Evaluation of the Maternal Opioid Misuse (MOM) Model Second Annual Report

(Implementation Year 1)

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Authors

Insight Policy Research

Meg Tucker, Jordan Stangle, Diana Cassar-Uhl, Sade Akinbayo, Dominick Esposito, Terry Moore

Urban Institute

Ian Hill, Brigette Courtot, Sarah Benatar, Emily Johnston, Lisa Clemens Cope

Abt Associates

Katharine Witgert

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U.S. Department of Health and Human Services
Centers for Medicare & Medicaid Services
7500 Security Boulevard
Mail Stop B3-30-03
Baltimore, MD 21244-1850

Project Officer

Caitlin Cross-Barnet

Submitted by

Westat Insight
1310 North Courthouse Road
Suite 880
Arlington, VA 22201

Project Director

Terry Moore

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Contents

Part 1

Part 2

Tables

Figures

Abbreviations and Acronyms

4Ps	Parents, Partner, Past, and Present assessment
ACA	Affordable Care Act
ACEs	Adverse Childhood Experiences screening;
APM	alternative payment model
ASQ	Ask Suicide-Screening Questions tool
CARA	Comprehensive Addiction and Recovery Act of 2016
CCDF	Child Care and Development Fund
CHIP	Children's Health Insurance Program
CHoSEN QIC	Colorado Hospital Substance Exposed Newborns Quality Improvement Collaborative
CMS	Centers for Medicare & Medicaid Services
DAST-10	Drug Abuse Screening Test
DATA	Drug Addiction Treatment Act
DFMB	Drug Free Mom and Baby
ECHO	Extension for Community Healthcare Outcomes
EPDS	Edinburgh Postnatal Depression Scale
EHR	electronic health record
EMR	electronic medical record
ESC	Eat, Sleep, Console
FFS	fee for service
FPG	Federal Poverty Guidelines
GAD-7	General Anxiety Disorder-7
HC	Healthy Community screening
HCP-LAN	Health Care Payment Learning & Action Network
HIE	health information exchange
HIT	health information technology
HRSN	Health-Related Social Needs screening tool
IP3	Indiana Pregnancy Promise Program
LGBTQ+	lesbian, gay, bisexual, transgender, and queer
MACS	Maryland Addiction Consultation Service

MAT	medication-assisted treatment
MCE	managed care entity
MCO	managed care organization
MOM Model	Maternal Opioid Misuse (MOM) Model
MOHH	maternity opioid health home
MOUD	medications for OUD
MPAT	maternal perinatal addiction treatment
MPRA	Maryland Prenatal Risk Assessment
NAS	neonatal abstinence syndrome
NICU	neonatal intensive care unit
NIDA ASSIST SUD	National Institute on Drug Abuse Alcohol, Smoking, and Substance Involvement Screening Test
NOWS	neonatal opioid withdrawal syndrome
OTP	opioid treatment program
OUD	opioid use disorder
PAM	Patient Activation Measure
PHE	public health emergency
PHQ	Patience Health Questionnaire
PMPM	per member per month
PRAPARE	Protocol for Responding to and Assessing Patients' Assets, Risks, and Experiences screening tool
PRSI	Prenatal Risk Screening Instrument
RAE	Regional Accountable Entity
RE-AIM	reach, effectiveness, adoption, implementation, and maintenance
RIF	Research Identifiable Files
SAMHSA	Substance Abuse and Mental Health Services Administration
SBIRT	Screening, Brief Intervention, and Referral to Treatment
SPA	State Plan amendment
SRO	State Opioid Response
SUD	substance use disorder
T-MSIS	Transformed Medicaid Statistical Information System

Executive Summary

In 2018 in response to the opioid epidemic, the Centers for Medicare & Medicaid Services (CMS) announced the Maternal Opioid Misuse (MOM) Model. The MOM Model intends to provide resources to support delivery system transformation for pregnant and postpartum Medicaid beneficiaries with opioid use disorder (OUD). In the past decade, maternal opioid use has emerged as a critical focus of Federal and State efforts to improve maternal and infant health. Medicaid is on the frontlines of this crisis, covering 42 percent of births in 2020 and, as of 2018, an estimated 84 percent of births associated with neonatal opioid withdrawal syndrome (NOWS), a diagnosis resulting from in-utero exposure to opioids (Jarlenski et al., 2021).

A. MOM Model, Awardees, and Sites

The primary goals of the MOM Model are to (1) improve quality of care and reduce costs for pregnant and postpartum individuals with OUD and their infants; (2) expand access, service delivery capacity, and infrastructure based on State-specific needs; and (3) create sustainable coverage and payment strategies that support ongoing coordination and integration of care. The Model intends to achieve these goals by fostering coordinated and integrated care delivery, using CMS Innovation Center authorities and State financing flexibilities and strengthening provider capacity and infrastructure (CMS, 2022b). The MOM Model was planned as a 5-year initiative and made awards to 10 State Medicaid agencies (Colorado, Indiana, Louisiana, Maine, Maryland, Missouri, New Hampshire, Tennessee, Texas, and West Virginia). In the first implementation year, July 1, 2021–June 30, 2022, all but two awardees (Louisiana and Missouri) remained in the Model and began serving beneficiaries.

This second annual report describes activities MOM Model awardees undertook during the MOM Model's first implementation year.

1. MOM Model Evaluation

The Innovation Center contracted with Insight Policy Research and its partners, the Urban Institute and Abt Associates, to conduct an independent evaluation of the MOM Model. The evaluation design is a flexible mixed-methods approach that investigates and documents the extent to which implementing a coordinated care model for pregnant and postpartum people with OUD improves quality and health outcomes equitably across populations and reduces overall costs to Medicaid. The evaluation will investigate this primary research question through three integrated yet distinct components: qualitative case studies, assessments of participant-level process data, and evaluation of program impact, with analysis contextualized through a modified RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) framework (Glasgow et al., 1999; Kwan et al., 2019).

Qualitative case studies

Qualitative data and analysis will examine how States design and implement models of care, document stakeholders' perceptions of best practices and lessons learned, examine program sustainability, and describe MOM Model beneficiaries' experiences. Case studies also provide information and context for generating hypotheses for testing and interpreting participant-level process and impact findings.

Assessment of participant-level process data

Quantitative participant-level process data will describe the characteristics of MOM Model beneficiaries, their medical and psychosocial risks, their utilization of services, and outcomes associated with program participation. Findings from the process data will also benefit the design of qualitative protocols and interpretation of qualitative data.

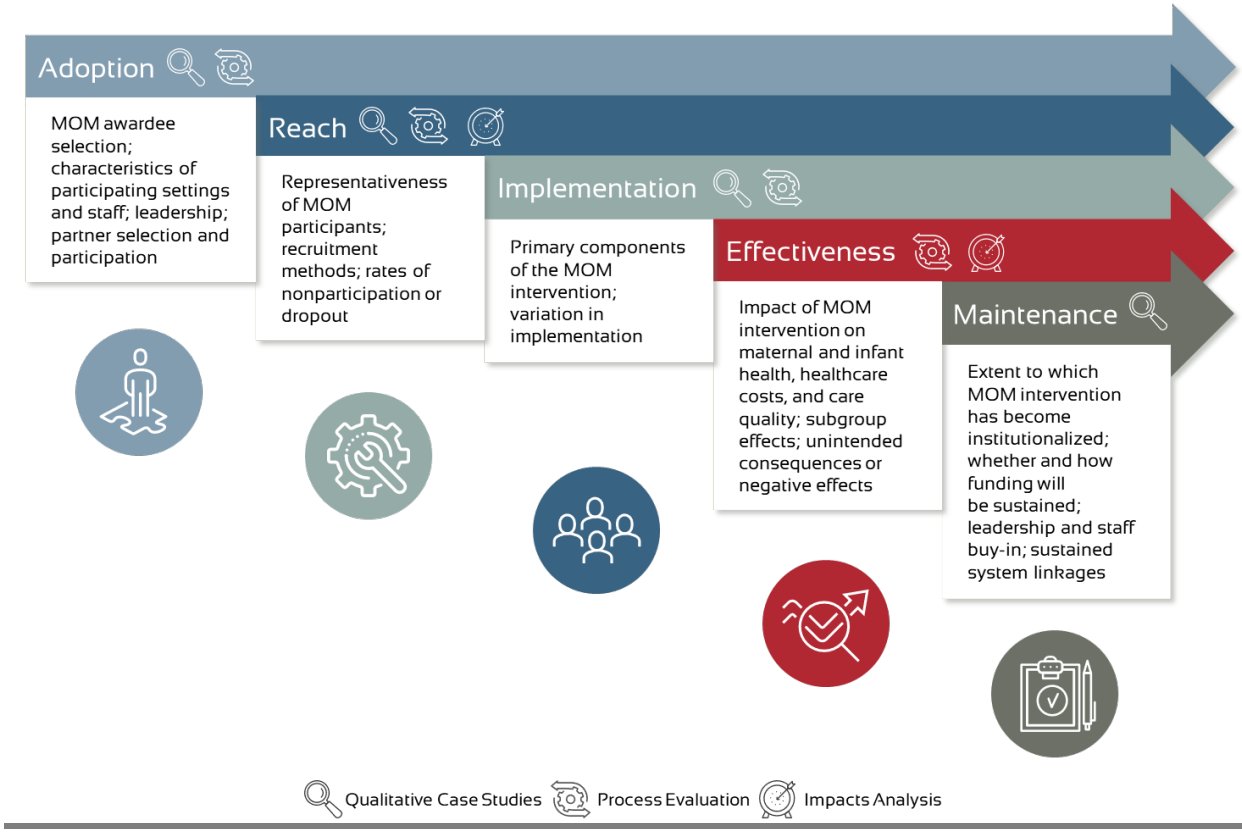
Evaluation of program impact

The impacts analysis will compare outcomes for Medicaid beneficiaries eligible for participation in the MOM Model and their infants to outcomes for Medicaid beneficiaries with similar characteristics in similar areas without access to MOM Model programs. Impacts analyses will be based on Medicaid eligibility, enrollment, claims, and encounter data from Transformed Medicaid Statistical Information System (T-MSIS) data, linked with vital statistics data from birth certificates and maternal, infant, and fetal death records.

Implementation evaluation framework

The evaluation is based on the RE-AIM framework, selected for its overall adaptability, utility in formative and summative evaluation, and capacity to address equity. The evaluation team adapted RE-AIM to meet the MOM Model's evaluation needs by reorganizing the order of the domains and reframing their descriptions to be more specific to the MOM Model evaluation (figure ES.1). Key characteristics of the domains remain true to the RE-AIM framework, and the evaluation team refers to the evaluation framework as RE-AIM throughout this report. Findings are presented in the order of the RE-AIM dimensions illustrated in figure ES.1: Adoption, Reach, Implementation, Effectiveness, and Maintenance.

Figure ES.1. MOM Model Modified RE-AIM Framework



Source: Insight Policy Research modification of RE-AIM Framework (RE-AIM, 2021)

2. Findings

During the first implementation year, the evaluation team conducted virtual site visits with all eight MOM Model awardees. The site visits included interviews with MOM Model leads at State Medicaid agencies, MOM Model care delivery partners and other community partners, providers and care provision staff serving pregnant and postpartum Medicaid beneficiaries with OUD, and MOM Model beneficiaries. The evaluation team also conducted virtual structured observations at provider sites and focus groups, interviews, and Photovoice[1] sessions with MOM Model beneficiaries to understand the lived experience of pregnant individuals with OUD. The team also received, processed, and analyzed participant-level data, including the characteristics of MOM Model beneficiaries and the services they receive, and how those services map to best practices in caring for pregnant and postpartum individuals with OUD.

Based on data from qualitative data collection and analysis of awardee-supplied data on enrollee characteristics, the evaluation team presents a number of early observations about the awardees' and care delivery partners' implementation of their MOM Model interventions, common challenges, and early successes. The team has summarized these early cross-cutting observations within four of the five domains of the modified RE-AIM framework (figure ES.1; Esposito et al., 2021a) to assess progress of the

[1] Photovoice is a participatory research method.

MOM Model along the MOM Model program implementation trajectory. Findings related to process and impacts data and the Effectiveness domain will be presented in future evaluation reports.

The Adoption domain of the RE-AIM framework considers the characteristics of each awardee's unique MOM Model, the establishment and maintenance of partnerships, and the setting in which Models are implemented. Three of eight awardees implemented MOM Model services statewide or nearly statewide during the first year of implementation, while five awardees served specific service areas within their States. MOM Model care delivery partners remained relatively unchanged during the first year of implementation.

MOM Model beneficiaries face a variety of challenges accessing care. For example, respondents from many awardee States indicated the COVID-19 pandemic continued to negatively affect access to support services during the first year of implementation. Respondents from all awardee States highlighted the existence of widespread stigma within local healthcare systems and communities, which negatively affected individuals' likelihood of pursuing OUD treatment and their access to treatment options.

The Reach domain of the RE-AIM framework considers recruitment methods and the representativeness of Model beneficiaries. During the first year of Model implementation, awardees implemented several strategies to reach potential MOM Model beneficiaries throughout their service areas, such as development and dissemination of outreach materials, engagement with community partners, and, in the case of Maine, development and implementation of a MOM Model communications campaign.

All awardees enrolled far fewer beneficiaries than they projected: All States other than Indiana and Tennessee enrolled fewer than 70 participants during the first implementation year. Case study findings reveal two universal issues that awardees and their partners identified as reasons for slowing enrollment: the COVID-19 public health emergency's effect on the availability of healthcare workers to staff MOM Models and the stigma pregnant beneficiaries with OUD face from friends, families, physicians, and other individuals.

As of the first implementation year, awardee-submitted data indicate the MOM Model is nearly exclusively serving non-Hispanic White women aged 25 to 34. The relatively high share of White beneficiaries is consistent with other reports of race and ethnicity among pregnant individuals with OUD. Most States implementing the Model have predominantly White populations, except Tennessee and Texas, which have substantial racial and ethnic diversity in the areas served. Beneficiaries served are generally in good physical health, but almost all face challenges related to mental health, substance use, and health-related social needs.

Health Equity Considerations

MOM Model beneficiaries enrolled to date are mostly non-Hispanic White and English-speaking. Equity-related challenges that affect the reach and accessibility of MOM Model services across awardees include stigma, lack of transportation, and inadequate childcare access. These challenges disproportionately affect underserved communities, such as individuals living in rural areas.

The implementation domain of the RE-AIM framework addresses the primary components of the MOM Model intervention and variation in implementation. Cross-site analysis of the eight MOM Model programs shows some evidence that care delivery partners are incorporating best practices, such as initiation of opioid agonist therapy or medications for OUD (MOUD), into their service approaches, with adoption of best practices most prominent in Models that were built around existing programs.

Awardees vary in their approach to care coordination, with an equal split between States that have adopted a case management approach and those that have sought to integrate Model services through care partners or centralized care. All awardees have integrated or are preparing to integrate peer recovery services into their Models, although some States have experienced challenges associated with recruiting and retaining peer recovery specialists. Models that have fully integrated peer recovery services report these services reduce feelings of stigma about OUD treatment in pregnancy, help with care coordination, and alleviate access barriers.

Common implementation successes across awardees included introducing or expanding peer recovery services and the use of case managers, strengthening data sharing and system infrastructure, and increasing provider collaboration. Common challenges were staffing shortages, burdens related to sharing Model-specific data, and problems with billing and payment for services.

Maintenance

The Maintenance domain of the RE-AIM framework explores the factors and processes that enable the Model to be maintained after the Innovation Center funding ceases. Maintenance depends on buy-in, sustained system linkages, and the sustained capacity of State Medicaid agencies and their care delivery partners to manage continued implementation in the face of internal change (e.g., staff turnover) and contextual factors (e.g., policy changes).

All MOM Model awardees currently use care coordination fees or per-member-per-month payments for care coordination. However, awardees are at different stages of contemplating, calculating, and implementing payment strategies to support the long-term sustainability of MOM Model services. Regardless of the mechanism employed to fund MOM Model services, amounts paid for MOM Model care coordination and service delivery vary widely across the eight States, with some States providing no additional payments beyond existing fees and others providing as much as $1,189 per member per month. In some States, despite program requirements designed to maintain programs long term, Medicaid reimbursement amounts may not suffice to sustain all MOM Model services beyond the program period.

Awardees are also increasing organizational and provider capacity to fully embed MOM Model services into States' care delivery systems. To date, awardees have experienced successes in providing training and educational opportunities and, in some cases, strengthening health information technology and health information exchange systems.

Part 1

Chapter 1. Overview of the MOM Model and MOM Evaluation

A. Introduction

The Maternal Opioid Misuse (MOM) Model is a patient-centered service delivery model that aims to improve the quality of care for pregnant and postpartum Medicaid beneficiaries with opioid use disorder (OUD) by supporting State interventions focused on coordinating clinical care and integrating other services critical for health, well-being, and recovery. The Centers for Medicare & Medicaid Services Innovation Center (CMS Innovation Center) is supporting State Medicaid agencies and their community partners over 5 years to implement the MOM Model with one or more care delivery partners in their communities.

1. Purpose of the Evaluation and This Report

The CMS Innovation Center contracted with Insight Policy Research and its partners, the Urban Institute and Abt Associates, to conduct an independent evaluation of the MOM Model. The evaluation uses a flexible mixed-methods design to examine the extent to which implementing a coordinated care model for pregnant and postpartum beneficiaries with OUD improves care quality while reducing costs.

The first MOM Model evaluation report, available at https://innovation.cms.gov/innovation-models/maternal-opioid-misuse-model, covered the program's pre-implementation period from January 1, 2020, to June 30, 2021. During this period, awardees prepared to serve beneficiaries and establish long-term payment mechanisms. This second report describes activities MOM Model awardees undertook during the MOM Model's first implementation year, July 1, 2021, through June 30, 2022. During this year, MOM Model awardees and their care delivery partners engaged in a wide range of activities. They finalized partnerships, conducted marketing and outreach to Medicaid beneficiaries, further developed data systems, enrolled beneficiaries into the MOM Model, and provided care and treatment to beneficiaries. Of particular interest to this evaluation are the following overarching research questions:

- To what extent did MOM Model awardees and providers incorporate best practices and guidelines in care for pregnant and postpartum beneficiaries with OUD and their infants?
- To what extent did treatment access and service capacity for treating pregnant and postpartum beneficiaries increase?
- How are States preparing to integrate MOM Model services into their Medicaid program to ensure sustainability beyond the funding period?

For additional details on the research questions to be investigated as part of the MOM Model evaluation, see appendix A. This chapter discusses the background of the MOM Model and summarizes key components of the evaluation.

B. MOM Model Background

OUD during pregnancy is a significant public health concern in the United States and can lead to neonatal opioid withdrawal syndrome (NOWS), a syndrome attributed to prenatal opioid exposure

diagnosed in the newborn shortly after birth.[2] According to a 2021 study, the number of pregnant individuals with opioid-related diagnoses at the time of delivery rose by 131 percent between 2010 and 2017 (Hirai et al., 2021). Nationally, the majority of individuals with maternal opioid-related diagnoses are non-Hispanic White Medicaid beneficiaries living in metropolitan areas, although rates of opioid-related diagnoses have increased more rapidly in rural areas (Hirai et al., 2021).

Untreated OUD is associated with adverse pregnancy outcomes, including overdose, fetal loss, and preterm birth (American College of Obstetricians and Gynecologists, 2012). Among pregnant and postpartum persons, overdose mortality increased approximately 81 percent between 2017 and 2020, driven by synthetic fentanyl and stimulants (Bruzelius & Martins, 2022). Because Medicaid bears a disproportionate share of costs related to pregnant and postpartum people with OUD and infants with NOWS (Fingar et al., 2015; Patrick et al., 2020), State-driven transformation of the delivery system surrounding this vulnerable population is critically needed.

1. Medications for OUD During Pregnancy

Historically, OUD treatment programs for pregnant individuals focused on opioid tapering and detoxification; both approaches can increase the risk of maternal and fetal death or morbidity from overdose or drug contaminants (Margerison et al., 2022; SAMHSA [Substance Abuse and Mental Health Services Administration], 2018; Winklbaur et al., 2008; SAMHSA, 2016a). Current guidelines recommend that healthcare providers engage in universal screening and provide comprehensive treatment, including medication for OUD (MOUD) and nonpharmacological supports and services (discussed in the next section) that enable individuals to manage withdrawal symptoms and achieve successful long-term recovery from opioid use.

Methadone and buprenorphine (opioid agonist therapy) are the first-line treatments for pregnant and postpartum individuals with OUD (SAMHSA, 2018; Klaman et al., 2017). Naltrexone is not recommended during pregnancy, although evidence for its use during pregnancy is emerging (Caritis & Venkataramanan, 2020). New evidence also supports the use of buprenorphine-naloxone (Suboxone) in pregnancy (Link et al., 2020; Gregg et al., 2023).

Methadone and buprenorphine have comparable safety in pregnancy and are associated with improved adherence to prenatal care, lower incidence of preterm birth, reduced return to opioid use, and fewer instances of opioid overdose and death from opioid overdose (Jones et al., 2013; Winklbaur et al., 2008). However, buprenorphine is associated with a lower risk of adverse neonatal outcomes than methadone, including preterm birth, small size for gestational age, and low birth weight (Clemans-Cope et al., 2019; Grossman et al., 2018; Cuneo, 2018; Suarez et al., 2022). Compared with methadone, buprenorphine also offers greater flexibility of treatment setting. Methadone is administered at federally regulated facilities, known as opioid treatment programs (OTPs), and typically requires patients to make daily clinic visits. In contrast, buprenorphine can be prescribed in outpatient primary care settings and is dispensed as an outpatient multiday prescription from most pharmacies. Because some individuals have better outcomes with one medication than another, SAMHSA (2018) recommends that pregnant people have access to both methadone and buprenorphine.[3] The evolving nature of the opioid crisis further highlights the importance of MOUD choice; notably, evidence suggests methadone may be more

[2] NOWS is often referred to as neonatal abstinence syndrome (NAS), a more general term for neonatal substance use withdrawal. Because infants with nonopioid drug exposure may require different assessment and management compared with infants exposed to opioids, this report uses the term NOWS.

[3] For example, research has shown methadone works well for those with fentanyl use and may be needed for those using fentanyl when buprenorphine treatment is not successful.

effective for individuals who use fentanyl, which is currently responsible for the majority of opioid-related overdose deaths in the United States (Volkow, 2021).

NOWS is an expected and treatable outcome of methadone and buprenorphine exposure, but the use of these medications to treat OUD during pregnancy results in less severe cases of NOWS compared with the absence of treatment (Cook & Fantasia, 2019). MOUD also improves maternal outcomes (Klaman et al., 2017; Krans et al., 2019; SAMHSA, 2009) and saves State and Federal dollars spent on healthcare, criminal justice, and child and family assistance (Patrick et al., 2015; Winkelman et al., 2018; Fairley et al., 2021; Rhyan, 2017).

2. Nonpharmacological Treatments and Supports

MOUD is an essential component of evidence-based OUD treatment during pregnancy and the postpartum period but must be complemented by services to meet other health and social needs. Pregnant and postpartum people with OUD frequently experience intimate partner violence; sexual abuse; transactional sex; unintended pregnancy; hepatitis C, HIV, and sexually transmitted infections; housing instability; malnutrition; and co-occurring substance use and psychiatric disorders that can adversely affect treatment engagement and retention (Krans et al., 2018; SAMHSA, 2016b; SAMHSA, 2018). SAMHSA (2018) recommends referring pregnant and postpartum people with OUD to psychosocial support services or behavioral health treatments, such as individual or group counseling. Other care components that may benefit pregnant and postpartum people with OUD include parenting education, family planning, linkage to services to address health-related social needs, screening and treatment of infectious and chronic diseases, and long-term follow-up care (Krans et al., 2015; SAMHSA, 2018). Ideally, all components integrate trauma-informed approaches that foster safety, connection, and provider cultural humility (Johnson, 2019).

Care teams for pregnant and postpartum people with OUD may include peer support specialists—people in stable recovery from OUD who can draw on their lived experience to provide nonprofessional, nonclinical recovery support services. Peer support specialists can help bridge cultural and linguistic barriers to care and serve as mentors or coaches, drawing on their experiences navigating service systems. SAMHSA (2009) recommends using peer support services to promote sustained remission from substance use disorders (SUDs), reflecting evidence that peer support can result in improved relationships with providers and social supports, increased referrals to treatment, increased satisfaction with the treatment experience overall, reduced rates of relapse, and increased retention in treatment (Eddie et al., 2019; Bassuk et al., 2016). In line with these findings, pregnant and postpartum people with OUD have reported that access to peer support services had a strong positive impact on their recovery (Fallin-Bennett et al., 2020).

3. Care Coordination

Meeting the needs of pregnant and postpartum people with OUD requires a coordinated effort among providers, health departments, and nonhealth social service entities, including Child Protective Services, housing authorities, and others. This evaluation uses the definition of care coordination from Healthcare.gov: "The organization of your treatment across several health care providers" (Healthcare.gov, n.d.). Various strategies may be used to support care coordination for pregnant and postpartum people with OUD:

- Including a dedicated care coordinator or case manager on the care team

- Co-locating treatment and care services
- Developing a patient-centered care team of providers who communicate regularly about treatment planning
- Using electronic health information exchanges to facilitate the exchange of data between providers
- Embedding tools to assess health-related social needs within electronic health records (EHRs) and making these needs assessments part of the standard workflows for clinician office visits
- Developing partnerships with community organizations to assist beneficiaries in addressing health-related social needs
- Using a hub-and-spoke approach, with an established full-service care location, or hub, and spoke locations that meet local community needs but refer patients with more complex care needs to the hub

There is a growing number of models for care coordination for pregnant and postpartum people with OUD (Seibert et al., 2022). Several use a collaborative care team approach, involving multiple clinicians and allied health professionals (e.g., community health workers, peer support specialists) who are not necessarily based in one location but work together closely to organize care (e.g., Cochran et al., 2019; Hodgins et al., 2019; Jones et al., 2021). Other models focus on co-locating care, such as embedding perinatal services within addiction treatment programs or augmenting obstetric services with MOUD treatment opportunities (e.g., Ellis et al., 2022; Goodman et al., 2022). Despite promising evidence, few studies have compared the effectiveness of care coordination models and strategies for pregnant and postpartum people with OUD.

C. Barriers to High-Quality Care

Studies based on Medicaid claims data indicate many pregnant beneficiaries with OUD do not receive MOUD (Clemans-Cope et al., 2019; Jarlenski et al., 2021).[4] Among those who do, many receive fragmented care that does not sufficiently address barriers to successfully accessing MOUD (Patrick et al., 2020; Clemans-Cope et al., 2019). The risk of discontinuing OUD treatment and relapsing is particularly high during the postpartum period (Krans & Patrick, 2016), reflecting stressors such as sleep deprivation, heightened risk of mood disorders, loss of health insurance, and threat of losing child custody.

Pregnant and postpartum people with OUD face many barriers in accessing high-quality, continuous care. This section describes some of the most salient barriers to care, including potential child welfare involvement and criminalization, stigma, and provider-related barriers. Barriers to care disproportionately affect underserved communities, which the White House defines as "populations sharing a particular characteristic, including geographic communities that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life" (Biden, 2021). The most widely documented inequities pertain to Black and Hispanic pregnant people and members of rural communities (see callout box "Inequities Experienced by Black and Hispanic Pregnant People and Individuals Living in Rural Areas"). Scant evidence exists regarding the extent and impact of health disparities on many underserved communities, including people with disabilities; sexual orientation and gender identity minorities;

[4] The incidence of OUD may be underreported in claims; thus, the percentage of eligible pregnant people receiving MOUD is likely to be lower.

individuals with limited English proficiency; and people with multiple marginalized identities (e.g., Black pregnant and postpartum individuals living in rural areas).

Inequities Experienced by Black and Hispanic Pregnant People and Individuals Living in Rural Areas

Compared with non-Hispanic White pregnant people, Black and Hispanic pregnant people are—

- Less likely to receive MOUD treatment during pregnancy (Henkhaus et al., 2021; Peeler et al., 2020)
- Less likely to receive consistent MOUD treatment (e.g., receiving treatment throughout their second and third trimesters; Schiff et al., 2020)
- Less likely to continue MOUD treatment during first year postpartum (Schiff et al., 2021)
- More likely to be diagnosed with OUD later in pregnancy (Gao et al., 2022)
- More likely to receive lower MOUD dosages (Rosenthal et al., 2021)

Compared with pregnant individuals living in urban areas, individuals living in rural areas are—

- Less likely to receive MOUD treatment during pregnancy (Henkhaus et al., 2021)
- Less likely to receive consistent MOUD treatment (e.g., receiving treatment throughout their second and third trimesters; Schiff et al., 2020)
- More likely to live in an area without a buprenorphine-certified prescriber (Andrilla et al., 2018) or a sufficient number of opioid treatment programs to meet demand (Dick et al., 2015)
- More likely to live in an "obstetric desert" (i.e., areas without hospital obstetric services; Hung et al., 2017; Brigance et al., 2022)

1. Child Welfare Involvement and Criminalization

Pregnant and postpartum people with OUD may face legal consequences for opioid use, particularly in States that have adopted statutory definitions of child abuse and neglect that incorporate prenatal drug use (Guttmacher Institute, 2023). Federal child welfare policies require notifying Child Protective Services when newborns are known to have prenatal substance exposure, and a health or social services provider must develop a Plan of Safe Care to address the health and treatment needs of infants and their caregivers (Comprehensive Addiction and Recovery Act of 2016). As a result of State-specific child maltreatment statutes, considerable variability exists across States in the interpretation and implementation of reporting requirements (Guttmacher Institute, 2023; McCourt et al., 2022; Lloyd et al., 2019). Reports do not automatically result in the opening of an active child welfare case, but they can lay the groundwork for child welfare involvement (Knopf, 2022). In some cases, reports may lead to temporary placement of a child in foster or kinship care and eventual termination of parental rights or criminal charges (Atkins & Durrance, 2020).

Prenatal Substance Use Reporting

A distinct notification pathway for infants who are not at risk of child abuse or neglect but still require a Plan of Safe Care can clarify the difference between a family in need of services and supports and a family with child maltreatment concerns that require Child Protective Services oversight (National Center on Substance Abuse and Child Welfare, 2021).

Prenatal substance use policies are intended to protect the fetus or infant from opioid exposure, but fear of child welfare involvement can deter pregnant people with OUD from seeking timely prenatal care, hinder disclosure of drug use to providers, and weaken trust in the patient-provider relationship (Angelotta et al., 2016). Punitive State policies have generally had no positive effect on birth outcomes (Atkins & Durrance, 2020). In the pre-implementation year, MOM Model partners highlighted that beneficiaries fear losing custody of their children if they engage in MOUD treatment (Esposito et al., 2021b). This year's MOM Model evaluation further revealed that some beneficiaries have direct experience with losing custody of older children as a result of substance use.

In addition to State policies on prenatal substance use, pregnant and postpartum people may be adversely affected by the Supreme Court's decision in *Dobbs v. Jackson Women's Health Organization* to overturn the longstanding *Roe v. Wade* decision that guaranteed individuals' constitutional right to abortion. The National Advocates for Pregnant Women (2020) suggest increased influence and policing of pregnant individuals' rights could result in some States introducing or expanding criminal prosecution for substance use during pregnancy, leading to fewer pregnant individuals with OUD pursuing timely SUD treatment and prenatal care because of fear of prosecution (Paltrow & Flavin, 2022). Individuals with OUD have high rates of unintended pregnancies (Auerbach et al., 2021), and under the new laws, many will no longer have the option to terminate. As a result, pregnant individuals with OUD may face increased risks of overdose, death, and incarceration (NAADAC, 2022).

2. Stigma

SUDs are often framed as a personal choice, reflecting moral failing and deficiency in willpower. As a result, individuals with OUD can face systematic stigmatization (Weber et al., 2021). Pregnant individuals who use substances face heightened stigma compared with nonpregnant individuals because of public perceptions that substances cause fetal harm, contrasting with expectations of normative behavior for people who are pregnant or parenting (Weber et al., 2021; Terplan et al., 2015). During the MOM Model pre-implementation period, care delivery partners and providers from all MOM Model States referenced stigma from friends, family, healthcare providers, Child Protective Services, family courts, and community members as a factor that negatively influences this population's likelihood of seeking MOUD care (Esposito et al., 2021b). These experiences mirror previous studies that have shown stigma as a barrier to treatment among pregnant and postpartum individuals with OUD (Barnett et al., 2021; Choi et al., 2022; Crawford et al., 2022).

Stigma in the healthcare system also presents challenges to engagement and retention in treatment. Despite evidence supporting the use of MOUD in pregnancy and growing recognition that NOWS is treatable, many healthcare providers continue to stigmatize people seeking MOUD (Madras et al., 2020; St. Louis et al., 2021). Providers with negative attitudes toward patients with OUD may be less engaged and empathetic with these patients (van Boekel et al., 2013). Language healthcare providers use, such as referring to people with SUD as "addicts," can also perpetuate stigma (Zwick et al., 2020). Medically accurate and person-centered language (e.g., "a person with OUD" rather than "addict") increases respect and may reduce discrimination and punitive approaches toward pregnant and postpartum individuals with OUD (Weber et al., 2021).

3. Provider-Related Barriers

Several provider-related barriers limit access to MOUD, notably buprenorphine. Until January 2023, buprenorphine could be administered only by providers who had obtained a Drug Addiction Treatment Act (DATA) waiver. Relatively few providers, including fewer than 2 percent of obstetrician-gynecologists who treat patients with Medicaid insurance (Taiko et al., 2020), had a waiver, and a majority of waivered providers did not prescribe up to their maximum capacity as allowed by law (Duncan et al., 2020). Various policies have sought to increase access to buprenorphine. For example, certified nurse midwives became eligible to obtain a waiver to prescribe buprenorphine under the Substance Use Disorder Prevention That Promotes Opioid Recovery and Treatment (SUPPORT) for Patients and Communities Act (2018). More recently, the 2023 Consolidated Appropriations Act eliminated the waiver requirement; patient limits associated with the waiver also no longer apply.

Whether these policy changes increase access to buprenorphine treatment for pregnant and postpartum beneficiaries with OUD remains unclear. Many providers do not accept pregnant patients for either buprenorphine or methadone treatment (Patrick et al., 2020; Phillippi et al., 2021). Many physicians are also reluctant to accept Medicaid patients with OUD because of low reimbursement and high administrative burden (Clemans-Cope et al., 2022; Cunningham & O'Malley, 2009; Decker, 2012; Saunders et al., 2022). Other provider factors that contribute to barriers to treatment include previously noted stigma toward people with OUDs; insufficient knowledge about evidence-based treatment for OUD during pregnancy, including the effectiveness of MOUD; lack of clinical experience in diagnosing and managing OUD; low confidence in caring for individuals with OUD; administrative burdens associated with providing MOUD (e.g., prior authorizations); provider shortages and burnout because of COVID-19; and inadequate institutional supports (Office of the Assistant Secretary for Planning and Evaluation, 2022; Cioe et al., 2020; Madras et al., 2020; St. Louis et al., 2021).

Unmet Health-Related Social Needs

Prior to implementation, MOM Model partners highlighted that it is especially difficult for pregnant and postpartum individuals with OUD to prioritize treatment when their **basic needs are unmet** and they lack resources necessary to consistently attend MOUD appointments (Esposito et al., 2021b). Common health-related social needs, or social determinants of health, that affect pregnant and postpartum people with OUD include transportation, childcare, housing, food and nutrition, and telephone and internet access.

Unmet health-related social needs disproportionally affect underserved communities. For example, individuals in rural areas often must travel considerable distances to attend MOUD treatment appointments and may lack the transportation supports necessary to maintain consistent attendance (Esposito et al., 2021b; Kvamme et al., 2013; Kramlich et al., 2018).

Impact of COVID-19

The coronavirus (COVID-19) pandemic, designated as a public health emergency just 2 months after the MOM Model began in January 2020, has posed significant challenges for pregnant and postpartum individuals with OUD and their care providers. Challenges include the following:

- Changes made to the provision of care and access (e.g., restrictions on visitors or support people in labor and delivery units; suspension of some support services, such as group-based care; barriers created by personal protective equipment to communication with patients)
- Impact of COVID-19 on staffing (e.g., staff shortages and burnout; reassignment of staff to provide care for patients with COVID-19)
- Impact of COVID-19 on health-seeking behavior and patient engagement (e.g., reduced engagement with healthcare due to a desire to maintain social distancing).

D. The MOM Model

The MOM Model was designed in response to the rising rates of OUD and NOWS during pregnancy and the significant barriers pregnant and postpartum Medicaid beneficiaries face when trying to access high-quality, coordinated care. The primary goals of the MOM Model are as follows:

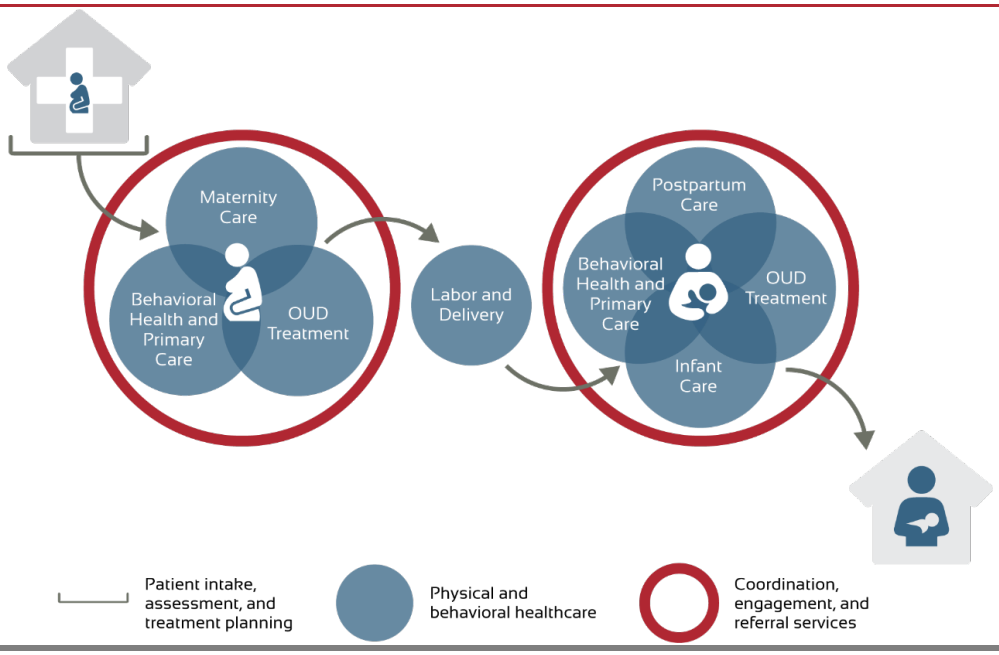
1. Improve quality of care and reduce costs for pregnant and postpartum individuals with OUD and their infants.
2. Expand access, service delivery capacity, and infrastructure based on State-specific needs.
3. Create sustainable coverage and payment strategies that support ongoing coordination and integration of care.

The Innovation Center refresh in 2021 identified patient-centered care and health equity as a focus for all models (CMS, 2023). The MOM Model's approach to health equity aligns with the goal of "the attainment of the highest level of health for all people, where everyone has a fair and just opportunity to attain their optimal health regardless of race, ethnicity, disability, sexual orientation, gender identity, socioeconomic status, geography, preferred language, or other factors that affect access to care and health outcomes" (CMS, 2022).

1. MOM Model Design

The MOM Model requires awardees to ensure that beneficiaries enrolled in the Model can access comprehensive physical and behavioral health services and providers have capacity to share relevant information. Awardees are also required to coordinate care, including referrals for health-related social services; engage MOM Model beneficiaries and retain them in care; and build community partnerships to meet the Model population's comprehensive needs (see figure 1.1).

Figure 1.1. MOM Model Design: Integrating Care



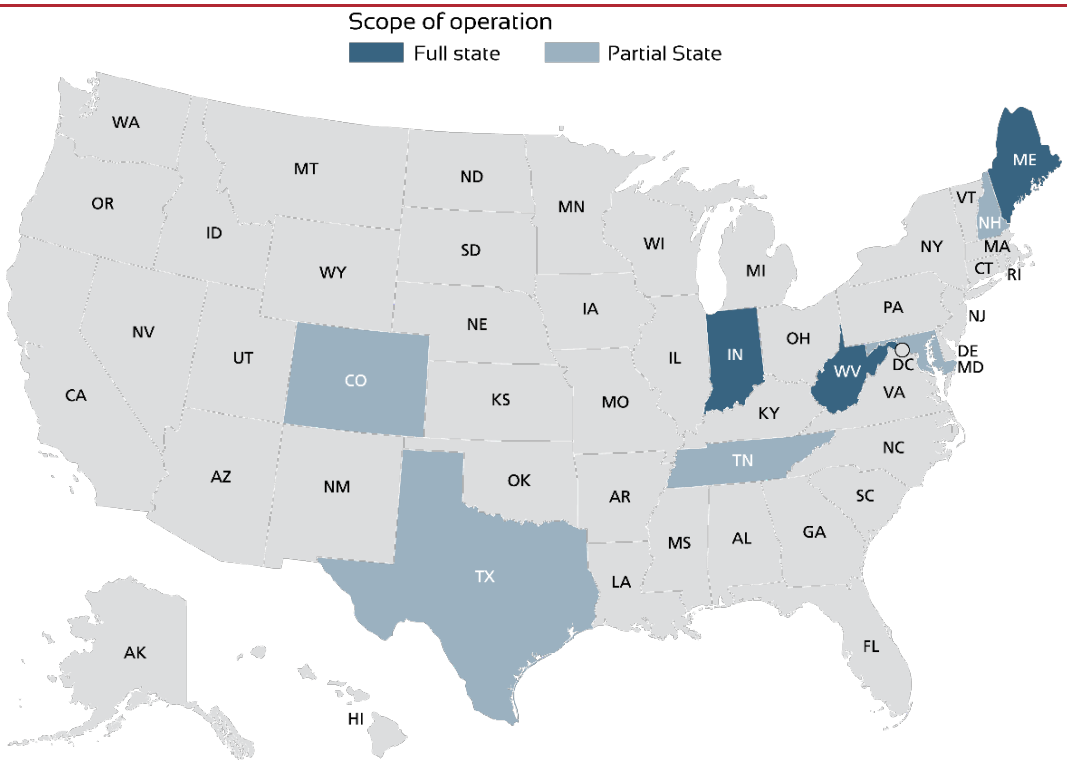
Note: OUD = opioid use disorder
Source: CMS, 2019a

2. Awardees and Care Delivery Partners

The CMS Innovation Center initially made awards to 10 State Medicaid agencies (Colorado, Indiana, Louisiana, Maine, Maryland, Missouri, New Hampshire, Tennessee, Texas, and West Virginia). Louisiana and Missouri ended their participation in the Model in the first year, before implementation, because of other pressing priorities. At the time of this report, Maryland was planning to withdraw from the MOM Model in December 2022[5] because of implementation challenges in its pilot county and concerns that it would not be able to meet Model requirements if it expanded the program to the full State. A map of current MOM Model awardee States appears in figure 1.2.

[5] For this report, findings for Maryland are reported as of the site visit, which concluded in July 2022.

Figure 1.2. MOM Model States



The CMS Innovation Center is providing different types of funding over the course of the MOM Model period of performance to support the development and implementation of State-designed interventions that target Medicaid beneficiaries with OUD during pregnancy, labor and delivery, and postpartum. State Medicaid agencies serve as MOM Model awardees, and each agency is collaborating with care delivery partners to build service delivery capacity, integrate health information systems, and implement enhanced coordinated care approaches on the ground. Care delivery partners may be local providers, health systems, or payers (e.g., hospital-based health clinics, health homes, and/or Medicaid managed care organizations [MCOs]), and awardees can work with more than one care delivery partner in a local area, multiple regions or counties, or their entire State. The design of the MOM Model interventions varies by awardee, as described in chapter 2, Adoption. Individual profiles of awardees' MOM Model interventions appear in part 2 of this report.

3. Implementation Timeline and Funding

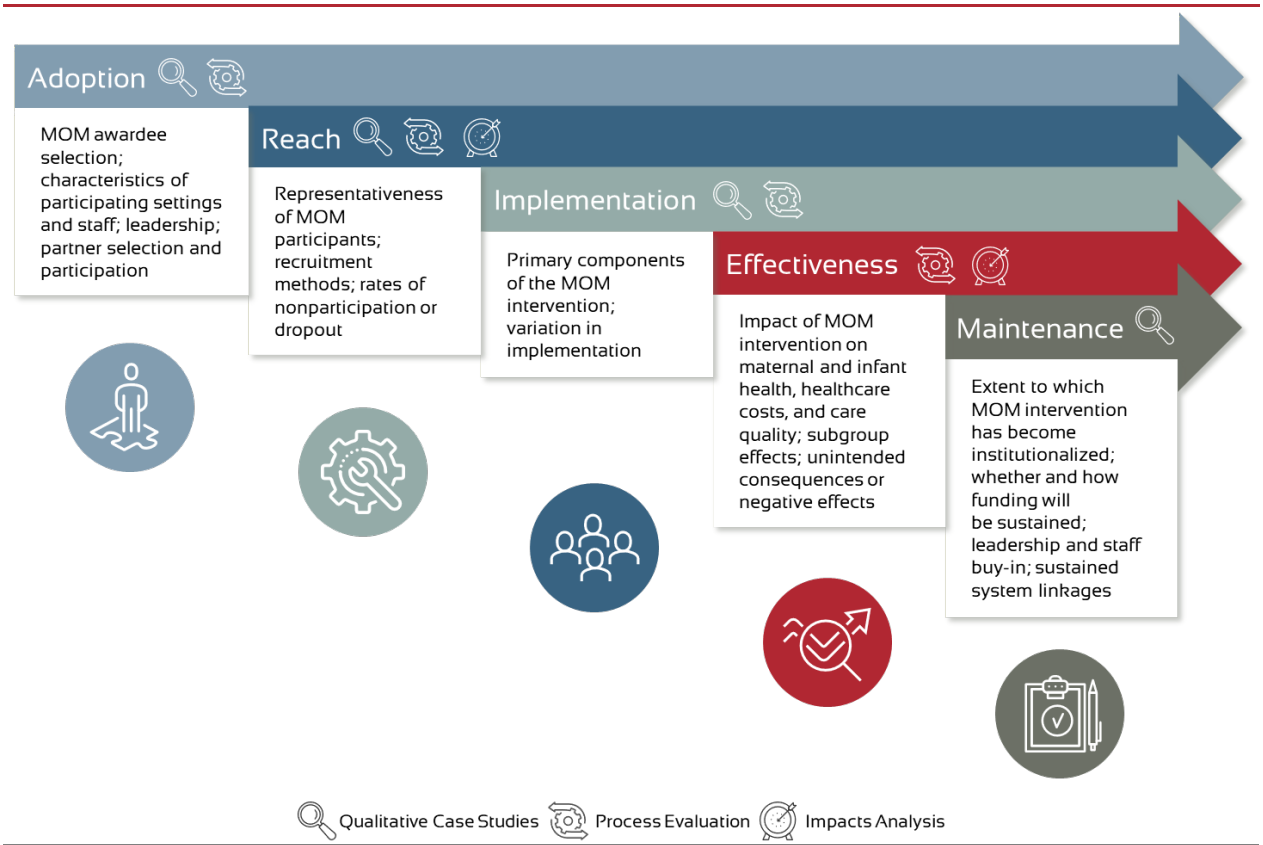
The CMS Innovation Center segmented the MOM Model into three periods: pre-implementation, transition, and implementation. The **pre-implementation** period occurred from January 1, 2020, through June 30, 2021, and gave awardees time to focus on designing their MOM Model interventions and building relationships with MOM Model partners (see https://innovation.cms.gov/innovation-models/maternal-opioid-misuse-model). For most States, the MOM Model **transition** period (year 1 of implementation) began July 1, 2021, when awardees began enrolling beneficiaries, and ended June 30, 2022. West Virginia and Colorado received extensions to address State-specific implementation challenges, allowing them to begin implementation January 1, 2022, and April 1, 2022, respectively.

