MASSACHUSETTS
HEALTH POLICY COMMISSION

Cost-Effective, Coordinated Care for Caregivers and Substance Exposed Newborns (C4SEN) Evaluation Report

SEPTEMBER 2026

CONTENTS

EXECUTIVE SUMMARY

The Massachusetts Health Policy Commission (HPC), established in 2012, is an independent state agency working to improve the affordability of health care in the Commonwealth. Through data-driven analysis, actionable policy insights, and public accountability, the HPC seeks to improve health care delivery, lower costs, and reduce health disparities. The HPC invests in and tests innovative care delivery and payment models that hold promise to support the Commonwealth's cost containment goals while improving access to high-quality care. The HPC is committed to better health and better care – at a lower cost – for all residents of the Commonwealth.

The HPC launched the Cost-Effective, Coordinated Care for Caregivers and Substance Exposed Newborns (C4SEN) program in 2021. The HPC developed the program based on the available research regarding the needs of these infants and their families and effective treatment to address the impacts of perinatal opioid use disorder OUD and neonatal opioid exposure. The HPC designed a program with the following requirements:

- Support substance-exposed newborns (SEN) and caregivers for a minimum of 12 months following birth;
- Coordinate with outpatient providers and/or directly provide access to pediatric services, adult primary care, and adult behavioral health, including evidence-based substance use disorder (SUD) treatment—particularly medication for opioid use disorder (MOUD)—for the caregiver;
- Collaborate with community-based and/or social service organizations to meet the non-medical needs (including health-related social needs (HRSN)) of caregivers and SEN;
- Ensure that SEN who are experiencing or at risk for developmental delays have access to supportive services, including early intervention (EI);
- Provide culturally competent care that is free of stigma and bias; and
- Address health equity considerations.

Applicants were also permitted to propose either a new program or an expansion of an existing program. The HPC awarded $1.46 million to five applicants. One awardee, Mercy Medical Center, had a shortened implementation period and concluded their program in December 2022. This evaluation report focuses on the remaining four programs: EMPOWER+ (Baystate Franklin Medical Center), Berkshire Connections (Berkshire Medical Center), New Beginnings (Southcoast Health), and SHORE (South Shore Hospital).

PROGRAM SERVICES AND IMPACTS

The C4SEN program required a number of services be provided to participants. These included coordination with adult primary care and behavioral health to provide evidence-based SUD treatment to participants, coordination with pediatric primary care to promote appropriate care for SEN, working with local EI systems to ensure infants at risk of developmental delays received appropriate care, and efforts to identify and meet the non-medical needs of caregivers and SEN such as HRSN.

Participants were already using MOUD at high rates upon enrolling in programs, and programs had high success rates in initiating treatment for those not taking MOUD. In addition, hospitals participating in C4SEN had statistically significantly higher rates of exclusive MOUD (no unprescribed opioid use) in their populations compared to hospitals without a C4SEN program. Programs found participants often required a tailored approach to pain management during labor and delivery due to the effects of MOUD and their history of opioid use disorder, and some pregnant individuals

required tailored dosing of MOUD due to the impact of pregnancy on metabolism. Participation in psychotherapy was much lower than in MOUD; this was largely due to shortages of providers, though hesitance was also a factor.

For SEN, well-child visit attendance for program participants was higher than documented for the SEN population in the literature and programs achieved high levels of initial EI referral for SEN. However, program staff encountered significant hesitancy from parents regarding EI visits.

Participants exhibited high levels of HRSN. Transportation was a critical need for this population due to the need for travel to supportive services located in multiple places, and many participants required support accessing it. In addition, finding housing options that met the needs of this population was challenging, especially identifying available treatment beds, sober, or transitional housing that allowed infants. Multiple programs also encountered participants experiencing intimate partner violence.

In addition to required services, programs also identified other needs in their populations and provided services to address these needs. Throughout the C4SEN program, staff provided significant support to participants around processes and filings with the Massachusetts Department of Children and Families (DCF). A recent policy change will reduce—but not eliminate—the number of DCF filings for this population.

