to me, I never asked either.*
> *– Postpartum woman*

> *Al principio de mi embarazo, tuve que buscar en internet, porque con la nutricionista, la vine a ver cuando yo tenía ya unas dos semanas para dar a luz. / At the start of my pregnancy I had to search the internet, because I saw the nutritionist only 1–2 weeks before delivery – Postpartum woman*

In summary, prenatal and postpartum participants wanted to know the clinic- and community-based resources available to them earlier in their pregnancy. As mentioned in the discussion section below, this theme could have been influenced by the COVID-19 pandemic context, where health care delivery was interrupted in multiple ways. Nevertheless, the overall lack of awareness of resources and delays in accessing resources highlight a need for resource curation that could be conducted by a community

health worker or other staff member.

Continuity of care is lacking for prenatal and postpartum people

Women and maternal health professionals identified multiple systems problems that hindered continuity of care. Two major areas were appointment availability and scheduling and having multiple providers. Participants saw the inability to obtain appointments in clinic as a barrier to timely care. In some cases, they expressed difficulty with reaching a scheduler by phone. Others noted that appointments were not always available, preventing them from carrying out the recommended timing for prenatal care initiation, for example. Participants voiced that they were making efforts to do the right thing for their pregnancy, but that this part of the care experience posed barriers.

> *I can't get through. Like, there's no one to talk to. I mean, if you do get through, the experience is not as great. It's always, "We don't have appointments available. We would have to call you back," and then no one ever calls you back. It's just not the best experience. – Prenatal woman*

> *"It's hard to get appointments. And it's hard to get appropriate appointments, for example, an old patient of mine on MyChart [patient portal] just sent me a message saying, "I was your patient a couple of years ago, I'm pregnant again. I called to make an appointment and they have no appointments till the end of July." – Provider*

Women and maternal health professionals expressed frustration about patients seeing multiple providers during prenatal and postpartum care (note, the study site is a

teaching hospital, and therefore many of the providers are resident physicians rotating through the clinic). The lack of provider continuity reduced the opportunity to establish a personal or emotional connection with a provider, reducing the potential for trusting relationships between patients and providers. Participants talked about having to repeat their story and concerns repeatedly, and that having many doctors can lead to varying opinions and orders.

> *I know there's charts, but when you have the same midwife or doctor feels like a little bit more personal in that, you [don't] have to repeat yourself 'cause they remember little details. So even details about family or like what you last spoke to them about that's happening in your life. That helps. – Prenatal woman*

> *I mean, doctors can't remember every single thing about someone, but you don't feel that real support when you don't see the same person all the time. I feel like, you're just another name, and you're just getting checked out and it's like 1, 2, 3. I hate that part. I hate that you fall in love with a doctor, they care, they make a suggestion, they notice something different, and then you wanna make an appointment with them again, but they're not gonna be there*
> *– Prenatal woman*

> *I think that can be really demoralizing to them [patients] because they feel like, oh, wow, I really connected with this person, but now I'm not seeing them again.*
> *– Provider*

In summary, the inability to obtain timely appointments and see consistent providers hindered perceptions of continuity of care and overall care satisfaction at the study site. Having multiple providers hindered the establishment of trust with a provider.

Trust with a provider was one of the key facilitators to care engagement, as discussed below.

A few prenatal and postpartum people's experiences or fear of discrimination, general disrespect, and stressful birth break trust with providers and the health system

Women in the study reported overall high satisfaction with their care (average net promoter score 8 out of 10 in rating "how likely would you recommend the care at [study site] to a pregnant friend or family member with 0 being not at all likely and 10 being very likely?").[67] Some mentioned how they vastly preferred their current care provider to past experiences at other hospitals. However, while not common, ten women had negative care experiences that were perceived as discriminatory (N=3), disrespectful (N=8), and / or emotionally distressing (N=8). These experiences provide an opportunity for learning and changes in practice.

Three of 32 women reported instances of discrimination in care. These experiences of discrimination were by language, race / ethnicity, immigration status, or health insurance status. Most of the incidents were described as rudeness, akin to microaggressions, while one person experienced systematic discrimination, which included perceived quotas for reporting to child services.

> *When I was gonna get my blood draw my mom called me and I started speaking Spanish ... and one of the nurses looked at me in an ugly manner.*
> *– Postpartum woman*

I felt I was judged by my race when she called ACS [Administration for Children's Services]. And she was just seeing me as a number. I don't know if it's like, you have to get a certain amount of numbers, in terms of ACS cases they have to report, but that is how I felt. – Postpartum woman

There were also *anticipated* negative care experiences based on race reported via the maternal health professionals. Four providers noted that some of their patients expressed mistrust and fear of poor treatment based on race in response to recent media reports about the Black maternal mortality crisis in the U.S.. The providers acknowledged that a trusting relationship with the provider is critical to assuage concerns and provide a feeling of protection from a larger system that is perceived as untrustworthy or harmful.

In the media, there's been so much information about increasing rates of maternal mortality. So, I've had patients straight up ask me, "How do you know that you're not gonna let me die. From what I hear, it's dangerous for Black women to be delivered in a hospital because you're not looking for my best interest" and that is very real and it's a hard question to tackle, because people are legitimately scared, and they also are very skeptical of the care that they're receiving. – Provider

And I think with this whole big issue of Black women mortality -a lot of patients have voiced concerns about that and I think seeing a provider that looks like them, talks like them, who have maybe similar backgrounds to them - it gives them a sense of comfort. And I know that I've had multiple patients who have said, "I came back because I know I would come back to see you." I think they are definitely fearful. You know, you hear stories, you see it on the news and, you

know, probably in speaking with other members of their family or friends, it's definitely a fear. – Provider

Providers noted that their patients' concerns about mistreatment and racism in health care were valid, and one provider believed an important solution was having Black medical providers with whom Black patients can relate and in whom they can trust.

Women participants (8 of 32) also shared some experiences of general disrespect in care, which included not honoring one's concerns, feelings, or bodily autonomy during the recent pregnancy, delivery, or postpartum period. Some reported disrespect as being ignored or "brushed off." Others described a more direct disrespect, either physical or verbal, such as a very uncomfortable physical exam, criticism, or in one case, perceived threats.

I had a medical concern and she was basically brushing it off like, oh, it's nothing. It's a normal thing. And I knew it wasn't normal for me. It wasn't until I had my next appointment with that midwife that I actually do like and I come to find out, I did have a medical concern that was going on. – Prenatal woman

I think this was like a resident that they were about to put on the floor to work on others, and yeah, she didn't really know the body parts too well or how to find them if she needed to. That's who they had basically helping... letting her get her little training during someone's labor. And that's the worst time, that's the most pain you feel. – Postpartum woman

She [the pediatrician] said "either you give him formula or we're taking him and we're admitting him to the hospital" The way she spoke to me and my husband, as

> *first time parents, basically threatening us to take away our baby and admit him to the hospital because we're starving him to death, which wasn't the case ... I don't wanna say she was the sole reason why my breastfeeding journey was ruined, but her advice probably wasn't the most beneficial, to put it in kinder words. And I didn't feel comfortable with her quality of care, or really caring about what I had to say, what I felt. – Postpartum woman.*

These instances of disrespect led to breeches of trust that caused emotional distress that could change the course of the pregnancy, birth, and / or postpartum experiences. Yet there were opportunities to repair the broken trust. For example, the postpartum woman who reported disrespect from the pediatrician initially lost her confidence in breastfeeding. Later she established care with a new pediatrician that led to a positive breastfeeding experience. The woman whose symptom concerns were ignored at her prenatal visit repaired trust in care through another midwife who acknowledged and followed up on her concerns at the next encounter.

Women (8 of 17 postpartum participants) expressed feelings of emotional distress specifically related to the recent labor and delivery experience. The interviews acted as an informal mechanism for women to recount their birth story and express any emotions about their experience. Three of these experiences were related to difficult epidural placements (multiple attempts). For those with complications around the birth, there was a sense of surprise or shock at unexpected events, and also relief and gratitude to the health care team that the baby and mother were ultimately safe. It is unclear if any of their experiences would qualify as a severe maternal morbidity (SMM) event.

And [they] said they have to do an emergency C-section and he ended up coming out with like the same [infection] that I had. So, he had to be in the NICU. And the experience, it wasn't too bad, I just wish I was able to do my natural labor that I wanted to. I didn't have problems with my pregnancy. I wasn't overweight. I didn't have high blood pressure. I was just shocked ... that wasn't planned, you know. – Prenatal woman

They had to do a bunch of different stuff in order to get him back to be breathing. So that was a really hard five minutes of my life. It didn't go exactly as planned, it happened the way that it should have happened. We're both alive, we're both healthy. At the end of the day, that's all that mattered to me. Once I was in that moment, the birth plan flew out the window and I said, "I don't care. Just make sure my baby's okay, and make sure I'm okay." And, you know, as long as we're fine, I don't care. – Postpartum woman

Two participants also spoke of emotional trauma, driven by fears of birth leading up to the delivery. One woman recently tragically lost a friend to childbirth. The other was struggling with an intense phobia surrounding birth and the systematization or medicalization of birth.

It was kinda scary because I had a girlfriend that just had a baby before me, and she passed away during birth. So that was a little traumatizing to me ... The biggest influence was just having a healthy baby and, and surviving through the whole, the procedure and, you know, avoid what my friend went through. – Postpartum woman

> *I haven't been able to talk about my delivery, just 'cause the experience was so horrifying to me. It was nothing that I prepared for or expected. It just felt very systematic.*
> *– Postpartum woman*

These labor and birth experiences highlight the potential need for support and emotional processing after labor and delivery. A CHW / health coach could provide that support in collaboration with mental health and medical providers.

In summary, participants shared negative care experiences of discrimination, fear of discriminatory care, disrespect, or emotional distress surrounding labor and delivery. These experiences caused confusion, upset, or breaking of trust in care, and they highlight a need for a culturally-sensitive, trauma-informed approach to clinical care and health coaching, as well as a possible need for more formal mechanisms in the care process to rebuild trust.

Facilitators to Self-Care and Health Care Engagement

Families, mom friends, the OB provider, and social media and other web applications are trusted sources of advice for prenatal and postpartum people

Family members and friends who also had babies were trusted sources of advice for self-care in pregnancy and postpartum, including rest and sleep, nutrition, labor, breastfeeding, as well as infant care. They were an especially strong source of advice and skills learning as their infants developed and new scenarios arose for caring for the baby. Some family and friends provided continuous support and motivation along with their

advice.

> *I just like how my family is encouraging me [to breastfeed] and they're telling me it may be difficult in the beginning but don't give up. So, I really liked that 'cause I did hear that breastfeeding can be difficult for some people but don't take anything personal and everything will work out. – Postpartum woman*

> *One of my friends, we actually were pregnant at the same time, and our babies are a week apart, so we both share some things that are helpful, and we talk about our kids and if we need anything. – Postpartum woman*

While women listened to their families and friends for information and advice, there were times when they provided conflicting information with what they were learning from other sources, such as the doctor or the internet. As a result, some women balanced the information from family and friends with their doctor's recommendations, while others strictly followed the OB provider's recommendations above all else.

> *I feel like I will be comfortable listening to whatever the doctor says and base a little bit also on what my mom is saying along with what I read online that is approved by the CDC. – Prenatal woman*

> *I'm going for what the doctor is saying. Right now, I don't think I'm in a position to take anybody else's advice. I'm going for what the doctor expects me to do and that's it.*
> *– Prenatal woman*

Social media and other web applications were also widely used for information and skills building (Instagram, YouTube, Google, What to Expect, Baby Center) as well as social support (Facebook support groups, Instagram). Most women did not read books but did review articles provided via What to Expect or Instagram, and video tutorials found on You Tube. Participants appreciated the quick and accessible learning and inspiration that applications like Instagram provide. For more in-depth social support and peer interaction, some participants preferred Facebook groups.

> *I feel like I learned a lot, like this day and age, you learn so much by like just reading and videos and Instagram stories dedicated to pregnancy and birth. I feel like I've learned a lot from those and apps that lead you to articles and just looking things up on Google.*
> *– Prenatal woman*

> *I joined a Facebook group [about childbirth]; there's already moms there that have given birth that are part of the community and they give a lot of advice on different things. – Postpartum woman*

In summary, while varying in order of importance for each person, most participants valued information provided by family, friends, their OB provider(s), and online sources, and creatively compared and synthesized the information to gain the best possible understanding. For some participants, the doctor's guidance was the bottom line to follow. All of these sources are important to include in the content and messaging of the future CHW / health coaching program.

Prenatal and postpartum people use diverse healthy coping strategies to manage emotional stress

Women reported using healthy forms of distraction to cope with emotional and mental stressors of pregnancy and postpartum. Some coping strategies focused on healthy distraction to "keep the mind off things, not let worries get me down." These included walking, listening to music, painting nails, watching movies, and social connection with friends and family. Others looked to more contemplative strategies of connecting with oneself and channeling or calming the body and mind, such as journaling, prayer, meditation, and yoga. The choice of coping strategy generally depended on the participant's personality, preferences, and spiritual or religious orientation, as well as resources available to them. The participants spoke of their self-care and coping activities in a way that highlighted how well-being is multifaceted and includes the physical, emotional, and spiritual levels.

> *So, whenever it's really nice here, I try to go outside as much as possible. One, to take the baby outside so he can get some fresh air. And, two, just because having that daily walk definitely helps me. – Prenatal woman*

> *I literally started praying more and speaking to God more and going to church and being positive. And trying to change my energy and be around good, positive energy and go on walks and stay active. – Prenatal woman*

> *For the most part, I just self-consciously speak affirmations to myself. I think that's what gets me by every day. – Prenatal woman*

Participants described an array of healthy coping strategies that they used, from physical movement to spirituality, all of which can be incorporated into the ethos and content of a health coaching program. Of note, many of these coping strategies align with evidence-based healthy self-care behaviors for diabetes, hypertension, or depression and anxiety and can be included in a coaching program curriculum.

Prenatal and postpartum people need to trust their providers in order to have a positive care experience

Participants viewed trust in their providers as a central component of a positive care experience. Accounts of how a sense of trust is instilled and grown fell into two categories:

1. Provider-patient relationship centered on communication, shared decision making, and taking an interest in the patient's life
2. Diversity of providers and staff

Women highlighted many positive care experiences that centered on trust in their medical provider (physician, nurse midwife, nurse practitioner, physician's assistant). When a medical provider showed open communication and respect for the patient's perspective and preferences, women had confidence and trust in their care. More specifically, the women valued the spirit of shared decision making, in which the provider gives information and partners with the patient on care decisions.

> *They would explain everything thoroughly to me, I just always felt like I knew the why of everything. And it was just really helpful to me. It just made me feel more calm about it all. – Postpartum woman*

They really left the option up to me. [With this recent delivery] they ask you like once [if you want an epidural], they came back one more time. And I was like, "No." And then that was it. There was no more like question about it.
– Postpartum woman

They render advice, but there wasn't any pressure. – Postpartum woman

Again, very comforting. She answers all my questions as best she can, and also always leaves things open in a sense. – Prenatal woman

In addition to communication and shared decision making, providers getting to know a patient and showing a deeper interest in the patient's life were important for building trust. One participant highlighted the idea that the medical provider "worries about your life," showing a deeper sense of concern for her safety and well-being. From this place of trust, women reported feeling calmer and more communicative with the health care team, two states that can improve maternal health outcomes.

I guess the midwife that had interest in me and offered help, like offered me things. I was able to communicate with them. I was able to open up with them.
– Postpartum woman

One of the doctors, they asked if I am doing well or if I had violence in my home. And I'm glad they ask because you never know what a patient could go through and maybe they don't want to raise their voice. Thank God in my situation I haven't gone through those things. But I feel that's a good thing that they will ask

those things. They worry about your life. – Postpartum woman

Women and maternal health professionals also highlighted how racial, ethnic, and cultural diversity of providers and staff can help build a sense of comfort leading to a trusting care relationship. Some prenatal and postpartum participants appreciated the diversity of the (non-physician) staff, allowing for a greater chance of interacting with "someone who looks like me, and understands me." Two providers expressed concerns about the lack of diversity among the medical provider group at the site, which they believed could result in patients feeling less comfortable or understood.

One thing I really like about [the hospital] is that the staff there seems really diverse. So no matter what your ethnic background is, there's someone there who can relate to you or, someone you can relate to. And just seeing the diversity there is nice."
– Prenatal woman

I am a provider of color and I know that I've had many patients say that they feel more comfortable speaking with me and getting care from me because I look like them. They see themselves when they look at me. And I think at [our hospital] often we don't have that. – Provider

When asked about preferences for their OB provider, many women stated that they would choose a woman provider because they would feel more comfortable with someone who can "relate to them firsthand." Just a few women reported preferring a provider of their own race or ethnicity, saying that this provider would be more relatable, understanding, and more likely to take you seriously.

> *I would choose preferably an African American doctor. [Interviewer: did you have an African American provider?] Yes during the delivery. She was a student, but very understanding … she was more relatable and listened and understood more.*
> *– Postpartum woman*

> *I know if I have a midwife or any staff member or any nurse who is of the same race … I just feel like, yes, I think that does matter because they know what it's like, not just in the medical field but just generally. And are more likely to take you seriously.*
> *– Prenatal woman*

In summary, many aspects of a trusting relationship between patient and provider involve open, reciprocal communication, shared decision making, and showing an interest in the patient's life. Participants highlighted diversity of staff and providers as a point of connection and potential trust between patients and health care. All these avenues of trust-building are important to consider in efforts to provide high quality, equitable care.

Participant Recommendations

Women and maternal health professionals shared recommendations on what is needed to ensure postpartum visit attendance. They then recommended the most important components of a maternal health coaching program and areas of focus for the CHW or health coach role. Finally, maternal health professionals recommended strategies

to ensure successful adoption, implementation, and sustainability of a maternal CHW program at their site.

Postpartum engagement requires many layers of support

Maternal health professionals and women highlighted what is needed for patients to successfully engage with postpartum care, including instrumental support and reminders at the individual level, as well as changes in postpartum visit timing and scheduling at the institutional level. Both types of participants shared the same sentiment that the postpartum period is a busy time with competing priorities, and that more than one form of support is likely needed for a person to attend postpartum visits.

Women and maternal health professionals emphasized instrumental support, such as transportation and childcare, to help with postpartum visit attendance. This was discussed in depth previously under the section on barriers. Two women made an important point about the need for assistance with lifting and mobility for any visits soon after the birth (wound check, blood pressure check).

> *That was another hard thing for me, like moving around and stuff. I had to go hospital right after I had a C-section, so it was a lot. And then I live on the fourth floor. So someone to be there would've really been helpful. – Postpartum woman*

The women (5 of 20) and a few maternal health professionals recommended appointment reminders or even personalized outreach to promote postpartum engagement. There was a sense from these women that these actions would make patients

feel valued and supported. Maternal health professionals and women stated the importance of providing the rationale about the postpartum visit to patients. Two physicians explained that they do not start talking about the postpartum visit until late in the pregnancy or after the baby is born, because their focus is on providing comprehensive labor and delivery anticipatory guidance. Therefore, a reminder and reinforcement of the visit's importance by someone like a CHW or health coach could be useful. One social worker suggested that reminder calls include an assessment of and plan for a person's barriers to visit attendance.

> *A personal [appointment reminder] phone call. Instead of going on your app and checking in and confirming on an app. – Postpartum woman*

> *Identifying these patients who could be lost at follow-up and having someone in the community reach out to them might be helpful. – Attending physician*

Finally, participants suggested structural changes to postpartum visits so they are more flexible and accommodating to patient schedules, with evening and weekend hours. In addition to flexible hours, a few providers indicated the need for sooner (before 6 weeks) and more numerous (more than 1–2) postpartum visits as standard of care. By checking in with a postpartum mother sooner, not only could this promote overall postpartum engagement, but risks could be detected earlier, such as mental health issues or breastfeeding challenges.

> *So I think that we should have a more formalized check-in with the patients at about the two week mark …ACOG has really pushed for the postpartum visits to be two parts, where you do one at the four week mark or sooner, and then at the six to 10 week mark. I know with insurance issues, that can be a little tricky, and hopefully legislation will help change that. I think by the time we have our patients come back at six-to-eight-week timeframe, it's just so far removed from the actual delivery that I think by then we've really missed the window for postpartum depression or increased anxiety, and breastfeeding issues.*
> *– Attending physician*

> *No, I think something in between really would be key, for someone to check in between the discharge and the postpartum visit, 'cause it's a long time [until the usual postpartum visit]. – Social Worker*

Postpartum people require some if not all of the categories of support to attend a postpartum visit. Community health workers and health coaches can deliver on many of these, in conjunction with social work and medical providers, and could be particularly useful for conducting a postpartum check-in before the official postpartum visit.

Community health workers can provide emotional, instrumental, and skills-building support to prenatal and postpartum people

Women and providers alike believed that a health coach could add value to maternity care. The women and providers had different perspectives on the ideal focus and components of health coaching (Table 3-3). When provided a menu of options on how health coaching could help prenatal and postpartum people, the women prioritized:

- Emotional support (doula / labor support, care accompaniment)
- Instrumental support (transportation, childcare)

When presented with the same menu of options, providers prioritized:

- Skills building (childbirth classes, breastfeeding support, chronic condition self-management education, learning to self-advocate,)
- Instrumental support (transportation)

Component	Women Preference	Maternal Health Professional Preference
Personal / Emotional Support		
Doula	72%	46%
Care accompany	59%	40%
Postpartum check-in with coach before leaving hospital	50% (N=17)	60%
Coaching on managing stress	50%	40%
Education		
Childbirth education	50%	73%
Chronic condition support / education	28%	67%
Breastfeeding support	31% (N=17)	87%
Advocacy (learning to advocate for oneself)	28%	60%
Partner education	47%	53%
Online / cell phone education program	53%	40%
Nutrition education	28%	26%
Instrumental		
Transportation	62%	53%
Childcare	53%	40%
Connect to community resources	46%	40%

Table 3-4. Preferred Components of a Maternal Health CHW Program according to Prenatal and Postpartum Participants (N=32) and Maternal Health Professionals (N=15)*

*Respondents chose top 2 components in groupings of 4

In the interviews, the women shared additional thoughts about the CHW / health coach role, describing them as someone they can trust for support and advice, and someone who could benefit first-time mothers (presented as subthemes below).

The CHW / coach as a "trusted someone"

Women (19 of 32) reported the importance of having someone they can trust and rely on for emotional support and information. They often described the coach as a trusted person who they could call and be comfortable reporting new issues or asking for advice. They also described the coach as someone who would reach out and check up on them. Trust in the coach was defined by participants as having good rapport and a long-standing relationship, in which the coach is consistently available and providing reassurance based on accurate information. They stated that having this person would provide a sense of security, reduce stress, and could assist with improving mental health. Of those who reported the importance of this trusted someone, half were first-time mothers.

> *A good maternal [coach] would be … by building a trust, 'cause that's a big factor … when the person is someone I trusted, I feel comfortable with, with the provider or the service, everything would be less stressed. -Postpartum woman*

> *I mean, just being there, having somebody be there for you, that's great, other than your husband, and your family and friends. They have the information you probably need and you want. They have that so you feel more secure, like the security, the reassurance. – Postpartum woman*

They at least have somebody to talk to if they need to … maybe feeling down and out, they have someone they can call outside of their family. 'Cause I'm not going through any postpartum depression or anything, but I'm pretty sure a lot of the women do go through it and they, they need someone to talk to. – Postpartum woman

I think emotional or mental health is a very important aspect, if not one of the most important aspects in pregnancy. So I think, um, integrating that into a program would be very, very important. – Prenatal woman

The majority of the women nearly (23 of 32) expressed interest in a doula as another form of trusted support and advice. The doula was defined as a labor support person that supports a person through the birth and afterwards (Table 3-3). Women cited lack of accessibility to doula services due to cost or general availability.

I think having access to a doula would definitely be top one of the top two [choices for program components]. 'Cause I feel like that's not something easily accessible to everyone and not everyone has the support, and some people want a doula but just can't afford it. – Prenatal woman

The CHW / coach could be particularly useful for first-time mothers

Some women participants (4 of 32) believed that first-time mothers could particularly benefit from a CHW / health coach to fill in gaps in knowledge, skills, and support on their path of new parenthood. Those who made this suggestion for support of first-time moms were equally first-time and experienced mothers. They provided examples

such as advising on what to expect in the pregnancy, providing support in care visit attendance, and connecting people to resources.

> *Some people who are first-time parents and that are young, to coach them in the best way possible. As I mentioned before, throughout this pregnancy, I didn't really learn about how to breastfeed or how to be a parent or what to expect. And sometimes you feel comfortable when it's a professional in that field telling you what to expect and just coaching you throughout their pregnancy and [see] how they're feeling. Be more available to go into depth with things. – Prenatal woman*

Community health workers can support prenatal and postpartum people with chronic conditions and high-risk pregnancies through check-ins and self-management skills training

Maternal health professionals believed the CHW intervention would be most useful for patients with chronic conditions and high-risk pregnancies. In reflecting on what would be most helpful for women with diabetes, hypertension, and other high-risk pregnancies, providers and prenatal and postpartum people emphasized education about a new diagnosis (hypertension or diabetes) and guidance on what to expect week-by-week during the pregnancy. Other key areas included nutrition education, self-monitoring of symptoms and results, and having someone with whom to check in about concerning symptoms and monitoring data. In addition, professionals suggested that CHWs / health coaches could reinforce provider messaging and instructions at each care touchpoint, including concerning signs and symptoms and when and how to call the health care team.

I definitely think nutrition. I think teaching how to monitor blood pressure and [blood glucose] finger sticks. I think making sure that they understand the importance of these diagnoses during prenatal care is so important. I think the classes would be really beneficial, or having someone check in on them in between provider visits. Or if they miss the visit then just having someone call to review the blood pressures and finger sticks and if it's elevated they can always let a provider know. – Provider

Just being informed on steps that you can take to manage the hypertension. Whether the nurse or the coach is giving you information on foods you can eat or activities you can do. I think that would be very helpful. – Prenatal woman

If they're able to understand the basics of hypertension, diabetes, and be able to help guide patients through that process. I feel like a lot of times, we tell them "This is what you should do." And very brief, "This is why you should do it." But it would be helpful to have someone really guide them through each step, and really explain why it's so important. – Provider

In their assessment of the needs of people with chronic conditions, the providers and women reported adequate mental health screening and treatment at the study site. Continuity with primary care in the postpartum period was mentioned by some providers but was not a major theme.

Adoption, Management, and Sustainability of a Maternal Community Health Worker Program is possible through stakeholder engagement, thoughtful implementation, and seed funding

Recommendations for Adoption

Maternal health professionals (MHPs) shared recommendations on the best pathways to ensure successful adoption of a health coaching program at their hospital. Successful adoption of a health coaching program fell under the following categories:

1. Gaining staff buy-in and providing staff with reassurance
2. Gaining patient buy-in and providing patients with reassurance
3. Defining coach role / scope / processes and integration into the care team

To gain staff buy-in, MHPs anticipated that staff would require understanding about how health coaching could improve patient care and reassurance that the coach would not encroach on their scope of practice or generate additional barriers to workflows. For example, nurses and social workers may be concerned about the overlap between their duties and those of a coach and any redundancy or friction in daily workflows. Doctors might be concerned about criticism or antagonism by the coach regarding their practice of patient care. Some MHPs also believed that patients might be hesitant to receive a coach in their home. Information on the value of a coach to their care might improve patient buy-in.

> *I think that there have to be meetings with all the individual folks, the residents, the social workers, who I can see could, could be a little bit territorial ... about*

> *this role. With the nursing staff, really emphasizing how these support people will integrate themselves within the process, and their goal is not to be obstructive in any way. – Attending physician*

> *They [patients] just don't want anyone of "authority" coming into their home. – Dietitian*

Another key to adoption cited by MHP participants was a clear definition and integration of the coach role into the team and workflows.[65–66] This would provide staff reassurance regarding the coach role as complementary and supportive to their work. Role definition is also critical to ensuring successful implementation of the program, so that the coach can have the greatest focused impact on the target population.

> *[It's important] for that person to really also be integrated into the clinic and understand what everyone else's role is, right? – Social Worker*

Recommendations for Management

Maternal health professionals also shared insight into the management and supervision needed to support health coaching practice at the site. Feedback on how to supervise and integrate health coaching into the clinic and team context fell under these categories:

1. The supervisor should be an attending physician
2. Consider adding a nurse layer between coach and doctor for escalating urgent issues
3. Closely link with social worker to provide guidance to the coach and also for cross-referrals

Many providers believed that the ideal supervisor would be an attending physician, as they are a consistent presence in clinic and possess a strong network within the hospital and across all aspects of care. If the program focuses on diabetes and hypertension, then a high risk (maternal fetal medicine) attending physician would be needed. One other option for the supervisor would be the high-risk clinic NP, but this role does not attend births, and participants felt a connection to all aspects of maternity care is important.

> *I think good supervision. If it's going to be the medical director or the nurse manager, I think that the health coaches need to feel supported in that they have the knowledge, or someone to really walk them through whatever they need to know. And someone to orient them to our clinic, right? – Social worker*

> *I feel like it would be really beneficial to have it be one of like the senior OBGYN physicians there. Who knows our patients and can understand needs of the patients, but also understands how the clinic works and can kind of be a good liaison for the coach to really navigate that system. – Resident physician*

Other suggestions included an escalation process to the clinic triage nurse to prioritize urgent issues, so that the attending physician supervisor only receives the most clinically urgent patient issues that cannot be solved by the nurse. Providers highlighted the utility of a close collaboration between the CHWs and social worker both for mentorship of the CHW, and for co-management of select patients with psychosocial stressors.

Recommendations for Sustainability

Providers recommended the following strategies for sustainability of the program:

1. Introduce the program to the department with external funding secured
2. Gain political support from stakeholders across the hospital
3. Show impact and benefit to key stakeholders in the OB department (staff, providers, administrative and clinical leaders)
4. Work to advocate for payor (New York State Medicaid managed care) coverage

The providers recommended approaching the implementation site with external funding secured. This would instill confidence in the staff that this was a program in which they could invest their time and energy. The seed funding would also allow an opportunity to conduct a pilot program for proof of concept at the site.

> *Pertaining to our department, I think that funding is the thing that is the limiting factor for everything that we do … So I think that is the political part of it, right? So if we don't have to come up for the budget, I feel like the department would be much more interested. Just as, that is our culture here. – Attending physician*

Another recommended strategy for sustainability was gaining support across the health system, by engaging and inspiring stakeholders throughout the hospital. Providers noted that showing early wins or impact of the program would be critical to engage both hospital-wide and departmental (OB/GYN) stakeholders.

You know, [name], who is our VP of patient experience here, she's always strongly believed in this patient navigator or community worker [model]. Sort of what you're talking about, she really feels that would make a difference. – Social Worker

I think it helps when trying to get support for a program like this to show the benefits of it, so keeping track of how this is helping patients. – Social Worker

Finally, gaining support through state-level policy would potentially allow for longer term sustainability. As one provider pointed out, New York State has shown an interest in the maternal health crisis in New York City, and has funded doula services in recent years via Medicaid. This doula funding precedent might open the door for conversations with NYS Medicaid and NYS Medicaid managed care leaders regarding support of CHW models that aim to reduce maternal morbidity and mortality.

I don't know exactly what the process is, but the funding should be written in for every patient. It should be paid for by the patient's Medicaid. So every patient who qualifies for Medicaid should get a home coach. And I get the sense that Governor Cuomo was supportive of this kind of thing. There was a bill that passed that provided funds for doula payments through Medicaid. So this seems like something that could be very similar. – Nurse Midwife

3.4 Discussion

This study explored barriers and facilitators at many levels of the social ecological model in order to inform the design of a maternal community health worker / health

coaching program. We identified key themes that hinder or facilitate maternal self-care and engagement in health care, as well as recommended components of a maternal CHW program.

Social determinants of health barriers were widely reported and included lack of transportation, childcare, and safe spaces, consistent with past studies looking at barriers to maternal health self-care and health care engagement stemming from structural inequities and racist policies.[68] In addition, analyses revealed the central importance of correct timing of resources, continuity of care, trust in care providers, and an equitable care experience. Facilitators identified in this study were family, mom friend, and OB provider advice, use of social media and other web applications, positive coping strategies, and a trusted provider relationship. Additional themes provided insight on what components to emphasize in a maternal community health worker / health coaching program, and strategies to ensure successful adoption, management, and sustainability of a program at the site.

Building trust between the health system and birthing people. Trust was a cross-cutting concept between themes in this research. The prenatal and postpartum women in the study emphasized the central importance of trust in any care relationship,[69] as well as continuity of care, especially in the form of a consistent provider[70–71] during prenatal care at minimum. Trusting relationships with the provider and other medical staff are important for engagement with care,[72] levels of pregnancy / prenatal stress,[73] and perceptions of a positive or negative care experience,[72] all of which can influence maternal health outcomes. The community health worker / health coach is positioned to

foster this trust and consistency in care, as they often grow the closest and most trusting relationship with the patient.[73] This strong and stable relationship can be especially important if there is no one else in their life to fill this role.[73] The health coach does not replace the need for a positive provider-patient relationship but can provide the trusting connection that is needed for a high quality care experience and care continuity for birthing people.[73–74]

The importance of a facilitated health journey. The theme of delayed introduction of resources identified in this study highlights the opportunity for a health coach to curate the prenatal / postpartum journey for patients, through assistance with timely appointments.[75–76] education on chronic conditions or skills relevant to their stage of pregnancy / postpartum, and community and clinic resources introduced at the right time and place for the pregnant / postpartum person. These functions have been used for other community health worker interventions with success,[39–41] and can add an important layer to the management of chronic conditions (diabetes, hypertension) throughout the prenatal and postpartum periods.

Promoting equitable, anti-racist / anti-discriminatory, and joyful care. Few women in this study reported experiencing disrespect or discrimination at the study site. Focus groups conducted by Janevic et al. (2020) at the same study site gained numerous complex accounts of disrespect and discrimination.[77] This dissertation was not solely focused on this topic, which may have prevented more in-depth accounts from the women, and there may have been a perceived connection between interviewers and care team that prevented women from sharing their experiences. Next steps might be to carry

out a similar assessment at nearby hospitals using a framework and methodology (in-person focus groups) similar to Janevic et al. (2020).[77] There are also qualitative data about New York City hospitals from the birth equity rating app, called Irth, that can complement this study's findings on discrimination, racism, and disrespect.[78]

This study's participants emphasized the importance of greater racial and ethnic diversity for improving trust in care. This recommendation is consistent with findings from some but not all studies on racial and ethnic patient-provider concordance.[79–82] A health coach, who is from the same community and trained in culturally sensitive care, can add value while policy and professional education programs change to improve provider diversity.

In reference to creating a joyful care experience, this study confirmed previous research, that some patients, particularly Black women, experience worry over anticipated discrimination and negative outcomes from hospital maternity care.[83] This finding highlights the need for health systems and providers to communicate safety and to use a culturally-sensitive, trauma-informed approach. Many leaders in the maternal health space are also advocating for a joyful strength-based approach to pregnancy and birth to reduce maternal stress.[84–86] This aligns with study findings that when birthing people feel positive social support, they have better health outcomes.[87–89]

Emotional distress from the birth experience. The birth experience is an important marker of care quality that can linger as a distressing memory for mothers many years after the birth.[90] The retelling of the birth story is a widespread practice among family and friend networks. In this study, this retelling happened via the

interviews, and highlighted a possible need for formal emotional processing within care, both to support mental health and to repair trust in care. This discussion builds on prior studies in the same geography, which highlight the missed opportunity to repair trust through formal follow-up after a traumatic peripartum event.[91] A recent study conducted in NYC during the height of the COVID-19 pandemic response found women with low birth satisfaction were more likely to report postpartum anxiety, stress, depressive symptoms, and lower exclusive breastfeeding rates.[92] The study also found that experiencing one or more incidents of health care discrimination during birth was associated with higher levels of postpartum stress and birth-related PTSD.[92]

Studies describe how postpartum people are grateful for receiving life-saving care and surviving complicated or traumatic deliveries, but because this bar is so unacceptably low, many traumas go unprocessed.[91, 93–94] There is equivocal evidence on whether a traumatic birth should be processed and how.[95] One review found that postnatal debriefing with a midwife within 72 hours of the traumatic birth event is more effective than usual care at preventing post-traumatic stress symptoms.[96] Another review suggested that "while there is no evidence that postnatal debriefing reduces maternal morbidity, women find the service of value."[97] Regardless, this study's findings highlight the importance of a trauma-informed approach to care.[98–100] Community health workers / health coaches can play a role in a debriefing process and in more broad community-based healing surrounding severe maternal morbidity and birth trauma.

Postpartum visit attendance requires an investment. Postpartum visit attendance is important for reducing the risks of maternal morbidity and complications.[101] This study

found that many layers of support need to be in place for the postpartum person to attend these visits, all of which would require investments by government and health systems in accessible transportation, childcare, care accompaniment, and health care system modifications.[102] A CHW, coupled with a resource such as transportation support, could improve this important endpoint. The coach can not only encourage postpartum visit attendance, but also conduct formal check-ins postpartum to bridge the time gap between leaving the hospital and the postpartum clinic visit, as recommended by the American College of Obstetricians and Gynecologists (ACOG).[101]

Defining CHW / heath coaching practice for maternal health. This study confirmed others that found women consider emotional support and structural support are essential[21, 103-104] for positive experiences. In addition, providers placed emphasis on skills building and education for chronic conditions, childbirth, and breastfeeding. In summary, based on this stakeholder input, health coaching practice domains, in collaboration with the maternity health care team, should include:

- Emotional support in collaboration with social worker as needed
- Instrumental support (transportation, childcare, care accompaniment) in conjunction with social worker
- Skills-building and education (chronic condition home monitoring, nutrition, diagnosis and what to expect) to reinforce provider and nurse messaging
- Detecting and escalating emerging risks with support of supervisor and / or provider

- Continuity and care coordination (appointments, checking in, introducing resources at right place and time)
- Advocacy in health care settings
- Processing birth experience in conjunction with social worker or provider
- Labor support (possibly)

These practice domains are consistent with others who have focused on chronic conditions in the community health worker space.[39–41] Coaching program components and coach competencies and scope of practice are provided in more detail in Chapter 5.

The CHW program will take a strength-based approach and focus on the assets or facilitators identified in this study, such as family and friend advice, provider guidance, use of social media, healthy coping strategies, and trusting care relationships. CHWs will be trained in the Black Mamas Matter / Reproductive Justice principles to guide their practice and advocacy for their patients. Adaptation of the Respectful Maternity Care (RMC) framework and CHW training materials to the local NYC context should incorporate ways to address discriminatory and disrespectful care into coaching and maternity care practice.[105] Other tools that will be considered are the NYC Standards of Respectful Care at Birth,[106] and shared decision-making tools such as one recently developed by Partner to Decide.[107]

Keys to successful adoption, implementation, and sustainability. Using the Intervention Mapping framework and its focus on adoption, implementation, and sustainability, the study findings highlighted key strategies that were consistent with a recent study building a sustainable maternal community health worker program,[108] recent

National Committee for Quality Assurance (NCQA) guidelines,[109] as well as Institute for Medicaid Innovation recommendations.[110] Importance of clear role definition for adoption and implementation is supported in the literature.[65–66] Findings also highlighted the essential role of clinical and administrative champions to promote systems change and ensure adoption of the CHW model.[111–112] In-depth recommendations and discussion for building a maternal CHW program including implementation and sustainability are presented in Chapter 5.

Strengths and limitations. Strengths of the study include rich stakeholder information due to an in-depth and thorough process of interviewing and analysis. The study team also had a close partnership with the study site, allowing for successful participant recruitment, relevant study design and research questions, and the strong potential for eventual implementation of an intervention based on the study findings.

There were some limitations to this study including the small sample sizes. Also, some prenatal and postpartum participants may have viewed the interviewers as affiliated, even if loosely, with their OB care providers, which could lead to social desirability bias, inhibiting an honest reporting about their care. The research team worked to minimize this risk by emphasizing their external researcher roles, confidentiality, and voluntariness at the beginning of each interview through a second review of informed consent. Participants were also informed that results would be deidentified and reported as themes. The interviewer emphasized rapport-building at the start of and throughout each interview. The same concern of social desirability bias could apply to the provider participants, as they were interviewed about their current place of

work. The interviewers identified themselves as members of an external research team and emphasized confidentiality at the start of each interview.

It is unclear how much the COVID-19 context influenced participants responses and therefore the results of the first three research questions. For example, the provider interview data could be influenced by certain levels of burnout from providing maternity care during the first year of the pandemic.[113–114] Another example is prenatal and postpartum people's perceptions of delayed resources or disrespectful care; studies suggest disrespectful care increased in frequency during the height of the pandemic.[92, 115–117]

Mental health, which is covered in more detail in Chapter 4, may have been better measured with pregnancy and postpartum-specific depression and anxiety screening questions,[55] but due to their length, the research team opted for the general 2-question depression (PHQ-2)[56–58, 118] and anxiety (GAD-2)[59] scales so as not to break the flow of the interview. This study did use the exact same four anxiety and depression questions as the Listening to Mothers survey.[60]

The maternal health professional sample size would ideally be larger and more diverse, with additional social workers and registered nurses interviewed. The sample is 50% physicians and 73% "treating provider," which includes physicians, certified nurse midwives, nurse practitioners, physician assistants. Nevertheless, certified nurse midwives, nurse practitioners, and a physician assistant, all have unique disciplines and training, and with that, diverse professional perspectives.

Due to the qualitative nature of this study, the findings are not generalizable to the

prenatal and postpartum population as a whole. However, findings could be used as lessons learned and points of exploration to understand and address maternal morbidity and mortality in similar U.S. communities. The findings are most transferable to mothers living in other urban communities in the U.S., particularly cities with low-income mothers of similar cultural backgrounds (Black/African American and/or Latina/e). Health systems that are best positioned to apply findings and subsequent recommendations (presented in Chapter 5) include larger academic medical centers and federally-qualified community health centers. These sites of care are more likely to have interdisciplinary teams, a history of clinical champions to promote systems change, and technology infrastructure such as electronic medical records.

3.5 Conclusions for Practice

This study uncovered important barriers and facilitators to optimal maternal self-care and engagement in health care. Findings emphasized the importance of care continuity with coordinated resources, investments in postpartum care, and the critical role of trust in the health care experience. While the experiences with care among prenatal and postpartum people were good overall, the interviews highlighted how some experienced disrespectful care and others worried about discriminatory care and their safety in health care. This finding confirms the need for evidence-based tools to build trust and equity in maternal health care. The CHW, a trusted source of support and advice for the patient, is one way to help build communication and trust in care. This study also highlighted the importance of stakeholder feedback that will assist in the design of a

relevant and strength-based CHW program. Findings and recommendations from this study can potentially be used for similar populations and settings in other U.S. communities, as we all work to build novel models to improve maternal morbidity and mortality.

References

1. Maternal Mortality in the United States: A Primer. Commonwealth Fund. Issue Brief and Report. December 16, 2020. Available from: https://www.commonwealthfund.org/publications/issue-brief-report/2020/dec/maternal-mortality-united-states-primer

2. Trost, SL, Beauregard J, Nije F, et al. Pregnancy-Related Deaths: Data from Maternal Mortality Review Committees in 36 US States 2017-2019. Atlanta, GA: Centers for Disease Control and Prevention, US Department of Health and Human Services; 2022

3. Huang RS, Spence AR, Abenhaim HA. Racial disparities in national maternal mortality trends in the United States from 2000 to 2019: a population-based study on 80 million live births. Arch Gynecol Obstet. 2023 Mar 18. doi: 10.1007/s00404-023-06999-6. Epub ahead of print. PMID: 36933039.

4. New York City Department of Health and Mental Hygiene (2016). Severe Maternal Morbidity in New York City, 2008–2012. New York, NY.

5. Thoma ME, Declercq ER. All-Cause Maternal Mortality in the US Before vs During the COVID-19 Pandemic. *JAMA Netw Open.* 2022;5(6):e2219133. doi:10.1001/jamanetworkopen.2022.19133

6. Howell, Elizabeth A., Natalia Egorova, Amy Balbierz, Jennifer Zeitlin, and Paul L. Hebert. "Black-White Differences in Severe Maternal Morbidity and Site of Care." American Journal of Obstetrics and Gynecology 214, no. 1. January 2016: 122.e1–122.e7. https://doi.org/10.1016/j.ajog.2015.08.019.

7. New York State Pregnancy Risk Assessment Monitoring database. Available from: https://apps.health.ny.gov/public/tabvis/PHIG_Public/prams/reports/#annual

8. Came, Heather, and Derek Griffith. "Tackling Racism as a 'Wicked' Public Health Problem: Enabling Allies in Anti-Racism Praxis." *Social Science & Medicine* 199 (February 2018): 181–88. https://doi.org/10.1016/j.socscimed.2017.03.028.