The **transition** period enabled awardees to begin delivering care through their MOM Model programs using MOM funding while Medicaid programs finalized coverage and payment strategies. Awardees received transition funds to pay for care delivery services not covered by Medicaid during the transition period. The **full implementation** period, in which awardees offer their full array of services and cover them without supplemental funds from the CMS Innovation Center, began July 1, 2022, and will continue through December 31, 2024. During this time, awardees are eligible for performance payments if they meet milestones that indicate successful implementation.

E. Evaluation Design

The MOM Model evaluation uses a flexible, iterative mixed-methods design. Three primary activities guide the analysis: qualitative case studies, participant-level process data assessment, and evaluation of program impacts using Medicaid claims from the Transformed Medicaid Statistical Information System (T-MSIS) linked with State vital records. The evaluation is based on the RE-AIM (Reach, Effectiveness, Adoption, Implementation, Maintenance) framework (Glasgow et al., 1999; Kwan et al., 2019), selected for its overall adaptability and capacity to address equity. The evaluation team adapted RE-AIM to meet the MOM Model's evaluation needs by reorganizing the order of the domains and reframing their descriptions. Figure 1.3 provides a graphical description of the modified MOM Model RE-AIM framework. This report discusses initial or preliminary findings across four of the five domains; findings related to the Model's Effectiveness will be addressed in the next evaluation report. Specific research questions are included in appendix A.

Figure 1.3. MOM Model Modified RE-AIM Framework



Source: Insight Policy Research modification of RE-AIM Framework (RE-AIM, 2021)

1. Data Sources and Methods

Throughout the implementation period, the evaluation team will conduct annual qualitative data collection, analyze quarterly awardee-reported process data, and develop awardee-specific impact evaluations using T-MSIS data and birth and death certificates from State vital records as they become available. Appendix B provides further methodological details and potential challenges and describes how the evaluation team will address them.

Qualitative data

Qualitative research methods help the evaluation team understand MOM Model awardees' design of their Models, alignment with recommended best practices for the treatment of pregnant and postpartum individuals with OUD, and the experiences of beneficiaries served. Qualitative evaluation methods also enable the evaluation team to assess evolving processes related to enrollment, service provision, beneficiary and staff retention, data collection, data sharing, and payment.

Data sources for the MOM Model's qualitative evaluation include the following:

1. Document reviews. The evaluation team has reviewed awardees' quarterly reports and materials collected during site visits to catalog interventions proposed and adopted by MOM Model awardees and the alignment of these interventions with best practices. The team has also reviewed State-specific publicly available information describing each awardee's State Medicaid program (e.g., Medicaid statistics compiled by the Medicaid and Children's Health Insurance Program [CHIP] Payment and Access Commission or the Kaiser Family Foundation, Medicaid State Plans Amendments and waivers) and descriptions of the localized opioid epidemic and legal context for treating people who are pregnant and use opioids (e.g., federal agency statistics, State laws).
2. Case studies. The evaluation team has conducted virtual site visits with all awardees, employing various methods of data collection. To examine how States design and implement MOM Models of care, the team conducted key informant interviews with Medicaid staff; program managers; care delivery partners; maternity care, behavioral health, and substance use treatment providers; and care coordinators, among others. The team also gathered input directly from MOM Model beneficiaries through focus groups, interviews, and Photovoice. Finally, site visits included structured observations (e.g., virtual tours of office facilities and the surrounding environment) to enable the team to observe the delivery sites where services to pregnant and postpartum individuals and their infants participating in the MOM Model are provided.

Participant-level process data reported by awardees

Process data that awardees submit to CMS provide information on the characteristics of MOM Model beneficiaries and the services they receive. The data also describe how those services map to best practices in caring for pregnant and postpartum individuals with OUD. Data elements gathered appear in appendix C. As implementation progresses, the evaluation team will use process data to track interim and longer term outcomes of MOM Model beneficiaries. Specifically, the process data can be used to track outcomes that will take longer to observe in administrative data and provide an opportunity to examine outcomes that may not be available through T-MSIS, vital records, or other data sources. For instance, the team will have process data on birth outcomes, which can be delayed up to a year in vital records data and even longer in claims data. The team will also be able to examine patterns of unmet

health-related social needs that can affect adherence to care but may not be available in T-MSIS or vital records.

As of the writing of this report, awardees have submitted four rounds of participant-level process evaluation data. Data submitted follow:

MOM Model beneficiary characteristics, including preexisting psychosocial and medical risk factors, mental and physical health, substance use, and social determinants of health

Service use type and frequency, such as information on prenatal care visits, OUD treatment initiation and visits, pharmacological and nonpharmacological treatments for infants, neonatal intensive care unit (NICU) use, and other supportive services, such as care coordination and connections to social services

Program and beneficiary outcomes, including best practices used during birth hospitalization (e.g., skin-to-skin care, rooming-in), maternal and infant birth outcomes, postpartum OUD treatment plans, breastfeeding uptake, family planning, and referrals to other services

Because current sample sizes are small and awardees remain engaged in quality improvement efforts regarding data collection, process data analysis is currently descriptive only. However, as enrollment builds and data quality improves, the team hopes to provide statistical analyses in future reports.

MOM Model awardee impacts analysis

The impacts analysis will compare outcomes for Medicaid beneficiaries eligible for participation in the MOM Model and their infants to outcomes for Medicaid beneficiaries with similar characteristics in similar areas without access to MOM Model programs. Impacts analyses will be based on Medicaid eligibility, enrollment, claims, and encounter data from T-MSIS data, linked with vital statistics data from birth certificates and maternal, infant, and fetal death records. The analysis will also rely on local area characteristics, such as the number of OTP clinics, to assess the availability of local buprenorphine and methadone treatment. During the first implementation year, the evaluation team used 2018 and 2019 Medicaid T-MSIS Research Identifiable Files (RIF) claims data to provide a contextual understanding of the MOM Model pre-implementation period.

To estimate program impacts, the team will (1) consider all individuals eligible for the MOM Model as the treatment group (regardless of whether they participate in the program), (2) identify a similar group

Key Evaluation Considerations

- Comprehensive evaluation depends on collecting, analyzing, and integrating multiple data sources.
- Data collection from beneficiaries to understand patient perspectives is important for equitable evaluation and requires flexible and diverse methods (e.g., interviews, focus groups, Photovoice).
- States submit Medicaid data to CMS through standard systems (e.g., MOM Model portal, T-MSIS); however, the quality and completeness of data submitted by States vary.
- Ongoing engagement with the awardees is important to learn more about data submission challenges and respond to the realities of implementation.
- Low enrollment levels create challenges for data reporting (e.g., disaggregating data for underserved communities) and may hinder the evaluation's ability to examine the impact of the MOM Model.

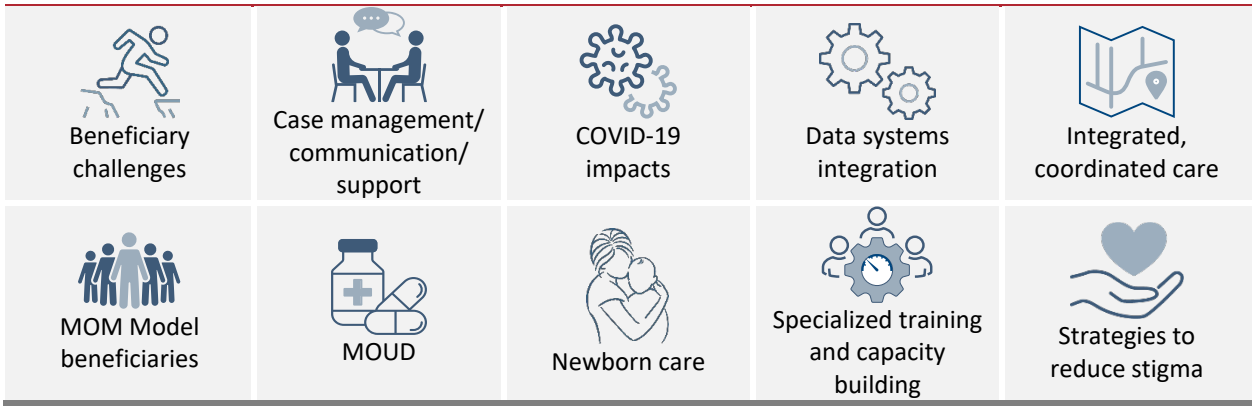
of individuals in a different area using Medicaid data in T- MISIS, and (3) compare changes in outcomes for each of these groups between the pre-implementation and implementation periods (also known as a difference-in-differences approach). Ideally, the evaluation team will use a similar approach across all awardees, but given sample size constraints or the availability of an appropriate comparison group, the team will develop an analysis best suited to the unique features of the awardee.

F. Organization of Report

Part 1 of this annual evaluation report summarizes early cross-cutting observations within the modified RE-AIM framework (figure 1.3; Esposito et al., 2021a) to assess progress along the MOM Model program implementation trajectory. Observations related to health equity, drawn primarily from key informant interviews with awardees and their partners, appear in callout boxes. Part 2 includes State-specific briefs for each MOM Model awardee.

Throughout the report, key themes and cross-cutting findings are noted using icons according to the legend in figure 1.4.

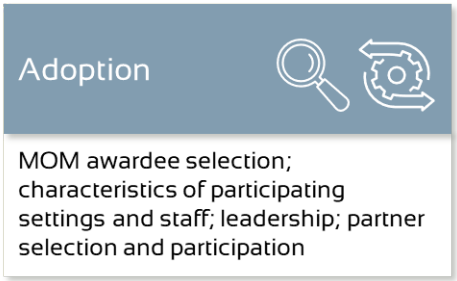
Figure 1.4. Report Icons



Note: MOUD = medications for opioid use disorder

Chapter 2. MOM Model Adoption

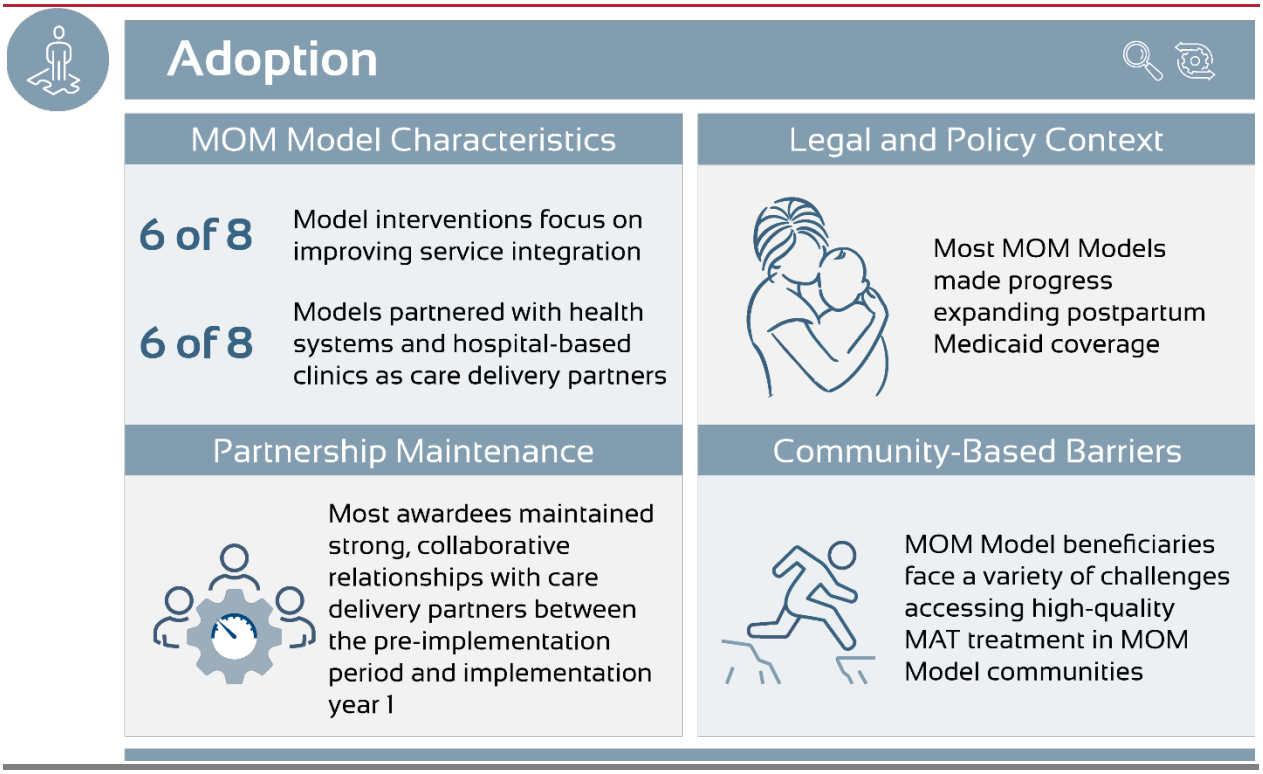
The Adoption domain of the RE-AIM framework considers the characteristics of each awardee's unique MOM Model, the establishment and maintenance of partnerships, and the setting in which Models are implemented. The research questions for the Adoption domain follow:



- What are the characteristics of MOM Models and partnerships across awardees?
- How are relationships forming between State Medicaid officials, care delivery partners, and local providers?
- What are the legal and Medicaid policy contexts within which the MOM Model is being implemented?
- What are the community characteristics of MOM Model awardee service areas?

In the first year of implementation, the evaluation team used key informant interviews to examine contextual factors influencing MOM Model implementation and understand how awardees developed, strengthened, and maintained partnerships. Figure 2.1 illustrates key first implementation year findings related to the Adoption domain.

Figure 2.1. Key Implementation Year 1 Findings Related to Adoption



Note: MAT = medication-assisted treatment

A. The MOM Model

1. Overview of MOM Model Characteristics

The eight States implementing the MOM Model designed their programs to leverage the strengths and resources of care providers in the communities they serve and meet the unique needs of pregnant and postpartum Medicaid beneficiaries with OUD in those areas. The design of each awardee's MOM Model varies considerably by service area, primary intervention, and partnership structure (table 2.1).

Table 2.1. Model Overview by Partial or Statewide Awardee

State	Indiana	Maine	West Virginia
Name of MOM Model	Indiana Pregnancy Promise Program	MaineMOM	West Virginia MOM Model
Service area	Statewide	Statewide at implementation; transitioned to 14 of 16 counties[a]	Nearly statewide; various regions within the State[c]
Primary intervention	Enhanced care management	Care integration	Care integration
Type of care delivery partners	MCO	Health systems/hospitals	Health systems/hospitals

Table 2.1. Model Overview by Partial or Statewide Awardee (continued)

State	Colorado	Maryland	New Hampshire	Tennessee	Texas
Name of MOM Model	Colorado MOM Model	Maryland MOM Model	New Hampshire MOM Model	Firefly	Texas MOM
Service area	Partial State: Three Regional Accountable Entity areas	Partial State: St. Mary's County[b]	Partial State: Greater Manchester region	Partial State: Nashville metropolitan area and surrounding counties	Partial State: Houston metropolitan area
Primary intervention	Care integration	Enhanced care management	Care integration	Care integration	Care integration
Type of care delivery partners	MCO	MCO	Health systems/ hospitals	Health systems/ hospitals	Health systems/ hospitals

Note: MCO = managed care organization
[a] The two counties no longer covered by MaineMOM are Washington County and Hancock County, located in the northeast region of Maine. Both counties are small, rural, and remote compared with other Maine counties served by the Model.
[b] During the first year of implementation, Maryland reported plans to expand the implementation of its MOM Model statewide by January 2023. However, Maryland ultimately decided to withdraw from the Model as of January 1, 2023, reportedly because of insurmountable data reporting challenges.
[c] West Virginia implemented the MOM Model at 5 of 16 Drug Free Moms and Babies provider sites during the first year of implementation, covering the northern, central, and southern regions of the State. During the first year of implementation, West Virginia reported plans to add five more Drug Free Moms and Babies sites to the MOM Model by January 2023.
Source: Insight Policy Research analysis of MOM Model site visit data, April–July 2022

Service area

During the first year of implementation, three MOM Models were implemented statewide or nearly statewide, four served singular cities or regions of their State, and one served three designated regions of its State (Colorado) (table 2.1). Two States, Maine and Colorado, reduced their service areas during the first year of implementation and during the pre-implementation period, respectively (see "Partnership Maintenance" section).

Peer Support Services

Although each MOM Model is designed to leverage unique interventions to improve care coordination and integration for MOM Model beneficiaries, **all MOM Models currently or plan to provide direct access or referrals to peer support services.**

Primary interventions

Each awardee developed a unique approach to meet the goal of integrating services and coordinating care. Six awardees designed their MOM Models to focus on increasing service integration between OUD treatment providers and maternity care providers, two focused on providing enhanced case management services, and one focused on improving information sharing to enhance care coordination. All MOM Models currently provide or plan to provide direct access or referrals to peer support services

moving forward. Low Model enrollment limits the evaluation's ability to assess which intervention design may improve outcomes and access to care among pregnant and postpartum Medicaid beneficiaries with OUD at this time. However, the evaluation team will continue investigating the effectiveness of MOM Model interventions as Model enrollment increases.

Partnership structure

The State Medicaid awardees partner with a variety of care delivery partners and other organizations, including health systems and hospital-based clinics, MCOs, and community-based organizations. Care delivery partners support the delivery and documentation of MOM Model services and coordinate service provision with partner organizations and other provider sites (table 2.1). Awardees and care delivery partners faced major challenges meeting MOM Model data reporting and collection requirements and sharing beneficiary data across Model partners during the first year of implementation. Awardees and their partners received assistance from organizations outside the MOM Model to address these challenges. This assistance included support in establishing and refining data systems capable of collecting and reporting MOM Model data and help with developing strategies and systems to share beneficiary data across provider sites. However, these partnerships were not always successful in addressing data-related challenges. (See callout box "Successes and Challenges: Data Collection, Reporting, and Sharing Support Across the MOM Model").

Awardees and care delivery partners also leveraged relationships with marketing firms to support outreach and recruitment. They formed and maintained external advisory groups of stakeholders from other government agencies and community-based organizations to troubleshoot implementation-related challenges and engaged with their States' agencies in charge of Child Protective Services. For more detail on the specific partnership structures established by individual awardees, see the key partner maps included in part 2 of this report.

Successes and Challenges: Data Collection, Reporting, and Sharing Support Across the MOM Model

Care delivery partners from several States received support from external organizations to improve the collection, reporting, and sharing of MOM Model data with CMS and across Model partners:

A nonprofit patient care organization supported the collection and reporting of data for Texas MOM during the first year of implementation. The Center worked with the awardee and care delivery partner to establish a procedure to convert data from Harris Health's electronic medical records system into a file compatible with the MOM Model Data Submission Gateway (Gateway).

The Maine awardee partnered with an academic partner to provide expertise and data analytics support related to Medicaid claims data and MOM Model enrollment data, including support to document mother-infant dyad linkages across Medicaid claims data.

The Maryland awardee established partnerships with two data partners to address data reporting and collection challenges. Maryland was able to successfully develop, implement, and refine a module for the collection of beneficiary case management data in partnership with the State's Health Information Exchange. However, Maryland was unsunsuccessful in addressing data reporting challenges through its academic data partner. The partnership was reportedly unable to develop a solution to address high data entry burden associated with reporting data to CMS from multiple data sources.

2. Partnership Maintenance

Partnership maintenance was a success across the MOM Model. All awardees maintained strong, collaborative relationships with care delivery partners by bringing them together for regular meetings to discuss the status of implementation and implementation-related challenges. These meetings also fostered learning collaborative environments by encouraging partners to share their experiences with implementation and solutions to challenges.

Fostering Positive Relationships

Awardees met with care delivery partners regularly and ad hoc when necessary to support them in addressing implementation-related challenges and maintain strong relationships.

Maintaining regular communication with care delivery partners was a best practice during the first year of implementation because it enabled awardees to routinely assess each partner's experience implementing the Model on the ground and facilitated quick identification of implementation-related challenges. Awardees also maintained flexibility with their partners by scheduling ad hoc meetings with individual care delivery partners when necessary. These quick-response meetings enabled awardees to provide efficient support and address time-sensitive challenges or issues specific to individual care delivery partners rather than waiting to address these challenges during regular meetings.

Although awardees maintained strong partnerships across the Model, misunderstandings of MOM Model data requirements and funding requirements by some awardees and care delivery partners inhibited implementation in some States. As a result of these challenges, a few Models were required to undertake high-resource activities to remain compliant with MOM Model requirements, such as revising budgets to align with MOM Model funding requirements and refining data collection and reporting systems to meet MOM Model data requirements.

Three care delivery partners across all awardees dropped out of the Model during the first year of implementation as a result of factors unique to their Model rather than systemic challenges in Model design. These factors included misunderstandings of MOM Model funding limitations, limited staffing resources to meet MOM Model administrative requirements (e.g., data collection, reporting, and care coordination requirements), and acquisition by another health system.

B. Legal and Policy Contexts

Expanding postpartum Medicaid coverage is a key goal of the MOM Model. Prior to the MOM Model awards, States were required to provide Medicaid coverage for pregnancy-related services to pregnant individuals with incomes less than 138 percent of the Federal Poverty Guidelines until at least 60 days postpartum. Recognizing the importance of extended Medicaid coverage for OUD treatment continuity and health outcomes, most MOM Model awardee States have made progress expanding postpartum coverage to ensure individuals with pregnancy-related coverage can continue receiving OUD treatment and other medical care beyond 2 months postpartum once the public health emergency declaration ends. Six of the eight MOM Model States have also expanded Medicaid coverage through the Affordable Care Act. Table 2.2 provides details on States' income eligibility limits for pregnancy, Affordable Care Act's Medicaid expansion status, and plans for postpartum coverage extension as of the end of the first implementation year.

Table 2.2. Medicaid Postpartum Coverage Extensions

State	ACA Adult Medicaid Expansion Status	Medicaid/CHIP Income Eligibility Limit for Pregnancy (Percent of FPG)	Status of State Action Related to Postpartum Coverage Extension
 *Colorado*	Adopted	265	Planning to implement 12-month postpartum coverage extension
 *Indiana*	Adopted	213	Planning to implement 12-month postpartum coverage extension (SPA in progress at time of this report[a])
 *Maine*	Adopted	214	12-month postpartum coverage extension implemented (SPA approved June 16, 2022)
 *Maryland*	Adopted	264	Planning to implement 12-month postpartum coverage extension (SPA in progress at time of this report[b])
 *New Hampshire*	Adopted	201	12-month postpartum coverage extension proposed and passed in State House of Representatives but is currently stalled
 *Tennessee*	Not adopted	200	12-month postpartum coverage extension implemented (Section 1115 waiver approved in January 2021)
 *Texas*	Not adopted	203	Limited coverage extension to 6 months postpartum proposed for individuals who "deliver or experience an involuntary miscarriage" In May 2022, Texas submitted Section 1115 waiver request to extend postpartum coverage to 6 months with continuous eligibility
 *West Virginia*	Adopted	305	Planning to implement 12-month postpartum coverage extension (SPA in progress at time of this report[c])

Note: ACA = Affordable Care Act; CHIP = Children's Health Insurance Program; FPG = Federal Poverty Guidelines; SPA = State Plan amendment
[a] Indiana implemented a 12-month extension following this reporting period through a SPA approved September 8, 2022.
[b] Maryland implemented a 12-month extension following this reporting period through a SPA approved August 16, 2022.
[c] West Virginia implemented a 12-month extension following this reporting period through a SPA approved September 8, 2022.
Source: Kaiser Family Foundation. (2022). *Medicaid postpartum coverage extension tracker*. https://www.kff.org/medicaid/issue-brief/medicaid-postpartum-coverage-extension-tracker/

In addition to the expansion of postpartum Medicaid coverage, awardee States are implementing the MOM Model within the context of the 2016 Comprehensive Addiction and Recovery Act (CARA). The CARA expanded requirements for the development of Plans of Safe Care for infants who show substance use withdrawal symptoms or a fetal alcohol spectrum disorder at birth. Depending on State laws, healthcare or Child Protective Services staff are required to draft a Plan of Safe Care to document strategies and resources to ensure prenatally exposed infants and their parents have plans in place to meet their substance use treatment and social needs. Awardees considered the establishment of Plans

of Safe Care as a best practice, and some piloted strategies to improve their development, including working with beneficiaries to develop Plans of Safe Care during the prenatal period. At least one care delivery partner offered a training to Child Protective Services staff around Plans of Safe Care to reduce stigma associated with substance use during pregnancy, while another care delivery partner highlighted that developing Plans of Safe Care with beneficiaries enables them to become more familiar and comfortable with Child Protective Services requirements. One interviewee suggested renaming these plans to "Plans of Supportive Care" to reduce the punitive connotation associated with the plans.

C. Community Characteristics of MOM Model Awardees

Communities implementing MOM Models have varying levels of resources to address beneficiaries' social- and health-related needs. Table 2.3 presents details on socioeconomic factors affecting communities within MOM Model States, derived from public health datasets, to provide context of community characteristics. Unless indicated, these data represent per capita characteristics for the specific service areas MOM Models cover in each State and are not limited to pregnant and parenting people with OUD in these service areas.

Wide variation exists among important community characteristics across MOM Model service areas, including mental health providers per 10,000 individuals, median household income, and social deprivation index. Other community characteristics are relatively similar across MOM Model service areas, including percentage reporting **severe housing problems**, percentage with **no car and limited access to food stores**, and number of **social service providers** for violence-related needs per 100,000 individuals.

Table 2.3. Community Characteristics in MOM Model Communities

Community Characteristic	Statewide Models				Region-Specific/Sub-State Models			
	Indiana	Maine	West Virginia	Colorado	Maryland	New Hampshire	Tennessee	Texas
Mental health providers/10,000[a]	16.1	47.6	13.0	53.3	11.4	29.8	19.3	11.8
Median household income[b]	57,966	56,606	45,445	63,239	89,964	83,233	66,248	60,241
Percent of children in single-parent households[c]	34.1	31.4	33.5	34.8	25.6	25.9	32.2	36.1
Social deprivation index[d]	44.0	25.6	42.8	73.6	9.0	9.8	47.0	82.0
Total social service providers: all categories/100,000[e]	122.1	196.4	127.9	205.7	100.3	170.9	126.2	88.6
Average months on waiting list for subsidized housing[f]	21.4	23.6	8.7	13.6	31.0	33.2	16.7	41.0
Percent reporting severe housing problems[g]	13.2	15.0	11.4	18.8	11.8	14.5	14.5	20.1
Percent with no car and limited access to food store[h]	2.3	2.8	4.3	1.3	3.8	1.9	1.6	0.9

Community Characteristic	Statewide Models				Region-Specific/Sub-State Models			
	Indiana	Maine	West Virginia	Colorado	Maryland	New Hampshire	Tennessee	Texas
Number of social service providers for violence-related needs/100,000[i]	0.0	0.3	0.2	0.4	0.0	0.2	0.3	0.0

Note: Community characteristic statistics for each State are weighted averages of county-level statistics and represent per capita characteristics unless otherwise indicated. For example, for statewide MOM Models, the evaluation team used information available for all counties in a State and weighted each county by its 2018 Census population estimate. For statewide Models, the weight for each county is that county's population divided by the total population in the State. For region-specific Models, the weight for each county is that county's population divided by the total population in all participating counties. For each State, weights add up to 100 percent by definition. In Texas and Maryland, which have only one county in the MOM Model, this table presents data for the participating county. Region-specific Models include data from the following regions: Maryland: St. Mary's County; New Hampshire: Greater Manchester, including Hillsborough, Merrimack, and Rockingham counties; Tennessee: Middle Tennessee, including Giles, Wayne, Maury, Wilson, Lincoln, Perry, Hickman, Sumner, Stewart, Lawrence, Dickson, Bedford, Davidson, Williamson, Rutherford, Smith, Lewis, Humphreys, Robertson, Macon, Marshall, Montgomery, Cheatham, Houston, Moore, and Trousdale counties; Texas: Harris County

[a] Ratio of the county population to the number of mental health providers (Bureau of Health Professions, Health Resources and Services Administration, 2017)

[b] Income where half of households in a county earn more and half of households earn less (U.S. Census Bureau, 2014–2017)

[c] Percentage of children in family households where the household is headed by a single parent (U.S. Census Bureau, 2014–2017)

[d] The social deprivation index is a composite measure of seven demographic characteristics collected in the American Community Survey that likely influence a patient's ability to access and maintain treatment, access reliable transportation and housing, and availability of support services for low-income families, including housing, car ownership, and employment, with the index scale from 0 to 100, with higher numbers indicating greater deprivation (U.S. Census Bureau, 2014–2017)

[e] A measure of the number of social service providers in the county, adjusted for county size (U.S. Census Bureau, 2009–2011)

[f] Average months on waiting list for a housing subsidy using the "date entered waiting list" and the new admission date; excludes programs that do not report waiting list dates (The Urban Institute, 2017)

[g] Percentage of households with at least one or more of the following housing problems: (1) housing unit lacks complete kitchen facilities; (2) housing unit lacks complete plumbing facilities; (3) household is severely overcrowded; or (4) household is severely cost burdened. Severe overcrowding is defined as more than 1.5 persons per room. Severe cost burden is defined as monthly housing costs (including utilities) that exceed 50 percent of monthly income (U.S. Department of Housing and Urban Development, 2017)

[h] Percentage of housing units in a county without a car and more than one mile from a supermarket, supercenter, or large grocery store (U.S. Department of Agriculture, Economic Research Service, 2021)

[i] A measure of the number of tax-exempt social service providers in the county (identified by the North American Industry Classification System code) that focus on health-related issues, adjusted for county population (Urban Institute, National Center for Charitable Statistics [NCCS core PC file], 2017)

Source: Insight Policy Research November 2022 analysis of the Community Characteristics Database compiled by Abt Associates for the CMS Innovation Center's Accountable Health Communities evaluation

D. Unique Needs of MOM Model Communities

During the pre-implementation period, MOM Model respondents nearly unanimously highlighted **societal stigma**, **limited access to social support services,** and **a shortage of maternity care providers comfortable providing medication-assisted treatment (MAT)** as barriers to accessing MAT treatment. These perceptions remained during the first year of implementation across most Models.

Respondents maintained that many local maternity care and primary care providers still lack the knowledge and confidence necessary to comfortably care for pregnant individuals with OUD, although some Models have implemented efforts to build provider capacity and close this gap. Maryland conducted a statewide needs assessment through the Maryland Addiction Consultation Service (MACS) for MOMs that validated this perception (see callout box "Select Findings From MACS for MOMs Statewide Needs Assessment"). Key informants from various Models also highlighted that maternity care and primary care providers in their communities have biases against providing appropriate MAT to pregnant individuals. At least one awardee noted that some providers only administer low doses of MAT

to pregnant individuals or encourage its use for short periods, despite current clinical recommendations (SAMHSA, 2018).

Select Findings From MACS for MOMs Statewide Needs Assessment

MACS for MOMs conducted a 2021 statewide needs assessment of maternity care providers in Maryland to inform services to build provider capacity for caring for pregnant beneficiaries with OUD.

- Providers cited major challenges developing protocols for treating pregnant individuals with OUD and lack of knowledge around the initiation of MOUD.
- Although providers reported feeling comfortable screening patients for OUD and substance use in general, few conducted screenings every trimester.
- Many providers reported being uncomfortable with discussing State substance use reporting laws with pregnant individuals.

Source: Sweeney et al., 2022

Similarly, key informants reiterated that limited access to affordable and reliable transportation, childcare, and housing support services, especially in rural areas, and widespread stigma within local healthcare systems and communities were limiting access to high-quality MAT in their communities.

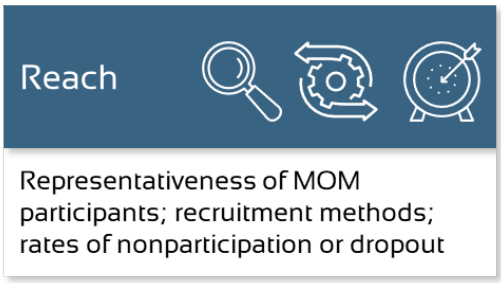
E. Summary and Future Considerations for the Evaluation

MOM Model adoption among the eight State Medicaid programs participating in the MOM Model varies widely. In addition to differences in primary care delivery partners, these States collaborate with a broad range of partners on the MOM Model, including marketing firms (to support outreach), universities or private firms (to support data collection/analysis), external advisory groups (to assist with planning and oversight), offices of child and family services/child protection (to help maintain families), legal services groups, and residential care providers. These partner relationships remained largely unchanged among the participating MOM Model awardees between the Model pre-implementation and implementation periods. Key informants at site visits universally described relationships between Medicaid agencies, care delivery partners, and other community partners as strong, collaborative, and productive. Most programs foster these relationships through regularly scheduled meetings between State and local partners.

Independently from the MOM Model, most awardees have already extended or are seeking to extend postpartum eligibility for Medicaid beneficiaries to 1 year. Postpartum coverage will help ensure MOM beneficiaries can continue to receive healthcare and OUD treatment well into their postpartum period, regardless of their eligibility for adult coverage. Key informants described a variety of challenges MOM Model beneficiaries face in accessing high-quality, integrated OUD treatment services in MOM Model coverage areas. Most notable challenges included societal and provider stigma against pregnant people with OUD, lack of reliable and affordable transportation and childcare, and housing instability, especially in rural areas. The next chapter discusses the prevalence of these health-related social needs and demographic and community characteristics of beneficiaries enrolled in the MOM Model.

Chapter 3. MOM Model Reach

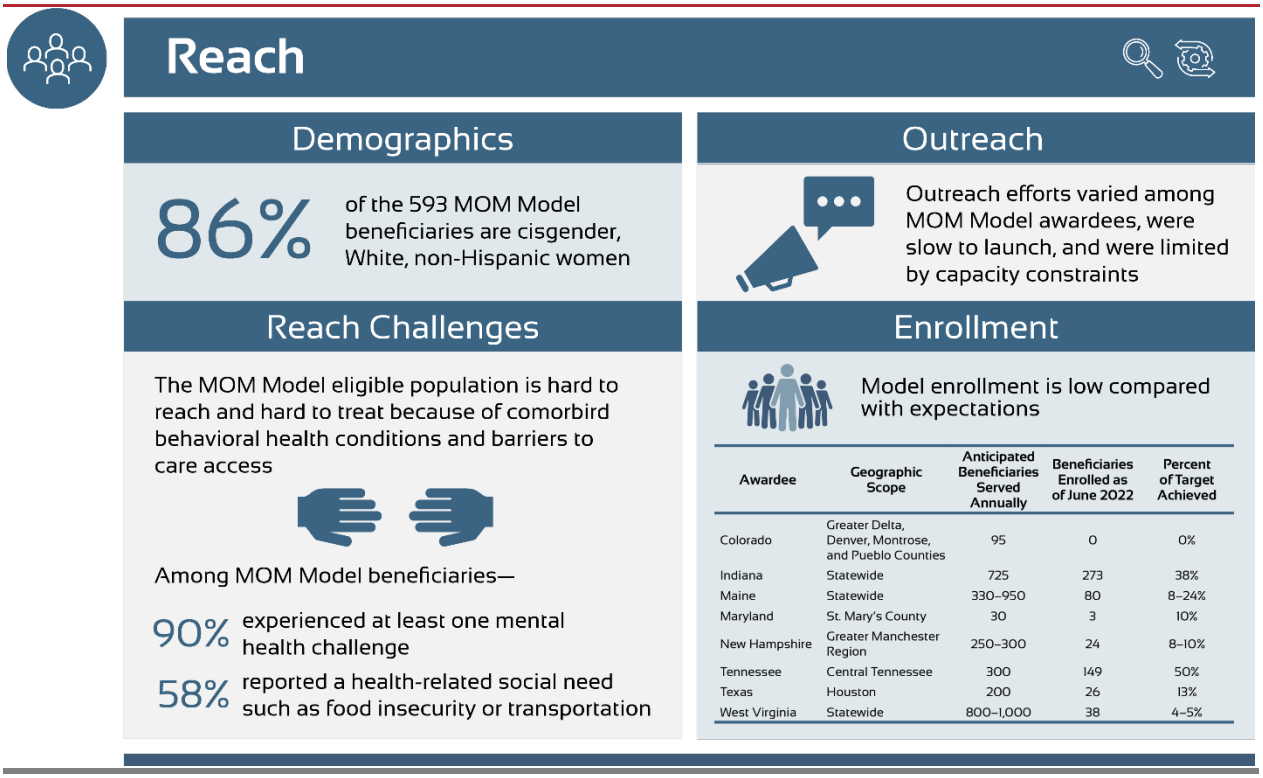
The Reach domain of the RE-AIM framework considers recruitment methods and the representativeness of MOM Model beneficiaries. The research questions for the Reach domain follow:



- To what extent do States use active outreach or recruitment efforts by the organization to bring people into care?
- How do MOM Models identify potentially eligible beneficiaries for MOM Model enrollment?
- What are the characteristics of MOM Model beneficiaries in each State and overall?

The evaluation team also examined beneficiary characteristics using beneficiary-level process data; detailed data appear in appendix D. Figure 3.1 illustrates key first implementation year findings related to the Reach domain.

Figure 3.1. Key Implementation Year 1 Findings Related to Reach



Awardee	Geographic Scope	Anticipated Beneficiaries Served Annually	Beneficiaries Enrolled as of June 2022	Percent of Target Achieved
Colorado	Greater Delta, Denver, Montrose, and Pueblo Counties	95	0	0%
Indiana	Statewide	725	273	38%
Maine	Statewide	330–950	80	8–24%
Maryland	St. Mary's County	30	3	10%
New Hampshire	Greater Manchester Region	250–300	24	8–10%
Tennessee	Central Tennessee	300	149	50%
Texas	Houston	200	26	13%
West Virginia	Statewide	800–1,000	38	4–5%

Note: While most awardee States began implementing the MOM Model in July 2021, implementation in West Virginia and Colorado began in January 2022 and April 2022, respectively.
Source: Insight Policy Research analysis of beneficiary-level process data submitted by awardees as of June 30, 2022

A. Enrollment and Outreach

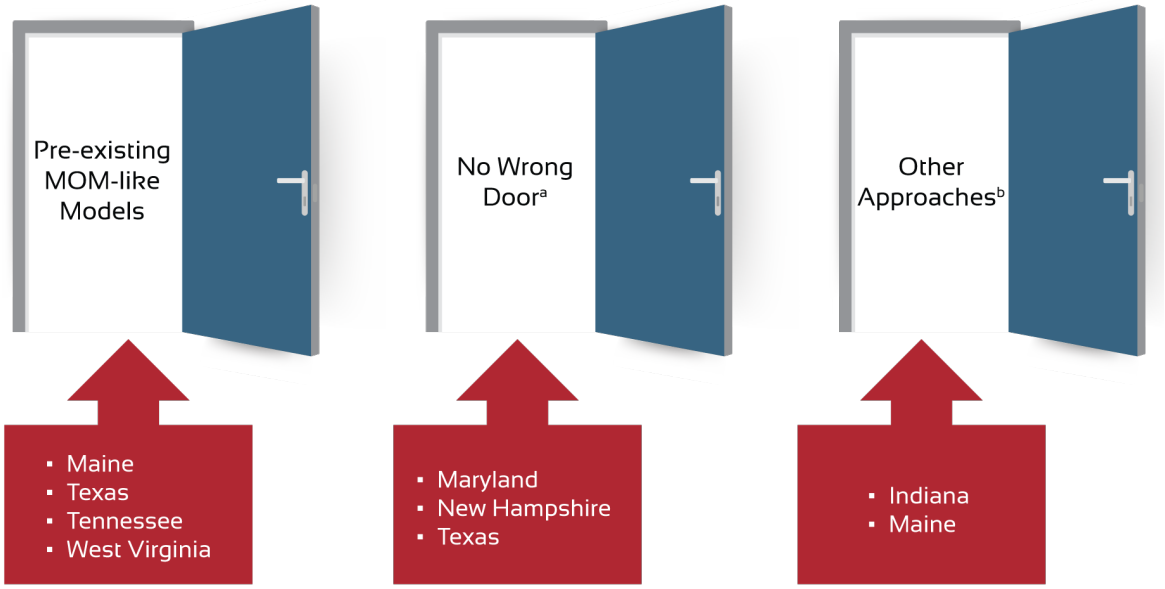
1. Enrollment Efforts

All States except Indiana and Tennessee enrolled fewer than 70 participants, despite original enrollment target projections ranging from 250 beneficiaries (New Hampshire) to 1,000 or more beneficiaries per year (West Virginia). Participating States' enrollment has ranged from 0 to 50 percent of projected enrollment targets.

Figure 3.2 presents three main pathways to MOM Model beneficiary enrollment. The Maine, Tennessee, Texas, and West Virginia MOM Models grew out of existing programming, so pathways for referral were already in place at the time of Model implementation. While all four of these programs approach enrollment differently, partnerships and community awareness of available programming provided an established path to enrollment for existing program beneficiaries when the Models launched.

All awardees enrolled fewer beneficiaries than projected, ranging from 0 in Colorado to 243 in Indiana at the time of site visits.

Figure 3.2. Pathways to Beneficiary Enrollment



[a] *No Wrong Door: referrals may come from any source, including prenatal care providers, community partners, insurers*
[b] *Other Approaches: referrals may come from statewide websites or via claims data mining activities*

Some States' enrollment strategies fall into more than one pathway. Texas, for example, has a "no wrong door" approach to enrollment, which means any source (e.g., prenatal care provider, OUD provider, community member, friend, insurer) can refer potential beneficiaries to the MOM Model, in addition to having a pre-existing MOM-like model. The most active avenue is referrals from a residential treatment program where outreach workers identify individuals ready to begin SUD treatment. Maryland and New Hampshire also use the no wrong door approach, with some variation. Going into the first year of implementation, Maryland expected to identify most MOM Model eligible beneficiaries by reviewing Maryland Prenatal Risk Assessments completed by Maryland prenatal care providers. However, providers were inconsistent in their administration of the assessments and not timely in their submissions of assessment results to county health departments. As a result, this approach was not

successful. New Hampshire relies more heavily on direct referrals from maternity care providers at partner organizations that contact program staff directly. To succeed in increasing enrollment, it is important that these partner organizations are knowledgeable about the MOM Model as a potential treatment option for pregnant patients with OUD. As of June 30, 2022, New Hampshire had enrolled 24 MOM beneficiaries, far below the initially anticipated enrollment targets of 250–300 beneficiaries annually. The evaluation team plans to further explore enrollment strategies and whether they are successful in the next year.

Some awardees use other approaches to enrollment, including integrating MOM Model referrals through online platforms, such as Indiana's Pregnancy Promise Program website and Maine's CradleME website; both are statewide referral systems for birthing individuals and families. Both platforms allow self-referral to their States' respective MOM Models and enable partner organizations to refer beneficiaries to the MOM Model online by visiting the website. Indiana also mines claims data and pregnancy assessment forms from providers to identify eligible beneficiaries; by mid-May, Indiana's managed care entities' (MCEs) data-mining systems identified 1,600 eligible pregnant or postpartum individuals. As of June 30, 2022, Indiana had enrolled 273 of an enrollment target of 750 beneficiaries into the MOM Model. Indiana's approach relies on 13 MOM Model case managers to conduct eligibility outreach, obtain consent, and enroll beneficiaries in the Model once potential eligibility is established.

Enrollment challenges

According to the awardees, the two most commonly cited factors that contributed to lower-than-expected enrollment numbers were (1) effects of the COVID-19 public health emergency on the availability of healthcare workers to staff MOM Models and (2) stigma pregnant beneficiaries with OUD face from friends, families, physicians, and other individuals. Awardees also attributed slow enrollment to enrollment capacity concerns (chapter 6, MOM Model Maintenance, provides further details about provider capacity constraints). Awardees also experienced external challenges that affected the number of beneficiaries served in the first implementation year; see Implementation Challenges.

2. Outreach Initiatives

Awardees implemented varying outreach, recruitment, and referral strategies to reach potential MOM Model beneficiaries in their service areas (table 3.1). Some awardees conducted direct outreach to potential clients (Indiana, Maryland, New Hampshire, Tennessee) and community partners (Colorado, Maryland, New Hampshire, Texas). Only one awardee (Maine) developed and implemented a dedicated professional communications campaign to raise awareness about the availability of MOM Model services (see figure 3.3).

Figure 3.3. MaineMOM Outreach Campaign Image

Table 3.1. MOM Model Awardee Outreach Efforts Reported During Evaluation Site Visits

State	Direct Outreach to Beneficiaries	Direct Outreach to Community Partners	Social Media	Marketing Materials (e.g., Posters, Videos)	Dedicated Website for MOM Self-Enrollment or Referrals	Communications and Marketing Campaign	Considering Targeted Outreach to Disadvantaged Communities
Colorado		●	●	●			●
Indiana	●		●		●		●
Maine			●	●	●	●	
Maryland	●	●	●	●	●		●
New Hampshire	●	●	●				
Tennessee	●		●	●	●		●
Texas		●	●	●	●		●
West Virginia*							

Note: Although this table captures each outreach activity reported during the evaluation site visits with awardees and their partners in the first implementation year, it may not comprehensively report all outreach activities conducted if certain activities were not reported during the evaluation site visits.
*West Virginia did not report active recruitment at the time of the site visit other than one MOM Model participating site mentioning the program in its newsletter.
Source: Insight Policy Research analysis of MOM Model site visit data, April–July 2022

As the two MOM Model awardees with the most diverse eligible populations, Texas and Tennessee cited targeted outreach efforts to reach non-White, non-English-speaking communities that may benefit from MOM Model programming. Key informants in these States referred to research that providers perceive the opioid epidemic as affecting the White community (Om, 2018; Schiff, Work, Foley et al., 2022), and most SUD outreach materials do not include images of people of color, highlighting the need for improved culturally appropriate outreach. Texas provider site staff intentionally developed MOM Model promotional materials featuring women of color (figure 3.4). Respondents in Tennessee indicated that non-English-speaking and rural beneficiaries are less likely to seek medication for OUD than White, urban residents. Tennessee believes future outreach efforts to non-White beneficiaries may need to focus on program aspects other than MAT treatment, such as peer recovery specialists or care coordination, because of cultural stigma against MAT in some non-White communities. This issue will be explored in later years of the evaluation.

Figure 3.4. Texas MOM Model Promotional Material Featuring Diverse Population in the Area

Equity in Outreach

Awardees are considering various approaches when conducting outreach about the MOM Model, such as using nonstigmatizing language, offering materials for non-English speakers (e.g., Spanish, Burmese), and targeting non-White, non-English-speaking communities that may benefit from MOM Model programming.