Staff also provided support to non-birthing parents and significant social support to those with few other close social or familial ties. Parenting support, including provision of supplies, education, support groups, and breastfeeding support, was also an important aspect of many programs and was highly appreciated by participants. Collaborating with a variety of community-based organizations, hospital departments, and other organizations was necessary for programs to meet goals and deliver comprehensive care.

While the aims of the C4SEN program centered on concrete care delivery, the broader intent was to improve overall care for this high-risk population and to improve health outcomes and well-being over a longer time frame. Programs intended to provide care in a manner satisfactory to participants, ensuring a positive experience and setting them up for continued success in their recovery journeys, parenting, and lives. While the timeframe for data collection was limited to the 21 months of program implementation, quantitative data and qualitative data from both staff and participants illustrate many positive impacts, including potential long-term impacts that can be inferred. Patients who responded to surveys after completing their programs reported high levels of satisfaction and low levels of perceived stigma and bias in program services. In addition, a majority of participants indicated they would recommend a C4SEN program to someone needing its services, and programs received both word-of-mouth referrals and had participants return for services during subsequent pregnancies.

Strong uptake of MOUD, especially exclusive MOUD use, has a significant evidence base for maintenance of recovery, which can support long-term well-being. The impact of avoided DCF investigations through C4SEN program services has significant implications for families and for the DCF system, though the nature of this impact is likely to shift due to recent policy changes. Staff and participants spoke to improvements in overall well-being and life progress and accomplishments that occurred during their enrollment in the programs.

CONTEXTUAL FACTORS IN PROGRAM IMPLEMENTATION

While not included as a required program component, robust patient engagement was a necessity for implementation. Engagement involved many strategies to create referral and identification pathways for those who might benefit from a program, encourage enrollment, and promote continued participation. Several key aspects of engagement emerged as themes in program evaluation: timing, identification and referral, education and enrollment processes, retention and program duration, flexible engagement offerings, service alignment, and a nonjudgmental approach.

A core aim of the C4SEN program was provision of care free of stigma. Specifically, this referred to the stigma attached to SUD and addiction, particularly in pregnant individuals. While teams staffing the programs were largely made up of individuals who were able and willing to deliver care in a manner focused on harm reduction and a nonjudgmental

approach, other hospital staff did not always share these views or experiences. To improve the care participants received and reduce their experiences of stigma, program staff provided opportunities for conversation and education outside of their care teams to change attitudes regarding perinatal SUD and treatment.

In addition to the aim of delivering a program free of stigma and bias, the C4SEN program encouraged awardees to consider racial equity principles when implementing their programs. While this aim was included due to well-documented racial inequities in maternal health and SUD treatment, C4SEN program enrollees were not as racially diverse as the opioid-exposed newborn population at other hospitals in Massachusetts. Data limitations precluded analysis of program data stratified by race and ethnicity. Overall, the breadth of the program aims and multiple competing priorities for awardees contributed to the lack of progress in this domain. This was a key learning for the HPC on the need for additional support, guidance, and specificity in health equity efforts by investment program awardees.

IMPLEMENTATION EXPERIENCES

While the Berkshire Connections and New Beginnings programs operated within a care coordination framework as a supplement to traditional clinical care, though with varied staffing structures and program offerings, the EMPOWER+ program functioned in a "clinic within a clinic" model, designating a family medicine physician within a clinic to serve as the primary care provide for infants and their caregivers. The SHORE program was situated within the behavioral health department of the hospital and connected participants with behavioral health providers in addition to providing care coordination.

Common themes in program successes and challenges highlight areas where programs serving this population should place focus and attention during implementation. Staffing was a critical factor in the success of programs, highlighting the value of lived experience, skills and desire for working with this population, and diversity that reflects the local community. Some programs also reflected on challenges related to staff turnover, highlighting the importance of hiring and retention.

Collaboration and connections outside the programs were other critical areas that emerged. Strong referral pathways from local providers and relationships with local community organizations required careful and intentional implementation but were emphasized by staff as very important.

The importance of collaboration points to another finding: the expansiveness and comprehensiveness of program offerings. From adding support groups, to supporting non-birthing parents, to attempting a one-stop-shop model embedded in a primary care clinic, programs sought to centralize care and support for this population, which helped with engagement and access. This was also reflected in patients' challenges with behavioral health and transportation access and programs' desires to find new ways to work around obstacles to provide these services.