9. Taylor, Jamila K. "Structural Racism and Maternal Health Among Black Women." *Journal of Law, Medicine & Ethics* 48, no. 3 (2020): 506–17. https://doi.org/10.1177/1073110520958875.

10. Goldsmith, Rachel E., Christina Gamache Martin, and Carly Parnitzke Smith. "Systemic Trauma." *Journal of Trauma & Dissociation* 15, no. 2 (March 15, 2014): 117–32. https://doi.org/10.1080/15299732.2014.871666.

11. Howell, Elizabeth A., Teresa Janevic, James Blum, Jennifer Zeitlin, Natalia N. Egorova, Amy Balbierz, and Paul L. Hebert. "Double Disadvantage in Delivery

Hospital for Black and Hispanic Women and High-Risk Infants." *Maternal and Child Health Journal* 24, no. 6 (June 2020): 687–93. https://doi.org/10.1007/s10995-020-02911-9.

12. Crear-Perry J, Correa-de-Araujo R, Lewis Johnson T, McLemore MR, Neilson E, Wallace M. Social and Structural Determinants of Health Inequities in Maternal Health. J Womens Health (Larchmt). 2021 Feb;30(2):230-235. doi: 10.1089/jwh.2020.8882. Epub 2020 Nov 12. PMID: 33181043; PMCID: PMC8020519.

13. Bailey ZD, Feldman JM, Bassett MT. How Structural Racism Works - Racist Policies as a Root Cause of U.S. Racial Health Inequities. N Engl J Med. 2021 Feb 25;384(8):768-773. doi: 10.1056/NEJMms2025396. Epub 2020 Dec 16. PMID: 33326717.

14. Venkataramani M, Ogunwole SM, Caulfield LE, Sharma R, Zhang A, Gross SM, Hurley KM, Lerman JL, Bass EB, Bennett WL. Maternal, Infant, and Child Health Outcomes Associated With the Special Supplemental Nutrition Program for Women, Infants, and Children : A Systematic Review. Ann Intern Med. 2022 Oct;175(10):1411-1422. doi: 10.7326/M22-0604. Epub 2022 Sep 6. PMID: 36063550.

15. Munger AL, Hofferth SL, Grutzmacher SK. The Role of the Supplemental Nutrition Assistance Program in the Relationship between Food Insecurity and Probability of Maternal Depression. J Hunger Environ Nutr. 2016;11(2):147-161. doi: 10.1080/19320248.2015.1045672. Epub 2016 Apr 22. PMID: 27482302; PMCID: PMC4962864.

16. Goldfeld S, Bryson H, Mensah F, Gold L, Orsini F, Perlen S, Price A, Hiscock H, Grobler A, Dakin P, Bruce T, Harris D, Kemp L. Nurse Home Visiting and Maternal Mental Health: 3-Year Follow-Up of a Randomized Trial. Pediatrics. 2021 Feb;147(2):e2020025361. doi: 10.1542/peds.2020-025361. PMID: 33483450.

17. Janevic, Teresa, Naissa Piverger, Omara Afzal, and Elizabeth A. Howell. "Just Because You Have Ears Doesn't Mean You Can Hear'—Perception of Racial-Ethnic Discrimination During Childbirth." *Ethnicity & Disease* 30, no. 4 (September 24, 2020): 533–42. https://doi.org/10.18865/ed.30.4.533.

18. Janevic T, Maru S, Nowlin S, McCarthy K, Bergink V, Stone J, Dias J, Wu S, Howell EA. Pandemic Birthing: Childbirth Satisfaction, Perceived Health Care Bias, and Postpartum Health During the COVID-19 Pandemic. Matern Child Health J. 2021 Jun;25(6):860-869. doi: 10.1007/s10995-021-03158-8. Epub 2021 Apr 28. PMID: 33909205; PMCID: PMC8079857.

19. Ahn R, Gonzalez GP, Anderson B, Vladutiu CJ, Fowler ER, Manning L. Initiatives to Reduce Maternal Mortality and Severe Maternal Morbidity in the United States : A Narrative Review. Ann Intern Med. 2020 Dec 1;173(11 Suppl):S3-S10. doi: 10.7326/M19-3258. PMID: 33253021.

20. Salihu HM, Myers J, August EM. Pregnancy in the workplace. Occup Med (Lond). 2012 Mar;62(2):88-97. doi: 10.1093/occmed/kqr198. PMID: 22355087.

21. Negron, Rennie, Anika Martin, Meital Almog, Amy Balbierz, and Elizabeth A. Howell. "Social Support During the Postpartum Period: Mothers' Views on Needs, Expectations, and Mobilization of Support." *Maternal and Child Health Journal* 17, no. 4 (May 2013): 616–23. https://doi.org/10.1007/s10995-012-1037-4.

22. Bedaso A, Adams J, Peng W, Sibbritt D. The relationship between social support and mental health problems during pregnancy: a systematic review and meta-analysis. Reprod Health. 2021 Jul 28;18(1):162. doi: 10.1186/s12978-021-01209-5. PMID: 34321040; PMCID: PMC8320195.

23. Razurel C, Kaiser B, Sellenet C, Epiney M. Relation between perceived stress, social support, and coping strategies and maternal well-being: a review of the literature. Women Health. 2013;53(1):74-99. doi: 10.1080/03630242.2012.732681. PMID: 23421340

24. Guardino CM, Schetter CD. Coping during pregnancy: a systematic review and recommendations. Health Psychol Rev. 2014;8(1):70-94. doi: 10.1080/17437199.2012.752659. Epub 2014 Jan 8. PMID: 24489596; PMCID: PMC3904449.

25. Kolk TA, Nath S, Howard LM, Pawlby S, Lockwood-Estrin G, Trevillion K. The association between maternal lifetime interpersonal trauma experience and perceived mother-infant bonding. J Affect Disord. 2021 Nov 1;294:117-127. doi: 10.1016/j.jad.2021.06.069. Epub 2021 Jul 1. PMID: 34280788; PMCID: PMC8424749.

26. Su Y, D'Arcy C. Interpersonal Violence Around Pregnancy Experienced by Rural and Urban Canadian Women: Correlates and Selected Health Outcomes. J Interpers Violence. 2022 Oct;37(19-20):NP19042-NP19065. doi: 10.1177/08862605211043576. Epub 2021 Sep 7. PMID: 34493096; PMCID: PMC9554279.

27. Srajer A, Johnson JA, Yusuf K. Preeclampsia and postpartum mental health: mechanisms and clinical implications. J Matern Fetal Neonatal Med. 2022 Dec;35(25):8443-8449. doi: 10.1080/14767058.2021.1978067. Epub 2021 Sep 19. PMID: 34538205.

28. Bailey L, Gaskin KSpotlight on maternal mental health: a prepandemic and postpandemic priority. Evidence-Based Nursing 2021;24:29-30.

29. Kenyon, Sara, Kate Jolly, Karla Hemming, Lucy Hope, Jackie Blissett, Sophie-Anna Dann, Richard Lilford, and Christine MacArthur. "Lay Support for Pregnant Women with Social Risk: A Randomised Controlled Trial." *BMJ Open* 6, no. 3 (March 2016): e009203. https://doi.org/10.1136/bmjopen-2015-009203.

30. Howell, Elizabeth A., Amy Balbierz, Susan Beane, Rashi Kumar, Tom Wang, Kezhen Fei, Zainab Ahmed, and José A. Pagán. Timely Postpartum Visits for Low-Income Women: A Health System and Medicaid Payer Partnership. American Journal of Public Health 110, no. S2 (July 2020): S215–18. https://doi.org/10.2105/AJPH.2020.305689.

31. Rodin D, Silow-Carroll S, Cross-Barnet C, Courtot B, Hill I. Strategies to Promote Postpartum Visit Attendance Among Medicaid Participants. J Womens Health (Larchmt). 2019 Sep;28(9):1246-1253. doi: 10.1089/jwh.2018.7568. Epub 2019 Jun 28. PMID: 31259648.

32. Mundorf, Christopher, Arti Shankar, Tracy Moran, Sherry Heller, Anna Hassan, Emily Harville, and Maureen Lichtveld. "Reducing the Risk of Postpartum Depression in a Low-Income Community Through a Community Health Worker Intervention." *Maternal and Child Health Journal* 22, no. 4 (April 2018): 520–28. https://doi.org/10.1007/s10995-017-2419-4.

33. Charanthimath, Umesh, Marianne Vidler, Geetanjali Katageri, Umesh Ramadurg, Chandrashekhar Karadiguddi, Avinash Kavi, Anjali Joshi, et al. "The Feasibility of Task-Sharing the Identification, Emergency Treatment, and Referral for Women with Pre-Eclampsia by Community Health Workers in India." *Reproductive Health* 15, no. Suppl 1 (June 22, 2018): 101. https://doi.org/10.1186/s12978-018-0532-5.

34. Pan Z, Veazie P, Sandler M, Dozier A, Molongo M, Pulcino T, Parisi W, Eisenberg KW. Perinatal Health Outcomes Following a Community Health Worker-Supported Home-Visiting Program in Rochester, New York, 2015-2018. Am J Public Health. 2020 Jul;110(7):1031-1033. doi: 10.2105/AJPH.2020.305655. Epub 2020 May 21. PMID: 32437282; PMCID: PMC7287532.

35. Population Health Approach is Pivotal in Lowering Maternal Mortality in U.S. Northwell Health. October 2022. Available from: https://www.northwell.edu/news/insights/population-health-approach-lowering-maternal-mortality-rate

36. Cunningham SD, Riis V, Line L, Patti M, Bucher M, Durnwald C, Srinivas SK. Safe Start Community Health Worker Program: A Multisector Partnership to Improve Perinatal Outcomes Among Low-Income Pregnant Women With Chronic Health

Conditions. Am J Public Health. 2020 Jun;110(6):836-839. doi: 10.2105/AJPH.2020.305630. Epub 2020 Apr 16. PMID: 32298174; PMCID: PMC7204480.

37. Williams, Corrine M., Sarah Cprek, Ibitola Asaolu, Brenda English, Tracey Jewell, Kylen Smith, and Joyce Robl. "Kentucky Health Access Nurturing Development Services Home Visiting Program Improves Maternal and Child Health." *Maternal and Child Health Journal* 21, no. 5 (May 2017): 1166–74. https://doi.org/10.1007/s10995-016-2215-6.

38. Nurse Family Partnership: NY State Profile. 2022. Available from: https://www.nursefamilypartnership.org/wp-content/uploads/2017/07/NY_2022-State-Profile.pdf

39. Federman, Alex D., Rachel O'Conor, Irina Mindlis, Jamillah Hoy-Rosas, Diane Hauser, Joseph Lurio, Nandini Shroff, et al. "Effect of a Self-Management Support Intervention on Asthma Outcomes in Older Adults: The SAMBA Study Randomized Clinical Trial." *JAMA Internal Medicine* 179, no. 8 (August 1, 2019): 1113. https://doi.org/10.1001/jamainternmed.2019.1201.

40. Waxman E, Thompson M, Aron L, Hoy-Rosas J, Haag E, Improving Chronic Illness Management in Harlem: Leveraging Community Health Coaches to Address the Challenge of Medication Management. Urban Institute. October 24, 2019. Available from: https://www.urban.org/research/publication/improving-chronic-illness-management-harlem

41. Burton R and Thompson M. What Do Patients with Diabetes Think about Health Coaching? Urban Institute. February 5, 2018. Available from: https://www.urban.org/sites/default/files/publication/96336/2001692_chw_client_interviews_brief_finalized_2.pdf

42. Kangovi S, Mitra N, Grande D, Huo H, Smith RA, Long JA. Community Health Worker Support for Disadvantaged Patients With Multiple Chronic Diseases: A Randomized Clinical Trial. Am J Public Health. 2017 Oct;107(10):1660-1667. doi: 10.2105/AJPH.2017.303985. Epub 2017 Aug 17. PMID: 28817334; PMCID: PMC5607679.

43. Johnson, D., Saavedra, P., Sun, E. *et al.* Community Health Workers and Medicaid Managed Care in New Mexico. *J Community Health* **37**, 563–571 (2012). https://doi.org/10.1007/s10900-011-9484-1

44. Vaughan K, Kok MC, Witter S, Dieleman M. Costs and cost-effectiveness of community health workers: evidence from a literature review. Hum Resour Health. 2015 Sep 1;13:71. doi: 10.1186/s12960-015-0070-y. PMID: 26329455; PMCID: PMC4557864.

45. Jack HE, Arabadjis SD, Sun L, Sullivan EE, Phillips RS. Impact of Community Health Workers on Use of Healthcare Services in the United States: A Systematic Review. J Gen Intern Med. 2017 Mar;32(3):325-344. doi: 10.1007/s11606-016-3922-9. Epub 2016 Dec 5. PMID: 27921257; PMCID: PMC5331010.

46. Kangovi S, Mitra N, Grande D, Long JA, Asch DA. Evidence-Based Community Health Worker Program Addresses Unmet Social Needs And Generates Positive Return On Investment. Health Aff (Millwood). 2020 Feb;39(2):207-213. doi: 10.1377/hlthaff.2019.00981. PMID: 32011942; PMCID: PMC8564553.

47. Thompson MP, Podila PSB, Clay C, Sharp J, Bailey-DeLeeuw S, Berkley AJ, Baker BG, Waters TM. Community navigators reduce hospital utilization in super-utilizers. Am J Manag Care. 2018 Feb;24(2):70-76. PMID: 29461853.

48. Powers BW, Modarai F, Palakodeti S, Sharma M, Mehta N, Jain SH, Garg V. Impact of complex care management on spending and utilization for high-need, high-cost Medicaid patients. Am J Manag Care. 2020 Feb 1;26(2):e57-e63. doi: 10.37765/ajmc.2020.42402. Erratum in: Am J Manag Care. 2020 Mar;26(3):132. PMID: 32059101.

49. Howell, Elizabeth A., Haywood Brown, Jessica Brumley, Allison S. Bryant, Aaron B. Caughey, Andria M. Cornell, Jacqueline H. Grant, et al. "Reduction of Peripartum Racial and Ethnic Disparities: A Conceptual Framework and Maternal Safety Consensus Bundle." *Journal of Obstetric, Gynecologic & Neonatal Nursing* 47, no. 3 (May 2018): 275–89. https://doi.org/10.1016/j.jogn.2018.03.004.

50. Black Mamas Matter Alliance and Center for Reproductive Rights. Black Mamas Matter: Advancing the Human Right to Safe and Respectful Maternal Health Care. Center for Reproductive Rights (2018). Available from: http://blackmamasmatter.org/wp-content/uploads/2018/05/USPA_BMMA_Toolkit_Booklet-Final-Update_Web-Pages-1.pdf

51. Bartholomew Eldrigde, L. K., Markham, C. M., Ruiter, R. A. C., Fernàndez, M. E., Kok, G., & Parcel, G. S. (2016). Planning health promotion programs: An Intervention Mapping approach (4th ed.). Hoboken, NJ: Wiley.

52. Fernandez, Maria E., Robert A. C. Ruiter, Christine M. Markham, and Gerjo Kok. "Intervention Mapping: Theory- and Evidence-Based Health Promotion Program Planning: Perspective and Examples." *Frontiers in Public Health* 7 (August 14, 2019): 209. https://doi.org/10.3389/fpubh.2019.00209.

53. Zoom encrypted telecommunications Software. Available from: https://zoom.us/

54. Seidman, Irving. Interviewing As Qualitative Research: A Guide for Researchers in Education and the Social Sciences. 4th ed. New York, Teachers College Press, 2013.

55. Kroenke K, Spitzer RL, Williams JB. The Patient Health Questionnaire-2: validity of a two-item depression screener. Med Care. 2003 Nov;41(11):1284-92. doi: 10.1097/01.MLR.0000093487.78664.3C. PMID: 14583691.

56. Gjerdingen D, Crow S, McGovern P, Miner M, Center B. Postpartum depression screening at well-child visits: validity of a 2-question screen and the PHQ-9. Ann Fam Med. 2009 Jan-Feb;7(1):63-70. doi: 10.1370/afm.933. PMID: 19139451; PMCID: PMC2625843.

57. Smith MV, Gotman N, Lin H, Yonkers KA. Do the PHQ-8 and the PHQ-2 accurately screen for depressive disorders in a sample of pregnant women? Gen Hosp Psychiatry. 2010 Sep-Oct;32(5):544-8. doi: 10.1016/j.genhosppsych.2010.04.011. Epub 2010 Jun 22. PMID: 20851275; PMCID: PMC2943487.

58. Staples LG, Dear BF, Gandy M, Fogliati V, Fogliati R, Karin E, Nielssen O, Titov N. Psychometric properties and clinical utility of brief measures of depression, anxiety, and general distress: The PHQ-2, GAD-2, and K-6. Gen Hosp Psychiatry. 2019 Jan-Feb;56:13-18. doi: 10.1016/j.genhosppsych.2018.11.003. Epub 2018 Nov 22. PMID: 30508772.

59. Pregnancy Risk Assessment Monitoring Survey. Phase 8 (2016-Present) questionnaire. Available from: https://www.cdc.gov/prams/questionnaire.htm

60. National Partnership for Women and Families. Listening to Mothers in California 2018 survey. Available from: https://www.chcf.org/wp-content/uploads/2018/09/ListeningMothersQuestionnaire2018.pdf

61. REV Transcription Services. Available from: https://www.rev.com/

62. Happy Scribe Transcription Services. Available from: https://www.happyscribe.com

63. Braun V and Clarke V. Thematic Analysis: a Practical Guide. 1st Edition. Sage Publications, December 6 2021.

64. NVivo 1 Qualitative Data Analysis Software. Available from: https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home

65. Brown-Johnson C, Shaw JG, Safaeinili N, Chan GK, Mahoney M, Asch S, Winget M. Role definition is key-Rapid qualitative ethnography findings from a team-based primary care transformation. Learn Health Syst. 2019 Feb 20;3(3):e10188. doi: 10.1002/lrh2.10188. PMID: 31317071; PMCID: PMC6628978.

66. Kwan BM, Hamer MK, Bailey A, Cebuhar K, Conry C, Smith PC. Implementation and Qualitative Evaluation of a Primary Care Redesign Model with Expanded Scope of Work for Medical Assistants. J Gen Intern Med. 2022 Apr;37(5):1129-1137. doi: 10.1007/s11606-021-07246-x. Epub 2022 Jan 7. PMID: 34997393; PMCID: PMC8971214.

67. NPS Koladycz R, Fernandez G, Gray K, Marriott H. The Net Promoter Score (NPS) for insight into client experiences in sexual and reproductive health clinics. Glob Health Sci Pract. 2018;6(3):413-424. https://doi.org/10.9745/GHSP-D-18-00068

68. Crear-Perry J, Correa-de-Araujo R, Lewis Johnson T, McLemore MR, Neilson E, Wallace M. Social and Structural Determinants of Health Inequities in Maternal Health. J Womens Health (Larchmt). 2021 Feb;30(2):230-235. doi: 10.1089/jwh.2020.8882. Epub 2020 Nov 12. PMID: 33181043; PMCID: PMC8020519.

69. Vanessa B Sheppard, Ruth E Zambrana, Ann S O'Malley, Providing health care to low-income women: a matter of trust, *Family Practice*, Volume 21, Issue 5, October 2004, Pages 484–491, https://doi.org/10.1093/fampra/cmh503

70. Perdok H, Verhoeven CJ, van Dillen J, Schuitmaker TJ, Hoogendoorn K, Colli J, Schellevis FG, de Jonge A. Continuity of care is an important and distinct aspect of childbirth experience: findings of a survey evaluating experienced continuity of care, experienced quality of care and women's perception of labor. BMC Pregnancy Childbirth. 2018 Jan 8;18(1):13. doi: 10.1186/s12884-017-1615-y. PMID: 29310627; PMCID: PMC5759271.

71. Dunkley-Bent J. The importance of continuity of carer in maternity services. National Health Service (NHS) Blog Post. March 23, 2018. Available from: https://www.england.nhs.uk/blog/the-importance-of-continuity-of-carer-in-maternity-services/

72. Jennifer Nicoloro-Santa Barbara, Lisa Rosenthal, Melissa V. Auerbach, Christina Kocis, Cheyanne Busso, Marci Lobel. Patient-provider communication, maternal anxiety, and self-care in pregnancy. Social Science & Medicine, Volume 190, 2017, Pages 133-140, ISSN 0277-9536, https://doi.org/10.1016/j.socscimed.2017.08.011.

73. Boyd LM, Mehra R, Thomas J, Lewis JB, Cunningham SD. Features and Impact of Trust-Based Relationships Between Community Health Workers and Low-Resource Perinatal Women with Chronic Health Conditions. Matern Child Health J. 2021 Dec;25(12):1866-1874. doi: 10.1007/s10995-021-03242-z. Epub 2021 Oct 21. PMID: 34674101.

74. Gjerdingen D, Froberg D, Fontaine P. The effects of social support on women's health during pregnancy, labor and delivery, and the postpartum period. Fam Med. 1991; 23(5):370. [PubMed: 1884933]

75. Reid CN, Fryer K, Cabral N, Marshall J. Health care system barriers and facilitators to early prenatal care among diverse women in Florida. Birth. 2021 Sep;48(3):416-427. doi: 10.1111/birt.12551. Epub 2021 May 5. PMID: 33950567.

76. Krukowski RA, Jacobson LT, John J, Kinser P, Campbell K, Ledoux T, Gavin KL, Chiu CY, Wang J, Kruper A. Correlates of Early Prenatal Care Access among U.S. Women: Data from the Pregnancy Risk Assessment Monitoring System (PRAMS). Matern Child Health J. 2022 Feb;26(2):328-341. doi: 10.1007/s10995-021-03232-1. Epub 2021 Oct 4. PMID: 34606031; PMCID: PMC8488070.

77. Janevic, Teresa, Naissa Piverger, Omara Afzal, and Elizabeth A. Howell. "Just Because You Have Ears Doesn't Mean You Can Hear'—Perception of Racial-Ethnic Discrimination During Childbirth." *Ethnicity & Disease* 30, no. 4 (September 24, 2020): 533–42. https://doi.org/10.18865/ed.30.4.533.

78. Irth birthing hospital review application https://irthapp.com/

79. Jetty A, Jabbarpour Y, Pollack J, Huerto R, Woo S, Petterson S. Patient-Physician Racial Concordance Associated with Improved Healthcare Use and Lower Healthcare Expenditures in Minority Populations. J Racial Ethn Health Disparities. 2022 Feb;9(1):68-81. doi: 10.1007/s40615-020-00930-4. Epub 2021 Jan 5. Erratum in: J Racial Ethn Health Disparities. 2021 Feb 24;: PMID: 33403653.

80. Schoenthaler A, Ravenell J. Understanding the Patient Experience Through the Lenses of Racial/Ethnic and Gender Patient-Physician Concordance. *JAMA Netw Open.* 2020;3(11):e2025349. doi:10.1001/jamanetworkopen.2020.25349

81. Badreldin N, DiTosto JD, Grobman WA, Yee LM. Association Between Patient-Prescriber Racial and Ethnic Concordance and Postpartum Pain and Opioid Prescribing. Health Equity. 2022 Mar 7;6(1):198-205. doi: 10.1089/heq.2021.0130. PMID: 35402767; PMCID: PMC8985536.

82. Oguz T. Is Patient-Provider Racial Concordance Associated with Hispanics' Satisfaction with Health Care? Int J Environ Res Public Health. 2018 Dec 24;16(1):31. doi: 10.3390/ijerph16010031. PMID: 30586847; PMCID: PMC6338960.

83. Attanasio LB, Ranchoff BL, Geissler KH. Perceived discrimination during the childbirth hospitalization and postpartum visit attendance and content: Evidence from the Listening to Mothers in California survey. PLoS One. 2021 Jun

23;16(6):e0253055. doi: 10.1371/journal.pone.0253055. PMID: 34161359; PMCID: PMC8221509.

84. Kimberly Seals Allers. Birthright podcast. Available from: https://www.audible.com/pd/Birthright-Podcast/B08K57B6Y5

85. Jamillah Hoy Rosas. RWJF Clinical Scholars Big Ideas Talk. Sept 2021. Available from: https://www.youtube.com/watch?v=scb7a8nncok

86. National Birth Equity Collaborative. https://birthequity.org/who-we-are/

87. Cutrona CE, Troutman BR. Social support, infant temperament, and parenting self efficacy: a mediational model of postpartum depression. Child Dev. 1986; 57(6):1507–1518. [PubMed: 3802975]

88. O'Hara MW, Rehm LP, Campbell SB. Postpartum depression: A role for social network and life stress variables. J Nerv Ment Dis. 1983; 171(6):336–341. [PubMed: 6854298]

89. Howell EA, Mora P, Leventhal H. Correlates of early postpartum depressive symptoms. Matern Child Health. 2006; 10(2):149–157.

90. Bossano CM, Townsend KM, Walton AC, Blomquist JL, Handa VL. The maternal childbirth experience more than a decade after delivery. Am J Obstet Gynecol. 2017 Sep;217(3):342.e1-342.e8. doi: 10.1016/j.ajog.2017.04.027. Epub 2017 Apr 25. PMID: 28455080.

91. Wang, Eileen, Kimberly B. Glazer, Shoshanna Sofaer, Amy Balbierz, and Elizabeth A. Howell. "Racial and Ethnic Disparities in Severe Maternal Morbidity: A Qualitative Study of Women's Experiences of Peripartum Care." *Women's Health Issues* 31, no. 1 (January 2021): 75–81. https://doi.org/10.1016/j.whi.2020.09.002.

92. Janevic T, Maru S, Nowlin S, McCarthy K, Bergink V, Stone J, Dias J, Wu S, Howell EA. Pandemic Birthing: Childbirth Satisfaction, Perceived Health Care Bias, and Postpartum Health During the COVID-19 Pandemic. Matern Child Health J. 2021 Jun;25(6):860-869. doi: 10.1007/s10995-021-03158-8. Epub 2021 Apr 28. PMID: 33909205; PMCID: PMC8079857.

93. Seals Allers K. Presentation at GA Black Maternal Mental Health Summit, Feb 26 2022. Available from: https://www.youtube.com/watch?list=PLf_X7PF8KC0fEEU0wTWgNl3ffbecBPKBV&v=y0zrKA2JKk0&feature=youtu.be

94. Snipe Margo. Haunted by Trauma: the Black Parents Who Almost Died in Childbirth. Capital B News. March 9 2023. Available from: https://capitalbnews.org/dangerous-deliveries-birth-trauma/

95. Bastos MH, Furuta M, Small R, McKenzie-McHarg K, Bick D. Debriefing interventions for the prevention of psychological trauma in women following childbirth. Cochrane Database Syst Rev. 2015 Apr 10;(4):CD007194. doi: 10.1002/14651858.CD007194.pub2. PMID: 25858181.

96. Taylor Miller PG, Sinclair M, Gillen P, McCullough JEM, Miller PW, Farrell DP, Slater PF, Shapiro E, Klaus P. Early psychological interventions for prevention and treatment of post-traumatic stress disorder (PTSD) and post-traumatic stress symptoms in post-partum women: A systematic review and meta-analysis. PLoS One. 2021 Nov 24;16(11):e0258170. doi: 10.1371/journal.pone.0258170. PMID: 34818326; PMCID: PMC8612536.

97. Baxter JD, McCourt C, Jarrett PM. What is current practice in offering debriefing services to post partum women and what are the perceptions of women in accessing these services: a critical review of the literature. Midwifery. 2014 Feb;30(2):194-219. doi: 10.1016/j.midw.2013.12.013. Epub 2013 Dec 27. PMID: 24491690.

98. Sperlich M, Seng JS, Li Y, Taylor J, Bradbury-Jones C. Integrating Trauma-Informed Care Into Maternity Care Practice: Conceptual and Practical Issues. J Midwifery Womens Health. 2017 Nov;62(6):661-672. doi: 10.1111/jmwh.12674. Epub 2017 Nov 28. PMID: 29193613.

99. Vogel TM, Coffin E. Trauma-Informed Care on Labor and Delivery. Anesthesiol Clin. 2021 Dec;39(4):779-791. doi: 10.1016/j.anclin.2021.08.007. PMID: 34776109.

100. Choi KR, Records K, Low LK, Alhusen JL, Kenner C, Bloch JR, Premji SS, Hannan J, Anderson CM, Yeo S, Cynthia Logsdon M. Promotion of Maternal-Infant Mental Health and Trauma-Informed Care During the COVID-19 Pandemic. J Obstet Gynecol Neonatal Nurs. 2020 Sep;49(5):409-415. doi: 10.1016/j.jogn.2020.07.004. Epub 2020 Aug 12. PMID: 32795425; PMCID: PMC7419279.

101. ACOG Committee Opinion No. 736: Optimizing Postpartum Care. Obstetrics & Gynecology: May 2018 - Volume 131 - Issue 5 - p e140-e150 doi: 10.1097/AOG.0000000000002633

102. Polk S, Edwardson J, Lawson S, Valenzuela D, Hobbins E, Prichett L, Bennett WL. Bridging the Postpartum Gap: A Randomized Controlled Trial to Improve Postpartum Visit Attendance Among Low-Income Women with Limited English Proficiency. Womens Health Rep (New Rochelle). 2021 Sep 9;2(1):381-388. doi: 10.1089/whr.2020.0123. PMID: 34671758; PMCID: PMC8524728.

103. Seefat-van Teeffelen A, Nieuwenhuijze M, Korstjens I. Women want proactive psychosocial support from midwives during transition to motherhood: a qualitative study. Midwifery. 2011 Feb;27(1):e122-7. doi: 10.1016/j.midw.2009.09.006. Epub 2009 Nov 20. PMID: 19931954.

104. De Sousa Machado T, Chur-Hansen A, Due C. First-time mothers' perceptions of social support: Recommendations for best practice. *Health Psychology Open*. 2020;7(1). doi:10.1177/2055102919898611

105. Ndwiga, Charity, Charlotte Warren, Timothy Abuya, Lucy Kanya, Alice Maranga, Christine Ochieng, Mary Wanjala, Beatrice Chelang'at, Anne Njeru, Annie Gituto, George Odhiambo, Faith Mbehero, Lucia and Jeremiah Maina. 2014. Respectful Maternity Care Resource Package; Community Facilitator's Guide, New York, Population Council.

106. NYC Health. New York City Standards for Respectful Care at Birth. Available from: https://www1.nyc.gov/assets/doh/downloads/pdf/ms/respectful-care-birth-brochure.pdf

107. Peralta, A. Shared Decision Making Tools for Maternal Health. Partner to Decide. Available from: https://www.partnertodecide.org/team

108. Mehra, Renee, Lisa M. Boyd, Jessica B. Lewis, and Shayna D. Cunningham. "Considerations for Building Sustainable Community Health Worker Programs to Improve Maternal Health." *Journal of Primary Care & Community Health* 11 (January 2020): 215013272095367. https://doi.org/10.1177/2150132720953673.

109. NCQA and Penn Medicine. Critical Inputs for Successful Community Health Worker Programs. White Paper. November 2021. Available from: https://www.ncqa.org/wp-content/uploads/2021/11/Critical-Inputs-for-Successful-CHW-Programs-White-Paper-November2021.pdf

110. Bakst, Carol, Moore, Jennifer, George, Karen, Shea, Karen. Community-Based Maternal Support Services: the Role of Doulas and Community Health Workers. Institute for Medicaid Innovation. May 2020. https://www.medicaidinnovation.org/_images/content/2020-IMI-Community_Based_Maternal_Support_Services-Report.pdf

111. Miech EJ, Rattray NA, Flanagan ME, Damschroder L, Schmid AA, Damush TM. Inside help: An integrative review of champions in healthcare-related implementation. SAGE Open Med. 2018 May 17;6:2050312118773261. doi: 10.1177/2050312118773261. PMID: 29796266; PMCID: PMC5960847.

112. Santos, W.J., Graham, I.D., Lalonde, M. *et al.* The effectiveness of champions in implementing innovations in health care: a systematic review. *Implement Sci Commun* **3**, 80 (2022). https://doi.org/10.1186/s43058-022-00315-0

113. Sultana A, Sharma R, Hossain MM, Bhattacharya S, Purohit N. Burnout among healthcare providers during COVID-19: Challenges and evidence-based interventions. Indian J Med Ethics. 2020 Oct-Dec;V(4):1-6. doi: 10.20529/IJME.2020.73. PMID: 34018959.

114. Shreffler J, Petrey J, Huecker M. The Impact of COVID-19 on Healthcare Worker Wellness: A Scoping Review. West J Emerg Med. 2020 Aug 17;21(5):1059-1066. doi: 10.5811/westjem.2020.7.48684. PMID: 32970555; PMCID: PMC7514392.

115. Janjua NB, Mohamed AF, Birmani SA, Donnelly O, Syed AH, Essajee M. COVID-19 Pandemic and Maternal Perspectives. Ir Med J. 2021 Aug 19;114(7):411. PMID: 34520646.

116. Lalor JG, Sheaf G, Mulligan A, Ohaja M, Clive A, Murphy-Tighe S, Ng ED, Shorey S. Parental experiences with changes in maternity care during the Covid-19 pandemic: A mixed-studies systematic review. Women Birth. 2023 Mar;36(2):e203-e212. doi: 10.1016/j.wombi.2022.08.004. Epub 2022 Aug 10. PMID: 35973917; PMCID: PMC9364727.

117. Anteneh Asefa, Aline Semaan, Therese Delvaux, Elise Huysmans, Anna Galle, Emma Sacks, Meghan A. Bohren, Alison Morgan, Michelle Sadler, Saraswathi Vedam, Lenka Benova. The impact of COVID-19 on the provision of respectful maternity care: Findings from a global survey of health workers. Women and Birth, Volume 35, Issue 4, 2022, Pages 378-386, ISSN 1871-5192, https://doi.org/10.1016/j.wombi.2021.09.003.

118. Park, SH., Kim, JI. Predictive validity of the Edinburgh postnatal depression scale and other tools for screening depression in pregnant and postpartum women: a systematic review and meta-analysis. *Arch Gynecol Obstet* (2022). https://doi.org/10.1007/s00404-022-06525-0

CHAPTER FOUR: ADDITIONAL RESULTS

Barriers and Facilitators related to the COVID-19 Pandemic for prenatal and postpartum people and maternal health professionals in Upper Manhattan, New York City

Brett Ives, MSN, CDCES, Jamillah Hoy-Rosas, MPH, RD, CDCES, Tanjeena Patwary, MPH, Leny Rivera, Omara Afzal, DO, MPH, Lisa Messersmith, PhD, Jacey Greece, DSc, Eugene Declercq, PhD

Abstract

This study was part of a larger needs and assets assessment that explored barriers and facilitators to maternal self-care and engagement in health care, and the preferred components of a maternal community health worker program. This study aimed to understand the lived experiences of prenatal and postpartum people and maternal health care professionals during the COVID-19 pandemic. In-depth interviews were conducted with prenatal and postpartum people (N=38) from a large teaching hospital in Upper Manhattan, New York City. In-depth interviews were also conducted with professionals delivering maternal health care at the same site (N=15). Interviews took place October 2020 and August 2022, with the majority occurring during the height of the COVID-19 pandemic from December 2020 – September 2021. The research team analyzed the interviews using thematic analysis. Participants highlighted important experiences of the pandemic in the following four major themes: 1. The COVID-19 pandemic increased

social and economic stressors for prenatal and postpartum people; 2. The COVID-19 pandemic increased emotional stress and affected the mental health of prenatal and postpartum people;

3. Prenatal and postpartum people felt lonely in their care experience during COVID-19 pandemic; and 4. Care delivery modifications during the COVID-19 pandemic had implications for future telehealth maternity care innovation. The findings highlight the multiple effects of the COVID-19 pandemic on experiences of prenatal and postpartum people and maternal health care professionals. These findings can also serve as a call for revisions in maternity models of care, including the use of telehealth and can also be applied to emergency preparedness efforts for future pandemics and other events.

4.1 Introduction

Maternal mortality in the United States is higher than in all other high-income countries.[1] Racial and ethnic disparities exist both nationally and in urban areas such as New York City. In New York City, Black birthing people experience the worst maternal health outcomes, followed by Latina/e and Asian / Pacific Islander birthing people.[2,3]

Another key maternal health measure is severe maternal morbidity (SMM), which is defined as a life-threatening complication occurring around or during birth.[4] Drivers of severe maternal morbidity and mortality inequities are many, but include racist policies and practices that hinder economic opportunity and health at the community level,[5–7] the individual,[8] interpersonal,[9–10] as well as at the health systems level.[11–12] Individual factors can also include psychosocial stressors[13] and pre-existing chronic conditions.[3] In

addition to issues of racism and bias, the U.S. health system is not designed for the continuity of maternity care, especially in the postpartum period, and many new mothers do not receive the care they need to reduce complications and poor outcomes.[14–22] Policy drivers such as inadequate paid family leave and lack of postpartum Medicaid coverage are also key determinants of poor health outcomes among postpartum people.[23–24]

The COVID-19 pandemic has been a social, economic, and health system stressor that negatively affected maternal health outcomes in the U.S. and led to a widening in racial disparities in maternal mortality.[25] Beyond the unacceptable increase in maternal deaths, studies found increased mental health distress[26–30] and worsened care experience[31–33] during the pandemic. This study attempted to fill in gaps in knowledge about the lived experiences of birthing people and maternal health providers during the COVID-19 pandemic (years 2020–2022). This research was part of a larger needs and assets assessment published elsewhere that sought to determine barriers and facilitators to self-care and care engagement by prenatal / postpartum people, as well as patient and provider recommendations to design a maternal community health worker program in Upper Manhattan, NYC.

4.2 Methods

Qualitative methods were used to answer the research question: How has the COVID-19 pandemic affected the health care experiences of prenatal / postpartum people and maternal health professionals? Methods included a literature review and in-depth interviews with prenatal or postpartum people and maternal health professionals.

Data Collection and Analysis

Purposive sampling was used to recruit prenatal and postpartum people and maternal health professionals between October 2020 and August 2022 at an ambulatory obstetrics and gynecology practice at an academic medical center in Upper Manhattan. The majority of interviews were conducted between December 2020 and September 2021. Eligibility criteria for the interviews with prenatal / postpartum people included: pregnant in 2nd/3rd trimester or postpartum up to 12 weeks; English or Spanish speaking. Eligibility for the maternal health professional interviews included current employment at the site as a doctor, certified nurse midwife, registered nurse, nurse practitioner, physician assistant, social worker, dietitian, or patient navigator.

The principal investigator recruited and consented eligible participants (prenatal / postpartum people and maternal health professionals) at the point of care, briefly introduced the study and answered questions, and consented any people who expressed interest in participating. Prenatal / postpartum people provided written consent. Maternal health professionals gave verbal consent as written consent was waived by the IRB. Interviews took place via Zoom, with participants calling in from their phones to lessen any technology barriers.[34] The interviewer reviewed informed consent before starting the interviews and conducted the interview in English or Spanish. Both interviewers were intensively trained in qualitative interviewing techniques, including reflection and probing.[35] A $50 gift card was provided for respondents' time upon completion of the interview.

The prenatal / postpartum participant and maternal health professional interview

guides had five questions, with multiple prompts for each that included open- and closed-ended questions. Prenatal / postpartum people and maternal health professionals were interviewed about barriers and facilitators to self-care, barriers and facilitators to engaging in health care, and recommendations for a maternal CHW program. Maternal health professionals were also asked their perspectives regarding the best ways to adopt, implement, and sustain a maternal health coaching program at their practice. Closed-ended questions in the prenatal / postpartum interview guide included depression (PHQ-2) and anxiety (GAD-2) scales,[36–38] pregnancy stress measure,[39] social support measure,[39] resources used, and demographics. Maternal health-specific questions were taken from Pregnancy Risk Assessment Monitoring System (PRAMS)[39] and wording for some of the interview probes were from Listening to Mothers.[40] Both interview guides had a closed-ended question about recommended maternal CHW program components.

The interviewer took brief notes to help guide her in the interviewing process and highlight points of importance. The interviewer wrote a memo at the end of every interview to record any observations of the interview and growing data set as a whole. Interviews were audio recorded via Zoom[34] and transcribed via Rev[41] for English interviews and Happy Scribe[42] for Spanish interviews.

Thematic analysis[43] was performed using the following steps: 1. thorough review of transcripts to draft a codebook with parent, child, and grandparent codes; 2. iterative testing of the codebook through coding of select transcripts by both coders followed by discussion and revision of the codebook; 3. coding of all transcripts by two coders in NVivo Release 1[44]; 4. review of the coded data and development of categories and

preliminary themes; 5. development of a theme matrix using Miro[45]; 6. analytic check-ins between the two coders and the third author on the study during theme development; and 7. theme mapping and refinement through multiple discussions between coders.[43] For the closed-ended demographic, health status, and preferences measures, the team calculated descriptive statistics such as sums, means, or percentages.

Study Sample and Human Subjects Protection

Sixty-three pregnant or postpartum people were approached, and 54 agreed to participate and were consented at point of care. Of those 54, thirty-two prenatal or postpartum women completed an interview. The sample is representative of the total sample at Mount Sinai Ambulatory OB/GYN in terms of race, ethnicity, and insurance type based on patient demographic data of the site. Of those who were interviewed prenatally, six completed a second interview in the postpartum period for a total of 38 interviews. Thirty respondents were interviewed in English and two in Spanish.

Prenatal participants were at least 20 weeks pregnant and postpartum participants were interviewed within six months of birth. All respondents had Medicaid insurance. Half of those interviewed were in the prenatal period. The majority of people were in the age range of 21–30 (56%). Participants self-identified as Black / African American (34%), Other (43%), or white (15%). Overall, 66% identified as Latina/e. All participants identified as women. Around half of the women were first-time mothers, and 20% of the sample had diabetes and / or hypertension during the current / recent

pregnancy. In their interviews, many participants reported worries about finances; a few had worries about having enough food; and three women had a recent or current stay in a shelter. When asked to choose the statement that best described their stress level during the recent pregnancy, one in five postpartum respondents reported that their recent pregnancy was "a moderately hard time" or "very hard time."[39]

Twenty-one maternal health professionals were approached, and 15 completed interviews, all in English. The maternal health professional sample included three social workers, a dietitian, two nurse practitioner / physician assistants, two certified nurse midwives, three resident physicians, and four attending physicians, one of whom was a maternal fetal medicine (high risk) specialist. For the purposes of this paper, "provider" refers to physician, nurse midwife, nurse practitioner, or physician assistant.

The study was approved by the Program for the Protection of Human Subjects at the Mount Sinai School of Medicine (HS#: 19-00183) and exemption category 2 status by Boston Medical Center / Boston University Medical Campus IRB.

4.3 Results

The research team identified the following four major themes related to the impact of the COVID-19 pandemic: 1. COVID complicated everything: the COVID-19 pandemic increased social and economic stressors for prenatal and postpartum people; 2. The COVID-19 pandemic increased emotional distress and affected the mental health of prenatal and postpartum people; . Prenatal and postpartum people felt lonely in their health care experience during the COVID-19 pandemic; and 4. Care delivery

modifications during the COVID-19 pandemic had implications for future telehealth maternity care innovation. Each of these themes are described more fully bellow.

COVID complicated everything: the COVID-19 pandemic increased social and economic stressors for prenatal and postpartum people

The pandemic caused social and economic stressors for prenatal / postpartum people, including their support systems, work, children's schooling, and coping outlets. These experiences are presented below via subthemes.

Usual support networks were not available and social life was reduced, leading to feelings of isolation and overwhelm

Some women participants reported having less social support during the pandemic due to social distancing measures and travel restrictions, particularly for relatives living in other countries (due to country-based travel bans, followed by vaccination requirements for foreign travelers to the U.S.). These reductions in social support caused feelings of isolation and overwhelm when pregnant and when taking care of their new baby. Some conveyed a sense that they had to "do the pregnancy on their own." Many women had to take on even greater responsibility for their infant, without family and friends to assist with household tasks and baby care.

> *My mom couldn't come travel to help me for the first three months [after the birth] – Postpartum woman, February 2021*

[Being pregnant during the pandemic] I felt really isolated. All of my friends' pledges [of help] fell to the wayside. I felt very lonely.

– Postpartum woman, December 2020

With COVID, I did not like the role that you basically have to do your whole pregnancy on your own by yourself. – Postpartum woman, August 2021

The pandemic also hindered social life with friends and family. Women discussed their frustrations with not having the same outlets for positive social connection, while also missing out on key social milestones to celebrate the pregnancy, such as having a baby shower. The lack of sense of belonging and fun provided by in-person social activities increased feelings of isolation for some women.

It's affected it a lot in ways of not being able to celebrate my bundle of joy through an actual baby shower, like having a celebration where everybody's in contact. First time I ever did a baby shower through mail.

– Prenatal woman, February 2021

Family support is good, but I feel like the typical dates and girl time and group outings and just being able to do things, for me is most supportive. I like to go out, I like to do things, so I have definitely felt more isolated.

– Prenatal woman, February 2021

Women expressed a tension of needing and wanting family and friend in-person support and connection while also needing to keep themselves and their baby safe from exposure to the virus.