- Indiana recently shared race and ethnicity data with Medicaid MCEs[6] to increase outreach to identified underserved communities.
- The MaineMOM communications team worked with the MaineMOM Advisory Group to design MaineMOM communications campaign, solicit feedback, and amplify the voices of people in recovery in the campaign. Discussions with Advisory Group members helped develop the program's taglines: "MaineMOM—Hope, Support, Recovery" and "Your Story Is Still Being Written."

3. Beneficiaries' Model Awareness

Beneficiaries' awareness of the model varied. In general, beneficiaries had greater understanding of the extent to which their coordinated services was part of an intentional care model when (1) providers commonly referred to a program name (such as Tennessee's Firefly program or Indiana's Pregnancy Promise program) and/or (2) in locations that provided centralized care. In New Hampshire, all focus group beneficiary participants had heard of the MOM Model, referring to it as the "MOM grant," and were aware they were enrolled in the program. When asked how they had been connected with the

[6] MCEs are Indiana's care delivery partners.

program, one woman shared she was referred by a partnering mental health organization, while two beneficiaries had heard about the program in conversations with friends who were also in recovery. Another beneficiary told a friend she was having trouble scheduling care appointments, and the friend suggested that the MOM Model might be able to help. This beneficiary said:

> *[The MOM Model has been] a real blessing … because they've made my life a lot easier, and I know that if I need other resources, especially when it comes to my recovery, I can rely on them.*

Across States, among the beneficiaries interviewed, those in Maine's MOM Model appeared to have the lowest levels of Model awareness. Several interview participants from Maine did not appear to understand MaineMOM was a distinct program or confused it with other programs that either predated it or provided other kinds of psychosocial support. For example, one beneficiary said her friend was "in the program for a long time, like 8 years," while another mainly recalled that it was a program that "could help me find housing or anything I need for my baby."

Beneficiaries' awareness of the Model may reflect providers' outreach and engagement efforts (such as the use of gift incentives to attend care appointments on time) or a detailed consent and enrollment process. However, whether beneficiaries' Model awareness and identity as a Model participant influence their engagement in the Model is not clear. Because beneficiaries' identification with belonging to a cohort of similarly serviced clients or Model branding may influence enrollment and engagement, the evaluation will analyze participant engagement and feedback from beneficiaries and providers regarding Model beneficiaries' awareness in the next report.

B. MOM Model Population

MOM Model awardees and their clinical delivery partners submit beneficiary-level screening and assessment data (called process data in the evaluation) to CMS. Awardees from Indiana, Maryland, Maine, New Hampshire, Tennessee, Texas, and West Virginia reported beneficiary-level process data for 593 beneficiaries they had enrolled through June 30, 2022. This section reports on screening results submitted via these beneficiary-level process data, including MOM Model enrollee demographics and behavioral health and other risk factors among the MOM Model population. Appendix D discusses the uses and limitations of these data.

1. Screenings

In each State, MOM Model staff administer several screening tools and assessments, but types of intake and screening instruments vary across awardees (table 3.2). Screenings contribute to the development of MOM Model care plans and often play a role in care coordination opportunities (discussed in chapter 4, MOM Model Implementation).

Case managers, program managers, peer recovery specialists, and maternal care providers conduct screenings and assessments in person in most States with enrolled beneficiaries. The exception is Indiana, where case managers complete all MOM Model-required assessments with new beneficiaries over the phone.

A few care delivery partners and providers cited collecting the required volume of sensitive information early on in the relationship with beneficiaries as a challenge. To address this challenge, some programs, including those in Indiana and Tennessee, adapted their intake screening and assessment processes. For

instance, in Indiana, one MCE described its strategy of bundling all required data elements into three assessment instruments that facilitate "more of a conversation … instead of just asking question after question." In Tennessee, during the first 8 months of implementation, a beneficiary's intake appointment lasted 3 hours. The intake included a clinical encounter with a maternity care provider, a social worker screening to assess social and general supports (e.g., family support, safe housing, transportation) and depression (e.g., Patient Health Questionnaire [PHQ]-9), and a program orientation meeting with a peer recovery specialist. In response to beneficiary feedback, MOM Model staff now split the intake process into two appointments. This two-step intake process gives beneficiaries the option to stack the in-person appointments on the same day or complete the second part of the intake on another day. The first appointment includes clinical assessments for pregnancy and OUD care, infectious diseases, and screenings for health-related social needs. At the conclusion of this appointment, beneficiaries receive informational handouts about the services they will receive and how to access them. At the second appointment, beneficiaries meet with a peer recovery specialist and social worker and complete any remaining assessments.[7]

Table 3.2. Screening Tools and Assessments Administered by Awardees

State	Screening Tool												
	Health-Related Social Needs			Mental Health				Substance Use				Other Tools	
	PRAPARE	HRSN	4 Ps	PHQ-9[c]	PHQ-2	EPDS	ACEs	SBIRT	Self-report Intake Form	Verbal Screening	Drug Screen	PAM	Other
Colorado[a]		●	●					●	●	●	●		One Key Question
Indiana		●				●	●				●	●	HC, mDwise High Risk Assessment
Maine[b]		●	●							●	●	●	None
Maryland		●		●	●				●			●	MPRA, GAD-7, NIDA ASSIST SUD
New Hampshire[d]	●			●	●			●					ASQ
Tennessee	●			●		●	●					●	None
Texas		●				●		●				●	DAST-10[e]
West Virginia		●										●	PRSI

Note: 4Ps = Parents, Partner, Past, and Present assessment; ACEs = Adverse Childhood Experiences screening; ASQ = Ask Suicide-Screening Questions tool; DAST-10 = Drug Abuse Screening Test; EPDS = Edinburgh Postnatal Depression Scale; GAD-7 = General Anxiety Disorder-7; HC = Healthy Community screening; HRSN = Health-Related Social Needs screening tool; MPRA = Maryland Prenatal Risk Assessment; NIDA ASSIST SUD = National Institute on Drug Abuse Alcohol, Smoking, and Substance Involvement Screening Test; PAM = Patient Activation Measure; PHQ = Patient Health Questionnaire; PRAPARE = Protocol for

[7] Assessments and screenings are voluntary and conducted only with beneficiary consent, unless mandated by the court.

Responding to and Assessing Patients' Assets, Risks, and Experiences screening tool; PRSI = Prenatal Risk Screening Instrument; SBIRT = Screening, Brief Intervention, and Referral to Treatment; SUD = substance use disorder
[a] Not all screening tools are used by all three subgrantees.
[b] Maine administers a universal SUD drug screening during pregnancy.
[c] The PHQ-9 is only conducted if a beneficiary screens positive for depression during HRSN screening.
[d] All partner agencies administer PRAPARE and may also use other screening and assessments not required by the MOM Model, which may result in a referral.
[e] Verbal substance use tool administered universally in Texas
Source: Insight Policy Research analysis of MOM Model site visit data, April–July 2022

Equity in Screening

Many professional organizations (e.g., American College of Obstetricians and Gynecologists, American Society of Addiction Medicine, Society for Maternal-Fetal Medicine) recommend conducting universal screening for substance use during pregnancy using validated tools. Selective screening—screening solely based on known or perceived risk factors such as prior substance use—perpetuates discrimination and is subject to provider biases. Maine, New Hampshire, and Texas require universal screening for OUD/SUD. Key informants from Maine emphasized the importance of a consistent, universal screening approach for SUD during pregnancy. However, although universal screening is becoming more common in Maine, they noted that not all providers currently implement this approach despite the requirement.

2. Demographic Characteristics

As of the first implementation year, the MOM Model has predominantly served non-Hispanic White women aged 25 to 34 who are in generally good physical health but face challenges related to mental health, polysubstance use, and histories of trauma and abuse. The findings in this chapter are limited to beneficiaries with nonmissing information for a given data element. Appendix D presents additional process data on characteristics of MOM Model beneficiaries.

All MOM Model beneficiaries to date identify as female. Seventy percent are aged 25 through 34, and very few enrolled beneficiaries are younger than 20. Eighty percent have a high school diploma or GED. More than half are married or living with their partner, and about one-quarter are not in a relationship. The majority of beneficiaries had health insurance coverage prior to pregnancy: Approximately 70 percent were enrolled in Medicaid, 4 percent were insured by private or other (non-Medicaid) insurers, 15 percent were uninsured, and 11 percent had an unknown insurance status before pregnancy.

The relatively high share of White beneficiaries (86 percent) is consistent with other reports of race and ethnicity among pregnant individuals with OUD. Although proportions vary by State, other studies have found that the majority of those included in their samples (between 66 percent and 86 percent) were White (Clemans-Cope et al., 2019; Krans et al., 2019; Maeda et al., 2014). Many States implementing the MOM Model have predominantly White populations; only Colorado, Tennessee, and Texas have substantial racial and ethnic diversity in the areas served (Denver, Nashville, and Houston, respectively).

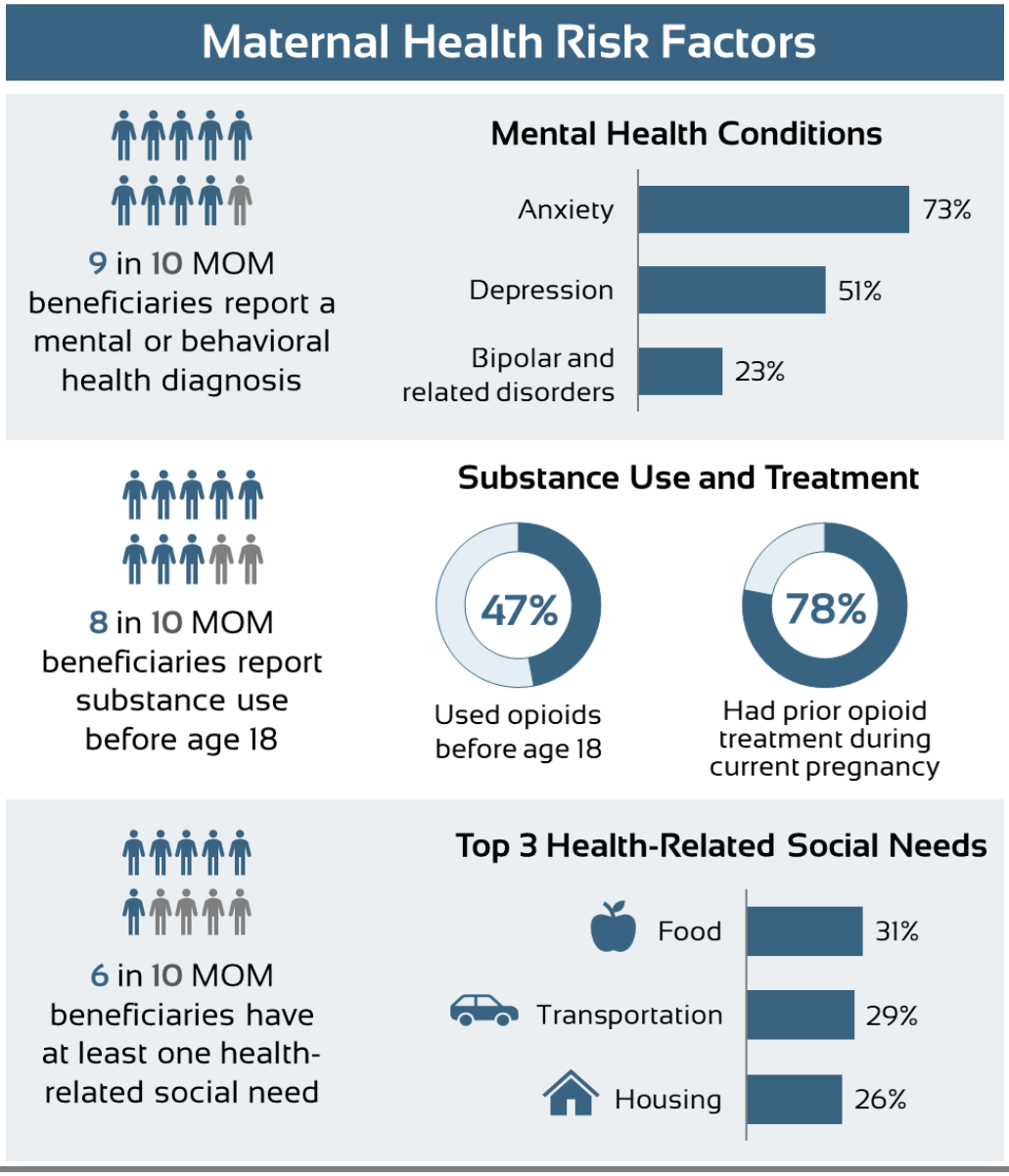
3. Risk Factors

Both pregnant and postpartum MOM Model beneficiaries reported high rates of maternal health risk factors that could adversely affect outcomes for themselves and their infants. The most common risks included mental health conditions, substance use and MAT during pregnancy, and health-related social needs (figure 3.5). The rates of mental health challenges identified through the MOM Model beneficiary screenings are higher than rates previously found among populations of pregnant Medicaid beneficiaries (Hill et al., 2018; Krans et al., 2018; Clemans-Cope et al., 2019). Most MOM Model beneficiaries self-reported or screened positive for mental or behavioral health conditions, most commonly depression,

anxiety, trauma- and stress-related disorders, bipolar and related disorders, and substance use-related disorders. Substance use-related disorders are defined as "mental health or behavioral health diagnoses other than OUD" in the MOM Model Data Reporting Guide. Most care delivery partners directly screened for depression and anxiety: About half of MOM Model beneficiaries screened positive for depression, and nearly three-quarters screened positive for anxiety. More than 80 percent of MOM Model beneficiaries also reported substance use before age 18.

Social needs among MOM Model beneficiaries were highlighted frequently during qualitative site visits, and more than half of beneficiaries screened positive for a health-related social need. The top three health-related social needs MOM Model beneficiaries reported were food insecurity, unreliable transportation, and housing insecurity, each reported by more than a quarter of enrolled beneficiaries.

Figure 3.5. Maternal Health Risk Factors Among MOM Model Beneficiaries During Implementation Year 1



Source: Insight Policy Research analysis of beneficiary-level process data submitted by awardees as of June 30, 2022

C. Summary and Future Considerations for the Evaluation

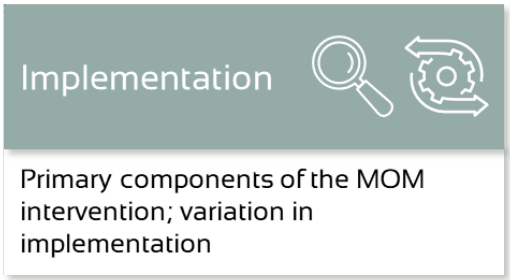
During the first implementation year, all but one MOM Model awardee State began enrolling beneficiaries. Although enrollment pathways varied across awardees, most used a flexible approach to support referrals from a variety of sources, often taking advantage of existing programs and infrastructure for pregnant beneficiaries with SUD. A majority of awardees used social media and developed a MOM Model website with contact information for referrals (including self-referrals). COVID-19, stigma, and provider availability and capacity all affected States' ability to engage beneficiaries, and all States remained well under their enrollment goals.[8]

The majority (80 percent or more) of enrolled MOM Model beneficiaries identified as White, non-Hispanic, and cisgender; had graduated from high school or had a GED; and were insured prior to pregnancy. MOM Model beneficiaries reported high levels of mental or behavioral health disorders and substance use beginning in adolescence or earlier (including previous opioid use). Almost one-third of enrolled beneficiaries reported food, transportation, or housing needs. The next chapter discusses how MOM Model awardees are implementing their MOM Model programs to meet the needs of enrolled beneficiaries.

[8] Data from Indiana, Maine, Maryland, New Hampshire, Tennessee, and Texas. West Virginia and Colorado delayed implementation by 6 and 10 months, respectively.

Chapter 4. MOM Model Implementation

The Implementation domain of the RE-AIM framework addresses the primary components of the MOM Model intervention and variation in implementation. The research questions for the Implementation domain follow:



- Did awardees incorporate best practices in care for pregnant and parenting people with OUD and their infants?
- Did awardees integrate care?
- What are beneficiaries' experiences with their States' MOM Models, and to what extent do they indicate satisfaction with the programs?

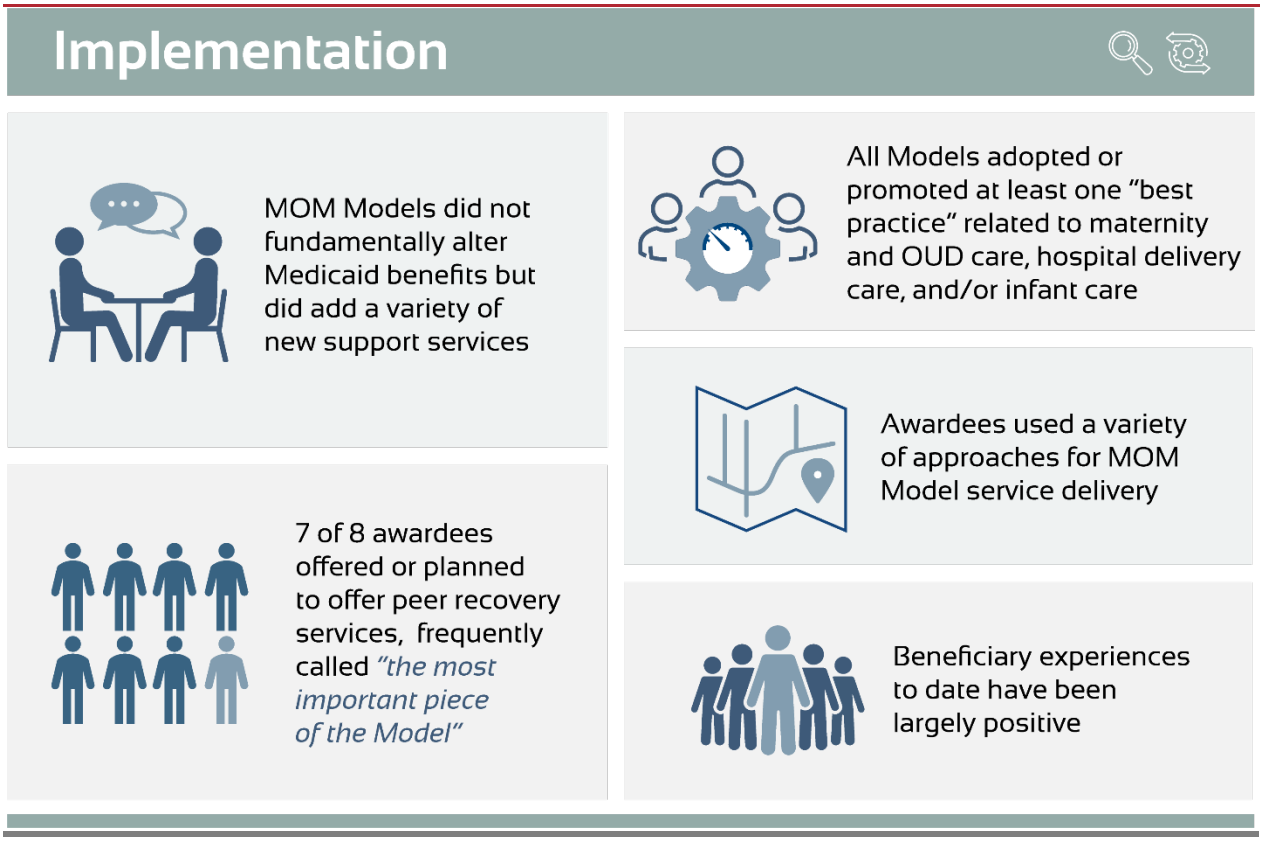
This chapter explores case study findings that describe how MOM Model implementation activities align with these research questions and the ways these activities are similar or unique across State awardees. The case study data featured in this chapter stem mostly from interviews with MOM Model staff. Case study teams also collected perspectives of beneficiaries through focus groups and individual interviews in five of the eight MOM Model States and led a Photovoice activity in one State (see table "Number of Beneficiaries Participating in Data Collection Activities, by State and Activity," appendix E). Enrollment was not sufficient to conduct beneficiary data collection in the remaining three States but will be collected during 2023 site visits. Throughout this chapter, Photovoice photographs illustrate findings in callout boxes labeled "Photovoice Entry."

All awardees except Indiana have implemented MOM Models that integrate OUD treatment with prenatal and postpartum care, though some awardees were still in the early stages of beneficiary engagement and enrollment at the end of the first implementation year. As mentioned in chapter 3, some Models (Maine, New Hampshire, Tennessee, Texas, West Virginia) have grown out of comprehensive, existing programs that serve the MOM population, while others (Colorado, Indiana, Maryland) developed from new partnerships and programming. These differences in Model startup and the variety of approaches each Model implements mean that enrollment is too low and programs have not been operational long enough for the evaluation to determine explicit implementation successes. However, through the analysis of site visit data from each MOM Model State's awardees, care delivery partners, and care provision sites, the evaluation team explored the following themes within and across Models:

- Adoption of best practices
- Care integration and coordination
- Peer recovery services
- Perceived early successes and challenges to Model implementation

Figure 4.1 illustrates key first implementation year findings related to the Implementation domain.

Figure 4.1. Key Implementation Year 1 Findings Related to Implementation



Note: OUD = opioid use disorder
Source: Insight Policy Research analysis of beneficiary-level process data submitted by awardees as of June 30, 2022

A. MOM Model Services and Key Features

MOM Models across the eight Model States have not made major changes to services provided to pregnant and parenting Medicaid beneficiaries with OUD. Clinical services in each Model cover screenings, prenatal and postpartum wellness visits, substance use treatment (including MOUD), and mental health services. The intensity and integration of these services vary across Models. Many Models have provider sites or partners that also offer nutrition services, family planning care, and childbirth education as part of their clinical services to MOM Model beneficiaries. However, these services are not always the standard of care at all MOM Model provider sites.

The approach to MOM Model service provision varies across States. Tennessee and Texas provide centralized Model services in one location. Colorado, New Hampshire, and Maryland operate in specific regions, and West Virginia, Maine, and Indiana serve all or most of their respective States. In Indiana, Maine, Maryland, New Hampshire, and West Virginia MOM Models, any care provider associated with a care delivery partner may enroll a MOM Model eligible patient in the State. Seven States enhanced or added services for MOM Model beneficiaries:

- **Childcare in Indiana.** In 2021, Indiana's awardee Family and Social Services Administration added a new childcare benefit for Indiana's MOM Model (Indiana Pregnancy Promise Program,

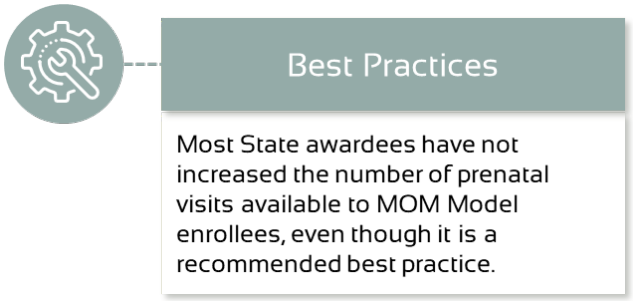
or IP3) beneficiaries to keep their appointments for OUD treatment, mental health visits, postpartum care, and life skills or parenting support classes.[9]

- **Doula care in Maine**. Though not a service addition, key informants mentioned that in the past year certified doulas (prenatal or postpartum) were added to the list of providers eligible to serve as MaineMOM patient navigators.
- **Lactation services in Tennessee.** In 2021, Tennessee MOM Model (Firefly) added a lactation consultant to provide services to MOM Model beneficiaries.
- **Peer recovery services** were made available Model-wide in Indiana, Maryland, Tennessee, and Texas and at some sites in Maine, New Hampshire, and West Virginia.

1. Adoption of Best Practices

This section examines the adoption of best practices across MOM Models in four main areas of care central to service provision for MOM Model beneficiaries:

- **Initiation of opioid agonist therapy or MOUD**.[10] Best practices of care for pregnant and postpartum people with OUD include screening for maternal substance use, SUD, and treatment initiation, including immediately initiating MOUD as needed. While MOUD may not be an appropriate treatment plan for all patients, best practice protocols recommend starting MOUD for qualifying candidates, with patient consent, as soon as treatment need is established (e.g., before or during pregnancy) and continuing through labor and birth, during postpartum care, and beyond.



- **Newborn care for infants with NOWS.** Best practices focusing on assessment of and care for NOWS include maternal-infant dyad bonding interventions, such as breastfeeding (Pritham et al., 2012); "rooming-in," meaning that the birth parent and infant stay together during the birth hospitalization (MacMillan et al., 2018); and reduced length of NICU stay (Lembeck et al., 2019) to reduce lengths of hospital stay or cost (Grossman et al., 2017; Holmes et al., 2016). The MOM Model does not require the application of specific best practices to newborn care for infants born to parents enrolled in the Model. However, most States with hospital-based partners initiated protocols to promote parent and infant boding for newborns with NOWS, including using the Eat, Sleep, Console (ESC) protocol to assess and treat NOWS.[11]

[9] Childcare funding is for MOM Model services but does not come from MOM Model funds; the Indiana awardee collaborated with the Indiana Office of Early Childhood Education and Out of School Learning and secured funding for Model beneficiaries' childcare from the Child Care and Development Fund (CCDF), administered by the federal Administration for Children and Families. States traditionally use CCDF to provide financial assistance to low-income families to access childcare so they can work or attend a job training or educational program.

[10] This evaluation does not assess providers' or beneficiaries' decisions to begin MOUD. However, in assessing best practice adherence, the evaluation team seeks to understand MOM Model beneficiaries' access to MOUD during and after pregnancy and the extent to which Model providers offer MOUD education and prescription options to beneficiaries. Chapter 3 provides an overview of beneficiary uptake of MOUD.

[11] The ESC protocol emphasizes nonpharmacologic care as the first line of treatment for NOWS. This protocol focuses on three "observation only" items to guide management: (1) Can the infant eat ≥ 1 oz per feed or breastfeed well? (2) Can the infant sleep ≥ 1 hour? (3) Can the infant be consoled within 10 minutes? If all three criteria are met, no further interventions are necessary. If not, increased nonpharmacologic interventions (e.g., swaddling and holding, feeding on demand, low stimulation environment) are prioritized before pharmacologic treatment is started.

- **Comprehensive care for pregnant and postpartum people with OUD**. Because of the complex care needs of pregnant people with OUD, this population is recommended to receive more frequent visits than the standard prenatal visit schedule (Johnson, 2019). All MOM Models aim to increase contact with Model beneficiaries through case management or increased prenatal, postpartum, and OUD care visits. Comprehensive care includes a shared decision-making approach with the provider and the pregnant person on how to handle pain in the prenatal, laboring, and postpartum periods.
- **Best practices in OUD in specialized training for clinical and nonclinical staff**. Staff training on stigma, bias, and discrimination and on providing trauma-informed care and treatment for pregnant and postpartum people with OUD is an essential component of all Model approaches.

Photovoice Entry

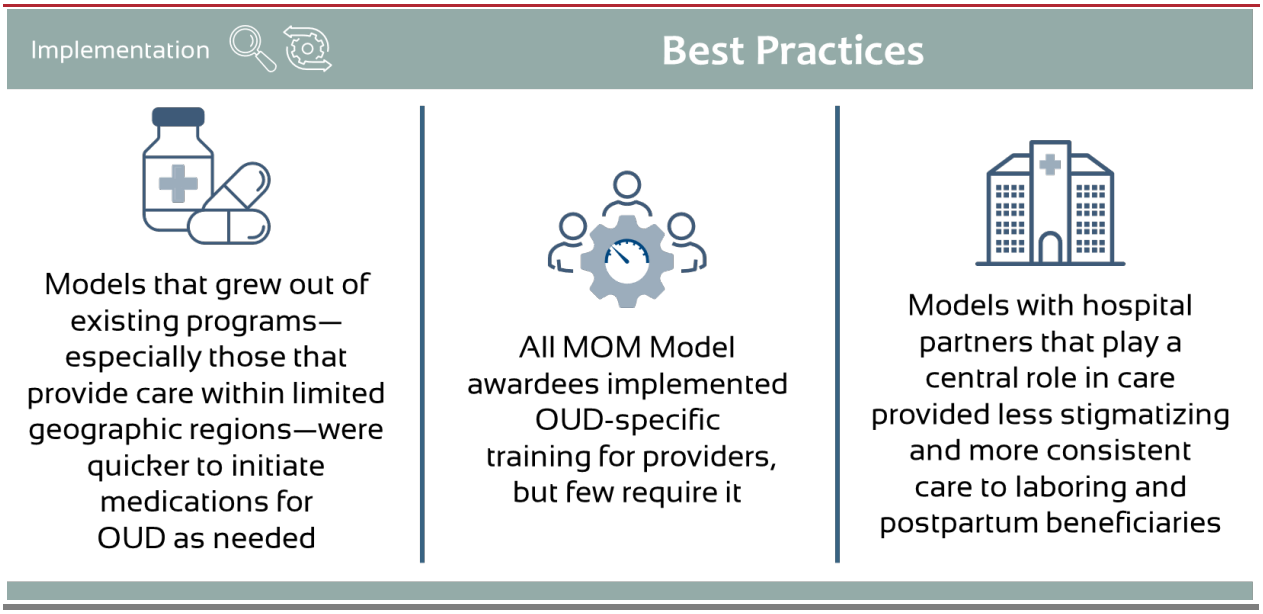
Stepping up: These are my feet with my daughter on my feet. If I wasn't sober I would not be a good role model for her to follow in my footsteps. Because I want to be there for her forever has been enough to keep me on the straight and narrow. The longer that I stay sober the more my brain is getting back to normal to where I can think more straight.

Implementation activities are still nascent, and many States are working toward incorporating more best practices into their service approaches. Case studies show that Models that promote best practices do so more frequently and consistently when Model activities take place in a single clinic or within a limited geographic region. Consistently promoting best practices is more difficult when Models are spread across several locations, even among programs that had preexisting services for Model-eligible patients. Models with hospital partners that play a central role in care were more likely to promote best practices for laboring and postpartum beneficiaries and their infants. These practices included the following:

- Adequate pain relief during labor and the postpartum period
- Best practices for newborns born to people with OUD, including consistent use of the ESC protocol and recognition that NOWS is an expected and treatable condition associated with MOUD
- Respectful and compassionate care of laboring and postpartum beneficiaries

Figure 4.2 provides an overview of key findings of best practices implementation across Models.

Figure 4.2. Key Findings Related to Best Practices Implementation in MOM Models



Note: OUD = opioid use disorder
Source: Insight Policy Research analysis of MOM Model site visit data, April–July 2022

Initiation of opioid agonist therapy or MOUD

Best practices regarding the initiation of MOUD in pregnant and postpartum people with OUD happened more frequently in Models with existing pathways for MOUD treatment. Beneficiaries found these pathways and their ability to initiate or stay on MOUD as a key reason to enroll in the MOM Model or stay engaged in Model services. These beneficiaries reported that consistent access to medically supervised MOUD was the most effective way to stay in recovery while pregnant; without MOUD, they would have relapsed and possibly lost their children as a result of infant death or Child Protective Services' involvement. One focus group participant stated:

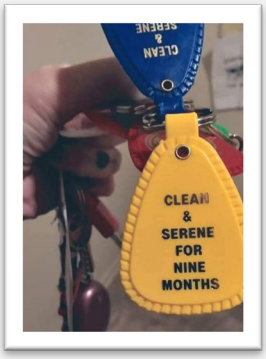
> *What I needed was to get on maintenance medicine. I planned my relapse before I even left the rehab a lot of times, and I didn't want that this time. I didn't want to lose my baby.*

In Models with consistent protocols about MOUD initiation across all sites, beneficiaries indicated that providers' positive attitudes about and promotion of MOUD supported their adherence to their treatment plans. One focus group participant explained the shame they felt after a pediatrician (external to the Model) berated them when their infant was hospitalized for NOWS symptoms. The participant then further described the compassionate response of a Tennessee MOM Model staff member, who noted that MOUD may have saved their lives:

> *I thought, "My baby wouldn't be like this if I hadn't been taking that medicine." And that's when my recovery coach in Firefly [Tennessee's MOM Model] and the lactation consultant were like, "Honey, if you hadn't been on that medicine, you and him both probably wouldn't be here," because I was really bad on heroin; I was injecting it like 15, 20 times a day.*

Newborn care for infants with NOWS

Photovoice Entry



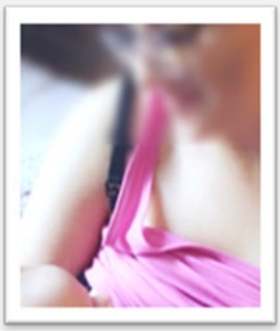
Nine months clean. I never thought I would be able to make it so far in recovery. I used to be existing. Now I am living.

Best practices related to infant care were easier to adopt when hospital staff and services were fully integrated into MOM Models. Some Models designed services only for the outpatient setting, leaving a gap in Model-specific services that apply to parents and infants during the birth hospitalization. As a result, best practices on NOWS care for infants were consistently reported only among Models that included a hospital with labor and delivery as a MOM Model partner (table 4.1).

The ESC protocol is one of several approaches neonatal clinicians use to assess NOWS as a replacement for previous assessments (the Finnegan scoring) (Wachman et al., 2018). ESC has been associated with reduced length of hospital stay (Grossman et al., 2018). During a focus group with MOM Model beneficiaries from Maine, one beneficiary commented how the switch from the previous scoring system for newborns to ESC made her feel less judged by hospital staff after delivering her second baby while receiving MOUD. She told the evaluation team:

> *The difference for me was the 'scoring' system they used [when] my [first] baby was born. They … scored [her] on screaming, the ability to calm down, sleeping, little things like that. This go-around, I was very, very pleased to learn that they [now] base it on quantity of sleep and ease of calming the baby down.… I feel this is going to be so much less judgmental.*

Photovoice Entry



Breastfeeding keeps me clean because whatever I eat, drink, or do, it'll go to my baby. Different things run through my head that help me stay clean

Table 4.1. Implementation of Specific Best Practices for NOWS Care as Standard Practices of Care at MOM Model Sites Visited in Implementation Year 1

State[a]	Best Practices for NOWS Care		
	Eat, Sleep, Console for Infants With NOWS	Dyad Bonding Approaches[b]	Staff Training on Care for Infants With NOWS
Colorado	◑	◑	◑
Indiana	◑	◑	◑
Maine	●	●	●
New Hampshire	◑	●	●
Tennessee	●	●	●
Texas	●	●	●

Note: NOWS = neonatal opioid withdrawal syndrome
● = standard of care reported in all sites; ◑ = standard of care reported in at least one site
[a] At this time, the evaluation team does not have information on the care provision for infants with NOWS at the only hospital providing care for MOM Model beneficiaries in Maryland's pilot site. West Virginia's MOM Model is clinic-focused, so hospital-based services discussed in the table do not apply to Model activities.
[b] Such as breastfeeding, rooming-in, and skin-to-skin contact
Source: Insight Policy Research analysis of MOM Model site visit data, April–July 2022

Comprehensive care for pregnant and postpartum people with OUD

MOM Models in which providers were closely integrated with Model protocols, such as Models with centrally located care or in States where the Model grew out of an existing program, also provided additional touchpoints for pregnant people throughout their pregnancies. These Models were more likely to have pain management protocols specific to the needs of people with OUD, designed through shared decision-making between a pregnant individual and their provider. As a result of these practices, beneficiaries in these States reported more positive experiences with care providers that worked at sites tightly integrated with the Model rather than providers that were not directly involved in collaboration efforts and had not received Model-based training. Beneficiaries appreciated case managers who helped them navigate medical care and related needs, in addition to receiving prenatal and OUD treatment appointment reminders and psychosocial support, such as budgeting assistance and applying for rent subsidies.

Best practices in specialized training on OUD for clinical and nonclinical staff

MOM Models delivered staff training using different curricula, and each had varied requirements for staff and provider participation (table 4.2).

Table 4.2. Clinical Training Modules by State MOM Model

State Model	Partner, if Applicable	Selected Training	Training Highlights
Colorado	Denver Health, one of Colorado's three partners	CHoSEN QIC	▪ Provide training in delivery of Edinburgh depression screenings; conduct screenings regularly during the prenatal care period; and implement the Eat, Sleep, Console model and Plans of Safe Care across service areas ▪ Host semiannual forums to discuss updated best practices for substance-exposed newborns and facilitate trainings to improve care
Indiana	Model-wide, not partner-specific	Project ECHO	▪ Pregnancy in OUD track: modules on stigma, MOUD in pregnancy, pain management, postpartum care, and peer recovery coaching ▪ Neonatal Abstinence Syndrome (NAS) track: unit on using Eat, Sleep, Console as evidence-based model of care for NAS/NOWS
Maryland	MACS for MOMs training		
Maine	MaineHealth, 1 of Maine's 14 sites		
West Virginia[a]	Marshall Health, one of West Virginia's five sites currently implementing MOM Model		
Texas	All partners	Training modules created by care delivery partners	▪ Evidence-based practice of care for MOM Model population and infants with NOWS, including pain management during labor and bonding approaches with infants after birth
Tennessee	Vanderbilt University Medical Center		

Note: CHoSEN QIC = Colorado Hospital Substance Exposed Newborns Quality Improvement Collaborative; ECHO = Extension for Community Healthcare Outcomes; MACS for MOMs = Maryland Addiction Consultation Service for Maternal Opioid Misuse; MOUD = medications for opioid use disorder; NOWS = neonatal opioid withdrawal syndrome; OUD = opioid use disorder; SUD = substance use disorder

[a] In addition to Project ECHO trainings listed, West Virginia requires its Drug Free Mom and Baby sites enrolled in the MOM Model to train staff on topics such as best practices in case management; cultural awareness; behavioral health with additional training on SUD; and evidence-based pregnancy care, infant care, trauma, and ethics.

Source: Insight Policy Research analysis of MOM Model site visit data, April–July 2022

Equity-Related Training and Education

All awardees have incorporated training and education to promote equitable care practices and reduce stigma, most commonly through Project ECHO (Extension for Community Healthcare Outcome; see table 4.2) and other types of training and learning opportunities. Colorado and New Hampshire are implementing or planning collaboratives for monthly educational opportunities. One care delivery partner in Colorado has held a training for child welfare workers on the development of a Plan of Safe Care for substance-exposed newborns, with the intention to reduce stigma directed toward MOM Model beneficiaries. Residential treatment centers in Indiana provide "person-first" language training to their intake team. In Texas, trainings available through the care delivery partner include the Centers for Disease Control and Prevention's Hear Her video series, which focuses on listening to patients. In response to prior evaluation findings, the care delivery partner provided several trainings on cognitive biases, such as anchoring and normalcy, and grand rounds now routinely include SUD-related cases where biases appear to have played a role in patient outcomes.

2. Care Coordination and Integration

All awardees changed how they coordinate care or share information across providers. Models include at least one approach to maximize care coordination for MOM Model beneficiaries. These approaches included the reduction of care siloes, case management, development of formal collaboration approaches among providers, or a combination of approaches. Some care delivery partners used their peer recovery coaches to help coordinate or manage care within the Model (table 4.3).

During MOM Model implementation, States used Model funds to improve care integration using widely varying approaches. Integrated care in the MOM Model refers to systems that break down care siloes between prenatal and postpartum care, OUD treatment, mental health treatment, and wraparound services that facilitate OUD recovery. Care integration occurs in Models that provide services through a single delivery system. Since sustainable payment systems are not yet in place, no MOM Model has achieved fully integrated care, but some Models have restructured care delivery through systemic changes to operations and information sharing.

In addition to these changes (see Esposito et al., 2021b), Models are working toward integrating care through modifying care coordination efforts. While care coordination activities differed across Models, they were either part of a *systemic approach* to care coordination or a *connecting approach* to care coordination.

The **systemic approach to care coordination**—

- More closely resembles the activities necessary to achieve full care integration, including organizing care activities, assembling care personnel and other resources, and managing information exchange and consultation among providers responsible for different aspects of care
- Involves efforts to eliminate care silos and integrate information sharing
- Attempts to create a culture where providers are more likely to change their behavior
- Occurs in MOM Models that are more geographically centralized and where existing care coordination was in place prior to the Model, but where Model funds facilitated an expansion of services and the improvement of information systems

The **connecting approach to care coordination**—

- Uses a lighter touch than the full revision of care systems and their communications and involves introducing connectors to bridge existing—but still siloed—systems
- Involves hiring care coordinators or case managers to coordinate care and improve care access for pregnant and postpartum Medicaid beneficiaries with OUD in their States, generally through connecting beneficiaries with siloed care for SUD, behavioral healthcare, prenatal and postpartum care, and other wraparound services
- Creates a culture where a single connector navigates a patient through care

- Occurs in MOM Models with more distributed systems or Models that have many providers across a larger geographic region and those that use a case management approach without fully engaging the case manager in information sharing across care types or practices (such as provider huddles)

States used Model funds to hire new care coordinators or expand the roles of existing care coordinators who worked with Model beneficiaries through case management, care coordination support, or the support and integration of information sharing (table 4.3). "Case management" is an optional Medicaid benefit defined as "services furnished to assist individuals eligible under the Medicaid State plan who reside in a community setting or are transitioning to a community setting, in gaining access to needed medical, social, educational, and other services" (CMS, 2019b, p. 85). Within the context of the MOM Model, case management involves personalized guidance through MOM Model services, including the development of personalized care plans and frequently the scheduling of care appointments across services.

Table 4.3. Use of Model Funds to Expand Care Coordinator Roles

Care Coordination Staffing	Approach	Implementation Activities
Formal case management	Connecting approach	▪ Indiana's MOM Model provides enhanced phone-based case management services to pregnant people with OUD through four Medicaid MCEs. Model beneficiaries have more frequent contact with case managers than Medicaid beneficiaries who are not eligible for MOM Model or choose not to enroll. MOM Model case managers' caseload is half that of Indiana's standard pregnancy case management programs. ▪ Maryland provided enhanced case management services, which included screenings and coordination activities, such as identifying and scheduling appointments with providers in disparate care areas. ▪ New Hampshire provides enhanced phone-based case management services to pregnant people with OUD through four Medicaid MCEs. Model beneficiaries receive more intensive contact with case managers than pregnant Medicaid beneficiaries not enrolled in the MOM Model. The MOM Model case managers serve a caseload of 35 beneficiaries, approximately half the caseload of case managers in standard State pregnancy case management programs (see also collaborative provider groups).
Case management-like approach	Connecting approach	▪ Colorado's Model funds care coordinators at each site. They identify needs and make referrals to formal care integrator support from a Regional Accountable Entity. ▪ To gather comparative information about the challenges and strengths of various approaches, Maine used Model funds to pilot projects on incorporating different models of patient navigation and using different types of staff to provide care coordination services. Findings from these pilot projects were not available at the time of the site visit, but the awardee plans to use findings from these projects to inform future care coordination staffing.

Care Coordination Staffing	Approach	Implementation Activities
Collaborative provider groups	Systemic approach	▪ New Hampshire's case management takes place in Care Coordination Committee meetings, which link partner staff and staff from other community organizations that work directly with MOM Model beneficiaries across the Model system (e.g., case managers, social workers, licensed mental health therapists, OB/GYNs, nurse practitioners, midwives). At these meetings, care managers share insights about cases and resources available to pregnant individuals with OUD. ▪ Tennessee's MOM Model created a formal Collaborative Care Program that begins at Model enrollment. Clinic staff hold two types of cross-team meetings: daily huddles and monthly collaboration meetings. Staff use the daily huddles to discuss the schedule and needs of each beneficiary who will visit the clinic that day; monthly meetings review patient progress through the Model. Peer recovery specialists lead much of the daily care coordination for Tennessee's MOM Model beneficiaries. ▪ Texas's MOM Model holds weekly multidisciplinary huddles that include Ben Taub Hospital clinic staff (physicians, nurses, the psychiatrist, and the clinic social worker) and peer specialists from the Model partner, Santa Maria Hostel. Huddle discussions focus on scheduled patients for the week and include conversations about the patient activation measure survey score and how staff can use that information when interacting with patients. This approach is not fully integrated because Santa Maria Hostel staff are unable to access Ben Taub's electronic records.

Source: Insight Policy Research analysis of MOM Model site visit data, April–July 2022

Models where labor and delivery services are closely incorporated into MOM Model services also reflect better integrated care than Models that do not formally communicate with providers and postpartum staff at birthing hospitals. Beneficiaries reported far more positive experiences with their labor and postdelivery care from hospitals associated with the MOM Model than the hospitals peripheral to the Model. For example, in Texas, two beneficiaries provided their perspectives on giving birth while enrolled in the Model compared with their previous birth experiences. Both interviewees described feeling understood and cared for during labor and delivery, in contrast to their prior experiences. One interviewee stated:

> *With my second daughter, I had the best labor and delivery experience. The nurses were just fantastic. They were just great coaches, even the doctor. She was a female doctor and just a great coach. Just very—just down to earth and, I don't know, comical. They understood me. Whereas when I had labor and delivery with my first daughter, they made me wait until I was dilated to a five before getting an epidural. I was screaming. I was in so much pain. They just—they weren't as caring with me … whereas with my second, they were just so much more caring.*

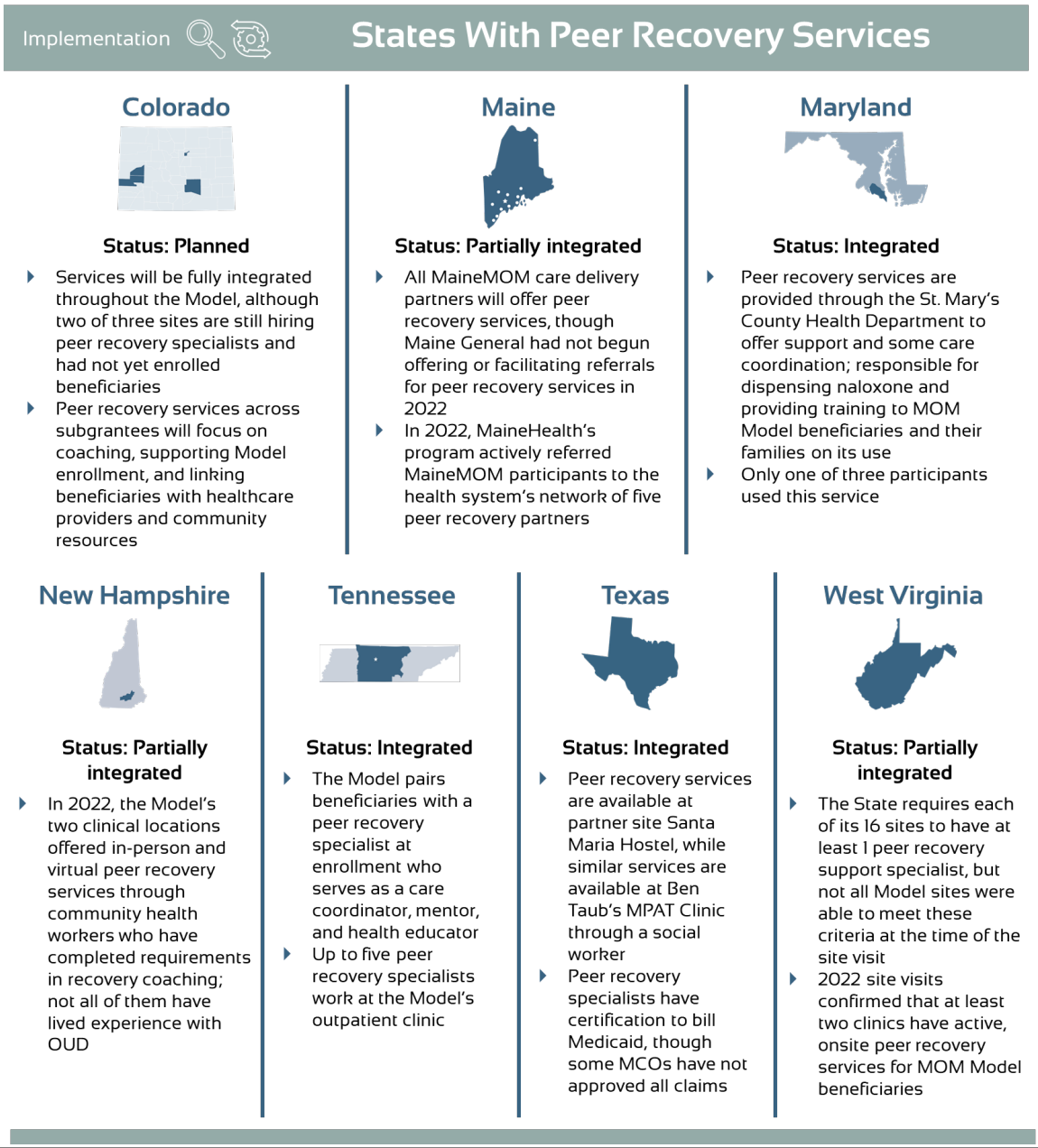
3. Peer Recovery Services

Peer recovery services are a common addition to care models and interventions serving people with OUD. Peer recovery services refer to the use of "peers" as individuals with lived experience of addiction and recovery who undergo training to assist and support others through the recovery process (Jack et al., 2018; SAMHSA, 2009). These services typically involve nonclinical assistance to support OUD recovery by providing emotional and informational support or assistance with coordinating treatment efforts (SAMHSA, 2009). Providers and beneficiaries indicated that peer recovery services were one of—

if not the most—important elements of care added to Model services because of the importance of integrating the support of a person with shared living experience into a recovery model. PRS staff provide emotional support, a sounding board for discussion and encouragement, and a nonjudgmental voice in helping people remain in recovery.