Programs also reflected on additional staff roles that would have been helpful additions to their teams, including peer recovery coaches, staff with lived experience, behavioral health providers, childcare providers, and doulas.

SUSTAINABILITY AND OVERALL CONCLUSIONS

Awardees took a variety of approaches to sustaining or continuing their work and programs beyond C4SEN. Two programs, Berkshire Connections and New Beginnings, applied for and received funding from the Massachusetts Department of Public Health's Bureau of Substance Abuse Services as part of the Moms Do Care program, which allowed them to continue and expand their programs. These awards were based in part on their demonstrated experience and success during the C4SEN program. One program, SHORE, had to scale back their services to a level that resembled their program prior to C4SEN to accommodate the available funding, from philanthropy, the hospital budget, and reimbursable services from the behavioral health providers that supported their program. They hoped to also explore additional opportunities for grant funding. And finally, EMPOWER+ sustained some of the collaborations and learnings that emerged during C4SEN, but ceased formal operations when C4SEN funding ended.

Overall, teams felt their work had a significant impact on care for pregnant individuals with SUD in their communities. They felt the quality and patient-centeredness of care had improved through the C4SEN program and that many of the changes would be sustained, thanks in part to these improved experiences and outcomes.

Overall awardees achieved success with the required elements of the C4SEN program. Programs achieved high rates of MOUD use and C4SEN hospitals achieved a statistically significantly higher rate of exclusive MOUD use than non-C4SEN hospitals. While rates of psychotherapy participation were lower, programs made efforts to connect patients with behavioral health supports and ultimately over two-thirds of participants received psychotherapy care. There were high rates of EI referrals, though participant hesitancy contributed to EI visit completion. Well-child visit attendance was high overall and was higher compared to the rate reported in the literature. HRSN were prevalent and in some cases were difficult to address, but program staff were able to support participants with an enormous range of needs.

Programs also surfaced areas not addressed by the C4SEN program design that are key considerations for this population. These included support for a wider range of individuals outside the targeted population for C4SEN, especially non-birthing parents. In addition, targeted support for breastfeeding and pain management in labor, as well as careful attention to the possibility of intimate partner violence, are essential. Finally, programs reflected on the need for services that could be hard to refer to, such as behavioral health, to be offered in-house to streamline access for participants and emphasized the importance of employing staff with lived experience when working with this population.

In total, the C4SEN program served 221 caregivers and 212 SEN across the Commonwealth. Programs worked with these dyads at an exceptionally critical and vulnerable time in their lives and were able to deliver evidence-based, comprehensive care that had positive impacts. The models and lessons from C4SEN serve as both a demonstration of what is possible for these families with sufficient support and a guide for ongoing efforts. The individuals served by this program all experienced the benefits of nonjudgmental, supportive care and in many cases received services that facilitated improved health and long-term prospects. The impacts and findings from this program evaluation serve to affirm the holistic care model centered in awardees' programs and provide valuable learnings for future programs serving this population.

INTRODUCTION

The Massachusetts Health Policy Commission (HPC), established in 2012, is an independent state agency working to improve the affordability of health care in the Commonwealth. Through data-driven analysis, actionable policy insights, and public accountability, the HPC seeks to improve health care delivery, lower costs, and reduce health disparities. The HPC invests in and tests innovative care delivery and payment models that hold promise to support the Commonwealth's cost containment goals while improving access to high-quality care. The HPC is committed to better health and better care – at a lower cost – for all residents of the Commonwealth.

The HPC launched the Cost-Effective, Coordinated Care for Caregivers and Substance Exposed Newborns (C4SEN) program in 2021 in response to a legislative directive to create and administer an investment program to support and care for families with substance-exposed newborns (SEN), including the study of long-term effects of neonatal abstinence syndrome (NAS, also referred to as neonatal opioid withdrawal syndrome or NOWS) on children up to the age of 18.[i] The program was intended to utilize a model that included both medical services and traditionally non-reimbursed services, including support services provided in clinic settings or in-home.[i] A total of $1.5 million was available for the investment program pursuant to Chapter 41 of the Acts of 2019, Chapter 208 section 108 of the Acts of 2018, and the Distressed Hospital Trust Fund under the authority of M.G.L. c. 6D, § 19; M.G.L. c. 29, § 2GGGG.[ii,iii]