> *She was gonna bring another aunt that flew in and I said "I don't think she should come here. She's not vaccinated. I'm worried." – Postpartum woman, July 2022*

> *[I see] my immediate family, my boyfriend's mom, his sister, and my two best friends. I don't really get to see anybody else. Not that I don't want to but I don't want anybody to get me sick. – Prenatal woman, February 2021*

Decisions about work and school were complex and dynamic

Prenatal and postpartum participants reported a lack of options or difficult decisions regarding paid work outside the home. Concerns about virus exposure were common. Participants weighed many factors such as the financial needs of their families, their love of work, and the health and safety of themselves and their babies.

> *A coworker passed away from COVID. I took time off [during pregnancy]. I was already scared … my hubby he was laid off also … I do need to go back to work and he wants to go back to work as well. – Postpartum woman, December 2020*

> *I'm gonna go back to work, but I have like a whole bunch of questions that I didn't have before. 'Cause I'm in the medical field, I'm like, "Should I go back to work?*

No, I have to go back to work." So I'm beating myself up, going back and forth.

– Postpartum woman, August 2021

Virtual schooling or school disruptions were a common barrier for returning or continuing to work. The unpredictability or increased demands of their children's schooling added stress for some participants, making it more difficult to not only work but rest, find time for themselves, and have a feeling of independence outside of the family. In one case, the family had to pause their child's schooling as they navigated a stressful pregnancy, delivery, and new baby.

I personally haven't been able to work because I have my son at home and his dad works and he's been trying to go to [in-person] school, but then, there's a COVID case and the schools get shut down, so, being able to be independent and have more time for myself has been the biggest challenge for me.

– Prenatal woman, February 2021

I started having a lot of issues already with my [pregnancy] weight. I felt heavy. So, he couldn't attend [virtual] classes anymore and now the baby is here and I just had an emergency C-section. We cannot do classes. So that's still on hold. I think that's the biggest struggle right now, that we put his school aside for now.

– Postpartum woman, October 2020

Usual coping outlets were restricted

Usual coping outlets to provide enjoyment and fulfill physical, emotional, and spiritual needs were less available to prenatal and postpartum participants due to concerns of exposure to the virus. These outlets included going to church, exercising at the gym, doing errands, or socializing. Spaces that once brought them joy, solace, and an easing of stress where simply not available. This finding carries implications for prenatal and postpartum well-being and health, as many of these coping outlets are important self-care measures for prenatal / postpartum people.

> *I do like going to church. I went a few times after COVID started and then I didn't go anymore in-person, I didn't feel comfortable. I just kind of go when there's no mass, there's a church nearby where I live, but I don't wanna attend mass just because I don't wanna expose myself to other people in that way.*
> *– Prenatal woman, December 2020*

> *I used to even go to the gym before. And that, that kind of helped me cope.*
> *– Postpartum woman, February 2021*

In summary, all facets of daily life (social support, social life, work / school and coping outlets) were disrupted or reduced by the pandemic. This added to participants' feelings of isolation, and complicated decision-making and management of the usual challenges of pregnancy and postpartum.

The COVID-19 pandemic increased emotional distress and affected the mental health of prenatal and postpartum people

Prenatal and postpartum participants reported emotional distress from the pandemic, often expressed as feeling scared, fearful, and worried. Participants expressed a feeling of vulnerability in being pregnant during the pandemic and reported fears of virus exposure to self or baby. At least two participants described having an exacerbation of a pre-existing anxiety condition. These feelings and concerns led some participants to stay home as much as possible in 2020 and early 2021.

> *The biggest challenge that I have, of course, is just trying not to feel so overwhelmed and anxiety on high. I feel more scared than I ever had before ... I'm in the house for the most part. I fear being around anybody 'cause I know that I could be more vulnerable, given that I am pregnant. And when the big day comes, my fear is as well for the baby. – Prenatal woman, February 2021*

> *I felt like every time I went to the store for something, with everything going on, people were just acting crazy and it would stress me out. And I had anxiety issues, so that didn't help. So, once I came in the house, that was it and I was staying maybe for the rest of the week. – Postpartum woman, December 2020*

Aligned with some participants' expression of fear, nervousness, and sometimes sadness, women in the sample screened positive for symptoms suggestive of anxiety or depression. Nine of 24 women surveyed had elevated anxiety (GAD-2)[38] or depression

(PHQ-2)[36–37] screening scores that were escalated to the clinical team for follow-up. Of the 9 women, three had elevated anxiety scores; two had elevated depression scores; and four had both anxiety and depression scores elevated. Of the 9 women, 5 were prenatal and 4 were postpartum. Another 2 women were referred to the clinical team for suspected mental health distress based on their interview content (one was prenatal and not screened and one was postpartum and screened negative). The depression and anxiety screening questions, while only designed to capture possible mental health symptoms, were a useful way to quantify the levels of mental health distress in the sample.

In summary, there were many stressors converging to increase the risk of emotional distress and mental health conditions for prenatal and postpartum people during the COVID-19 pandemic. The emotional distress expressed by participants often surrounded a concern of increased vulnerability to COVID-19 for pregnancy or a new baby. These feelings of vulnerability, combined with the economic and social stressors and reduction in social support from the pandemic, all could be major contributors to the emotional distress noted among participants in the sample.

Prenatal and postpartum people felt lonely in their health care experience during the COVID-19 pandemic

Prenatal and postpartum participants reported feeling isolated in their care experience, mostly due to visitor / companion restrictions at the prenatal clinic and hospital. Participants highlighted the difficulty of not having a support person present at care visits, with some participants reporting increased emotional stress from this lack of

company. Others expressed disappointment and concern that by not attending prenatal visits, their partners were missing out on an opportunity to connect with the pregnancy process and baby.

> *That was the only depressing part of it dealing with the hospital and not being able to have a support person to hold onto because my pregnancy was high-risk. There was a time that I have to go very often, for them to monitor the baby's heart beat. I think they should allow a support person, because you are already nervous. [It] could have caused a lot of stress on the mother and the child.*
> *– Postpartum woman, August 2021*

> *I was very, I was kinda scared. And I was kind of depressed because nobody could be there with me. I got a panic attack right there at the C-section room. I literally felt I was going to die. I couldn't breathe. But they kept telling me, "You can breathe. You can actually breathe. We are looking at your oxygen levels and you are fine."*
> *– Postpartum woman, February 2021*

> *Not being able to have someone whether it's my sister or my partner in the room with me was like, okay, I gotta do this alone. Like maybe [my partner] would have more of a bond or feel more bonded immediately by being in the room and seeing the reality of what's happening. Right now, it's like just everything is being told to*

him.

– Prenatal woman, February 2021

Women and maternal health professional participants also expressed their concern surrounding reduced length of hospital stay, perceived to be due to a COVID-19 policy. With the length of postpartum hospital stay shortened, postpartum patients could leave the hospital before ready (physical readiness or skills readiness by missing instruction on lactation, infant care, for example). This also contributed to a feeling of lack of support or isolation in the care experience.

Another issue is we discharge people on day one or day two postpartum. They've gotten so much support and then going home, that's it. Because of COVID.

– Nurse midwife, August 2021

I had [someone] asking me to leave the hospital because of Covid. But I had twins, it was impossible to leave next day. They want me to leave next day and I'm like "I'm not going anywhere. I can't." I understand because of Covid they keep them less, but the two nurses, they respected it and said "No, you have twins. You can stay one more day"

– Postpartum woman, July 2021

Like I guess given the circumstances because of COVID, they were like, "Okay, we got to get you in and out." – Postpartum woman, August 2021

In summary, the women highlighted how the pandemic hospital policies took away key support when they needed it most, leaving them feeling more alone, and with potentially higher stress levels. Due to visitor policies, they expressed concerns about lack of bonding by partners to the pregnancy process and baby through their removal from the exam room and any in-person interaction with the provider and care team. Postpartum length of stay also was perceived as shortened due to the pandemic, also contributing to feelings of reduced support. While these policies loosened as the pandemic progressed, these women were expressing their experience at that particular point in time when outside social support in the care experience was limited.

Care delivery modifications during the COVID-19 pandemic had implications for future telehealth maternity care innovation

Care delivery had to shift at the height of the COVID-19 pandemic to meet safety regulations and any changes in staffing or resources. When asked about their experience delivering care during the COVID-19 pandemic, maternal health professionals (MHPs) often raised the topic of telehealth. MHPs had differing impressions about the uptake and effectiveness of telehealth at their practice during the height of the COVID-19 pandemic. Many MHPs (11 of 15), of all disciplines and levels of clinical experience, found telehealth to be very helpful to patients, improving care access by eliminating barriers to attending an in-person visit, such as transportation or childcare. Some MHPs also thought

that telehealth can help a patient feel more connected to care.

Other maternal health professionals noted the benefit of telehealth to the providers and their delivery of care, through increased time efficiency and closer communication with their patients. Two MHPs suggested that telehealth increased communication with patients, allowing them to answer questions and identify needs. An attending physician observed that the use of MyChart, the patient portal, improved providers' responsiveness to their patients' needs by direct messaging with them on the platform. A social worker found that her interactions with patients increased when she connected with them by phone.

> *I never did telehealth visits pre-COVID, at all. And I think it really makes it a lot easier for some patients who can't get in because of transportation or babysitting, or just a number of different issues or reasons. – Nurse Practitioner, July 2021*

> *I think the fact that we found that telehealth really works and is a low-cost way of doing things. Checking in with patients and making sure they have their medication, where they can get COVID testing, I think that was actually a good thing that came out of this terrible pandemic. – Attending physician, July 2021*

> *I think providers have learned to be more responsive [using MyChart, the patient portal]. It's a good way [for a patient] to directly follow up with a question. – Attending physician, September 2021*

For some patients it even increased our interactions with them because sometimes it's easier when patients are busy, have kids at home, to catch them on the phone.

– Social worker, June 2021

Two maternal health professionals perceived telehealth as not well or uniformly adopted by their patients, and another expressed concerns about patient access to technology infrastructure. It is unknown how many years of experience these providers possess, but one was an attending physician and another a social work supervisor, suggesting experience. The perceived poor telehealth adoption was attributed to lack of patient technology infrastructure (internet), lack of patient interest, or patient expectations for care. Another physician also suggested that the clinic's implementation of telehealth was a driver of poor adoption but did not provide further clarification on that point.

Telehealth wasn't so popular here. For whatever reason, it didn't work so well with our patients. And I think if we get another pandemic, it's gonna be bad, because whereas some of my other colleagues in other departments found great opportunities to engage patients and their patients were engaged in telemedicine health, we didn't see that here. Some of it is cultural, believing that, well, how can a doctor really assess me?

– Social worker, August 2021

[Telehealth] was not so big in our patient populations. I think the interest was there, but just the actual execution wasn't great [by the clinic]. I think part of it

was the actual patients, their lack of good internet access, and I think they also just wanted to see the doctor in-person, 'cause they expect it, especially for prenatal care. I think a lot of other patient populations may have really embraced the convenience of it, and it just wasn't so much embraced by our patient population. I would say it got better … but they don't always have reliable internet access, or they're not savvy enough, or interested enough to look at MyChart [patient portal]. – Attending physician, July 2021

There are a lot of tools, like MyChart [patient portal], that people are comfortable with. And for the patient that you do encounter that has limited access to technology, to bridge those gaps would be useful … – Attending physician, September 2021

Three providers (two resident physicians and a physician assistant) expressed an interest in converting components of prenatal and postpartum care to telehealth as standard practice to increase care engagement and ensure higher visit attendance. They emphasized that this option would be best for low-risk patients, and that certain clinical activities require an in-person visit for all patients, such as vaccine administration, laboratory testing, ultrasounds, and blood pressure checks. One provider raised the need for a quality assurance mechanism for home blood pressure monitoring for virtual visits.

Something that really expanded, not just in OB/GYN, but in all fields, is telehealth. I think, especially for low-risk patients, identifying times when they might not have to come to the hospital, that can really increase the number of times that they actually get care. A lot of our low-risk patients come in and they don't need labs drawn that week and so we chat for five minutes and we listen to the baby's heart beat and measure the belly and they go home. But they've waited for me for an hour for that five-minute visit. I think if that could be converted into a telephone call, we could do more frequent telephone calls instead of once every two or once every four weeks in-person visit.

– Resident physician, June 2021

I feel like we have so many prenatal visits that some of them, as long as a patient meets certain criteria and they're very uncomplicated, could probably just be done as a televisit. Then that could save a lot of time on both ends.

– Resident physician, June 20201

In summary, the majority of maternal health professionals saw telehealth as a positive aspect of care delivery as a result of the COVID-19 pandemic. A smaller group of MHPs saw telehealth as poorly adopted in the practice, and raised important concerns about patient access to internet, interest, and expectations. These perspectives from maternal health professionals highlight the need for further study of possible telehealth innovation in maternal health care delivery.

4.4 Discussion

Prenatal / postpartum people, partners, and families encountered multiple challenges as they navigated pregnancies during a global pandemic. The reported disruptions to work, school, and social support aligned with other studies on COVID-19 pandemic stressors.[46] McCool-Myers et al. (2022), found four subgroups of women reporting adverse effects from the pandemic, and those experiencing the highest adversity (financial strains, food insecurity, increased conflict in the home, poor mental or physical health, or barriers to accessing care) were more likely to be African American and / or Latino/a or of a sexual minority group.[46] Participants in our study (approximately one third) reported at least one of McCool-Myers' indicators of highest adversity in their interviews, but with the added layer of complexity and vulnerability of pregnancy and the postpartum period. Reduced social support due to social distancing guidelines and travel restrictions also affected the prenatal and postpartum experience, which aligns with other recent studies.[26, 47–49]

Increases in mental health disorders have been reported in other studies on COVID-19,[27–29] including a tripling of postpartum depression.[30] Koyucu et al. (2021) found that the incidence of mental health disorders in pregnant women during the pandemic period was much higher than that during the pre-pandemic period, and that economic difficulties, including financial strain and losing employment, increased anxiety, depression, and stress.[26] They also found that the perception of social support was highly protective against these same conditions of depression, anxiety and stress.[26] These quantitative findings provide a context for our study in which participants reported

emotional stress navigating financial difficulties, job loss, fear of virus exposure, and strains on social support during pregnancy and the postpartum period.

The care experience was disrupted negatively due to hospital visitor policies, particularly when it came to support person, partner, and family involvement in prenatal care and labor and delivery. These findings are consistent with Janjua et al. (2021), in which the negative impact of hospital visitor restrictions and psychological distress were the two major themes for their UK sample.[50] Another review by Lalor et al. (2023) found that maternity care did not adhere to WHO quality maternity care standards during the pandemic, with issues such as confusing regulations, lack of support persons, and lack of support by health care professionals during the postpartum period.[51] Another study by Antaneh et al. (2022) found that maternity care providers in high-income countries struggled to meet WHO standards for Respectful Maternity Care during the COVID-19 pandemic, due to factors such as lack of birth companionship or gaps in evidence-based practice delivery.[32] A study by Janevic et al. (2021) found that NYC women who gave birth during the peak of the pandemic response had lower birth satisfaction and higher perceived health care discrimination, particularly women who were SARS-CoV-2 positive, or Black or Latina women.[33] Lower birth satisfaction was associated with higher symptoms of depression, anxiety, stress, and lower exclusive breastfeeding, and higher perceived health care discrimination was associated with higher levels of postpartum stress and birth-related PTSD.[33]

Care delivery had to shift drastically to meet the demands of the pandemic context, including an expansion of telehealth[52] with the support of federal COVID-19

waivers and regulatory changes. While there were some differing perceptions among providers about patient uptake and clinic implementation of telehealth in this study, this may be partly based on how providers defined telehealth (phone calls versus full suite including patient portal use). Consistent with the minority provider opinion in our study, Galle et al. (2021) found through a large survey of maternity care providers that there were challenges with telehealth infrastructure, patient technology literacy, distrust from patients, and a concern of increased inequity in access to care and potential decreased quality of care.[53]

The evidence remains equivocal as to whether maternity telehealth can improve or reduce care access and equity. A descriptive paper by Peahl et al. (2020) argued that new models of prenatal care that include some virtual visits (in this case four in-person visits, one ultrasound visit, and four virtual visits) can address health disparities by improving access to care for low-income pregnant people.[54] A 2022 systematic review by Cantor et al. (2022) found that replacing or supplementing in-person maternity care with telehealth results in similar clinical outcomes and patient satisfaction, yet the effect on access to care and equity is unclear.[55] Concerns regarding equity and the digital divide for lower income communities were raised by two provider participants in this study, echoing a 2020 brief by the Urban Institute.[56]

The shift to a hybrid tele / in-person care model for maternity care carries potential for care innovation[57] but ultimately relies on clinical consensus and advocacy from bodies such as the American College of Obstetricians and Gynecologists (ACOG);[58–59] policy change by Centers for Medicare and Medicaid Services (CMS)[60–62]

community infrastructure investments[62] by federal and state government to ensure equitable access; and health system commitment to the right infrastructure and processes.

Study Strengths and Limitations

The strengths of this study include access to key stakeholders and first-hand accounts from prenatal / postpartum people and front-line maternal health professionals in a city greatly affected by the COVID-19 pandemic. This study also highlighted the difference in perspectives of health care providers and patients about priorities for maternal health care and support. These findings can inform future research as well as program development for maternal health and social services. The interview process and analysis were thorough and comprehensive, providing a robustness of data and resultant themes. The close partnership with the study site and the decades of community health work experience of the research team members ensured that the study design, research questions, and data collection were closely tailored to the community, the hospital site, and the patient population.

While the majority of interviews were conducted Feb 2021 – Sept 2021, there was a long data collection period that encompassed different phases of the COVID-19 pandemic. The prenatal / postpartum participant quotes provided in the results section were mostly from interviews conducted between December 2020 and February 2021, which reflects the period in which COVID-19 was a perceived threat by many in New York City and when COVID-19 vaccines were not yet available. The maternal health professional participant interviews took place July 2021–September 2021 and could

reflect a period of relief with the availability of COVID-19 vaccines, but also burnout from the previous year and a half.[63]

Mental health measures of the prenatal / postpartum participants would ideally have been pregnancy / postpartum-specific,[64] but due to their length, the research team opted for shorter general first pass depression and anxiety scales to ensure that the flow of the in-depth interview was not broken.[65–66] Studies have found that PHQ-2 can be a valid pregnancy or postpartum depression screening tool.[65–66] Less has been studied about the use of the GAD-2 in pregnancy or during the postpartum period, and perinatal anxiety measures have equivocal validity.[67–68] This study used the same four depression and anxiety questions as were used in the Listening to Mothers survey.[40]

Some participants may have perceived the study as linked to their health care provider or employer, which could affect their comfort in sharing honestly. To address this, the interviewer identified herself as a member of an external research team and emphasized confidentiality at the start of the interview. The interviewer explained that results of the study would be de-identified and reported as themes.

When asked about their experiences delivering care during the COVID-19 pandemic, many providers raised the topic of telehealth; however, they were not then prompted to define telehealth (phone versus video calls versus patient portal messaging), which may have led to the variability of findings in this area.

Due to the qualitative nature of this study, the findings are not generalizable to the prenatal and postpartum population as a whole. However, findings could be used as lessons learned and points of exploration in similar U.S. communities.

4.5 Conclusion

Findings from this study highlight the social and economic vulnerability of low-income prenatal and postpartum people. Study results call for bolstering social supports during pandemics, and even in non-pandemic times. At the health system level, supports could include care models that include community health workers or other trusted team members, and increased mental health and social support screenings. As touched upon in this study, maternity care delivery models that include some virtual care could improve care attendance and patient experience without sacrificing patient safety, outcomes, and equity. Clinical consensus and political will and investments are necessary to move this forward.

Finally, the findings of this study can be applied to emergency preparedness planning for any future events that cause greater social and economic vulnerability, including natural or human-made disasters. More specifically, these findings can serve as lessons for planning for future pandemics, which will likely become more common with changes in global climate.[69]

References

1. Maternal Mortality in the United States: A Primer. Commonwealth Fund. Issue Brief and Report. December 16, 2020. Available from: https://www.commonwealthfund.org/publications/issue-brief-report/2020/dec/maternal-mortality-united-states-primer

2. New York City Department of Health and Mental Hygiene Bureau of Maternal and Child Health. Pregnancy-Associated Mortality NYC, 2011-2015. New York, NY. Available from: https://www1.nyc.gov/assets/doh/downloads/pdf/ms/pregnancy-associated-mortality-report-2011-2015.pdf

3. New York City Department of Health and Mental Hygiene (2016). Severe Maternal Morbidity in New York City, 2008–2012. New York, NY. Available from: https://www.nyc.gov/assets/doh/downloads/pdf/data/maternal-morbidity-report-08-12.pdf

4. Howell, Elizabeth A., Natalia Egorova, Amy Balbierz, Jennifer Zeitlin, and Paul L. Hebert. "Black-White Differences in Severe Maternal Morbidity and Site of Care." American Journal of Obstetrics and Gynecology 214, no. 1. January 2016: 122.e1–122.e7. https://doi.org/10.1016/j.ajog.2015.08.019.

5. Came, Heather, and Derek Griffith. "Tackling Racism as a 'Wicked' Public Health Problem: Enabling Allies in Anti-Racism Praxis." *Social Science & Medicine* 199 (February 2018): 181–88. https://doi.org/10.1016/j.socscimed.2017.03.028.

6. Taylor, Jamila K. "Structural Racism and Maternal Health Among Black Women." *Journal of Law, Medicine & Ethics* 48, no. 3 (2020): 506–17. https://doi.org/10.1177/1073110520958875.

7. Williams, David, and Lisa Cooper. "Reducing Racial Inequities in Health: Using What We Already Know to Take Action." *International Journal of Environmental Research and Public Health* 16, no. 4 (February 19, 2019): 606. https://doi.org/10.3390/ijerph16040606.

8. Geronimus, Arline T., Margaret Hicken, Danya Keene, and John Bound. "'Weathering' and Age Patterns of Allostatic Load Scores Among Blacks and Whites in the United States." *American Journal of Public Health* 96, no. 5 (May 2006): 826–33. https://doi.org/10.2105/AJPH.2004.060749.

9. Kolk TA, Nath S, Howard LM, Pawlby S, Lockwood-Estrin G, Trevillion K. The association between maternal lifetime interpersonal trauma experience and perceived mother-infant bonding. J Affect Disord. 2021 Nov 1;294:117-127. doi: 10.1016/j.jad.2021.06.069. Epub 2021 Jul 1. PMID: 34280788; PMCID: PMC8424749.

10. Noursi, S., Saluja, B. & Richey, L. Using the Ecological Systems Theory to Understand Black/White Disparities in Maternal Morbidity and Mortality in the United States. J. Racial and Ethnic Health Disparities 8, 661–669 (2021). https://doi-org.ezproxy.bu.edu/10.1007/s40615-020-00825-4

11. Howell, Elizabeth A., Teresa Janevic, James Blum, Jennifer Zeitlin, Natalia N. Egorova, Amy Balbierz, and Paul L. Hebert. "Double Disadvantage in Delivery Hospital for Black and Hispanic Women and High-Risk Infants." *Maternal and Child Health Journal* 24, no. 6 (June 2020): 687–93. https://doi.org/10.1007/s10995-020-02911-9.

12. Janevic, Teresa, Jennifer Zeitlin, Natalia Egorova, Paul L. Hebert, Amy Balbierz, and Elizabeth A. Howell. "Neighborhood Racial And Economic Polarization, Hospital Of Delivery, And Severe Maternal Morbidity: An Examination of Whether Racial and Economic Neighborhood Polarization Is Associated with Severe Maternal Morbidity Rates and Whether the Delivery Hospital Partially Explains the Association." *Health Affairs* 39, no. 5 (May 1, 2020): 768–76. https://doi.org/10.1377/hlthaff.2019.00735.

13. Eick SM, Goin DE, Izano MA, Cushing L, DeMicco E, Padula AM, Woodruff TJ, Morello-Frosch R. Relationships between psychosocial stressors among pregnant women in San Francisco: A path analysis. PLoS One. 2020 Jun 12;15(6):e0234579. doi: 10.1371/journal.pone.0234579. PMID: 32530956; PMCID: PMC7292353.

14. Attanasio LB, Ranchoff BL, Cooper MI, Geissler KH. Postpartum Visit Attendance in the United States: A Systematic Review. Womens Health Issues. 2022 Jul-Aug;32(4):369-375. doi: 10.1016/j.whi.2022.02.002. Epub 2022 Mar 15. PMID: 35304034; PMCID: PMC9283204.

15. McCloskey, Lois, Judith Bernstein, Michael Winter, Ronald Iverson, and Aviva Lee-Parritz. "Follow-Up of Gestational Diabetes Mellitus in an Urban Safety Net Hospital: Missed Opportunities to Launch Preventive Care for Women." Journal of Women's Health 23, no. 4 (April 2014): 327–34. https://doi.org/10.1089/jwh.2013.4628.

16. Mathieu, Irène P., Yanna Song, and Shubhada M. Jagasia. "Disparities in Postpartum Follow-Up in Women With Gestational Diabetes Mellitus: Table 1." *Clinical Diabetes* 32, no. 4 (October 2014): 178–82. https://doi.org/10.2337/diaclin.32.4.178.

17. Hunt, Kelly J., and Deborah L. Conway. "Who Returns for Postpartum Glucose Screening Following Gestational Diabetes Mellitus?" *American Journal of Obstetrics and Gynecology* 198, no. 4 (April 2008): 404.e1-6. https://doi.org/10.1016/j.ajog.2007.09.015.

18. Almario, Christopher V., Teresa Ecker, Leslie A. Moroz, Lynne Bucovetsky, Vincenzo Berghella, and Jason K. Baxter. “Obstetricians Seldom Provide Postpartum Diabetes Screening for Women with Gestational Diabetes.” *American Journal of Obstetrics and Gynecology* 198, no. 5 (May 2008): 528.e1-528.e5. https://doi.org/10.1016/j.ajog.2007.11.001.

19. New York State Department of Health Office of Quality and Patient Safety. Medicaid Perinatal Study. March 2013.

20. Levine, L. D., C. Nkonde-Price, M. Limaye, and S. K. Srinivas. “Factors Associated with Postpartum Follow-up and Persistent Hypertension among Women with Severe Preeclampsia.” *Journal of Perinatology: Official Journal of the California Perinatal Association* 36, no. 12 (2016): 1079–82. https://doi.org/10.1038/jp.2016.137.

21. Bauer, Nerissa S., Susan Ofner, Amy Pottenger, Aaron E. Carroll, and Stephen M. Downs. “Follow-up of Mothers with Suspected Postpartum Depression from Pediatrics Clinics.” *Frontiers in Pediatrics* 5 (October 3, 2017): 212. https://doi.org/10.3389/fped.2017.00212

22. Anstey EH, Chen J, Elam-Evans LD, Perrine CG. Racial and Geographic Differences in Breastfeeding — United States, 2011–2015. MMWR Morb Mortal Wkly Rep 2017;66:723–727. DOI: http://dx.doi.org/10.15585/mmwr.mm6627a3

23. Eliason, Erica L. “Adoption of Medicaid Expansion Is Associated with Lower Maternal Mortality.” *Women’s Health Issues* 30, no. 3 (May 2020): 147–52. https://doi.org/10.1016/j.whi.2020.01.005.

24. Jou, Judy, Katy B. Kozhimannil, Jean M. Abraham, Lynn A. Blewett, and Patricia M. McGovern. “Paid Maternity Leave in the United States: Associations with Maternal and Infant Health.” *Maternal and Child Health Journal* 22, no. 2 (February 2018): 216–25. https://doi.org/10.1007/s10995-017-2393-x.

25. Thoma ME, Declercq ER. All-Cause Maternal Mortality in the US Before vs During the COVID-19 Pandemic. *JAMA Netw Open.* 2022;5(6):e2219133. doi:10.1001/jamanetworkopen.2022.19133

26. Koyucu RG, Karaca PP. The Covid 19 outbreak: Maternal Mental Health and Associated Factors. Midwifery. 2021 Aug;99:103013. doi: 10.1016/j.midw.2021.103013. Epub 2021 Apr 15. PMID: 33957520; PMCID: PMC9756965.

27. Cameron EE, Joyce KM, Delaquis CP, Reynolds K, Protudjer JLP, Roos LE. Maternal psychological distress & mental health service use during the COVID-19 pandemic. J Affect Disord. 2020 Nov 1;276:765-774. doi:

10.1016/j.jad.2020.07.081. Epub 2020 Jul 20. PMID: 32736186; PMCID: PMC7370903.

28. Naureen Akber Ali, Anam Shahil Feroz. Maternal mental health amidst the COVID-19 pandemic. Asian Journal of Psychiatry. Volume 54, 2020.102261, ISSN 1876-2018,

29. Keating NE, Dempsey B, Corcoran S, McAuliffe FM, Lalor J, Higgins MF. Women's experience of pregnancy and birth during the COVID-19 pandemic: a qualitative study. Ir J Med Sci. 2022 Oct;191(5):2177-2184. doi: 10.1007/s11845-021-02862-2. Epub 2021 Dec 2. PMID: 34855128; PMCID: PMC8636585.

30. Shuman, C.J., Peahl, A.F., Pareddy, N. *et al.* Postpartum depression and associated risk factors during the COVID-19 pandemic. *BMC Res Notes* **15**, 102 (2022). https://doi.org/10.1186/s13104-022-05991-8

31. Lalor JG, Sheaf G, Mulligan A, Ohaja M, Clive A, Murphy-Tighe S, Ng ED, Shorey S. Parental experiences with changes in maternity care during the Covid-19 pandemic: A mixed-studies systematic review. Women Birth. 2023 Mar;36(2):e203-e212. doi: 10.1016/j.wombi.2022.08.004. Epub 2022 Aug 10. PMID: 35973917; PMCID: PMC9364727

32. Anteneh Asefa, Aline Semaan, Therese Delvaux, Elise Huysmans, Anna Galle, Emma Sacks, Meghan A. Bohren, Alison Morgan, Michelle Sadler, Saraswathi Vedam, Lenka Benova. The impact of COVID-19 on the provision of respectful maternity care: Findings from a global survey of health workers. Women and Birth, Volume 35, Issue 4, 2022, Pages 378-386, ISSN 1871-5192, https://doi.org/10.1016/j.wombi.2021.09.003.

33. Janevic T, Maru S, Nowlin S, McCarthy K, Bergink V, Stone J, Dias J, Wu S, Howell EA. Pandemic Birthing: Childbirth Satisfaction, Perceived Health Care Bias, and Postpartum Health During the COVID-19 Pandemic. Matern Child Health J. 2021 Jun;25(6):860-869. doi: 10.1007/s10995-021-03158-8. Epub 2021 Apr 28. PMID: 33909205; PMCID: PMC8079857.

34. Zoom encrypted telecommunications Software. Available from: https://zoom.us/

35. Seidman, Irving. Interviewing As Qualitative Research: A Guide for Researchers in Education and the Social Sciences. 4th ed. New York, Teachers College Press, 2013.

36. Kroenke K, Spitzer RL, Williams JB. The Patient Health Questionnaire-2: validity of a two-item depression screener. Med Care. 2003 Nov;41(11):1284-92. doi: 10.1097/01.MLR.0000093487.78664.3C. PMID: 14583691.

37. Gjerdingen D, Crow S, McGovern P, Miner M, Center B. Postpartum depression screening at well-child visits: validity of a 2-question screen and the PHQ-9. Ann Fam Med. 2009 Jan-Feb;7(1):63-70. doi: 10.1370/afm.933. PMID: 19139451; PMCID: PMC2625843.

38. Staples LG, Dear BF, Gandy M, Fogliati V, Fogliati R, Karin E, Nielssen O, Titov N. Psychometric properties and clinical utility of brief measures of depression, anxiety, and general distress: The PHQ-2, GAD-2, and K-6. Gen Hosp Psychiatry. 2019 Jan-Feb;56:13-18. doi: 10.1016/j.genhosppsych.2018.11.003. Epub 2018 Nov 22. PMID: 30508772.

39. Centers for Disease Control and Prevention. Pregnancy Risk Assessment Monitoring Survey (PRAMS). Phase 8 (2016-Present) Standard Questionnaire. Available from: https://www.cdc.gov/prams/questionnaire.htm

40. National Partnership for Women and Families. Listening to Mothers in California 2018 survey. Available from: https://www.chcf.org/wp-content/uploads/2018/09/ListeningMothersQuestionnaire2018.pdf

41. REV Transcription Services. Available from: https://www.rev.com/

42. Happy Scribe Transcription services. Available from: https://www.happyscribe.com

43. Braun V and Clarke V. Thematic Analysis: a Practical Guide. 1st Edition. Sage Publications, December 6 2021.

44. NVivo 1 Qualitative Data Analysis Software. Available from: https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home

45. Miro Visual Collaboration Platform. Available from: https://miro.com/app/dashboard/

46. McCool-Myers, M., Grasso, D., Kozlowski, D. *et al.* The COVID-19 pandemic's intersectional impact on work life, home life and wellbeing: an exploratory mixed-methods analysis of Georgia women's experiences during the pandemic. *BMC Public Health* **22**, 1988 (2022). https://doi-org.ezproxy.bu.edu/10.1186/s12889-022-14285-4

47. Tania AT, Natalia AR, Verónica VB, Pilar MS, Rubén GF, Cristina LP. Social support and mental health in maternity: Effects of the COVID-19 pandemic. Midwifery. 2022 Dec 24;118:103580. doi: 10.1016/j.midw.2022.103580. Epub ahead of print. PMID: 36584610; PMCID: PMC9789545.

48. Brown A, Shenker N. Experiences of breastfeeding during COVID-19: Lessons for future practical and emotional support. Matern Child Nutr. 2021 Jan;17(1):e13088.

doi: 10.1111/mcn.13088. Epub 2020 Sep 23. PMID: 32969184; PMCID: PMC7537017.

49. Snyder K, Worlton G. Social Support During COVID-19: Perspectives of Breastfeeding Mothers. Breastfeed Med. 2021 Jan;16(1):39-45. doi: 10.1089/bfm.2020.0200. Epub 2020 Dec 23. PMID: 33372829.

50. Janjua NB, Mohamed AF, Birmani SA, Donnelly O, Syed AH, Essajee M. COVID-19 Pandemic and Maternal Perspectives. Ir Med J. 2021 Aug 19;114(7):411. PMID: 34520646.

51. Lalor JG, Sheaf G, Mulligan A, Ohaja M, Clive A, Murphy-Tighe S, Ng ED, Shorey S. Parental experiences with changes in maternity care during the Covid-19 pandemic: A mixed-studies systematic review. Women Birth. 2023 Mar;36(2):e203-e212. doi: 10.1016/j.wombi.2022.08.004. Epub 2022 Aug 10. PMID: 35973917; PMCID: PMC9364727.

52. Fryer K, Delgado A, Foti T, Reid CN, Marshall J. Implementation of Obstetric Telehealth During COVID-19 and Beyond. Matern Child Health J. 2020 Sep;24(9):1104-1110. doi: 10.1007/s10995-020-02967-7. PMID: 32564248; PMCID: PMC7305486.

53. Galle A, Semaan A, Huysmans E, *et al*. A double-edged sword—telemedicine for maternal care during COVID-19: findings from a global mixed-methods study of healthcare providers. *BMJ Global Health* 2021;**6:**e004575.

54. Peahl AF, Smith RD, Moniz MH. Prenatal care redesign: creating flexible maternity care models through virtual care. Am J Obstet Gynecol. 2020 Sep;223(3):389.e1-389.e10. doi: 10.1016/j.ajog.2020.05.029. Epub 2020 May 17. PMID: 32425200; PMCID: PMC7231494.

55. Cantor AG, Jungbauer RM, Totten AM, Tilden EL, Holmes R, Ahmed A, Wagner J, Hermesch AC, McDonagh MS. Telehealth Strategies for the Delivery of Maternal Health Care : A Rapid Review. Ann Intern Med. 2022 Sep;175(9):1285-1297. doi: 10.7326/M22-0737. Epub 2022 Jul 26. PMID: 35878405.

56. Hill I and Burroughs E. Maternal telehealth has expanded dramatically during the COVID-19 pandemic: equity concerns and promising approaches. Urban Institute. October 28 2020. Available from: https://www.urban.org/research/publication/maternal-telehealth-has-expanded-dramatically-during-covid-19-pandemic

57. Kemmerer, A, Zook M, Traylor, J. Maternity care innovations during COVID-19: Short-term solutions, long-term potential. To the Point (blog). Commonwealth Fund. May 6, 2021.

58. ACOG Committee opinion – guidelines on implementing telehealth. February 2020. Available from: https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2020/02/implementing-telehealth-in-practice

59. Peahl, Alex Friedman MD, MSc; Zahn, Christopher M. MD; Turrentine, Mark MD; Barfield, Wanda MD, MPH; Blackwell, Sean D. MD; Roberts, Suni Jo BS; Powell, Allison R. MD, MSE; Chopra, Vineet MD, MSc; Bernstein, Steven J. MD, MPH. The Michigan Plan for Appropriate Tailored Healthcare in Pregnancy Prenatal Care Recommendations. Obstetrics & Gynecology 138(4):p 593-602, October 2021. | DOI: 10.1097/AOG.0000000000004531 https://journals.lww.com/greenjournal/Citation/2021/10000/The_Michigan_Plan_for_Appropriate_Tailored.12.aspx

60. Rep Liz Cheney. HR 4040. Advancing Telehealth Beyond COVID-19 Act of 2021. Approved by House 7/2022. https://www.congress.gov/bill/117th-congress/house-bill/4040

61. Allen E and Benatar S. Maternity care financing: challenges and opportunities highlighted by the COVID-19 pandemic. Urban Institute. October 28 2020. Available from: https://www.urban.org/research/publication/maternity-care-financing-challenges-and-opportunities-highlighted-covid-19-pandemic

62. New York State Taskforce on Maternal Mortality and Disparate Racial Outcomes. NY State Expert Panel on Postpartum Care Report. NY State Department of Health. January 2021. Available from: https://www.health.ny.gov/community/adults/women/task_force_maternal_mortality/docs/2021-01_expert_panel_on_postpartum_care_final_report.pdf

63. Schmitt, N., Mattern, E., Cignacco, E. *et al.* Effects of the Covid-19 pandemic on maternity staff in 2020 – a scoping review. *BMC Health Serv Res* **21**, 1364 (2021). https://doi.org/10.1186/s12913-021-07377-1

64. Park, SH., Kim, JI. Predictive validity of the Edinburgh postnatal depression scale and other tools for screening depression in pregnant and postpartum women: a systematic review and meta-analysis. *Arch Gynecol Obstet* (2022). https://doi.org/10.1007/s00404-022-06525-0

65. Chae SY, Chae MH, Tyndall A, Ramirez MR, Winter RO. Can we effectively use the two-item PHQ-2 to screen for postpartum depression? Fam Med. 2012 Nov-Dec;44(10):698-703. PMID: 23148001.

66. Smith MV, Gotman N, Lin H, Yonkers KA. Do the PHQ-8 and the PHQ-2 accurately screen for depressive disorders in a sample of pregnant women? Gen Hosp Psychiatry. 2010 Sep-Oct;32(5):544-8. doi:

10.1016/j.genhosppsych.2010.04.011. Epub 2010 Jun 22. PMID: 20851275; PMCID: PMC2943487.

67. Rose Meades, Susan Ayers. Anxiety measures validated in perinatal populations: A systematic review, Journal of Affective Disorders, Volume 133, Issues 1–2, 2011, Pages 1-15, ISSN 0165-0327, https://doi.org/10.1016/j.jad.2010.10.009.

68. Silverio, S.A., Davies, S.M., Christiansen, P. *et al.* A validation of the Postpartum Specific Anxiety Scale 12-item research short-form for use during global crises with five translations. *BMC Pregnancy Childbirth* **21**, 112 (2021). https://doi.org/10.1186/s12884-021-03597-9

69. Carlson, C.J., Albery, G.F., Merow, C. *et al.* Climate change increases cross-species viral transmission risk. *Nature* **607**, 555–562 (2022). https://doi.org/10.1038/s41586-022-04788-w

CHAPTER FIVE: PRACTICE GUIDE

Using the Intervention Mapping Framework for Design and Implementation of a Maternal Community Health Worker Program in U.S. Communities: the case of Maternal Health Matters in New York City

Brett Ives, MSN, CDCES, Jamillah Hoy-Rosas, MPH, RD, CDCES, Tanjeena Patwary, MPH, Leny Rivera, Omara Afzal, DO, MPH, Lisa Messersmith, PhD, Jacey Greece, DSc, MPH, Eugene Declercq, PhD

5.1 Overview: Problem Statement, Purpose, and Planning Framework

Problem Statement and Purpose

The United States has the highest maternal mortality rate of any high-income country, 84% of which is preventable with better access to and quality of prenatal, intrapartum and postpartum care and self-management of chronic diseases.[1] In 2017–2019, around 20% of U.S. maternal deaths occur during pregnancy, 13% on the day of delivery, and 65% in the postpartum period.[1] Severe maternal morbidity, defined as a life-threatening complication before, after, or during the birth,[2] is another key measure of maternal health. Racial and ethnic inequities in maternal mortality and severe maternal morbidity exist nationally, in which Black American and Native American birthing people experience higher rates of poor maternal health outcomes, regardless of income

level.[3–8] Overall U.S. maternal mortality worsened and racial and ethnic disparities widened further during the COVID-19 pandemic in 2020 and 2021.[9–10]

As on the national level, Black non-Latina/e New Yorkers experience the highest rates of maternal mortality and severe maternal morbidity, followed by Latina/e and Asian / Pacific Islander birthing people.[11–12] The severe maternal morbidity rate was also highest in the lowest income zip codes in NYC.[13] In 2013–14 in East Harlem, the study site's location, severe maternal morbidity occurred in 327.9 per 10,000 births, compared with 141.1 in the neighboring Upper East Side.[13] Drivers of race- and place-based disparities in maternal mortality and severe maternal morbidity are complex and include social determinants and discriminatory policies within society,[14–16] as well as racial bias within health care systems, that leads to fewer resources, choice, or safety of care for individuals navigating the pregnancy journey.[17–18]

Community health worker (CHW) models are one promising approach to improving maternal health and reducing racial and ethnic disparities. CHW models in the U.S. have been shown to improve control of chronic conditions such as hypertension, diabetes, and asthma,[19–22] reduced emergency room visits,[19] and lowered health care costs.[23–29] U.S. CHW models have also reduced maternal stress and depression[31–33] and improved breastfeeding rates,[34–35] and there is growing evidence that these models can prevent pregnancy complications and reduce maternal morbidity through social support and early detection of risks.[35–38]

Given the promise of CHW models, there is a growing interest by U.S. health care and public health leaders to add a community health worker layer of care to their practice

in order to deliver cost effective, high quality, culturally competent services.[39–40] However, many questions arise as to how to best assess local needs, design a CHW intervention, and implement and sustain the intervention successfully.[41–42]

A team in Upper Manhattan, New York City, called Maternal Health Matters, conducted a needs and assets assessment in order to design a stakeholder-informed community health worker program to improve maternal health outcomes at a large teaching hospital. Community health worker programs consist of highly trained community health teams (lay health workers and often a clinical supervisor) that can deliver disease management, social resource linkage, social support, and motivational coaching in the home, by phone, and at the doctor's office.[19–29]

The purpose of this paper is to provide a framework and an illustrative case study for maternity health care teams that seek to develop a community health worker program at their site of care. This paper presents each step of Intervention Mapping and how it guided the development of an evidence-informed, feasible, and outcome-oriented maternal health program in NYC. Future work should explore the barriers and facilitators to implementation and sustainability of the program.

Planning Framework

Intervention Mapping[43–45] is a framework that guides assessment of context and design of interventions and is appropriate for developing a maternal community health worker program. The six steps of Intervention Mapping[43,46] are iterative in nature and include: 1) conduct a needs assessment of the community and organization; 2) develop

program goals and performance and change objectives, based on findings from the needs assessment, to guide the intervention development; 3) select theory-based methods and develop practical strategies to address the performance and change objectives as well as a logic model of change; 4) plan the intervention by weaving together the evidence, methods, and strategies into a feasible yet comprehensive intervention; 5) develop an adoption, implementation, and sustainability plan to ensure the intervention is used and maintained over time; 6) evaluate the intervention to determine the extent to which the performance and change objectives were addressed by the methods and strategies given the context of the community. The application of each Intervention Mapping step to the NYC study is provided in Table 5-1.