To date, most MOM Models aim to fully integrate peer recovery specialists into their services (figure 4.3). The Models that have fully integrated these services report that they reduce feelings of stigma about OUD treatment in pregnancy, coordinate care, and remove barriers to receiving care in the Model.

Figure 4.3. Overview of Peer Recovery Services by State



Note: MCO = managed care organization; MPAT = Maternal Perinatal Addiction Treatment; OUD = opioid use disorder
Source: Insight Policy Research analysis of MOM Model site visit data, April–July 2022

Even with initial praise on the role of peer recovery services in less stigmatized care, Models have been facing challenges in recruiting and maintaining peer recovery specialists with appropriate qualifications. For instance, at the time of the Colorado 2022 site visit, one State subgrantee had a peer recovery specialist position that had remained unfilled for months because applicants did not meet the requirement for lived experience with OUD. In Tennessee, the MOM Model met its goal of hiring five peer recovery specialists, but informants reported an unexpectedly high rate of turnover among these staff during the first year, and at the time of the 2022 site visit, only two specialists remained on staff. In response to these challenges, leadership in Tennessee's Model assessed lessons learned and took the following actions:

- Engaged external partners with experience integrating peer recovery specialists in their programs
- Collaborated with and attended trainings by the Tennessee Association of Alcohol, Drug, and other Addiction Services on effective supervision and hiring of peer recovery specialists
- Made mental health resources available to peer recovery specialists to help process trauma; resources included monthly group meetings with a psychologist and one-on-one counseling

In contrast to Tennessee's Model, MaineMOM intentionally keeps peer recovery specialists outside the clinical teams to ensure protected and private relationship between the peer recovery specialist and the client. This intentional separation may be the reason Maine did not experience some of the similar staffing issues reported by Tennessee's partners; the evaluation team will explore this contrast further in the next evaluation report.

Equity in Peer Recovery Support Services

People with SUDs often receive inferior care and are stigmatized in mainstream healthcare settings. MOM Model awardees highlighted that peer recovery support specialists and other staff members with lived experience of OUD during pregnancy help engage beneficiaries and foster trust. In Maine, key informants emphasized the value of disconnecting the role of peer recovery partners from that of other providers. After providers make a referral, they do not have any further communication with the peer recovery specialist to protect patient privacy and trust. One peer recovery specialist explained:

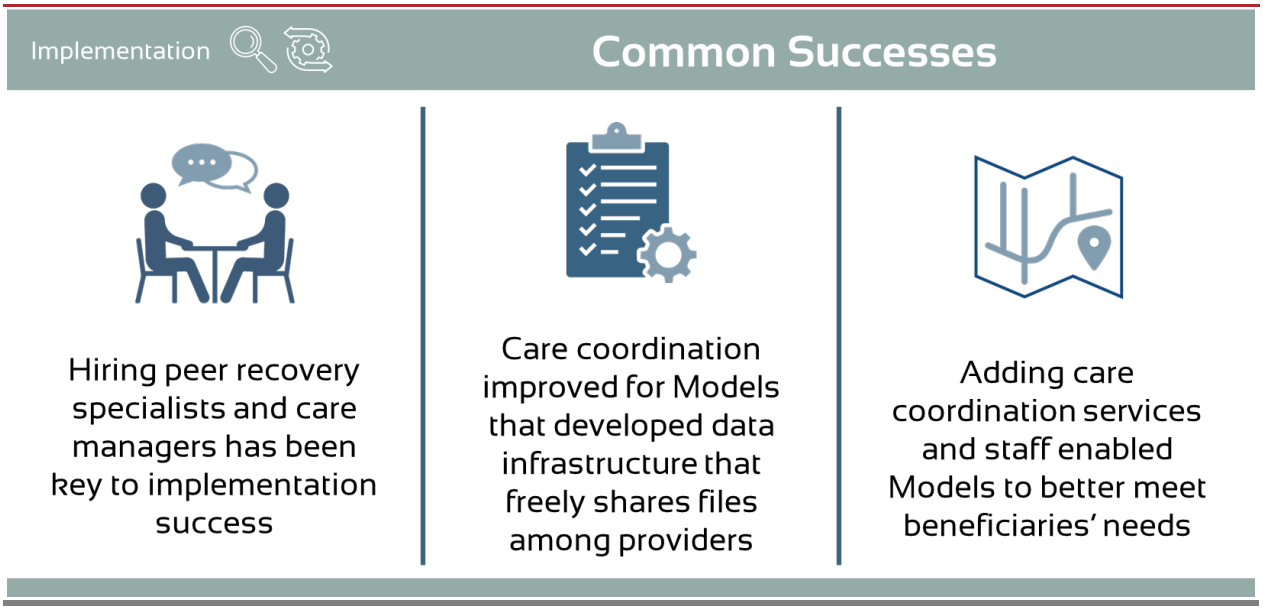
> *"When I receive information that does not come directly from the person, it creates a rift in that relationship. I know something about them that they have not [personally] disclosed to me, and that puts me in a position of power over them. I am not more powerful; I am just another human being who has had a similar experience."*

B. Implementation Successes

The evaluation team asked all key informants across Model sites to identify areas of success during the first year of Model implementation. Common themes emerged about progress in the following implementation areas (figure 4.4):

- Introduction or expansion of peer recovery services
- Data sharing and system infrastructure development
- Addition of care coordination services and case management

Figure 4.4. Common Contributors to Implementation Success Across Models



Source: Insight Policy Research analysis of MOM Model site visit data, April–July 2022

1. Hiring of Peer Recovery Service Support Staff

Access to care from providers with lived experience is an important component of equitable access to supportive care for MOM Model beneficiaries. Key informants in two States unanimously emphasized the value of peer recovery services and reinforced the idea that this component was "the most important piece of this Model" (said specifically by a Maine care provider). Providers and beneficiaries reported that Model beneficiaries value peer recovery specialists because they have experienced pregnancy and parenting with OUD and are a "familiar face" available at any time for support. Nearly all Model beneficiaries interviewed believed that peer recovery specialists remove barriers to OUD recovery.

2. Data Sharing and System Infrastructure Development

MOM Model successes included strengthened infrastructure in existing programs. Informants from co-located care models pointed out that the development of data collection and sharing protocols specific to the MOM Model strengthened their existing infrastructure for serving the MOM Model population, reflecting improved data systems and more focused screening protocols. These Models brought in partners that refined data sharing and data transfer technologies to ensure all MOM Model data elements can be reported. The addition of these systems enabled MOM providers to refer beneficiaries to services and track these referrals.

3. Addition of Care Coordination Services

Key informants cited increases in provider collaboration and coordination services as an early MOM Model "win." When asked about successful Model components from the first year of implementation, key informants from six of the eight MOM Models said partner and provider collaboration led to the greatest gains in ensuring the MOM Model met beneficiaries' needs and partners delivered services according to Model plans. In most cases, key informants credited Medicaid awardees to this early collaboration, indicating that Medicaid staff promoted the need for early collaboration and meetings

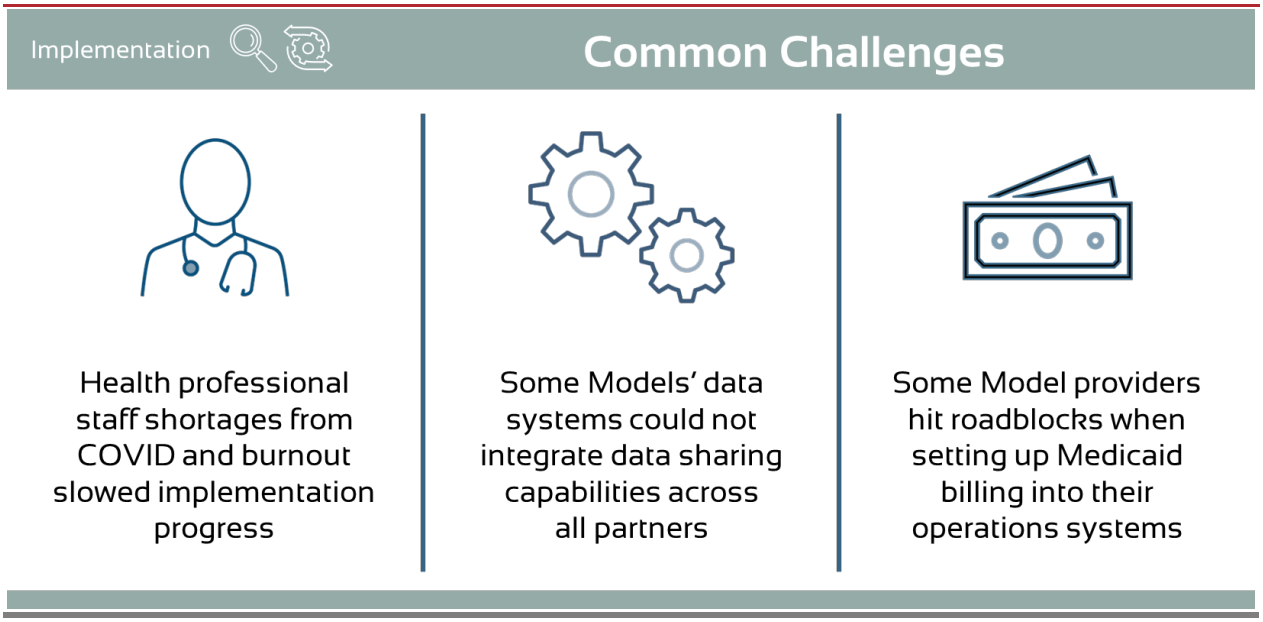
among Model providers. Often, informants explained that collaboration among partners was the main contributor to improvements in care coordination and information sharing. Models that held regular care coordination meetings with different provider types indicated these meetings were an opportunity to determine how to connect beneficiaries to the services they need within the MOM Model network and beyond. Key informants reported these meetings also help target the specific care Model beneficiaries need to meet their recovery goals and have healthier pregnancies.

C. Implementation Challenges

Key informants identified challenges that have hindered Model implementation during the first implementation year. The leading challenges identified were (figure 4.5):

- Staffing shortages
- Burdens related to sharing of Model-specific data
- Problems with billing and payment for services

Figure 4.5. Common Implementation Challenges Across Models



Source: Insight Policy Research analysis of MOM Model site visit data, April–July 2022

1. Staffing Shortages

Staffing shortages, burnout, and a lack of qualified personnel created implementation challenges in most States. Informants indicated staff shortages initially grew as a result of COVID-19 during the pre-implementation year and continued into the first implementation year. Provider sites across Maine, New Hampshire, Texas, and West Virginia indicated staff turnover, transitions, and shortages were commonplace. Key informants noted that finding adequately trained and qualified healthcare staff to treat pregnant and postpartum people with OUD was a challenge prior to the COVID-19 public health emergency, and maintaining staff because of burnout has become an even greater challenge for Model provider sites since 2020. The pandemic has reportedly exacerbated turnover rates among licensed

providers at rural MOM Model provider sites, particularly those in Colorado and West Virginia, resulting in inconsistencies in care.

Because Model outreach, enrollment, and even care coordination rely heavily on relationships between partner organizations, staff turnover can also mean needing to start from scratch building a partner relationship when key staff leave. Key informants noted program staff and providers had limited bandwidth to focus on MOM Model implementation because of the pandemic-related responsibilities (e.g., operating vaccine clinics), and the pandemic was preventing beneficiaries from gathering in person for group care and support. Some key informants viewed the absence of in-person MAT and prenatal and postpartum support groups as a key missing piece of the MOM Model.

2. Burdens and Challenges Related to Data Entry and Sharing of Model-Specific Data

Some States continued to experience challenges with data sharing permissions and reporting across MOM Model systems and providers. Model leaders are working to address these challenges. A wider issue is the concerns of potential MOM Model enrollees about their children being removed from their custody if they share information about their OUD and OUD treatment with State programs, Child Protective Services, or their prenatal providers. Concerns about child welfare involvement may be suppressing MOM Model enrollment numbers. The evaluation team plans to explore this connection in future implementation years.

Equity in Data Collection and Reporting

Several awardees described challenges in disaggregating data by race, ethnicity, and other characteristics because of small denominators. For example, Texas reported it currently has too few individuals enrolled to facilitate meaningful subgroup analysis. Similarly, when the Colorado MOM Model begins enrolling beneficiaries, each of the three subgrantees will collect some level of sociodemographic and social determinants of health screening data. However, because the data systems are not shared across subgrantees within the State and each subgrantee anticipates enrolling a small number of beneficiaries each year, subgroups may not be sufficient for meaningful analysis.

3. Problems With Billing and Payment for Services

Many States experienced challenges transitioning to Medicaid billing as a new part of their operations in collaboration with the MOM Model, including billing for some care coordination and peer recovery specialist services not covered by State Medicaid programs. The clearest example of struggles with the Medicaid payment system is in West Virginia, where none of the grant-based partner sites slated to transition into the MOM Model had previous experience billing Medicaid for services because they were grant-based organizations. During the transition year, approximately half of the provider sites experienced challenges setting up Medicaid billing in their operations—a primary reason for 6 of the initial 16 sites withdrawing from formal participation in the Model.

D. Summary and Future Considerations for the Evaluation

During the first year of implementation, awardees have sought to increase their use of best practices for the care of pregnant and postpartum individuals with OUD, including practices related to comprehensive care, MOUD initiation, pain management, care for infants with NOWS, and collaborative models of care. Awardees vary in their approach to care coordination, with an equal split between States that have adopted a case management approach and those that have sought to integrate Model

services through care partners or centralized care. All awardees have integrated or are preparing to integrate peer recovery services into their Models, although some States have experienced challenges associated with recruiting and retaining peer recovery specialists. Upcoming data collection will involve a deep dive into how the variations of Model design influence the number of touchpoints in Model services and how the volume of these touchpoints may be influenced by the variations in care integration across Models. The evaluation team will also explore how design and implementation aspects influence the promotion of best practices and how Models that exemplify best practices can be scaled or replicated for similar populations and health systems.

Chapter 5. MOM Model Maintenance

The Maintenance domain of the RE-AIM framework serves as the foundation of assessing the Model's potential to be scaled up to achieve the highest levels of reach and impact. Maintenance includes several dimensions, such as whether and how funding will be sustained, the ongoing commitment of leadership and staff, and the strength of community partnerships forged in building the MOM Model. The ability of the MOM Model to be maintained depends on the sustained capacity of Medicaid agencies and their care delivery partners to manage continued implementation in the face of internal change (e.g., staff turnover) and contextual factors (e.g., policy changes). The research questions for the Maintenance domain in the first implementation year follow:

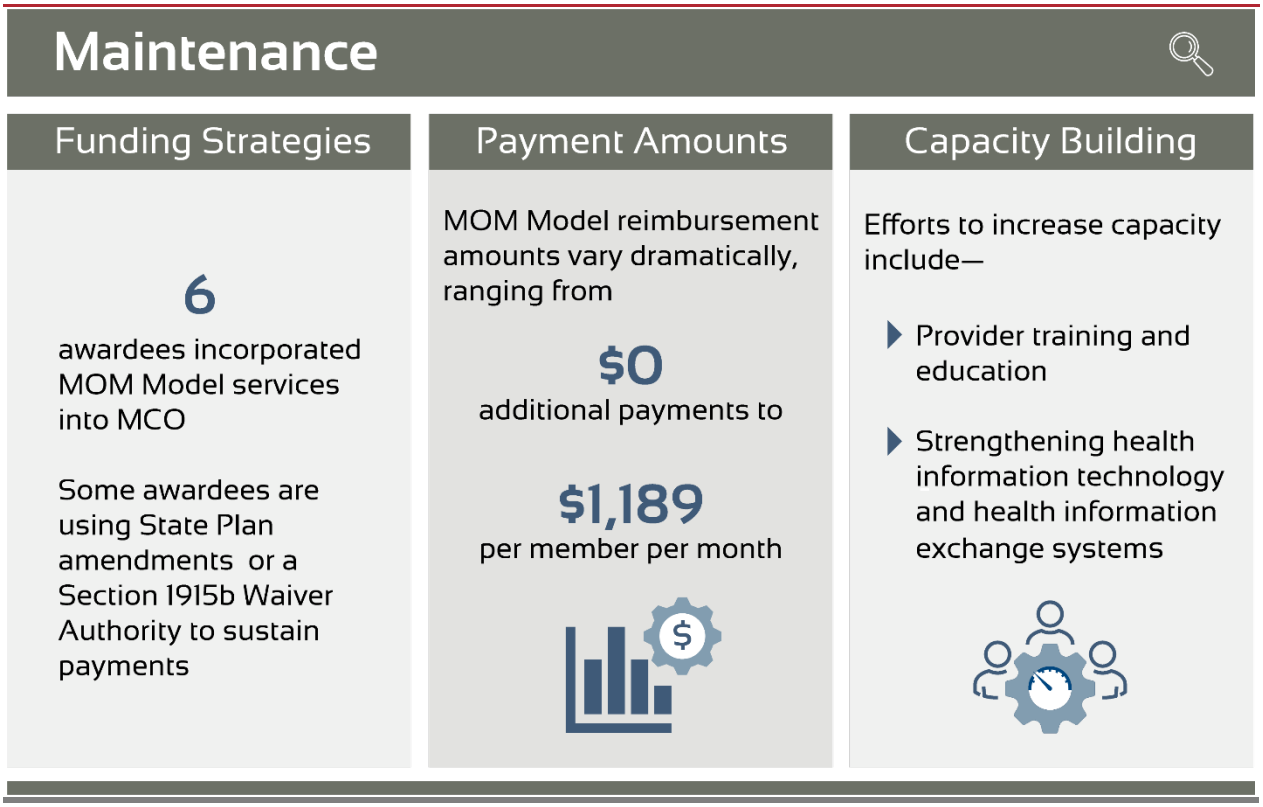
Maintenance

Extent to which MOM intervention has become institutionalized; whether and how funding will be sustained; leadership and staff buy-in; sustained system linkages

- Did States meet their program goals for self-funding their program moving forward?
- How are awardees developing capacity to maintain and scale up MOM Model services?
- What factors facilitate or act as barriers to maintaining MOM Model services?

Information on maintenance primarily came from case study reports. Figure 5.1 illustrates key first implementation year findings related to the Maintenance domain.

Figure 5.1. Key Implementation Year 1 Findings Related to Maintenance



Note: MCO = managed care organization

A. Model Funding Strategies

In accordance with the Model's terms and conditions, the Innovation Center provided MOM Model transition funding in the first year of implementation as a bridge to cover Model services that are not yet adequately covered by awardees' State Medicaid plans. These services include intake, assessment, creation of a treatment plan, wraparound care coordination, engagement, and referral activities. MOM Model funds may not be used to supplant or duplicate existing funding sources. By the second implementation year, States will assume full responsibility for funding all MOM Model services. Further information is provided in the pre-implementation annual report.

All MOM Model awardees currently pay care coordination fees or per-member-per-month (PMPM) payments for care coordination. They are at different stages of contemplating, calculating, and implementing payment strategies to support the long-term sustainability of MOM Model services (table 5.1).

Table 5.1. MOM Model Awardee Payment Strategies

Permanent Payment Strategy Established	Payment Strategy in Development	No Payment Updates Planned
▪ Maine ▪ Maryland ▪ West Virginia	▪ Indiana (potential APM strategy) ▪ Tennessee* ▪ Texas (potential APM strategy)	▪ Colorado ▪ New Hampshire

Note: APM = alternative payment model; MCO = managed care organization
* At the time of the site visit, Tennessee was negotiating new contracts with MCOs to ensure coverage for MOM Model services.
Source: Insight Policy Research analysis of MOM Model site visit data, April–July 2022

Care coordination payment amounts vary. Indiana, Maryland, New Hampshire, Tennessee, Texas, and West Virginia are integrating care coordination fees into managed care arrangements. Payments vary within these arrangements. For example, Maryland and West Virginia pay a monthly case management fee of $200 PMPM and $273 PMPM, respectively, for MOM Model beneficiaries. In contrast, Texas provides care coordination services as an administrative function of the State's Medicaid MCOs, and no additional reimbursement is offered for these services; however, the State is currently evaluating this payment approach. Similarly, New Hampshire has not adjusted reimbursement for providers serving MOM Model beneficiaries because the State is not offering new Medicaid services or benefits as part of the MOM Model. This finding highlights the need for States to consider current Medicaid provisions for care coordination services when developing approaches to improve care coordination for pregnant and postpartum beneficiaries with OUD.

Some awardees are sustaining funding through State Plan amendments or waiver authorities. Maine, Colorado, and West Virginia are using unique payment structures enabled by State Plan amendments (SPA) or waiver authorities to integrate the MOM Model services into care. SPAs and waiver authorities can facilitate maintenance and sustainability by providing States with the flexibility to deliver and pay for healthcare services through Medicaid.

- Maine used a SPA to fund maternity opioid health homes (MOHH) to serve MOM Model beneficiaries, building on a successful opioid health home model. In the MOHH, participating care delivery sites receive a PMPM fee in addition to fee-for-service (FFS) payments. The PMPM is determined by which "bundle" of care category is selected (table 5.2).

Table 5.2. MaineMOM PMPM Payment Categories

Category	Payment Strategy in Development	PMPM
Integrated services	Co-located OUD treatment, perinatal care, and care coordination at one care delivery site	$1,189
Partnership services	OUD treatment and care coordination are provided at one location; perinatal care and related care coordination are delivered by external providers	$1,089
Perinatal navigation services	Perinatal care and care coordination are available on site; OUD treatment services are delivered by external providers	$626

Note: OUD = opioid use disorder; PMPM = per member per month
Source: Insight Policy Research analysis of MOM Model site visit data, April–July 2022

- West Virginia submitted a SPA that will update Medicaid MOM Model requirements to include all diagnosed SUDs broadly rather than OUD only. Through this mechanism, the MOM Model could be scaled up to meet the costs of coordinating and providing care to all pregnant and postpartum beneficiaries with SUD. Currently, services for pregnant and postpartum beneficiaries with SUDs other than OUD—which are provided at the same care delivery sites that serve MOM Model beneficiaries—are paid through the grant-funded Drug Free Moms and Babies program.
- Colorado is building the MOM Model through Regional Accountable Entities (RAEs), which receive flexible funding—authorized through an existing 1915b waiver—to provide integrated physical and behavioral health services through a PMPM fee. RAEs participating in the MOM Model receive regionally specific sub-grants for integrating SUD treatment into primary and obstetric care sites that are appropriate to their community. Representatives from the Colorado Department of Health Care Policy & Financing (Colorado's Medicaid agency) are confident MOM Model services can be sustained with payments authorized through the 1915b waiver. However, representatives expressed concern about the feasibility of fully absorbing the costs of MOM Model care coordination services within the time remaining for Model implementation, given the State's delay in program start.

Awardees are developing strategies that link payment to quality and value. Awardees' payment strategies can be examined in light of the Health Care Payment Learning & Action Network (HCP-LAN) Alternative Payment Model (APM) Framework, which ranks payment approaches on a continuum (HCP-LAN, 2017). Creators of the HCP-LAN framework regard traditional FFS (Category 1) as the least desirable payment model because it can lead to large volumes of low-value care. APMs that reward healthcare providers for delivering high-quality, coordinated care range from FFS models linked to quality and value (Category 2) to prospective, population-based payments (Category 4). Compared with FFS payment approaches, APMs give providers more flexibility to coordinate and optimally manage for patients and also lower overall costs by reducing the use of services that do not achieve desired outcomes.

Payment Strategies

MaineCare withholds 4 percent of each PMPM fee from the MaineMOM provider based on performance on two measures:

1. Percentage of MaineMOM patients who are screened for hepatitis C virus prior to the end of their pregnancy
2. Percentage of MaineMOM patients with a qualifying outpatient postpartum visit between 21 and 56 days from the date of delivery

Providers in Maine will have the opportunity to earn back more than the 4 percent withheld amount based on their performance.

Under the HCP-LAN APM Framework, PMPM payments, which most MOM Model awardees use, represent an advance on FFS payments because care coordination may improve the quality of patient care. Some awardees have established or are working to establish additional APM approaches for MOM Model services.

- MaineMOM's payment approach includes a pay-for-performance element (Category 2c) intended to reward providers that perform well on quality metrics (see also callout box).
- Indiana has established milestone funding payments that reward managed care entities for timely, accurate reporting of MOM Model data (pay-for-reporting, Category 2b). It plans to shift to pay-for-performance (Category 2c) for case management services in the future.
- Texas is gathering implementation data to inform the development of an APM for MOM Model care coordination services.

The adoption of APMs may enhance the sustainability of the MOM Model by reducing the total cost of care while improving the quality of care. APMs also present an opportunity to incentivize improvements in care delivery to reduce inequities in care and outcomes (HCP-LAN, 2021). Although awardees were not required to develop APMs as part of the MOM Model, the adoption of APMs may be seen as a best practice that could be replicated by other States seeking to improve care for pregnant and postpartum Medicaid beneficiaries with OUD.

Some awardees experienced payment-related challenges. Several awardees highlighted challenges related to payment. In some cases, these challenges are likely to be temporary—for example, some awardees reported delays in reimbursement for sites that were not previously registered as Medicaid providers. Other challenges may have potential longer term implications for maintenance of the MOM Model if not addressed.

- Care delivery partners in Texas noted that some services provided to MOM Model beneficiaries are not reimbursable by Medicaid. Contrary to the terms of the MOM Model cooperative agreement, MOM Model funds currently pay for these services, which include lactation consultation, navigation services, and some peer recovery support services (e.g., outreach to engage pregnant and postpartum beneficiaries in care). An additional payment concern in Texas is that direct clinical care (i.e., preparing for and conducting clinician visits) for Texas MOM Model beneficiaries requires more time and effort than care for standard prenatal patients. However, these patient visits are not reimbursed at a higher rate, and no plans are in place to increase reimbursement rates for already covered services provided by Texas MOM Model providers. As noted above, Texas is considering the development of an APM that may address these issues and ensure the long-term sustainability of the Model.

This example points to the need to consider what services Medicaid covers, particularly in States that contract with MCOs, whose plans may vary in their coverage of specific services. It also highlights the complex needs of pregnant and postpartum Medicaid beneficiaries with OUD and the potential impact on care delivery and costs, particularly compared with pregnant and postpartum beneficiaries without an SUD.

- In West Virginia, the Bureau of Medical Services (the State Medicaid agency) and its partners expressed concern over "cash-cow" MAT providers that provide only medication, not comprehensive treatment. Key informants reported that these sites use automatic billing templates to submit claims that exceeded services provided. One provider had billed Medicaid

for 23 hours of MAT services in a single day. The Bureau of Medical Services has made several fraud referrals to the State's Attorney General's Office and continues to monitor MAT providers and disenroll them when they are not adequately serving patients.

West Virginia's issue with unscrupulous MAT sites highlights the need for continuous efforts to prevent, identify, and combat fraud, waste, and abuse in Medicaid, including in efforts to improve care for pregnant and postpartum beneficiaries with OUD. It also highlights the need to develop payment approaches that specifically incentivize the provision of comprehensive, coordinated care for OUD.

Equity in Maintenance: Childcare Supports

MOM Models are working across agencies to make long-term changes to programs and initiatives that can help address beneficiaries' health-related social needs. Parents cannot access treatment and other services without access to childcare, which creates inequities in access, particularly for mothers, who are most commonly primary caregivers. To increase equitable treatment access for MOM Model beneficiaries, Indiana's Medicaid agency collaborated with the Office of Early Childhood Education and Out of School Learning to define Pregnancy Promise Program beneficiaries as a priority population for the Child Care and Development Fund (CCDF), administered by the Federal Administration for Children and Families. States traditionally use CCDF to provide financial assistance to low-income families to access childcare to enable them to work or attend a job training or educational program. In Indiana, the standard work or education requirements are waived for enrollees in the Pregnancy Promise Program who attend OUD treatment, behavioral healthcare appointments, and prenatal/postpartum care appointments. This policy allows MOM Model beneficiaries' attendance at treatment to fulfill the CCDF requirement for participating in work or school, allowing beneficiaries to access subsidized childcare for their children. Key informants reported that at least 50 MOM Model beneficiaries have cited this childcare benefit as a motivation for their participation in MOM Model services. This benefit should also enable future beneficiaries to access safe, regulated childcare while engaging in MOM Model services.

B. Organizational and Provider Capacity Building

In addition to developing sustainable payment strategies, MOM Model awardees must have the organizational and provider capacity to maintain and scale MOM Model services. Awardees described efforts to expand providers' capacity to implement best practices for MOM Model beneficiaries and strengthen data systems. They also reported several capacity constraints, including physical space limitations.

Within their existing workforce, awardees have sought to enhance provider capacity to meet the needs of MOM Model beneficiaries. As described under the Implementation domain (chapter 4), all awardees offered provider trainings during the first implementation year to increase the adoption of best care practices for pregnant and postpartum individuals with OUD. For example, West Virginia used SAMHSA State Opioid Response (SOR) funding to provide MAT waiver trainings to increase the number of buprenorphine-waivered providers.[12] The SOR program provides resources to States to increase access to MOUD and support the continuum of prevention, harm reduction, treatment, and recovery support services for OUD and other concurrent SUDs. By using SOR funding to support the MOM Model, West Virginia is able to address limited

[12] As noted in chapter 1, the requirement for providers to obtain a Drug Enforcement Administration (DEA) waiver to prescribe buprenorphine was recently eliminated through the Consolidated Appropriations Act of 2023, which mandates that prescriptions for buprenorphine only require a standard DEA registration number.

availability of buprenorphine-waivered providers, a key barrier to MOUD access for pregnant and postpartum beneficiaries with OUD.

Some MOM Models tailored trainings to ensure relevance to providers based on needs assessments and lessons learned earlier in the Model. For example, Tennessee reported difficulties in building capacity for peer recovery support services because of high levels of turnover. The State has introduced the Tennessee Association for Alcohol, Drug, and Other Addiction Services training to MOM Model program staff who supervise peer recovery specialists to strengthen providers' capacity to work effectively with peer support specialists.

Several awardees increased organizational and provider capacity by strengthening health information technology (HIT) and electronic health information exchange (HIE) systems to support outreach, referral, care coordination, and treatment.

- Indiana noted success in the release of a data collection interface for case managers to enable data collection and reporting on MOM Model beneficiaries.
- In Tennessee, the Vanderbilt University Medical Center successfully integrated additional data streams into its HIE. The Medical Center is also designing a dashboard that will be available to all MOM Model staff to support the implementation of real-time quality improvement activities.
- Texas has worked with a local nonprofit organization, the Patient Care Innovation Center, to develop a care coordination platform that includes links to healthcare and social service providers.

These examples suggest that investing in data capabilities and infrastructure to ensure data are collected, shared, and reported in standard and user-friendly ways can help providers better coordinate care and monitor progress. Despite these successes in HIT and HIE developments, programs also reported challenges and delays. For example, New Hampshire intended the creation of an integrated data system connecting all providers to be the backbone of the State's MOM Model, but the development of the system has been delayed, and will be scaled back to not include community providers, as originally expected.

Two awardees attributed lower than anticipated enrollment to physical space constraints. For Tennessee and Texas, physical space constraints contributed to challenges in meeting enrollment targets (see chapter 3).

- Tennessee had enrolled 149 beneficiaries across its 2 provider sites by June 30, 2022, but without further physical space expansion will be unable to meet its enrollment target of 300 beneficiaries. At the time of the site visit, the awardee was attempting to identify a third provider site that could support eligible MOM Model beneficiaries in rural areas.
- Texas had intended to enroll up to 50 beneficiaries during the first implementation year and up to 70 in the second year. The State planned to cap enrollment at 110 beneficiaries per year beginning in the third year because of capacity constraints. However, having enrolled 26 beneficiaries as of June 30, 2022, the care delivery site, Ben Taub Hospital, was already described as being near physical capacity. Harris Health System planned to request additional space from Ben Taub administrators but was not considering adding other provider sites.

Having sufficient physical space to support efforts to coordinate care for pregnant and postpartum beneficiaries with OUD is critical for maintenance and, if increased, may facilitate the scaling up of MOM

Model interventions. For example, incorporating additional provider sites may enable awardees not only to serve more patients but also to reach a wider population of eligible beneficiaries.

Equity in Maintenance: Stigma and Bias

Institutionalizing processes and practices intended to reduce stigma, bias, and discrimination is an important component of maintaining the MOM Model to ensure equitable and respectful care is embedded in the culture of healthcare delivery for pregnant and postpartum people with OUD. In Texas, Harris Health's quality, equity, and safety grand rounds now routinely include SUD cases where biases have played a role in patient outcomes (e.g., use of stigmatizing language, provider's dismissal of beneficiary's concerns, treatment decisions inconsistent with best practices). Harris Health intends to develop specific interventions for the most common cognitive biases (e.g., making decisions based on stereotyping or prior expectations).

C. Summary and Future Considerations for the Evaluation

Awardees are at various stages of developing sustainable payment strategies for the MOM Model, primarily involving PMPM fees for care coordination. A majority of States are integrating care coordination fees into existing managed care arrangements. Two awardees have developed a permanent payment strategy, notably through SPAs (Maine and West Virginia). Two awardees (Colorado and New Hampshire) do not plan to change PMPM fees for care coordination for pregnant and postpartum Medicaid beneficiaries and are confident that all MOM Model services can be absorbed by current fees beyond the MOM Model funding period. Other awardees are still in the process of developing a payment strategy, with two States (Texas and Indiana) using the MOM Model as an opportunity to collect data to inform a future APM strategy. Awardees' development of sustainable payment strategies, including APM innovations such as pay-for-performance, will continue to be a key focus of next year's evaluation as States assume responsibility for funding wraparound care coordination, engagement, and referral services.

Awardees are also increasing organizational and provider capacity to fully embed MOM Model services into States' care delivery systems. To date, awardees have experienced successes in providing training and educational opportunities and, in some cases, strengthening HIT and HIE systems. Other factors that may influence MOM Model maintenance, to be studied in future evaluation years, include the ongoing commitment of leadership and staff, the strength of community partnerships, and awardees' ability to adapt MOM Model services to better fit local communities and contexts (e.g., to reflect the preferences and values of minority populations currently underrepresented in the MOM Model). In the coming years, the evaluation team will also track awardee efforts to scale up and expand MOM Model services.

Chapter 6. Conclusion

Most MOM Model awardees and their partners began enrolling eligible Medicaid beneficiaries during the first implementation year while continuing to formalize care delivery partnerships; establish alternative approaches to sustainably funding MOM Model service delivery; and enhance existing data collection, sharing, and reporting systems to support more integrated care.

Qualitative data collected across eight awardees via key informant interviews, focus groups, and Photovoice identify several **MOM Model implementation successes**, including the following:

- Improvements in care integration or case management for MOM Model beneficiaries
- Adoption of best practices related to maternity and OUD care, hospital delivery care, and infant care
- Inclusion of peer recovery services as critical team members in the care of MOM Model beneficiaries

Improvements to care coordination. All awardees structure care delivery through systems that increase care integration or case management for MOM Model beneficiaries. All States already had and used care coordination in their systems of care, but the MOM Model has enabled them to enhance and intensify care coordination.

Adoption of best practices. Adoption of best practices in perinatal and postpartum care and treatment for pregnant people with OUD is most prominent in MOM Models that were built around existing programs serving pregnant people with OUD (e.g., MaineMOM, West Virginia's Drug Free Moms and Babies program).

Inclusion of peer recovery services. These services are near-universally supported among MOM Models, though awardees described challenges recruiting and maintaining peer recovery specialists and some difficulty integrating peer recovery specialists with clinical providers.

Site visits with all eight MOM Model awardees and an analysis of MOM Model enrollee characteristics reveal that awardees are encountering **challenges across most domains of the RE-AIM framework**, including the following:

- Low MOM Model enrollment
- Continued impact of the COVID-19 public health emergency, such as staffing shortages
- Risks to the sustainability of MOM Models as a result of minimal changes to MCO payment approaches by participating States
- Provision of equitable care

Low MOM Model enrollment. Awardees implemented several strategies to reach potential MOM Model beneficiaries throughout their service areas, including the development and dissemination of outreach materials and engagement with community partners. Despite these efforts, all awardees enrolled far fewer beneficiaries than projected during the pre-implementation period. The number of enrolled beneficiaries ranged from 0 in

Colorado to 243 in Indiana at the time of the site visits, representing between 0 and 50 percent of original proposals.

Continued impact of the COVID-19 public health emergency. Informants indicated staff shortages initially grew as a result of COVID-19 during the pre-implementation year and continued into the Model transition year. Provider sites indicated staff turnover, transitions, and shortages were commonplace. Key informants noted that finding adequately trained and qualified healthcare staff to treat pregnant and postpartum people with OUD was a challenge prior to the COVID-19 public health emergency, and maintaining staff because of burnout has become an even greater challenge for Model provider sites since 2020.

Risks to program sustainability. States have begun to implement a variety of payment approaches to support MOM Model services, tailored to fit within each State's unique Medicaid program and existing infrastructure to serve pregnant people with OUD. Establishing sustainable payment strategies will be a key focus of next year's evaluation as States assume responsibility for funding wraparound care coordination, engagement, and referral activities. The evaluation team will also continue to assess the extent to which MOM Model interventions have become fully embedded within States' care delivery systems for pregnant and postpartum individuals with OUD, as evidenced by leadership and staff buy-in and robust linkages with community partners, including social supports and family services.

Provision of equitable care. States experienced challenges around equity that affected the reach and accessibility of their programs. The most common issues mentioned were stigma, lack of transportation, inadequate childcare access, and health insurance coverage. Other issues included a lack of culturally and linguistically appropriate care, court system biases, lack of affordable housing and a living wage, and treatment access disparities. Most awardees offered provider trainings to address stigma and health equity, and many beneficiaries reported they felt supported by at least some members of their care team (e.g., individual therapists at a community health center, staff at a residential treatment facility, case managers). For several awardees, peer recovery support specialists and other staff members with lived experience of OUD during pregnancy were particularly important as trusted, nonjudgmental sources of support who helped beneficiaries become and stay engaged in the recovery process. However, several beneficiaries described stigmatizing attitudes and behavior among care providers that were less closely involved with Model protocols, particularly in labor and delivery care settings.

All awardees acknowledge the serious challenges presented by social stigma against persons with OUD—often working to prevent persons from pursuing recovery—and the deeply ingrained inequities that run through American communities and health systems. By addressing these challenges and providing more integrated, coordinated, and person-centered maternity and behavioral healthcare, including MOUD, to pregnant and parenting persons with OUD, MOM Model awardees hope to achieve a wide array of improved outcomes in maternal health, infant health, sustained recovery, and stronger families.

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Part 2

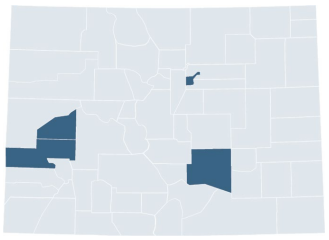
Colorado MOM Model: In Brief

The Colorado MOM Model began implementation April 1, 2022. The Colorado Department of Health Care Policy and Financing (HCPF) selected three subgrantees from different Regional Accountable Entity (RAE) areas to implement unique MOM Models. The central tenet of the Colorado MOM Model is expanded care coordination services facilitated through each RAE. Each subgrantee designed its unique models to meet the needs of the local community and make use of the strengths of local providers.

Under the MOM Model, Denver Health provides peer support and expands specialized care coordination services within its current hub and spoke model. In Denver, River Valley Family Health Center expands current substance use and pregnancy screening, care coordination, and telehealth services in Delta, Montrose, and Olathe. The Southern Colorado Harm Reduction Association expands access to current co-located and bidirectional care services, peer support, and telehealth services for pregnant individuals with opioid use disorder (OUD) in Pueblo.

Geographic Scope

Greater Delta, Denver, Montrose, and Pueblo Counties



Urbanicity

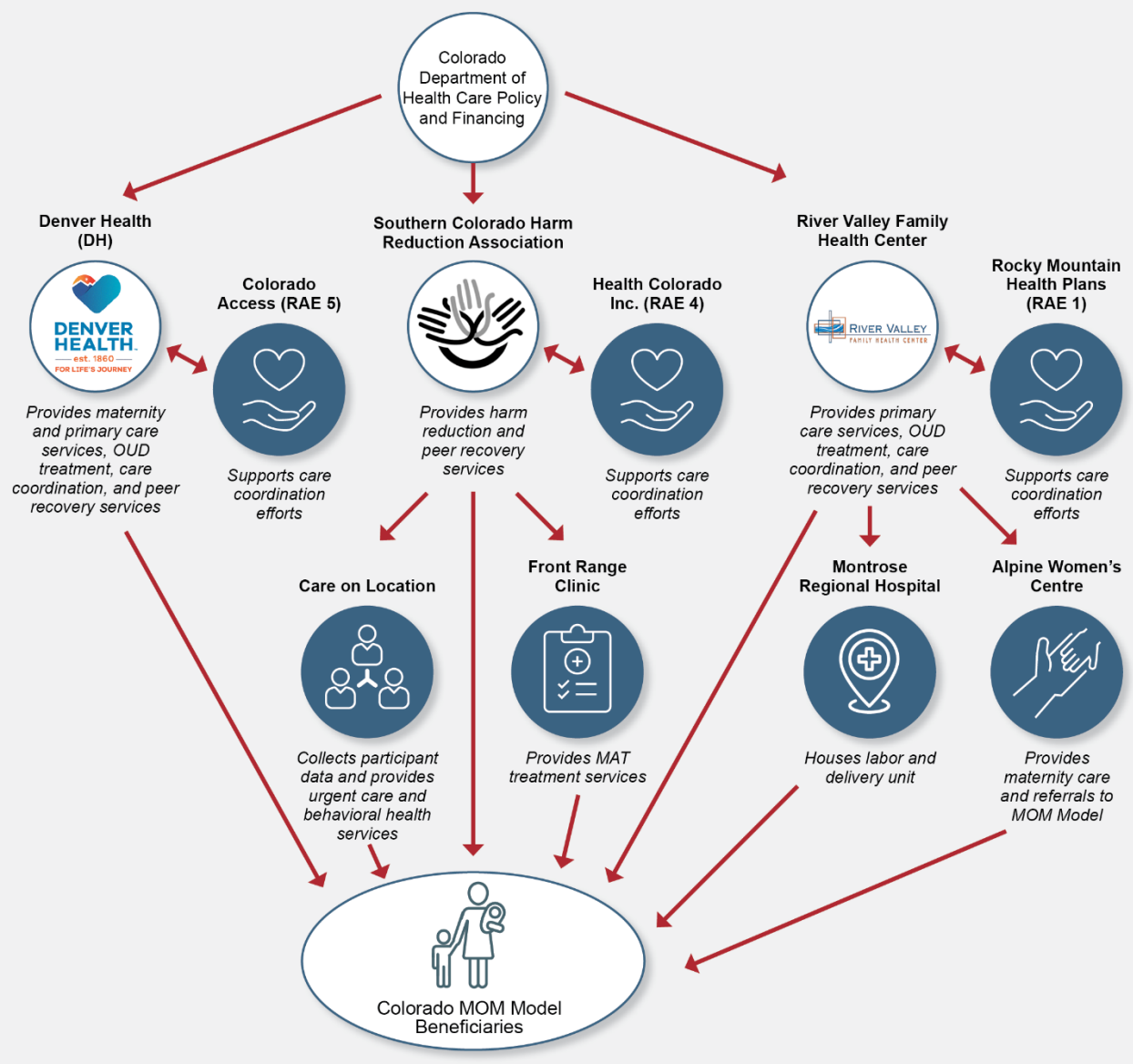
Urban, suburban, and rural

Enrollment

No enrollment in Year 1 of implementation

In recent years, the pandemic has exacerbated the OUD epidemic in Colorado. Opioid overdose deaths in the State rose by 54 percent between 2019 and 2020, accounting for almost two-thirds of the State's overdose deaths during a year that saw an all-time-high overdose death toll of 1,477. Between 2014 and 2016, unintentional drug overdose accounted for the second highest cause of death among pregnant individuals in the State. The incidence of neonatal abstinence syndrome increased significantly in Colorado from 2.4 per 1,000 hospital births in 2012 to 5.5 per 1,000 hospital births in 2020

Key Model Partners



MAT = medication-assisted therapy OUD = opioid use disorder RAE = Regional Accountable Entity

Implementation Lessons Learned

Implementation successes. Colorado's subgrantees established staff roles and infrastructure to support MOM Model beneficiaries since beginning implementation in April 2022. For example, Denver Health hired a social worker, intern, and peer recovery specialist to its MOM team, while Southern Colorado Harm Reduction Association (SCHRA) assigned one of its peer recovery coaches to the MOM Model. SCHRA also implemented a new Athena Health electronic medical record (EMR) system, and River Valley Family Health Center (RVFHC) collaborated with its partner hospital and obstetrics and gynecology (OB/GYN) organizations to establish processes and procedures to increase the frequency of pregnancy testing and drug screenings to identify potential MOM Model beneficiaries.

Implementation challenges. Contract implementation, data system establishment, and stigma affecting MOM Model beneficiaries' access to care were major challenges HCPF and its three MOM Model subgrantees experienced since beginning implementation. MOM Model subgrantees experienced delays in the contract approval process with HCPF and confusion related to what service provision and staffing expenses could be covered by MOM Model funding and for how long. Subgrantees also experienced challenges establishing or modifying data systems to meet MOM Model data collection and reporting requirements and support care coordination across MOM Model partners.