In collaboration with stakeholders and building on the HPC's past work in the areas of substance use disorder (SUD), particularly opioid use disorder (OUD),[iv] and NAS,[v] the HPC developed a program based in the available research regarding the needs of these children and their families and effective treatment to address the impacts of perinatal OUD and neonatal opioid exposure. This included the evidence that risk of relapse and overdose increased after six months postpartum (and therefore programs should extend through this period),[1] the need for evidence-based OUD treatments such as medication for opioid use disorder (MOUD) and psychotherapy, and the importance of consistent primary care for infants to address any health concerns, monitor development, and identify the need for early intervention (EI) services for any infants at risk for developmental delays.[2,3,4] The HPC also recognized the need for supportive care to address non-medical barriers to care, as well as racial inequities in access to treatment and the impact of stigma and bias on the experience of seeking care for this population.[5]

The HPC designed a program with the following requirements:

- Support SEN and caregivers for a minimum of 12 months following birth;
- Coordinate with outpatient providers and/or directly provide access to pediatric services, adult primary care, and adult behavioral health, including evidence-based SUD treatment—particularly MOUD—for the caregiver;
- Collaborate with community-based and/or social service organizations to meet the non-medical needs (including health-related social needs) of caregivers and SEN;
- Ensure that SEN who are experiencing or at risk for developmental delays have access to supportive services, including EI;
- Provide culturally competent care that is free of stigma and bias; and
- Address health equity considerations.

i For text of the law, see: https://malegislature.gov/Laws/SessionLaws/Acts/2018/Chapter208

ii For text of the law, see: https://malegislature.gov/Laws/SessionLaws/Acts/2019/Chapter41#:~:text=Each%20agency%2C%20board%2C%20department%2C,or%20termination%2C%20rates%20of%20compensation%2C

iii For text of the law, see: https://malegislature.gov/Laws/GeneralLaws/PartI/TitleIII/Chapter29/Section2gggg

iv For more on the SHIFT-Care OUD program, see: https://masshpc.gov/publications/care-delivery-material/shift-care-challenge-evaluation

v For more on the NAS Investment program, see: https://masshpc.gov/publications/care-delivery-material/nas-investment-program-evaluation-report

For the purposes of the C4SEN program, the term "caregiver" was defined to mean the birthing parent experiencing a SUD, and "SEN" was defined to mean their infant who had experienced substance exposure in utero. Throughout this report, "caregiver" or "participant" will be used to refer to the birthing parent and "infant" will primarily be used to refer to the SEN, though on occasion other terminology will be used.

Programs were encouraged to structure care around meeting the needs of both individuals in this dyad where possible, given the idea that improving the health and well-being of the caregiver would have beneficial effects on the infant and that the well-being of the infant would be an important driver of the caregiver's well-being.

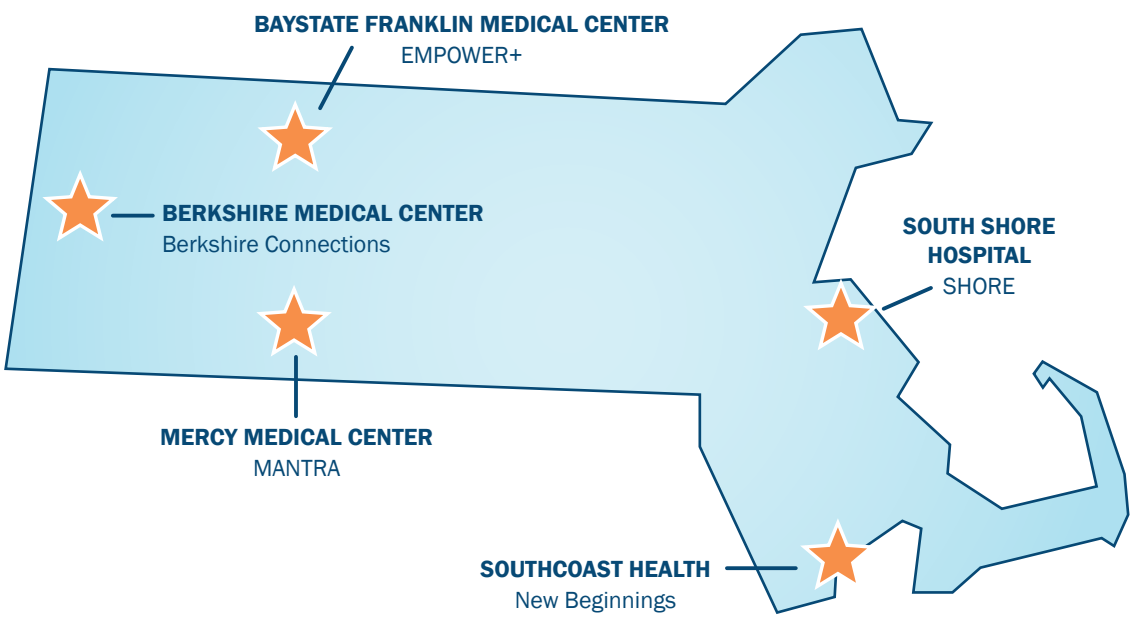
The HPC awarded $1.46 million to five applicants shown in **Exhibit 1** below.