Intervention Mapping Step	**Application to NYC Study**
1) Conduct a needs and assets assessment and establish a planning team.	• Established planning team with the site's clinical leadership • Needs assessment: Used epidemiological national/New York State/New York City data, literature review, in-depth interviews with patients and maternal health professionals • Assessed organizational context of the site via stakeholder analysis and in-depth interviews
2) Develop program goal, performance objectives, and change objectives[46]	• Reviewed needs and assets assessment findings and developed criteria to chose performance objectives • Carried out a prioritization exercise to choose performance objectives • Selected 2 major performance objectives (increase postpartum visit attendance and improve control of chronic conditions) • Developed change objectives for each performance objective
3) Select theory-based intervention methods	• Chose theoretical models to guide the intervention methods • Developed a logic model of the intervention

4) Develop an intervention plan	• Designed program components, patient curriculum, and CHW core competencies
5) Build an adoption, implementation, and sustainability plan	• Using needs assessment findings and planning team member input, performed a stakeholder analysis • Outlined CHW and supervisor workflow, hiring, and training plans
6) Generate an evaluation plan	• Designed a monitoring and evaluation plan (process and outcome evaluations)

Table 5-1. Intervention Mapping Framework and Application to Current Study

5.2 Intervention Mapping Step 1: Needs and Assets Assessment

Intervention Mapping Step 1 includes convening a planning group and conducting a needs and assets assessment. The NYC team used qualitative and quantitative methods to explore the current local context of the problem (epidemiologic, social, behavioral, political) and the needs and strengths of the community and target population.[43] The founding team members included the medical director of the ambulatory OB/GYN practice who engaged other potential key partners and implementers in social work, medicine, and nursing at different points in the planning process. The team had already decided to develop a CHW program based on a previous evaluation of patient navigator models at the site.[47] They defined their needs and assets assessment questions as:

1) What are the barriers and facilitators to engaging in maternal self-care?
2) What are the barriers and facilitators to engaging in maternal health care?
3) What are the recommended components of a maternal health community health worker program?

4) How has the COVID-19 pandemic affected the health care experiences of prenatal and postpartum people and maternal health professionals?

Quantitative data sources included city- and state-level epidemiological data and qualitative data sources included a literature review and in-depth interviews with prenatal and postpartum people and maternal health care professionals (physicians, nurse midwives, nurse practitioners, social workers, and dietitian). The interviews were analyzed using thematic analysis.[48] As depicted in Table 5-2, findings from the in-depth interviews fall into the categories of barriers, facilitators, and participant recommendations for a maternal CHW program. The respondent source for each barrier, facilitator, or recommendation is in parentheses after each item.

Barriers to maternal self-care and health care engagement (Specific Aim 1)	**Facilitators to maternal self-care and health care engagement (Specific Aim 1)**	**Recommendations for program components and adoption / implementation / sustainability (Specific Aim 2)**
1) Transportation, childcare, neighborhood safety (all) 2) Delayed resources (women) 3) Discontinuity of care issues (all) 4) Concerns of discrimination / racism / disrespect (all) 5) COVID-19 pandemic context with social support, economic stability, care experience (women) and care delivery (professionals)	1) Families, mom friends, OB providers, and online apps as trusted sources of information (women) 2) Healthy coping via body and mind activities (women) 3) Trust enables high quality care experience (women)	1) Postpartum engagement requires layers of support (all) 2) Core CHW domains (all): a. Emotional support b. Instrumental support c. Skills building d. Chronic condition management 3) Clearly defined coach role and workflows, staff and patient buy-in, clinical champions, and seed funding (professionals)

Table 5-2. Executive Summary of Findings from NYC Needs and Assets Assessment

Barriers

Barriers to maternal self-care and health care engagement identified by prenatal / postpartum and maternal health professional participants included social determinants of health such as lack of access to transportation, affordable childcare, and safe neighborhood spaces, which aligned with barriers identified in the literature.[49] This highlights the need for thorough assessment of social needs and connection to the right resources in any CHW program. Another barrier identified by prenatal and postpartum participants was delayed introduction of support resources in the prenatal and postpartum journey. For example, a prenatal person who just learns about childcare education opportunities in the 39th week of the pregnancy. This indicates the importance of well-timed introduction of resources during the pregnancy/postpartum journey.

Barriers related to engagement with care included lack of care continuity (between providers), in which prenatal and postpartum participants did not have the trust and communication with their health care team that they desired. General disrespect, discrimination, or anticipation of discrimination by race, ethnicity, language, or immigration status was also cited by a few prenatal and postpartum participants, underscoring the importance of centering equity, respect and anti-racism in the program design and operations.[50–52]

The COVID-19 pandemic posed another barrier to prenatal and postpartum participants' self-care and engagement in care, with reductions in social support at home and at health care visits due to social distancing policies. Maternal health professionals also shared their experiences with care delivery during COVID-19, with mostly positive

but some differing opinions about telehealth's success in their practice.

Facilitators

Facilitators or assets identified in this study included prenatal and postpartum participants' healthy coping strategies for caring for themselves and managing stress. Prenatal and postpartum participants also highlighted how family members, friends who are mothers, their doctor, and social media and other web applications acted as key sources of information. One example of family advice was to mostly stay home and rest for the first approximately six weeks postpartum, to heal from the birth and to protect the newborn.[53] This and other cultural and religious beliefs and practices that the participants shared will inform content and scripts for the CHW / health coaching curriculum. Trust in the health care team, particularly a trusting relationship with the provider(s) was another key facilitator of health care engagement and a positive care experience identified by prenatal and postpartum participants.

Participant Recommendations for Core Coaching Program Components

The study explored participant recommendations on the core components of a maternal health CHW program. The prenatal and postpartum participants emphasized features that provide emotional and instrumental (transportation, childcare) support, while the maternal health professional (MHP) participants prioritized the building of self-care skills and instrumental support. Based on the needs assessment findings and evidence-based health coach scope of practice,[19–23] the team determined coaching domains for the maternal coaching intervention. MHP participants reported that the CHW

intervention would be most useful for patients with chronic conditions and high-risk pregnancies.

Maternal health professional participants also shared their thoughts about how a maternal health coaching program could best be adopted, managed, and sustained at their site. Themes included the importance of staff buy-in, regular communication of program progress to staff, and a clearly defined coaching role. Participants also emphasized the importance of starting with external funding to further strengthen staff buy-in and adoption. The maternal health professional participants noted the importance of strong supervision of the CHWs, and recommended supervision be carried out by a key clinical leader who has strong network throughout the health system and interfaces with high- and low- risk providers. Note, "provider" in this paper refers to physician, nurse midwife, nurse practitioner, or physician assistant.

Lessons Learned, Practice Recommendations, and Applications to other Contexts

The NYC team's lessons learned during Intervention Mapping Step 1 are presented below, followed by recommendations and applications in the field based on each lesson. Table 5-3 summarizes the further description below.

Lessons Learned	Practice Recommendation	Application to Other Contexts
Lesson 1: Long institutional review board delays, resulting in delays of the study and any resulting intervention	Recommendation 1: Consider a quality improvement approach as opposed to a research study	A resource on determining whether your project is quality improvement or needs IRB approval[54]
Lesson 2: Broad needs assessment with in-depth interviews was time- and resource-intensive	Recommendation 2: To address any time or resource constraints, consider a more focused assessment with efficient methods whenever possible.	National Institute for Children's Health Quality (NICHQ) senior analyst: tips on conducting needs assessment based on available resources[55]
Lesson 3: More focus on assessment of organizational readiness	Recommendation 3: Formally assess organizational readiness	Reviews of two organizational readiness assessments[56–57]
Lesson 4: Importance of partnerships, especially clinical champions on planning team	Recommendation 4: Ensure there is a clinical champion on planning team	Key attributes that can serve as criteria to identify clinical champion(s)[58] A CDC case study of Missouri Women, Infants, and Children (WIC) program demonstrates the importance of identifying the program champions at the state and clinic level, and provides domain areas of clinical champions.[59]

Table 5-3. Lessons Learned, Practice Recommendations, and Applications to Other Contexts for Intervention Mapping Step 1

Lessons Learned

Lessons learned from this phase of the project are centered on how to execute the needs and assets assessment quickly and efficiently. While necessary to publish any findings, the full IRB review of the project caused major delays for the Maternal Health

Matters team. The needs assessment casted a wide net to understand multiple perspectives and levels of the social ecological model. Since the team was relatively certain that the intervention would target postpartum visit attendance and control of chronic conditions, the needs and assets assessment probably could have been focused more on these areas of relevance, saving time and resources. In terms of methods, while in-depth interviews resulted in a rich data set, a survey of patients and providers may have also saved time and planning team effort, while still providing the information needed to design a stakeholder-tailored intervention.

The project may have benefited from a formal assessment of organizational readiness beyond the stakeholder analysis and interviews of maternal health professionals. However, because the medical director was a leader on the planning team, she provided built-in input about organizational capacity. Finally, the power and importance of partnerships were evident during this first phase of the project. The input and facilitation by the study site's medical director ensured the needs assessment was relevant, realistic, and executable.

Practice Recommendations and Applications

Based on the lessons learned, practitioners should consider four recommendations and potential applications to their context during Step 1 of Intervention Mapping.

Recommendation 1: Consider a quality improvement project as opposed to a research study. If a planning team is collaborating with a research team they can consider carrying

out the needs and assets assessment as quality improvement rather than research. While this will waive the ability to publish any findings, it will save much time in the IRB review process. Guidance on how to assess whether a program is human subjects research or quality improvement or both and ensure proper protection for patients is provided by Bass and Maloy (2020).[54]

Recommendation 2: To address any time or resource constraints, consider a more focused assessment with efficient methods whenever possible. One important way to work within time and resource constraints is to identify and scope the problem(s) and focus the needs assessment. The same should be considered when choosing methods. For example, while in-depth interviews yield rich data, a survey may be most feasible. A senior analyst at the National Institute for Children's Health Quality (NICHQ) recommends planners "be realistic with resources and capacity" and suggests online surveys if time or resources are limited.[55]

To save some time and resources, practitioners interested in developing maternal health CHW program can also consider using some of the data from this study's needs assessment. Many of the barriers identified in our study can be applied to many U.S. contexts, particularly the themes regarding discontinuity and discrimination in health care. Barriers such as transportation are more place-specific and may not apply. Facilitators identified in our study such as family and online advice and healthy coping strategies may apply to other settings but likely will vary based on cultural and local contexts of the participants. Some of the participant recommendations, such as

components of a maternal CHW / health coaching program and ways to ensure postpartum follow-up, may be applicable to many contexts.

Recommendation 3: Formally assess organizational readiness. Before or during the needs assessment, practitioners should focus on organizational readiness for this type of intervention. A stakeholder analysis (presented below) can help with the organizational assessment. If implementers are on the planning team and partnerships with the site's clinical and administrative leaders are well established, these leaders can greatly inform the assessment of the organization. Guidance on how to further assess organizational readiness includes tailoring any assessment to the specific project and context.[56] In a review of organizational readiness assessments, Miake-Lye et al (2020) found the top seven constructs covered in these assessments included readiness for implementation, implementation climate, other personal attributes (self-efficacy, knowledge and beliefs about the intervention), structural characteristics (workforce, information technology, operational structure), networks and communications (openness to new ideas and problem solving orientation), and organizational culture.[56]

Recommendation 4: Ensure there is a clinical champion on planning team. A clinical champion co-leading the planning process from the beginning is essential. Without this, the chance of successful implementation of an intervention will be lower. The planning team should form partnerships with clinical implementers of the future intervention as soon as possible during the needs assessment process. Clinical champions are

increasingly used to effectively implement evidence-based practice and promote organizational change.[60–61] These key personnel can work with the program planning team to design the needs assessment and identify the best methods and data sources based on their in-depth knowledge of the implementation site. In a CDC case study about identifying program champions of a Missouri Women, Infants and Children (WIC), clinical champion domains included: support with training and implementation; help staff resolve problems; orient new staff to the program; ensure materials are readily available; and provide feedback and encouragement to staff.[59]

The clinical champions are also key agents of innovation and care transformation,[62] as they introduce new offerings such as a maternal community health program. Key attributes of clinical champions identified by Bonawitz et al. (2020) in a study of maternity care include: influence (the ability to shape the behavior and opinions of others); ownership (feeling deep personal responsibility for change efforts); presence at point of change (possessing intimate knowledge of the people and workflows impacted by change efforts); grit (tenacity in the face of setbacks); persuasiveness (ability to present information in a compelling way to various audiences); and empathetic leadership (ability to illicit and validate others' perspectives).[58]

5.3 Intervention Mapping Step 2: Program Goal and Performance Objectives

Intervention Mapping Steps 2 involves developing the program goal, performance objectives, and change objectives.[46] The team formally stated the overarching program goal as improving maternal health among the site's patients, with a focus on maternal

morbidity. In preparation for setting performance objectives, which are the desired actions of the target participant to reach the overarching goal,[46] the Maternal Health Matters team reviewed possible points of intervention where a CHW could have the highest impact.

Possible Points of Intervention for CHW / Health Coaching

Based on barriers and facilitators identified in the needs and assets assessment (IM Step 1) and prior evidence and guidelines on CHW scope of practice,[18–22] the NYC team identified the points of possible intervention that could be delivered by a maternal community health worker (Figure 5-1).

As depicted in Figure 5-1, facilitators (in green) or barriers (in yellow) can lead to outputs that then connect to positive or negative outcomes. Noted as points of intervention (in pink), CHWs can facilitate healthy coping techniques, chronic condition self-management skills building, and a trusting patient-provider relationship with an eye to equitable, anti-racist care interactions. They can also address barriers such as discontinuity of care and mistimed / delayed resources by being a consistent presence and introducing resources as needed for each person's prenatal and postpartum journey. Practitioners can carry out a similar exercise, in which they list the barriers and facilitators identified in the needs assessment, and then reflect on where a CHW / health coach would have greatest and least impact.

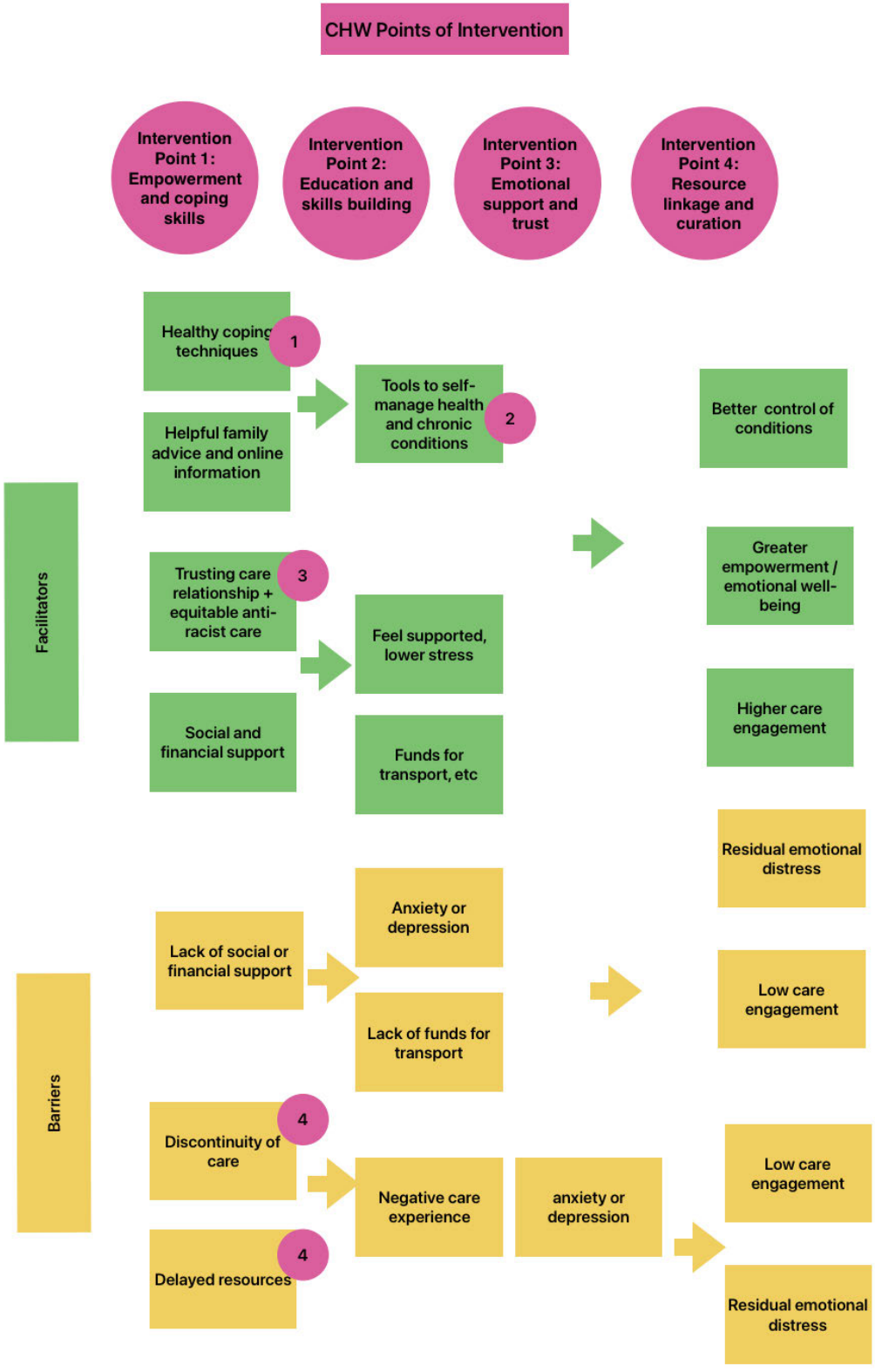

Figure 5-1. Possible Points of Intervention for NYC Maternal CHW Program

Prioritization of Performance Objectives

Performance objectives are the observable and measurable action that participants should achieve as a result of receiving the full intervention that work to meet the overarching program goal.[43] To evaluate which performance objectives to pursue, the planning team carried out a prioritization exercise using the following criteria for their decision-making:

1) Organizational priorities: what are current priorities and quality improvement initiatives at the site and how do we align and add to these efforts.

2) Local city and state data: what are the drivers of severe maternal morbidity and mortality in NYC

3) Current performance of the site on key metrics: how is the site performing on National Committee for Quality Assurance (NCQA) Healthcare Effectiveness Data and Information Set (HEDIS) measures such as postpartum visit attendance, timeliness of prenatal care, prenatal and postpartum depression screening and follow-up,[63] as well as prenatal and postpartum hospitalizations, postpartum glucose testing, and postpartum blood pressure testing.

4) Needs assessment findings: what are the key barriers, facilitators, and recommendations identified in the needs assessment

5) Alignment with scope of CHW / health coaching: in what domains do CHWs / health coaches have the most impact, which includes the CHW points of intervention discussed above (Figure 5-1).

6) Strengths and capacity of the planning and implementation teams: the assets or expertise of the planning and implementation teams.

7) Budget and available resources: available funding and entities or stakeholders that control funding decisions.

	Objectives			
Criteria	**Increase postpartum visit attendance**	**Increase mental health screening and follow-up**	**Improve chronic condition control**	**Reduce postpartum hemorrhage**
Organizational priorities [2]	5[10]	3[6]	4[8]	3[6]
Address low performance in city/state data [1]	3[3]	2[2]	4[4]	4[4]
Address low performance of site [3]	5[15]	3[9]	3[9]	2[6]
Needs assessment findings [3]	5[15]	4[12]	5[15]	2[6]
CHW scope [2]	5[10]	4[8]	5[10]	3[6]
Strengths of team [2]	5[10]	3[6]	5[10]	3[6]
Available resources/budget [2]	5[10]	3[6]	3[6]	3[6]
Weighted Total	**33[73]**	**22[49]**	**29[62]**	**20[40]**

Table 5-4. Program Objective Prioritization based on Key Criteria[64]

Scale: 1–5 with 1 being least and 5 being the most aligned. Weights assigned in brackets, with 1 being least important and 3 being most important.

After deciding on key prioritization factors, the team scored each possible objective with a score of 1–5 for how aligned each objective was for each factor (Table 5-4).[64] A score of 1–2 indicated little to no alignment; 3–4 indicated good alignment; and 5 was excellent alignment. The team also applied weights of importance on each criterion with 1 being least important and 3 being most important. The objectives of increase

postpartum visit attendance and improve chronic condition control were the highest scoring, at 73 and 62 respectively.

Performance and Change Objectives

Based on the prioritization exercise scores and associated discussions, the team decided to focus on the performance objectives of increasing postpartum visit attendance and improving control of chronic conditions (hypertension, diabetes). Postpartum visit attendance was chosen because the study site had historically low attendance; the postpartum visit can identify and correct postpartum complications that lead to severe maternal morbidity and mortality; the needs assessment findings highlight the need for additional postpartum supports; and postpartum visit attendance has been an organizational and clinical priority at the site. Improving chronic condition control was chosen based on the NYC data that high-risk patients with chronic conditions such as hypertension, diabetes or heart disease were three times as likely to have SMM as women with no chronic conditions; room for improvement in site performance; alignment with CHW scope of practice; and strengths of the planning team.[12] The planning team has strong experience in designing and implementing CHW / coaching interventions that focus on hypertension and diabetes and detection of emerging complications through evidence-based training and clinical supervisory protocols.[19–21]

Based on these performance objectives, the team decided on change objectives for the project.[43] Change objectives are the changes the program should achieve on the interpersonal, institutional, or societal/environmental level.[43–44] Accomplishment of a set

of important and changeable change objectives leads to overall behavior change, which are described by developing performance objectives.

The change objectives below are informed by the Maternal Health Matters needs assessment findings. For example, participants noted the importance of childcare and transportation for postpartum visit attendance (Change objective 1.1). Participants, both patients and maternal health professionals, also shared the importance in having a trusted person to check in with for any questions and concerns, leading to improvements in the health care team's detection of emerging risks (Change objective 2.3).

Performance objective 1: Increase postpartum visit attendance among postpartum people at the site

Change objective 1.1: Coach and health care team assess for social needs and link postpartum people to resources (transportation, childcare, etc.) that enable postpartum visit attendance

Change objective 1.2: Coach and health care team ensure that a well-functioning appointment reminder system is in place

Change objective 1.3: Coach performs check-in (phone or home) with patient in the early postpartum period (within 3 days of discharge from hospital).

Performance objective 2: Improve blood pressure and/or blood glucose control among prenatal and postpartum people with hypertension and/or diabetes at the site

Change objective 2.1: Patient demonstrates correct technique for measuring blood pressure and/or blood glucose and recording results to share with the care team

Learning objective 2.2: Patient immediately relays any concerning signs or symptoms that could be complications to the health care team immediately

Change objective 2.3: Health coach detects emerging risks and escalates any symptoms or elevated readings promptly to the clinical supervisor

5.4 Intervention Mapping Step 3: Select theory-based intervention methods

Once the performance and change objectives were established, the team selected theory-based methods to address the objectives.[45] Intervention Mapping uses a variety of theories to inform development of program components, and most well-designed interventions usually use a combination of theories. Theory-based methods selected for the Maternal Health Matters program were the social ecological model, the stages of change / transtheoretical model, and the theory of planned behavior.

The social ecological model[65] was used as a framework for both the needs assessment and the intervention, which has a focus on change on the individual and institutional levels. The stages of change / transtheoretical model[65] supports the structured goal setting and motivational interviewing that are key aspects of the intervention. The theory of planned behavior[66] lays the foundation for the coaching approach, which takes into account social norms and behaviors, as well as someone's perceived control over engaging in a behavior. The coaching model focuses on building self-efficacy among

participants.

Logic Model

From these methods, the team identified the program activities (Intervention Mapping Step 3). The team developed a logic model that depicts the objectives, resources and activities, outputs, and the expected short-, intermediate-, and long-term outcomes of the program (Figure 5-2). As a graphic representation of the intervention, the logic model provides strong rationale for the intervention design and activities, guides evaluation of the program, and is used to communicate the program to stakeholders.

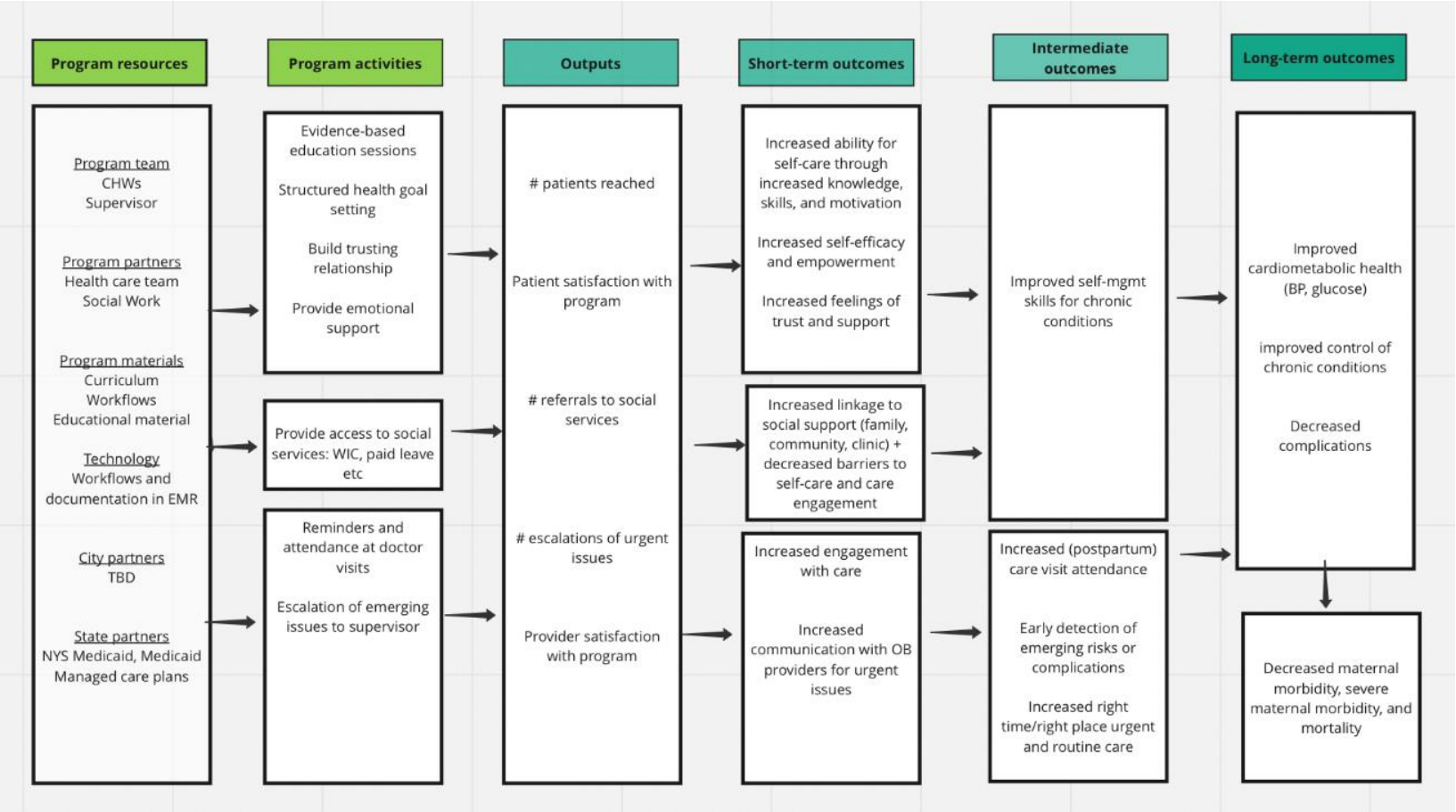

Figure 5-2. Maternal Health Matters Logic Model

5.5 Intervention Mapping Step 4: Develop an Intervention Plan

The Maternal Health Matters team then developed an intervention plan (Intervention Mapping Step 4), which included program components, a patient curriculum, CHW / coach competencies, tech-enabled workflows, and a hiring and training plan for the CHWs.

Program Components

The components of the Maternal Health Matters intervention included: planned care through a sequential coaching curriculum; responsive care for issues that need to be escalated to the health care team; and linkage to social/economic resources. Based on the needs assessment findings, the intervention was centered on equity, both in its components and in the content of the educational messaging. The program follows the patient any time from second trimester of pregnancy until one year postpartum.

Planned care

Planned care are touchpoints along the pregnancy or postpartum journey where the CHW / coach delivers a session focused on education, goal setting and skills building, and emotional support. The beginning of the program journey will include an active phase, with CHW / coach curriculum encounters every 1–4 weeks and as needed. A maintenance phase will start between 3–6 months postpartum, depending on the clinical supervisor's assessment of the patient, through one year postpartum.

The coach uses a motivational interviewing approach to each patient interaction, which focuses on empowerment and building self-efficacy. In addition to a set educational curriculum (see below), the CHW will facilitate personalized, structured self-care goal setting with each patient. The CHW will provide emotional support and accompany the patient to care visits, when indicated.

Responsive care

Responsive care is the relaying of information to the supervisor through clear escalation protocols. These escalations focus on emerging social or medical risks. Social risks would include significant changes in housing, food insecurity, financial status or benefits, insurance or prescription coverage, transportation, or domestic / intimate partner violence. Medical risks would include positive mental health screening results or signs of mental health distress, signs or symptoms of exacerbation of chronic condition or new complication, monitoring results outside of safe range (blood pressure, blood glucose), or gaps in medication access or adherence. The CHW is available to the patient during educational sessions and as needed by phone for any concerns. The supervisor will then triage the escalation to the appropriate team member, usually the patient's provider or team social worker.

Resource linkage and care journey curation

CHWs also provide the needed social resources at the right place and right time

along the pregnancy journey. Resources can include community-based items such as transportation by NYS Medicaid, childcare via affordable community options, food / nutrition support from WIC and a local food pantry, breastfeeding support via WIC, or possibly doula services as funded by NYS Medicaid. Resources can also be clinic-based, with CHWs referring patients to childbirth education, a nutritionist, or chronic condition management classes, when available. By providing what a person needs in a centralized fashion, the CHW can also deliver educational points and advice based on where a person is in their pregnancy and based on any complications or instructions from the provider that arise.

Patient Curriculum

The key barriers and facilitators found in the needs assessment and program components informed the development of the patient curriculum. The patient curriculum covers knowledge and skills specific to gestational hypertension or gestational diabetes, as well as general information on prenatal and postpartum health throughout. The curriculum is based on evidence-based materials by the U.S. Community Preventive Services Task Force Community Guide,[67] the American College of Obstetricians and Gynecologists (ACOG)[68] and the American Heart Association (AHA),[69] and the Association of Diabetes Care and Education Specialists (ADCES) ADCES7 self-management behavior framework.[70]

The curriculum content was tailored for participants based on the findings from the needs and assets assessment, particularly any cultural beliefs and practices, sources of

information including social media, and locally relevant community resources. For example, the needs assessment found a common cross-cultural practice of staying home for the first 40 days. This was incorporated into the curriculum content to honor cultural beliefs and practices and to discuss in a culturally-sensitive manner how they may overlap and diverge from the current evidence. The curriculum will refer to the role of family, friends with babies, the OB provider, and social media and other web applications as important sources of information, and the online applications will be curated and vetted by the planning team and customized to each person's assets and preferences. Community resources will be vetted by the CHWs, to ensure quality and access to these resources for patients.

The curriculum modules (Table 5-5) available to patients are flexible and customized to patient's needs and skills gaps rather than providing mandatory and general coverage. The CHW will need to be fully skilled in all of these areas in order to support the individual needs of the patient. Structured questions will be embedded in every CHW encounter template asking them to assess and prioritize need for each module, including the flex modules.

The location of each module is also customized to the patient's needs, health conditions, and preferences. The supervisor and CHW will determine the most likely locations for delivery of the modules upon patient enrollment in the program. Many can occur by phone or at clinic before or after a prenatal care visit (space permitting). Home is a great location option for the medications module if the patient needs assistance with medication organization or learning insulin injection technique in a more comfortable

environment. Home may also be warranted for the postpartum check-in depending on medical history and social needs.

Module	**Learning Objective (LO)**	**Activities for Skills-Building / Other Notes**	**Location**
Module 1: What is gestational diabetes and/or hypertension, how to monitor for complications and reduce risk	LO 1: Know signs and symptoms of general complications and complications related to diabetes and hypertension including, cardiomyopathy, hemorrhage, infection, elevated blood pressure, elevated blood glucose, and how to reach the health care team immediately. LO 2: Learn how to monitor blood sugar and blood pressure.	Teach back of glucose meter and / or blood pressure monitor technique. Demonstrate steps on how to reach the health care team.	Clinic, home, or phone
Module 2: Nutrition for gestational diabetes and hypertension	LO 1: Know best food groups and combinations (My Plate)[71] as well as optimal timing of meals and snacks. LO 2: Understand the importance of hydration.	Teach back of food groups, My Plate portions, label reading (carbohydrates) as needed for diabetes.	Clinic or phone
Module 3: Medications	LO 1: Know basic medication mechanisms of action and rationale for taking the medication.	Demonstrate process of organizing medications.	Clinic or home

	LO 2: Demonstrate knowledge of how to best organize medications and consistently take them.	Demonstrate insulin injection technique (where applicable).	
Module 4: Strengths and resources	LO 1: Know the available community- and clinic-based resources to support mother, family, and baby in the prenatal and postpartum periods. LO 2: Discuss family beliefs and practices for caring for mother and baby and learn which are aligned with medical guidance.	Draft a list or map of community resources and how to access them. Draft a list of clinic resources and how to access them.	Clinic or phone
Module 5: Emotional health, interpersonal safety, and healthy coping	LO 1: Know techniques for stress management and decide on 1–2 go-to techniques. LO 2: Name signs and symptoms of depression and anxiety and when / how to reach out for help. LO3: Assess for and identify any signs of intimate partner abuse or violence and how to escalate to the CHW supervisor and social worker	Demonstrate via role play or describe coping and go-to stress management techniques.	Phone, clinic, or home
Module 6: Postpartum check-in	LO 1: Demonstrate understanding of importance of postpartum self-care,	Teach back of previous blood glucose or blood	Home or phone

and reinforcement of educational areas	postpartum chronic condition self-management, and postpartum visit attendance. LO 2: Describe signs and symptoms of complications or urgent issues and who / how to call for immediate assistance. LO 3: Show awareness of when to call and what resources are available for breastfeeding support, infant care tips.	pressure monitoring techniques. Demonstrate steps on how to reach the health care team.	(supervisor decides)
Flex Module 1: Self-advocacy and support in health care interactions	LO 1: Demonstrates how to write a list of questions to prepare for the OB visit. LO 2: Demonstrates skills in self-advocacy with support of CHW.	Role play of medical visit. CHW accompanies patient to medical visit and provides link between patient and provider outside of the visit as needed.	Clinic or phone
Flex Module 2: Emotional processing of labor and delivery experience	LO 1: Expresses awareness of need for emotional support after perceived difficulties during labor and delivery.	Social worker, provider, and coach provide visit(s) to assess patient and recommend any follow-up treatment.	Clinic

Table 5-5. Patient Curriculum for Maternal Health Matters

Module 1: What is gestational diabetes or hypertension in pregnancy / postpartum, how to monitor for and prevent complications and lower risks. The focus will be on signs and symptoms of cardiomyopathy, hemorrhage, infection, elevated blood pressure, elevated blood glucose and how to immediately notify the health care team. The patient will also learn how to monitor blood glucose or blood pressure readings at home, where applicable.

Module 2: Nutrition: best ways and types of foods to eat for gestational diabetes or hypertension, timing of meals and snacks, balance of macronutrients, hydration.

Module 3: Medications: medication mechanism of action and rationale for taking it, how to take medications, how to organize medications, tips for best adherence

Module 4: Assessing strengths and gathering resources: what family, community, and clinic resources would be helpful and when during the prenatal / birth / postpartum journey, including transportation, childcare, leave benefits (in NY state), food support including WIC, childbirth education, breastfeeding support, other educational classes, and more. Also will share and discuss what family cultural practices are supportive during prenatal and postpartum periods, and how they align with medical guidance.

Module 5: Emotional health, interpersonal safety, and healthy coping: importance of mental health support, signs and symptoms of mental health distress, screening for depression and anxiety, assessing for signs and symptoms of intimate partner abuse and violence and how to escalate any issues identified to the CHW supervisor and social worker, stress management, and when to obtain professional support.

Module 6: Postpartum check-in and reinforcement of educational areas: a phone call or home visit after birth to review patient needs and check in about chronic condition management and complication prevention, signs and symptoms of when to call.

Flex Modules: Additional modules available based on patient need: For patients requiring support or advocacy in their interactions with health care, accompaniment to care visit(s) in the prenatal and / or postpartum period. For patients who report emotional distress related to their labor of delivery experience, processing of birth experience in conjunction with social work and / or medical provider team member.

CHW Core Competencies

Based on the intervention components and patient curriculum, the following are the CHW / coach core practice competencies.

- Foundational Competency: Demonstrate understanding of philosophical approach to the work: Respectful Maternity Care;[72] Joy-focused antiracist care;[73–74] Reproductive Justice principles.[75] This competency is cross-cutting through every aspect of CHW practice
- Competency 1: Deliver empowerment-focused coaching and encourage healthy coping skills
- Competency 2: Provide education and self-management skills building
    - Highlight supplementary online / social media sources of information

- Competency 3: Provide emotional support and build trust with the patient
- Competency 4: Connect patients to community- and clinic-based resources and curate resources based on needs in their pregnancy care journey
- Competency 5: Ensure postpartum attendance and provide postpartum support (emotional, instrumental, medical in conjunction with health care team)

The planning team decided to not initially include labor support as a core competency for the CHW / coach, to allow for more focused learning and easier implementation at the site. However, the team is considering including labor support in the CHW scope in the future, and in the meantime will partner with local community-based doula organizations, particularly those accredited by Medicaid.

Lessons Learned, Practice Recommendations, and Applications to other Contexts

The NYC team's lessons learned during Intervention Mapping Steps 2, 3, and 4 are presented below, followed by practice recommendations and applications in the field based on each lesson. Table 5-6 summarizes the further description below.

Lessons Learned	Practice Recommendation	Application to Other Contexts
Lesson 5: Developing program objectives and activities required more time and effort than anticipated	Recommendation 5: Invest time on setting program objectives and consider using a prioritization exercise to determine key objectives and focus of the intervention	Priority setting and prioritization exercise template[64]
	Recommendation 6: Develop a logic model to connect objectives to program activities and outcomes	Logic model resource[76] CDC guidelines on importance of logic model and step-by-step on how to develop a logic model[77] CDC example of logic model development for heart disease and stroke prevention program[78]
Lesson 6: CHW / coach roles and responsibilities can vary based on program objectives and early scoping would be helpful	Recommendation 7: Early in the intervention planning, while developing objectives and activities, carry out an exercise to determine the best use of CHW / coach effort, with clear scoping of role	CDC CHW scope of practice and evidence-based guidelines by condition area[79] Center for Medicaid and Medicare Services (CMS), Community Health Worker guidelines, 2021[80]

Table 5-6. Lessons Learned, Practice Recommendations, and Applications to Other Contexts for Intervention Mapping Steps 2–4

Lessons Learned

Lessons learned from the intervention design process (IM Steps 2, 3, and 4) were focused on gaining clarity before moving towards implementation. One lesson was to take the necessary time to get clear on objectives and logic of program before moving forward with further program design. Ultimately the objectives were the NYC team's

north star as they considered program activities, and the logic model provided a focus and discipline to design an intervention with the best chance of improving outcomes. As depicted in the prioritization exercise above, it was important to define the role and scope of the CHW early on, as this helped guide the development of the objectives and intervention activities. The team also recognized how their content expertise in obstetrics and gynecology and chronic condition management was instrumental in the design of the needs assessment and intervention, particularly the patient curriculum.

Practice Recommendations and Applications

Based on the lessons learned, practitioners should consider three recommendations and potential applications to their context during Steps 2–4 of Intervention Mapping. Recommendations and application of these lessons for practitioners in other contexts focuses on the importance of thoughtful early planning.

Recommendation 5: The planning team should ideally carry out a prioritization exercise as depicted above (Table 5-4) to determine the target population, key objectives, and focus of the intervention. Baltussen and Niessen (2006) provides rationale and a template for multi-criteria prioritization matrix that can guide decision making on intervention design.[64] Factors to consider in the prioritization include organizational priorities, budget / resources, hospital performance on key metrics, needs assessment findings, alignment with evidence-based CHW scope of practice, and strengths and weaknesses of the planners and implementers. In terms of organizational priorities, the site might have a

current quality improvement initiative to decrease rates of postpartum complications or to increase rates of postpartum visit attendance that could synergize well with CHW program objectives and activities. Findings from the needs assessment should also inform the focus of the intervention, for example, prenatal participants reporting mistrust of the health care team, leading to lower engagement with care could lead to a program objective focused on building trust between patients and providers, with the CHW as supportive intermediary.

Recommendation 6: Develop a logic model to connect objectives to program activities and outcomes. A well-developed logic model can ensure rigor in program design by making all program activities link to short- and long-term desired outcomes, which will then be measured in the monitoring and evaluation plan. The CDC recommends logic models for program planning, and provides step-by-step instructions on logic model development,[77] as well as an example of logic model use for heart disease and stroke prevention program planning.[78] Finally, the logic model can be a helpful tool for communicating and collaborating on the program with key stakeholders.[81]

Recommendation 7: When scoping the CHW / coach role, practitioners should consider that the role may vary greatly based on the program objectives.[79] A more medically-focused CHW role that works on chronic disease management and early detection of emerging risks, for example, can make a great impact on health outcomes but will require

in-depth training. A more socially-focused role can address social needs and provide emotional support yet it is unclear if this will have the same impact on some health outcomes. The training implications for these roles are quite different in terms of training time and trainer expertise, and need to be considered early in the planning process. The Center for Medicare and Medicaid Services (CMS) provides guidelines on CHW scope of practice and core competencies.[80] The CDC guidelines provide evidence for CHW scope by health condition areas.[79]

5.6 Intervention Mapping Step 5: Adoption, Implementation, and Sustainability Plan

Intervention Mapping Step 5 is to develop an adoption, implementation, and sustainability plan for the program. Findings from the needs assessment, which included organizational recommendations on supervision, staff and patient buy-in, and organizational politics, guided the development of the plan.

Adoption

Key goals when planning adoption included:

1. Determine the key stakeholders for this program
2. Discover who is likely to want to champion the program (clinical, administrative)
3. Plan how the program will be promoted and communicated to the team and to target patients

The team performed a stakeholder analysis early in the needs assessment process (Figure 5-3).[82] With input from the medical director, the team identified key stakeholders, including who would benefit and be impacted by the program, who holds the resources, and who could foster or impede implementation.[60] The influence and interest of each stakeholder was then scored by the medical director and planning team members using a 5 point Likert scale (1=very low, 2=low, 3=average, 4=high, 5=very high).[60] Influence was defined as how much power the stakeholder has to affect the Maternal Health Matters program, and interest was how interested would the stakeholder be in what Maternal Health Matters is aiming to accomplish.[60] The high influence and / or high interest stakeholders identified were as follows: providers (a key program referral source and program collaborator); patients; hospital leadership; and payors. Community members and hospital staff were identified as low influence, though this could shift through changes in leadership or political landscape. Through this stakeholder analysis, the planning team also determined potential clinical champions both in social work and medicine departments and devised a plan to include them in implementation planning.

Strategic promotion of the intervention will raise staff awareness and buy-in, with a focus on providers, hospital leadership, and patients. The promotion includes clearly stating the CHW role and how it differs from other team roles, sharing the impact of maternal CHWs in other contexts, and communicating that the program is or will soon be supported by an external funder. Early program wins will be communicated to providers in a timely fashion through group emails and departmental meeting announcements to increase staff buy-in. Payors will require a different promotional approach, with more

incremental relationship building through meetings and electronic communications with contacts at local payor entities.

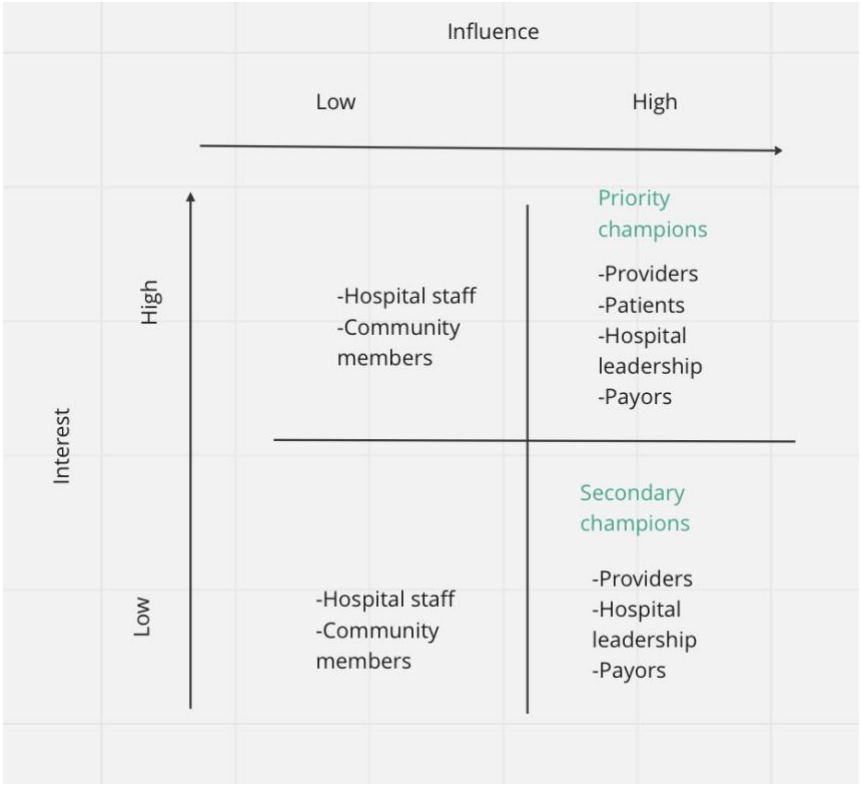

Figure 5-3. Stakeholder Analysis for NYC Program[82]

Implementation

Implementation planning for the program included developing protocols, policies, and structures to operationalize the intervention plan. Goals of the implementation plan included:

1. Determine the main implementers
2. Describe the CHW role areas of responsibility or duties?

3. Indicate who will supervise the CHW's work and how
4. Design the CHW workflows and technology enablement (dashboard and templates)
5. Plan the CHW and supervisor be training
6. Determine how the program will initially be funded and what are potential sources of funding

The NYC team planned the CHW role and curriculum (#1–#2), in the intervention plan above (section 5.5). Plans for workflow design, hiring and training, and funding (#3–#6) are introduced below.