For example, RVFHC has been unable to connect its data systems with local hospital and OB/GYN partners, resulting in staff having to share MOM Model beneficiary data manually across organizations. Finally, respondents from all subgrantees highlighted the stigma apparent in subgrantee communities as a major barrier to engaging with pregnant and postpartum individuals with OUD. Colorado subgrantees are implementing marketing campaigns, provider trainings, peer support services, and virtual and in-person outreach events to address this barrier to care in their communities and improve engagement of the populations eligible for the MOM Model.

Program Features

Partnership maintenance. Colorado's three subgrantees operate independently of one another and maintain relationships with their own RAE and partner organizations. All three subgrantees will participate in monthly virtual Learning Collaboratives facilitated by HCPF to discuss topics related to the MOM Model, including sharing best practices for how to best care for pregnant and postpartum individuals with OUD.

For homeless MOM Model beneficiaries and those without access to vehicles and childcare, Colorado's terrain, weather, and lack of public transit pose a major access issue, especially in rural areas. Although each subgrantee offers translation services, culturally appropriate care is also lacking among local providers for the State's tribal, immigrant, and non-English-speaking populations.

Subgrantees strengthened MOM Model partnerships since beginning implementation by administering trainings to partner organization staff and establishing standardized screening procedures across partner organizations. Denver Health scaled up its work with the Colorado Hospital Substance Exposed Newborns Quality Improvement Collaborative to provide trainings for maternal and substance use disorder care providers, while SCHRA developed and implemented trauma-informed screening procedures with Care on Location, its telehealth-focused urgent care and behavioral health services partner. RVFHC held OUD screening trainings with providers from its partner organizations, Alpine Women's Centre and Montrose Regional Health hospital, and coordinated an increase in urine substance screening on the hospital's labor and delivery unit.

Enrollment, intake, and assessment. No beneficiaries had enrolled in Colorado's MOM Model as of June 30, 2022. The three subgrantees project a combined enrollment goal of 95 beneficiaries per year moving forward. Both RVFHC and SCHRA conduct outreach with community partners and providers to establish referrals for the MOM Model, while Denver Health will rely on referrals from internal OB/GYN and medication-assisted treatment (MAT) providers. MOM Model screenings and assessments vary across subgrantees, with Denver Health and SCHRA conducting verbal screenings and Brief Intervention and Referral to Treatment (known as SBIRT) assessments, and RVFHC using self-completed intake forms.

Subgrantees highlighted three major barriers to enrollment in the Colorado MOM Model: (1) stigma and fear of losing a child as a result of Child Protective Services involvement, (2) lack of transportation, and (3) lack of childcare. In response to stigma, all three subgrantees are conducting or preparing to conduct anti-stigma outreach efforts using in-person events, provider trainings, and social and print media. Each subgrantee is also aiming to address transportation and childcare challenges facing MOM Model awardees. For example, RVFHC is planning to add transportation support services to their model in Year 2 of implementation, while all three subgrantees are expanding access to care by making use of telehealth services.

MOM Model services. The central tenet of the Colorado MOM Model is expanded care coordination services facilitated through each RAE. This service is offered at all sites, while additional services vary by subgrantee. Subgrantees designed each of the unique MOM Models to align with a set of best practices HCPH identified during the subgrantee application stage. Descriptions of each subgrantee model follow:

- Denver Health's MOM Model creates a perinatal "spoke" within its hub and spoke model. This enables the hospital to coordinate co-located care from OB/GYN, behavioral health, MAT providers, and peer support specialists. The model also focuses on expanding its telehealth services.
- RVFHC's MOM Model focuses on expanding screening and referral, telehealth services, and peer recovery support including an incentive-based contingency management program.
- SCHRA considers peer recovery support as the "heart" of its MOM Model, but the model also incorporates co-located and bidirectional services and expanded telehealth services.

Data systems. Each Colorado MOM subgrantee maintains its own EMR and coordinates its own MOM Model data collection and reporting to the Centers for Medicare & Medicaid Services. RVFHC and Denver Health are Medicaid providers. They capture patient-level data required under the MOM Model directly through their Athena and Epic EMRs, respectively. Alternatively, SCHRA uses partnerships with Care on Location and Front Range Clinic to meet MOM Model data collection and reporting requirements. HCPF provides ad hoc technical assistance to the subgrantees in need of data collection and reporting support.

Medicaid Context and Sustainability

MOM Model sustainability. HCPF expects to sustain MOM Model financing by absorbing all services within the administrative per member per month (PMPM) payments made to the RAEs by the end of the MOM Model implementation period. Current PMPM payments are authorized through a 1915b waiver, and the State does not require new federal authority to pay for services through this mechanism.

Medicaid and other State context related to MOM Model. Colorado has begun several initiatives to integrate behavioral health and physical health care services, stemming from longstanding challenges in adequately responding to behavioral health needs of Medicaid beneficiaries in the primary care setting. The Accountable Care Collaborative aligns the administration of physical and behavioral health services under one entity, the RAE. Colorado awarded seven RAE contracts in November 2017. The State also applied for and received approval of a State Plan Amendment to add MAT as a mandatory Medicaid benefit.

Colorado is an expansion State where pregnant women with income up to 200 percent of the federal poverty rate are covered until the last day of the month in which they reach 60 days postpartum. The State plans to extend Medicaid postpartum coverage to 12 months through a State Plan Amendment in the future.

Conclusion

While each Colorado MOM Model subgrantee faced its own challenges in the first few months of implementation, all three had success in training internal and partner staff on MOM Model screening procedures and requirements and in implementing data systems to meet MOM Model data collection and reporting requirements. Respondents from HCPF and all subgrantees reported an awareness of the challenges associated with providing care for pregnant and postpartum individuals with OUD in Colorado. The barriers include lack of access to transportation, insufficient childcare support, and pervasive stigma related to OUD, and reportedly all respondents have developed strategies to address them.

In future site visits, the evaluation team will investigate how subgrantee relationships with partners developed after enrolling beneficiaries, whether the planned monthly HCPF Learning Collaboratives are successful, whether subgrantees' understanding of MOM Model funding improves, and what progress is made to address community and system-level stigma that affects enrollment.

Indiana MOM Model: In Brief

The Indiana MOM Model, known as the Indiana Pregnancy Promise Program, began implementation July 1, 2021. Led by Indiana's Family and Social Services Agency (FSSA), the program offers enhanced case management services statewide to pregnant individuals with opioid use disorder (OUD). Case managers at Indiana's four Medicaid managed care entities (MCEs) conduct outreach and enrollment, assist with appointment scheduling and referrals, and facilitate information sharing with providers. MOM Model beneficiaries may receive care at any in-network Medicaid provider in Indiana.

Substance use disorder (SUD) contributed to over half of all pregnancy-associated maternal deaths in Indiana in 2018. The incidence of neonatal abstinence syndrome was 7.1 per 1,000 hospital births in 2020. The Indiana Pregnancy Promise Program is intended to lead to more effective care coordination for pregnant individuals with OUD, better pregnancy outcomes, and sustained recovery in the postpartum period.

Geographic Scope

4 care delivery partners enrolling beneficiaries statewide

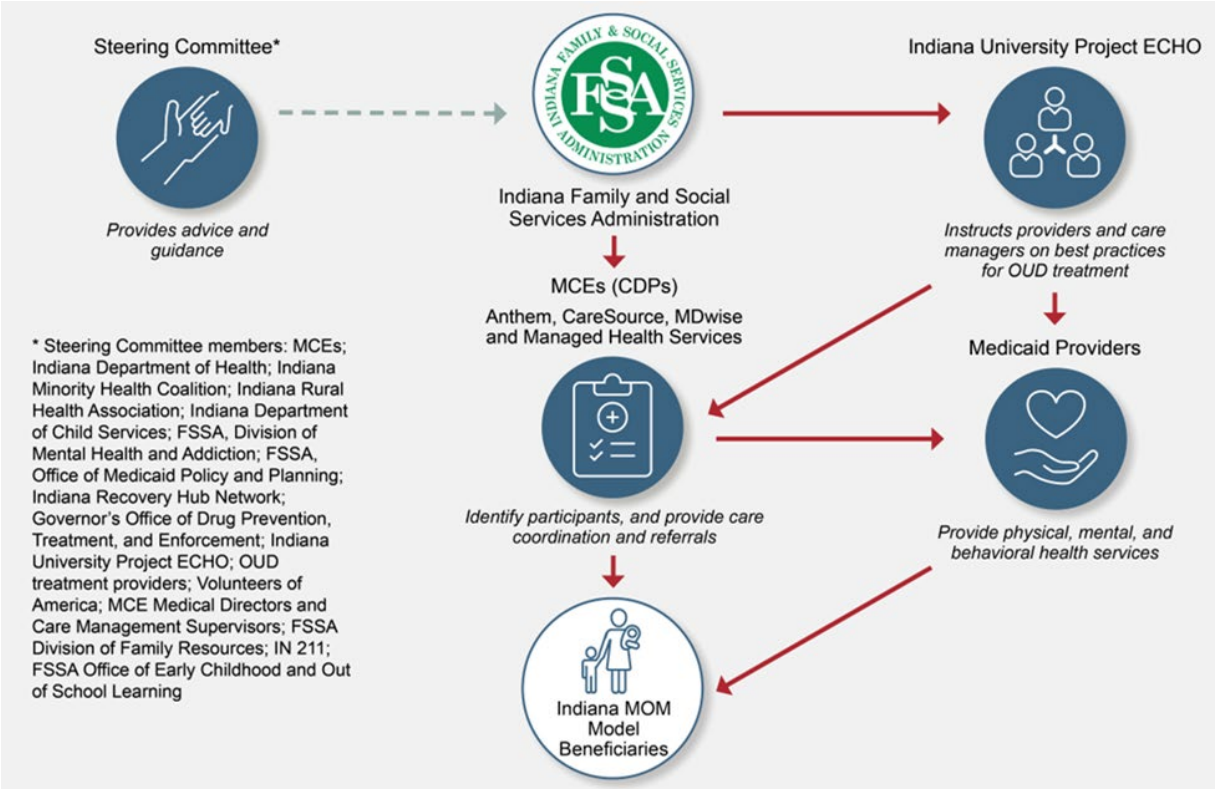
Urbanicity

Urban, suburban, and rural

Enrollment

273 individuals served in Year 1 of implementation

Key Model Partners



CDP = care delivery partner; ECHO = Extension for Community Healthcare Outcomes; FSSA = Family and Social Services Agency; MCE = managed care entity; OUD = opioid use disorder

Implementation Lessons Learned

Implementation successes. The Indiana Pregnancy Promise (Promoting Recovery from Opioid Use: Maternal Infant Support and Engagement) Program provides enhanced case management services to pregnant people with OUD. FSSA has partnered with Indiana's four Medicaid MCEs: Anthem, CareSource, Managed Health Services, and MDwise. The MCEs have hired experienced case managers, who must be nurses or social workers, to enroll Pregnancy Promise Program beneficiaries statewide and provide case management. Key informants regard the collaboration across partners as a major success of the Indiana MOM Model to date.

FSSA has partnered with the Office of Early Childhood Education and Out-of-School Learning to designate Pregnancy Promise Program beneficiaries as a priority population for the Child Care and Development Fund (CCDF), which provides financial assistance to families with low incomes to access childcare. Attending OUD treatment and prenatal/postpartum care visits as part of Pregnancy Promise Program now fulfills the CCDF requirement for participating in work or school. This benefit has helped to address childcare barriers to attending opioid treatment programs, mental health visits, postpartum visits, and life skills or parenting support classes. FSSA reported that "at least 50" Pregnancy Promise Program beneficiaries have cited this childcare benefit as a motivation for their participation in the program.

Key informants from the Indiana Department of Child Services credit the Pregnancy Promise Program with reducing family separation. As one interviewee said, "We love working with the Pregnancy Promise case managers, and because of [the Pregnancy Promise Program] we've been able to keep parent[s] and infant[s] together, or we've been able to reunify parent[s] and infant[s] because [the Pregnancy Promise Program] helped the parent get treatment and put together a plan of safe care."

Implementation challenges. Pregnancy Promise Program beneficiaries can receive care from any Medicaid provider within their MCE's network. Through a formal partnership with Indiana University Project Extension for Community Healthcare Outcomes (ECHO), FSSA offers training on best practices for treating pregnant people with OUD and their infants to physicians and other clinical providers throughout Indiana. FSSA offers this training free of charge; continuing education credits are awarded. FSSA reports that some employers require the training. In 2021, Indiana reported 20–60 attendees per session. However, it is unclear to what extent clinicians are adopting such practices. For example, case managers noted inconsistencies in whether hospitals follow best practices for infants with opioid withdrawal symptoms (e.g., using Eat, Sleep, Console as the standard of care).

Although no difficulties have been no reported in obtaining signed consent from beneficiaries to participate in the Pregnancy Promise Program, some beneficiaries are hesitant to sign a release form that allows patient information to be shared with medical and OUD providers. Case managers at one MCE reported obtaining the release from fewer than 20 percent of Pregnancy Promise Program beneficiaries. Without this release, case managers cannot share information about beneficiaries with service providers, which hampers care coordination efforts. Case managers commented it can be challenging to collect the large volume of sensitive information required by the MOM Model early in their relationship with Pregnancy Promise Program beneficiaries.

Program Features

Partnership maintenance. The four Medicaid MCEs collaborate with FSSA as care delivery partners to implement the Pregnancy Promise Program. MCE case managers meet biweekly with FSSA to share tips, review challenging cases, and troubleshoot solutions. Case managers make referrals to two provider sites that specialize in caring for pregnant people with SUD: Fresh Start Recovery Homes and CHOICE Pregnancy and SUD Program.

Key informants identified disparities in treatment access, healthcare coverage, and social determinants of health as areas where pregnant people with OUD face inequities.

FSSA holds quarterly meetings with the Pregnancy Promise Program steering committee, which is composed of members from multiple sectors and agencies (e.g., MCEs, Indiana Department of Health, Indiana Minority Health Coalition, Indiana Department of Child Services, Office of Medicaid Policy and Planning, Division of Mental Health and Addiction, Indiana Housing and Community Development Authority, Office of Early Childhood and Out-of-School Learning). The steering committee hears updates on Pregnancy Promise Program implementation, discusses emerging issues, and provides suggestions for improving the Pregnancy Promise Program. Key informants emphasized the positive relationships across partners.

Enrollment, intake, and assessment. Case managers are responsible for outreach, enrollment, and intake assessments for the Pregnancy Promise Program. Referrals can be submitted via the State Pregnancy Promise Program website by individuals themselves, family members, and providers. Potential enrollees may be identified through claims data or from pregnancy assessment forms clinical providers complete. As of May 11, 2022, FSSA reported 327 referrals through the website and another 1,600 eligible individuals identified through the MCEs' claims data mining systems.

After a referral is made, the relevant case manager initiates outreach by telephone, in person, or through written documentation to offer beneficiaries participation in the Pregnancy Promise Program. One MCE noted that the continuous Medicaid enrollment policy in effect during the COVID-19 public health emergency led to an increase in the Medicaid population overall and in individuals potentially eligible for the Pregnancy Promise Program. As a result, it is sometimes challenging for case managers to contact all potential enrollees in a timely manner.

Indiana's target enrollment for Year 1 of MOM Model implementation was 750 individuals; it had enrolled 243 beneficiaries as of May 11, 2022. Although enrollment was lower than predicted, FSSA reported that uptake in the Pregnancy Promise Program is higher than in other Medicaid case management programs, which they attribute to case managers' intensive outreach and follow-up efforts.

MOM Model services. Case managers offer support and provide referrals to connect beneficiaries and infants to services and resources during and after pregnancy. Most case management services are provided by telephone; however, some case managers also engage with MOM beneficiaries through text messages or FaceTime. Individuals enrolled in the Pregnancy Promise Program reportedly receive more intensive contact with case managers than Medicaid beneficiaries participating in other MCE-led pregnancy case management programs.

Pregnancy Promise Program beneficiaries are eligible for subsidized childcare through CCDF. This benefit facilitates beneficiaries' ability to engage in opioid treatment programs, mental health visits, postpartum visits, and life skills or parenting support classes, which require significant time commitments.

The Pregnancy Promise Program does not stipulate any standards or training for providers who care for pregnant people with OUD other than those required for Medicaid participation. The Pregnancy Promise Program funds virtual trainings in partnership with Indiana University Project ECHO to address best practices in caring for pregnant people and infants affected by OUD. As a result of the limited engagement the evaluation team had with providers, it was difficult to assess whether providers are broadly implementing these best practices. The CHOICE clinic, which predates the Pregnancy Promise Program, has independently adopted many best practices for treating pregnant individuals with SUD (e.g., pain management options, breastfeeding education, use of peer recover specialists) and infants born exposed to opioids (e.g., Eat, Sleep, Console method).

MCEs and FSSA identified an ongoing need to change clinical culture and reduce stigmatizing behaviors by providers caring for pregnant people with OUD.

Indiana Medicaid reimburses for peer recovery support services, but Indiana's Medicaid MCEs do not employ peer recovery specialists. MCE case managers reported that the majority of Pregnancy Promise Program beneficiaries are not interested in talking with a peer recovery specialist. Pregnancy Promise Program case managers can connect beneficiaries who are interested with a community-based peer recovery specialist.

Data systems. Indiana collects all required MOM Model data elements. Indiana did not add elements beyond those specified by the MOM Model. FSSA built a data collection interface for case managers to facilitate data collection and reporting. Through this interface, FSSA can extract reports and produce maps showing enrollment by county or by case manager. Recently, FSSA shared information on outreach and enrollment in the Pregnancy Promise Program by race and ethnicity with the MCEs to start a discussion about targeting outreach to underserved populations.

Beneficiary Perspective

Key takeaways. Beneficiaries who participated in a focus group reported mixed experiences. Most beneficiaries reported feeling supported by their Pregnancy Promise Program case managers and felt this relationship was the most helpful part of their maternity and postpartum care. They appreciated receiving reminders to attend prenatal care and OUD treatment appointments.

> *" [The Pregnancy Promise Program case manager] helped me a lot. She's helped me get stuff that I've needed. I had to have a blood pressure machine because my blood pressure after I had my son was really high. So, they've sent me stuff like that, and she's helped me keep track of doctor's appointments and she'll remind me and call me sometimes and is like, "Do you remember your appointments?" And it does help; I like that point of it."*

Beneficiaries also described receiving psychosocial support, including help budgeting, applying for rental assistance, and reminders to attend appointments.

> "Pregnancy Promise, they did a lot for me … There were a lot of things that we just could not afford at that point in time, and [my case manager] worked with me like when it came to budgeting and … getting rental assistance and things … and her walking me through that step by step, that was helpful."

In contrast to their positive experiences with Pregnancy Promise Program case managers, several beneficiaries felt their maternity and postpartum care had been inadequate or stigmatizing. Those who had been pregnant prior to their experience with OUD noted it had been "easier to get care without addiction issues." One beneficiary said she was "treated terribly when [my providers] found out that I was on suboxone." One beneficiary, who stated she is not currently receiving medication-assisted treatment, said, "I know I will relapse" and discussed feeling afraid to go through withdrawal.

Beneficiaries preferred providers who could be "like a sponsor" and have a similar background to them. However, none of the focus group participants recalled having been given the option to connect with a peer recovery specialist.

Medicaid Context and Sustainability

MOM Model sustainability. FSSA is currently collecting data on Pregnancy Promise Program costs and savings to help inform sustainment of Pregnancy Promise Program case management services once the MOM Model ends. On September 8, 2022, FSSA received approval from the Centers for Medicare & Medicaid Services (CMS) of a Medicaid State Plan Amendment for 12-month Medicaid postpartum coverage, an extension from the current 60-day postpartum coverage limit. The extended coverage applies to anyone who received Medicaid maternity care beginning April 1, 2022.

Medicaid and other State context. In June 2021, Indiana withdrew a pending Section 1115 waiver that would have extended postpartum Medicaid coverage to 12 months for pregnant individuals with OUD only. In a letter to CMS, the State announced its intention to instead pursue the 12-month postpartum coverage extension authorized by the American Rescue Plan Act of 2021. The Indiana legislature passed a bill (HB 1140) that was signed by the Governor in March 2022 requiring FSSA to extend postpartum Medicaid eligibility to all Medicaid beneficiaries to 12 months.

Conclusion

Indiana's Pregnancy Promise Program launched successfully and hired care coordinators who appear to work well with the MOM Model population. At the time of the site visit, the Indiana MOM Model had enrolled roughly a third of its enrollment target for the year. The evaluation team will continue to track Indiana's enrollment numbers and examine factors that influence enrollment rates and the capacity of care coordinators to manage the increase in enrollees. The team plans to follow up on the extent to which MCEs are able to obtain consent from Pregnancy Promise Program beneficiaries to share information with providers.

The team will also seek to learn more about the extent to which Medicaid providers serving Pregnancy Promise Program beneficiaries adopt clinical best practices for treating pregnant and postpartum individuals with OUD and their infants and how FSSA and MCEs are increasing adoption of these best practices. The team will plan to explore how clinical teams consider addressing the need for clinical culture change related to reducing stigmatizing behaviors by providers caring for pregnant people with OUD. Finally, the evaluation team is interested in further understanding beneficiaries' perspectives on the care they receive under the Pregnancy Promise Program, including both case management services and clinical care, whether and how the program has facilitated access to psychosocial and community supports, and beneficiaries' uptake of peer recovery support services.

MaineMOM Model: In Brief

The MaineMOM program, housed within the State Office of MaineCare Services, began implementation July 1, 2021. During MaineMOM's first year of implementation, program staff designed a system of treatment and recovery for MOM Model beneficiaries that integrates a medication first model with prenatal, delivery, and postpartum care. Model services include same-day access to medication for treatment of opioid use disorder (OUD), referrals to community support, eat/sleep/console methods to enhance parent-infant bonding, and recovery coach support. MaineMOM has conducted a public outreach campaign to increase awareness of available services and reduce stigma. MaineCare developed a sustainable funding structure for the MaineMOM program during the first year of implementation.

The prevalence of infants diagnosed with NAS per 1,000 deliveries in Maine decreased from 22.9 in 2019 to 20.3 in 2020. MaineMOM extends pre-existing State efforts to improve outcomes for individuals with OUD in Maine, such as Opioid Health Homes.

Geographic Scope

14 sites statewide

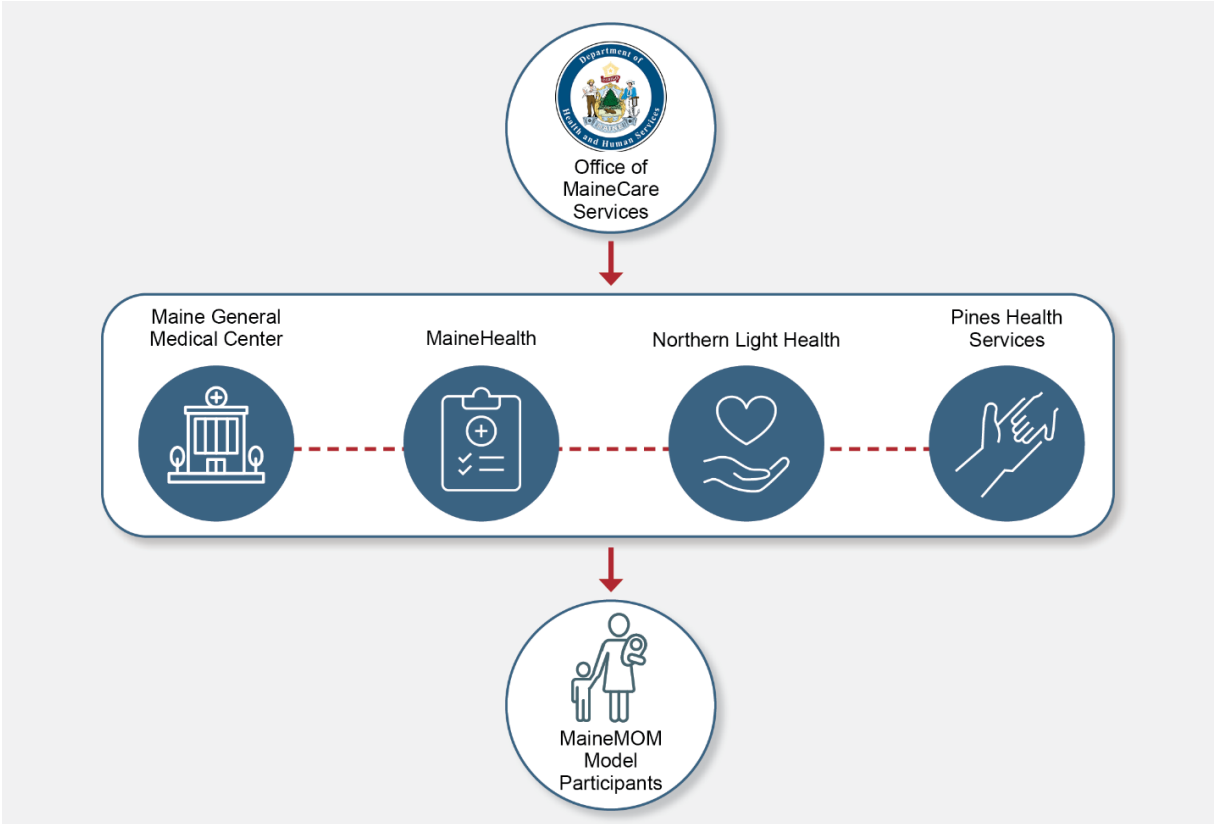
Urbanicity

Rural, suburban, and urban

Enrollment

80 individuals served in Year 1 of implementation

Key Model Partners



Implementation Lessons Learned

Implementation successes. In the first year of implementation, MaineMOM created a formal infrastructure for a system of comprehensive, integrated care for pregnant and postpartum people in the State with OUD. Care delivery partners with well-established models of care prior to MaineMOM used MaineMOM resources to bolster their care teams and test innovative practices. The program also successfully expanded access to services, including peer recovery services, and more providers in the State are now offering coordinated obstetric and OUD services to patients.

Specific MaineMOM implementation successes that key informants have highlighted include the creation of the MaineMOM Advisory Group, which convenes each month to provide input and guidance on model design and implementation. The MaineMOM Extension for Community Healthcare Outcomes learning series and the program's clinical office hours provide critical training and education on best practices for caring with pregnant and postpartum people with OUD and have helped bolster provider confidence in treating this population. Finally, key informants unanimously emphasized the value of peer recovery services and indicated this component was "the most important piece of this Model."

Implementation challenges. Staffing shortages have slowed implementation and stretched program staff capacity. Program staff and providers also had limited bandwidth to focus on MOM Model implementation because of responsibilities related to COVID-19, and the pandemic prevented beneficiaries from gathering in person for group care and support.

Care delivery partners have found fulfilling MaineMOM's data collection requirements to be challenging, particularly incorporating tools such as the patient activation measure (PAM) and health-related social needs (HSRN) screenings because these elements have added extra paperwork burden to providers.

Finally, providers have reported enrollment challenges related to difficulties billing Medicaid for MOM Model care coordination services. Many potential enrollees are ineligible for MaineMOM because they are already receiving Medicaid services considered to be "duplicative" (e.g., targeted case management, medication and counseling for OUD, participation in Opioid Health Homes), or the State's data on what services beneficiaries are receiving are sometimes erroneous. Providers' challenges with data collection and reporting may be deterring some from enrolling beneficiaries.

Program Features

Partnership maintenance. MaineMOM currently has contracts with four care delivery partners—down from six in the pre-implementation year. One partner dropped out of the program because of staffing challenges, and another was acquired by another care delivery partner. As a result, the previously statewide initiative now has service sites in 14 of Maine's 16 counties. Other partners involved in MaineMOM include the University of Southern Maine, Ethos Marketing and Design, the Maine Center for Disease Control, the State Office of Behavioral Health, and the Office of Child and Family Services. MaineMOM Model partners reportedly feel supported by the State team, with one informant noting the awardee project director had been "amazingly helpful, hands-on, and responsive."

Enrollment, intake, and assessment: MOM Model beneficiaries can enter the program through one of several different pathways developed during the pre-implementation year. Most often, providers at participating maternity and substance use treatment sites have offered enrollment to current patients. Other providers have referred patients to MaineMOM through the Maine Center for Disease Control's CradleME statewide referral system for birthing families.

Key informants named stigma related to OUD and its treatment as their primary health equity concern. They perceived the problem of stigma and bias among healthcare providers and society at large were improving over time, though some described persistent stigmatizing behaviors, particularly among pharmacy staff and Department of Health and Human Services Child and Family Service caseworkers. Some key informants also mentioned health inequities that result when people experience barriers to care such as lack of transportation, childcare, a living wage, or safe housing.

To promote MaineMOM and raise public awareness of the needs of pregnant and parenting people with OUD, MaineMOM contracted with Ethos Marketing and Design to develop a communications campaign that launched in the summer and fall of 2021. The Ethos team worked closely with the MaineMOM Advisory Group on the design of the campaign, which incorporated input and feedback from people in recovery. The campaign uses various print and digital media materials that provide information about MaineMOM and direct potential enrollees to the program's website (mainemom.org).

MaineMOM sites are required to conduct universal substance use disorder screening for people who are pregnant. All MaineMOM clinical sites generally complete enrollment and intake soon after an individual presents for services. Within the first few visits, potential enrollees complete assessments with a care team member (e.g., care manager, behavioral health counselor), sign the MaineMOM consent form, and are offered patient navigation and peer recovery services.

MOM Model services. The awardee did not add any new services to Medicaid; however, program officials created a maternity care version of the existing Opioid Health Home benefit. Primary model components of MaineMOM include same-day access to "medication first" care; care coordination with referrals; home visiting when appropriate; increased focus on pain management during delivery; adherence to Eat, Sleep, Console methods to enhance mother-infant bonding after delivery; ongoing group and individual therapy through 12 months postpartum; and peer recovery support. All MaineMOM provider sites strive to integrate the delivery of prenatal, birth, postpartum, and OUD treatment services, but integrated care does not necessarily mean co-located care. Only some sites can offer pregnancy-related and OUD treatment services at the same location.

Care coordination is a central component of the MaineMOM Model, and several different care coordination models are in use across MaineMOM's care delivery partners. MaineMOM recognizes two different types of care coordinator: (1) a patient navigator, who coordinates healthcare, mental health, and social services to help support the member in their recovery; and (2) a nurse care manager, who contributes to implementation, coordination, and oversight for each patient enrolled in MaineMOM services. MaineMOM recently funded pilot projects to examine the challenges and strengths of different models of patient navigation and care coordination staffing.

Though all MaineMOM care delivery partners intend to integrate peer recovery services into their scope of care, they were at varying stages of achieving this goal at the time of the site visit. Five of the eight

MaineHealth sites are actively referring MaineMOM beneficiaries to the health system's network of five peer recovery partners. After providers make a referral, they do not have further communication with the peer recovery partners, a practice intended to protect patient privacy and trust. One peer recovery partner explained, "When I receive information that does not come directly from the person … that puts me in a position of power over them. I am not more powerful; I am just another human being who has had a similar experience."

Data systems. MaineMOM care delivery partners have faced challenges in incorporating newly required tools such as the PAM and HSRN screening into well-established data systems. Program officials enlisted help from the Centers for Medicare & Medicaid Services Innovation Center in communicating the importance of these data elements to the care delivery partners. However, key informants expressed concern that the burden of MaineMOM data collection may eventually prompt providers to stop participation in the Model.

MaineMOM Beneficiary Perspective

Key takeaways. The evaluation team conducted individual in-depth interviews with five MaineMOM beneficiaries to obtain their perspectives on receiving care under the model. For the most part, women shared positive experiences, describing how care was well structured, highly supportive, and coordinated. One woman described the support she received:

> *"[My care coordinator] has been like a mom to me. Both of my parents are struggling with addiction. She will check in on me or text me to make sure I am okay. I don't know what I would've done without [her]."*

When comparing MaineMOM care with their care during previous pregnancies, several women described their care under MaineMOM as more supportive and less judgmental with easier access to counseling and therapy. One woman shared:

> *"Having a program for mothers fighting addiction and in recovery is huge [and] makes a big difference. [Compared with my first pregnancy with my oldest son,] you didn't have all that support. You had your baby [and] went home."*

All the women shared that the MaineMOM program was helping them on their journey to recovery. For example, one said:

> *"The … thing for me now … is that my life is so much better. I would never imagine being where I am today. I am a great mother. It's worth it to be here alive on this earth and spend time with family and kids. It's amazing to look back on where I used to be. I am a totally different person."*

Medicaid Context and Sustainability

MOM Model sustainability. In July 2022, the State Office of MaineCare Services implemented its State Plan Amendment (SPA) to cover Maternity Opioid Health Home services for any eligible Medicaid beneficiary, which established sustainable federal funding for MaineMOM. To pay providers for

rendering MaineMOM services, the State created three categories of care, each with its own per-member per-month payment. These categories follow:

- ***Integrated services***, where OUD treatment, perinatal care, and care coordination are available in one care delivery site
- ***Partnership services,*** where OUD treatment and care coordination are provided in one location, and perinatal care is provided elsewhere through a formal partnership agreement
- ***Perinatal navigation services***, where perinatal care and care coordination are available onsite, but OUD treatment services are delivered externally

Medicaid and other State context related to MOM Model. Earlier this year, Maine received federal approval of a SPA to extend postpartum coverage for Medicaid beneficiaries who have their pregnancies covered by Medicaid to 12 months postpartum. This expansion took effect August 1, 2022.

Conclusion

During the first year of implementation, MaineMOM successfully launched its program on time, implemented integrated medication first services and best practices, focused on destigmatizing substance use disorder and OUD, and received approval for a SPA to establish federal funding for the program. Throughout the next round of case study data collection, the evaluation team plans to examine various topics that emerged from the first year of implementation. One such topic is the extent to which virtual care has remained a routine practice under MaineMOM.

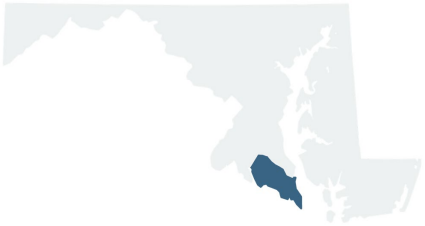
The team also plans to examine the extent to which pregnant and postpartum people with OUD received MaineMOM services without formally enrolling in the program to determine whether problems with "duplicative services" are suppressing MaineMOM enrollment. The team will also explore the extent to which the target population is receiving care without formally being enrolled in MaineMOM now that Medicaid reimbursement is broadly available for MaineMOM services (regardless of whether a provider officially participates in the MOM Model) under the State's Maternity Opioid Health Home SPA. Data collection challenges could discourage providers from enrolling their patients in MaineMOM. Finally, the team will investigate how alternative approaches to care coordination are working and determine if any models appear more successful than others.

Maryland MOM Model: In Brief

The Maryland MOM Model began implementation July 1, 2021. The Maryland Department of Health partnered with nine managed care organizations to offer enhanced case management and peer support services to pregnant and postpartum individuals with opioid use disorder (OUD). Managed care organizations (MCOs) partnered with the St. Mary's County Health Department to provide these services during the first year of implementation. The Maryland Department of Health also partnered with the Maryland Addiction Consultation Service for MOMs to provide medication-assisted treatment capacity building services targeted toward Maryland providers. These services included webinars, technical assistance, and Drug Addiction and Treatment Act of 2000 trainings to improve provider knowledge and capacity to care for pregnant and postpartum individuals with OUD

Geographic Scope

St. Mary's County



Urbanicity

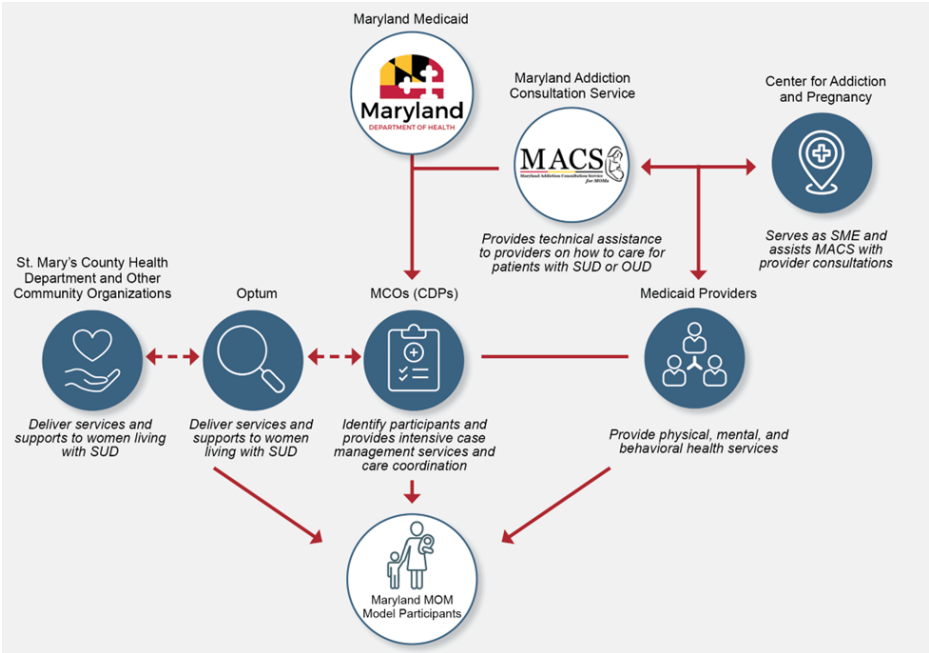
Rural

Enrollment

3 individuals served in Year 1 of implementation

The Maryland MOM Model served St. Mary's County during the first year of implementation and planned to expand to additional counties in July 2022 and statewide by January 2023. However, following the first year of implementation, Maryland ultimately decided to withdraw from the MOM Model as of December 31, 2022, reportedly because of data reporting burden. This In Brief reports on Maryland's plans as of the end of the first year of implementation.

Key Model Partners



CDP = care delivery partner; MACS = Maryland Addiction Consultation Service; MCO = managed care organization; OUD = opioid use disorder; SME = subject matter expert; SUD = substance use disorder

Implementation Lessons Learned

Implementation successes. Considering that Maryland enrolled only three beneficiaries during the first year of implementation, their successes primarily centered on planning for service provision and partnership maintenance. Seven of nine MCOs operate in St. Mary's County. These MCOs established contracts with the St. Mary's County Health Department (SMCHD) to provide enhanced case management and peer support services to MOM Model beneficiaries. SMCHD case managers applied lessons learned from providing enhanced case management services under Strong Beginnings, a St. Mary's County program similar to the MOM Model, to smoothly implement enhanced case management services for three MOM Model beneficiaries. However, it was unclear whether the successful implementation of enhanced case management services would be maintained as enrollment increased.

The Maryland Department of Health (MDH) developed guidance materials to ensure case managers were familiar with best practices and standard procedures for enrolling and providing case management services to pregnant and postpartum Medicaid beneficiaries with OUD. These training materials were well received by SMCHD case managers and MCO staff.

The Maryland Addiction Consultation Service for MOMs (MACS for MOMs), the "second arm" of the Maryland MOM Model, saw various successes during the first year of implementation, including attendance from more than 150 providers across two quarterly educational webinars. MACS for MOMs also provided technical assistance to providers and health systems seeking to learn about strategies for integrating medication-assisted treatment for pregnant and postpartum individuals.

Implementation challenges. Variation in contracting procedures across MCOs created increased burden for SMCHD leadership because they were required to develop distinct contracts with each of the seven MCOs active in the county for the provision of MOM Model services. MCOs anticipated similar challenges when contracting with various local health departments if the model had expanded statewide as planned in January 2023. MDH was identifying strategies to introduce uniformity into the contracting process, including the development of a contract template to reduce burden on MCOs and local health departments.

Beneficiary data collection and reporting was cited as a challenge for MCO staff because of difficulties identifying and correcting automated data submission errors and the burden of compiling beneficiary data from multiple sources into the MOM Model Data Submission Gateway template. Staff from one MCO indicated that compiling data for just two beneficiaries (only two of the three beneficiaries enrolled during the first implementation year were enrolled at the time of data reporting) was burdensome during the first year of implementation and cited concerns about increased burden if enrollment in the Model increased as expected. The Centers for Medicare & Medicaid Services was working with MDH, Chesapeake Regional Information System for Our Patients (CRISP), and the Hilltop Institute to identify strategies for automating aspects of the manual data entry process to reduce burden for future MOM Model beneficiary data submissions.

MCOs and SMCHD also experienced challenges with low enrollment, enrolling only three beneficiaries in the Model as of June 30, 2022. Factors that limited enrollment during the first year of implementation can be found in the Enrollment, Intake, and Assessment section below.

Program Features

Partnership maintenance. Partnerships between MDH and other MOM Model partners were maintained during the first year of implementation, and MCOs established contracts to formalize partnerships with SMCHD to provide MOM Model services. MDH shared plans with MCOs to expand the MOM Model from St. Mary's County to additional counties in July 2022 and statewide by January 2023. In response, MCOs began planning to partner with local health departments and case management vendors to provide MOM Model services. MDH supported MCOs' planning efforts through monthly joint meetings throughout the first year of implementation and by offering one-on-one meetings with MCOs to address specific expansion-related questions and concerns.

MDH also established a MOM Model advisory board, MOMMA, which met for the first time in spring 2022. The board included public and maternal health staff from various groups and programs within MDH (e.g., Maternal Child Health Bureau, Maryland Prescription Drug Monitoring Program) and representatives from SMCHD, MCOs, CRISP, the Hilltop Institute, and Optum. The goal of MOMMA was to coordinate maternal health efforts across Maryland's State agencies and discuss challenges and lessons learned among MOM Model partners.

Enrollment, intake, and assessment. MDH planned to enroll between 20 and 30 beneficiaries from St. Mary's County in the MOM Model during the first year of implementation. However, as of June 30, 2022, only three beneficiaries had enrolled and received MOM Model services. MCOs faced various challenges identifying eligible beneficiaries during the first year, including prenatal care providers' inconsistent administration of the Maryland Prenatal Risk Assessment, which flags pregnant individuals with OUD; limited access to beneficiaries' substance use diagnoses and treatment records; limited self-referrals by beneficiaries because of stigma and lack of engagement with the healthcare system during the COVID-19 pandemic; and inadequate MOM Model marketing to providers.

Two Historically Black Universities, Bowie State University and Morgan State University, partnered with MDH to conduct a qualitative study to investigate diversity and equity within the MOM Model and determine strategies for improving equitable access to care.

MOM Model services. During the year of implementation, MOM Model services included enhanced case management and peer recovery services. Case managers met with beneficiaries in person once per month to provide care coordination, education, and tracking of beneficiaries' progress meeting care plan goals. Care coordination and case management services had been identified as a primary need for pregnant and postpartum individuals with OUD in Maryland through a statewide needs assessment of providers conducted by MACS for MOMs. During intake, case managers screened beneficiaries for physical and behavioral health and social needs and helped them identify and access providers and resources to address those needs. Beneficiaries were also offered engagement with a peer recovery specialist during the MOM Model intake meeting; however, as of the time of the case study, no beneficiaries had opted to receive peer support services.

Data systems. CRISP is Maryland's regional health information exchange, which hosted the MOM Model Care Coordination Module. Case managers entered beneficiary care plans and case management records into the Care Coordination Module. MDH collaborated closely with CRISP staff during the first

year of implementation to improve user experiences, entering data into the module and addressing errors in data entry requirement logic. CRISP staff provided training to case managers, which included a walk-through of the software with "test beneficiaries" and time for questions following the training to highlight specific user experience challenges with data entry and identify other areas for improvement. Despite these efforts, reporting beneficiary-level data remained difficult and time-consuming for MCO case managers.

Medicaid Context and Sustainability

MOM Model sustainability. MCOs receive a per member per month (PMPM) payment of about $200 to provide enhanced case management services, health screenings, and peer support to beneficiaries. MDH received approval to sustain MOM Model financing through the 1115 HealthChoice demonstration waiver during the first year of implementation. The HealthChoice waiver will include federal matching for the MOM Model PMPM payment beginning July 1, 2022.

Medicaid and other State context related to MOM Model. MDH expanded Medicaid coverage for women from 2 months postpartum to 12 months postpartum on April 1, 2022.[13] The 12-month postpartum coverage period begins at the infant's birth and ends on the last day of the 12th month. The newborn automatically qualifies for Medicaid for the first year following birth and is enrolled in the same MCO as the birthing parent.

Conclusion

At the time of the site visit, the Maryland MOM Model had enrolled only three beneficiaries, roughly 10 percent of its enrollment target for the year. In addition to the problem of low enrollment, key informants had noted a variety of implementation challenges, including cumbersome contracting processes and the burden of data entry and submission.

Before the Maryland MOM Model withdrew, the evaluation team had planned to investigate how lessons learned from the St. Mary's County pilot implementation could be used to support expansion of the model to more counties, what challenges MCOs encountered when expanding the model, and how MDH supported expansion efforts. The team also planned to better understand the MOM Model's marketing plans to support model expansion and how uniformly MOM Model services would be implemented across MCOs and local health department partners. Finally, the team had hoped to learn about preliminary findings from a study by Bowie State and Morgan State Universities to investigate diversity and equity within the model.

[13] Maryland Department of Health HealthChoice. (n.d.). *Coverage for pregnant women*. https://health1.maryland.gov/mmcp/healthchoice/Pages/Pregnancy-Coverage.aspx

New Hampshire MOM Model: In Brief

The New Hampshire MOM Model began implementation July 1, 2021. New Hampshire's Department of Health and Human Services has partnered with Elliot Hospital, which serves the Greater Manchester Region. During the first year of implementation, New Hampshire's MOM Model built on the region's opioid misuse prevention and treatment efforts for those who are pregnant and postpartum. Prenatal care, medication-assisted treatment, and other substance use treatment are provided at Amoskeag Health (a federally qualified health center) and the Catholic Medical Center.

The New Hampshire MOM Model collaborates with four community organizations for referrals and care coordination: Families in Transition, the Mental Health Center of Greater Manchester, Elliot Drug Court, and Waypoint. Medicaid financing is directed toward developing information technology to bolster care coordination and support a community health worker at Elliot Hospital.