Exhibit 1. C4SEN Awardee Programs and Award Amounts

AWARDEE HOSPITAL	PROGRAM NAME	AWARD AMOUNT
Baystate Franklin Medical Center	Engaging Mothers for Positive Outcomes through Early Referrals (EMPOWER+)	$299,993
Berkshire Medical Center	Berkshire Connections	$300,000
Mercy Medical Center	Mothers and Newborns' Treatment and Recovery Alignment (MANTRA)	$299,978
Southcoast Health	New Beginnings Community Outreach Program	$287,541
South Shore Hospital	Supporting: Hope, Opportunity, Resilience, Empowerment (SHORE)	$274,030

The HPC Board voted to approve the awards on April 14, 2021, and all programs began their preparation period in July 2021, with implementation beginning in October 2021 for four awardees, and November 2021 for the fifth awardee. Implementation ran through June or July 2023, with two awardees receiving approval for no-cost extensions through December 2023. The locations of the awardee hospitals are indicated on the map below.

Exhibit 2. Map of C4SEN Awardees



Of note, due to operational challenges, the Medical Center program ceased operations in November 2022 with a contract end date in December 2022. Due to their shortened implementation period, the total amount expended on their program was significantly less than the award amount and their program had significantly lower enrollment and less data collected than other awardees. As a result, the following evaluation report centers on the work of the other four awardees, and information on Mercy Medical Center's MANTRA program can be found in **Appendix A**.

REPORT OVERVIEW

In the following report, the HPC seeks to evaluate the awardees' programs against the primary requirements of the C4SEN investment program and to surface important findings about practices for implementing successful programs serving birthing parent-infant dyads impacted by SUD. In addition, the report discusses the positive impacts of the C4SEN program on the participants. This evaluation report draws from data collected from awardee hospitals during the C4SEN program and data supplied from the Perinatal Neonatal Quality Improvement Network of Massachusetts' Perinatal Opioid Project, which is a voluntary program of monthly data reporting on opioid-exposed newborns born at a Massachusetts birthing hospital.[vi] Quantitative and qualitative data were both used in the development of this report, and the HPC contracted with an outside group to conduct an evaluation of patient experience in the C4SEN program, which included surveys and interviews with participants. For details on the evaluation methods used to prepare this report, please see **Appendix B**.

This report is divided into four parts. Part 1 covers the provision of both required and extended wraparound services to the participants and infants and the impacts of these services. Part 2 covers program efforts to engage participants, combat stigma, and address health equity considerations within the population and programs. Part 3 details the awardee program models and implementation experiences of the individual awardees. Part 4 addresses the potential for sustainability of the programs, both in terms of continued service provision after the funding period and long-term changes in practices and culture at the awardee hospitals. It also discusses the key learnings from programs and overall conclusions.

In Parts 1 and 2, call-out boxes at the beginning of each section will highlight key takeaways from the section; these are not meant to be comprehensive but merely to provide the reader with a brief overview of high-level points addressed in the section. In Parts 3 and 4, concluding subsections provide similar key takeaways.