Workflows: CHW and Supervisor

All of the coaching program workflows will be enabled by the electronic medical record. The team will determine a system for referral to the program, which would include warm hand-offs to the CHW / coach during patient sessions for the first few months of program initiation, as well as a simple referral form in the electronic medical record (EMR) that is directed to the clinical supervisor. To further facilitate referrals, CHWs / coaches will participate in care team daily huddle and the coach highlights any patients scheduled for that day that might benefit from coaching. Once referrals are made, the supervisor will assign patients to each CHW's panel.

The CHW will have a central dashboard to track their patient panel and EMR encounter templates for each planned care touchpoint, where any education and goal setting is tracked. The supervisor will also have a dashboard which monitors the entire

population of program patients and each coach's performance. For responsive care encounters, an escalation message from the CHW in the EMR with high priority notification and a follow-up phone call allows the supervisor to act on the information in a timely manner. CHWs will attend program team case review meetings led by the supervisor, with providers and social workers also present, to discuss shared patients in their panels.

Hiring and Training

CHWs will be recruited from the local community and within the health system (hospital staff with current roles as patient navigators, for example). A didactic training will cover core CHW competencies and any background knowledge and skills required to deliver the patient curriculum. Training will also cover what is needed to deliver responsive care, which includes identification of emerging complications such as preeclampsia, cardiomyopathy, infection, and hemorrhage.

In terms of teaching methods, training will include multiple teach-back and role play sessions, in which new CHWs can practice their motivational interviewing and goal setting skills. Once the classroom training is complete, coaches will shadow the program supervisor during clinic sessions to apply their knowledge. The supervisor will then decide when they are ready to start taking referrals and building their panels. Program staff will train CHWs in the EMR and workflows, and ensure coaches have the resources and skills they need. Regular meetings with CHWs and program staff will ensure coaches are supported and that implementation is successful.

Sustainability

For sustainability, the program team planned to focus on institutionalization of the program through seeking support from high impact and interest stakeholders in the health system. The program team also planned to seek funding opportunities from external grants with a focus on maternal health; this seed funding would cover the time for a pilot for proof of concept. Finally, the team planned to pursue financial sustainability through discussions with payors. Conversations and relationship building were planned for local Medicaid managed care payors, for example NYS HealthFirst Medicaid. HealthFirst was selected strategically due to their commitment to innovative and novel payment and care models and to improved quality and cost savings for maternal health. Furthermore, this payor already co-designed and funded a payment model demonstration project at this site.[47]

Lessons Learned, Practice Recommendations, and Applications to other Contexts

The NYC team's lessons learned during Intervention Mapping Step 5 are presented below, followed by practice recommendations and applications in the field based on each lesson. Table 5-7 summarizes the further description below.

Lessons Learned	Practice Recommendation	Application to Other Contexts
Lesson 7: Need for a detailed implementation plan	Recommendation 8: Dedicate time to develop a formal implementation plan	Implementation plan template by Colorado Hospital Transformation Program (2021)[83]
Lesson 8: Clinical champion turnover at the site	Recommendation 9: Assess for and engage interested and aligned clinical and administrative stakeholders at the site who can support adoption and long-term sustainability	Stakeholder engagement planning guide: Ten simple rules on how to develop a stakeholder engagement plan[84]
Lesson 9: Lack of funding to get started	Recommendation 10: Obtain seed funding and begin conversations with payors for sustainability	Examples of payor-provider partnerships for maternal health care model innovation[85–86]

Table 5-7. Lessons Learned, Practice Recommendations, and Applications to Other Contexts for Intervention Mapping Step 5

Lessons Learned

Lessons learned about adoption, implementation, and sustainability are based on the status of the project to date (planned but not implemented). One key lesson was on the importance of a detailed implementation plan, with attention to hiring and training of CHWs and mapping of CHW and supervisor workflows. Another lesson was that adoption of the program can be sidelined with the departure of key implementers and champions, in this case, the medical director. Another barrier to adoption and implementation was the lack of pilot funding for the program, however funding for this project could have been obtained with more time. In the case of Maternal Health Matters, the payor relationships with the clinical site were previously established, and therefore could have been a fruitful path to sustainability.[85]

Practice Recommendations and Applications

Based on the lessons learned, practitioners should consider three recommendations and potential applications to their context during Step 5 of Intervention Mapping. Recommendations and application of these lessons for practitioners in other contexts focuses on stakeholder engagement, implementation planning, and funding strategies.

Recommendation 8: Dedicate time to develop a formal implementation plan. Practitioners should take time to formally record an implementation plan which includes what technology / EMR modules and workflows will the coaches use, a daily schedule with expectations for daily work, and how and to whom do they escalate urgent issues. Without these protocols, tools, and guidelines in place, it will be difficult for the intervention to function and gain traction. An implementation plan template from Colorado Hospital Transformation Program (2021) provides more in-depth guidelines on implementation plan components.[83] Additionally, the planning team should invest in hiring, training, and workflow development to set up the program for best success. Every attempt should be made to hire from the local community, or from any current employees (patient navigators, care coordinators) who are from local or nearby communities. Training should be competency-based and focus most on skills-building.[87–88]

Recommendation 9: Assess for and engage interested and aligned clinical and administrative stakeholders at the site who can support adoption and long-term

sustainability. To ensure higher chance of adoption, implementation, and sustainability, engage clinical and administrative stakeholders at the site who are highly engaged and likely to remain in place at the site for the next few years. Tampio, Haapsalo, and Ali (2022) provide a thoughtful description of the stakeholder landscape and recommendations on stakeholder management within a hospital system.[89] A stakeholder engagement planning guide by Hollmann et al. (2022) emphasizes the importance of a stakeholder engagement system and processes, which includes evaluating and course correcting based on stakeholder feedback.[84]

Recommendation 10: The planning team should pursue pilot or seed funding early in the planning process, so that these funds are available early in implementation. This funding will also increase the potential for staff buy-in and political support. For longer financial sustainability, building payor partnerships is a strong strategy. At the start of project planning, practitioners should determine how to start or continue conversations with 1–2 key payors. In these conversations, they should share evidence on the potential cost savings that could be obtained through this type of intervention. Program leaders should choose payors who have a record and reputation as being forward thinking, focused on quality and equity, and an even greater advantage is if they have a stated interest in maternal health.[85–86]

5.7 Intervention Mapping Step 6: Evaluation Plan

Intervention Mapping Step 6 is to develop an evaluation plan. For the evaluation plan, the team planned process and outcome measures for the program, to be put in place before program initiation. The evaluation uses primarily quantitative and some qualitative methods. Difference in differences design will be used, with comparison group assigned as patients in the same practice and residence zip codes who were not asked to participate in the program. To ensure appropriate counterfactual, the team will include propensity matching scores on major variables. Self-selection is one threat to validity with this evaluation design. One mitigation of selection threat is that the comparison group will be from the same location as the intervention group and will be members that this small pilot program team did not have the opportunity to offer program participation (but would have if program team capacity was larger).[97] The presence of a closely-matched comparison group will mitigate the validity threat of regression to the mean.[97] Process and impact indicators are presented below, and are reflective of key outputs and outcomes in the logic model (Tables 5-8 and 5-9). All metrics are collected monthly. Process measures are reviewed monthly and outcome measures are analyzed quarterly.

Measure	Source
#Coach encounters per Woman (visit or phone)	Program database
#Social service referrals (includes FMLA / paid leave)	Program database
#WIC referrals	Program database / Medical record
#Issue escalations	Program database
Show rate prenatal and postpartum visits (HEDIS timely postpartum care)	Hospital administrative data
Patient satisfaction and experience with program services	Net Promoter Score, QA calls (Program database)
Clinic staff experience and satisfaction with program workflows and service	Survey / interviews

Table 5-8. Measures for Process Evaluation

Measure	Source
Medication adherence (Morisky)	Program database
Breastfeeding practices	Program database
If diagnosis of GDM, postpartum glucose testing completed Y/N	Medical record / administrative data
If diagnosis of GHTN, postpartum blood pressure testing completed Y/N	Medical record / administrative data
Glucose (OGTT, fasting BG, and/or HgbA1C)	Medical record
Blood pressure	Medical record
Postpartum depression score (Edinburgh)	Medical record
Maternal stress / anxiety (Perinatal and Postpartum Specific Anxiety Scales)	Medical record
Pregnancy / delivery complications	Medical record
Postpartum complications	Medical record
Per member per month cost	Insurance database

Table 5-9. Measures for Outcome Evaluation

Lessons Anticipated, Practice Recommendations, and Applications to other Contexts

The NYC team's lessons learned during Intervention Mapping Step 6 are presented below, followed by practice recommendations and applications in the field based on each lesson. Table 5-10 summarizes the further description below.

Lessons Learned	Practice Recommendation	Application to Other Contexts
Lesson 10: Too many indicators lead to lack of clarity and decreased feasibility of data collection	Recommendation 11: Streamline the list of indicators for the outcome evaluation.	Frameworks for selecting indicators: "5 P"[90] and modified Delphi[91]
Lesson 11: Some indicators are difficult to measure due to lack of available data sources	Recommendation 12: Practitioners should think about data sources and determine if measures are accessible.	Agency for Health Care Research and Quality (AHRQ) Data sources for measuring health care quality[92] American Association of Family Physicians article on why and how to build a simple registry from EMR data[93] AHRQ Registries for Evaluating Patient Outcomes: a User's Guide[94]
Lesson 12: Lack of data monitoring plan and designated staff to support it	Recommendation 13: Develop a monitoring and data management plan early in project planning	How to develop a monitoring and evaluation plan[95] How to plan data management early in your project[96]

Table 5-10. Lessons Learned, Practice Recommendations, and Applications to Other Contexts for Intervention Mapping Step 6

Lessons Learned

Lessons learned from developing the Maternal Health Matters evaluation plan are based on the status of the project to date (planned but not implemented). These are mostly anticipated lessons from the program team's prior work in this area. Lessons focus on the importance of a streamlined selection of performance indicators, and making sure the data sources for each indicator are accessible. Related to this, monitoring of the data can only take place with a designated person monitoring the data and a data management plan, which can be difficult to implement for less resourced program teams.

Practice Recommendations and Applications

Based on the lessons learned, practitioners should consider three recommendations and potential applications to their context during Step 6 of Intervention Mapping. Recommendations and application of these lessons for practitioners in other contexts focuses on streamlining the monitoring and evaluation approach to increase feasibility of successful data collection.

Recommendation 11: Streamline the list of indicators for the outcome evaluation. "Keep your eye on the prize" with the outcome evaluation by focusing on key endpoints. For example, with Maternal Health Matters, the key outcome measures are postpartum visit attendance rate, blood pressure, blood glucose, any complications (prenatal, perinatal, postpartum) and cost. While nice to have, the breastfeeding measures or even mental health screening measures could be eliminated to streamline the indicator list and allow for more efficient monthly monitoring and quarterly analysis. Two frameworks for indicator selection are the 5P (purpose, polity, prepare, procedure, prove) framework by Heenan, Randall, and Evans (2022),[90] and the modified Delphi approach by Giltenane et al. (2021),[91] the latter of which presents an example of postpartum indicator selection. Planning teams can use these frameworks as inspiration for an indicator selection process rather than as a required structure.

Recommendation 12: Practitioners should think about data sources and determine if measures are accessible. EMR mineable data will also allow for greater ease of

monitoring and analysis. A simple registry could make the data even more accessible for analysis. Agency for Health Care Research and Quality (AHRQ)[94] and American Association of Family Physicians (AAFP)[93] provide information on the rationale and process of building a registry. In addition, a strong relationship and collaboration with payors may allow for access to more comprehensive or in-depth claims data for clinical and cost analysis. When possible, align the program measures with any HEDIS or other quality measures that are being collected by the administration. Not only might this increase data access, but it may allow for comparison between quality improvement initiatives at the site.

Recommendation 13: Develop a monitoring and data management plan early in project planning. This would include including designation of who will monitor and analyze the data and at what intervals. Guidelines on a establishing a monitoring and evaluation plan are provided by Compass[95] and include practical considerations including how to designate monitoring roles and responsibilities by indicator, and what to include in an analysis and reporting plan.[95] Another important area of work is developing a data management system to organize and store the collected data. Recommendations on building a data management plan are provided by DataOne.[96]

5.8 Next Steps

This paper outlined the problem of maternal mortality and morbidity in the U.S., the promise of community health worker models, and use of the Intervention Mapping framework to assess for, design, and evaluate a CHW intervention in maternal health care settings in U.S. communities. A case study of design of a New York City maternal CHW program with lessons learned, practice recommendations, and future applications was provided throughout. As a summary, health care and public health leaders should consider the following next steps:

1) Conduct a focused needs and assets assessment
2) Design a feasible, stakeholder-informed, and evidence-based intervention with monitoring and evaluation plan
3) Document an adoption and implementation plan, which includes a communication plan for key stakeholders
4) Develop a funding strategy and sustainability plan

5.9 Conclusion of Dissertation

This study reviewed qualitative data on barriers, facilitators, and recommendations from multiple stakeholders in maternal health care in NYC, with a more robust reporting on facilitators and self-care approaches than past studies. The results and recommendations from this study serve as a blueprint to build capacity of health systems in CHW models of care, with an eye on equity at every step of the

process. Using the Intervention Mapping Framework, a practice guide was developed for the design of a maternal community health worker model of care in similar U.S. communities.

CHW models for maternal health could be one of many solutions to help turn the tide on the maternal health crisis in the U.S. Healthcare and public health leaders are well positioned to invest in this layer of community-focused care, improve health outcomes, and potentially save lives.

References

1. Trost, SL, Beauregard J, Nije F, et al. Pregnancy-Related Deaths: Data from Maternal Mortality Review Committees in 36 US States 2017-2019. Atlanta, GA: Centers for Disease Control and Prevention, US Department of Health and Human Services; 2022.

2. Howell, Elizabeth A., Natalia Egorova, Amy Balbierz, Jennifer Zeitlin, and Paul L. Hebert. "Black-White Differences in Severe Maternal Morbidity and Site of Care." American Journal of Obstetrics and Gynecology 214, no. 1. January 2016: 122.e1–122.e7. https://doi.org/10.1016/j.ajog.2015.08.019.

3. Louis JM, Menard MK, Gee RE. Racial and Ethnic Disparities in Maternal Morbidity and Mortality. Obstetrics and Gynecology 2015;125:690-4.

4. Sarto GE, Brasileiro J, Franklin DJ. Women's Health: Racial and Ethnic Health Inequities. Global Advances in Health and Medicine: Improving Healthcare Outcomes Worldwide 2013;2:50-3.

5. Ellison K and Martin N. Nearly Dying in Childbirth: Why Preventable Complications are Growing in U.S. NPR December 22 2017. Available from: https://www.npr.org/2017/12/22/572298802/nearly-dying-in-childbirth-why-preventable- complications-are-growing-in-u-s?utm_source=facebook.com&utm_medium=social&utm_campaign=npr&utm_term=nprnews&u tm_content=2051

6. Lockart PR. Too many Black Women like Erica Garner are Dying in America's Maternal Mortality Crisis. Vox. January 20 2018. Available from: https://www.vox.com/identities/2018/1/10/16865750/black-women-maternal-mortality-erica- garner

7. Winter M. A Matter of Life and Death: Why are Black Women in the U.S. More Likely to Die During or After Childbirth? Essence. September 26 2017. Available from: https://www.essence.com/news/black-women-mortality-rate-child-deaths-united-states

8. Marian F. MacDorman, Marie Thoma, Eugene Declcerq, Elizabeth A. Howell, "Racial and Ethnic Disparities in Maternal Mortality in the United States Using Enhanced Vital Records, 2016–2017", *American Journal of Public Health* 111, no. 9. September 1, 2021: pp. 1673-1681.

9. Thoma ME, Declercq ER. All-Cause Maternal Mortality in the US Before vs During the COVID-19 Pandemic. *JAMA Netw Open.* 2022;5(6):e2219133. doi:10.1001/jamanetworkopen.2022.19133

10. Thoma, Marie E. PhD, MHS; Declercq, Eugene R. PhD. Changes in Pregnancy-Related Mortality Associated With the Coronavirus Disease 2019 (COVID-19) Pandemic in the United States. Obstetrics & Gynecology ():10.1097/AOG.0000000000005182, March 16, 2023. | DOI: 10.1097/AOG.0000000000005182

11. New York City Department of Health and Mental Hygiene Bureau of Maternal and Child Health. Pregnancy-Associated Mortality NYC, 2011-2015. New York, NY. Available from: https://www1.nyc.gov/assets/doh/downloads/pdf/ms/pregnancy-associated-mortality-report-2011-2015.pdf

12. New York City Department of Health and Mental Hygiene (2016). Severe Maternal Morbidity in New York City, 2008–2012. New York, NY.

13. New York City Department of Health and Mental Hygiene (2018). Severe Maternal Morbidity in New York City data 2013-2014. Available from: https://www.nyc.gov/assets/doh/downloads/pdf/data/severe-maternal-morbidity-data.pdf

14. Came, Heather, and Derek Griffith. "Tackling Racism as a 'Wicked' Public Health Problem: Enabling Allies in Anti-Racism Praxis." *Social Science & Medicine* 199 (February 2018): 181–88. https://doi.org/10.1016/j.socscimed.2017.03.028.

15. Taylor, Jamila K. "Structural Racism and Maternal Health Among Black Women." *Journal of Law, Medicine & Ethics* 48, no. 3 (2020): 506–17. https://doi.org/10.1177/1073110520958875.

16. Williams, David, and Lisa Cooper. "Reducing Racial Inequities in Health: Using What We Already Know to Take Action." *International Journal of Environmental Research and Public Health* 16, no. 4 (February 19, 2019): 606. https://doi.org/10.3390/ijerph16040606.

17. Howell, Elizabeth A., Teresa Janevic, James Blum, Jennifer Zeitlin, Natalia N. Egorova, Amy Balbierz, and Paul L. Hebert. "Double Disadvantage in Delivery Hospital for Black and Hispanic Women and High-Risk Infants." *Maternal and Child Health Journal* 24, no. 6 (June 2020): 687–93. https://doi.org/10.1007/s10995-020-02911-9.

18. Janevic, Teresa, Jennifer Zeitlin, Natalia Egorova, Paul L. Hebert, Amy Balbierz, and Elizabeth A. Howell. "Neighborhood Racial And Economic Polarization, Hospital Of Delivery, And Severe Maternal Morbidity: An Examination of Whether Racial and Economic Neighborhood Polarization Is Associated with Severe Maternal Morbidity Rates and Whether the Delivery Hospital Partially Explains the Association." *Health Affairs* 39, no. 5 (May 1, 2020): 768–76. https://doi.org/10.1377/hlthaff.2019.00735.

19. Federman, Alex D., Rachel O'Conor, Irina Mindlis, Jamillah Hoy-Rosas, Diane Hauser, Joseph Lurio, Nandini Shroff, et al. "Effect of a Self-Management Support Intervention on Asthma Outcomes in Older Adults: The SAMBA Study Randomized Clinical Trial." *JAMA Internal Medicine* 179, no. 8 (August 1, 2019): 1113. https://doi.org/10.1001/jamainternmed.2019.1201.

20. Waxman E, Thompson M, Aron L, Hoy-Rosas J, Haag E, Improving Chronic Illness Management in Harlem: Leveraging Community Health Coaches to Address the Challenge of Medication Management. Urban Institute. October 24, 2019. Available from: https://www.urban.org/research/publication/improving-chronic-illness-management-harlem

21. Burton R and Thompson M. What Do Patients with Diabetes Think about Health Coaching? Urban Institute. February 5, 2018. Available from: https://www.urban.org/sites/default/files/publication/96336/2001692_chw_client_interviews_brief_finalized_2.pdf

23. Kangovi S, Mitra N, Grande D, Huo H, Smith RA, Long JA. Community Health Worker Support for Disadvantaged Patients With Multiple Chronic Diseases: A Randomized Clinical Trial. Am J Public Health. 2017 Oct;107(10):1660-1667. doi: 10.2105/AJPH.2017.303985. Epub 2017 Aug 17. PMID: 28817334; PMCID: PMC5607679.

24. Johnson, D., Saavedra, P., Sun, E. *et al.* Community Health Workers and Medicaid Managed Care in New Mexico. *J Community Health* **37**, 563–571 (2012). https://doi.org/10.1007/s10900-011-9484-1

25. Vaughan K, Kok MC, Witter S, Dieleman M. Costs and cost-effectiveness of community health workers: evidence from a literature review. Hum Resour Health. 2015 Sep 1;13:71. doi: 10.1186/s12960-015-0070-y. PMID: 26329455; PMCID: PMC4557864.

26. Jack HE, Arabadjis SD, Sun L, Sullivan EE, Phillips RS. Impact of Community Health Workers on Use of Healthcare Services in the United States: A Systematic Review. J Gen Intern Med. 2017 Mar;32(3):325-344. doi: 10.1007/s11606-016-3922-9. Epub 2016 Dec 5. PMID: 27921257; PMCID: PMC5331010.

27. Kangovi S, Mitra N, Grande D, Long JA, Asch DA. Evidence-Based Community Health Worker Program Addresses Unmet Social Needs And Generates Positive Return On Investment. Health Aff (Millwood). 2020 Feb;39(2):207-213. doi: 10.1377/hlthaff.2019.00981. PMID: 32011942; PMCID: PMC8564553.

28. Thompson MP, Podila PSB, Clay C, Sharp J, Bailey-DeLeeuw S, Berkley AJ, Baker BG, Waters TM. Community navigators reduce hospital utilization in super-utilizers. Am J Manag Care. 2018 Feb;24(2):70-76. PMID: 29461853.

29. Powers BW, Modarai F, Palakodeti S, Sharma M, Mehta N, Jain SH, Garg V. Impact of complex care management on spending and utilization for high-need, high-cost Medicaid patients. Am J Manag Care. 2020 Feb 1;26(2):e57-e63. doi: 10.37765/ajmc.2020.42402. Erratum in: Am J Manag Care. 2020 Mar;26(3):132. PMID: 32059101.

30. Chowdhary, Neerja, Siham Sikander, Najia Atif, Neha Singh, Ikhlaq Ahmad, Daniela C. Fuhr, Atif Rahman, and Vikram Patel. "The Content and Delivery of Psychological Interventions for Perinatal Depression by Non-Specialist Health Workers in Low and Middle Income Countries: A Systematic Review." *Best Practice & Research. Clinical Obstetrics & Gynaecology* 28, no. 1 (January 2014): 113–33. https://doi.org/10.1016/j.bpobgyn.2013.08.013.

31. Mundorf, Christopher, Arti Shankar, Tracy Moran, Sherry Heller, Anna Hassan, Emily Harville, and Maureen Lichtveld. "Reducing the Risk of Postpartum Depression in a Low-Income Community Through a Community Health Worker Intervention." *Maternal and Child Health Journal* 22, no. 4 (April 2018): 520–28. https://doi.org/10.1007/s10995-017-2419-4.

32. Roman, Lee Anne, Joseph C. Gardiner, Judith K. Lindsay, Joseph S. Moore, Zhehui Luo, Lawrence J. Baer, John H. Goddeeris, et al. "Alleviating Perinatal Depressive Symptoms and Stress: A Nurse-Community Health Worker Randomized Trial." *Archives of Women's Mental Health* 12, no. 6 (December 2009): 379–91. https://doi.org/10.1007/s00737-009-0083-4.

33. Roman, Lee Anne, Jennifer E. Raffo, and Cristian I. Meghea. "Maternal Perceptions of Help From Home Visits by Nurse–Community Health Worker Teams." *American Journal of Public Health* 102, no. 4 (April 2012): 643–45. https://doi.org/10.2105/AJPH.2011.300455.

34. Furman, Lydia M., and Catherine Dickinson. "Community Health Workers: Collaborating to Support Breastfeeding among High-Risk Inner-City Mothers." *Breastfeeding Medicine: The Official Journal of the Academy of Breastfeeding Medicine* 8, no. 1 (February 2013): 73–78. https://doi.org/10.1089/bfm.2012.0027.

35. Mannan, I., S. M. Rahman, A. Sania, H. R. Seraji, S. E. Arifeen, P. J. Winch, G. L. Darmstadt, A. Baqui, and Bangladesh Projahnmo Study Group. "Can Early Postpartum Home Visits by Trained Community Health Workers Improve Breastfeeding of Newborns?" *Journal of Perinatology: Official Journal of the California Perinatal Association* 28, no. 9 (September 2008): 632–40. https://doi.org/10.1038/jp.2008.64.

36. Population Health Approach is Pivotal in Lowering Maternal Mortality in U.S. Northwell Health. October 2022. Available from:

https://www.northwell.edu/news/insights/population-health-approach-lowering-maternal-mortality-rate

37. Cunningham SD, Riis V, Line L, Patti M, Bucher M, Durnwald C, Srinivas SK. Safe Start Community Health Worker Program: A Multisector Partnership to Improve Perinatal Outcomes Among Low-Income Pregnant Women With Chronic Health Conditions. Am J Public Health. 2020 Jun;110(6):836-839. doi: 10.2105/AJPH.2020.305630. Epub 2020 Apr 16. PMID: 32298174; PMCID: PMC7204480.

38. Williams, Corrine M., Sarah Cprek, Ibitola Asaolu, Brenda English, Tracey Jewell, Kylen Smith, and Joyce Robl. "Kentucky Health Access Nurturing Development Services Home Visiting Program Improves Maternal and Child Health." *Maternal and Child Health Journal* 21, no. 5 (May 2017): 1166–74. https://doi.org/10.1007/s10995-016-2215-6.

39. U.S. Dept of Health and Human Services. Community Health Workers: Roles and Opportunities in Health Care Delivery System Reform. January 2016. Available from: https://aspe.hhs.gov/sites/default/files/migrated_legacy_files//132001/CHWPolicy.pdf

40. Zulu, J.M., Perry, H.B. Community health workers at the dawn of a new era. *Health Res Policy Sys* **19** (Suppl 3), 130 (2021). https://doi.org/10.1186/s12961-021-00761-7

41. The Commonwealth Fund. In Focus: Integrating Community Health Workers into Care Teams. December 17, 2015. Available from: https://www.commonwealthfund.org/publications/2015/dec/focus-integrating-community-health-workers-care-teams

42. Advisory Board. Overcome these 5 Barriers to a Successful Community Health Worker Program. February 25, 2019. Available from: https://www.advisory.com/blog/2019/02/chw-barriers

43. Bartholomew Eldrigde, L. K., Markham, C. M., Ruiter, R. A. C., Fernàndez, M. E., Kok, G., & Parcel, G. S. (2016). Planning health promotion programs: An Intervention Mapping approach (4th ed.). Hoboken, NJ: Wiley.

44. Fernandez, Maria E., Robert A. C. Ruiter, Christine M. Markham, and Gerjo Kok. "Intervention Mapping: Theory- and Evidence-Based Health Promotion Program Planning: Perspective and Examples." *Frontiers in Public Health* 7 (August 14, 2019): 209. https://doi.org/10.3389/fpubh.2019.00209.\

45. Fernandez ME, ten Hoor GA, van Lieshout S, Rodriguez SA, Beidas RS, Parcel G, Ruiter RAC, Markham CM and Kok G (2019) Implementation Mapping: Using

Intervention Mapping to Develop Implementation Strategies. Front. Public Health 7:158. doi: 10.3389/fpubh.2019.00158

46. Sassen, B. (2023). Intervention Mapping Step 2: Defining Performance and Change Objectives. In: Nursing: Health Education and Improving Patient Self-Management. Springer, Cham. https://doi.org/10.1007/978-3-031-11255-3_13

47. Howell, Elizabeth A., Norma A. Padrón, Susan J. Beane, Joanne Stone, Virginia Walther, Amy Balbierz, Rashi Kumar, and José A. Pagán. "Delivery and Payment Redesign to Reduce Disparities in High Risk Postpartum Care." Maternal and Child Health Journal 21, no. 3 (March 2017): 432–38. https://doi.org/10.1007/s10995-016-2221-8.

48. Braun V and Clarke V. Thematic Analysis: a Practical Guide. 1st Edition. Sage Publications, December 6 2021.

49. Crear-Perry J, Correa-de-Araujo R, Lewis Johnson T, McLemore MR, Neilson E, Wallace M. Social and Structural Determinants of Health Inequities in Maternal Health. J Womens Health (Larchmt). 2021 Feb;30(2):230-235. doi: 10.1089/jwh.2020.8882. Epub 2020 Nov 12. PMID: 33181043; PMCID: PMC8020519.

50. Hudson KD, Matsuzaka S, Mehrotra G. Intersectional Antiracist Advocacy Practice in Health Care Organizations. Health Promot Pract. 2023 May;24(3):426-431. doi: 10.1177/15248399221131833. Epub 2022 Nov 8. PMID: 36346160.

51. Matthews K, Morgan I, Davis K, Estriplet T, Perez S, Crear-Perry JA. Pathways To Equitable And Antiracist Maternal Mental Health Care: Insights From Black Women Stakeholders. Health Aff (Millwood). 2021 Oct;40(10):1597-1604. doi: 10.1377/hlthaff.2021.00808. PMID: 34606342.

52. Ricks TN, Abbyad C, Polinard E. Undoing Racism and Mitigating Bias Among Healthcare Professionals: Lessons Learned During a Systematic Review. J Racial Ethn Health Disparities. 2022 Oct;9(5):1990-2000. doi: 10.1007/s40615-021-01137-x. Epub 2021 Sep 3. PMID: 34480317; PMCID: PMC8415190.

53. Dennis C-L, Fung K, Grigoriadis S, Robinson GE, Romans S, Ross L. Traditional Postpartum Practices and Rituals: A Qualitative Systematic Review. Women's Health. 2007;3(4):487-502. doi:10.2217/17455057.3.4.487

54. Bass PF 3rd, Maloy JW. How to Determine if a Project Is Human Subjects Research, a Quality Improvement Project, or Both. Ochsner J. 2020 Spring;20(1):56-61. doi: 10.31486/toj.19.0087. PMID: 32284684; PMCID: PMC7122260.

55. O'Donnell E. Seven Steps for Conducting a Successful Needs Assessment. Available from: https://nichq.org/insight/seven-steps-conducting-successful-needs-assessment

56. Miake-Lye IM, Delevan DM, Ganz DA, Mittman BS, Finley EP. Unpacking organizational readiness for change: an updated systematic review and content analysis of assessments. BMC Health Serv Res. 2020 Feb 11;20(1):106. doi: 10.1186/s12913-020-4926-z. PMID: 32046708; PMCID: PMC7014613.

57. Weiner BJ, Amick H, Lee S-YD. Review: Conceptualization and Measurement of Organizational Readiness for Change: A Review of the Literature in Health Services Research and Other Fields. *Medical Care Research and Review*. 2008;65(4):379-436. doi:10.1177/1077558708317802

58. Bonawitz K, Wetmore M, Heisler M, Dalton VK, Damschroder LJ, Forman J, Allan KR, Moniz MH. Champions in context: which attributes matter for change efforts in healthcare? Implement Sci. 2020 Aug 6;15(1):62. doi: 10.1186/s13012-020-01024-9. PMID: 32762726; PMCID: PMC7409681.

59. Centers for Disease Control and Prevention. Developmental Milestone Checklist for WIC Program Staff. Last updated June 6, 2023. Available from: https://www.cdc.gov/ncbddd/wicguide/identifying-program-champions.html

60. Miech EJ, Rattray NA, Flanagan ME, Damschroder L, Schmid AA, Damush TM. Inside help: An integrative review of champions in healthcare-related implementation. SAGE Open Med. 2018 May 17;6:2050312118773261. doi: 10.1177/2050312118773261. PMID: 29796266; PMCID: PMC5960847.

61. Santos, W.J., Graham, I.D., Lalonde, M. *et al.* The effectiveness of champions in implementing innovations in health care: a systematic review. *Implement Sci Commun* **3**, 80 (2022). https://doi.org/10.1186/s43058-022-00315-0

62. Shaw EK, Howard J, West DR, Crabtree BF, Nease DE Jr, Tutt B, Nutting PA. The role of the champion in primary care change efforts: from the State Networks of Colorado Ambulatory Practices and Partners (SNOCAP). J Am Board Fam Med. 2012 Sep-Oct;25(5):676-85. doi: 10.3122/jabfm.2012.05.110281. PMID: 22956703; PMCID: PMC3535479.

63. National Committee for Quality Assurance (NCQA) HEDIS Measures and Technical Resources. Available from: https://www.ncqa.org/hedis/measures/

64. Baltussen, R., Niessen, L. Priority setting of health interventions: the need for multi-criteria decision analysis. *Cost Eff Resour Alloc* **4**, 14 (2006). https://doi.org/10.1186/1478-7547-4-14

65. LaMorte, W. Boston University School of Public Health. Behavioral Change Models. 2022. Available from: https://sphweb.bumc.bu.edu/otlt/mph-modules/sb/behavioralchangetheories/BehavioralChangeTheories2.html

66. Ajzen I. The Theory of planned behavior. *Organizational Behavior and Human Decision Processes.* 1991;50:179–211

67. U.S. Community Preventive Services Task Force. The Community Guide. Available from: https://www.thecommunityguide.org/pages/link-to-us.html

68. American College of Obstetricians and Gynecologist (ACOG). Your Pregnancy and Childbirth: a Guide from the Nation's Ob-Gyns (7th Ed). ACOG. January 26, 2021.

69. Riegel B, et al. and on behalf of the American Heart Association. Self-Care for the Prevention and Management of Cardiovascular Disease and Stroke. Journal of the American Heart Association. 2017;6:e006997

70. Kolb L. An Effective Model of Diabetes Care and Education: The ADCES7 Self-Care Behaviors™. The Science of Diabetes Self-Management and Care. 2021;47(1):30-53. doi:10.1177/0145721720978154

71. NYC.gov. My Plate Planner. Available from: https://www.nyc.gov/assets/doh/downloads/pdf/csi/obesity-plate-planner-13.pdf

72. Ndwiga, Charity, Charlotte Warren, Timothy Abuya, Lucy Kanya, Alice Maranga, Christine Ochieng, Mary Wanjala, Beatrice Chelang'at, Anne Njeru, Annie Gituto, George Odhiambo, Faith Mbehero, Lucia and Jeremiah Maina. 2014. Respectful Maternity Care Resource Package; Community Facilitator's Guide, New York, Population Council.

73. Kimberly Seals Allers. Birthright podcast. Available from: https://birthrightpodcast.com

74. National Black Birth Joyline Launches. Business Fortnight. Feb 10 2023. Available from: https://businessfortnight.com/national-black-birth-joyline-launches/

75. Black Mamas Matter Alliance and Center for Reproductive Rights. Black Mamas Matter: Advancing the Human Right to Safe and Respectful Maternal Health Care. Center for Reproductive Rights (2018). Available from: http://blackmamasmatter.org/wp-content/uploads/2018/05/USPA_BMMA_Toolkit_Booklet-Final-Update_Web-Pages-1.pdf

76. Walker, T.J., Foster, M., Szeszulski, J. *et al.* Evidence-Based Intervention (EBI) Mapping: a systematic approach to understanding the components and logic of

EBIs. *BMC Public Health* **22**, 1300 (2022). https://doi.org/10.1186/s12889-022-13692-x

77. Centers for Disease Control and Prevention, Office of Policy, Performance, and Evaluation. Program Evaluation Checklist for Step 2: Describe the Program. Last updated December 12, 2018. Available from: https://www.cdc.gov/evaluation/steps/step2/index.htm

78. CDC Division for Heart Disease and Stroke Prevention. Evaluation Guide: Developing and Using a Logic Model. Available from: https://www.cdc.gov/dhdsp/docs/logic_model.pdf

79. National Center for Chronic Disease Prevention and Disease Promotion. Community Health Worker Resources. Last reviewed February 28, 2023. Available from: https://www.cdc.gov/chronicdisease/center/community-health-worker-resources.html

80. U.S. Department of Health and Human Services. On the Front Lines of Equity: Community Health Workers. April 2021. Available from: https://www.cms.gov/files/document/community-health-worker.pdf

81. John A. McLaughlin, Gretchen B. Jordan. Logic models: a tool for telling your programs performance story. Evaluation and Program Planning. Volume 22, Issue 1. 1999. Pages 65-72. ISSN 0149-7189.

82. Eden, C., & Ackermann, F. (1998). *Making strategy: The journey of strategic management.* SAGE Publications Ltd, https://dx.doi.org/10.4135/9781446217153

83. Colorado Healthcare Affordability and Sustainability Enterprise. Colorado Hospital Transformation Program: Implementation Plan Template and Milestone Requirements. May 20, 2021. Available from: https://hcpf.colorado.gov/sites/hcpf/files/Implementation%20Plan%20Template%20and%20Milestone%20Requirements_5.20.2021.pdf

84. Hollmann S, Regierer B, Bechis J, Tobin L, D'Elia D. Ten simple rules on how to develop a stakeholder engagement plan. PLoS Comput Biol. 2022 Oct 13;18(10):e1010520. doi: 10.1371/journal.pcbi.1010520. PMID: 36227852; PMCID: PMC9560496.

85. Howell EA, Balbierz A, Beane S, Kumar R, Wang T, Fei K, Ahmed Z, Pagán JA. Timely Postpartum Visits for Low-Income Women: A Health System and Medicaid Payer Partnership. Am J Public Health. 2020 Jul;110(S2):S215-S218. doi: 10.2105/AJPH.2020.305689. PMID: 32663077; PMCID: PMC7362690.

86. Knauss, M. The Way Forward: Partnering to Raise the Bar on Maternal Health. Alliance of Community Health Plans. Oct 7, 2021. Available from:

https://achp.org/blog-the-way-forward-partnering-to-raise-the-bar-on-maternal-health/

87. Malcarney MB, Pittman P, Quigley L, Horton K, Seiler N. The Changing Roles of Community Health Workers. Health Serv Res. 2017 Feb;52 Suppl 1(Suppl 1):360-382. doi: 10.1111/1475-6773.12657. PMID: 28127766; PMCID: PMC5269544.

88. Schleiff, M.J., Aitken, I., Alam, M.A. *et al.* Community health workers at the dawn of a new era: 6. Recruitment, training, and continuing education. *Health Res Policy Sys* 19 (Suppl 3), 113 (2021). https://doi.org/10.1186/s12961-021-00757-3

89. Tampio, K.-P., Haapasalo, H. and Ali, F. (2022), "Stakeholder analysis and landscape in a hospital project – elements and implications for value creation", *International Journal of Managing Projects in Business*, Vol. 15 No. 8, pp. 48-76. https://doi.org/10.1108/IJMPB-07-2021-0179

90. Heenan MA, Randall GE, Evans JM. Selecting Performance Indicators and Targets in Health Care: An International Scoping Review and Standardized Process Framework. Risk Manag Healthc Policy. 2022 Apr 21;15:747-764. doi: 10.2147/RMHP.S357561. PMID: 35478929; PMCID: PMC9038160.

91. Giltenane M, Sheridan A, Kroll T, Frazer K. Identification of quality indicators of public health nursing practice: "modified Delphi" approach. Public Health Nurs. 2022 Jan;39(1):214-228. doi: 10.1111/phn.13000. Epub 2021 Oct 25. PMID: 34697828.

92. Agency for Healthcare Research and Quality. Data Sources for Health Care Quality Measures. AHRQ. Last reviewed July 2018. Available from: https://www.ahrq.gov/talkingquality/measures/understand/index.html

93. Pongones S, Mullins A, Tucker GG. Put Your Clinical Data to Work with a Registry. *Fam Pract Manag.* 2021;28(6):21-24. Available from: https://www.aafp.org/pubs/fpm/issues/2021/1100/p21.html

94. Agency for Healthcare Research and Quality (US). Gliklich RE, Dreyer NA, Leavy MB, editors. Registries for Evaluating Patient Outcomes: A User's Guide [Internet]. 3rd edition. Rockville (MD). 2014 Apr.

95. Compass. How to Develop a Monitoring and Evaluation Plan. Retrieved July 18 2023. Available from: https://thecompassforsbc.org/how-to-guide/how-develop-monitoring-and-evaluation-plan

96. DataONE Best Practices Working Group, DataONE (July 01, 2010) "Best Practice: Plan data management early in your project". Accessed through the Data Management Skillbuilding Hub at

https://dataoneorg.github.io/Education/bestpractices/plan-data-management on Aug 31, 2020

97. Grembowski D. The Practice of Health Program Evaluation. Sage Publications. Second Edition. October 22, 2015.

APPENDICES

Appendix A: Interview Guides for Prenatal, Postpartum, and Postpartum Follow-Up

INTERVIEW PROTOCOL: PRENATAL PERSPECTIVES

INFORMED CONSENT

Hello, welcome! My name is Jamillah Hoy-Rosas and I am a researcher and health care administrator. I am working with Mount Sinai Obstetrics on the project I am about to describe to you. Thank you for making time to talk to us today! Before we start asking you interview questions, I'd like to give you a quick refresher about our study, just to make sure you are fully informed and comfortable with doing this interview.

Mount Sinai Obstetrics has decided to develop a maternal health coaching program for prenatal and postpartum women. A maternal health coach is a person who can provide you with support and health information during pregnancy and after the baby is born; they could call you or visit you at home or come with you to a doctor's visit. We are interviewing 30 prenatal or postpartum patients who get their health care from Mount Sinai Obstetrics. Your responses and insights from this interview will help us design the best possible maternal health coaching program. We are planning to offer this coaching program to all women, with a focus on those with gestational diabetes or high blood pressure. Have you ever experienced diabetes or high blood pressure? Whether you have experienced these health conditions or not, your feedback is very important to us!

Anything you say will be combined with what other patients say in our report, and we won't quote any patient by name -- so no one at Mount Sinai or elsewhere will know which patient said what. We are keeping your identity a secret because we want you to feel comfortable sharing your honest opinions about your prenatal and postpartum experiences at Mount Sinai and in general. We think this conversation will take about 45 to 60 minutes.

You can skip any question you don't want to answer – just say "I'll pass on that one." You can also end the conversation at any time if you don't like how it's going, and we will still send you the $50 gift card we promised you. Your decision to participate or decline participation in this project will not in any way affect your care at Mount Sinai. This study may not directly benefit you, but it could benefit other women and families in the prenatal or postpartum period who enroll in the coaching program.

We'd like to record this conversation, to make sure our notes are complete. The audio recording and our notes will be saved to a computer that only researchers on this project can access and will be destroyed when our study is done.

Now that we've told you about our study, are you OK with us turning on our audio recorder and asking you our interview questions? Do you have any questions for me about our study?
How is your pregnancy going, how many weeks are you? Do you have any other children?

When answering the questions below, we would like you to think about your current pregnancy experience. Some questions will be multiple choice questions and some will be whatever you want to tell us.

Part A: Interview questions

Assets/Facilitators: interpersonal, community, institutional

1A. What support or resources have been helpful to you **during pregnancy**?

a. What has been the role of your family in terms of support or resources?
b. Your partner/baby's father
c. Friends
d. What resources services in the community/neighborhood did you use? Say No if you did not receive the service or Yes if you received the service.
   - ☐ WIC (the Special Supplemental Nutrition Program for Women, Infants, and Children)
   - ☐ Food stamps or money to buy food
   - ☐ Childbirth education classes
   - ☐ Breastfeeding counseling (La Leche League)
   - ☐ Child care
   - ☐ Doula services
   - ☐ Counseling for family and personal problems
   - ☐ Help to quit smoking
   - ☐ Church program
   - ☐ Food pantry
   - ☐ Program that provides clothes or other items for baby
   - ☐ Other Please tell us:
e. [PROMPT] What other services in the community do you know about, if any?
f. [PROMPT]: Also, were there resources from your OB clinic that you found helpful?
g. **What are the best resources that you have used?