Geographic Scope

Greater Manchester

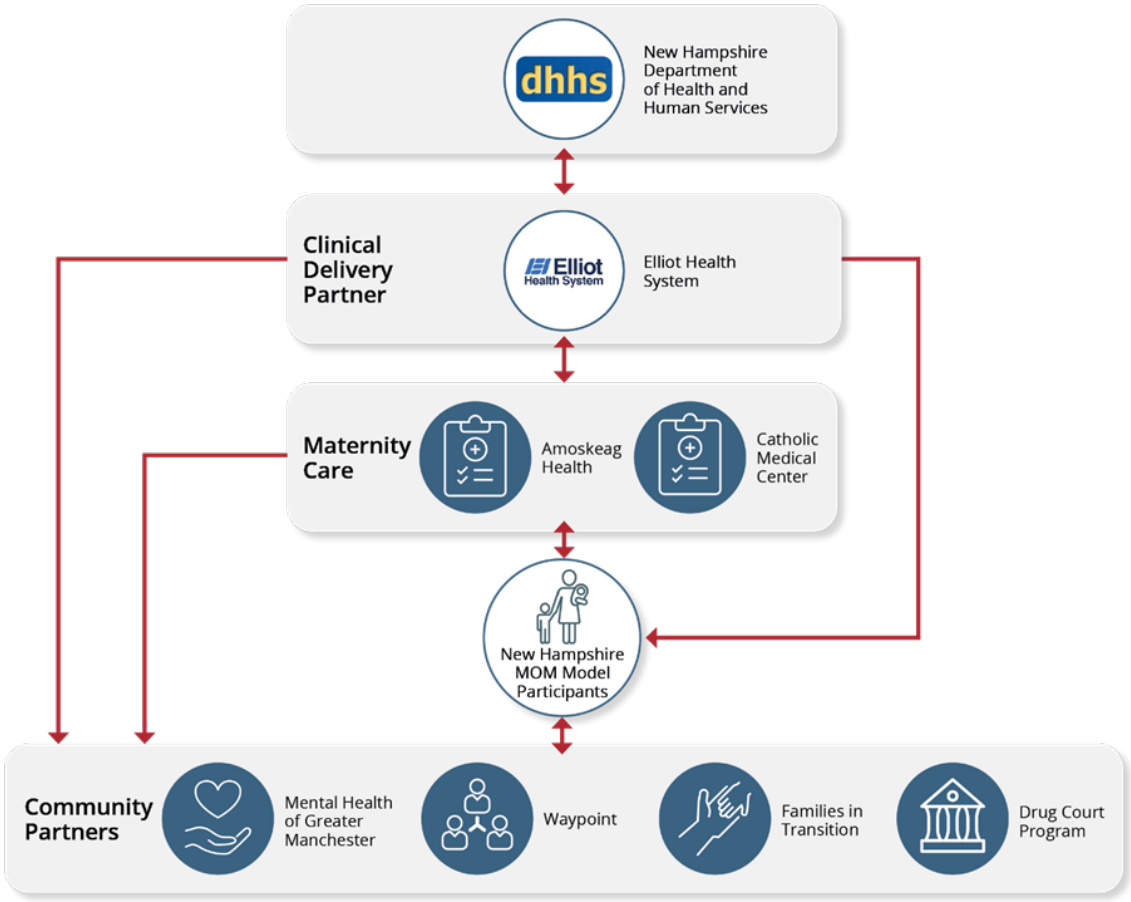
Urbanicity

Mixed urban and rural

Enrollment

18 individuals served in Year 1 of implementation

Key Model Partners



Implementation Lessons Learned

Implementation successes. The New Hampshire MOM Model has reportedly had success in care coordination, engaging with the community, and raising awareness about the MOM Model. MOM Model staff members value the monthly care coordination meetings as an opportunity to discuss how to connect beneficiaries to the services they need. The Model has hired a community health worker with lived experience of opioid use disorder (OUD) and strong connections to the Manchester recovery community, and she has forged trusting relationships with MOM beneficiaries. By going into the community daily, including homeless shelters and provider offices, she has also reportedly helped to disseminate information about New Hampshire's MOM Model and increase enrollment rates.

Implementation challenges. The Model has encountered barriers related to enrollment, infrastructure, and data integration. As of spring 2022, the Model had enrolled 18 beneficiaries, far below the initially anticipated enrollment target of 200 beneficiaries annually. New Hampshire MOM Model team members have reported limited resources available in Manchester to meet health-related social needs, including access to affordable housing and recovery housing options, transportation, and childcare. Staffing turnover, transitions, and shortages have created challenges to maintaining partner relationships.

The New Hampshire MOM Model has also experienced delays in implementing an enhanced information technology (IT) system that will improve service integration among providers within the Elliot Health System. Challenges to implementation have included the recent Solution Health merger with Southern New Hampshire Hospital, the need to build components for other programs into the system, and an overloaded IT team working on multiple projects. Elliot expected to implement the new IT system by late summer or early fall 2022.

Program Features

Partnership maintenance. Model partners, including the New Hampshire Department of Health and Human Services , Elliot Hospital, Amoskeag Health, Catholic Medical Center, and four community partners have maintained productive relationships during the first year of implementation.

Data systems. The New Hampshire MOM Model team originally planned to create an enhanced IT system through the Elliot Health System, which facilitates information sharing across healthcare providers and community partners. This system remains under development and is now expected to be used only by Elliott Hospital because of challenges in implementation.

Key informants consistently discussed the stigma surrounding current or past OUD as the primary barrier to equitable treatment for MOM Model beneficiaries when accessing healthcare and other services. Patients often feel judged or treated differently once a provider learns about their substance use.

Currently, all MOM Model partner organizations, including Elliot Hospital, are using a REDCap system designed for the MOM Model to report beneficiary data to the Centers for Medicare & Medicaid Services (CMS). The State Medicaid agency does not directly interact with the REDCap system; instead, Elliot Health Systems collects data from the partners and augments with claims data, and Elliot sends the data to CMS.

Enrollment, intake, and assessment. New Hampshire has a "no wrong door" approach to enrollment for their MOM Model. Beneficiaries are referred to the program by maternity care providers at Amoskeag Health and Catholic Medical Center, staff at key partner organizations, or the community health worker or medication-assisted treatment care coordinator at Elliott Hospital. In addition to these direct outreach efforts, people can connect with the program by calling 211 or visiting 211NH.org. Concerns related to COVID-19 and staffing challenges have contributed to slow enrollment in the Model.

New Hampshire uses the Protocol for Responding to and Assessing Patients' Assets, Risks, and Experiences (PRAPARE) for social needs screening with all beneficiaries. All partner agencies have access to PREPARE and may also use other screening instruments and assessments, such as Screening, Brief Intervention, and Referral to Treatment. All six partner organizations enter screening information into REDCap to be shared with Elliot Hospital.

MOM Model services. By design, New Hampshire MOM Model has not added any new Medicaid services during the implementation period, though a community health worker has been added—and funded by the MOM Model—to support care coordination. Prior to implementing the MOM Model, local maternity care and substance use disorder treatment providers had adopted many best practices in the care they offer. Best practices are used for all patients, not just MOM Model beneficiaries. All partners participate in establishing Plans of Safe Care.

Care coordination is a central tenet of the New Hampshire MOM Model. The community health worker at Elliot Hospital serves as the primary care coordinator for the MOM Model and personally provides care coordination services to all beneficiaries. At the time of the interview, the MOM Model's community health worker had a caseload of approximately 18 women and indicated that if that number more than doubled, she would likely need help to maintain the same quality of care and frequency of contact she currently provides MOM Model beneficiaries. This community health worker is not funded through Medicaid, and sustainability for this position needs to be clarified. While New Hampshire does not have a peer recovery coach as part of its model, the community health worker serves a similar role. To facilitate coordination across partner organizations, Elliot Hospital hosts two monthly committee meetings.

Medicaid Context and Sustainability

MOM Model sustainability. To ensure the MOM Model would be sustained after the end of the MOM cooperative agreement, New Hampshire did not add any Medicaid-covered services or populations as part of the MOM Model. As a result, they do not have plans to apply for a State Plan Amendment or an 1115 Waiver. Similarly, the Medicaid program did not need to renegotiate its contracts with managed care organizations (MCOs) because of any changes made by its MOM Model.

Medicaid and other State context. A bill extending postpartum coverage to 12 months stalled earlier this year in New Hampshire's State legislature. Postpartum beneficiaries with pregnancy-related Medicaid coverage remain covered until the end of the COVID-19 public health emergency federal declaration.

All three of New Hampshire's Medicaid MCOs are required to provide case management services to pregnant members and members with substance use disorder. Some MCO care coordinators are participating in the New Hampshire MOM Model's Care Coordination meetings to share insights about cases and resources available to pregnant and postpartum individuals with OUD.

Beneficiary Perspectives

Key takeaways. Three beneficiaries from New Hampshire's MOM Model participated in a focus group to discuss their experiences with the program during its first year of implementation. The women praised MOM Model staff, especially the community health worker, in supporting their recovery journey. The community health worker went "above and beyond" in providing support by connecting beneficiaries to important resources and helping complete daily tasks and goals, such as scheduling appointments, filling out paperwork, and making phone calls.

The women also believed their relationships with the MOM Model staff were "less judgmental" than those with other providers and even family members because they felt more understood and could open up about their experiences. Two of the women shared the following:

> *"[It's been] a real blessing … because they've made my life a lot easier, and I know that if I need other resources, especially when it comes to my recovery, I can rely on them."*

> *"I've had a better experience through the [MOM program] not feeling stigmatized and not feeling judged. I opted for their case management rather than where my OB was … I am glad I did give [the MOM program] a shot because this is the exact thing I did need."*

The women expressed gratitude for the program staff, their children, and the people they have met on their recovery journey, who are "all big reasons" that continually motivate the women to stay sober and feel supported during difficult times.

Conclusion

Enrollment into the New Hampshire MOM Model is lower than anticipated, with only 18 of the originally anticipated target of 200 beneficiaries enrolled 1 year into implementation. Delays in implementing an enhanced IT system intended to improve service integration between providers within the Elliot Health System has been a barrier to implementation, as has staff turnover. Beneficiaries expressed praise for how MOM Model staff treated and helped them in recovery.

In the next round of case study data collection, the evaluation team plans to examine various topics that emerged from the first year of implementation. For instance, the team plans to continue to track the progress of Elliot Health System's IT system, which has not yet been implemented, and how this system will interact and support the REDCap system through which the MOM Model partners outside of Elliot collect and share data (including prenatal care and OUD care provider partners). The team will also track New Hampshire's enrollment numbers and whether it will be able to scale up its capacity and continue to provide high-quality, high-intensity care to converge with prespecified enrollment targets. Finally, the team will examine how the care coordinator's role will change as more beneficiaries are enrolled and inquire about the process of hiring additional staff with a profile similar to that of the current care coordinator.

Tennessee MOM Model: in Brief

The Tennessee MOM Model program, called Firefly, builds on the work of the Vanderbilt Maternal Addiction Recovery Program and Team Hope. Firefly operates in two service locations at Vanderbilt University Medical Center. Model implementation started as planned July 1, 2021. During Firefly's first year of implementation, program staff—

- Designed a system of treatment and recovery for enrollees using a centralized, coordinated treatment plan that prioritizes medication-assisted treatment (MAT)
- Hired and trained a team of peer recovery coaches to assist in care management, education, and treatment support
- Developed equity-focused training for clinic and hospital staff during the pre-implementation year and concerted organizational focus on destigmatizing MAT and other treatments for substance use disorder in pregnant and parenting people
- Designed a sustainable funding structure for Firefly program per federal requirements

Geographic Scope

2 sites statewide

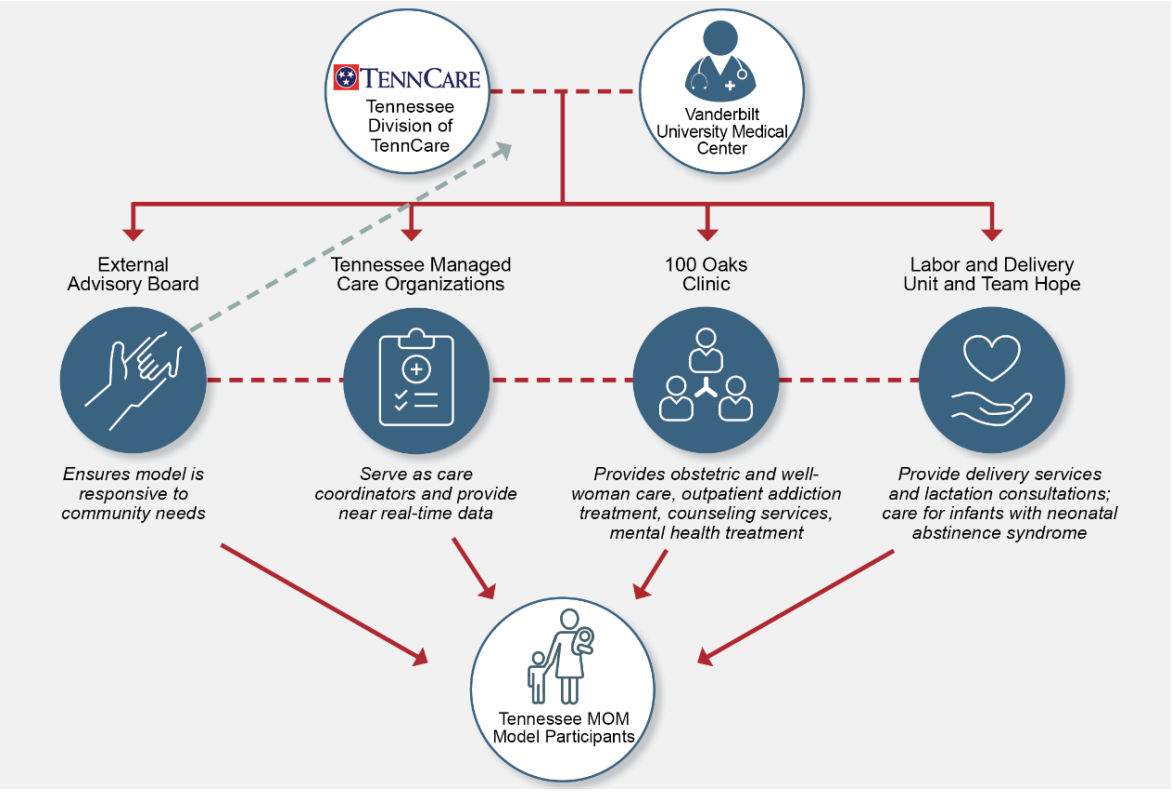
Urbanicity

Rural, suburban, and urban

Enrollment

149 individuals served in Year 1 of implementation

Key Model Partners



Implementation Lessons Learned

Implementation successes. Tennessee successfully enrolled individuals shortly after program implementation by transitioning patients at the existing clinic program into the new Firefly program, which offers additional services, including peer support, lactation consultation services, and an intensive outpatient program. Respondents noted staff flexibility and eagerness to improve have enabled them to adjust implementation strategies based on lessons learned throughout the first year of Firefly implementation. For example, program staff recognized that completing all intake screenings, drug tests, and education during one intake appointment was overwhelming for beneficiaries. Consequently, the team divided intake procedures into two sessions. Respondents also cited the team's integration of data collection and reporting activities into the Epic electronic medical records system as a major success during the first year of implementation.

Implementation challenges. Physical space constraints in the care location create challenges to integrating a new care model serving many beneficiaries. Although the program initially planned to expand into open space within Vanderbilt's Center for Women's Health at the One Hundred Oaks clinic as enrollment increased, these efforts have encountered barriers. For example, available space within the Center for Women's Health was being filled by other Vanderbilt providers. Firefly postponed initial marketing plans early in the implementation period to slow enrollment because of space constraints.

Limited clinic space and a yet-to-be-determined funding stream for childcare prevent the One Hundred Oaks clinic from offering onsite childcare at this time. The care delivery partner and clinic staff continue to investigate strategies for providing this service, including the possibility of partnering with programs that provide childcare vouchers.

Program Features

Partnership maintenance. All informants agreed that TennCare and Vanderbilt University Medical Center (VUMC) have a strong, transparent, and communicative partnership. These two main partnerships are responsible for the pre-implementation activities and starting Model implementation in 2021. At the time of the site visit, VUMC was negotiating contracts with TennCare's managed care organizations (MCOs) to sustain funding for Model services. Firefly also relies on input from two advisory boards:

- **External advisory board.** The Firefly external advisory board consists of municipal and community partner organizations, including people with lived experience with opioid

Respondents highlighted various health equity concerns facing Firefly beneficiaries. Respondents reported most Firefly beneficiaries are English-speaking White people from rural areas, while the population of patients receiving care at VUMC outside the MOM Model is more racially, ethnically, and linguistically diverse. Respondents suggested the lack of minority enrollment in Firefly may result from differences in cultural beliefs and trust in the healthcare system. Respondents also highlighted the effects of stigma on individuals' pursuit of OUD treatment during and after pregnancy. Some pregnant and postpartum individuals with OUD neglect to pursue OUD treatment because they fear how they will be treated by their providers, friends, and family.

use disorder (OUD) during pregnancy. More details on this board can be found on page 27 of the MOM Model Pre-Implementation Evaluation Report. External advisory board membership did not change in the first year of implementation, and the board continues to meet quarterly to discuss Firefly's implementation, improvement, and expansion.

- **Internal advisory board.** As part of improving care coordination through Firefly, the care delivery partner's principal investigator established an internal advisory board at VUMC. This board includes providers of obstetrics and gynecology, pharmacology, neonatology, and substance use disorder treatment services. The board offers input on program components and disseminates best practices for care and treatment of the VUMC beneficiary population.

Data systems. In the pre-implementation year, the Firefly team invested extensive time, effort, and resources in data integration to facilitate easy coordination of care and services across providers. These early investments facilitated updating of the updated Epic electronic health records platform to be fully operational and ready to assist with clinical workflow for Model beneficiaries at the start of program implementation July 1, 2021.

Enrollment, intake, and assessment. At the start of the first implementation year, current obstetric patients (both prenatal and postpartum) eligible for Firefly transitioned from the Vanderbilt Maternal Addiction Recovery Program to Firefly, resulting in nearly instant enrollment of 131 beneficiaries. The Firefly enrollment goal is 300 beneficiaries per year, which Firefly is unlikely to achieve until it expands implementation beyond One Hundred Oaks and addresses staffing capacity challenges. This expansion will not happen in the first year of implementation. At the time of the April 2022 site visit, approximately 90 beneficiaries were actively participating in Firefly; that number increased to 149 by June 30, 2022.

Enrollment begins with provider referrals internal and external to VUMC, including local obstetricians and primary care physicians, VUMC's emergency room and psychiatric hospital, external psychiatric hospitals, methadone clinics, and recovery treatment centers. Program staff indicated that interested people also self-refer, and many learn about the program by word of mouth, often through Model alumni. During the first 8 months of implementation, interviewees reported a FireFly beneficiary's intake appointment lasted 3 hours and included a clinical encounter with an obstetrics provider, a social worker screening, and a program orientation meeting with a peer recovery specialist (PRS).

The 3-hour intake appointments reportedly felt overwhelming to new beneficiaries, so Firefly leadership now splits the intake process into two appointments, giving beneficiaries the option to stack the in-person appointments. The first appointment includes clinical assessments for pregnancy and OUD care, infectious diseases, and screenings for health-related social needs. At the conclusion of this appointment, beneficiaries receive informational handouts about the services they will receive and how to access them. At the second appointment, beneficiaries meet with a PRS and social worker and complete any remaining assessments.

MOM Model services. VUMC provides in-person and telehealth services to Firefly beneficiaries. Each Firefly beneficiary receives a personalized treatment plan at enrollment that requires pre- or postnatal care (depending on stage of pregnancy), group counseling, and individual PRS services. Most, but not all, beneficiaries receive MAT and/or pharmacological services for other behavioral health issues as a part of their personalized treatment plan. Program staff at One Hundred Oaks reported that Firefly beneficiaries receive more frequent and enhanced prenatal and perinatal care services than other

pregnant patients at the clinic who are not enrolled in Firefly. These enhanced services include the following:

- **Peer recovery services.** A PRS provides one-on-one coaching to help beneficiaries navigate their recovery journey and refers them to community resources.
- **Additional fetal monitoring and infant observation.** Beneficiaries receive additional prenatal appointments and additional ultrasounds to monitor fetal growth.
- **Collaborative Care Program (CCP).** Beneficiary-level data that Tennessee submitted via the Gateway[14] revealed that 93 percent of their Firefly beneficiaries have mental health conditions co-occurring with OUD.[15] VUMC incorporated CCP into Firefly to meet beneficiaries' mental health needs without the extra burden of a psychiatry appointment at another location. Clinic staff hold two types of cross-team meetings: daily huddles and monthly collaboration meetings. Staff use the daily huddle to discuss the schedule and needs of each beneficiary who will visit the clinic that day.
- **Lactation consultant**. A lactation consultant hired specifically for the Model serves Firefly beneficiaries throughout their time in the program. Prior to delivery, the lactation consultant provides beneficiaries with breastfeeding education, assistance obtaining a breast pump, an overview of what to expect after being admitted to the hospital for their birth, education about neonatal opioid withdrawal syndrome (NOWS) symptoms, and nonpharmacological strategies for soothing a newborn. After delivery, the lactation consultant remains available to beneficiaries through their 12 months of postpartum eligibility.
- **Intensive outpatient program (IOP).** A 9-week pilot IOP began this year with four beneficiaries. The pilot included psychoeducation, parenting education, and art therapy activities. MOM Model leadership paused IOP in response to staff turnover but planned to begin a second 9-week session in summer 2022.
- **Tailored intrapartum and postpartum pain management plans for people in OUD recovery.** Firefly developed special pain management guidelines for use with individuals with OUD during and after birth to ensure their pain management plan is tailored to their needs. Developing a secondary plan for each beneficiary may include discussing pain management options with the beneficiary if initial approaches are not effective. Team HOPE continues to provide nonpharmacologic labor pain management (e.g., water births, nitrous oxide) in addition to labor anesthesia (e.g., epidurals).
- **Evidence-based approaches to treatment for infants with NOWS.** VUMC nurses initiate nonpharmacological NOWS treatment before attempting pharmacological approaches, and the lactation consultant provides beneficiaries with guidance on how to soothe infants with NOWS. Pharmacological treatment options are used only if nonpharmacological approaches are ineffective. Infants born to Firefly beneficiaries are not tested for drug exposure if their birth parent is receiving MAT, has maintained compliance with treatment, and has not screened positive on a drug test within 12 weeks before delivery or disclosed drug use.

[14] The MOM Model Data Submission Gateway is the mechanism MOM Model awardees use to submit beneficiary-level data to the CMS Innovation Center quarterly.

[15] Cassar-Uhl, D., Benatar, S., Johnson, E., & Moore, T. (2022). *CMS Innovation Center MOM Model evaluation semiannual report* [Internal report]. Insight Policy Research.
Additional analysis of 2018 and 2019 T-MSIS data found that 54.4 percent of Medicaid beneficiaries potentially eligible for the MOM Model had evidence of mental health diagnoses within 12 months of the birth of their child.

Medicaid Context and Sustainability

TennCare is a 100 percent managed care funding model. At the time of the site visit, VUMC was negotiating new contracts with the MCOs to ensure coverage for PRS services, group meetings, and other Firefly-specific services; coverage for labor and delivery services will not change. All informants who spoke about MOM Model sustainability agreed Firefly is on track to have all necessary funding in place before July 1, 2022, when the Coronavirus Aid, Relief, and Economic Security Act, which extended pregnancy and postpartum medical coverage, will expire. At quarterly meetings with the TennCare MCOs, conversations center on efforts to fit Firefly services into available case management bundles. On April 1, 2022, Tennessee expanded postpartum Medicaid coverage to 12 months. Under this expansion, dental benefits are also available to postpartum beneficiaries.

Beneficiary Perspective

Key takeaways. Beneficiaries reported that the ability to receive MAT treatment while pregnant motivated them to enroll in the Model. Support from Firefly providers, especially the lactation consultant and PRSs, drove Model engagement. Both beneficiaries and Firefly staff noted that other facilitators for engagement and treatment adherence included the Firefly program incentives and flexibility offered by telehealth appointments and satellite lab locations. Beneficiaries perceived their providers as responsive to their needs throughout treatment and specifically noticed the personalized approach to their care. One focus group participant said:

> *[My OB] sits and listens. The therapist, he's been great. [The psychiatrist], he's been adjusting my medication for me to kind of help me get through this process because I struggle with severe PTSD [posttraumatic stress disorder]. I can reach out to my recovery coach. For me, they were always reassuring me that they had my back, which I know that without a doubt. I'm struggling, I'm dealing with some past issues that's come up, and they're still right there.*
>
> —Firefly Beneficiary

Staff turnover, particularly among PRSs, created barriers to sustained engagement. Access to transportation and childcare continue to be barriers to care.

Conclusion

During the first year of implementation, Firefly launched its program on time in a centralized care site founded specifically for model services. Model staff enrolled 131 eligible participants throughout the first year of implementation—under half of its enrollment target—but reportedly have established pathways for consistent enrollment through screening and referral processes. The Firefly outpatient clinic and inpatient labor and delivery unit delivered coordinated and centralized care based on best practices for treating pregnant, laboring, and postpartum people with OUD. Two noteworthy achievements include (1) the establishment of a peer recovery coach program that at times employed as many as five peer recovery coaches and (2) the implementation of a long-term funding strategy for Model services based on contracts with MCOs.

The evaluation team will continue assessing the status of MOM Model implementation in Tennessee as more beneficiaries enroll. The team plans to explore how Firefly manages its space constraints in the coming year, the extent to which data sharing extends to services outside VUMC, and the effectiveness of outreach and enrollment efforts.

Texas MOM Model: In Brief

The Texas MOM Model (Texas MOM) began implementation July 1, 2021. The Texas Health and Human Services Commission (HHSC) has partnered with Harris Health System (Harris Health), the public healthcare system for Houston and surrounding areas of Harris County. Texas MOM builds on the existing Maternal Perinatal Addiction Treatment clinic at Ben Taub Hospital, which provides comprehensive prenatal care, physical and mental healthcare, substance use treatment services, and connections to social services.

A community partner, Santa Maria Hostel, offers residential substance use treatment services, peer counseling, and connections to social services. The Patient Care Intervention Center, a nonprofit organization, supports Texas MOM's data collection and reporting. Medicaid financing occurs primarily through contracts with five of Texas's managed care organizations (MCOs).

Geographic Scope

1 hospital and 1 residential substance use facility

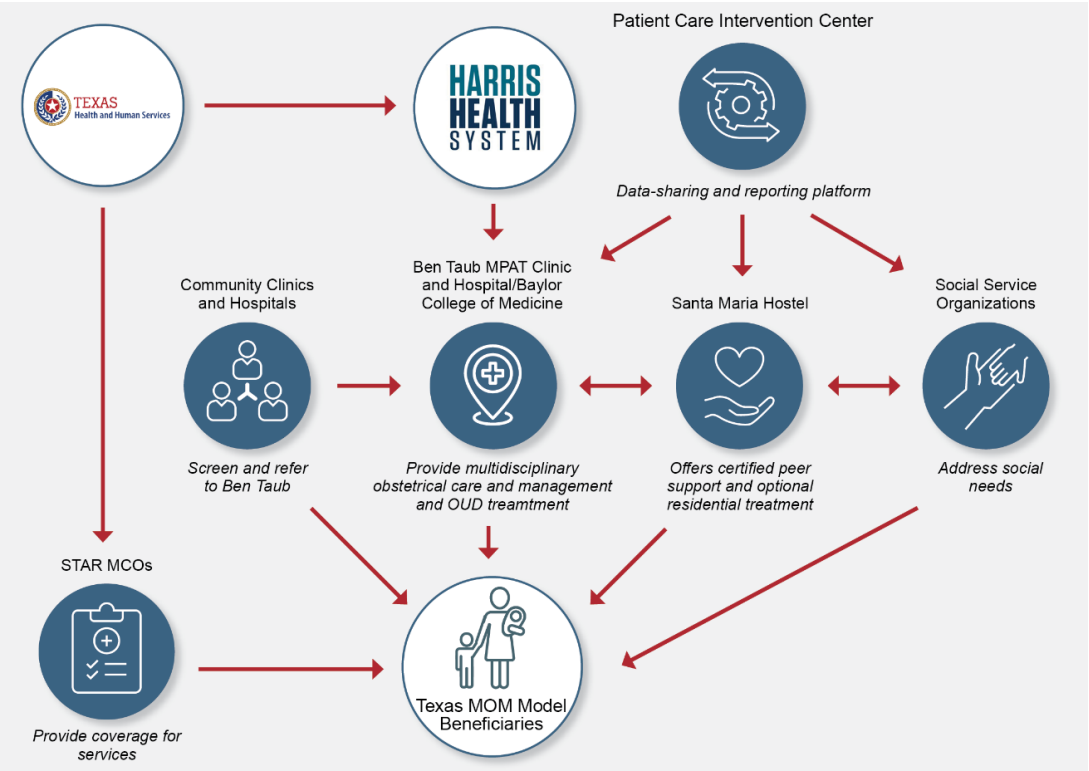
Urbanicity

Urban

Enrollment

26 individuals served in Year 1 of implementation

Key Model Partners



MCO = managed care organization; MPAT = Maternal Perinatal Addiction Treatment; OUD = opioid use disorder

Implementation Lessons Learned

Implementation successes. Key informants described Texas MOM as a model that responds to the multifaceted needs of the target population and strengthens partner relationships. The care delivery partner, Harris Health, located in Houston, noted that implementation went "as smooth[ly] as possible given challenges with COVID." Interviewees underscored that their low-barrier access model and "no wrong door" approach have been key to keeping participants engaged in the model. Harris Health also noted the Plan of Safe Care and providers' ability to effectively manage patients' pain through labor and delivery have been meaningful successes.

Interviewees emphasized the continued integrated approach among partners. HHSC and Harris Health have a strong working relationship, which includes at least weekly meetings to discuss model implementation and updates. The Texas MOM project manager at Ben Taub, the care delivery site, maintains regular communication with Santa Maria's peer specialists and coordinates care for Maternal Perinatal Addiction Treatment (MPAT) Clinic appointments for beneficiaries living at Santa Maria. Harris Health's partnership with the Patient Care Intervention Center (PCIC) has enabled Texas MOM to provide and track referrals for beneficiaries and report data to the Centers for Medicare & Medicaid Services (CMS).

Implementation challenges. Based on physical space and staffing constraints, Ben Taub is near capacity for serving Texas MOM beneficiaries. Interviewees noted they had underestimated the level of care coordination the Texas MOM population needs, even relative to beneficiaries with other high-risk conditions (not related to substance use). Challenges associated with providing adequate care have been compounded by the ongoing burden of the COVID-19 pandemic, which has reduced clinical staffing and personnel well-being and increased burnout. Harris Health will be meeting with hospital leadership to request additional nursing staff and clinic space to expand the MPAT Clinic.

Interviewees also cited reimbursement and billing challenges. Texas Medicaid does not cover all services provided to MOM Model beneficiaries, such as lactation consultation, and one partner noted reimbursement for covered services is inadequate as currently structured. Efforts to fund ancillary services have thus far been unsuccessful. Santa Maria encountered obstacles when attempting to bill Medicaid for peer specialist services for the first time, and they are working with Texas Medicaid to resolve the issues.

Accurately identifying opioid drug use through self-report or urine drug screening is difficult because of the prevalence of synthetics. Ben Taub's urine drug screen cannot test for fentanyl or other synthetics because fentanyl screens are cost-prohibitive for the Harris Health system.

Program Features

Partnership maintenance. Texas MOM partners reportedly have strong working relationships. HHSC, Harris Health, and PCIC have met frequently to address data collection and reporting issues.

Enrollment, intake, and assessment. Texas MOM projected enrolling up to 50 beneficiaries in the first implementation year and had enrolled 26 beneficiaries as of June 2022. A majority of MPAT Clinic patients are

As a result of COVID-19, referrals were initially lower than expected. However, Harris Health has seen increased referrals in 2022, most likely the result of word of mouth in the community.

referred from Santa Maria. Challenges to enrollment include delays to community outreach as a result of COVID-19 and difficulty identifying which pregnant people use opioids. Ben Taub's in-house urine drug screen does not test for fentanyl or other synthetics, and fentanyl screens are reportedly unaffordable for the Harris Health system.

To increase outreach efforts, Ben Taub has distributed informational flyers about Texas MOM to opioid treatment providers, Medicaid MCOs, and the Southeast Texas Regional Advisory Council, a coalition of healthcare providers and emergency responders. To identify participants eligible for Texas MOM, the Harris Health system began conducting universal, verbal substance use screening using the Drug Abuse Screening Test (DAST-10) in June 2021. Healthcare providers administer this test during patients' first prenatal visits and to anyone admitted to a hospital. By mid-May 2022, Harris Health reported approximately 80–85 percent of patients receive the DAST-10. Providers refer eligible patients identified through DAST-10 screening to the MPAT Clinic.

MOM Model services. Harris Health adopted several evidence-based best practices in anticipation of implementing Texas MOM. The MPAT Clinic began using some of these best practices, such as universal drug screening by self-report; rooming in; and the Eat, Sleep, Console approach prior to the Texas MOM enrollment period that began July 1, 2021.

The MPAT Clinic design—offering all prenatal, postnatal, and substance use disorder (SUD) treatment services (except methadone) in one location on a single day—mitigates logistical challenges pregnant people with opioid use disorder face in accessing healthcare and SUD treatment services. Individual clinician visits are longer for Texas MOM beneficiaries than for other obstetric patients and include customized pain management plans for each Texas MOM beneficiary prior to delivery.

About 75 percent of MPAT Clinic patients concurrently participate in Santa Maria's Caring for Two Program, where they receive residential SUD treatment, peer recovery support, health navigation, parent coaching, group counseling support, and transportation to their MPAT Clinic appointments.

Key informants identified cognitive biases, language barriers, transportation challenges, and health insurance coverage as areas that exacerbate inequities in outcomes for pregnant people with opioid use disorder.

Care coordination. MPAT Clinic staff meet in weekly, multidisciplinary huddles to discuss the needs of the day's scheduled patients. PCIC created a care coordination platform that both Ben Taub and Santa Maria staff can use to access and share data. Peer specialists share their patient interactions during the clinic huddle, and the Ben Taub staff include that information in electronic medical records (EMRs). Interviewees noted a dedicated care coordinator would be helpful because Texas MOM beneficiaries often have multiple untreated co-morbidities and complex care management needs beyond clinical care; however, funding is reportedly insufficient to support such a role.

Data systems. HHSC and Harris Health established systems that collect and report data CMS requires. PCIC converts data from Harris Health's EMR to a dataset that can be submitted to the MOM Model Data Submission Gateway, helping Harris Health overcome some of the challenges related to extracting data from its EMR. Integration of data from Santa Maria is on hold as a result of technological hurdles and staff capacity limitations.

Medicaid Context and Sustainability

MOM Model sustainability. Texas did not seek a State Plan Amendment or waiver to implement Texas MOM because most of the Model's services are already covered by Medicaid. As the program is implemented, however, Harris Health has noted that clinical appointments for Texas MOM beneficiaries require more time than those for standard prenatal patients, and Medicaid does not reimburse for the additional MOM services they provide (such as social work and lactation consultation). While the Santa Maria Hostel peer recovery specialists are certified by the Texas Certification Board to bill Medicaid, some MCOs have not approved all claims to date. Therefore, sustainability of the model is uncertain. HHSC is gathering implementation data to develop a possible MCO alternative payment methodology for Texas MOM services.

Medicaid and other State context related to MOM Model. Harris Health and HHSC interviewees noted Medicaid policies that, while not directly part of Texas MOM, affect the delivery of MOM Model services. Healthy Texas Women Plus, effective beginning September 1, 2020, is an 1115 research and demonstration waiver targeted to beneficiaries with low incomes. It uses State-only funds and extends limited Medicaid coverage for postpartum services to 12 months. HHSC has requested federal matching funds; that waiver amendment is pending.

In spring 2021, the Texas legislature passed and the Governor signed legislation (HB 133) to extend full Medicaid coverage to 6 months postpartum. The legislation directs HHSC to seek an amendment to the Texas Healthcare Transformation Quality Improvement Program (THTQIP) 1115 waiver from CMS to implement this coverage extension. On May 25, 2022, HHSC submitted a request to CMS to amend the THTQIP to provide 6 months of postpartum coverage. HHSC also submitted a waiver request to extend postpartum coverage for all Medicaid beneficiaries from 2 to 6 months.

Beneficiary Perspectives

Key takeaways. The evaluation team conducted telephone interviews with two Texas MOM beneficiaries. Interviewees felt the treatment they received through Texas MOM substantially aided their recovery. One beneficiary drew motivation to continue returning to the clinic because the treatment lifted her mood and helped her feel like herself. The second beneficiary indicated the medication itself facilitated her recovery. One interviewee was particularly pleased with the Texas MOM psychiatrist, noting—

> *"[The Texas MOM doctor] actually works with pregnant women and opiate dependence and women who have drug histories. And so, I was like, 'wow, a doctor who understands.' Once I was able to see him, it was easy for me. I really didn't have to worry about any kind of cravings."*

Both interviewees described well-organized prenatal, postpartum, and infant care visits and felt they received high-quality care. Both interviewees described feeling understood and cared for during labor and delivery, in contrast to their prior experiences giving birth. One interviewee stated:

> *"With my second daughter, I had the best labor and delivery experience. The nurses were just fantastic. They were just great coaches. [The doctor] was female … and … a great coach. They understood me. When I had labor and delivery with my first daughter, they made me wait until I was [fully] dilated … before getting an epidural. I was screaming. I was in so much pain. They just—they weren't as caring with me … whereas with my second, they were just so much more caring."*

Conclusion

The Texas MOM Model met roughly half of its enrollment target for the year and is near capacity for serving Texas MOM beneficiaries. In addition to problems with capacity, key informants noted a range of implementation challenges, including staff shortages and burnout, lack of community outreach, difficulty identifying opioid use disorder, data integration at Santa Maria, and Medicaid reimbursement. Beneficiaries' perspectives are positive; they value that their providers care personally about them and their health outcomes and that providers see them consistently.

The evaluation team will continue assessing the status of MOM Model implementation in Texas as more beneficiaries enroll, including beneficiaries' experiences of receiving care and their perceptions of the program's effectiveness. The team plans to monitor Medicaid-related changes (e.g., development of an alternate payment methodology) and their influence on service delivery. The team will also explore whether the Texas MOM Model has been able to expand its capacity to enroll in the model. Finally, the team will investigate whether the Texas MOM data system is successful in facilitating the work of case managers and other staff involved with integrating care for Texas MOM beneficiaries.

West Virginia MOM Model: In Brief

The West Virginia Perinatal Partnership established the Drug Free Moms and Babies (DFMB) program in 2012 to support pregnant and postpartum individuals with opioid use disorder (OUD) through comprehensive, integrated medical and behavioral care services. West Virginia's MOM Model aims to sustain the DFMB program by transitioning its services from grant-based financing to Medicaid financing. The Model also intends to standardize best practices across participating DFMB sites. MOM Model beneficiaries will have access to care coordination, obstetric care, behavioral healthcare, peer support, medication-assisted treatment, and home visiting. West Virginia's MOM Model began implementation on January 1, 2022.

West Virginia has the highest rates of opioid overdose and neonatal abstinence syndrome in the country. In 2008, about 43 of every 1,000 newborns birthed in hospital or admitted to the hospital after birth in West Virginia were diagnosed with neonatal abstinence syndrome, a rate more than 20 diagnoses per 1,000 newborns higher than any other State.

Geographic Scope

Currently 5 sites with a projected additional 5 sites to enroll by January 2023

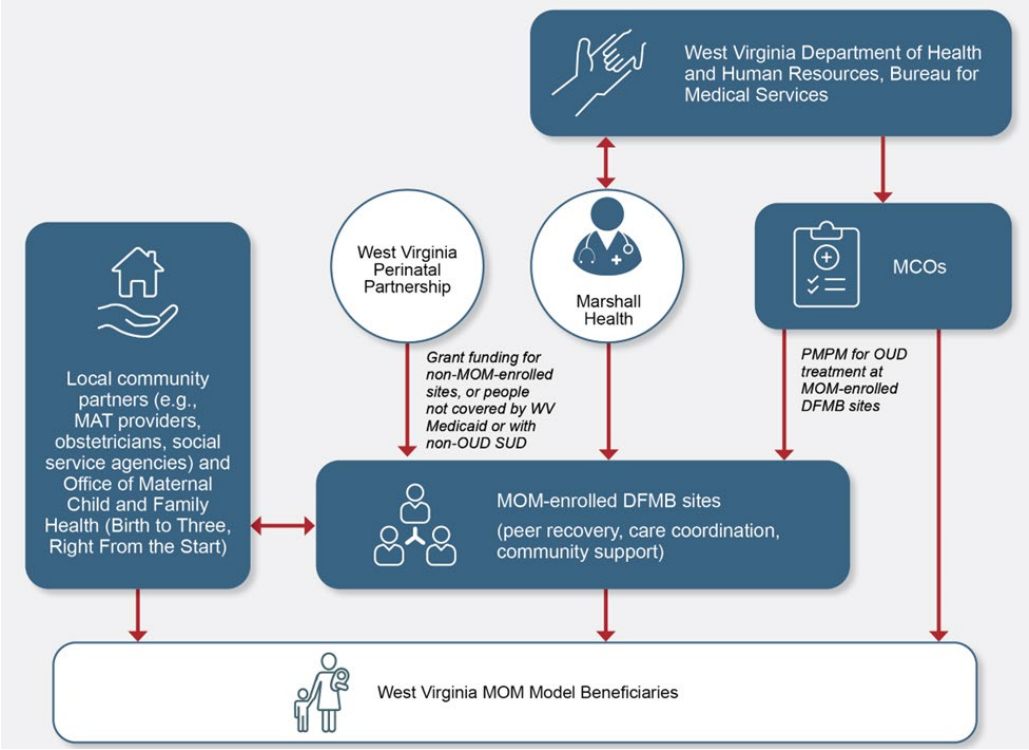
Urbanicity

Urban, suburban, and rural

Enrollment

38 individuals served in Year 1 of implementation

Key Model Partners



DFMB = Drug Free Moms and Babies; MCO = managed care organization; OUD = opioid use disorder; PMPM = per member per month; SUD = substance use disorder; WV = West Virginia

Implementation Lessons Learned

Implementation successes. The continuous and comprehensive supports provided to beneficiaries throughout their pregnancy and postpartum period are considered essential to the DFMB program, and by extension, the MOM Model. Under the MOM Model, care coordinators or peer recovery support specialists provide practical support (e.g., scheduling a medical appointment), advocacy after stigmatizing encounters, and assistance addressing access barriers in real time. MOM Model staff indicated these supports helped maintain beneficiary engagement in the model and improved beneficiary outcomes during the first year of implementation.

West Virginia's Bureau of Medical Services (BMS) developed a Medicaid payment structure to support the sustainability of the DFMB program, which is the central component of the MOM Model. The transition to Medicaid reimbursement is expected to improve the DFMB program's reach to pregnant and postpartum individuals with OUD throughout the State and to sustain financing for the program.

The standardization of DFMB services and provider requirements facilitated by Medicaid reimbursement has established a foundation that reportedly helps providers feel more comfortable providing care because the services are part of an integrated package under Medicaid and do not have to be offered as "additional" services. As a result, Valley Health's Highlawn Clinic, a MOM-participating DFMB site, observed a meaningful increase in communication among treatment providers and in available substance use disorder treatment options in the county, particularly among those comfortable treating pregnant people.

Implementation challenges. Staffing shortages brought on by the COVID-19 pandemic have affected implementation. Insufficient staff is the main reason BMS delayed implementation from July 1, 2021, to January 1, 2022 and why only 5 of an anticipated 10 DFMB sites participated in the MOM Model during the first implementation year. The evaluation team will assess the impact of the staffing shortages on MOM Model service delivery in the coming year and explore any efforts to combat the challenges.

The transition of DFMB to Medicaid reimbursement further complicated implementation. Staff familiar with the DFMB program had little understanding of Medicaid billing rules and procedures, and employees familiar with billing knew little about the DFMB program and the services it provided. Complicating these challenges, each of West Virginia's three MCOs has a different format for submitting Medicaid claims. At the time of our case study, some sites were still unable to bill Medicaid because of internal challenges related to submitting claims.

Many of the larger DFMB sites are located near the West Virginia State border, resulting in individuals from neighboring States seeking care from DFMB sites or giving birth at West Virginia hospitals. Conversely, individuals from West Virginia may give birth in an out-of-state hospital, which can pose challenges both for funding and data collection. Sites cannot bill West Virginia Medicaid for DFMB services provided to out-of-state individuals, and the State cannot effectively link parent-baby dyads for out-of-state births. Currently, sites could support providing these services with DFMB grant funding, but it is unclear whether that support will continue when all DFMB services transition to Medicaid in 2024.

Program Features

Partnership maintenance. Marshall Health, a part of Marshall University's Joan C. Edwards School of Medicine, remains the sole care delivery partner. Marshall Health also hosts its own MOM-participating

DFMB site. This care delivery partner considers the State an "excellent resource and good partner to work with." The BMS lead for the MOM Model, described by Marshall Health as "the true binding person" among the Model contributors, retired in early 2022. As BMS looks for a replacement, Marshall Health has taken a more active role in coordinating with the West Virginia Perinatal Partnership (WVPP), which oversees the DFMB program and MOM Model partners. Marshall Health and the State's MOM Model team meet at least monthly and ad hoc as needed.

Interviewees cite the challenges of meeting the needs of people in rural areas as of most concern. DFMB sites are primarily located in urban areas when compared with West Virginia as a whole. As a result, many people must travel long distances to receive their care.

All DFMB sites continue to engage with WVPP, which designed DFMB, around programmatic issues. During the MOM Model transition period, Marshall Health has become the main point of contact for MOM-participating DFMB sites. These sites refer to Marshall Health for help as they learn of and transition to Medicaid billing and changing data collection requirements.

Enrollment, intake, and assessment. West Virginia requires that maternity care providers use the Prenatal Risk Screening Instrument (PRSI) to identify people with or at risk of substance use during pregnancy, and sites may use other tools in addition to PRSI. When a maternity care provider confirms an individual's pregnancy and determines, using the PRSI, they are at risk of or are using substances, they refer the person to a DFMB site. A care coordinator at the DFMB site determines whether the person meets the criteria for DFMB services, and if they do, they begin the enrollment process.

A single process enrolls individuals in both DFMB and, for eligible Medicaid beneficiaries, the MOM Model. The enrollment process includes discussing the DFMB program with the beneficiary, reviewing consent paperwork for both DFMB and the MOM Model, and having the discussions needed to collect the data required for both DFMB and the MOM Model. For MOM Model enrollees, this includes completing the Insignia's Patient Activation Measure survey. Often a peer recovery support specialist discusses DFMB services with potential beneficiaries because their lived experience tends to help them relate to the beneficiary and reportedly increases likelihood of model enrollment. BMS developed a standard DFMB enrollment form, which is included in West Virginia's Medicaid Provider Manual.

The State began enrolling people in the MOM Model January 1, 2022, and had enrolled 38 beneficiaries as of June 30, 2022. Only 5 of the 16 DFMB sites are currently participating in the MOM Model, though they expect at least five more sites to participate by January 2023. At the time of the site visit, no one reported active beneficiary recruitment activities except one MOM-participating site that mentioned their DFMB program in a newsletter. The main beneficiary referral sources are maternity care providers, self-referral, and to a lesser extent, child protective services and the court system. Absent targeted outreach, people who typically do not interact with the healthcare system may not be aware of available DFMB programs in their area.

MOM Model services. Each MOM-participating DFMB site must have a care coordinator who develops a treatment plan with beneficiaries, a community health worker who actively connects beneficiaries to resources in the community, and a peer recovery support specialist who serves as a support person with lived experience. A peer recovery support specialist may serve a dual role

While the MOM Model focuses on standardizing services at the clinic level, the care people and their infants receive at hospitals continues to vary.

as the community health worker. Interviewees believed MOM-enrolled beneficiaries would not notice any difference between MOM Model and DFMB program services, other than some additional MOM Model paperwork.