PROGRAM OVERVIEW

C4SEN applicants were given wide latitude to design their programs' care models so long as they could deliver the required components of the investment program. Applicants were also permitted to propose either a new program or an expansion of an existing program. Below is a brief description of each awardee's care model, including whether it was new or existing, any embedding or co-location with other hospital system services, and primary staff delivering services (see **Part 3: Program Models and Implementation Experiences** for more detail on each care model):

EMPOWER+ (Baystate Franklin Medical Center): A new program, intended as an extension of their existing EMPOWER Moms Do Care program. EMPOWER+ was operated primarily as a "clinic within a clinic" where a dedicated family medicine physician provided care to both caregivers and infants and a dedicated care coordinator provided other program services.

Berkshire Connections (Berkshire Medical Center): A new program, co-located in outpatient obstetrics offices with care coordinators who worked with participants to connect them to all program services.

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vi For details on the PNQIN Perinatal Opioid Project, see: https://pnqinma.org/perinatal-opioid-project-pop/

SHORE (South Shore Hospital): An expansion of an existing program, embedded within the behavioral health department's perinatal behavioral health program. Behavioral health providers worked with patients along with a nurse care manager and an inpatient care coordinator.

New Beginnings (Southcoast Health): An expansion of an existing program, this was a free-standing team of nurses and care coordinators working with patients in partnership with obstetrics offices in the system.

Exhibit 3, below, displays information about the awardees' use of awarded funds. This does not include any in-kind or supplementary funding that may have been provided by the awardee. **Exhibit 4** details overall statistics describing the individual SEN and caregivers enrolled in the C4SEN program.

Exhibit 3. Awardee Spend

AWARDEE	BAYSTATE FRANKLIN MEDICAL CENTER	BERKSHIRE MEDICAL CENTER	SOUTHCOAST HEALTH	SOUTH SHORE HOSPITAL
Total Spending (% of award)	$98,898.15 (33%)[vii]	$267,047.93 (89%)	$285,461.66 (99%)	$266,534.43 (97%)
Personnel Spending (% of total)	$92,652.30 (94%)	$194,947.59 (73%)	$277,687.54 (97%)	$211,226.07 (79%)
Support Services Spending (% of total)	$45.00 (<1%)	$72,100.34 (27%)	$7,774.12 (3%)	$55,308.36 (21%)
Contractor/ Partner Spending (% of total)	$6,200.85 (6%)	0	0	0

Source: C4SEN reimbursement requests submitted by awardees
Note: Percentages may total over 100 due to rounding. This data does not include any in-kind funding awardees provided for their programs.

vii Due to hiring delays, staff departures, and other programmatic adjustment, the Baystate Franklin EMPOWER+ program spent only a limited portion of their award. Investment programs administered by the HPC are reimbursement-based, so awardees are only provided with funding for costs incurred during the program.

The enrolled population of the C4SEN program and associated demographics are noted below.

Exhibit 4. Program Enrollment and Demographics

MEASURE	N
Total caregiver enrollment	221
Total SEN enrollment	212
CAREGIVER AGE	**N**
18-25	22
26-30	47
31-35	91
≥36	61
CAREGIVER RACE	**N**
Asian	0
Native Hawaiian or other Pacific Islander	0
Native American, American Indian, or Alaskan Native	3
Black or African American	8
White	193
Patient identified Other	12
Two or more	4
Missing	0
Refused	1
CAREGIVER ETHNICITY	**N**
Hispanic/Latino	9
Not Hispanic/Latino	207
Missing	3
Refused	2
SEN GESTATION AT BIRTH	**N**
≤31 weeks	1
32-36 weeks	36
≥37	173
Missing	3
Unknown	2
SEN NAS/NOWS DIAGNOSIS	**N**
# SEN diagnosed with NAS/NOWS	182
# SEN not diagnosed with NAS/NOWS	28
Missing	0
Unknown	2

Source: HPC compilation of C4SEN awardee-reported data

In total, the C4SEN program served 221 caregivers and 212 SEN across the Commonwealth. Programs worked with these dyads at an exceptionally critical and vulnerable time in their lives and were able to deliver evidence-based, comprehensive care that had positive impacts during the course of the C4SEN program and are likely to improve long-term outcomes. In the following report, details about the delivery of required care components and additional wraparound services, efforts to engage participants and provide care free of stigma and bias, and general lessons and conclusions from the C4SEN program are presented. The impacts and findings from this program evaluation serve to affirm the holistic care model centered in awardees' programs and provide valuable learnings for future programs serving this population.