Assets/Facilitators: sources of information at interpersonal, community/society levels

2. Many people have things they know or believe about pregnancy and motherhood that they learn from their families and other sources.

a. Do family or friends have ideas about pregnancy and motherhood that they passed on to you?
    i. [PROMPT]: What do they recommend is the best way to care for a mother during pregnancy (and during the weeks after the birth)?
    ii. [PROMPT] Best way to care for the baby in the weeks after birth?

b. Is there anything else that has had an effect on your beliefs about pregnancy and motherhood?
    i. [PROMPT}: For example, does your culture or religion suggest certain ways to care for yourself or your baby?
    ii. [PROMPT]: Have you followed suggestions from online or online social networks? Any TV shows?
    iii. Have you learned any helpful suggestions from books or articles?

c. **Of all of the influences you named (family, online sources, books), which one or two were the greatest influence?

Needs/Barriers: individual, interpersonal, community, society

3A. What challenges did you face and what helped you during pregnancy? What are the biggest challenges you've had with taking care of yourself during this period?

a. [PROMPT:] What did you find stressful or overwhelming during pregnancy? How do you cope with these fears and stressful moments?
    i. If report high stress/anxiety: During your recent pregnancy, how often were you bothered by feeling nervous, anxious, or on edge?
    ☐Never ☐Sometimes ☐Usually ☐Always

    ii. If report high stress/anxiety: During your recent pregnancy, how often were you bothered by not being able to stop or control worrying?
    ☐Never ☐Sometimes ☐Usually ☐Always

b. [PROMPT] Some women feel depressed or sad during pregnancy. Have you ever felt that way and can you mention some of the things you have been doing to take care of it?
    i. If report depression or sadness: During your recent pregnancy, how often were you bothered by feeling down, depressed, or hopeless?
    ☐Never ☐Sometimes ☐Usually ☐Always

ii. If report depression or sadness, during your recent pregnancy, how often were you bothered by having little interest or pleasure in doing things?
☐Never ☐Sometimes ☐Usually ☐Always

c. [PROMPT] What are some examples of what you have been doing to care for your mental and emotional wellbeing? How about your physical wellbeing?
d. [PROMPT] [If woman has diabetes or HTN]: During this time of pregnancy, how has it been to take care of your diabetes or hypertension?
e. [PROMPT]: Do you have childcare? If so, who provides it and how often?
f. [PROMPT]: If you are working outside the home, what is it like to balance pregnancy and working? What has your employer been like?
g. [PROMPT]: Any issues with health insurance coverage?
h. How has the COVID-19 affected your pregnancy experience?

>>Now I will ask some more sensitive questions, feel free to not answer if you like.

i. [PROMPT]: During your pregnancy, were you worried about money, resources, or whether your food would run out before you got money to buy more?
j.[PROMPT]: Do you feel safe/calm/secure in your home (apartment/house)? In your building? In your neighborhood?
k. [PROMPT]: Did you find you wanted or needed cigarettes, alcohol, or other substances during times of stress?
l. **Of everything you have mentioned so far, what were the top two challenges for taking care of yourself?

Barriers and Facilitators: Institutional (health care)

4. We want to create a high quality maternal coaching program. This question about your health care will help us improve services. Your honest feedback would be appreciated. What has been your experience with your doctor and the prenatal clinic since becoming pregnant?

a. [PROMPT]: What are some of the good aspects of working with them?
b. [PROMPT]: What are some things you'd change about your doctor/nurse midwife?
c. [PROMPT]: What about other medical staff such as nurses? Administrative staff (front desk, billing)?
d. [PROMPT]: Can you walk through a typical appointment with them? ("walk us through what you do during a typical appointment")
e. [PROMPT]: [If woman has diabetes or HTN]
    a. Has your doctor talked with you about HTN/DM? If so, what did your doctor say or what advice did they give about your GDM/DM or HTN?

b. Who else did you meet with to learn about your GDM/DM or HTN? (dietician, social worker, CDE, doula, CHW)
    i. How many times did you meet with them?
    ii. What did you learn? (medications, nutrition, other self-care skills)
    iii. Did they give you guidance on monitoring your levels?
c. How did you feel when you learned of the GDM or HTN?
d. Can you tell me what is recommended for a doctor check-up for the mother after that baby is born?

f. [PROMPT]: What are your conversations like with your doctor? What do they feel like?
g. [PROMPT]: How do you feel about raising concerns or worries with your doctor?
h. [PROMPT]: How was your experience with getting information from the doctor?
i. [PROMPT]: Do you feel you have been treated poorly or differently, not listened to, or disrespected in any way by your doctor or medical staff? If so, why do you think that is?
j. [PROMPT]: Do you feel the staff and doctor understand and value your culture (and language if applicable)?
k. [PROMPT]: If you could choose, what race or ethnicity would you prefer for your provider? What gender would you prefer?

l. [PROMPT]: How likely **i**s it that you would recommend Mount Sinai Obstetrics to a pregnant friend or family member, with 0 not at all likely to 10 very likely?

5. Part 1: Given your experience during pregnancy and reflecting back on you needs, what are the most important parts of a good maternal health coaching program?

Part 2: The reason we ask about your pregnancy needs is because we are building a maternal health coaching program. What do you imagine a health coach could do for you; how could a health coach help?

Which of these options/elements would you be most interested in seeing? **(I'm going to read these options to you in groups, you should select your top 2 from each group)**.

(Prenatal)

1. ☐ Group childbirth education
2. ☐ Certified labor and delivery support person (doula)
3. ☐ Learning on nutrition
4. ☐ Coaching on managing stress

5. ☐ Managing chronic conditions (diabetes and high blood pressure)
6. ☐ Child care voucher
7. ☐ Transportation voucher to get to clinic appointments
8. ☐ Help accessing WIC, food stamps, food pantry
9. ☐ Going with you to a prenatal OB visit
10. ☐ Learning to advocate for yourself with your doctor, nurses, or other staff
11. ☐ Information and education for partner/baby's father (partner support)
12. ☐ Online/cell phone based interactive information and education
13. ☐ Anything we didn't mention that you would want to suggest?

Barriers and Facilitators for Attendance of Care Visits and Chronic Condition Management

Part 3:

1. Many women who have given birth have difficulties attending OB appointments. What do you think would be most helpful to make sure someone can attend their postpartum visits?
2. [If patient has diabetes or hypertension]: What do you think would be most helpful for a woman with diabetes or hypertension in the prenatal or postpartum period?

6. Is there anything else you would like to tell me or recommend in how we design our coaching program?

Summary: Now that we have completed the interview questions, I would like to give a brief summary of the main points that I heard from you during this interview.

I would like to ask some brief multiple-choice questions now before we finish our call.

Part B: Background Information

1. What is your age (range)?
   - ☐ 15–20
   - ☐ 21–25
   - ☐ 26–30
   - ☐ 31–35
   - ☐ 36–40
   - ☐ 40–45

2. What is your gender?
    - ☐ Male
    - ☐ Female
    - ☐ Non-Binary
    - ☐ Other
    - ☐ Don't know
    - ☐ Prefer not to answer

3. Do you consider yourself to be Hispanic, Latina/o, or of Spanish origin?
    - ☐ Yes
    - ☐ No
    - ☐ Don't know
    - ☐ Prefer not to answer

4. Please look at the categories below. What race or races do you consider yourself to be? Please select all that apply.
    - ☐ American Indian or Alaska Native
    - ☐ Asian
    - ☐ Black or African American
    - ☐ Native Hawaiian or Pacific Islander
    - ☐ North African or Middle Eastern
    - ☐ White
    - ☐ Other
    - ☐ Don't know
    - ☐ Prefer not to answer

5. How would you describe your sexual orientation?
    - ☐ Straight/heterosexual
    - ☐ Lesbian/Gay
    - ☐ Bisexual
    - ☐ Pansexual
    - ☐ Asexual

6. How many other children do you have (not including your current pregnancy)?
    - ☐ 0
    - ☐ 1
    - ☐ 2
    - ☐ 3
    - ☐ 4
    - ☐ 5

7. What is your marital status?
    - ☐ Married
    - ☐ Separated or divorced
    - ☐ Widowed
    - ☐ Never married
    - ☐ Living with a partner
    - ☐ Don't know
    - ☐ Prefer not to answer

8. Are you planning to co-parent the baby? If so, with who are you going to co-parent?
    - ☐ Baby's father
    - ☐ Partner/boyfriend/husband
    - ☐ Other
    - ☐ Not co-parenting but family member(s) helping
    - ☐ Not co-parenting

9. What is the highest grade or level of school you completed or the highest degree you have received?
    - ☐ Never attended school or only attended kindergarten
    - ☐ Grades 1 through 8 (Elementary)
    - ☐ Grades 9 through 11 (Some high school)
    - ☐ Grade 12 or GED (High school graduate)
    - ☐ College 1 year to 3 years (Some college or technical school)
    - ☐ College 4 years or more (College graduate)
    - ☐ Graduate degree (Master's, PhD, etc.)
    - ☐ Don't know
    - ☐ Prefer not to answer

10. Which of the following best describes your current work status?
    - ☐ Working full time (>= 35 hours per week)
    - ☐ Working part time (< 35 hours per week)
    - ☐ Homemaker
    - ☐ Unemployed
    - ☐ Disabled
    - ☐ Retired
    - ☐ Other
    - ☐ Don't know
    - ☐ Prefer not to answer

Part C: Additional Questions

11. How would you describe the time during your most recent pregnancy? Choose ONE answer:
    - ☐ One of the happiest times of my life
    - ☐ A happy time with few problems
    - ☐ A moderately hard time
    - ☐ A very hard time
    - ☐ One of the worst times of my life

12. Before you got pregnant, would you say that, in general, your health was:
    - ☐ Excellent
    - ☐ Very Good
    - ☐ Good
    - ☐ Fair
    - ☐ Poor

Closing: Thank you so much for your time and for sharing your experience and insights. We will send your gift card to the address on file at Mount Sinai. **Would you be willing to do a second phone interview sometime after the baby is born?**

INTERVIEW PROTOCOL: POSTPARTUM PERSPECTIVES

INFORMED CONSENT

Hello, welcome! My name is Jamillah Hoy-Rosas and I am a researcher and health care administrator. I am working with Mount Sinai Obstetrics on the project I am about to describe to you. Thank you for making time to talk to us today! Before we start asking you interview questions, I'd like to give you a quick refresher about our study, just to make sure you are fully informed and comfortable with doing this interview.

Mount Sinai Obstetrics has decided to develop a maternal health coaching program for prenatal and postpartum women. We are interviewing 30 prenatal or postpartum patients who get their health care from Mount Sinai Obstetrics. Your responses and insights from this interview will help us design the best possible maternal health coaching program. A maternal health coach is a person who can provide you with support and health information during pregnancy and after the baby is born; they could call you or visit you at home or come with you to a doctor's visit. We are planning to offer this coaching program to all women, with a focus on those with gestational diabetes or high blood

pressure. Have you ever experienced diabetes or high blood pressure? Whether you have experienced these health conditions or not, your feedback is very important to us!

Anything you say will be combined with what other patients say in our report, and we won't quote any patient by name -- so no one at Mount Sinai or elsewhere will know which patient said what. We are keeping your identity a secret because we want you to feel comfortable sharing your honest opinions about your prenatal and postpartum experiences at Mount Sinai and in general. We think this conversation will take about 45 to 60 minutes.

You can skip any question you don't want to answer – just say "I'll pass on that one." You can also end the conversation at any time if you don't like how it's going, and we will still send you the $50 gift card we promised you. Your decision to participate or decline participation in this project will not in any way affect your care at Mount Sinai. This study may not directly benefit you, but it could benefit other women and families in the prenatal or postpartum period who enroll in the coaching program.

We'd like to record this conversation, to make sure our notes are complete. The audio recording and our notes will be saved to a computer that only researchers on this project can access and will be destroyed when our study is done.

Now that we've told you about our study, are you OK with us turning on our audio recorder and asking you our interview questions? Do you have any questions for me about our study?
How is your baby doing/pregnancy going? Do you have any other children?

When answering the questions below, we would like you to think about your current pregnancy and/or postpartum experience. Some questions will be multiple choice questions and some will be whatever you want to tell us.

Part A: Interview questions

1B. What support or resources are you accessing **since giving birth**?

a. Family
b. Partner/baby's father
c. Friends
d. What resources or services did you use?
   - ☐ WIC (the Special Supplemental Nutrition Program for Women, Infants, and Children)
   - ☐ Food stamps or money to buy food
   - ☐ Childbirth education classes

☐Breastfeeding counseling (La Leche League)
☐Child care
☐Doula services
☐Counseling for family and personal problems
☐Help to quit smoking
☐Other Please tell us:

2. Many people have things they know or believe about pregnancy and motherhood that they learn from their families and other sources.
   a. Do family or friends have ideas about pregnancy and motherhood that they passed on to you?
      ii. [PROMPT]: What do they recommend is the best way to care for a mother during the weeks after the birth?
      iii. [PROMPT] Best way to care for the baby in the weeks after birth?
   b. Is there anything else that has had an effect on your beliefs about pregnancy and motherhood?
      iv. [PROMPT}: For example, does your culture or religion suggest certain ways to care for yourself or your baby?
      v. [PROMPT]: Have you followed suggestions from online or online social networks? Any TV shows?
      vi. Have you learned any helpful suggestions from books or articles?
   c. **Of all of the influences you named (family, online sources, books), which one or two were the greatest influence?

3B. What challenges did you face and what helped you after giving birth (postpartum)? What are the biggest challenges you've had with taking care of yourself during this period?

   i. [PROMPT:] What did you find stressful or overwhelming during pregnancy and new motherhood? How do you cope with these fears and stressful moments?
      i. If report high stress/anxiety: In the past 2 weeks, how often were you bothered by feeling nervous, anxious, or on edge?
      ☐Never ☐Sometimes ☐Usually ☐Always

      ii. If report high stress/anxiety: In the past 2 weeks, how often were you bothered by not being able to stop or control worrying?
      ☐Never ☐Sometimes ☐Usually ☐Always

j. [PROMPT] Some women feel depressed or sad during pregnancy or after having their child. Have you ever felt that way and can you mention some of the things you have been doing to take care of it?
    i. If report depression or sadness: In the past 2 weeks, how often were you bothered by feeling down, depressed, or hopeless?
    ☐Never ☐Sometimes ☐Usually ☐Always

    ii. If report depression or sadness: In the past 2 weeks, how often were you bothered by having little interest or pleasure in doing things?
    ☐Never ☐Sometimes ☐Usually ☐Always

k. [PROMPT] What are some examples of what you have been doing to care for your mental and emotional wellbeing? How about your physical wellbeing?
l. [PROMPT] [If woman has diabetes or HTN]: During this time of a new baby, how has it been to take care of your diabetes or hypertension?
m. [PROMPT]: Do you have childcare? If so, who provides it and how often?
n. [PROMPT]: If you are working outside the home, what is it like to balance new motherhood/baby and working? What has your employer been like?
o. [PROMPT]: Any issues with health insurance coverage since giving birth?
p. How has the COVID-19 affected your pregnancy or postpartum experiences?

>>Now I will ask some more sensitive questions, feel free to not answer if you like.

j. [PROMPT]: During the time since the baby arrived, were you worried about money, resources, or whether your food would run out before you got money to buy more?
k. [PROMPT]: Do you feel safe/calm/secure in your home (apartment/house)? In your building? In your neighborhood?
l. [PROMPT]: Did you find you wanted or needed cigarettes, alcohol, or other substances during times of stress?

**Of everything you have mentioned so far, what were the top two challenges for taking care of yourself?

4. We want to create a high quality maternal coaching program. This question about your health care will help us improve services. Your honest feedback would be appreciated. What has been your experience with your doctor and the prenatal clinic since becoming pregnant?
    c. [PROMPT]: What are some of the good aspects of working with them?
    d. [PROMPT]: What are some things you'd change about your doctor/nurse midwife?

m. [PROMPT]: What about other medical staff such as nurses? Administrative staff (front desk, billing)?
n. [PROMPT]: Can you walk through a typical appointment with them? ("walk us through what you do during a typical appointment")
o. [PROMPT]: [If woman has diabetes or HTN]
    a. Has your doctor talked with you about HTN/DM? If so, what did your doctor say or what advice did they give about your GDM/DM or HTN?
    b. Who else did you meet with to learn about your GDM/DM or HTN? (dietician, social worker, CDE, doula, CHW)
        a. How many times did you meet with them?
        b. What did you learn? (medications, nutrition, other self-care skills)
            a. Did they give you guidance on monitoring your levels?
    c. How did you feel when you learned of the GDM or HTN?
    d. Can you tell me what is recommended for a doctor check-up after that baby is born?
p. [PROMPT]: What are your conversations like with your doctor? What do they feel like?
q. [PROMPT]: How do you feel about raising concerns or worries with your doctor?
r. [PROMPT]: How was your experience with getting information from the doctor?
s. [PROMPT]: Do you feel you have been treated poorly or differently, not listened to, or disrespected in any way by your doctor or medical staff? If so, why do you think that is?
t. [PROMPT]: Do you feel the staff and doctor understand and value your culture (and language if applicable)?
u. [PROMPT]: Does the race or ethnicity of your provider matter to you? Does the gender of the provider matter to you?
v. [PROMPT]: How likely is it that you would recommend Mount Sinai Obstetrics to a pregnant friend or family member, with 0 not at all likely to 10 very likely?

w. [PROMPT]: What was the delivery/birth experience for you?
    a. Who was there with you? (doula, family member, friend)
    b. Did you have a C-section or vaginal birth?
    c. Did nurses or lactation consultants or others give breastfeeding advice in the hospital after you had your baby?
    d. Did you feel pressure from any provider to induce, to have a c-section, or to breastfeed?
x. [PROMPT]: [Did you attend your postpartum appointment(s) (in first 8 weeks after the birth)? What was it like?

a. If no, what is the main reason why you didn't have the postpartum visit
    - I didn't need more care
    - I didn't have insurance for the visit
    - I didn't have a way to get to the visit
    - I didn't feel well/was tired and didn't want to go out
    - I had other things to do and didn't have time
    - Other _____

5. Part 1: Given your experience during pregnancy and/or postpartum and reflecting back on you needs, what are the most important parts of a good maternal health coaching program. What are some of the things we can do to improve the care you are getting and how could a health coach help?

Part 2: The reason we ask about your prenatal and postpartum needs is because we are building a maternal health coaching program. What could a health coach do for you?

Which of these options/elements would you be most interested in seeing? **(I'm going to read these options to you in groups, you should select your top 2 from each group)**.

Prenatal)

2. ☐ Group childbirth education
3. ☐ Certified labor and delivery support person (doula)
4. ☐ Learning on nutrition
5. ☐ Coaching on managing stress

7. ☐ Managing chronic conditions (diabetes and high blood pressure)
8. ☐ Child care voucher
8. ☐ Transportation voucher to get to clinic appointments
9. ☐ Help accessing WIC, food stamps, food pantry

14. ☐ Going with you to a prenatal OB visit
15. ☐ Learning to advocate for yourself with your doctor, nurses, or other staff
16. ☐ Information and education for partner/baby's father (partner support)
17. ☐ Online/cell phone based interactive information and education

(Postpartum)

11. ☐ Going with you to postpartum OB visit

12. ☐Breastfeeding support
13. ☐Postpartum check-in with coach (before leave hospital with baby)
14. ☐Child care voucher
12. ☐Transportation voucher to get to clinic appointments
13. ☐Anything we didn't mention that you would want to suggest?

Part 3:

3. Many women who have given birth have difficulties attending OB appointments. What do you think would be most helpful to make sure someone can attend their postpartum visits?
4. [If patient has diabetes or hypertension]: What do you think would be most helpful for a woman with diabetes or hypertension in the prenatal or postpartum period?

6. Is there anything else you would like to tell me or recommend in how we design our coaching program?

Summary: Now that we have completed the interview, I would like to give a brief summary of the main points that I heard from you during this interview.

Closing:
Thank you so much for your time and for sharing your experience and insights. We will send your gift card to the address on file at Mount Sinai.

**Mandatory sub-questions

Part B-1: Social Support Question

1. During your most recent pregnancy, would you have had the kinds of help listed below if you needed them? For each one, say No if you would have not had it or Yes if you would have had it. No Yes

- ☐Someone to loan me $50
- ☐Someone to help me if I were sick and needed to be in bed
- ☐Someone to take me to the clinic or doctor's office if I needed a ride
- ☐Someone to take care of my baby
- ☐Someone to help me if I were tired and feeling frustrated with my new baby
- ☐Someone to talk with about my problems

Part B-2: Background Information

2. What is your age (range)?
   - ☐ 15–20
   - ☐ 21–25
   - ☐ 26–30
   - ☐ 31–35
   - ☐ 36–40
   - ☐ 40–45

3. What is your gender?
   - ☐ Male
   - ☐ Female
   - ☐ Non-Binary
   - ☐ Other
   - ☐ Don't know
   - ☐ Prefer not to answer

4. Do you consider yourself to be Hispanic, Latino, or of Spanish origin?
   - ☐ Yes
   - ☐ No
   - ☐ Don't know
   - ☐ Prefer not to answer

5. Please look at the categories below. What race or races do you consider yourself to be? Please select all that apply.
   - ☐ American Indian or Alaska Native
   - ☐ Asian
   - ☐ Black or African American
   - ☐ Native Hawaiian or Pacific Islander
   - ☐ North African or Middle Eastern
   - ☐ White
   - ☐ Other
   - ☐ Don't know
   - ☐ Prefer not to answer

6. How would you describe your sexual orientation?
   1. ☐ Straight/heterosexual
   2. ☐ Lesbian/Gay
   3. ☐ Bisexual

4. ☐ Pansexual
5. ☐ Asexual

7. How many other children do you have (not including your current pregnancy)?

6. ☐ 1
7. ☐ 2
8. ☐ 3
9. ☐ 4
10. ☐ 5

8. What is your marital status?

- ☐ Married
- ☐ Separated or divorced
- ☐ Widowed
- ☐ Never married
- ☐ Living with a partner
- ☐ Don't know
- ☐ Prefer not to answer

9. Are you planning to co-parent the baby? If so, with who are you going to co-parent?

11. ☐ Baby's father
12. ☐ Partner/boyfriend/husband
13. ☐ Other
14. ☐ Not co-parenting but family member(s) helping
15. ☐ Not co-parenting and not a lot of help from family or friends

10. What is the highest grade or level of school you completed or the highest degree you have received?

- ☐ Never attended school or only attended kindergarten
- ☐ Grades 1 through 8 (Elementary)
- ☐ Grades 9 through 11 (Some high school)
- ☐ Grade 12 or GED (High school graduate)
- ☐ College 1 year to 3 years (Some college or technical school)
- ☐ College 4 years or more (College graduate)
- ☐ Graduate degree (Master's, PhD, etc.)
- ☐ Don't know
- ☐ Prefer not to answer

11. Which of the following best describes your current work status?
    - ☐ Working full time (>= 35 hours per week)
    - ☐ Working part time (< 35 hours per week)
    - ☐ Homemaker
    - ☐ Unemployed
    - ☐ Disabled
    - ☐ Retired
    - ☐ Other
    - ☐ Don't know
    - ☐ Prefer not to answer

Part C: Additional Questions

12. How would you describe the time during your most recent pregnancy? Choose ONE answer:
    - ☐ One of the happiest times of my life
    - ☐ A happy time with few problems
    - ☐ A moderately hard time
    - ☐ A very hard time
    - ☐ One of the worst times of my life

13. Before you got pregnant, would you say that, in general, your health was:
    - ☐ Excellent
    - ☐ Very Good
    - ☐ Good
    - ☐ Fair
    - ☐ Poor

INTERVIEW PROTOCOL: FOLLOW-UP INTERVIEW POSTPARTUM PERSPECTIVES

INFORMED CONSENT

Hello, welcome! My name is Jamillah Hoy-Rosas and I am a researcher and health care administrator. I am working with Mount Sinai Obstetrics on the project I am about to describe to you. Thank you for making time to talk to us today! Before we start asking you interview questions, I'd like to give you a quick refresher about our study, just to make sure you are fully informed and comfortable with doing this interview.

Mount Sinai Obstetrics has decided to develop a maternal health coaching program for prenatal and postpartum women. We are interviewing 30 prenatal or postpartum patients who get their health care from Mount Sinai Obstetrics. Your responses and insights from this interview will help us design the best possible maternal health coaching program. A maternal health coach is a person who can provide you with support and health information during pregnancy and after the baby is born; they could call you or visit you at home or come with you to a doctor's visit. We are planning to offer this coaching program to all women, with a focus on those with gestational diabetes or high blood pressure. Have you ever experienced diabetes or high blood pressure? Whether you have experienced these health conditions or not, your feedback is very important to us!

Anything you say will be combined with what other patients say in our report, and we won't quote any patient by name -- so no one at Mount Sinai or elsewhere will know which patient said what. We are keeping your identity a secret because we want you to feel comfortable sharing your honest opinions about your prenatal and postpartum experiences at Mount Sinai and in general. We think this conversation will take about 30 to 45 minutes.

You can skip any question you don't want to answer – just say "I'll pass on that one." You can also end the conversation at any time if you don't like how it's going, and we will still send you the $50 gift card we promised you. Your decision to participate or decline participation in this project will not in any way affect your care at Mount Sinai. This study may not directly benefit you, but it could benefit other women and families in the prenatal or postpartum period who enroll in the coaching program.

We'd like to record this conversation, to make sure our notes are complete. The audio recording and our notes will be saved to a computer that only researchers on this project can access and will be destroyed when our study is done.

Now that we've told you about our study, are you OK with us turning on our audio recorder and asking you our interview questions? Do you have any questions for me about our study?
How is your baby doing? Remind me, do you have any other children?

When answering the questions below, we would like you to think about your postpartum experience. Some questions will be multiple choice questions and some will be whatever you want to tell us.

Part A: Interview questions

1B. What support or resources are you accessing **since giving birth**?

e. Family
f. Partner/baby's father
g. Friends
h. What resources or services did you use?

- ☐ WIC (the Special Supplemental Nutrition Program for Women, Infants, and Children)
- ☐ Food stamps or money to buy food
- ☐ Childbirth education classes
- ☐ Breastfeeding counseling (La Leche League)
- ☐ Child care
- ☐ Doula services
- ☐ Church program
- ☐ Program that provides clothes for baby
- ☐ Food pantry
- ☐ Counseling for family and personal problems
- ☐ Help to quit smoking
- ☐ Other Please tell us:

2. Many people have things they know or believe about motherhood and new baby that they learn from their families and other sources.

a. Do family or friends have ideas that they passed on to you?
   iii. [PROMPT]: What do they recommend is the best way to care for a mother during the weeks after the birth?
   iv. [PROMPT] Best way to care for the baby in the weeks after birth?
b. Have you followed suggestions from online or online social networks? Any TV shows?
c. Have you learned any helpful suggestions from books or articles?

3B. What challenges did you face and what helped you after giving birth (postpartum)? What are the biggest challenges you've had with taking care of yourself during this period?

q. [PROMPT:] What did you find stressful or overwhelming during pregnancy and new motherhood? How do you cope with these fears and stressful moments?
   i. If report high stress/anxiety: In the past 2 weeks, how often were you bothered by feeling nervous, anxious, or on edge?
   ☐ Never ☐ Sometimes ☐ Usually ☐ Always

ii. If report high stress/anxiety: In the past 2 weeks, how often were you bothered by not being able to stop or control worrying?
☐Never ☐Sometimes ☐Usually ☐Always

r. [PROMPT] Some women feel depressed or sad during pregnancy or after having their child. Have you ever felt that way and can you mention some of the things you have been doing to take care of it?
   i. If report depression or sadness: In the past 2 weeks, how often were you bothered by feeling down, depressed, or hopeless?
   ☐Never ☐Sometimes ☐Usually ☐Always

   ii. If report depression or sadness: In the past 2 weeks, how often were you bothered by having little interest or pleasure in doing things?
   ☐Never ☐Sometimes ☐Usually ☐Always

s. [PROMPT] What are some examples of what you have been doing to care for your mental and emotional wellbeing since the baby was born? How about your physical wellbeing?
t. [PROMPT] [If woman has diabetes or HTN]: During this time of a new baby, how has it been to take care of your diabetes or hypertension?
u. [PROMPT]: Do you have childcare? If so, who provides it and how often?
v. [PROMPT]: If you are working outside the home, what is it like to balance new motherhood/baby and working? What has your employer been like?
w. [PROMPT]: Any issues with health insurance coverage since giving birth?
x. How has the COVID-19 affected your postpartum experiences?

>>Now I will ask some more sensitive questions, feel free to not answer if you like.

j. [PROMPT]: During the time since the baby arrived, were you worried about money, resources, or whether your food would run out before you got money to buy more?
k. [PROMPT]: Do you feel safe/calm/secure in your home (apartment/house)? In your building? In your neighborhood?
l. [PROMPT]: Did you find you wanted or needed cigarettes, alcohol, or other substances during times of stress?

**Of everything you have mentioned so far, what were the top two challenges for taking care of yourself in the weeks since the birth?

4. We want to create a high quality maternal coaching program. This question about your health care will help us improve services. Your honest feedback would be appreciated. What has been your experience with your doctor for the birth and since the baby has been born (in the hospital for the delivery and any interactions or clinic appointments you have had with them after the delivery up until today)?

y. [PROMPT]: What was the delivery/birth experience for you?
   I. Who was there with you? (doula, family member, friend)
   II. Did you have a C-section or vaginal birth?
   III. Did nurses or lactation consultants or others give breastfeeding advice in the hospital after you had your baby?
   IV. Did you feel pressure from any provider to induce, to have a c-section, or to breastfeed?

z. [PROMPT]: What are your conversations like with your doctor? What do they feel like?
aa. [PROMPT]: How do you feel about raising concerns or worries with your doctor?
bb. [PROMPT]: How was your experience with getting information from the doctor during the birth?
cc. [PROMPT]: Do you feel you have been treated poorly or differently, not listened to, or disrespected in any way by your doctor or medical staff? If so, why do you think that is?
dd. [PROMPT]: Do you feel the staff and doctor understand and value your culture (and language if applicable)?
ee. [PROMPT]: Does the race or ethnicity of your provider matter to you? Does the gender of the provider matter to you? Alternative: If you could choose, what race or ethnicity would you prefer for your provider? What gender would you prefer?
ff. [PROMPT]: How likely is it that you would recommend Mount Sinai Obstetrics to a pregnant friend or family member, with 0 not at all likely to 10 very likely?
gg. [PROMPT]: [Did you attend your postpartum appointment(s) (in first 8 weeks after the birth)? What was it like?
   a. If no, what is the main reason why you didn't have the postpartum visit
      - I didn't need more care
      - I didn't have insurance for the visit
      - I didn't have a way to get to the visit
      - I didn't feel well/was tired and didn't want to go out
      - I had other things to do and didn't have time
      - Other _____
hh. [PROMPT]: [If woman has diabetes or HTN]
   a. Can you talk a little about how your GDM/DM or HTN was managed during the birth?

b. Since the baby was born, have you been in contact with any one (doctor, nurse, dietician, social worker, CDE, doula, CHW) to manage your GDM/DM or HTN?
    a. How many times did you meet with them?
    b. What did you learn? (medications, nutrition, other self-care skills)
    c. Did they give you guidance on monitoring your levels?
c. Can you tell me what is recommended for a doctor check-up after that baby is born?

5. Part 1: Given your experience during the postpartum period and reflecting on you needs, what are the most important parts of a good maternal health coaching program. What are some of the things we can do to improve the care you are getting and how could a health coach help?

Part 2: The reason we ask about your prenatal and postpartum needs is because we are building a maternal health coaching program. What could a health coach do for you?

Which of these options/elements would you be most interested in seeing? **(I'm going to read these options to you in groups, you should select your top 2 from each group)**.

(Postpartum)
☐ A doula/support person for the postpartum period
☐Learning on nutrition
☐Coaching on managing stress
☐Breastfeeding support

☐Managing chronic conditions (diabetes and high blood pressure)
☐Child care voucher
☐Transportation voucher to get to clinic appointments
☐Help accessing WIC, food stamps, food pantry

☐Going with you to postpartum OB visit
☐Postpartum check-in with coach (before leave hospital with baby)
☐Information and education for partner/baby's father (partner support)
☐Online/cell phone based interactive information and education
☐Anything we didn't mention that you would want to suggest?

Part 3:

5. Many women who have given birth have difficulties attending OB appointments. What do you think would be most helpful to make sure someone can attend their postpartum visits?
6. [If patient has diabetes or hypertension]: What do you think would be most helpful for a woman with diabetes or hypertension in the prenatal or postpartum period?

6. Is there anything else you would like to tell me or recommend in how we design our coaching program?

Summary: Now that we have completed the interview, I would like to give a brief summary of the main points that I heard from you during this interview.

Closing:
Thank you so much for your time and for sharing your experience and insights. We will send your gift card to the address on file at Mount Sinai.

**Mandatory sub-questions

Part B: Social Support Question

4. During your most recent pregnancy, would you have had the kinds of help listed below if you needed them? For each one, say No if you would have not had it or Yes if you would have had it. No Yes

- ☐ Someone to loan me $50
- ☐ Someone to help me if I were sick and needed to be in bed
- ☐ Someone to take me to the clinic or doctor's office if I needed a ride
- ☐ Someone to take care of my baby
- ☐ Someone to help me if I were tired and feeling frustrated with my new baby
- ☐ Someone to talk with about my problems

Part C: Additional Questions

5. How would you describe the time during your most recent pregnancy? Choose ONE answer:
   - ☐ One of the happiest times of my life
   - ☐ A happy time with few problems
   - ☐ A moderately hard time
   - ☐ A very hard time
   - ☐ One of the worst times of my life

6. Before you got pregnant, would you say that, in general, your health was:
   - ☐ Excellent
   - ☐ Very Good
   - ☐ Good
   - ☐ Fair
   - ☐ Poor

Appendix B: Interview Guide for Maternal Health Professionals

PROVIDER INTERVIEW: DEVELOPING A NEW MATERNAL HEALTH COACHING PROGRAM

Hello, my name is Brett Ives, I work with Dr. Afzal on a research study funded by Robert Wood Johnson Foundation aimed at assessing needs and eventually developing a maternal health coaching program. As staff of Mount Sinai Obstetrics and Gynecology, I would like to gain your perspectives and insights about what you feel is most important in developing a maternal health coaching program for prenatal and postpartum women in our practice. I will be performing short interviews with ten of you, representing a range of professions. Anything you say will be combined with what other staff members say in our report, and we won't quote any provider by name. We are keeping your identity confidential. I would like to record this conversation, to make sure our notes are complete. The audio recording and our notes will be saved to a computer that only researchers on this project can access and will be destroyed when our study is done. Do you have any questions? I will now begin the interview questions and press record.

Brett Ives
Consultant
Omara Afzal, MD
Medical Director

1. What do you think are the biggest challenges that your patients face in the prenatal and postpartum periods? What systems issues do you see in care delivery at your clinic?

2. What do you think are the biggest assets, strengths, and resources your patients bring to their prenatal and postpartum experiences?

3. What do you think are the most important ways to improve patient experience of care in your clinic?

4. Is there anything you would recommend to improve communication between patient and doctor? Anything to help standardize quality of care delivery? Anything to promote equitable care?

5. What staffing and management structures do you think need to be in place to bring on a maternal health coaching team?

6. What is key to adoption of a maternal health coaching program at your clinic? What could be some pitfalls?

7. What is needed to sustain a program such as this?

8. Which of these elements would you be most interested in seeing in a maternal health coaching program? Which of these options/elements would you be most interested in seeing? **(I'm going to read these options to you in groups, you should select your top 2 from each group)**.

    (Prenatal)
    1. Group childbirth education
    2. Certified labor and delivery support person (doula)
    3. Personalized health coaching about nutrition
    4. Coaching on managing stress

    5. Managing chronic conditions (diabetes and high blood pressure)
    6. Child care support (voucher)
    7. Transportation support (voucher) to get to clinic appointments
    8. Help accessing community resources (WIC, food stamps, food pantry)

    9. Accompaniment of coach to a prenatal OB visit

    10. Learning to advocate for oneself with your doctor, nurses, or other staff
    11. Information and education for partner/baby's father (partner support)
    12. Online/cell phone based interactive information and education

    (Postpartum)
    13. Accompaniment of coach to postpartum OB visit
    14. Breastfeeding support
    15. Postpartum check-in with coach (before leave hospital with baby)
    16. Child care support (voucher)
    17. Transportation support (voucher) to get to clinic appointments
    18. Anything we didn't mention that you would want to suggest?

9. What do you think would be most helpful to make sure someone can attend their postpartum visits?

10. What do you think would be most helpful for a woman with diabetes or hypertension in the prenatal or postpartum period?

Appendix C: Interviewer Training Curriculum

Maternal Health Matters In-depth Patient Interview Training

Text: Interviewing as Qualitative Research, 4th edition. By Irving Seidman. https://www.amazon.com/Interviewing-Qualitative-Research-Researchers-Education-ebook-dp-B00DY6W4WE/dp/B00DY6W4WE/ref=mt_kindle?_encoding=UTF8&me=&qid=1557160179

5th edition offers e-formats https://www.amazon.com/Interviewing-Qualitative-Research-Researchers-Education-ebook-dp-B07TB1QRNX/dp/B07TB1QRNX/ref=mt_other?_encoding=UTF8&me=&qid=1599324889

Session 1: Introduction to Needs/Asset Assessment, Qualitiative Research

Lecture/Discussion

Learning Objectives

Background on Maternal Health Matters

Background on needs and asset assessment approach

Objectives for the MHM needs assessment-- present outline

Objectives for in-depth patient interviews- main research question + sub questions

Review project interview guide

Discuss how interview transcripts will be analyzed and used to inform MHM program

Review components of an interview guide (questions and probes/prompts)

Homework (to be completed before the session)

Videos

Identifying Community Assets+Needs, GenerationOn, Minutes 0–16:30	https://www.youtube.com/watch?v=EVLH2n5BYGM
What is Qualitative Research?, Yale SPH 10m	https://www.youtube.com/watch?v=wbdN_sLWl88

Reading

RWJF proposal
Needs+ Assets assessment outline
Interview guide

Session 2: IRB and Informed Consent Principles

Lecture/Discussion

Learning Objectives Review IRB and principles of informed consent
Review project IRB verbal consent script

Role play: practice introduction/consent to the project interview

Homework (to be completed before the session)

Reading

Seidman Chapter 5, p 60–80 (IRB and informed consent)

Session 3: Intro to In-depth Interviewing

Lecture/Discussion

Learning Objectives

Discuss core principles of in-depth interviewing -- why it is used, what it can tell us
Review basic interviewing tips (below)
**Review Seidman p 84–86 and p 93–95 together

Role play: practice a "guided conversation": what is the experience of starting a career as a dietician

1. Tell me what influenced you to become a dietician? prompt: anyone in your family?
me through a day in the life of a

Homework (to be completed before the session)

Videos

	What Makes a Good Interview? U of Derby 5m	https://www.youtube.com/watch?v=LPwO-vOVxD4
	Semi-Structured Interviewing, Quirkos:	https://www.youtube.com/watch?v=WgtLTSB6NIg
Reading	Seidman Chapter 6, p 81–96	
	Strategies for Qualitative Interviews, Harvard Sociology	https://sociology.fas.harvard.edu/files/sociology/files/interview_strategies.pdf

Review question

What are the 12 qualities of a successful interviewer?

Interviewing Tips

Think of it as a "guided conversation"
Interview guide is a framework, not a script
Establishing rapport at the beginning is crucial
However at beginning of interview, err on side of formality rather than familiarity
Rehearse introduction: know informed consent intro
Ask open questions-- avoid yes or no questions
Listen. The respondent should be doing most of the talking
Do not show the respondent your own viewpoint
Stay open, inquisitive, non-judgemental
Leave your clinical/coaching background behind
Avoid reinforcing their answers- and do not talk too much or give verbal cues, "ah ha, hm"
Allow silence
Do not move on too fast from a question if respondent has more to say
Redirect the participant when they have fallen off track
Rather than interrupting for clarification, you can jot down key words and ask for clarification after
Try to memorize the interview guide
Take notes to help guide the conversation. Take additional notes after the interview is complete
The concrete details constitute the experience; attitudes and opinions are based on them.

Session 4: Practice In-depth Interviewing

Lecture/Discussion

Learning Objectives

- Review additional interviewing principles and techniques
- Become familiar and comfortable with interviewing via practice
- Practice and become very familiar with the project interview guide

Helpful probes (from Yale Interviews video, minute 11:33)		https://www.youtube.com/watch?v=6PhcglOGFg8
	Clarifying	"You said the word x, can you describe what you meant by that?" Can you tell me again what happened?
	Neutral	"I see" "uh huh"
	Echo	repeat what respondent said, then ask them to continue
	Direct	Can you tell me more about that? "What was that like for you?" What did that mean to you?"
Redirecting statements		
	If they start talking with you regarding your role as a health care provider, admin, etc.	"Today I am in my role as an interviewer, today but I would be happy to talk about x after this call is finished" "I see you are interested in talking about x topic; we can talk about that after we finish that interview."
	If they are going on tangents that do not seem related to maternal health	"Thank you for sharing this important information. I want to move on and ask you about x' "Sounds like this is important, and I would like to hear this story, but I would like to hear it after we finish the interview so I could give it full attention"

Role play: practice interviewing with project interview guide

Homework (to be completed before the session)

Videos

How to do a Research Interview, with 2 interview examples, U of Huddersfield 12m — https://www.youtube.com/watch?v=9t-_hYjAKww

Reading

Seidman Chapter 7, 96–114- includes section on phone interviewing

Session 5: Logistics: Orientation to phone interview recording software/hardware

Lecture/Discussion

Learning Objectives

To orient study team to encrypted Zoom as well as the handheld recorder

To review work flow for all aspects of the participant experience

To review logistics during interview (first interviewer runs interview, second interviewer back-up notes)

CUMULATIVE BIBLIOGRAPHY

Abt Associates Inc. Family and Medical Leave in 2012: Detailed Results Appendix. Prepared for U.S. Department of Labor. September 6, 2012. Available from: https://www.dol.gov/sites/dolgov/files/OASP/legacy/files/FMLA-Detailed-Results-Appendix.pdf

Access NYC. Health Food for Families. Available from: https://access.nyc.gov/programs/women-infants-and-children-wic/

ACOG Committee Opinion No. 736: Optimizing Postpartum Care. *Obstetrics & Gynecology.* 2018;131(5): e140–e150 doi: 10.1097/AOG.0000000000002633

ACOG Committee opinion – guidelines on implementing telehealth. February 2020. Available from: https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2020/02/implementing-telehealth-in-practice

Advisory Board. Overcome these 5 Barriers to a Successful Community Health Worker Program. February 25, 2019. Available from: https://www.advisory.com/blog/2019/02/chw-barriers

Agency for Healthcare Research and Quality (US) Gliklich RE, Dreyer NA, Leavy MB, editors. Registries for Evaluating Patient Outcomes: A User's Guide [Internet]. 3rd edition. Rockville (MD). 2014 Apr.

Agency for Healthcare Research and Quality. Data Sources for Health Care Quality Measures. AHRQ. Last reviewed July 2018. Available from: https://www.ahrq.gov/talkingquality/measures/understand/index.html

Ahn R, Gonzalez GP, Anderson B, Vladutiu CJ, Fowler ER, Manning L. Initiatives to Reduce Maternal Mortality and Severe Maternal Morbidity in the United States : A Narrative Review. *Annals of Internal Medicine.* 2020 Dec 1;173(11 Suppl): S3–S10. doi: 10.7326/M19-3258. PMID: 33253021.

Ajzen I. The Theory of planned behavior. *Organizational Behavior and Human Decision Processes.* 1991;50: 179–211.

Akber Ali, N., Shahil Feroz. A. (2020) Maternal mental health amidst the COVID-19 pandemic. *Asian Journal of Psychiatry.* 2020;54: 102261. https://doi.org/10.1016/j.ajp.2020.102261

Alakaam, Amir, Jennifer Lemacks, Kathleen Yadrick, Carol Connell, Hwanseok Winston Choi, and Ray G. Newman. Maternity Nurses' Knowledge and Practice of

Breastfeeding in Mississippi:" *MCN, The American Journal of Maternal/Child Nursing.* 2018;43(4): 225–230. https://doi.org/10.1097/NMC.0000000000000437.

Allen E and Benatar S. Maternity care financing: challenges and opportunities highlighted by the COVID-19 pandemic. Urban Institute. October 28 2020. Available from: https://www.urban.org/research/publication/maternity-care-financing-challenges-and-opportunities-highlighted-covid-19-pandemic

Almario, Christopher V., Teresa Ecker, Leslie A. Moroz, Lynne Bucovetsky, Vincenzo Berghella, and Jason K. Baxter. "Obstetricians Seldom Provide Postpartum Diabetes Screening for Women with Gestational Diabetes." *American Journal of Obstetrics and Gynecology.* 2008;198(5): 528.e1–528.e5. https://doi.org/10.1016/j.ajog.2007.11.001.