The MOM Model focuses on standardizing services at the DFMB site level; however, DFMB site respondents indicated variation in services is apparent among West Virginia hospitals. The State and Marshall Health are engaged in separate, related efforts to standardize maternal SUD care in care settings outside DFMB sites, including hospitals. One DFMB site reported specific improvements in the alignment of hospital-services with best practices over the past few years. For example, Lily's Place, a neonatal intensive care unit specializing in care for opioid-exposed newborns in Huntington, now allows rooming in. Cabell-Huntington Hospital has updated its breastfeeding policies and now rarely discourages breastfeeding.[16] Another DFMB site, however, felt local hospitals "didn't get it" and reported inadequate follow-up when initiating medication-assisted treatment and some providers not addressing OUD during labor and delivery.

All DFMB sites are required to provide access to peer recovery services, though only MOM-enrolled sites are required to provide these services on site. Prior to the MOM Model, DFMB sites with integrated peer recovery services were typically associated with a university or large hospital system, while smaller DFMB sites with fewer resources may have referred beneficiaries to behavioral health providers to receive peer recovery or other behavioral health services. Currently, most DFMB sites provide onsite peer support services. Interviewees believed this component of the DFMB program has helped to produce better outcomes for beneficiaries. Marshall Health has trained peer recovery support specialists to serve as community health workers, allowing them to serve dual roles.

Data systems. The DFMB sites submit data to the WVPP using a REDCap database. Marshall Health reported the only overlap between what sites must report for DFMB and what they must report for the MOM Model is basic birth and substance use information. Beyond those basic data, DFMB programs not participating in the MOM Model have not collected information on sexual orientation, gender identity, physical disabilities, or co-occurring mental health disorders, all of which are requirements for MOM Model sites. Marshall Health developed a second REDCap database for MOM-participating DFMB sites to enter the additional data needed for the MOM Model. Long term, Marshall Health would like to combine the two REDCap databases to give sites a single point of entry and reduce the burden of data collection. Each site can run site-specific reports on their patients, which should help them better identify subpopulations if they choose.

Medicaid Context and Sustainability

MOM Model sustainability. West Virginia renegotiated its MCO contracts in June 2021, and MCOs now provide a monthly per member per month (PMPM) payment of about $207 to DFMB sites for beneficiaries enrolled in the MOM Model. BMS established policies related to MOM Model Medicaid billing and enrollment in fall 2021 so sites could be ready to bill for services in January 2022. Medicaid reimbursement provides a predictable source of revenue for sites, but for smaller rural sites with low volume, informants note the additional PMPM payment may not be sufficient to sustain Model services. Sites continue to use DFMB grant funding to support services provided to pregnant individuals who are not eligible for MOM.

[16] Medical Cannabis Act, West Virginia Code § 16A-8-1 (2017) requires a safety insert for medical cannabis to include a warning to pregnant and breastfeeding women about the risks of using cannabis while pregnant or breastfeeding.

The State is developing a State Plan Amendment (SPA) that will update the MOM Model Medicaid requirements to include SUD more broadly, creating a single program for pregnant individuals with SUD when the MOM Model is over. The State does not anticipate using DFMB grant funding for services after the SPA becomes effective.

Other State context related to Medicaid and the MOM Model. West Virginia expanded Medicaid under the Patient Protection and Affordable Care Act, and all adults up to 138 percent of the poverty line can receive coverage. Currently, those who are pregnant or up to 60 days postpartum are eligible with incomes up to 190 percent of the poverty line, and the postpartum expansion would maintain coverage for this population for a full year postpartum rather than terminating at 60 days.

Conclusion

MOM Model enrollment is lower than anticipated in West Virginia, with only 38 beneficiaries enrolled as of June 2022 and enrollment having started later than other MOM Model States. Statewide implementation has been delayed, with only 5 of the 16 DFMB sites participating in the MOM Model at the time of the site visit. The COVID-19 public health emergency has reportedly affected implementation, primarily because of resulting staff shortages.

The evaluation team will continue assessing the participation of DFMB sites in the MOM Model and factors that facilitate or inhibit participation. The team plans to investigate the extent to which standardized services across DFMB sites has influenced the usage of best practices for caring for pregnant and postpartum individuals with OUD and improved the quality of data collected from MOM Model beneficiaries. The team will also seek to better understand the relationship between West Virginia's MCOs and DFMB sites, including how care coordinators from each organization are communicating. Finally, the team will investigate how the expansion of postpartum Medicaid coverage from two months to 12 months postpartum influenced the MOM Model.

Appendices

Appendix A. Implementation Period Research Questions

The evaluation team pursued a variety of implementation-related research questions during the first year of implementation, including the following:

- Did Maternal Opioid Misuse (MOM) Model awardees and providers incorporate best practices and guidelines in care for pregnant and parenting mothers with opioid use disorder (OUD) and their infants? How did health equity concerns influence implementation?
- Were maternal outcomes improved (e.g., retention in treatment, lower emergency department use, reduced birth complications)? Were improvements experienced equitably across all women?
- Were infant outcomes during birth hospitalization improved (e.g., shorter length of birth hospital stay; lower neonatal intensive care unit [NICU] admission; reduced rates of preterm birth, low birth weight, fetal or neonatal death; reduction of pharmacological treatment for neonatal opioid withdrawal syndrome)? Were improvements experienced equitably across all infants?
- Did maternal and infant healthcare costs decrease or remain stable (e.g., maternal ambulatory-sensitive inpatient, emergency department, and residential care use; NICU admission/use)?
- Did MOM Model awardees adopt care coordination and care integration best practices (e.g., Substance Abuse and Mental Health Services Administration's "Collaborative Approach" framework)?
- Did pregnant/postpartum women with OUD receive a full array of medical, behavioral, and mental health services and opioid agonist treatment as needed? Was there an adequate supply of providers to serve beneficiaries? Were all beneficiaries served equitably?
- Were referrals to needed social supports and services (e.g., housing, nutrition, intimate partner violence counseling/shelter) successfully achieved? Was there an adequate supply of social supports and services to serve beneficiaries? Were all beneficiaries served equitably?
- Were family outcomes improved (e.g., fewer infants placed in State custody)?
- Did States meet their program goals for self-funding their program moving forward? If not, what were the barriers to achieving milestones?
- Did States establish sustainable coverage/funding via Section 1115 waivers, State Plan Amendments, and/or other mechanisms?

Appendix B. Evaluation Data Components

The Maternal Opioid Misuse (MOM) Model evaluation relies on a flexible, mixed-methods design that integrates multiple data sources, including qualitative case studies, participant-level process data, and program impact data. This appendix provides details on these activities.

A. Qualitative Case Studies

The qualitative component of the evaluation examines how MOM Model States designed and have implemented their models of care. Qualitative data collection has documented best practices and lessons learned during the first year of Model implementation, including, where possible, MOM Model beneficiaries' experiences. Qualitative case studies have also examined how each MOM Model awardee's program has evolved from the pre-implementation period to the implementation period. The case studies organize data collection and analysis to align with each theme in the RE-AIM framework:

1. **Model adoption:** characteristics of Model setting and staff, leadership, partner selection, participation, and the evolution of those relationships
2. **Model reach:** recruitment methods, Model enrollment, and the representativeness of MOM Model beneficiaries
3. **Model implementation:** primary components of the Model and variation in Model implementation
4. **Model maintenance/sustainability:** the extent to which the Model has become institutionalized and whether or how funding will be sustained
5. **Model effectiveness:** the extent to which key informants feel the Model improves health outcomes

1. Data Collection

Qualitative data collection activities consisted of—

- Key informant interviews with MOM Model awardees, providers, and community partners
- Focus groups, Photovoice sessions, and one-on-one interviews with MOM Model beneficiaries
- Virtual structured observations at provider sites serving pregnant and postpartum opioid use disorder (OUD) patients with Medicaid coverage[17]

To limit evaluation burden on MOM Model provider sites, the evaluation team asked provider site staff to support either focus group and interview recruitment or Photovoice recruitment.

Data collection activities occurred between March and July 2022. Facilitators obtained participants' informed consent and permission to audiorecord data collection activities before starting the discussion or observation. Table B.1 lists the type and number of data collection activities that occurred per awardee.

[17] Provider sites observed in the first implementation year were not observed during the pre-implementation period.

Table B.1. Type of Data Collection Activity per MOM Model Awardee

Data Collection Activity	Colorado	Indiana	Maine	Maryland	New Hampshire	Tennessee	Texas	West Virginia
Key informant interviews	10	11	14	10	12	19	11	12
Beneficiary focus group participants	-	4	-	-	3	4	-	-
Photovoice participants	-	-	-	-	-	4	-	-
Beneficiary interviews	-	-	5	-	-	-	2	-
Structured observations	1	1	-	-	-	-	-	2

Note: Low enrollment numbers in Colorado, Maryland, and West Virginia prevented the evaluation team from conducting beneficiary data collection in these States.
Source: Insight Policy Research analysis of MOM Model site visit data, April–July 2022

Key informant interviews with Project Officers, program managers, healthcare providers, and community partners provided detailed information on the implementation status to date and how beneficiaries experienced the Model in the first implementation year. Project Officers assisted the evaluation team in recruiting key informants involved in implementing the MOM Model by sharing their contact information with the team. Interviews ranged from 60 to 90 minutes, and topics discussed are listed by key informant type in table B.2. The team discussed health equity approaches and concerns with all key informants and asked specific follow-up questions identified in pre-implementation case study reports.

Focus groups and one-on-one interviews were held with beneficiaries to understand how they learned about the program and how they experienced the services and care they received through the MOM Model. Two focus groups and seven individual one-on-one interviews were held across all awardees.

Three New Hampshire beneficiaries and four Tennessee beneficiaries participated in a focus group in their respective State. Focus groups took place virtually over the Zoom video conferencing platform and lasted approximately 90 minutes. The team discussed a range of topics with participants, such as a normal day in their life, including positive and negative issues that can affect their day; their impressions of the MOM Model; experience receiving opioid use treatment during pregnancy and/or postpartum; and interactions with MOM Model providers.

One-on-one interviews with five Maine beneficiaries and two Texas beneficiaries occurred by telephone and lasted about 30 minutes. Interview topics were similar to those discussed in focus groups. Beneficiaries described a normal day in their life and shared their experience receiving care prenatally, during delivery, and postpartum. They also described their experiences receiving care for their infant. Within these conversations, the team explored factors that made, or make, it easier or more challenging for beneficiaries to receive the care they need. Beneficiaries also described their journey to recovery.

Photovoice, a community-based participatory research method, supplemented information gathered through focus groups and interviews with beneficiaries. Because of privacy concerns with low enrollment numbers in some States, the evaluation team only conducted Photovoice in Tennessee. Two Photovoice activities took place over one week through the Zoom platform. A 30-minute virtual training

preceded a 60-minute Photovoice session. Beneficiaries shared pictures they took that represent what makes it easier or more difficult for them to receive care for themselves and their infant. After beneficiaries shared and described their photos, the group engaged in a facilitated discussion.

For the three beneficiary-focused data collection activities (focus groups, interviews, Photovoice), the evaluation team shared recruitment materials, such as site-specific flyers and recruitment scripts, with provider staff to highlight the purpose of the activity. These materials also noted that participation was voluntary and discussions with the evaluation team were confidential.

Provider staff obtained beneficiaries' consent to share their contact information with the evaluation team. Once the team received beneficiaries' consent to contact, team members contacted beneficiaries, screened them for eligibility, and shared meeting days and times with eligible and interested beneficiaries. As a thank-you to beneficiaries for their participation in focus groups, interviews, and Photovoice sessions, each received a gift basket of parent and baby-related items valued around $50.

Structured observations were conducted in Colorado and Indiana to provide further insight into the environment where services are delivered to pregnant and parenting Medicaid beneficiaries with OUD and their infants. These observations were structured as a 60-minute virtual tour of the clinic space and the surrounding built environment. The team used an observation guide that included a set of items to ask or observe in the environment, including housing, public transportation, community services (e.g., grocery stores, pharmacies, schools/daycares), and other neighborhood characteristics (e.g., signs of gentrification, physical damage, criminal or drug-related activity). Inside the clinic space, the evaluation team observed and asked semistructured questions about the waiting room area and exam rooms (e.g., educational materials, artwork, way-finding signage). Participants were also asked to describe a typical visit with a pregnant or postpartum client.

Table B.2. Qualitative Case Study Topics Explored by Key Informant Type

Project Officer	Awardee	Care Delivery Partner	Program Manager	Maternity Care Provider	SUD Provider	Community Partner
▪ Status of Model implementation activities ▪ Efforts to develop sustainable funding ▪ Lessons learned	▪ Model structure and partnerships ▪ Model sites ▪ Enrollment, intake, and assessments ▪ Retention ▪ Model intervention and service delivery ▪ Medicaid/CHIP program features and State context ▪ Anticipated program outcomes ▪ Lessons learned	▪ Model enrollment, intake, and assessments ▪ Model intervention and service delivery ▪ Anticipated program outcomes ▪ Lessons learned	▪ Enrollment, intake, and assessments ▪ Retention ▪ Changes to Model intervention ▪ Services provided to beneficiaries ▪ Care coordination ▪ Peer recovery services ▪ Relationship with Child Protective Services ▪ Anticipated program outcomes ▪ Lessons learned	▪ Patient characteristics ▪ Screenings and assessments ▪ Prenatal and postpartum care ▪ Hospital management procedures and protocols for pregnant patients with OUD and opioid-exposed newborns ▪ Clinical best practices ▪ Special education, training, and team collaboration for patients' treatment	▪ Patient characteristics ▪ Screenings and assessments ▪ Tailored care for patients with OUD ▪ Clinical best practices ▪ Medicaid claims data and maternal medication for OUD rates ▪ Special education, training, and team collaboration for patients' treatment	▪ Beneficiary characteristics ▪ Awardee and community partner(s) relationship ▪ Enrollment, intake, and assessments ▪ Role in Model and services delivered ▪ Relationship with Child Protective Services ▪ Anticipated program outcomes ▪ Lessons learned

Note: CHIP = Children's Health Insurance Program; OUD = opioid use disorder; SUD = substance use disorder
Source: Insight Policy Research MOM Model evaluation data collection protocols, January 2022

2. Data Analysis

Prior to data collection, the team updated a standard outline and template for the case study report to be used by all qualitative team members. This outline ensured reporting was consistent across States, information reported for each awardee addressed all research questions, and information reported aligned with the five domains of the RE-AIM framework. The outline also captured the analysis of activities that promote health equity or barriers that awardees currently face to achieving health equity in Model implementation.

Throughout data collection, members from each case study team reported findings biweekly. These conversations helped teams identify potential gaps in data collection and analysis while site visits were still ongoing. During data collection, case study teams cleaned all notes in preparation for analysis. The analysis was an iterative process of reviewing notes from discussions with various providers, care managers, community partners, focus groups, Photovoice, and interviews with MOM Model beneficiaries to identify key themes that emerge based on data collected or during team discussions. Analysts involved in data collection coded notes in Dedoose software following a flexible coding scheme that aligns with the RE-AIM framework and domains that crosswalk with the evaluation research questions. The team used Dedoose software to query the coded qualitative data in the database for similar types of information based on key research questions and sources of data (e.g., key informant types, focus groups, Photovoice).

Insight trained all coders on the study coding scheme and reviewed double-coded sets of samples of notes with each coding team (one per organizational partner) to resolve any discrepancies. The coding scheme enabled the team to incorporate emergent themes during data collection and analysis. During analysis, the team noted consistency and divergence in those themes and used them to build detailed sub-outlines for each section of the case study report template.

Impact of COVID-19

Conducting case studies virtually in response to COVID-19 provided advantages and challenges. The greatest advantage was the evaluation team's ability to move forward with planned qualitative data collection activities at a time when travel and in-person interaction were not possible. The team successfully employed virtual key informant interviews, structured observations, focus groups, and one Photovoice activity during the first year of evaluation. While virtual site visits offer greater flexibility in scheduling, this approach also extended the overall duration of data collection. Some site visits took place in "chunks" of data collection based on the availability of providers and the team's ability to recruit beneficiaries for data collection activities. This approach created challenges keeping case study analysis and report production on schedule and may have added burden to sites and research teams.

The greatest disadvantages of virtual case studies were a limited view of provider and care delivery partner sites, lack of in-person interactions with MOM Model staff or provider partners, and a more resource-intensive effort than expected. While virtual structured observations provided an opportunity to view provider sites and observe what a MOM Model beneficiary's visit entails, being physically present on site would give observers a 360-degree view that could provide nuance that was unobservable on computer screens or a telephone call. Awardees and care delivery partners or other providers were more likely to reschedule virtual interviews than they might have been for an in-person site visit. At times, this resulted in some virtual site visits requiring more time than anticipated.

B. Participant-Level Process Data Evaluation

Awardee-reported process data provide information on the characteristics of MOM Model beneficiaries and the services they receive. These data are used to describe the population, track interim and longer term outcomes of MOM Model beneficiaries, and interpret findings from the impact and qualitative components of the evaluation. In addition to providing timely information for quarterly and annual reports, these data are used to help refine impact analysis design, contextualize findings, and assist in the development of qualitative protocols.

1. Data Collection

MOM Model awardees have flexibility in how they collect beneficiary-level data. For example, guidance documents indicate they may use any data source that contains the necessary information for a process data element and is available in time for the reporting deadline. Awardees are permitted to add or revise process data for up to one year after submission. Awardees are expected to use the same data collection method among all care delivery partners and providers within the State to ensure consistency in reporting. Once collected, awardee staff and/or care delivery partner staff are responsible for preparing and submitting data files. The MOM Model Implementation & Monitoring (I&M) and Learning System contractors have developed training materials and webinars to provide technical assistance and support to awardees as they undertake the data collection and reporting process. The evaluation team supports these efforts in coordination with the other contractors by contributing to training materials and guidance documents and participating in webinars and one-on-one technical assistance calls with awardees.

Several awardees are currently using or plan to use claims data to fulfill certain process data elements. The evaluation team anticipates that the use of claims data will result in delays in submission of complete data, at least into the year in which awardees are permitted to add and revise data. The extent to which the use of claims data may compromise the quality of process data varies by what is being measured. For example, if a beneficiary's prior births are being reported through claims data, only prior births covered by Medicaid will appear in the data. Similarly, OUD treatment a beneficiary might have received prior to enrollment in the MOM Model not covered by Medicaid will not appear in the data. The process evaluation team is aware of how awardees will use claims data and will consider potential issues of data completeness or quality.

2. Data Components

The beneficiary-level process data include two types of data elements collected by awardees: reporting requirement data elements and evaluation data elements. Awardees collect and submit data to meet MOM Model reporting requirements as specified in the original funding opportunity announcement and as a condition of the award. These data address MOM Model requirements, support monitoring of the intervention, enable calculation of performance milestones and payments, and are included in the MOM Model evaluation. Importantly, awardees are required to report these data elements for all MOM Model beneficiaries for successful data submission. Required data elements cover topics such as—

- Enrollee participation dates, demographic characteristics, pregnancy characteristics, and OUD and pharmacotherapy history
- Encounter-level services provided as part of the MOM Model

- Health-related social needs screening categories assessed and results
- Depression screening records
- Tobacco screening records
- Pregnancy outcomes, including birth outcomes, length of hospitalization for mother and infant, infant opioid screening, and nonmedical out-of-home placements.

Awardees also collect data elements beyond those required to calculate performance milestones and payment to support the MOM Model evaluation. These evaluation-specific data elements are critical to the Model's evaluation, but they are not required to be reported by awardees for successful data submission (table B.3). The distinction between reporting requirement data elements and evaluation data elements has implications for data quality, as discussed below. The evaluation team analyzed both types of data elements as part of the process evaluation.

3. Data Quality

The process data included in this annual report are limited in depth and scope by the amount and quality of data the evaluation team receives. The data MOM Model awardees are required to submit to meet the MOM Model milestones are complete. However, awardees continue to encounter challenges with their data collection efforts, and, as a result, some measures have high rates of missing data. Several elements designed to support a robust evaluation are missing data for at least a quarter of enrolled beneficiaries. For instance, anxiety screening data are missing for 31 percent of beneficiaries, and data on current alcohol use are missing for 30 percent of beneficiaries. HIV and hepatitis C screening data are missing for 43 percent and 41 percent of beneficiaries, respectively. Data about the presence of any risk factors related to a prior birth—a strong predictor of subsequent birth outcomes—are missing for 38 percent of multiparous beneficiaries. Percentages reported in the text of this report are among beneficiaries with nonmissing data for a given measure; appendix tables and footnotes provide details about the universe and the quality of the data presented, including the rate of missing data for each element.

To protect the confidentiality of MOM Model beneficiaries, particularly among awardees with few beneficiaries enrolled in their Models, the data in the body of this report are presented in aggregate across the six reporting awardees. As data volume and quality improve over time, future reports may include more detailed descriptions and analyses. For example, it will be possible to present characteristics of beneficiaries who enrolled before and after their birth event separately when greater numbers of beneficiaries are enrolled in the MOM Model over longer periods.[18]

The evaluation team developed protocols to assess the quality of process data for each awardee submission, which are described in detail in appendix D.2. These protocols go beyond the initial quality checks built into the data collection process, such as file failures if required information is missing, and are distinct from the data quality check protocols developed and used by the I&M contractor, which the evaluation team reviewed during the development of data quality protocols. Broadly, most data quality checks are designed to identify illogical or improbable data values. Illogical data values are most likely to occur in multiselection categorical variables (e.g., when a beneficiary has multiple selections for types of care coordination received, but one selection was "None of the above"). Improbable data values are most likely to occur when dates are out of range. For instance, if a beneficiary has an encounter

[18] Process data are cumulative; the data included in this report will also appear in subsequent reports. Awardees are permitted to add or revise their data for one year after the data have been submitted. Data presented in this report will be updated and amended.

measure listed on a date prior to their enrollment in the program, it would be an improbable value. In addition to the data quality checks, rates of item nonresponse are reported for each data element. Item nonresponse occurs when beneficiary information is available for some but not all data elements.

4. Data Analysis

First, process data elements were mapped to RE-AIM domains and MOM Model research questions, as described in table B.4. After assessing data quality, the evaluation team produced awardee-level estimates for each data element. For some elements, this process required defining the universe for the analysis. For example, the analysis of prior birth experiences is limited to beneficiaries who report a prior birth. Most estimates are reported as categorical percentages that sum to 100 percent. For data elements that allowed for more than one response per beneficiary, categorical percentages sum to more than 100 percent. Mean, median, minimum, and maximum values are reported for noncategorical data elements, such as the number of cigarettes smoked and number of encounters. These estimates are reported in appendix D. Estimates based on fewer than 11 beneficiaries in the numerator are suppressed to protect confidentiality of MOM Model beneficiaries.

The body of the report includes selected estimates for each RE-AIM domain. These estimates were highlighted based on data quality, relevance to the early implementation of the MOM Model, and contribution of new information. For example, much of the process data in this annual report describe the characteristics of MOM Model beneficiaries because this information is of high quality in the current data, is not available elsewhere, and provides important insight into the unique needs of MOM Model beneficiaries. Future annual reports will include more information on prenatal care, service use, and birth outcomes as MOM Model beneficiaries progress through their pregnancy to delivery and the postpartum period.

Table B.3. Evaluation-Specific Data Elements

Data Element Name	Description
HEALTH_INS_PREPREG	Health insurance before beneficiary became pregnant
ABUSE_EXPERIENCE	Types of abuse ever experienced by beneficiary (sexual abuse, physical abuse, emotional abuse, transactional sex)
PRIOR_CHILD_PLACED	Indicator for whether beneficiary's prior children have ever been placed outside of home
RELATIONSHIP_STATUS	Beneficiary's current relationship status
HIGH_SCHOOL_OR_GED	Indicator for whether beneficiary obtained high school diploma or GED
SUBSTANCE_USE_RECENT	Indicator for whether beneficiary used following substances in last year: alcohol, cigarettes or other tobacco, vaping, cannabis, amphetamines, or benzodiazepine
YOUNG_ONSET_SUBSTANCE_USE	Indicator for whether beneficiary first used following substances before age 18: alcohol, cigarettes or other tobacco, vaping, cannabis, opioids, amphetamines, or benzodiazepine
PRIOR_BIRTH_DATE	Date of most recent prior birth
PRIOR_BIRTH_EXPERIENCE	Outcomes from prior pregnancies (premature birth, low birth weight, stillbirth, NOWS, other)
PRIOR_PREG_RISK	Pregnancy risk factors during prior pregnancies (preeclampsia, gestational diabetes, gestational hypertension, HELLP syndrome, hemorrhage, other)

Data Element Name	Description
OUDTREATMENT_TYPE_POSTPARTUM	Pharmacotherapy type during beneficiary's postpartum period (none, buprenorphine, naltrexone, methadone, other)
LABOR_PAIN_MANAGEMENT	Pain management during labor (epidural, IV narcotics, other, none)
DELIVERY_METHOD	Beneficiary's delivery method (vaginal, induced, augmented, VBAC, emergency C-section, planned C-section)
POSTPARTUM_CONTRACEPTION	Contraception plan during postpartum period (none, natural family planning, pull-out method, barrier or spermicide, hormonal, injectable, LARC, tubal ligation, other)
PRIOR_BIRTH	Indicator for whether beneficiary had prior birth
INFANT_PHARMA_TREATMENT	Infant pharmacotherapy treatment (for NOWS)
INFANT_FEEDING	Infant feeding method postpartum (breastfeeding, pumping, both breastfeeding and pumping, supplementing with formula, formula only)
ALCOHOL_USE	Number of alcoholic drinks beneficiary consumed in average week during last month (14+, 8–13, 4–7, 1–3, < 1, did not drink)
CIGARETTES_NUM	Number of cigarettes beneficiary smoked per day (0–180)
ANXIETY	Anxiety screening result (none, mild, moderate, severe)
DEPRESSION_SCREENER_USED	Depression screener used (at each screening)
DEPRESSION_SCREENER_SCORE	Depression screening result (score of screener)

Note: GED = General Educational Development test; HELLP = hemolysis, elevated liver enzymes, low platelet count; IV = intravenous; LARC = long-acting reversible contraception; NOWS = neonatal opioid withdrawal syndrome; VBAC = vaginal birth after cesarean
Source: Insight Policy Research MOM Model evaluation required data elements, 2022

Table B.4. Process Evaluation Constructs and RE-AIM Domains, Data Elements, and Research Questions

Construct and RE-AIM Domain	Data Elements	Research Question
Demographics/ Reach	▪ Age ▪ Self-identified gender ▪ Self-identified race and ethnicity ▪ Relationship status ▪ Educational attainment ▪ Health insurance before pregnancy	▪ What are the characteristics of MOM Model participants?
Mental Health/ Reach	▪ Depression screening result ▪ Depression screen follow-up plan ▪ Anxiety screening result ▪ Other mental or behavioral health diagnoses ▪ Beneficiary history of abuse and transactional sex ▪ Dementia or cognitive impairment	▪ Did pregnant/postpartum women with OUD receive a full array of medical, behavioral, and mental health services and opioid agonist treatment as needed? Was there an adequate supply of providers to serve participants? ▪ Were participants of different racial and ethnic groups screened for needs and/or conditions equitably? Were the full array of medical, behavioral, and mental health services and opioid agonist treatment services provided equitably? Did participants of different racial and ethnic groups receive needed care and support services equitably?

Construct and RE-AIM Domain	Data Elements	Research Question
Physical Health/ Reach	▪ Chronic conditions ▪ HIV indicator ▪ Hepatitis C indicator	▪ Did pregnant/postpartum women with OUD receive a full array of medical, behavioral, and mental health services and opioid agonist treatment as needed? Was there an adequate supply of providers to serve participants? ▪ Were participants of different racial and ethnic groups screened for needs and/or conditions equitably? Were the full array of medical, behavioral, and mental health services and opioid agonist treatment services provided equitably? Did participants of different racial and ethnic groups receive needed care and support services equitably?
Substance Use/Reach, Adoption, Implementation	▪ Tobacco use ▪ Tobacco intervention ▪ Number of cigarettes ▪ Change in number of cigarettes ▪ Alcohol use ▪ Substance use past year ▪ Substance use prior to age 18	▪ What are the characteristics of MOM Model participants? ▪ Did pregnant/postpartum women with OUD receive a full array of medical, behavioral, and mental health services and opioid agonist treatment as needed? Was there an adequate supply of providers to serve participants? ▪ Were participants of different racial and ethnic groups screened for needs and/or conditions equitably? Were the full array of medical, behavioral, and mental health services and opioid agonist treatment services provided equitably? Did participants of different racial and ethnic groups receive needed care and support services equitably?
Social Determinants of Health/Reach	▪ Housing needs ▪ Food security ▪ Transportation needs ▪ Utilities ▪ Family ▪ Safety	▪ Were referrals to needed social supports and services (e.g., housing, nutrition, intimate partner violence counseling/shelter) successfully achieved? Was there an adequate supply of social supports and services to serve participants? ▪ Were participants of different racial and ethnic groups screened for needs equitably? Were the full array of medical, behavioral, and mental health services and opioid agonist treatment services provided equitably? Did participants of different racial and ethnic groups receive needed care and support services equitably?

Construct and RE-AIM Domain	Data Elements	Research Question
Service Use/ Adoption, Implementation	▪ Prenatal encounters ▪ Postpartum encounters ▪ Prenatal hospital admissions ▪ Postpartum hospital admissions ▪ OUD encounters ▪ Prenatal provider type ▪ Postpartum visit indicator ▪ Postpartum visit practitioner type ▪ Visits with other providers ▪ Referral receipt ▪ Referral status ▪ Referral type ▪ Referral completed ▪ Referral completed type ▪ Receipt of care coordination activities ▪ Frequency of care coordination activities ▪ PAM score ▪ Family planning indicator ▪ Postpartum contraception ▪ Engagement outreach (for lost to follow-up)	▪ Were referrals to needed social supports and services (e.g., housing, nutrition, intimate partner violence counseling/shelter) successfully achieved? Was there an adequate supply of social supports and services to serve participants? ▪ Did MOM Model awardees adopt care coordination and care integration best practices (e.g., SAMHSA's "Collaborative Approach" framework)? ▪ Did pregnant/postpartum women with OUD receive a full array of medical, behavioral, and mental health services and opioid agonist treatment as needed? Was there an adequate supply of providers to serve participants? ▪ Were participants of different racial and ethnic groups screened for needs and/or conditions equitably? Were the full array of medical, behavioral, and mental health services and opioid agonist treatment services provided equitably? Did participants of different racial and ethnic groups receive needed care and support services equitably?
OUD Treatment/Adoption, Implementation	▪ Prior OUD treatment during current pregnancy ▪ Prior inpatient OUD treatment (ever) ▪ Pharmacotherapy initiation ▪ Pharmacotherapy type at initiation ▪ Pharmacotherapy type at delivery ▪ Pharmacotherapy type postpartum ▪ Relapse indicator ▪ OUD encounter types received ▪ OUD treatment service types received ▪ Treatment plan at Model exit	▪ Did pregnant/postpartum women with OUD receive a full array of medical, behavioral, and mental health services and opioid agonist treatment as needed? Was there an adequate supply of providers to serve participants? ▪ Were participants of different racial and ethnic groups screened for needs and/or conditions equitably? Were the full array of medical, behavioral, and mental health services and opioid agonist treatment services provided equitably? Did participants of different racial and ethnic groups receive needed care and support services equitably?
Pregnancy Conditions/Reach	▪ Prior birth ▪ Prior birth experiences ▪ Prior pregnancy health risk factors ▪ Prior out-of-home placement ▪ Multifetal gestation ▪ Prenatal condition types	▪ Were maternal outcomes improved (e.g., retention in treatment, lower emergency department use, reduced birth complications)? ▪ Did participants of different racial and ethnic groups experience different rates of pregnancy conditions?

Construct and RE-AIM Domain	Data Elements	Research Question
Maternal Outcomes/ Effectiveness	▪ Pregnancy outcome ▪ MOM Model participant death ▪ Maternal LOS (delivery) ▪ Labor pain management ▪ Delivery method	▪ Were maternal outcomes improved (e.g., retention in treatment, lower emergency department use, reduced birth complications)? ▪ Were family outcomes improved (e.g., fewer infants placed in State custody)? ▪ Did maternal outcomes vary across participants of different racial and ethnic groups? Were observed changes in outcomes equitable across groups?
Infant Outcomes/ Effectiveness	▪ Hospital LOS (delivery) ▪ NICU at delivery ▪ NICU LOS at delivery ▪ Estimated gestational age ▪ Birth weight ▪ Positive opioid screen ▪ NOWS indicator ▪ Infant pharmacotherapy treatment for NOWS ▪ Out-of-home placement ▪ Infant feeding	▪ Were infant outcomes during birth hospitalization improved (e.g., shorter length of birth hospital stay; lower NICU admission; reduced rates of preterm birth, low birth weight, fetal or neonatal death)? ▪ Were family outcomes improved (e.g., fewer infants placed in State custody)? ▪ Did infant and family outcomes vary across participants of different racial and ethnic groups? Were observed changes in outcomes equitable across groups?

Note: HIV = human immunodeficiency virus; LOS = length of stay; NICU = neonatal intensive care unit; NOWS = neonatal opioid withdrawal syndrome; OUD = opioid use disorder; PAM = patient activation measure; RE-AIM = reach, effectiveness, adoption, implementation, maintenance; SAMHSA = Substance Abuse and Mental Health Services Administration
Source: Insight Policy Research MOM Model evaluation design, October 2021

C. Impact Evaluation

The goal of the evaluation impact analysis is to assess whether MOM Model awardees improve quality of care and health outcomes and reduce expenditures for pregnant and postpartum individuals with OUD and their infants. The evaluation uses administrative data sources in the assessment of MOM Model population characteristics and program impact evaluation, including CMS Transformed Medicaid Statistical Information System (T-MSIS) data and vital records.

1. Measures

Study sample characteristics are created from T-MSIS and, when available, linked to vital records data. Variables describing sample characteristics will be used for a variety of purposes, including descriptive analyses and as control variables in the estimation of program impacts. These variables include demographic and household characteristics of MOM Model beneficiaries and information on Medicaid eligibility and enrollment, MOM Model enrollees' participation in other government programs such as Social Security Disability Insurance and Supplemental Security Income, and maternal and infant health characteristics.

For some characteristics, such as age and race/ethnicity, both T-MSIS and vital records offer information, but vital records data are known to be of higher quality on overlapping variables. Therefore, the team will use vital records when available to assess T-MSIS data quality for MOM Model awardee States and fill in missing T-MSIS data (e.g., race/ethnicity data) when available. Vital records

data have been obtained thus far for one awardee (Maine).[19] Preliminary analysis of consistency between these data and the matched T-MSIS claims for MOM Model eligible beneficiaries suggests reasonable agreement; 88 percent of records contained the same race/ethnicity in both data sources, and 6 percent of records with unknown race/ethnicity in the claims data were identified in the associated vital records data. As further vital records data become available, the evaluation team will continue to assess the extent to which missing T-MSIS data can be supplemented by vital records. The team will also assess the consistency of values on common variables between the two data sources.

To provide additional descriptors of MOM Model beneficiaries, the team will incorporate a measure of maternal comorbidities at the time of birth hospitalization. The evaluation team will use a comorbidity measure to summarize the burden of illness in the MOM Model eligible population and adjust for risk in the estimation of program impacts. To estimate potential measures, the team used an established grouping system for diagnoses that may be employed to summarize co-occurring conditions. The single-level Clinical Classification Software (CCS) from the Agency for Healthcare Research and Quality contains 285 categories but may be further collapsed. These diagnoses are used to construct scores based on the Obstetric Comorbidity Scoring System for Predicting Severe Maternal Morbidity developed by the California Maternal Quality Care Collaborative (Leonard, 2020). This score accounts for 26 comorbidities and characteristics weighted by the strength of their association with severe maternal morbidity. Some of the most heavily weighted comorbidities include placenta accreta, pulmonary hypertension, and chronic renal disease, whereas the lowest weighted factors are maternal age greater than 35 years and gestational diabetes mellitus. Two versions of the score are calculated: one determined based on the outcome of all severe maternal morbidity and one excluding blood transfusions. Transfusions are the only indicator of severe morbidity in roughly half of cases, some of which may be less severe forms of severe maternal morbidity (Leonard, 2020). Thus, the importance of some comorbidities in predicting severe morbidity differs slightly depending on the inclusion of transfusions, so both scores are considered.

Outcome measures. Most core measures of health outcomes and healthcare use, quality, and costs are obtained from State Medicaid program data reported in T-MSIS data (table B.5). For sub-State area awardees, the evaluation team will use vital records for the treatment and comparison groups to expand the number of outcomes explored (e.g., gestational age, initial prenatal visit, number of prenatal visits, gestational age at the start of opioid agonist therapy, number of days in the neonatal intensive care unit) and identify sample characteristics not available in T-MSIS data (e.g., mother's and father's education, father's age and race/ethnicity, maternal daily cigarettes before pregnancy, conditions related to pregnancy, maternal sexually transmitted infections). The team will also use outcomes available from vital records data to inform a participation analysis for all awardees. If racial/ethnic subgroup sample sizes permit, the team can also assess equity in MOM Model participation and potential disparities in impacts.

[19] The evaluation team also received vital records data from Maryland, but analysis of those data was not ready by the time of this report.

Table B.5. Potential Core Outcome Measures for MOM Model Impact Evaluation

Potential Outcome Measures			Use	Cost	Study Period		
					12 Months Before Birth	Birth Hospitalization	12 Months After Birth
Maternal Prenatal Care	Gestational age at initial prenatal visit, week*		●	●	●	N/A	N/A
	Number of prenatal visits or recommended prenatal visits (before and during MOM Model)*		●	●	●	N/A	N/A
Mother's Healthcare Use and Cost	Total cost			●	●	●	●
Maternal Prescription Medications Related to OUD and Other Behavioral Health Needs	Gestational age at start of opioid agonist therapy (methadone or buprenorphine), week*		●		●	N/A	N/A
	Opioid agonist therapy (methadone or buprenorphine)		●		●	N/A	●
	Opioid antagonist therapy (e.g., Vivitrol); days of treatment		●		●	N/A	●
	Methadone days of treatment		●	●	●	No data	●
	Buprenorphine days of treatment		●	●	●	No data	●
Care Related to Maternal Behavioral Health	Screenings (e.g., SUD, mental health, SDOH, social-emotional, depression, urine)		●	●	●	●	●
Maternal Care	Primary maternal care provider, contact within 3 weeks after birth						●
	Primary maternal care provider, ongoing follow-up 3–12 weeks after birth						●
	Any contraceptive services		●	●	●	●	●
Newborn Care Measures	Total cost for birth hospital stay (for infants ≥ 37 weeks)			●		●	N/A
	Length of birth hospital stay (for infants ≥ 37 weeks)		●			●	N/A
	Fetal/neonatal death, week				●	●	N/A
	NICU during birth hospitalization	Number of NICU days, if any NICU	●	●		●	N/A
			●	●		●	N/A
		Number of hospital days during birth hospitalization	●	●		●	N/A
	Preterm (< 37 weeks)	Low birth weight (less than 2,500 grams)				●	N/A
						●	N/A

Potential Outcome Measures		Use	Cost	Study Period		
				12 Months Before Birth	Birth Hospitalization	12 Months After Birth
Maternal-Infant Dyad Care and Measures	Breastfeeding/lactation services or counseling *(if data are available; data may not be available in T-MSIS to support this measure)*	●	●		●	●
Infant Care Measures	Number of well-child visits (in first year)	●	●			●
	Number of inpatient stays	●	●			●
	Number of emergency department visits	●	●			●

Note: N/A = not applicable; NICU = neonatal intensive care unit; OUD = opioid use disorder; SDOH = social determinants of health; SUD = substance use disorder; T-MSIS = Transformed Medicaid Statistical Information System

* Birth records/vital records are likely needed to construct this measure.

Source: Insight Policy Research implementation evaluation design, 2021

2. Challenges

The impact analysis is currently limited to the pre-implementation period because the analysis relies on Medicaid eligibility, enrollment, claims, and encounter data from T-MSIS, which will not be finalized for the implementation period until fall 2023. The evaluation team has analyzed initial pre-implementation outcomes for mothers and continues to refine these measures. In the initial analysis, the following challenges related to consistency of T-MSIS data have emerged for characterizing the sample and reporting outcomes:

- **Identification of SUD:** Some States may be more likely to report a diagnosis of "unspecified substance use disorder" than other States, making it difficult to distinguish OUD and non-OUD diagnoses to support the impact evaluation. The evaluation team will minimize unobserved differences in analytic samples by reweighting observations on observable characteristics related to MOM Model participation.
- **Analysis of expenditures:** States may provide supplemental payments for complicated births but vary in how these births are recorded in T-MSIS. The evaluation team will meet with specialists in each State to understand supplemental payment practices and inform the conversation through initial expenditure analyses.
- **Quality of maternal care outcomes:** Coding and billing practice variations within and between States make it difficult to reliably identify the timing of prenatal care, gestational age at birth, and other maternal care outcomes. The team will use vital statistics from awardees to validate claims data on maternal care outcomes.

While pre-implementation analysis has been possible for mothers, analysis of infant outcomes requires identification of maternal-infant dyads through linkages of Medicaid participants to vital statistics data performed by awardees. The evaluation team has collected initial vital statistics data and linkages from five awardees but continues to work with awardees to collect all essential elements for the impact analysis. The team has faced the following challenges in obtaining and using vital statistics data from awardees:

- **Establishing IRB approval and data sharing agreements:** Several States have been delayed in providing vital statistics data by the process of obtaining IRB approval and/or data sharing agreements for the requested data elements. To support States' efforts, the evaluation team has worked with States to establish the need for data elements and affirm processes in place for data security.
- **Performing linkages and sharing dyad information:** Some States have faced challenges in matching Medicaid mothers and infants to each other and to vital statistics data and documenting their matching process for the evaluation team. The team will continue to communicate missing elements with States, report back to States on linkage data quality issues, and offer the States support in matching.

3. Data Analysis

The evaluation team will continue to triangulate information to identify the most rigorous and flexible analytic approach for estimating program impacts for each MOM Model awardee. The primary factors used to determine which analytic design is appropriate for each awardee follow:

- **Data availability:** Are outcomes data available for pre- and post-implementation periods or post-implementation periods only? Are outcomes data available for defensible and appropriate comparison groups during only post-implementation period or both pre- and post-implementation periods?
- **Data quality:** Do claims data include usable and expected number of diagnosis codes and enrollment information? Are the quality and coverage of claims data consistent across study periods and study regions (e.g., within and across treatment and comparison areas)? Can mother-child dyads be linked in the claims data?
- **Sample size:** Is the number of treated individuals who consent to program participation and are identifiable in the claims data sufficient to estimate meaningful treatment effects?
- **Availability of comparison groups:** Are there MOM Model eligible women in areas of MOM Model awardee States not covered by the MOM Model or other non-awardee States that make for a defensible and appropriate comparison group? If so, are outcomes and vital records data available for these women and their babies to use for modeling purposes?

The preferred analytic approach is an intent-to-treat, difference-in-differences framework using pre- and post-implementation period data on treatment and comparison groups, where the treatment group is the eligible population in area(s) that implement the MOM Model through which the team will obtain estimates of the treatment on the treated. At a minimum, the implementation of this approach requires claims-based outcomes for individuals eligible for treatment in the awardee treatment States (or regions for partial State awardees) and similar individuals in similar but untreated regions or States. Given an identifiable comparison group and claims data of sufficient quality, the team will test for parallel pre-trends between the treatment and comparison group outcomes. In the absence of parallel pre-trends, which are a necessary assumption of the difference-in-differences approach, the assumption is violated, and the approach is not suitable for estimating causal effects.

If the base approach is not feasible for one or more awardees, the team will consider other analytic approaches for the impact analysis. For instance, in the absence of plausible comparison groups, a pre-post or interrupted time series design can be used to estimate differences between outcomes among MOM Model eligible women after versus before program implementation in awardee-covered regions. Although this approach would only require data from an awardee's covered region, it does not account for preexisting trends in services and outcomes because of factors unrelated to the MOM Model intervention. As an additional option, a cross-sectional comparison group design can be used if data for the pre-period are unavailable and data from comparison areas are available. A limitation of this approach is that it would not adjust for preexisting differences between treatment and comparison areas.

The team will calculate minimum detectable effects based on available sample sizes to determine whether the preferred estimation approach can detect meaningful treatment effects. The team will establish the threshold for meaningful effects with the CMS Innovation Center. For awardees with small sample sizes, the team will use Bayesian regression models to estimate full posterior probability distributions for treatment effects and report findings as probabilistic statements—for example, "X

percent probability the treatment effect is more than Y percentage points." This analysis would enable the team to describe the possible size of impacts more intuitively. If this approach is used for some awardees, the team may consider applying such analysis for all awardees to produce comparable estimates.

A potential cross-awardee analysis will be informed by the breadth of MOM Model interventions and data availability. The variation in MOM Model programs makes the awardee programs not directly comparable. For example, some States will implement the MOM Model in distinct areas of the State (e.g., rural areas or one metropolitan area), while others will implement the MOM Model throughout the entire State. Likewise, the number of individuals treated in each State will vary substantially across awardees. Because of differences in the size and scope of awardees' programs and other contextual differences, all awardees' treatment group data cannot be pooled into one population. Instead, the evaluation team will account for these differences in cross-site analysis by creating similar cohorts of MOM Model awardees/participants across States by combining treatment group data for different MOM Model cohorts with similar characteristics. This method will facilitate comparisons across MOM Model programs among similar groups of awardees of comparable sample sizes. Although the design of this cross-site analysis has not been developed yet, some potential considerations follow:

- Combine data for awardees that enroll individuals from rural areas.
- Create cohorts by similarities in models of care for pregnant and postpartum individuals with OUD.
- Develop cohorts based on the presence of Medicaid expansion in a State.
- Identify cohorts based on preexisting perinatal OUD programs before the implementation of the MOM Model.

Outcomes analysis across MOM Model sites may also be limited by variations in data availability and quality across awardees. At a minimum, the team will conduct cross-site analysis of outcomes available in T-MSIS and vital records data.

Appendix C. Process Data Tables

Tables C.1 to C.11 present beneficiary-level aggregate data from seven MOM Model awardees (Indiana, Maryland, Maine, New Hampshire, Tennessee, Texas, West Virginia) during the first year of implementation, submitted by awardees through the CMS Innovation Center Gateway.[20] Data from all awardees reflect the period from July 1, 2021, through June 30, 2022, except West Virginia, which collected data from January 1 through June 30, 2022, because of a 6-month delay in MOM Model implementation. Percentages reported are among beneficiaries with nonmissing data for a given measure; table notes provide details about the universe of the data presented. Awardees may add and revise data for one year following initial submission.

Table C.1. MOM Model Beneficiary Enrollment

Data Elements	Indiana	Maryland	Maine	New Hampshire	Tennessee	Texas	West Virginia	Total
Cumulative count by awardee	273	3	80	24	149	26	38	593

Table C.2. MOM Model Beneficiary Demographics

Data Elements		Data Indicator	All MOM Model Beneficiaries
Beneficiary's Age	Beneficiaries with missing data	*N*	–
	Beneficiaries with nonmissing data	*N*	593
	Younger than 18	%	0.2
	18–19	%	0.2
	20–24	%	11.0
	25–29	%	32.7
	30–34	%	37.6
	Older than 35	%	18.4
Beneficiary's Self-Identified Gender	Beneficiaries with missing data	*N*	–
	Beneficiaries with nonmissing data	*N*	593
	Female	%	100
	Male	%	0
	Other or nonbinary	%	0
Beneficiary's Self-Identified Race and Ethnicity	Beneficiaries with missing data	*N*	–
	Beneficiaries with nonmissing data	*N*	593
	Hispanic	%	4.7
	Non-Hispanic Black or African American	%	6.1
	Non-Hispanic White	%	86.3
	Non-Hispanic other or multiple races	%	2.0
	Unspecified	%	0.8

[20] The following variables are not presented in these tables: dementia or cognitive impairment indicator (data not yet collected); change in cigarette use during MOM Model enrollment (not enough time has elapsed to measure changes); number of prenatal hospital admissions (zero to report); number of postpartum hospital admissions (zero to report); Patient Activation Measure (PAM) score (data not yet collected); MOM Model beneficiary death (zero to report).