American College of Obstetricians and Gynecologist (ACOG). Your Pregnancy and Childbirth: a Guide from the Nation's Ob-Gyns (7th Ed). ACOG. January 26, 2021.

Anstey EH, Chen J, Elam-Evans LD, Perrine CG. Racial and Geographic Differences in Breastfeeding — United States, 2011–2015. *MMWR: Morbidity and Mortality Weekly Report.* 2017;66: 723–727. http://dx.doi.org/10.15585/mmwr.mm6627a3

APHA. Support for Community Health Workers to Increase Health Access and Reduce Health Inequities. November 2009. Available from: https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/09/14/19/support-for-community-health-workers-to-increase-health-access-and-to-reduce-health-inequities

Arteaga S, Hubbard E, Arcara J, Cuentos A, Armstead M, Jackson A, Gomez AM, Marshall C. "They're gonna be there to advocate for me so I'm not by myself": A qualitative analysis of Black women's motivations for seeking and experiences with community doula care. *Women and Birth.* 2023 May;36(3): 257–263. doi: 10.1016/j.wombi.2022.08.007.

Asefa, Anteneh, Aline Semaan, Therese Delvaux, Elise Huysmans, Anna Galle, Emma Sacks, Meghan A. Bohren, Alison Morgan, Michelle Sadler, Saraswathi Vedam, Lenka Benova. The impact of COVID-19 on the provision of respectful maternity care: Findings from a global survey of health workers. *Women and Birth*. 2022;35(4): 378–386. https://doi.org/10.1016/j.wombi.2021.09.003.

Attanasio, Laura, and Katy B. Kozhimannil. "Patient-Reported Communication Quality and Perceived Discrimination in Maternity Care." *Medical Care.* 2015;53(10): 863–71. https://doi.org/10.1097/MLR.0000000000000411.

Attanasio LB, DaCosta M, Kleppel R, Govantes T, Sankey HZ, Goff SL. Community Perspectives on the Creation of a Hospital-Based Doula Program. *Health Equity.*

2021 Sep 3;5(1): 545–553. doi: 10.1089/heq.2020.0096.

Attanasio LB, Ranchoff BL, Geissler KH. Perceived discrimination during the childbirth hospitalization and postpartum visit attendance and content: Evidence from the Listening to Mothers in California survey. *PLoS One*. 2021 Jun 23;16(6): e0253055. doi: 10.1371/journal.pone.0253055.

Attanasio LB, Ranchoff BL, Cooper MI, Geissler KH. Postpartum Visit Attendance in the United States: A Systematic Review. *Womens Health Issues*. 2022 Jul–Aug;32(4): 369–375. doi: 10.1016/j.whi.2022.02.002.

Badreldin N, DiTosto JD, Grobman WA, Yee LM. Association Between Patient-Prescriber Racial and Ethnic Concordance and Postpartum Pain and Opioid Prescribing. *Health Equity*. 2022 Mar 7;6(1): 198–205. doi: 10.1089/heq.2021.0130.

Bailey ZD, Feldman JM, Bassett MT. How Structural Racism Works - Racist Policies as a Root Cause of U.S. Racial Health Inequities. *New England Journal of Medicine.* 2021 Feb 25;384(8): 768–773. doi: 10.1056/NEJMms2025396.

Bailey L, Gaskin K. Spotlight on maternal mental health: a prepandemic and postpandemic priority. *Evidence-Based Nursing* 2021;24: 29–30.

Bakst, Carol, Moore, Jennifer, George, Karen, Shea, Karen. Community-Based Maternal Support Services: The Role of Doulas and Community Health Workers. Institute for Medicaid Innovation. May 2020. https://www.medicaidinnovation.org/_images/content/2020-IMI-Community_Based_Maternal_Support_Services-Report.pdf

Ballantyne, M., K. Benzies, P. Rosenbaum, and A. Lodha. “Mothers’ and Health Care Providers’ Perspectives of the Barriers and Facilitators to Attendance at Canadian Neonatal Follow-up Programs.” *Child: Care, Health and Development.* 2015 Sept; 41(5): 722–733. https://doi.org/10.1111/cch.12202.

Ballesteros V. A stigmatizing dilemma in the labour room: Irrationality or selfishness? *Journal of Evaluation in Clinical Practice*. 2022 Oct;28(5): 875–882. doi: 10.1111/jep.13747

Baltussen, R., Niessen, L. Priority setting of health interventions: the need for multi-criteria decision analysis. *Cost Effectiveness and Resource Allocation: C/E.* 2006;4: 14. https://doi.org/10.1186/1478-7547-4-14

Bartholomew Eldrigde, L. K., Markham, C. M., Ruiter, R. A. C., Fernàndez, M. E., Kok, G., & Parcel, G. S. (2016). *Planning health promotion programs: An Intervention* Mapping approach (4th ed.). Hoboken, NJ: Wiley.

Bass PF 3rd, Maloy JW. How to Determine if a Project Is Human Subjects Research, a Quality Improvement Project, or Both. *Ochsner Journal*. 2020 Spring;20(1): 56–61. doi: 10.31486/toj.19.0087

Bastos MH, Furuta M, Small R, McKenzie-McHarg K, Bick D. Debriefing interventions for the prevention of psychological trauma in women following childbirth. *Cochrane Database of Systematic Reviews*. 2015 Apr 10;(4): CD007194. doi: 10.1002/14651858.CD007194.pub2

Bauer, Nerissa S., Susan Ofner, Amy Pottenger, Aaron E. Carroll, and Stephen M. Downs. "Follow-up of Mothers with Suspected Postpartum Depression from Pediatrics Clinics." *Frontiers in Pediatrics*. 2017 Oct. 3;5: 212. https://doi.org/10.3389/fped.2017.00212

Baxter JD, McCourt C, Jarrett PM. What is current practice in offering debriefing services to post partum women and what are the perceptions of women in accessing these services: a critical review of the literature. *Midwifery*. 2014 Feb;30(2): 194–219. doi: 10.1016/j.midw.2013.12.013

Bedaso A, Adams J, Peng W, Sibbritt D. The relationship between social support and mental health problems during pregnancy: a systematic review and meta-analysis. *Reproductive Health*. 2021 Jul 28;18(1): 162. doi: 10.1186/s12978-021-01209-5. PMID: 34321040; PMCID: PMC8320195.

Bernstein, Judith Apt, Emily Quinn, Omid Ameli, Myrita Craig, Timothy Heeren, Aviva Lee-Parritz, Ronald Iverson, Brian Jack, and Lois McCloskey. "Follow-up after Gestational Diabetes: A Fixable Gap in Women's Preventive Healthcare." *BMJ Open Diabetes Research & Care*. 2017 Sept.; 5(1): e000445. https://doi.org/10.1136/bmjdrc-2017-000445.

Black Mamas Matter Alliance and Center for Reproductive Rights. Black Mamas Matter: Advancing the Human Right to Safe and Respectful Maternal Health Care. Center for Reproductive Rights (2018). Available from: http://blackmamasmatter.org/wp-content/uploads/2018/05/USPA_BMMA_Toolkit_Booklet-Final-Update_Web-Pages-1.pdf

Bloch JR, Cordivano S, Gardner M, Barkin J. Beyond bus fare: deconstructing prenatal care travel among low-income urban mothers through a mix methods GIS study. *Contemporary Nurse*. 2018 Jun;54(3): 233–245. doi: 10.1080/10376178.2018.1492349.

Bonawitz K, Wetmore M, Heisler M, Dalton VK, Damschroder LJ, Forman J, Allan KR, Moniz MH. Champions in context: which attributes matter for change efforts in healthcare? *Implementation Science*. 2020 Aug 6;15(1):62. doi: 10.1186/s13012-020-01024-9

Bossano CM, Townsend KM, Walton AC, Blomquist JL, Handa VL. The maternal childbirth experience more than a decade after delivery. *American Journal of Obstetrics and Gynecology*. 2017 Sep;217(3): 342.e1–342.e8. doi: 10.1016/j.ajog.2017.04.027

Boyd, Rhonda C., Marjie Mogul, Deena Newman, and James C. Coyne. "Screening and Referral for Postpartum Depression among Low-Income Women: A Qualitative Perspective from Community Health Workers." *Depression Research and Treatment* 2011 (2011): 320605. https://doi.org/10.1155/2011/320605

Boyd LM, Mehra R, Thomas J, Lewis JB, Cunningham SD. Features and Impact of Trust-Based Relationships Between Community Health Workers and Low-Resource Perinatal Women with Chronic Health Conditions. *Maternal and Child Health Journal*. 2021 Dec;25(12): 1866–1874. doi: 10.1007/s10995-021-03242-z.

Braun V and Clarke V. *Thematic Analysis: A Practical Guide.* Sage Publications, 2021.

Brown A, Shenker N. Experiences of breastfeeding during COVID-19: Lessons for future practical and emotional support. *Maternal & Child Nutrition*. 2021 Jan;17(1):e13088. doi: 10.1111/mcn.13088.

Brown-Johnson C, Shaw JG, Safaeinili N, Chan GK, Mahoney M, Asch S, Winget M. Role definition is key-Rapid qualitative ethnography findings from a team-based primary care transformation. *Learning Health Systems.* 2019 Feb 20;3(3): e10188. doi: 10.1002/lrh2.10188

Burton R and Thompson M. What Do Patients with Diabetes Think about Health Coaching? Urban Institute. February 5, 2018. Available from: https://www.urban.org/sites/default/files/publication/96336/2001692_chw_client_interviews_brief_finalized_2.pdf

Byatt, Nancy, Kathleen Biebel, Rebecca S. Lundquist, Tiffany A. Moore Simas, Gifty Debordes-Jackson, Jeroan Allison, and Douglas Ziedonis. "Patient, Provider, and System-Level Barriers and Facilitators to Addressing Perinatal Depression." *Journal of Reproductive and Infant Psychology*. 2012 Nov.;30(5): 436–449. https://doi.org/10.1080/02646838.2012.743000.

Byatt N, Simas TA, Lundquist RS, Johnson JV, Ziedonis DM. Strategies for improving perinatal depression treatment in North American outpatient obstetric settings. *Journal of Psychosomatic Obstettics and Gynaecology.* 2012 Dec;33(4): 143–161. doi: 10.3109/0167482X.2012.728649

C3; Rosenthal, EL, Rush, CH, Allen, CG. Understanding scope and competencies: a contemporary look at the United States community health worker field. Progress Report of the Community Health Worker (CHW) Core Consensus (C3) Project:

Building National Consensus on CHW Core Roles, Skills, and Qualities, 2016. https://chwcentral.org/wp-content/uploads/2016/08/CHW-C3-Project.pdf

Came, Heather, and Derek Griffith. "Tackling Racism as a 'Wicked' Public Health Problem: Enabling Allies in Anti-Racism Praxis." *Social Science & Medicine.* 2018 Feb.;199: 181–188. https://doi.org/10.1016/j.socscimed.2017.03.028.

Cameron EE, Joyce KM, Delaquis CP, Reynolds K, Protudjer JLP, Roos LE. Maternal psychological distress & mental health service use during the COVID-19 pandemic. *Journal of Affective Disorders*. 2020 Nov 1;276: 765–774. doi: 10.1016/j.jad.2020.07.081

Cantor AG, Jungbauer RM, Totten AM, Tilden EL, Holmes R, Ahmed A, Wagner J, Hermesch AC, McDonagh MS. Telehealth Strategies for the Delivery of Maternal Health Care : A Rapid Review. *Annals of Internal Medicine.* 2022 Sep;175(9): 1285–1297. doi: 10.7326/M22-0737

Cardenas, J.F., Colwell, M.J. Maternal Well-Being and the Transition to Childcare: Impact of Caregiver Support. *International Journal of Early Childhood: IJEC.* 2022. https://doi.org/10.1007/s13158-022-00339-6

Carlson, C.J., Albery, G.F., Merow, C. *et al.* Climate change increases cross-species viral transmission risk. *Nature.* 2022;607: 555–562. https://doi.org/10.1038/s41586-022-04788-w

Caulfield LE, Bennett WL, Gross SM, Hurley KM, Ogunwole SM, Venkataramani M, Lerman JL, Zhang A, Sharma R, Bass EB. Maternal and Child Outcomes Associated with the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (US); 2022 Apr. Report No.: 22-EHC019. https://www.ncbi.nlm.nih.gov/books/NBK579797/

CDC Division for Heart Disease and Stroke Prevention. Evaluation Guide: Developing and Using a Logic Model. Available from: https://www.cdc.gov/dhdsp/docs/logic_model.pdf

Centers for Disease Control. Addressing Chronic Disease through Community Health Workers: A Policy Brief. 2015. Available from: https://www.cdc.gov/dhdsp/docs/chw_brief.pdf

Centers for Disease Control. States Implementing Community Health Worker Strategies: A Technical Assistance Guide. Available from: https://www.cdc.gov/dhdsp/programs/spha/docs/1305_ta_guide_chws.pdf

Centers for Disease Control and Prevention. Community Health Worker Resources. February 28, 2023. Available from: https://www.cdc.gov/chronicdisease/center/community-health-worker-resources.html

Centers for Disease Control and Prevention. Developmental Milestone Checklist for WIC Program Staff. Last updated June 6, 2023. Available from: https://www.cdc.gov/ncbddd/wicguide/identifying-program-champions.html

Centers for Disease Control and Prevention, Office of Policy, Performance, and Evaluation. Program Evaluation Checklist for Step 2: Describe the Program. Last updated December 12, 2018. Available from: https://www.cdc.gov/evaluation/steps/step2/index.htm

Centers for Disease Control and Prevention. Pregnancy Risk Assessment Monitoring Survey (PRAMS). Phase 8 (2016-Present) Standard Questionnaire. Available from: https://www.cdc.gov/prams/questionnaire.htm

Chae SY, Chae MH, Tyndall A, Ramirez MR, Winter RO. Can we effectively use the two-item PHQ-2 to screen for postpartum depression? *Family Medicine.* 2012 Nov–Dec;44(10): 698–703.

Charanthimath, Umesh, Marianne Vidler, Geetanjali Katageri, Umesh Ramadurg, Chandrashekhar Karadiguddi, Avinash Kavi, Anjali Joshi, et al. "The Feasibility of Task-Sharing the Identification, Emergency Treatment, and Referral for Women with Pre-Eclampsia by Community Health Workers in India." *Reproductive Health.* 2018 June;15(Suppl 1): 101. https://doi.org/10.1186/s12978-018-0532-5.

Choi KR, Records K, Low LK, Alhusen JL, Kenner C, Bloch JR, Premji SS, Hannan J, Anderson CM, Yeo S, Cynthia Logsdon M. Promotion of Maternal-Infant Mental Health and Trauma-Informed Care During the COVID-19 Pandemic. *Journal of Obstetric, Gynecologic, and Neonatal Nursing: JOGNN*. 2020 Sep;49(5): 409–415. doi: 10.1016/j.jogn.2020.07.004.

Chowdhary, Neerja, Siham Sikander, Najia Atif, Neha Singh, Ikhlaq Ahmad, Daniela C. Fuhr, Atif Rahman, and Vikram Patel. "The Content and Delivery of Psychological Interventions for Perinatal Depression by Non-Specialist Health Workers in Low and Middle Income Countries: A Systematic Review." *Best Practice & Research. Clinical Obstetrics & Gynaecology.* 2014 Jan.;28(1): 113–133. https://doi.org/10.1016/j.bpobgyn.2013.08.013.

The CLIP Working Group, Salésio Macuácua, Raquel Catalão, Sumedha Sharma, Anifa Valá, Marianne Vidler, Eusébio Macete, et al. "Policy Review on the Management of Pre-Eclampsia and Eclampsia by Community Health Workers in Mozambique." *Human Resources for Health.* 2019 Dec.;17(1): 15. https://doi.org/10.1186/s12960-019-0353-9.

Coffman MJ, Scott VC, Schuch C, Mele C, Mayfield C, Balasubramanian V, Stevens A, Dulin M. Postpartum Depression Screening and Referrals in Special Supplemental Nutrition Program for Women, Infants, and Children Clinics. *Journal of Obstetric, Gynecologic, and Neonatal Nursing: JOGNN*. 2020 Jan;49(1): 27–40. doi: 10.1016/j.jogn.2019.10.007

Colorado Healthcare Affordability and Sustainability Enterprise. Colorado Hospital Transformation Program: Implementation Plan Template and Milestone Requirements. May 20, 2021. Available from: https://hcpf.colorado.gov/sites/hcpf/files/Implementation%20Plan%20Template%20and%20Milestone%20Requirements_5.20.2021.pdf

The Commonwealth Fund. In Focus: Integrating Community Health Workers into Care Teams. December 17, 2015. Available from: https://www.commonwealthfund.org/publications/2015/dec/focus-integrating-community-health-workers-care-teams

Compass. How to Develop a Monitoring and Evaluation Plan. Retrieved July 18 2023. Available from: https://thecompassforsbc.org/how-to-guide/how-develop-monitoring-and-evaluation-plan

Crear-Perry J, Correa-de-Araujo R, Lewis Johnson T, McLemore MR, Neilson E, Wallace M. Social and Structural Determinants of Health Inequities in Maternal Health. *Journal of Women's Health.* 2021 Feb;30(2): 230–235. doi: 10.1089/jwh.2020.8882

Cunningham, Emilie M., Eva I. Doyle, and Rodney G. Bowden. "Maternity Nurses' Perceptions of Implementation of the Ten Steps to Successful Breastfeeding." *MCN. The American Journal of Maternal Child Nursing.* 2018 Feb.;43(1): 38–43. https://doi.org/10.1097/NMC.0000000000000392.

Cunningham SD, Riis V, Line L, Patti M, Bucher M, Durnwald C, Srinivas SK. Safe Start Community Health Worker Program: A Multisector Partnership to Improve Perinatal Outcomes Among Low-Income Pregnant Women with Chronic Health Conditions. *American Journal of Public Health*. 2020 Jun;110(6): 836–839. doi: 10.2105/AJPH.2020.305630

Currie J, Rajani I. Within-Mother Estimates of the Effects of WIC on Birth Outcomes in New York City. *Economic Inquiry.* 2015 Oct;53(4): 1691–1701. doi: 10.1111/ecin.12219

Cutrona CE, Troutman BR. Social support, infant temperament, and parenting self efficacy: a mediational model of postpartum depression. *Child Development.* 1986; 57(6):1507–1518. https://doi.org/10.2307/1130428

DataONE Best Practices Working Group, DataONE (July 01, 2010) "Best Practice: Plan data management early in your project". Accessed through the Data Management Skillbuilding Hub at https://dataoneorg.github.io/Education/bestpractices/plan-data-management on Aug 31, 2020

Dennis C-L, Fung K, Grigoriadis S, Robinson GE, Romans S, Ross L. Traditional Postpartum Practices and Rituals: A Qualitative Systematic Review. *Women's Health.* 2007;3(4): 487–502. doi:10.2217/17455057.3.4.487

De Sousa Machado T, Chur-Hansen A, Due C. First-time mothers' perceptions of social support: Recommendations for best practice. *Health Psychology Open*. 2020;7(1). doi:10.1177/2055102919898611

Dunkley-Bent J. The importance of continuity of carer in maternity services. National Health Service (NHS) Blog Post. March 23, 2018. Available from: https://www.england.nhs.uk/blog/the-importance-of-continuity-of-carer-in-maternity-services/

Eden, C., & Ackermann, F. (1998). *Making strategy: The journey of strategic management.* SAGE Publications Ltd., https://dx.doi.org/10.4135/9781446217153

Eggertson L. Stigma a major barrier to treatment for pregnant women with addictions. *CMAJ: Canadian Medical Association Journal.* 2013 Dec 10;185(18):1562. doi: 10.1503/cmaj.109-4653

Eick SM, Goin DE, Izano MA, Cushing L, DeMicco E, Padula AM, Woodruff TJ, Morello-Frosch R. Relationships between psychosocial stressors among pregnant women in San Francisco: A path analysis. *PLoS One.* 2020 Jun 12;15(6):e0234579. doi: 10.1371/journal.pone.0234579

Ejembi, Clara Ladi, Pamela Norick, Ann Starrs, and Kusum Thapa. "New Global Guidance Supports Community and Lay Health Workers in Postpartum Hemorrhage Prevention." *International Journal of Gynaecology and Obstetrics*. 2013 Sept;122(3): 187–189. https://doi.org/10.1016/j.ijgo.2013.05.001.

Eliason, Erica L. "Adoption of Medicaid Expansion Is Associated with Lower Maternal Mortality." *Women's Health Issues*. 2020 May;30(3): 147–152. https://doi.org/10.1016/j.whi.2020.01.005.

Elkins, Tonya, Maria Del Pilar Aguinaga, Caitlin Clinton-Selin, Barbara Clinton, and Gerald Gotterer. "The Maternal Infant Health Outreach Worker Program in Low-Income Families." *Journal of Health Care for the Poor and Underserved.* 2013 Aug.;24(3): 995–1001. https://doi.org/10.1353/hpu.2013.0143.

Ellison K and Martin N. Nearly Dying in Childbirth: Why Preventable Complications are Growing in U.S. NPR December 22 2017. Available from: https://www.npr.org/2017/12/22/572298802/nearly-dying-in-childbirth-why-preventable- complications-are-growing-in-u-s?utm_source=facebook.com&utm_medium=social&utm_campaign=npr&utm_term=nprnews&u tm_content=2051

Federman, Alex D., Rachel O'Conor, Irina Mindlis, Jamillah Hoy-Rosas, Diane Hauser, Joseph Lurio, Nandini Shroff, et al. "Effect of a Self-Management Support Intervention on Asthma Outcomes in Older Adults: The SAMBA Study Randomized Clinical Trial." *JAMA Internal Medicine.* 2019 Aug. 1;179(8): 1113. https://doi.org/10.1001/jamainternmed.2019.1201.

Fernandez, Maria E., Robert A. C. Ruiter, Christine M. Markham, and Gerjo Kok. "Intervention Mapping: Theory- and Evidence-Based Health Promotion Program Planning: Perspective and Examples." *Frontiers in Public Health.* 2019 Aug. 14;7: 209. https://doi.org/10.3389/fpubh.2019.00209.\

Fernandez ME, ten Hoor GA, van Lieshout S, Rodriguez SA, Beidas RS, Parcel G, Ruiter RAC, Markham CM and Kok G. Implementation Mapping: Using Intervention Mapping to Develop Implementation Strategies. *Frontiers in Public Health.* 2019;7: 158. doi: 10.3389/fpubh.2019.00158

Fry-Bowers EK, Maliski S, Lewis MA, Macabasco-O'Connell A, DiMatteo R. The association of health literacy, social support, self-efficacy and interpersonal interactions with health care providers in low-income Latina mothers. *Journal of Pediatric Nursing*. 2014 Jul–Aug;29(4): 309–20. doi: 10.1016/j.pedn.2014.01.006

Fryer K, Delgado A, Foti T, Reid CN, Marshall J. Implementation of Obstetric Telehealth During COVID-19 and Beyond. *Maternal and Child Health Journal*. 2020 Sep;24(9): 1104–1110. doi: 10.1007/s10995-020-02967-7

Furman, Lydia M., and Catherine Dickinson. "Community Health Workers: Collaborating to Support Breastfeeding among High-Risk Inner-City Mothers." *Breastfeeding Medicine.*. 2013 Feb.;8(1): 73–78. https://doi.org/10.1089/bfm.2012.0027.

Galle A, Semaan A, Huysmans E*, et al*. A double-edged sword—telemedicine for maternal care during COVID-19: findings from a global mixed-methods study of healthcare providers. *BMJ Global Health* 2021;6: e004575.

Gennaro S, O'Connor C, McKay EA, Gibeau A, Aviles M, Hoying J, Melnyk BM. Perinatal Anxiety and Depression in Minority Women. *MCN: The American Journal of Maternal Child Nursing.* 2020 May/Jun;45(3): 138–144. doi: 10.1097/NMC.0000000000000611

Geronimus, Arline T., Margaret Hicken, Danya Keene, and John Bound. "'Weathering' and Age Patterns of Allostatic Load Scores Among Blacks and Whites in the United States." *American Journal of Public Health.* 2006 May;96(5): 826–833. https://doi.org/10.2105/AJPH.2004.060749.

Giltenane M, Sheridan A, Kroll T, Frazer K. Identification of quality indicators of public health nursing practice: "modified Delphi" approach. *Public Health Nursing.* 2022 Jan;39(1): 214–228. doi: 10.1111/phn.13000

Gjerdingen D, Froberg D, Fontaine P. The effects of social support on women's health during pregnancy, labor and delivery, and the postpartum period. *Family Medicine.* 1991; 23(5): 370.

Gjerdingen D, Crow S, McGovern P, Miner M, Center B. Postpartum depression screening at well-child visits: validity of a 2-question screen and the PHQ-9. *Annals of Family Medicine.* 2009 Jan–Feb;7(1): 63–70. doi: 10.1370/afm.933

Gleason S, Wilkin MK, Sallack L, Whaley SE, Martinez C, Paolicelli C. Breastfeeding Duration Is Associated With WIC Site-Level Breastfeeding Support Practices. *Journal of Nutrition Educaction and Behavior.* 2020 Jul;52(7): 680–687. doi: 10.1016/j.jneb.2020.01.014

Global expert panel 2017 Black, Robert E, Carl E Taylor, Shobha Arole, Abhay Bang, Zulfiqar A Bhutta, A Mushtaque R Chowdhury, Betty R Kirkwood, et al. "Comprehensive Review of the Evidence Regarding the Effectiveness of Community–Based Primary Health Care in Improving Maternal, Neonatal and Child Health: 8. Summary and Recommendations of the Expert Panel." *Journal of Global Health.* 2017 June;7(1): 010908. https://doi.org/10.7189/jogh.07.010908

Goldfeld S, Bryson H, Mensah F, Gold L, Orsini F, Perlen S, Price A, Hiscock H, Grobler A, Dakin P, Bruce T, Harris D, Kemp L. Nurse Home Visiting and Maternal Mental Health: 3-Year Follow-Up of a Randomized Trial. *Pediatrics.* 2021 Feb;147(2): e2020025361. doi: 10.1542/peds.2020-025361

Goldsmith, Rachel E., Christina Gamache Martin, and Carly Parnitzke Smith. "Systemic Trauma." *Journal of Trauma & Dissociation.* 2014 Mar. 15;15(2): 117–132. https://doi.org/10.1080/15299732.2014.871666.

Graner, Sophie, Ingrid Mogren, Le Q Duong, Gunilla Krantz, and Marie Klingberg-Allvin. "Maternal Health Care Professionals' Perspectives on the Provision and Use of Antenatal and Delivery Care: A Qualitative Descriptive Study in Rural Vietnam." *BMC Public Health.* 2010 Dec.;10(1): 608. https://doi.org/10.1186/1471-2458-10-608.

Grembowski D. *The Practice of Health Program Evaluation.* Second Edition. Sage Publications: 2015.

Guardino CM, Schetter CD. Coping during pregnancy: a systematic review and recommendations. *Health Psychology Review*. 2014;8(1): 70–94. Doi: 10.1080/17437199.2012.752659

Hadfield, Holly, and Anja Wittkowski. "Women's Experiences of Seeking and Receiving Psychological and Psychosocial Interventions for Postpartum Depression: A Systematic Review and Thematic Synthesis of the Qualitative Literature." *Journal of Midwifery & Women's Health*. 2017 Nov.;62(6): 723–736. https://doi.org/10.1111/jmwh.12669.

Happy Scribe Transcription services. Available from: https://www.happyscribe.com

Heaman, Maureen I, Wendy Sword, Lawrence Elliott, Michael Moffatt, Michael E Helewa, Heather Morris, Patricia Gregory, Lynda Tjaden, and Catherine Cook. "Barriers and Facilitators Related to Use of Prenatal Care by Inner-City Women: Perceptions of Health Care Providers." *BMC Pregnancy and Childbirth*, 2015 Dec.; 15(1): 2. https://doi.org/10.1186/s12884-015-0431-5.

Heenan MA, Randall GE, Evans JM. Selecting Performance Indicators and Targets in Health Care: An International Scoping Review and Standardized Process Framework. *Risk Management and Healthcare Policy.* 2022 Apr 21;15: 747–764. doi: 10.2147/RMHP.S357561

Hettinger K, Margerison C. Postpartum Medicaid Eligibility Expansions and Postpartum Health Measures. *Population Health Management.* 2023 Feb;26(1): 53–59. doi: 10.1089/pop.2022.0183

Hill I and Burroughs E. Maternal telehealth has expanded dramatically during the COVID-19 pandemic: equity concerns and promising approaches. Urban Institute. October 28 2020. Available from: https://www.urban.org/research/publication/maternal-telehealth-has-expanded-dramatically-during-covid-19-pandemic

Hodgkinson S, Godoy L, Beers LS, Lewin A. Improving Mental Health Access for Low-Income Children and Families in the Primary Care Setting. *Pediatrics.* 2017 Jan; 139(1): e20151175. doi: 10.1542/peds.2015-1175

Hodnett, Ellen D, and Suzanne Fredericks. "Support during Pregnancy for Women at Increased Risk of Low Birthweight Babies." *Cochrane Database of Systematic Reviews.* 2003 July; CD000198. https://doi.org/10.1002/14651858.CD000198

Hoffman, Kelly M., Sophie Trawalter, Jordan R. Axt, and M. Norman Oliver. “Racial Bias in Pain Assessment and Treatment Recommendations, and False Beliefs about Biological Differences between Blacks and Whites.” *Proceedings of the National Academy of Sciences of the United States of America.* 2016 Apr.:113(16): 4296–4301. https://doi.org/10.1073/pnas.1516047113.

Hollmann S, Regierer B, Bechis J, Tobin L, D'Elia D. Ten simple rules on how to develop a stakeholder engagement plan. *PLoS Computational Biology.* 2022 Oct 13;18(10): e1010520. doi: 10.1371/journal.pcbi.1010520

Howell EA, Mora P, Leventhal H. Correlates of early postpartum depressive symptoms. *Maternal and Child Health Journal.* 2006; 10(2): 149–157.

Howell, Elizabeth A., Natalia Egorova, Amy Balbierz, Jennifer Zeitlin, and Paul L. Hebert. “Black-White Differences in Severe Maternal Morbidity and Site of Care.” *American Journal of Obstetrics and Gynecology.* 2016 Jan.;214(1): 122.e1–122.e7. https://doi.org/10.1016/j.ajog.2015.08.019.

Howell, Elizabeth A., Norma A. Padrón, Susan J. Beane, Joanne Stone, Virginia Walther, Amy Balbierz, Rashi Kumar, and José A. Pagán. “Delivery and Payment Redesign to Reduce Disparities in High Risk Postpartum Care.” *Maternal and Child Health Journal.* 2017 Mar.;21(3): 432–438. https://doi.org/10.1007/s10995-016-2221-8

Howell, Elizabeth A., Haywood Brown, Jessica Brumley, Allison S. Bryant, Aaron B. Caughey, Andria M. Cornell, Jacqueline H. Grant, et al. “Reduction of Peripartum Racial and Ethnic Disparities: A Conceptual Framework and Maternal Safety Consensus Bundle.” *Journal of Obstetric, Gynecologic & Neonatal Nursing.* 2018 May;47(3): 275–289. https://doi.org/10.1016/j.jogn.2018.03.004.

Howell, Elizabeth A., Teresa Janevic, James Blum, Jennifer Zeitlin, Natalia N. Egorova, Amy Balbierz, and Paul L. Hebert. “Double Disadvantage in Delivery Hospital for Black and Hispanic Women and High-Risk Infants.” *Maternal and Child Health Journal.* 2020 June;24(6): 687–693. https://doi.org/10.1007/s10995-020-02911-9.

Howell, Elizabeth A., Amy Balbierz, Susan Beane, Rashi Kumar, Tom Wang, Kezhen Fei, Zainab Ahmed, and José A. Pagán. “Timely Postpartum Visits for Low-Income Women: A Health System and Medicaid Payer Partnership.” *American Journal of Public Health.* 2020 July;110(S2): S215–218. https://doi.org/10.2105/AJPH.2020.305689.

Hoy Rosas, Jamillah, RWJF Clinical Scholars Big Ideas Talk. Sept 2021. Available from: https://www.youtube.com/watch?v=scb7a8nncok

Huang RS, Spence AR, Abenhaim HA. Racial disparities in national maternal mortality trends in the United States from 2000 to 2019: a population-based study on 80 million

live births. *Archives of Gynecology and Obstetrics.* 2023 Mar 18. Online ahead of print. Doi: 10.1007/s00404-023-06999-6

Hudson KD, Matsuzaka S, Mehrotra G. Intersectional Antiracist Advocacy Practice in Health Care Organizations. *Health Promotion Practice.* 2023 May;24(3): 426-431. doi: 10.1177/15248399221131833

Hunt, Kelly J., and Deborah L. Conway. "Who Returns for Postpartum Glucose Screening Following Gestational Diabetes Mellitus?" *American Journal of Obstetrics and Gynecology.* 2008 Apr.;198(4): 404.e1–6. https://doi.org/10.1016/j.ajog.2007.09.015.

Irth birthing hospital review application https://irthapp.com/

Jack HE, Arabadjis SD, Sun L, Sullivan EE, Phillips RS. Impact of Community Health Workers on Use of Healthcare Services in the United States: A Systematic Review. Journal of General Internal Medicine. 2017 Mar;32(3): 325–344. doi: 10.1007/s11606-016-3922-9

Janevic, Teresa, Jennifer Zeitlin, Natalia Egorova, Paul L. Hebert, Amy Balbierz, and Elizabeth A. Howell. "Neighborhood Racial And Economic Polarization, Hospital Of Delivery, And Severe Maternal Morbidity: An Examination of Whether Racial and Economic Neighborhood Polarization Is Associated with Severe Maternal Morbidity Rates and Whether the Delivery Hospital Partially Explains the Association." *Health Affairs.* 2020 May 1;39(5): 768–776. https://doi.org/10.1377/hlthaff.2019.00735.

Janevic, Teresa, Naissa Piverger, Omara Afzal, and Elizabeth A. Howell. "Just Because You Have Ears Doesn't Mean You Can Hear'—Perception of Racial-Ethnic Discrimination During Childbirth." *Ethnicity & Disease.* 2020 Sept. 24;30(4): 533–42. https://doi.org/10.18865/ed.30.4.533

Janevic T, Maru S, Nowlin S, McCarthy K, Bergink V, Stone J, Dias J, Wu S, Howell EA. Pandemic Birthing: Childbirth Satisfaction, Perceived Health Care Bias, and Postpartum Health During the COVID-19 Pandemic. *Maternal and Child Health Journal.* 2021 Jun;25(6): 860–869. doi: 10.1007/s10995-021-03158-8

Janjua NB, Mohamed AF, Birmani SA, Donnelly O, Syed AH, Essajee M. COVID-19 Pandemic and Maternal Perspectives. *Irish Medicine Journal.* 2021 Aug 19;114(7): 411.

Jetty A, Jabbarpour Y, Pollack J, Huerto R, Woo S, Petterson S. Patient-Physician Racial Concordance Associated with Improved Healthcare Use and Lower Healthcare Expenditures in Minority Populations. *Journal of Racial and Ethnic Health Disparities.* 2022 Feb;9(1): 68–81. doi: 10.1007/s40615-020-00930-4. Erratum in: *Journal of Racial and Ethnic Health Disparities*. 2021 Feb 24.

Jiang L, Zhu Z. Maternal mental health and social support from online communities during pregnancy. *Health & Social Care in the Community*. 2022 Nov;30(6): e6332–e6344. doi: 10.1111/hsc.14075

Johnson, D., Saavedra, P., Sun, E. *et al.* Community Health Workers and Medicaid Managed Care in New Mexico. *Journal of Community Health.* 2012;37: 563–571. https://doi.org/10.1007/s10900-011-9484-1

Jou, Judy, Katy B. Kozhimannil, Jean M. Abraham, Lynn A. Blewett, and Patricia M. McGovern. "Paid Maternity Leave in the United States: Associations with Maternal and Infant Health." *Maternal and Child Health Journal.* 2018 Feb.;22(2): 216–225. https://doi.org/10.1007/s10995-017-2393-x

Kangovi S, Mitra N, Grande D, Huo H, Smith RA, Long JA. Community Health Worker Support for Disadvantaged Patients with Multiple Chronic Diseases: A Randomized Clinical Trial. *American Journal of Public Health*. 2017 Oct;107(10): 1660–1667. doi: 10.2105/AJPH.2017.303985

Kangovi S, Mitra N, Grande D, Long JA, Asch DA. Evidence-Based Community Health Worker Program Addresses Unmet Social Needs and Generates Positive Return On Investment. *Health Affairs.* 2020 Feb;39(2): 207–213. doi: 10.1377/hlthaff.2019.00981

Keating NE, Dempsey B, Corcoran S, McAuliffe FM, Lalor J, Higgins MF. Women's experience of pregnancy and birth during the COVID-19 pandemic: a qualitative study. *Irish Journal of Medical Science.* 2022 Oct;191(5): 2177–2184. doi: 10.1007/s11845-021-02862-2

Kemmerer, A, Zook M, Traylor, J. Maternity care innovations during COVID-19: Short-term solutions, long-term potential. To the Point (blog). Commonwealth Fund. May 6, 2021. https://www.commonwealthfund.org/blog/2021/maternity-care-innovations-during-covid-19-short-term-solutions-long-term-potential

Kenyon, Sara, Kate Jolly, Karla Hemming, Lucy Hope, Jackie Blissett, Sophie-Anna Dann, Richard Lilford, and Christine MacArthur. "Lay Support for Pregnant Women with Social Risk: A Randomised Controlled Trial." *BMJ Open.* 2016 Mar.;6(3): e009203. https://doi.org/10.1136/bmjopen-2015-009203

Knauss, M. The Way Forward: Partnering to Raise the Bar on Maternal Health. Alliance of Community Health Plans. Oct 7, 2021. Available from: https://achp.org/blog-the-way-forward-partnering-to-raise-the-bar-on-maternal-health/LaMorte, W. Boston University School of Public Health. Behavioral Change Models. 2022. Available from: https://sphweb.bumc.bu.edu/otlt/mph-modules/sb/behavioralchangetheories/BehavioralChangeTheories2.html

Koladycz, NPS, R, Fernandez G, Gray K, Marriott H. The Net Promoter Score (NPS) for insight into client experiences in sexual and reproductive health clinics. *Global Health, Science and Practice.* 2018;6(3): 413–424. https://doi.org/10.9745/GHSP-D-18-00068

Kolb L. An Effective Model of Diabetes Care and Education: The ADCES7 Self-Care Behaviors™. *The Science of Diabetes Self-Management and Care*. 2021;47(1): 30–53. doi:10.1177/0145721720978154

Kolk TA, Nath S, Howard LM, Pawlby S, Lockwood-Estrin G, Trevillion K. The association between maternal lifetime interpersonal trauma experience and perceived mother-infant bonding. *Journal of Affective Disorders.* 2021 Nov 1; 294:117–127. doi: 10.1016/j.jad.2021.06.069

Koyucu RG, Karaca PP. The Covid 19 outbreak: Maternal Mental Health and Associated Factors. *Midwifery.* 2021 Aug;99: 103013. doi: 10.1016/j.midw.2021.103013

Kroenke K, Spitzer RL, Williams JB. The Patient Health Questionnaire-2: validity of a two-item depression screener. *Medical Care.* 2003 Nov;41(11): 1284–1292. doi: 10.1097/01.MLR.0000093487.78664.3C

Krukowski RA, Jacobson LT, John J, Kinser P, Campbell K, Ledoux T, Gavin KL, Chiu CY, Wang J, Kruper A. Correlates of Early Prenatal Care Access among U.S. Women: Data from the Pregnancy Risk Assessment Monitoring System (PRAMS). *Maternal and Child Health Journal*. 2022 Feb;26(2): 328–341. doi: 10.1007/s10995-021-03232-1

Kwan BM, Hamer MK, Bailey A, Cebuhar K, Conry C, Smith PC. Implementation and Qualitative Evaluation of a Primary Care Redesign Model with Expanded Scope of Work for Medical Assistants. *Journal of General Internal Medicine*. 2022 Apr;37(5): 1129–1137. doi: 10.1007/s11606-021-07246-x

Laanterä, Sari, Tarja Pölkki, and Anna-Maija Pietilä. "A Descriptive Qualitative Review of the Barriers Relating to Breast-Feeding Counselling: Barriers in Breast-Feeding Counselling." *International Journal of Nursing Practice.* 2011 Feb.;17(1): 72–84. https://doi.org/10.1111/j.1440-172X.2010.01909.x

Lalor JG, Sheaf G, Mulligan A, Ohaja M, Clive A, Murphy-Tighe S, Ng ED, Shorey S. Parental experiences with changes in maternity care during the Covid-19 pandemic: A mixed-studies systematic review. *Women and Birth.* 2023 Mar;36(2): e203–e212. doi: 10.1016/j.wombi.2022.08.004

Lapham J, Martinson ML. The intersection of welfare stigma, state contexts and health among mothers receiving public assistance benefits. *SSM – Population Health*. 2022 May 9;18: 101117. doi: 10.1016/j.ssmph.2022.101117

Leiferman, Jenn A., Sarah E. Dauber, Kurt Heisler, and James F. Paulson. “Primary Care Physicians’ Beliefs and Practices toward Maternal Depression.” *Journal of Women’s Health.* 2008 Sept.;17(7): 1143–1150. https://doi.org/10.1089/jwh.2007.0543.

Lerner, S. The Real War on Families: Why the U.S. Needs Paid Leave Now. In These Times. August 18, 2015. Available from: https://inthesetimes.com/article/the-real-war-on-families

Levine, L. D., C. Nkonde-Price, M. Limaye, and S. K. Srinivas. “Factors Associated with Postpartum Follow-up and Persistent Hypertension among Women with Severe Preeclampsia.” *Journal of Perinatology.* 2016;36(12): 1079–1082. https://doi.org/10.1038/jp.2016.137

Lockart PR. Too many Black Women like Erica Garner are Dying in America’s Maternal Mortality Crisis. *Vox.* January 20, 2018. Available from: https://www.vox.com/identities/2018/1/10/16865750/black-women-maternal-mortality-erica-garner

Louis JM, Menard MK, Gee RE. Racial and Ethnic Disparities in Maternal Morbidity and Mortality. *Obstetrics and Gynecology.* 2015;125: 690–694. https://doi.org/10.1097/aog.0000000000000704

LoVerde, Bianca, Alison Falck, Pamela Donohue, and Brenda Hussey-Gardener. “Supports and Barriers to the Provision of Human Milk by Mothers of African American Preterm Infants:” *Advances in Neonatal Care.* 2018 June;18(3): 179–188. https://doi.org/10.1097/ANC.0000000000000477

Lutenbacher, Melanie, Tonya Elkins, Mary S. Dietrich, and Anais Riggs. “The Efficacy of Using Peer Mentors to Improve Maternal and Infant Health Outcomes in Hispanic Families: Findings from a Randomized Clinical Trial.” *Maternal and Child Health Journal.* 2018 Oct.;22(S1): 92–104. https://doi.org/10.1007/s10995-018-2532-z.

Lyall V, Wolfson L, Reid N, Poole N, Moritz KM, Egert S, Browne AJ, Askew DA. "The Problem Is that We Hear a Bit of Everything…": A Qualitative Systematic Review of Factors Associated with Alcohol Use, Reduction, and Abstinence in Pregnancy. *International Journal of Environmental Research and Public Health.* 2021 Mar 26;18(7):3445. doi: 10.3390/ijerph18073445

MacDorman, Marian F., Marie Thoma, Eugene Declercq, Elizabeth A. Howell, “Racial and Ethnic Disparities in Maternal Mortality in the United States Using Enhanced Vital Records, 2016–2017”, *American Journal of Public Health.* 2021 Sept 1;111(9): 1673–1681.

Malcarney MB, Pittman P, Quigley L, Horton K, Seiler N. The Changing Roles of Community Health Workers. *Health Services Research*. 2017 Feb;52(Suppl 1):360–382. doi: 10.1111/1475-6773.12657

Mannan, I., S. M. Rahman, A. Sania, H. R. Seraji, S. E. Arifeen, P. J. Winch, G. L. Darmstadt, A. Baqui, and Bangladesh Projahnmo Study Group. "Can Early Postpartum Home Visits by Trained Community Health Workers Improve Breastfeeding of Newborns?" *Journal of Perinatology*. 2008 Sept.; 8(9): 632–640. https://doi.org/10.1038/jp.2008.64

Martin, Nina. Black Mothers Keep Dying After Giving Birth. Shalon Irving's Story Explains Why. *NPR.* December 7, 2017. Available from: https://www.npr.org/2017/12/07/568948782/black-mothers-keep-dying-after-giving-birth-shalon-irvings-story-explains-why

Maternal Mortality in the United States: A Primer. Commonwealth Fund. Issue Brief and Report. December 16, 2020. Available from: https://www.commonwealthfund.org/publications/issue-brief-report/2020/dec/maternal-mortality-united-states-primer

Mathieu, Irène P., Yanna Song, and Shubhada M. Jagasia. "Disparities in Postpartum Follow-Up in Women With Gestational Diabetes Mellitus: Table 1." *Clinical Diabetes.* 2014 Oct.;32(4): 178–182. https://doi.org/10.2337/diaclin.32.4.178

Matsuo K, Green JM, Herrman SA, Mandelbaum RS, Ouzounian JG. Severe Maternal Morbidity and Mortality of Pregnant Patients With COVID-19 Infection During the Early Pandemic Period in the US. *JAMA Network Open.* 2023;6(4): e237149. doi:10.1001/jamanetworkopen.2023.7149

Matthews K, Morgan I, Davis K, Estriplet T, Perez S, Crear-Perry JA. Pathways To Equitable And Antiracist Maternal Mental Health Care: Insights From Black Women Stakeholders. *Health Affairs.* 2021 Oct;40(10): 1597–1604. doi: 10.1377/hlthaff.2021.00808. PMID: 34606342.

Maxwell, December, Sarah R. Robinson, and Kelli Rogers. "'I Keep It to Myself': A Qualitative Meta-interpretive Synthesis of Experiences of Postpartum Depression among Marginalised Women." *Health & Social Care in the Community.* 2019 May; 27(3): e23–36. https://doi.org/10.1111/hsc.12645.

Mayor Adams Signs Legislation Providing Doula Services Across Five Boroughs, Strengthen Maternal Health. NYC Health and Hospitals. September 7 2022. Available from: https://www.nychealthandhospitals.org/pressrelease/mayor-adams-signs-legislation-providing-doula-services-across-five-boroughs-strengthen-maternal-health/

Mayor Adams Takes Action to Reduce Maternal and Infant Health Inequities by Expanding Access to Doulas and Midwives March 23 2022. Available from: https://www.nyc.gov/office-of-the-mayor/news/149-22/mayor-adams-takes-action-reduce-maternal-infant-health-inequities-expanding-access-to#/0

Mazul, Mary C., Trina C. Salm Ward, and Emmanuel M. Ngui. "Anatomy of Good Prenatal Care: Perspectives of Low Income African-American Women on Barriers and Facilitators to Prenatal Care." *Journal of Racial and Ethnic Health Disparities*. 2017 May;4(1): 79–86. https://doi.org/10.1007/s40615-015-0204-x.

McCloskey, Lois, Judith Bernstein, Michael Winter, Ronald Iverson, and Aviva Lee-Parritz. "Follow-Up of Gestational Diabetes Mellitus in an Urban Safety Net Hospital: Missed Opportunities to Launch Preventive Care for Women." *Journal of Women's Health*. 2014 Apr.;23(4): 327–334. https://doi.org/10.1089/jwh.2013.4628.

McCloskey, Lois, Marlena L. Sherman, Meryl St John, Hannah Siegel, Julie Whyte, Ronald Iverson, Aviva Lee-Parritz, and Judith Bernstein. "Navigating a 'Perfect Storm' on the Path to Prevention of Type 2 Diabetes Mellitus After Gestational Diabetes: Lessons from Patient and Provider Narratives." *Maternal and Child Health Journal*. 2019 May;23(5): 603–612. https://doi.org/10.1007/s10995-018-2649-0.

McCool-Myers, M., Grasso, D., Kozlowski, D. *et al.* The COVID-19 pandemic's intersectional impact on work life, home life and wellbeing: an exploratory mixed-methods analysis of Georgia women's experiences during the pandemic. *BMC Public Health.* 2022 Oct. 31;22(1): 1988. https://doi.org/10.1186/s12889-022-14285-4

McLaughlin, John A., Gretchen B. Jordan. Logic models: a tool for telling your programs performance story. *Evaluation and Program Planning*. 1999;22(1): 65–72. https://doi.org/10.1016/S0149-7189(98)00042-1

Meades, R., Ayers, S. Anxiety measures validated in perinatal populations: A systematic review. *Journal of Affective Disorders*. 2011;133(1–2): 1–15. https://doi.org/10.1016/j.jad.2010.10.009.

Medley N and Strope A. Missouri Department of Health and Senior Services, Bureau of WIC and Nutrition Services. Participant Satisfaction Survey: Summary Report. 2021–2022. Available from: https://health.mo.gov/living/families/wic/pdf/customer-satisfaction-survey-report.pdf

Mehra, Renee, Lisa M. Boyd, Jessica B. Lewis, and Shayna D. Cunningham. "Considerations for Building Sustainable Community Health Worker Programs to Improve Maternal Health." *Journal of Primary Care & Community Health*. 2020 Jan.;11: 215013272095367. https://doi.org/10.1177/2150132720953673.

Metallinos-Katsaras E, Brown L, Colchamiro R. Maternal WIC participation improves breastfeeding rates: a statewide analysis of WIC participants. *Maternal and Child Health Journal*. 2015 Jan;19(1): 136–43. doi: 10.1007/s10995-014-1504-1

Miake-Lye IM, Delevan DM, Ganz DA, Mittman BS, Finley EP. Unpacking organizational readiness for change: an updated systematic review and content analysis of assessments. *BMC Health Services Research*. 2020 Feb 11;20(1):106. doi: 10.1186/s12913-020-4926-z

Microsoft Excel 2023. Available from: https://www.microsoft.com/en-us/microsoft-365/excel?ms.officeurl=excel&rtc=1

Microsoft Word Software. Available from: https://www.microsoft.com/en-us/microsoft-365/word?ms.officeurl=word&rtc=1&activetab=tabs%3afaqheaderregion3

Miech EJ, Rattray NA, Flanagan ME, Damschroder L, Schmid AA, Damush TM. Inside help: An integrative review of champions in healthcare-related implementation. *SAGE Open Medicine.* 2018 May 17;6: 2050312118773261. doi: 10.1177/2050312118773261

Miro Visual Collaboration Platform. Available from: https://miro.com/app/dashboard/

Morrissey, T.W. Child care and parent labor force participation: a review of the research literature. *Review of Economics of the Household.* 2017;15: 1–24. https://doi.org/10.1007/s11150-016-9331-3

Mortality in the United States: A Primer. Commonwealth Fund. Issue Brief and Report. December 16, 2020. Available from: https://www.commonwealthfund.org/publications/issue-brief-report/2020/dec/maternal-mortality-united-states-primer

Morton J, Vignato J, Anbari AB. Stigma Experienced by Perinatal Women with Opioid Dependency in the United States: A Qualitative Meta-Synthesis. *Western Journal of Nursing Research.* 2023 Jun 29: 1939459231182495. doi: 10.1177/01939459231182495

Moseson H, Mahanaimy M, Dehlendorf C, Gerdts C. "…Society is, at the end of the day, still going to stigmatize you no matter which way": A qualitative study of the impact of stigma on social support during unintended pregnancy in early adulthood. *PLoS One*. 2019 May 23;14(5): e0217308. doi: 10.1371/journal.pone.0217308

Mugo, Ngatho S., Michael J. Dibley, Eliaba Yona Damundu, and Ashraful Alam. "Correction to: Barriers Faced by the Health Workers to Deliver Maternal Care Services and Their Perceptions of the Factors Preventing Their Clients from Receiving the Services: A Qualitative Study in South Sudan." *Maternal and Child*

Health Journal. 2018 Dec.;2(12): 1834–1834. https://doi.org/10.1007/s10995-018-2574-2.

Mundorf, Christopher, Arti Shankar, Tracy Moran, Sherry Heller, Anna Hassan, Emily Harville, and Maureen Lichtveld. "Reducing the Risk of Postpartum Depression in a Low-Income Community Through a Community Health Worker Intervention." *Maternal and Child Health Journal*. 2018 Apr.;22(4): 520–528. https://doi.org/10.1007/s10995-017-2419-4.

Munger AL, Hofferth SL, Grutzmacher SK. The Role of the Supplemental Nutrition Assistance Program in the Relationship between Food Insecurity and Probability of Maternal Depression. *Journal of Hunger & Environmental Nutrition*. 2016;11(2): 147–161. doi: 10.1080/19320248.2015.1045672

Nagpal TS, Liu RH, Myre M, Gaudet L, Cook J, da Silva DF, Adamo KB. Weight stigma and prenatal physical activity: Exploring the perspectives of pregnant women living with obesity. *Midwifery*. 2022 Jan;104: 103186. doi: 10.1016/j.midw.2021.103186

National Birth Equity Collaborative. https://birthequity.org/who-we-are/

National Black Birth Joyline Launches. Business Fortnight. Feb 10 2023. Available from: https://businessfortnight.com/national-black-birth-joyline-launches/

National Board for Health and Wellness Coaching (NBHWC). What is a Board-Certified Health Coach? NBHWC website. Available from: https://nbhwc.org/what-is-a-health-coach/

National Center for Chronic Disease Prevention and Disease Promotion. Community Health Worker Resources. Last reviewed February 28, 2023. Available from: https://www.cdc.gov/chronicdisease/center/community-health-worker-resources.html

National Committee for Quality Assurance (NCQA) HEDIS Measures and Technical Resources. Available from: https://www.ncqa.org/hedis/measures/

National Institute for Occupational Safety and Health (NIOSH). Physical Job Demands – Reproductive Health. Last reviewed May 1, 2023. Available from: https://www.cdc.gov/niosh/topics/repro/physicaldemands.html

National Partnership for Women and Families. Listening to Mothers in California 2018 survey. Available from: https://www.chcf.org/wp-content/uploads/2018/09/ListeningMothersQuestionnaire2018.pdf

NCQA and Penn Medicine. Critical Inputs for Successful Community Health Worker Programs. White Paper. November 2021. Available from: https://www.ncqa.org/wp-

content/uploads/2021/11/Critical-Inputs-for-Successful-CHW-Programs-White-Paper-November2021.pdf

Ndwiga, Charity, Charlotte Warren, Timothy Abuya, Lucy Kanya, Alice Maranga, Christine Ochieng, Mary Wanjala, Beatrice Chelang'at, Anne Njeru, Annie Gituto, George Odhiambo, Faith Mbehero, Lucia and Jeremiah Maina. 2014. Respectful Maternity Care Resource Package; Community Facilitator's Guide, New York, Population Council.

Negron, Rennie, Anika Martin, Meital Almog, Amy Balbierz, and Elizabeth A. Howell. "Social Support During the Postpartum Period: Mothers' Views on Needs, Expectations, and Mobilization of Support." *Maternal and Child Health Journal.* 2013 May*;*17(4): 616–623. https://doi.org/10.1007/s10995-012-1037-4

New York City Department of Health and Mental Hygiene Bureau of Maternal and Child Health. Pregnancy-Associated Mortality NYC, 2011–2015. New York, NY. Available from: https://www1.nyc.gov/assets/doh/downloads/pdf/ms/pregnancy-associated-mortality-report-2011-2015.pdf

New York City Department of Health and Mental Hygiene. Pregnancy-Associated Mortality in York City: 2017. January 2021. Available from: https://www.nyc.gov/assets/doh/downloads/pdf/data/maternal-mortality-annual-report-2020.pdf

New York City Department of Health and Mental Hygiene. Pregnancy-Associated Mortality in York City: 2018. January 2022. Available from: https://www.nyc.gov/assets/doh/downloads/pdf/data/maternal-mortality-annual-report-2021.pdf

New York City Department of Health and Mental Hygiene. Pregnancy-Associated Mortality in New York City: 2019. January 2023. Available from: https://www.nyc.gov/assets/doh/downloads/pdf/data/maternal-mortality-annual-report-2022.pdf

New York City Department of Health and Mental Hygiene. Women's Experiences with Severe Maternal Morbidity in New York City: a Qualitative Report. December 2020. Available from: https://www1.nyc.gov/assets/doh/downloads/pdf/csi/womens-experience-with-severe-maternal-morbidity-nyc-qualitative-report.pdf

New York City Department of Health and Mental Hygiene (2016). Severe Maternal Morbidity in New York City, 2008–2012. New York, NY. Available from: https://www.nyc.gov/assets/doh/downloads/pdf/data/maternal-morbidity-report-08-12.pdf

New York City Department of Health and Mental Hygiene (2018). Severe Maternal Morbidity in New York City data 2013–2014. Available from: https://www.nyc.gov/assets/doh/downloads/pdf/data/severe-maternal-morbidity-data.pdf

New York City Department of Health and Mental Hygiene (2021). Maternal Mortality and Severe Maternal Morbidity in New York City, 2017. Available from: https://www.nyc.gov/assets/doh/downloads/pdf/data/maternal-mortality-annual-report-2020.pdf

New York State Department of Health Office of Quality and Patient Safety. Medicaid Perinatal Study. March 2013.

New York State Maternal and Infant Community Health Collaboratives (MICHC) Initiative. Revised January 2023. Available from: https://www.health.ny.gov/community/adults/women/maternal_and_infant_comm_health_collaboratives.htm

New York State Pregnancy Risk Assessment Monitoring database. Available from: https://apps.health.ny.gov/public/tabvis/PHIG_Public/prams/reports/#annual

New York State Taskforce on Maternal Mortality and Disparate Racial Outcomes. Recommendations to the Governor to Reduce Maternal Mortality and Racial Disparities. March 2019. Available from: https://www.governor.ny.gov/sites/governor.ny.gov/files/atoms/files/maternal_mortality_Mar12.pdf

New York State Task Force on Maternal Mortality and Disparate Outcomes. Panel on Postpartum Care: Report. January 2021. Available from: https://www.health.ny.gov/community/adults/women/task_force_maternal_mortality/docs/2021-01_expert_panel_on_postpartum_care_final_report.pdf

Nicoloro-Santa Barbara, Jennifer, Lisa Rosenthal, Melissa V. Auerbach, Christina Kocis, Cheyanne Busso, Marci Lobel. Patient-provider communication, maternal anxiety, and self-care in pregnancy. *Social Science & Medicine.* 2017;190: 133-140. https://doi.org/10.1016/j.socscimed.2017.08.011.

Northern Manhattan Perinatal Partnership website. Available from: https://nmppcares.org/node/5

Noursi S, Saluja B, Richey L. Using the Ecological Systems Theory to Understand Black/White Disparities in Maternal Morbidity and Mortality in the United States. *Journal of Racial and Ethnic Health Disparities*. 2021 Jun;8(3):661–669. doi: 10.1007/s40615-020-00825-4

Nurse-Family Partnership: New York State profile. 2022. Available from: https://www.nursefamilypartnership.org/wp-content/uploads/2017/07/NY_2022-State-Profile.pdf

Nurse-Family Partnership. Research Trials and Outcomes. 2022. Available from: https://www.nursefamilypartnership.org/wp-content/uploads/2022/03/NFP-Research-Trials-and-Outcomes.pdf

NVivo Release 1 Qualitative Data Analysis Software. Available from: https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home

NYC.gov. My Plate Planner. Available from: https://www.nyc.gov/assets/doh/downloads/pdf/csi/obesity-plate-planner-13.pdf

NYC Health. New York City Standards for Respectful Care at Birth. Available from: https://www1.nyc.gov/assets/doh/downloads/pdf/ms/respectful-care-birth-brochure.pdf

O'Donnell E. Seven Steps for Conducting a Successful Needs Assessment. Available from: https://nichq.org/insight/seven-steps-conducting-successful-needs-assessment

Oguz T. Is Patient-Provider Racial Concordance Associated with Hispanics' Satisfaction with Health Care? *International Journal of Environmental Research and Public Health.* 2018 Dec 24;16(1):31. doi: 10.3390/ijerph16010031

O'Hara MW, Rehm LP, Campbell SB. Postpartum depression: A role for social network and life stress variables. *Journal of Nervous and Mental Disease*. 1983; 171(6):336–341. https://journals.lww.com/jonmd/toc/1983/06000

Pan Z, Veazie P, Sandler M, Dozier A, Molongo M, Pulcino T, Parisi W, Eisenberg KW. Perinatal Health Outcomes Following a Community Health Worker-Supported Home-Visiting Program in Rochester, New York, 2015–2018. *American Journal of Public Health.* 2020 Jul;110(7):1031–1033. doi: 10.2105/AJPH.2020.305655

Park, SH., Kim, JI. Predictive validity of the Edinburgh postnatal depression scale and other tools for screening depression in pregnant and postpartum women: a systematic review and meta-analysis. *Archives of Gynecology and Obstetrics.* 2023;307: 1331–1345. https://doi.org/10.1007/s00404-022-06525-0

Peahl AF, Smith RD, Moniz MH. Prenatal care redesign: creating flexible maternity care models through virtual care. *American Journal of Obstetrics and Gynecology.* 2020 Sep;223(3): 389.e1–389.e10. doi: 10.1016/j.ajog.2020.05.029

Peahl, Alex Friedman; Zahn, Christopher M.; Turrentine, Mark; Barfield, Wanda; Blackwell, Sean D.; Roberts, Suni Jo; Powell, Allison R.; Chopra, Vineet; Bernstein,

Steven J.. The Michigan Plan for Appropriate Tailored Healthcare in Pregnancy Prenatal Care Recommendations. *Obstetrics & Gynecology.* 2021 Oct.;138(4): 593–602. DOI: 10.1097/AOG.0000000000004531 https://journals.lww.com/greenjournal/Citation/2021/10000/The_Michigan_Plan_for_Appropriate_Tailored.12.aspx

Penner, L. A., Phelan, S. M., Earnshaw, V., Albrecht, T. L., & Dovidio, J. F. (2017). Patient stigma, medical interactions, and health care disparities: A selective review. In *The Oxford Handbook of Stigma, Discrimination, and Health* (pp. 183–201). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780190243470.001.0001

Peralta, A. Shared Decision Making Tools for Maternal Health. Partner to Decide. Available from: https://www.partnertodecide.org/team

Perdok H, Verhoeven CJ, van Dillen J, Schuitmaker TJ, Hoogendoorn K, Colli J, Schellevis FG, de Jonge A. Continuity of care is an important and distinct aspect of childbirth experience: findings of a survey evaluating experienced continuity of care, experienced quality of care and women's perception of labor. *BMC Pregnancy and Childbirth.* 2018 Jan 8;18(1):13. doi: 10.1186/s12884-017-1615-y

Perry-Jenkins M, Smith JZ, Wadsworth LP, Halpern HP. Workplace Policies and Mental Health among Working-Class, New Parents. *Community, Work & Family.* 2017; 20(2): 226–249. https://doi.org/10.1080/13668803.2016.1252721

Philis-Tsimikas, Athena, Addie L. Fortmann, Sapna Dharkar-Surber, Johanna A. Euyoque, Monica Ruiz, James Schultz, and Linda C. Gallo. “Dulce Mothers: An Intervention to Reduce Diabetes and Cardiovascular Risk in Latinas after Gestational Diabetes.” *Translational Behavioral Medicine.* 2014 Mar.;4(1): 18–25. https://doi.org/10.1007/s13142-014-0253-4

Phillippi JC. Women's perceptions of access to prenatal care in the United States: a literature review. *Journal of Midwifery & Women’s Health.* 2009 May–Jun;54(3): 219–225. doi: 10.1016/j.jmwh.2009.01.002

Polk S, Edwardson J, Lawson S, Valenzuela D, Hobbins E, Prichett L, Bennett WL. Bridging the Postpartum Gap: A Randomized Controlled Trial to Improve Postpartum Visit Attendance Among Low-Income Women with Limited English Proficiency. *Women’s Health Reports*. 2021 Sep 9;2(1): 381–388. doi: 10.1089/whr.2020.0123

Pongones S, Mullins A, Tucker GG. Put Your Clinical Data to Work with a Registry. *Family Practice Management.* 2021;28(6): 21–24. Available from: https://www.aafp.org/pubs/fpm/issues/2021/1100/p21.html

Popo, Emma, Sara Kenyon, Sophie-Anna Dann, Christine MacArthur, and Jacqueline Blissett. “Effects of Lay Support for Pregnant Women with Social Risk Factors on Infant Development and Maternal Psychological Health at 12 Months Postpartum.” Edited by Jacobus P. van Wouwe. *PLoS ONE.* 2017 Aug. 28;12(8): e0182544. https://doi.org/10.1371/journal.pone.0182544.

Population Health Approach is Pivotal in Lowering Maternal Mortality in U.S. Northwell Health. October 2022. Available from: https://www.northwell.edu/news/insights/population-health-approach-lowering-maternal-mortality-rate

Powers BW, Modarai F, Palakodeti S, Sharma M, Mehta N, Jain SH, Garg V. Impact of complex care management on spending and utilization for high-need, high-cost Medicaid patients. *American Journal of Managed Care*. 2020 Feb 1;26(2): e57–e63. doi: 10.37765/ajmc.2020.42402. Erratum in: *American Journal of Managed Care*. 2020 Mar;26(3):132.

Pregnancy Risk Assessment Monitoring Survey. Phase 8 (2016–Present) questionnaire. Available from: https://www.cdc.gov/prams/questionnaire.htm

Prevatt, Betty-Shannon, and Sarah L. Desmarais. “Facilitators and Barriers to Disclosure of Postpartum Mood Disorder Symptoms to a Healthcare Provider.” *Maternal and Child Health Journal.* 2018 Jan.:22(1): 120–129. https://doi.org/10.1007/s10995-017-2361-5.

Ramadurg, Umesh, Marianne Vidler, Umesh Charanthimath, Geetanjali Katageri, Mrutyunjaya Bellad, Ashalata Mallapur, Shivaprasad Goudar, et al. “Community Health Worker Knowledge and Management of Pre-Eclampsia in Rural Karnataka State, India.” *Reproductive Health.* 2016 Sept. 30;13(Suppl 2): 113. https://doi.org/10.1186/s12978-016-0219-8.

Ramey-Collier K, Jackson M, Malloy A, McMillan C, Scraders-Pyatt A, Wheeler SM. Doula Care: A Review of Outcomes and Impact on Birth Experience. *Obstetrical and Gynecological Survey.* 2023 Feb;78(2): 124–127. doi: 10.1097/OGX.0000000000001103

Razurel C, Kaiser B, Sellenet C, Epiney M. Relation between perceived stress, social support, and coping strategies and maternal well-being: a review of the literature. *Women & Health.* 2013;53(1):74–99. doi: 10.1080/03630242.2012.732681

Reece J. More Than Shelter: Housing for Urban Maternal and Infant Health. *International Journal of Environmental Research and Public Health*. 2021 Mar 24; 18(7): 3331. doi: 10.3390/ijerph18073331

Reid CN, Fryer K, Cabral N, Marshall J. Health care system barriers and facilitators to early prenatal care among diverse women in Florida. *Birth*. 2021 Sep;48(3): 416–427. doi: 10.1111/birt.12551

Rep Liz Cheney. HR 4040. Advancing Telehealth Beyond COVID-19 Act of 2021. Approved by House 7/2022. https://www.congress.gov/bill/117th-congress/house-bill/4040

REV Transcription Services. Available from: https://www.rev.com/

Ricks TN, Abbyad C, Polinard E. Undoing Racism and Mitigating Bias Among Healthcare Professionals: Lessons Learned During a Systematic Review. *Journal of Racial and Ethnic Health Disparities*. 2022 Oct;9(5): 1990–2000. doi: 10.1007/s40615-021-01137-x

Riegel B, et al. and on behalf of the American Heart Association. Self-Care for the Prevention and Management of Cardiovascular Disease and Stroke. *Journal of the American Heart Association*. 2017;6:e006997

Roberts A, Rogers J, Mason R, Siriwardena AN, Hogue T, Whitley GA, Law GR. Alcohol and other substance use during the COVID-19 pandemic: A systematic review. *Drug and Alcohol Dependence*. 2021 Dec 1;229(Pt A): 109150. doi: 10.1016/j.drugalcdep.2021.109150

Robinson, Karen, Alissa Fial, and Lisa Hanson. "Racism, Bias, and Discrimination as Modifiable Barriers to Breastfeeding for African American Women: A Scoping Review of the Literature." *Journal of Midwifery & Women's Health*. 2019 Nov.; 64(6): 734–742. https://doi.org/10.1111/jmwh.13058.

Rodin D, Silow-Carroll S, Cross-Barnet C, Courtot B, Hill I. Strategies to Promote Postpartum Visit Attendance Among Medicaid Participants. *Journal of Women's Health*. 2019 Sep;28(9): 1246–1253. doi: 10.1089/jwh.2018.7568

Roman, Lee Anne, Joseph C. Gardiner, Judith K. Lindsay, Joseph S. Moore, Zhehui Luo, Lawrence J. Baer, John H. Goddeeris, et al. "Alleviating Perinatal Depressive Symptoms and Stress: A Nurse-Community Health Worker Randomized Trial." *Archives of Women's Mental Health*. 2009 Dec.;12(6): 379–391. https://doi.org/10.1007/s00737-009-0083-4.

Roman, Lee Anne, Jennifer E. Raffo, and Cristian I. Meghea. "Maternal Perceptions of Help from Home Visits by Nurse–Community Health Worker Teams." *American Journal of Public Health*. 2012 Apr.;102(4): 643–645. https://doi.org/10.2105/AJPH.2011.300455.

S.1606 Black Maternal Health Momnibus Act. May 15, 2023. Available from: https://www.congress.gov/bill/118th-congress/senate-bill/1606

Salam, Maya. For Serena Williams, Childbirth was a Harrowing Ordeal. She's not Alone. *New York Times*. January 11, 2018. Available from:https://www.nytimes.com/2018/01/11/sports/tennis/serena-williams-baby-vogue.html

Saldaña J. *The Coding Manual for Qualitative Researchers.* Sage Publications, 2016.

Salganicoff A. The Importance of Strengthening Workplace and Health Policies to Support Breastfeeding. *Breastfeeding Medicine.* 2018 Oct.;13(8): 532–534. Doi: 10.1089/bfm.2018.0122

Salihu HM, Myers J, August EM. Pregnancy in the workplace. *Occupational Medicine.* 2012 Mar;62(2): 88–97. doi: 10.1093/occmed/kqr198

Saluja, Bani, and Zenobia Bryant. "How Implicit Bias Contributes to Racial Disparities in Maternal Morbidity and Mortality in the United States." *Journal of Women's Health.* 2021 Feb. 1;30(2): 270–273. https://doi.org/10.1089/jwh.2020.8874

Santos, W.J., Graham, I.D., Lalonde, M. *et al.* The effectiveness of champions in implementing innovations in health care: a systematic review. *Implementation Science Communications.* 2022;3: 80. https://doi.org/10.1186/s43058-022-00315-0

Sarto GE, Brasileiro J, Franklin DJ. Women's Health: Racial and Ethnic Health Inequities. *Global Advances in Health and Medicine: Improving Healthcare Outcomes Worldwide.* 2013;2(5): 50–53. https://doi.org/10.7453/gahmj.2013.052

Sassen, B. (2023). Intervention Mapping Step 2: Defining Performance and Change Objectives. In: *Nursing: Health Education and Improving Patient Self-Management.* Springer, Cham. https://doi.org/10.1007/978-3-031-11255-3_13

Schleiff, M.J., Aitken, I., Alam, M.A. *et al.* Community health workers at the dawn of a new era: 6. Recruitment, training, and continuing education. *Health Research Policy and Systems.* 2021;19(Suppl 3): 113. https://doi.org/10.1186/s12961-021-00757-3

Schoenthaler A, Ravenell J. Understanding the Patient Experience Through the Lenses of Racial/Ethnic and Gender Patient-Physician Concordance. *JAMA Network Open.* 2020;3(11): e2025349. doi:10.1001/jamanetworkopen.2020.25349

Schmitt, N., Mattern, E., Cignacco, E. *et al.* Effects of the Covid-19 pandemic on maternity staff in 2020 – a scoping review. *BMC Health Services Research.* 2021;21: 1364. https://doi.org/10.1186/s12913-021-07377-1

Sears Allers, Kimberly. Birthright podcast. Available from: https://birthrightpodcast.com

Seals Allers K. Presentation at GA Black Maternal Mental Health Summit, Feb 26 2022. Available from: https://www.youtube.com/watch?list=PLf_X7PF8KC0fEEU0wTWgNl3ffbecBPKBV&v=y0zrKA2JKk0&feature=youtu.be

Seefat-van Teeffelen A, Nieuwenhuijze M, Korstjens I. Women want proactive psychosocial support from midwives during transition to motherhood: a qualitative study. *Midwifery.* 2011 Feb;27(1): e122–127. doi: 10.1016/j.midw.2009.09.006

Seidman, Irving. *Interviewing As Qualitative Research: A Guide for Researchers in Education and the Social Sciences*. 4th ed. New York, Teachers College Press, 2013.

Shaw EK, Howard J, West DR, Crabtree BF, Nease DE Jr, Tutt B, Nutting PA. The role of the champion in primary care change efforts: from the State Networks of Colorado Ambulatory Practices and Partners (SNOCAP). *Journal of the American Board of Family Medicine.* 2012 Sep–Oct;25(5): 676–685. doi: 10.3122/jabfm.2012.05.110281

Sheppard, Vanessa B, Ruth E Zambrana, Ann S O'Malley, Providing health care to low-income women: a matter of trust, *Family Practice*. 2004 Oct.;21(5): 484–491. https://doi.org/10.1093/fampra/cmh503

Shorey S, Chee CYI, Ng ED, Lau Y, Dennis CL, Chan YH. Evaluation of a Technology-Based Peer-Support Intervention Program for Preventing Postnatal Depression (Part 1): Randomized Controlled Trial. *Journal of Medical Internet Research.* 2019 Aug 29;21(8): e12410. doi: 10.2196/12410

Shreffler J, Petrey J, Huecker M. The Impact of COVID-19 on Healthcare Worker Wellness: A Scoping Review. *Western Journal of Emergency Medicine.* 2020 Aug 17;21(5):1059–1066. doi: 10.5811/westjem.2020.7.48684

Shuman, C.J., Peahl, A.F., Pareddy, N. *et al.* Postpartum depression and associated risk factors during the COVID-19 pandemic. *BMC Research Notes.* 2022;15: 102. https://doi.org/10.1186/s13104-022-05991-8

Shumway, E. Beyond the FMLA: Will a Federal Paid Leave Law Ever Come to Pass? HR Drive. March 6, 2023. Available from: https://www.hrdive.com/news/beyond-fmla-will-federal-paid-leave-law-ever-come-to-pass/644239/#:~:text=While%20the%20Build%20Back%20Better,paid%20family%20and%20medical%20leave%3F

Silverio, S.A., Davies, S.M., Christiansen, P. *et al.* A validation of the Postpartum Specific Anxiety Scale 12-item research short-form for use during global crises with

five translations. *BMC Pregnancy and Childbirth*. 2021; 21: 112. https://doi.org/10.1186/s12884-021-03597-9

Slaughter-Acey, Jaime C., Devon Sneed, Lauren Parker, Verna M. Keith, Nora L. Lee, and Dawn P. Misra. "Skin Tone Matters: Racial Microaggressions and Delayed Prenatal Care." *American Journal of Preventive Medicine*. 2019 Sept.;57(3): 321–329. https://doi.org/10.1016/j.amepre.2019.04.014.

Slomski, Anita. "Why Do Hundreds of US Women Die Annually in Childbirth?" *JAMA: The Journal of the American Medical Association.* 2019 Apr. 2;321(13): 1239. https://doi.org/10.1001/jama.2019.0714.

Smith MV, Gotman N, Lin H, Yonkers KA. Do the PHQ-8 and the PHQ-2 accurately screen for depressive disorders in a sample of pregnant women? *General Hospital Psychiatry.* 2010 Sep–Oct;32(5): 544–548. doi: 10.1016/j.genhosppsych.2010.04.011

Snipe Margo. Haunted by Trauma: the Black Parents Who Almost Died in Childbirth. *Capital B News.* March 9 2023. Available from: https://capitalbnews.org/dangerous-deliveries-birth-trauma/

Snyder K, Worlton G. Social Support During COVID-19: Perspectives of Breastfeeding Mothers. Breastfeeding Medicine. 2021 Jan;16(1): 39–45. doi: 10.1089/bfm.2020.0200

Sperlich M, Seng JS, Li Y, Taylor J, Bradbury-Jones C. Integrating Trauma-Informed Care Into Maternity Care Practice: Conceptual and Practical Issues. *Journal of Midwifery and Women's Health*. 2017 Nov;62(6):661–672. doi: 10.1111/jmwh.12674

Srajer A, Johnson JA, Yusuf K. Preeclampsia and postpartum mental health: mechanisms and clinical implications. *Journal of Maternal-fetal & Neonatal Medicine*. 2022 Dec;35(25): 8443–8449. doi: 10.1080/14767058.2021.1978067

Staples LG, Dear BF, Gandy M, Fogliati V, Fogliati R, Karin E, Nielssen O, Titov N. Psychometric properties and clinical utility of brief measures of depression, anxiety, and general distress: The PHQ-2, GAD-2, and K-6. *General Hospital Psychiatry.* 2019 Jan–Feb;56: 13–18. doi: 10.1016/j.genhosppsych.2018.11.003

Steenland MW, Wherry LR. Medicaid Expansion Led To Reductions In Postpartum Hospitalizations. *Health Affairs*. 2023 Jan;42(1): 18–25. doi: 10.1377/hlthaff.2022.00819

Su Y, D'Arcy C. Interpersonal Violence Around Pregnancy Experienced by Rural and Urban Canadian Women: Correlates and Selected Health Outcomes. *Journal of Interpersonal Violence*. 2022 Oct;37(19–20):NP19042–NP19065. doi: 10.1177/08862605211043576

Suglia SF, Duarte CS, Sandel MT. Housing quality, housing instability, and maternal mental health. *Journal of Urban Health*. 2011 Dec;88(6): 1105–16. doi: 10.1007/s11524-011-9587-0

Sultana A, Sharma R, Hossain MM, Bhattacharya S, Purohit N. Burnout among healthcare providers during COVID-19: Challenges and evidence-based interventions. *Indian Journal of Medical Ethics*. 2020 Oct–Dec;V(4): 1–6. doi: 10.20529/IJME.2020.73

Sun S, Pellowski J, Pisani C, Pandey D, Go M, Chu M, Ruan J, Werner EF. Experiences of stigma, psychological distress, and facilitative coping among pregnant people with gestational diabetes mellitus. *BMC Pregnancy and Childbirth*. 2023 Sep 7;23(1):643. doi: 10.1186/s12884-023-05949-z

Sword W, Heaman MI, Brooks S, Tough S, Janssen PA, Young D, Kingston D, Helewa ME, Akhtar-Danesh N, Hutton E. Women's and care providers' perspectives of quality prenatal care: a qualitative descriptive study. *BMC Pregnancy and Childbirth.* 2012 Apr 13;12: 29. doi: 10.1186/1471-2393-12-29

Tampio, K.-P., Haapasalo, H. and Ali, F. Stakeholder analysis and landscape in a hospital project – elements and implications for value creation. *International Journal of Managing Projects in Business*. 2022;15(8):48–76. https://doi.org/10.1108/IJMPB-07-2021-0179

Tania AT, Natalia AR, Verónica VB, Pilar MS, Rubén GF, Cristina LP. Social support and mental health in maternity: Effects of the COVID-19 pandemic. *Midwifery.* 2022 Dec 24;118: 103580. doi: 10.1016/j.midw.2022.103580

Taylor, Jamila K. "Structural Racism and Maternal Health Among Black Women." *Journal of Law, Medicine & Ethics*. 2020;48(3): 506–517. https://doi.org/10.1177/1073110520958875.

Taylor J and Bernstein A. Tracking Progress of the Black Maternal Health Momnibus. The Century Foundation. May 26, 2023. Available from: https://tcf.org/content/data/black-maternal-health-momnibus-tracker/

Taylor Miller PG, Sinclair M, Gillen P, McCullough JEM, Miller PW, Farrell DP, Slater PF, Shapiro E, Klaus P. Early psychological interventions for prevention and treatment of post-traumatic stress disorder (PTSD) and post-traumatic stress symptoms in post-partum women: A systematic review and meta-analysis. *PLoS One*. 2021 Nov 24;16(11): e0258170. doi: 10.1371/journal.pone.0258170

Thoma ME, Declercq ER. All-Cause Maternal Mortality in the US Before vs. During the COVID-19 Pandemic. *JAMA Network Open.* 2022;5(6): e2219133. doi:10.1001/jamanetworkopen.2022.19133

Thoma, Marie E., Declercq, Eugene R. Changes in Pregnancy-Related Mortality Associated With the Coronavirus Disease 2019 (COVID-19) Pandemic in the United States. *Obstetrics and Gynecology*. 2023 May 1;141(5): 911–917. doi: 10.1097/AOG.0000000000005182

Thompson MP, Podila PSB, Clay C, Sharp J, Bailey-DeLeeuw S, Berkley AJ, Baker BG, Waters TM. Community navigators reduce hospital utilization in super-utilizers. *American Journal of Managed Care.* 2018 Feb;24(2): 70–76.

Torres Sanchez A, Park AL, Chu W, Letamendi A, Stanick C, Regan J, Perez G, Manners D, Oh G, Chorpita BF. Supporting the mental health needs of underserved communities: A qualitative study of barriers to accessing community resources. *Journal of Community Psychology.* 2022 Jan;50(1): 541–552. doi: 10.1002/jcop.22633

Trost, SL, Beauregard J, Nije F, et al. Pregnancy-Related Deaths: Data from Maternal Mortality Review Committees in 36 US States 2017–2019. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services; 2022.

Trust for America's Health. The Impact of Chronic Underfunding on America's Public Health System: Trends, Risks, Recommendations, 2022. Trust for America's Health. July 2022. Available from: https://www.tfah.org/wp-content/uploads/2022/07/2022PublicHealthFundingFINAL.pdf

UN Secretary General Special Envoy and Mount Sinai Arnhold Institute for Global Health. Closing the Gap: Applying Global Lessons Towards Sustainable Community Health Worker Models in the U.S. December 2016. Available from: http://www.healthenvoy.org/wp-content/uploads/2014/05/Closing-the-Gap-Applying-Global-Lessons-Toward-Sustainable-Community-Health-Models-in-the-U.S..pdf

U.S. Community Preventive Services Task Force. The Community Guide. Available from: https://www.thecommunityguide.org/pages/link-to-us.html

U.S. Dept of Health and Human Services. Community Health Workers: Roles and Opportunities in Health Care Delivery System Reform. January 2016. Available from: https://aspe.hhs.gov/sites/default/files/migrated_legacy_files//132001/CHWPolicy.pdf

U.S. Department of Health and Human Services. On the Front Lines of Equity: Community Health Workers. April 2021. Available from: https://www.cms.gov/files/document/community-health-worker.pdf

U.S. House of Representatives Black Maternal Health Caucus. Momnibus Act of 2021. Available from:https://blackmaternalhealthcaucus-underwood.house.gov/Momnibus

Valizadeh, Sousan, Mina Hosseinzadeh, Eesa Mohammadi, Hadi Hassankhani, Marjaneh M. Fooladi, and Virginia Schmied. "Addressing Barriers to Health: Experiences of Breastfeeding Mothers after Returning to Work: Breastfeeding Working Mothers' Health." *Nursing & Health Sciences.* 2017 Mar.;19(1): 105–111. https://doi.org/10.1111/nhs.12324

VanderZanden A, et al. What does Community-Oriented Primary Care Look Like? Lessons from Costa Rica. Commonwealth Fund. Mar 2021. https://doi.org/10.26099/ehbv-g283

Vaughan K, Kok MC, Witter S, Dieleman M. Costs and cost-effectiveness of community health workers: evidence from a literature review. *Human Resources for Health*. 2015 Sep 1;13:71. doi: 10.1186/s12960-015-0070-y

Vedam, S., Stoll, K., Taiwo, T.K. *et al.* The Giving Voice to Mothers study: inequity and mistreatment during pregnancy and childbirth in the United States. *Reproductive Health.* 2019;16, 77. https://doi.org/10.1186/s12978-019-0729-2

Venkataramani M, Ogunwole SM, Caulfield LE, Sharma R, Zhang A, Gross SM, Hurley KM, Lerman JL, Bass EB, Bennett WL. Maternal, Infant, and Child Health Outcomes Associated with the Special Supplemental Nutrition Program for Women, Infants, and Children: A Systematic Review. *Annals of Internal Medicine.* 2022 Oct;175(10): 1411–1422. doi: 10.7326/M22-0604

Vogel TM, Coffin E. Trauma-Informed Care on Labor and Delivery. *Anesthesiology Clinics.* 2021 Dec;39(4): 779–791. doi: 10.1016/j.anclin.2021.08.007

Walker, Lorraine O., Eun-Ok Im, and Diane O. Tyler. "Maternal Health Needs and Interest in Screening for Depression and Health Behaviors during Pediatric Visits." *Journal of Pediatric Health Care.* 2013 Aug.; 27(4): 267–277. https://doi.org/10.1016/j.pedhc.2011.11.008.

Walker, T.J., Foster, M., Szeszulski, J. *et al.* Evidence-Based Intervention (EBI) Mapping: a systematic approach to understanding the components and logic of EBIs. *BMC Public Health.* 2022;22: 1300. https://doi.org/10.1186/s12889-022-13692-x

Wang, Eileen, Kimberly B. Glazer, Shoshanna Sofaer, Amy Balbierz, and Elizabeth A. Howell. "Racial and Ethnic Disparities in Severe Maternal Morbidity: A Qualitative Study of Women's Experiences of Peripartum Care." *Women's Health Issues*. 2021 Jan.;31(1): 75–81. https://doi.org/10.1016/j.whi.2020.09.002.

Waxman E, Thompson M, Aron L, Hoy-Rosas J, Haag E, Improving Chronic Illness Management in Harlem: Leveraging Community Health Coaches to Address the Challenge of Medication Management. Urban Institute. October 24, 2019. Available from: https://www.urban.org/research/publication/improving-chronic-illness-management-harlem

Weber A, Miskle B, Lynch A, Arndt S, Acion L. Substance Use in Pregnancy: Identifying Stigma and Improving Care. *Substance Abuse and Rehabilitation*. 2021 Nov 23;12:105–121. doi: 10.2147/SAR.S319180

Weiner BJ, Amick H, Lee S-YD. Review: Conceptualization and Measurement of Organizational Readiness for Change: A Review of the Literature in Health Services Research and Other Fields. *Medical Care Research and Review*. 2008;65(4): 379–436. doi:10.1177/1077558708317802

Wheeler SM, Massengale KEC, Adewumi K, Fitzgerald TA, Dombeck CB, Swezey T, Swamy GK, Corneli A. Pregnancy vs. paycheck: a qualitative study of patient's experience with employment during pregnancy at high risk for preterm birth. *BMC Pregnancy and Childbirth*. 2020 Sep 25;20(1): 565. doi: 10.1186/s12884-020-03246-7

Williams, Corrine M., Sarah Cprek, Ibitola Asaolu, Brenda English, Tracey Jewell, Kylen Smith, and Joyce Robl. "Kentucky Health Access Nurturing Development Services Home Visiting Program Improves Maternal and Child Health." *Maternal and Child Health Journal.* 2017 May;21(5): 1166–1174. https://doi.org/10.1007/s10995-016-2215-6.

Williams, David, and Lisa Cooper. "Reducing Racial Inequities in Health: Using What We Already Know to Take Action." *International Journal of Environmental Research and Public Health.* 2019 Feb. 19;16(4): 606. https://doi.org/10.3390/ijerph16040606

Winter M. A Matter of Life and Death: Why are Black Women in the U.S. More Likely to Die During or After Childbirth? Essence. September 26 2017. Available from: https://www.essence.com/news/black-women-mortality-rate-child-deaths-united-states

World Health Organization. Recommendations on Postnatal Care of the Mother and Newborn. WHO 2014. Available from: http://apps.who.int/iris/bitstream/10665/97603/1/9789241506649eng.pdf

Yan J. Is WIC effective in improving pregnancy-related outcomes? An empirical reassessment. *Economics and Human Biology*. 2022 Dec;47: 101197. doi: 10.1016/j.ehb.2022.101197

Yee, Lynn M., Karolina Leziak, Jenise Jackson, Charlotte M. Niznik, and Melissa A. Simon. “Health Care Providers’ Perspectives on Barriers and Facilitators to Care for Low-Income Pregnant Women With Diabetes.” *Diabetes Spectrum*. 2020 May;33(2): 190–200. https://doi.org/10.2337/ds19-0044

Yu, S.M., Huang, Z.J., Schwalberg, R.H. *et al.* Parental Awareness of Health and Community Resources among Immigrant Families. *Maternal and Child Health Journal.* 2005;9: 27–34. https://doi.org/10.1007/s10995-005-2547-0

Zephyrin L et al. Community-Based Models to Improve Maternal Health Outcomes and Promote Health Equity. Commonwealth Fund. Mar 2021. https://doi.org/10.26099/6s6k-5330

Zoom encrypted telecommunications Software. Available from: https://zoom.us/

Zulu, J.M., Perry, H.B. Community health workers at the dawn of a new era. *Health Research Policy and Systems.* 2021;19(Suppl 3): 130. https://doi.org/10.1186/s12961-021-00761-7

CURRICULUM VITAE