Data Elements		Data Indicator	All MOM Model Beneficiaries
Beneficiary's Self-Identified Detailed Race	Beneficiaries with missing data	*N*	–
	Beneficiaries with nonmissing data	*N*	593
	White	%	89.4
	Black or African American	%	6.1
	American Indian or Alaska Native	%	0.2
	Asian	%	0
	Native Pacific Islander	%	0
	Multiple races	%	1.9
	Unspecified	%	2.5
Beneficiary's Self-Identified Detailed Ethnicity	Beneficiaries with missing data	*N*	–
	Beneficiaries with nonmissing data	*N*	593
	Not of Latino/a or Spanish origin	%	94.3
	Mexican, Mexican American, Chicano/a	%	0
	Puerto Rican	%	0.2
	Cuban	%	0
	Another Latino/a or Spanish origin	%	1.3
	Other, unknown, or multiple Hispanic ethnicities	%	3.2
	Ethnicity unspecified	%	1.0
Beneficiary's Relationship Status	Beneficiaries with missing data	*N*	42
	Beneficiaries with nonmissing data	*N*	551
	Married, living with spouse	%	14.2
	Married, not living with spouse	%	2.2
	Living with partner	%	38.3
	In relationship, not living together	%	19.6
	Not in relationship right now	%	25.8
Beneficiary's Educational Attainment	Beneficiaries with missing data	*N*	72
	Beneficiaries with nonmissing data	*N*	521
	High school diploma or GED	%	79.7
	No high school diploma or GED	%	20.3
Beneficiary Health Insurance Before Pregnancy	Beneficiaries with missing data	*N*	25
	Beneficiaries with nonmissing data	*N*	568
	Medicaid	%	69.5
	Private insurance	%	3.3
	Other insurance	%	0.7
	Uninsured	%	15.3
	Unknown	%	11.1

Note: Missing data in this table are the result of item nonresponse.
– = no data; GED = General Educational Development test
Source: Insight Policy Research analysis of beneficiary-level data submitted via the Gateway, November 2022

Table C.3. Mental Health of MOM Model Beneficiaries

Data Elements		Data Indicator	All MOM Model Beneficiaries
Other Mental or Behavioral Health Diagnoses	Beneficiaries with missing data	*N*	84
	Beneficiaries with nonmissing data	*N*	509
	Anxiety- and fear-related disorders	%	63.1
	Bipolar and related disorders	%	23.0
	Depressive disorders	%	57.2
	Personality disorders	%	5.9
	Schizophrenia spectrum and other psychotic disorders	%	4.9
	Trauma- and stress-related disorders	%	27.3
	Other mood disorders	%	16.9
	Other mental and behavioral disorders/conditions	%	22.8
	Alcohol-related disorders	%	8.4
	Tobacco-related disorders	%	36.9
	Other substance-related disorders	%	50.9
Depression Screening Result[a]	Beneficiaries with missing data	*N*	28
	Beneficiaries with nonmissing data	*N*	565
	Positive	%	50.8
	Exclusion/self-report positive	%	0.9
	Negative	%	48.3
Depression Screen Follow-Up Plan[b]	Not in universe[c]	*N*	306
	Beneficiaries with missing data	*N*	1
	Beneficiaries with nonmissing data	*N*	286
	Additional evaluation for depression	%	36.7
	Suicide risk assessment	%	13.6
	Referral to practitioner who is qualified to diagnose and treat depression	%	36.4
	Pharmacological interventions	%	19.2
	Other interventions or follow-up for diagnosis or treatment of depression	%	36.7
	No follow-up plan at this time[d]	%	30.4
Anxiety Screening Result	Missing data	*N*	183
	Beneficiaries with nonmissing data	*N*	410
	Screening complete, result unknown	%	5.6
	Mild anxiety	%	26.6
	Moderate anxiety	%	24.4
	Severe anxiety	%	22.2
Beneficiary History of Abuse and Transactional Sex	Beneficiaries with missing data	*N*	115
	Beneficiaries with nonmissing data	*N*	478
	Sexual abuse	%	18.6
	Physical abuse	%	41.0
	Emotional abuse	%	40.8
	Transactional sex	%	4.0
	None of the above	%	47.1

[a] Some beneficiaries had multiple depression screen results reported. Only one screen per beneficiary is represented here, with priority given to any positive screen result over the other response options. If a beneficiary ever screened positive for depression, it is shown here.

[b] Texas is not represented because of an issue with the quality of depression screen follow-up data.
[c] This universe includes only beneficiaries with a positive screen for depression.
[d] If "no follow-up plan at this time" was ever reported for a beneficiary, it is indicated here. A depression screen follow-up plan may also have been offered during a subsequent encounter or after another positive screen.
Source: Insight Policy Research analysis of beneficiary-level data submitted via the Gateway, November 2022

Table C.4. Physical Health of MOM Model Beneficiaries

Data Elements		Data Indicator	All MOM Model Beneficiaries
Chronic Conditions	Beneficiaries with missing data[a]	*N*	454
	Beneficiaries with nonmissing data	*N*	139
	Diabetes	%	8.6
	Hypertension	%	36.7
	Heart disease	%	5.8
	Class 3 obesity (BMI > 40)	%	3.6
	Other	%	56.8
HIV Indicator	Beneficiaries with missing data	*N*	253
	Beneficiaries with nonmissing data	*N*	340
	Positive	%	1.8
	Negative	%	87.1
	Not assessed	%	11.2
Hepatitis C Indicator	Beneficiaries with missing data	*N*	244
	Beneficiaries with nonmissing data	*N*	349
	Positive	%	36.7
	Negative	%	53.6
	Not assessed	%	9.7

Note: BMI = body mass index; HIV = human immunodeficiency virus
[a] For this measure, "missing" represents nonresponse. This question has no "none of the above" response option.
Source: Insight Policy Research analysis of beneficiary-level data submitted via the Gateway, November 2022

Table C.5. Substance Use Among MOM Model Beneficiaries

Data Elements		Data Indicator	All MOM Model Beneficiaries
Tobacco Screening Result	Beneficiaries with missing data	*N*	46
	Beneficiaries with nonmissing data	*N*	547
	Positive	%	73.3
	Negative	%	26.5
	Exclusion criteria met[a]	%	0.2
Tobacco Intervention	Not in universe[b]	*N*	192
	Beneficiaries with nonmissing data	*N*	401
	Brief counseling provided	%	72.8
	Medication offered and refused	%	11.0
	Medication offered and accepted	%	8.0
	Referred to tobacco cessation program	%	35.9
	Other intervention provided	%	5.5

Data Elements		Data Indicator	All MOM Model Beneficiaries
Average Number of Cigarettes Smoked per Day	Beneficiaries with nonmissing data[c]	*N*	311
	Mean		10.8
	Median		10
	Minimum		1
	Maximum		30
Alcohol Use	Beneficiaries with missing data	*N*	180
	Beneficiaries with nonmissing data	*N*	413
	14 drinks or more a week	%	0.5
	8–13 drinks per week	%	0
	4–7 drinks per week	%	0.2
	1–3 drinks per week	%	0.7
	Less than 1 drink per week	%	1.5
	I didn't drink in the last month	%	92.3
	Did not answer/unknown	%	4.8
Substance Use in the Past Year	Beneficiaries with missing data	*N*	112
	Beneficiaries with nonmissing data	*N*	481
	Alcohol	%	16.6
	Cigarettes/other tobacco	%	78.0
	Vaping/electronic nicotine delivery system	%	9.1
	Cannabis	%	38.0
	Amphetamines	%	28.5
	Benzodiazepine	%	12.3
	None	%	8.5
Substance Use Before Age 18	Beneficiaries with missing data	*N*	120
	Beneficiaries with nonmissing data	*N*	473
	Alcohol	%	52.0
	Cigarettes/other tobacco	%	61.1
	Vaping/electronic nicotine delivery system	%	3.6
	Cannabis	%	56.4
	Opioids	%	46.5
	Amphetamines	%	16.7
	Benzodiazepine	%	11.0
	None	%	17.3

Note: Beneficiaries may have received different interventions (or no intervention) at each encounter. This table reflects the receipt of each listed intervention at least once during the reporting period.

[a] Beneficiaries who declined to be screened for tobacco use or were not screened because of medical reasons meet exclusion criteria.

[b] This universe includes beneficiaries with a positive tobacco screen.

[c] Among tobacco users who smoke cigarettes and reported at least one cigarette count; if multiple cigarette counts were reported for a beneficiary, one was chosen at random.

Source: Insight Policy Research analysis of beneficiary-level data submitted via the Gateway, November 2022

Table C.6. Social Determinants of Health Among MOM Model Beneficiaries

Data Elements		Data Indicator	All MOM Model Beneficiaries
HRSN Screening Result	Beneficiaries with missing data	*N*	48
	Beneficiaries with nonmissing data	*N*	545
	Positive	%	58.3
	Negative	%	41.7
HRSN Food Result	Beneficiaries with missing data	*N*	50
	Beneficiaries with nonmissing data	*N*	543
	Positive	%	31.3
	Negative	%	68.7
HRSN Transportation Result	Beneficiaries with missing data	*N*	58
	Beneficiaries with nonmissing data	*N*	535
	Positive	%	29.0
	Negative	%	71.0
HRSN Utilities Result	Beneficiaries with missing data	*N*	72
	Beneficiaries with nonmissing data	*N*	521
	Positive	%	20.9
	Negative	%	79.1
HRSN Safety Result	Beneficiaries with missing data	*N*	57
	Beneficiaries with nonmissing data	*N*	536
	Positive	%	10.4
	Negative	%	89.6
HRSN Housing Result	Beneficiaries with missing data	*N*	63
	Beneficiaries with nonmissing data	*N*	530
	Positive	%	25.8
	Negative	%	74.2
HRSN Family Result	Beneficiaries with missing data	*N*	69
	Beneficiaries with nonmissing data	*N*	524
	Positive	%	20.4
	Negative	%	79.6

Note: Social determinants of health are measured using HRSN screening tool that considers up to six dimensions (food, transportation, utilities, safety, housing, family).
HRSN = health-related social needs
Source: Insight Policy Research analysis of beneficiary-level data submitted via the Gateway, November 2022

Table C.7. Service Use Among MOM Model Beneficiaries

Data Elements		Data Indicator	All MOM Model Beneficiaries
Number of Prenatal Encounters	Beneficiaries with missing data	*N*	213
	Beneficiaries with nonmissing data[a]	*N*	380
		Mean	6.4
		Median	5
		Minimum	1
		Maximum	36

Data Elements		Data Indicator	All MOM Model Beneficiaries
Number of Postpartum Encounters	Not in universe[b]	*N*	248
	Beneficiaries with missing data	*N*	168
	Beneficiaries with nonmissing data	*N*	177
		Mean	4.2
		Median	2
		Minimum	1
		Maximum	25
Number of OUD Encounters	Beneficiaries with missing data[c]	*N*	109
	Beneficiaries with nonmissing data	*N*	484
		Mean	14.8
		Median	9
		Minimum	1
		Maximum	235
Prenatal Care Provider Type	Not in universe[d]	*N*	213
	Beneficiaries with missing data	*N*	9
	Beneficiaries with nonmissing data	*N*	371
	Physician	%	94.6
	Physician assistant	%	0
	Nurse	%	20.5
	Nurse practitioner	%	15.9
	Midwife	%	7.8
	Other	%	12.9
Postpartum Visit Practitioner Type	Not in universe[e]	*N*	416
	Beneficiaries with missing data	*N*	0
	Beneficiaries with nonmissing data	*N*	177
	OB/GYN practitioner	%	74.6
	Midwife	%	8.5
	Family practitioner	%	11.3
	Other primary care provider	%	32.8
	None of the above	%	9.0
Visits With Other Providers	Beneficiaries with missing data	*N*	49
	Beneficiaries with nonmissing data	*N*	544
	Care coordination specialist	%	39.2
	OUD treatment specialist	%	47.4
	Lactation consultant	%	17.1
	Psychologist	%	8.5
	Social worker	%	31.6
	Other	%	64.3
Beneficiary Received Referral	Beneficiaries with missing data	*N*	246
	Beneficiaries with nonmissing data	*N*	347
	Yes	%	64.8
	No	%	35.2

Data Elements		Data Indicator	All MOM Model Beneficiaries
Referral Status[f]	Beneficiaries with missing data	*N*	246
	Beneficiaries with nonmissing data	*N*	347
	Referral was needed and made	%	64.8
	Referral was needed and not made	%	5.8
	Referral was not needed	%	53.3
	Did not assess need for referral	%	28.8
Referral Type	Not in universe	*N*	142
	Beneficiaries with missing data	*N*	225
	Beneficiaries with nonmissing data	*N*	226
	Opioid treatment	%	21.2
	Housing/living situation	%	31.9
	Food/nutrition	%	20.4
	Transportation	%	16.4
	Utilities	%	9.7
	Safety	%	6.2
	Family and community support	%	20.8
	Behavioral health, non-OUD	%	19.9
	Other medical	%	24.3
	Other	%	27.0
Referral Completed	Not in universe		368
	Beneficiaries with missing data	*N*	0
	Beneficiaries with nonmissing data	*N*	225
	Yes	%	24.9
	No	%	75.1
Referral Completed Type	Not in universe		368
	Beneficiaries with missing data	*N*	169
	Beneficiaries with nonmissing data	*N*	56
	Opioid treatment	%	41.1
	Housing/living situation	%	48.2
	Food/nutrition	%	35.7
	Transportation	%	37.5
	Utilities	%	8.9
	Safety	%	10.7
	Family and community support	%	26.8
	Behavioral health, non-OUD	%	12.5
	Other medical	%	23.2
	Other	%	12.5
Receipt of Care Coordination Activities	Beneficiaries with missing data	*N*	1
	Beneficiaries with nonmissing data	*N*	592
	Shared relevant information with at least one other provider involved in beneficiary's care	%	59.1
	Assessed beneficiary needs and goals	%	98.5
	Discussed self-management goals with beneficiary	%	92.1
	Reviewed beneficiary's medications	%	83.4

Data Elements		Data Indicator	All MOM Model Beneficiaries
	Consulted other providers involved in beneficiary's care	%	39.0
	Other care coordination activity	%	34.5
	None of the above	%	1.4
Frequency of Care Coordination Activities[g]	Shared relevant information with at least one other provider involved in beneficiary's care	Mean	10.2
	Assessed beneficiary needs and goals	Mean	12.8
	Discussed self-management goals with beneficiary	Mean	11.7
	Reviewed beneficiary's medications	Mean	12.0
	Consulted other providers involved in beneficiary's care	Mean	4.3
	Other care coordination activity	Mean	3.6
	None of the above	Mean	1.0
Qualifying Postpartum Encounter Indicator	Not in universe[h]	*N*	248
	Beneficiaries with missing data	*N*	151
	Beneficiaries with nonmissing data	*N*	194
	Yes	%	94.3
	No	%	5.7
Family Planning Indicator	Not in universe[h]	*N*	248
	Beneficiaries with missing data	*N*	39
	Beneficiaries with nonmissing data	*N*	306
	Current method of contraception	%	41.1
	Discussion of contraceptive options	%	55.8
	Provision of contraception	%	16.8
	Pregnancy testing and counseling	%	6.3
	Discussion of reproductive goals with life planning	%	22.1
	None	%	21.1
Postpartum Contraception	Not in universe[h]	*N*	248
	Beneficiaries with missing data	*N*	88
	Beneficiaries with nonmissing data	*N*	257
	None	%	12.8
	Natural family planning	%	1.2
	Pull-out method	%	0
	Barrier or spermicide	%	1.2
	Hormonal	%	12.5
	Injectable	%	5.1
	LARC	%	23.0
	Tubal ligation	%	21.0
	Other	%	6.2
	Unknown	%	18.7

Note: – = no data; HRSN = health-related social needs; LARC = long-acting reversible contraceptives; OB/GYN = obstetrics and gynecology; OUD = opioid use disorder

[a] Prenatal encounters are counted among all beneficiaries who received at least one prenatal encounter, regardless of when in their pregnancies (early, late) they enrolled in the MOM Model. The number of prenatal encounters may not reflect the true number of encounters beneficiaries received.

[b] Postpartum encounters are counted among all beneficiaries who received at least one postpartum encounter, regardless of how much time had elapsed since the beneficiaries' end-of-pregnancy date and the end of the reporting period. The number of postpartum encounters may not reflect the true number of postpartum encounters beneficiaries received.
[c] OUD encounters are counted among all beneficiaries who received at least one OUD encounter during the reporting period. The number of OUD encounters may not reflect the true intensity of OUD care received.
[d] Prenatal care provider types are counted among beneficiaries who received at least one prenatal care encounter. A beneficiary could have received prenatal care from more than one provider type.
[e] Postpartum visit practitioner types are counted among beneficiaries whose pregnancy ended within 6 weeks of the end of the reporting period and who received at least one postpartum encounter. A beneficiary could have received postpartum care from more than one provider type.
[f] Referral outcomes differ by encounter; presented here is the share of beneficiaries who experienced each referral outcome at least once. Therefore, results will not sum to 100 percent.
[g] This table presents mean frequencies of each care coordination activity among those who received it at least once.
[h] The universe for qualifying postpartum care, family planning, and postpartum contraception is limited to beneficiaries who gave birth at least 6 weeks before the end of the reporting period.
Source: Insight Policy Research analysis of beneficiary-level data submitted via the Gateway, November 2022

Table C.8. OUD Treatment Among MOM Model Beneficiaries

Data Elements		Data Indicator	All MOM Model Beneficiaries
Prior OUD Treatment During Current Pregnancy	Beneficiaries with missing data	*N*	90
	Beneficiaries with nonmissing data	*N*	503
	Yes	%	77.9
	No	%	22.1
Prior OUD Inpatient Treatment	Beneficiaries with missing data	*N*	107
	Beneficiaries with nonmissing data	*N*	486
	Yes	%	44.9
	No	%	55.1
Pharmacotherapy Initiation	Beneficiaries with missing data	*N*	–
	Beneficiaries with nonmissing data	*N*	593
	At Model enrollment	%	55.0
	Prenatal	%	13.3
	Postpartum	%	8.1
	Never	%	23.6
Pharmacotherapy Type at Initiation	Beneficiaries with missing data	*N*	–
	Beneficiaries with nonmissing data	*N*	453
	Buprenorphine	%	70.0
	Methadone	%	15.7
	Naltrexone	%	0.2
	None	%	10.4
	Other	%	3.8
Pharmacotherapy Type at Delivery	Not in universe[a]	*N*	225
	Beneficiaries with missing data	*N*	147
	Beneficiaries with nonmissing data	*N*	221
	Buprenorphine	%	76.0
	Methadone	%	18.6
	Naltrexone	%	0.9
	Other	%	4.5
	None	%	0

Data Elements		Data Indicator	All MOM Model Beneficiaries
Pharmacotherapy Type Postpartum	Not in universe[b]	*N*	214
	Beneficiaries with missing data	*N*	99
	Beneficiaries with nonmissing data	*N*	280
	Buprenorphine	%	58.2
	Methadone	%	14.3
	Naltrexone	%	1.1
	None	%	2.9
	Other	%	23.6
Experienced Relapse During MOM Model Participation	Beneficiaries with missing data	*N*	134
	Beneficiaries with nonmissing data	*N*	459
	Yes	%	30.5
	No	%	69.5
OUD Encounter Types Received	Not in universe[c]	*N*	109
	Beneficiaries with missing data		0
	Beneficiaries with nonmissing data	*N*	484
	Inpatient	%	3.5
	Outpatient	%	98.8
	Intensive outpatient	%	1.0
	Partial hospitalization	%	0.4
	Residential treatment service	%	12.6
	Telehealth	%	1.9
OUD Treatment Service Types Received	Not in universe	*N*	109
	Beneficiaries with missing data		0
	Beneficiaries with nonmissing data	*N*	484
	Pharmacotherapy	%	84.7
	Behavioral health counseling or therapy	%	51.7
	Health and behavior interventions for OUD	%	69.2
	Psychotherapy: individual or group	%	45.0
	Social work services related to OUD treatment	%	42.4
	Community support services related to OUD	%	40.5
	Training, educational services, and skills development related to OUD treatment	%	43.2
	Crisis intervention	%	7.0
	Recreational therapy related to OUD	%	16.5
	Psychosocial rehabilitation services	%	1.2
	Community psychiatric supportive treatment	%	5.0
	None	%	0.0

Data Elements		Data Indicator	All MOM Model Beneficiaries
Treatment Plan at Model Exit	Not in universe[d]	*N*	472
	Beneficiaries with missing data		7
	Beneficiaries with nonmissing data	*N*	114
	Pharmacotherapy	%	40.4
	Behavioral health counseling or therapy	%	15.8
	Health and behavior interventions for OUD	%	31.6
	Psychotherapy: individual or group	%	7.9
	Social work services related to OUD treatment	%	1.8
	Community support services related to OUD	%	13.2
	Training, educational services, and skills development related to OUD treatment	%	8.8
	Crisis intervention	%	2.6
	Recreational therapy related to OUD	%	0.9
	Psychosocial rehabilitation services	%	0.9
	Community psychiatric supportive treatment	%	0.9
	None	%	40.4

Note: – = no data; OUD = opioid use disorder
[a] This universe is limited to beneficiaries who delivered a live infant.
[b] This universe is limited to beneficiaries with an end-of-pregnancy date.
[c] This universe is limited to beneficiaries with at least one OUD encounter.
[d] This universe is limited to beneficiaries who have exited the Model.
Source: Insight Policy Research analysis of beneficiary-level data submitted via the Gateway, November 2022

Table C.9. Pregnancy Conditions and Risk Factors Among MOM Model Beneficiaries

Data Elements		Data Indicator	All MOM Model Beneficiaries
Prior Birth	Beneficiaries with missing data	*N*	106
	Beneficiaries with nonmissing data	*N*	487
	Yes	%	84.0
	No	%	16.0
Prior Birth Experiences (Infant Outcomes)	Not in universe	*N*	184
	Beneficiaries with missing data	*N*	154
	Beneficiaries with nonmissing data	*N*	255
	Premature (< 37 weeks)	%	24.7
	Low birth weight (< 2,500 g)	%	7.5
	Stillborn infant	%	6.3
	Infant diagnosed with NAS	%	8.6
	Unknown	%	10.6
	None	%	50.6
	Not applicable	%	2.4

Data Elements		Data Indicator	All MOM Model Beneficiaries
Prior Pregnancy Health Risk Factors (Maternal Outcomes)	Not in universe	*N*	184
	Beneficiaries with missing data	*N*	142
	Beneficiaries with nonmissing data	*N*	267
	Preeclampsia or pregnancy-induced hypertension	%	15.0
	Gestational diabetes	%	5.6
	Gestational hypertension	%	5.6
	HELLP syndrome	%	0.4
	Hemorrhage	%	3.7
	Other	%	7.1
	Unknown	%	10.1
	None	%	59.9
	Not applicable	%	1.1
Prior Child Out-of-Home Placement	Beneficiaries with missing data	*N*	63
	Beneficiaries with nonmissing data	*N*	530
	Yes	%	38.1
	No	%	43.8
	Not applicable	%	6.0
	Not known	%	12.1
Multifetal Gestation	Beneficiaries with missing data	*N*	93
	Beneficiaries with nonmissing data	*N*	500
	Yes	%	3.0
	No	%	95.4
	Unknown	%	1.6
Prenatal Condition Types	Not in universe	*N*	184
	Missing data	*N*	326
	Beneficiaries with nonmissing data	*N*	83
	Preeclampsia	%	44.6
	Gestational diabetes	%	16.9
	Gestational hypertension	%	26.5
	HELLP syndrome	%	0
	Hemorrhage	%	9.6
	Other	%	22.9

Note: HELLP = hemolysis, elevated liver enzymes, and low platelets; NAS = neonatal abstinence syndrome
Source: Insight Policy Research analysis of beneficiary-level data submitted via the Gateway, November 2022

Table C.10. Maternal Outcomes Among MOM Model Beneficiaries

Data Elements		Data Indicator	All MOM Model Beneficiaries
Pregnancy Outcomes	Not in universe[a]	*N*	214
	Beneficiaries with missing data	*N*	0
	Beneficiaries with nonmissing data	*N*	379
	Spontaneous abortion (before 20 weeks) (miscarriage)	%	2.1
	Fetal death at 20 weeks onward	%	0.5
	Therapeutic abortion	%	0.3
	Live birth	%	97.1
	Multiple nonlive birth outcomes	%	0.0
Maternal Hospital Length of Stay for Delivery	Not in universe[b]	*N*	225
	Beneficiaries with missing data	*N*	191
	Beneficiaries with nonmissing data	*N*	177
	1 day	%	0.6
	2 days	%	21.5
	3 days	%	32.2
	4 days	%	13.6
	5 or more days	%	13.0
	No hospitalization for delivery	%	19.2
Labor Pain Management	Not in universe[b]	*N*	225
	Beneficiaries with missing data	*N*	73
	Beneficiaries with nonmissing data	*N*	295
	Epidural	%	85.1
	Intravenous narcotics	%	3.7
	Other	%	7.8
	No/none	%	7.8
Delivery Method	Not in universe[b]	*N*	225
	Beneficiaries with missing data	*N*	29
	Beneficiaries with nonmissing data	*N*	339
	Vaginal	%	34.2
	Vaginal, induced or augmented	%	24.8
	Vaginal, VBAC	%	0.6
	Emergency C-section	%	16.2
	Planned C-section	%	24.2

Note: – = no data; VBAC = vaginal birth after cesarean

[a] This universe is limited to beneficiaries with an end-of-pregnancy date.

[b] This universe is limited to beneficiaries who delivered a live infant.

Source: Insight Policy Research analysis of beneficiary-level data submitted via the Gateway, November 2022

Table C.11. Outcomes Among Infants Born to MOM Model Beneficiaries

Data Elements		Data Indicator	All MOM Model Beneficiaries
Hospital Length of Stay at Delivery[a]	Infants with missing data	*N*	0
	Infants with nonmissing data	*N*	368
	1 day	%	3.0
	2 days	%	14.4
	3 days	%	10.6
	4 days	%	19.3
	5 or more days	%	50.3
	No hospitalization for delivery	%	2.4
NICU at Delivery	Infants with missing data	*N*	0
	Infants with nonmissing data	*N*	368
	Yes	%	35.3
	No	%	64.7
NICU Length of Stay at Delivery	Infants with missing data	*N*	0
	Infants with nonmissing data	*N*	368
	1 day	%	4.9
	2 days	%	3.0
	3 days	%	2.7
	4 days	%	1.4
	5 or more days	%	23.4
	No NICU stay	%	64.7
Estimated Gestational Age	Infants with missing data	*N*	1
	Infants with nonmissing data	*N*	367
	Very preterm (20 weeks < = EGA < = 34 weeks)	%	4.4
	Preterm (34 weeks < = EGA < 37 weeks)	%	12.3
	Term (37 weeks < = EGA < 42 weeks)	%	83.1
	Postterm (> 42 weeks)	%	0.3
Birth Weight	Infants with missing data	*N*	4
	Infants with nonmissing data	*N*	364
	Very low birth weight (< 1,500 g)	%	3.0
	Low birth weight (> = 1,500 g < 2,500 g)	%	13.5
	Normal birth weight (> = 2,500 g < 4,000 g)	%	79.7
	Macrosomic (> = 4,000 g)	%	4.4
Positive Opioid Screen	Infants with missing data	*N*	0
	Infants with nonmissing data	*N*	368
	Yes	%	50.3
	No	%	49.7
Neonatal Abstinence Syndrome Indicator	Infants with missing data	*N*	0
	Infants with nonmissing data	*N*	368
	Positive	%	28.8
	Negative	%	71.2

Data Elements		Data Indicator	All MOM Model Beneficiaries
Infant Pharmacotherapy Treatment for Neonatal Abstinence Syndrome	Infants with missing data	*N*	99
	Infants with nonmissing data	*N*	269
	Yes	%	14.1
	No	%	72.1
	Not known	%	13.8
Out-of-Home Placement	Infants with missing data	*N*	–
	Infants with nonmissing data	*N*	368
	Yes	%	10.1
	No	%	89.9
Infant Feeding	Infants with missing data	*N*	5
	Infants with nonmissing data	*N*	363
	Breastfeeding	%	16.3
	Pumping breastmilk for bottle or catheter feeding	%	3.0
	Both breastfeeding and pumping breastmilk for bottle or catheter feeding	%	5.2
	Breastfeeding or pumping and supplementing breastmilk with formula	%	17.4
	Formula feeding only	%	32.8
	Unknown	%	25.3

Note: For all elements presented in table C.11, the total population = 368 infants born to beneficiaries during the reporting period.

– = no data; EGA = estimated gestational age; NAS = neonatal abstinence syndrome; NICU = neonatal intensive care unit

[a] The proportion of infants with a hospital stay of greater than five days may be larger than the proportion of infants admitted to the NICU when additional non-NICU options, such as a special care nursery, are available.

Source: Insight Policy Research analysis of beneficiary-level data submitted via the Gateway, November 2022

Appendix D. Process Data Quality Checks

Table D.1. Process Data Quality Checks

Data Quality Check Number	Data Element	Check Description	Check Definition	Process Team Considerations	Analytic Decision
1	PRAC_TYPE	Illogical combination of values selected for practitioner type	"None of the Above" selected in combination with another valid value		Expand categorical variables into individual binary options If "None of the Above" is selected in tandem with another valid value, "None of the Above" binary will be dropped
2	CARE_COORD_ACT	Illogical combination of values selected for type of care coordination that occurred during encounter	"None of the Above" selected in combination with another valid value		Expand categorical variables into individual binary options If "None of the Above" is selected in tandem with another valid value, "None of the Above" binary will be dropped
3	DEP_SCRN_DATE	Screening date either predates program enrollment or is set later than current reporting period	Predates/postdate: 2023_06_07 2003_11_21		Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters: Does not predate program enrollment, and date is not after reporting timeline Dates that fail to meet date requirements will be counted as missing

Data Quality Check Number	Data Element	Check Description	Check Definition	Process Team Considerations	Analytic Decision
4	DOB	Birth date suggests a patient to be too young or too old	Too young/old: 2013_06_07 1956_11_21	Set lower and upper bounds as 9 and 65 years prior to end of current reporting period	Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters—born outside of age range Dates that fail to meet date requirements will be counted as missing
5	DEP_FUP_DATE	Follow-up date is before DEP_SCRN_DATE or after current reporting period	Predates/postdate: 2023_04_03 2003_05_11		Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters—depression screen and current reporting period Dates that fail to meet date requirements will be counted as missing
6	ENC_END_DATE	Encounter end date either predates program enrollment or is set later than current reporting period	Predates/postdate: 2023_06_07 2003_11_21	If encounter end date is before encounter start date, flag and remove both dates; otherwise, only flag	Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters—start of encounter date and enrollment and before current reporting period Dates that fail to meet date requirements will be counted as missing

Data Quality Check Number	Data Element	Check Description	Check Definition	Process Team Considerations	Analytic Decision
7	ENC_START_DATE	Encounter date either predates program enrollment or is set later than current reporting period	Predates/postdate: 2023_06_07 2003_11_21	If encounter end date is before encounter start date, flag and remove both dates; otherwise, only flag	Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters—start of enrollment and before current reporting period Dates that fail to meet date requirements will be counted as missing
8	END_PREG_DATE	End pregnancy date postdates current reporting period	Predates/postdates: 2023_06_07		Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters—start of enrollment and before current reporting period Dates that fail to meet date requirements will be counted as missing
9	HRSN_SCREEN_DATE	Screen date predates program enrollment or is set later than current reporting period	Predates/postdates: 2022_06_19 2003_11_21		Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters—start of enrollment and before current reporting period Dates that fail to meet date requirements will be counted as missing

Data Quality Check Number	Data Element	Check Description	Check Definition	Process Team Considerations	Analytic Decision
10	MODEL_ENGAGE_SVC	Illogical combination of values selected for type of Model engagement services selected that occurred (other than care coordination or referrals)	"22" selected in combination with another valid value		Expand categorical variables into individual binary options If "22" selected in tandem with another valid value, "22" binary will be dropped
11	MODEL_ENROLL_DATE_1	Predates start of MOM Model program for awardee or is set later than current reporting period	Predates/postdates: 2022_06_19 2003_11_21		Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters—start of program for awardee and before current reporting period Dates that fail to meet date requirements will be counted as missing
12	MODEL_EXIT_DATE_1	Exit date predates program enrollment or is set later than current reporting period	Predates/postdates: 2022_06_19 2003_11_21		Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters Dates that fail to meet date requirements will be counted as missing
13	PHARMA_INIT_DATE	Pharma initiation predates program enrollment or is set later than current reporting period	Predates/postdates: 2022_06_19 2003_11_21		Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters Dates that fail to meet date requirements will be counted as missing

Data Quality Check Number	Data Element	Check Description	Check Definition	Process Team Considerations	Analytic Decision
14	PP_ENC_FP_IND	Illogical combination of values	"None" selected in combination with another valid value		Expand categorical variables into individual binary options If "None of the Above" is selected in tandem with another valid value, "None of the Above" binary will be dropped
15	PRIOR_BIRTH_DATE	Postdates program enrollment	Postdates the MODEL_ENROLL_DATE		If PRIOR_BIRTH_DATE is after MODEL_ENROLLMENT_DATE, data element will be counted as missing
16	TOBACCO_SCRN_DATE	Predates program enrollment or is set later than current reporting period	Predates/postdates: 2022_06_19 2003_11_21	If date is outside of window, remove date, but keep result and intervention values Also check if it is the only screening	Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters Dates that fail to meet date requirements will be counted as missing
17	TOBACCO_INTERVENTION	Illogical combination of values selected for type of tobacco intervention	"No intervention provided during this visit" selected in combination with another intervention type		Expand categorical variables into individual binary options If "No intervention provided during this visit" is selected in tandem with another valid value, "No intervention …" binary will be dropped
18	BIRTH_WT	Integer value outside of possible range	Low: 750 High: 6,500		Create a flag for any enrollee for whom their child's birth weight falls outside of range For any birth weight outside of range, consider as missing temporarily—ask for correction for awardee if possible

Data Quality Check Number	Data Element	Check Description	Check Definition	Process Team Considerations	Analytic Decision
19	INFANT_DOB	Infant DOB set later than current reporting period	Postdates 2022_06_19		Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters Dates that fail to meet date requirements will be counted as missing
20	DEP_SCREN_FUP_TYPE	Illogical combination for depression follow-up	"No follow up plan" selected in tandem with another follow-up plan		Expand categorical variables into individual binary options If "No intervention provided during this visit" is selected in tandem with another valid value, "No intervention …" binary will be dropped
23	PREG_OUTCOME	Illogical combination of pregnancy outcomes given a multigestational pregnancy	Enrollee has been noted to have multigestational pregnancy, but only one pregnancy outcome is listed, or vice versa		If enrollee does not have an indicator for multigestation but has multiple pregnancy outcomes—pregnancy outcome in its entirety will be considered missing If enrollee has partial completion of pregnancy outcomes for their multigestational pregnancy, only one pregnancy outcome will be considered complete, and other one will be considered missing

Note: DOB = date of birth

Table D.2. Single Data Element: Nonrequired

Data Quality Check Number	Data Element	Check Description	Check Definition	Process Team Considerations	Analytic Decision
24	ABUSE_EXPERIENCE	Illogical combination of values selected for abuse experience	"None of the Above" selected in combination with another valid value		Expand categorical variables into individual binary options If "None of the Above" is selected in tandem with another valid value, "None of the Above" binary will be dropped
25	ASSESS_COMP_DATE	Predates patient enrollment date or is set later than current reporting period	Predates/postdates: 2022_06_19 2003_11_21		Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters Dates that fail to meet date requirements will be counted as missing
26	DEATH_DATE	Predates patient enrollment in program or is set later than current reporting period	Predates/postdates: 2022_06_19 2003_11_21		Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters Dates that fail to meet date requirements will be counted as missing
27	INIT_TRTMT_PLAN_DATE	Predates start of program for awardee or is set later than current reporting period	Predates/postdates: 2022_06_19 2003_11_21		Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters Dates that fail to meet date requirements will be counted as missing
28	INTAKE_COMP_DATE	Predates start of program for awardee or set later than current reporting period	Predates/postdates: 2022_06_19 2003_11_21		Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters Dates that fail to meet date requirements will be counted as missing

Data Quality Check Number	Data Element	Check Description	Check Definition	Process Team Considerations	Analytic Decision
29	LABOR_PAIN_MANAGEMENT	Illogical combination of values selected for abuse experience	"No/None" selected in combination with another valid value		Expand categorical variables into individual binary options If "No/None" is selected in tandem with another valid value, "No/None" binary will be dropped
30	OUTREACH_DATE_#	Predates participant's enrollment in program or is set later than current reporting period	Predates/postdates: 2022_06_19 2003_11_21		Create flag variable for observations that fail to meet date requirements given an "if" statement around specific date parameters Dates that fail to meet date requirements will be counted as missing
31	PRIOR_BIRTH_EXPERIENCE	Illogical combination of values selected for prior birth experience	"No/None/Unknown" or "Not applicable" selected in combination with another valid value		Expand categorical variables into individual binary options If "No/None/Unknown" is selected in tandem with another valid value, "No/None/Unknown" binary will be dropped
32	EXIT_TRTMT_PLAN	Illogical combination of values selected for exit treatment type	"None" selected in combination with another valid value		Expand categorical variables into individual binary options If "None of the Above" is selected in tandem with another valid value, "None of the Above" binary will be dropped
33	POSTPARTUM_CONTRACEPTION	Illogical combination of values selected for postpartum contraception	"None" selected in combination with another valid value		Expand categorical variables into individual binary options If "None" is selected in tandem with another valid value, "None" binary will be dropped
34	PRIOR_PREG_RISK	Illogical combination of values selected for prior pregnancy risk	"None" selected in combination with another valid value		Expand categorical variables into individual binary options If "None" is selected in tandem with another valid value, "None" binary will be dropped

Data Quality Check Number	Data Element	Check Description	Check Definition	Process Team Considerations	Analytic Decision
35	SUBSTANCE_USE_RECENT	Illogical combination of values selected for substance use recent	"None" selected in combination with another valid value		Expand categorical variables into individual binary options If "None" is selected in tandem with another valid value, "None" binary will be dropped
36	YOUNG_ONSET_SUBSTANCE_USE	Illogical combination of values selected for young onset substance abuse	"None" selected in combination with another valid value		Expand categorical variables into individual binary options If "None" is selected in tandem with another valid value, "None" binary will be dropped

Table D.3. MOM Model Process Data Quality Checks Defined: Multiple Data Element Checks

Data Quality Check Number	Data Elements	Check Description	Check Definition	Process Team Considerations	Analytic Decision
37	HRSN_SCREEN_RESULT HRSN_LIVING_IND HRSN_FOOD_IND HRSN_TRANSPORT_IND HRSN_UTILITIES_IND HRSN_SAFETY_IND HRSN_FAMILY_IND	Illogical HRSN screening result and need identified combination	"Positive" selected for HRSN screening result field in combination with "No" selected for HRSN need indicator fields or "Negative" selected for HRSN screening result field in combination with "Yes" selected for any HRSN need indicator fields		Filter by screen result type and awardee to assess conflicting results based on simple results table Treat screening as positive if either HRSN_SCREEN_RESULT is "Positive" or any of the specific need indicator fields is "Positive"

Data Quality Check Number	Data Elements	Check Description	Check Definition	Process Team Considerations	Analytic Decision
38	DEP_SCRN_COMP_IND DEP_SCRN_RESULT DEPRESSION_SCREENER_SCORE DEPRESSION_SCREENER_USED	Illogical depression result term and need identified combination	"Exclusion Met" or "Beneficiary Refused" was selected for Depression Screen Complete indicator, but there is— ▪ An outcome for depression result ▪ Depression score ▪ The type of screener used	If *only* ever refused or excluded yet have at least each of other three (depression result, score, screener type used), flag, but do not remove	Create flag variable for any enrollee whose depression completion indicator is "exclusion met" or "beneficiary refused" and has an answer for any other variable If enrollee has answers for all three other variables, treat depression complete indicator as "yes" If enrollee has fewer than three other variables, consider depression screening to be entirely missing temporarily—ask for correction from awardee if possible
39	ENC_END_DATE ENC_SVC_TYPE ENC_START_DATE	Illogical combination of encounter end date based on encounter type and encounter start date	Encounter end date is not same date as encounter start date for what should be one-day, same-day encounter (i.e., encounter is prenatal visit, but end-of-encounter date is several days after start date)	Prenatal, postpartum, and other should be single day; hospital admissions, birth, or OUD can be multiday	Create flag for any enrollee for whom their encounter date is longer than same-day appointment For any same-day encounters out of range, treat ENC_END_DATE to be same as start date Clarify with awardee for confirmation
40	ENC_SVC_TYPE ENC_SVC_TYPE_OTHER	Illogical combination of encounter service types	Encounter service was not "other," but ENC_SVC_TYPE_OTHER variable is filled out, or vice versa		For any enrollee who has commentary in ENC_SVC_TYPE_OTHER when not necessary, observe on case-by-case basis whether to drop "other" variable
41	REFERRAL_TYPE REFERRAL_TYPE_OTHER	Illogical combination of the referral types	Referral type was not "other," but REFERRAL_TYPE_OTHER variable is filled out, or vice versa		For any enrollee who has commentary in REFERRAL_TYPE_OTHER when not necessary, observe on case-by-case basis whether to drop "other" variable

Data Quality Check Number	Data Elements	Check Description	Check Definition	Process Team Considerations	Analytic Decision
42	REFERRAL_TYPE REFERRAL_MADE_IND REFERRAL_COMP_IND	Illogical combination of referral types made and completed Or illogical combination of referral type based on indicator	Referral indictor was not "referral was needed and made," but referral type is still filled out Or referral type does not match referral completed	Flag if value from completed indicator is not in referral type; do not remove values	For any referral combination that is illogical, consider referral as entirety and as missing temporarily. Ask for correction for awardee if possible—otherwise, consider referral completed to dictate referral made
43	TOBACCO_SCRN_RESP_CODE TOBACCO_SCRN_EXCL_IND TOBACCO_SCRN_RESULT	Illogical combination of tobacco screen response with screening result or with inclusion indicator	Tobacco screen response being "exclusion met" but screening result being "positive or negative" Or tobacco screen response being "yes" but exclusion indicator being answered	Flag, but do not remove	For any enrollee with contradicting information, tobacco screening will be counted as missing; ask for clarification from awardee if possible
44	TOBACCO_SCRN_RESP_CODE CIGARETTES_NUM	Illogical positive tobacco screening with number of cigarettes smoked	Tobacco screening is positive but no answer for number of cigarettes smoked	Will create longitudinal dataset long term, separating number of cigarettes during prenatal and postpartum periods	Enrollees with missing cigarette number smoked per day will receive "999" valuation to signal unknown
45	YOUNG_ONSET_SUBSTANCE_USE SUBSTANCE_USE_RECENT DOB	Illogical combination of recent substance use and young onset use if enrollee is currently under 18	Enrollee is currently under 18 but only one substance use variable is filled in	If young onset is missing or equals none, and SUBSTANCE_USE_RECENT is not missing, impute YOUNG_ONSET with SUBSTANCE_USE_RECENT	For any enrollees under 18 who have only one of two variables filled out, response of one will be copied into other variable

Data Quality Check Number	Data Elements	Check Description	Check Definition	Process Team Considerations	Analytic Decision
46	PHARMA_INIT_TYPE PHARMA_INIT_OTHER	Illogical combination of pharma initiation types	Pharma initiation type was not "other," but PHARMA_INIT_OTHER variable is filled out, or vice versa		For any enrollee who has commentary in PHARMA_INIT_OTHER when not necessary, observe on case-by-case basis whether to drop "other" variable
47	PHARMA_DELIVERY_TYPE PHARMA_DELIVERY_OTHER	Illogical combination of pharma at delivery types	Pharma at delivery was not "other," but PHARMA_DELIVERY_OTHER variable is filled out, or vice versa		For any enrollee who has commentary in PHARMA_DELIVERY_OTHER when not necessary, observe on case-by-case basis whether to drop "other" variable
48	HEPC_IND ENC_SVC_DATE	Confirmation that hepatitis C was assessed	Hepatitis C was "not assessed" in initial encounter but was checked in subsequent encounter	If HEPC_IND is *only* not assessed or missing, flag	For any enrollee who has had two encounters but no HEPC_IND complete, send urgent follow-up to awardee
49	HIV_IND ENC_SVC_DATE	Confirmation that HIV indicator was assessed	HIV was "not assessed" in initial encounter but was checked in subsequent encounter	If *only* not assessed/missing for HIV_IND, flag	For any enrollee who has had two encounters but no HIV_IND complete, send urgent follow-up to awardee
50	MATERNAL_HOSP_LOS ENC_SVC_TYPE ENC_END_DATE ENC_START_DATE	Illogical combination of encounter service type and length of stay Or illogical LOS with dates given	Encounter type is not hospital admission, but maternal hospital LOS is filled out for encounter Or LOS does not match with given encounter dates	For ENC_SVC_TYPE of birth, encounter dates should match maternal length of stay	For any enrollee with illogical LOS with dates given, recalculate to appropriate length For any 1-day encounter for hospitalization, consider encounter as an entirety as missing temporarily—ask for correction for awardee if possible
51	OUDTREATMENT_TYPE_POSTPARTUM ENC_SVC_TPE	Illogical combination of postpartum visit and OUD treatment	Enrollee has received postpartum OUD pharmacotherapy but no postpartum encounter visit under ENC_SVC_TYPE	Do not wipe OUD data if flagged	For any enrollees who have OUD pharmacotherapy postpartum but no postpartum encounter, consider information missing temporarily until clarification from awardee

Data Quality Check Number	Data Elements	Check Description	Check Definition	Process Team Considerations	Analytic Decision
52	INFANT_DOB END_PREG_DATE PREG_OUTCOME	Illogical combination of infant DOB and end pregnancy date	If pregnancy outcome is live birth and infant DOB is not same as end-of-pregnancy date		For any enrollee who has an INFANT_DOB mismatched with END_PREG_DATE, INFANT_DOB date will become new END_PREG_DATE until clarification from awardee
53	MODEL_ENROLL_DATE_1 DOB INTAKE_COMP_DATE ASSESS_COMP_DATE INIT_TRTMT_PLAN_DATE	Incomplete combination of information required for full enrollment of participant	While DOB and MODEL_ENROLL_DATE_1 are required, information is incomplete if enrollee is missing any of three remaining variables		Enrollees for whom intake, assessment, or treatment plan dates are missing will be counted as missing and will not count toward "universe" of enrolled participants of awardee

Note: DOB = date of birth; HEPC = hepatitis C; HRSN = health-related social needs; LOS = length of stay; OUD = opioid use disorder