PART 1:
PROGRAM SERVICES AND IMPACTS

SECTION 1: REQUIRED PROGRAM SERVICES

The goals of the C4SEN program included a number of required services to be provided to participants. These included coordination with adult primary care and adult behavioral health to provide evidence-based substance use disorder (SUD) treatment to participants, coordination with pediatric primary care to promote appropriate care for substance-exposed newborns (SEN), working with local early intervention (EI) systems to ensure infants at risk of developmental delays received appropriate care, and efforts to identify and meet the non-medical needs of caregivers and SEN such as health-related social needs (HRSN).

KEY TAKEAWAYS FROM THE EVALUATION OF REQUIRED PROGRAM SERVICES

- Participants were already using MOUD at high rates upon enrolling in programs, and programs had high success rates in initiating treatment for those not taking MOUD.
- Hospitals participating in C4SEN had statistically significantly higher rates of exclusive MOUD (no illicit opioid use) in their populations compared to hospitals without a C4SEN program.
- Prescribing of MOUD within programs or very close relationships with community treatment organizations were critical for programs.
- Regulations around some types of MOUD medications created barriers to access, especially during participants' delivery hospitalization.
- Participants may require a tailored approach to pain management during labor and delivery due to the effects of MOUD and their history of OUD, and pregnant individuals may require tailored dosing of MOUD due to the impact of pregnancy on metabolism.
- Participation in psychotherapy was much lower than in MOUD; this was largely due to shortages of providers though hesitance was also a factor.
- Participants exhibited high levels of health-related social needs.
- Addressing IPV is a key consideration for this population.
- Finding housing options meeting the needs of this population was challenging.
- Transportation was a critical need for this population due to the need for travel to supportive services located in multiple places and many participants required support accessing it.
- Well-child visit attendance for program participants was higher than documented for the SEN population in the literature.
- Programs achieved high levels of initial EI referral for SEN.
- Program staff encountered significant hesitancy regarding EI visits from parents.

Medication for Opioid Use Disorder

Evidence-based treatment for SUD includes medication for opioid use disorder (MOUD), and often includes psychotherapy in some form, either individual or group services.[6,7] Programs were evaluated based on the proportions of participants who were connected to these treatments. Overall, rates of MOUD use were high among program participants. A large majority (79.2%) of participants were already receiving MOUD at enrollment in the C4SEN program and another 14% of the total enrolled population was connected to MOUD treatment during the program.

Data was collected on the engagement and connection of participants to MOUD by race and ethnicity, due to known inequities in access.[8,9] However, due to small sample sizes, meaningful conclusions cannot be drawn.

Looking at data collected outside of the C4SEN investment program, the Perinatal Neonatal Quality Improvement Network of Massachusetts (PNQIN) obtains data on opioid-exposed newborn (OEN) births via voluntary hospital reporting. PNQIN provided data for the period the C4SEN program was active, which included 295 OEN births at the five hospitals with a C4SEN program, and 254 at a comparison group of hospitals who also reported data consistently in the same time period. This sample of OEN births from C4SEN hospitals represents an overlap with the enrolled population, as well as other OENs whose caregivers were not enrolled in the C4SEN program. Based on these data, awardee programs reached approximately 75% of OENs born at their hospitals during this period—some C4SEN programs included a small number of infants with substance exposure other than opioids—a proportion which might have been higher had Mercy Medical Center's tenure in the C4SEN program continued for the entire duration. PNQIN data reports on both the number of OENs who were exposed to any MOUD, meaning any in-utero exposures to MOUD, regardless of exposure to other opioids or related compounds, and exclusive MOUD, meaning the infant was not exposed to any other opioid-related compounds in-utero besides MOUD.[viii] This distinction is used as an indication that the birthing parent was taking MOUD throughout their pregnancy but not using any non-prescribed or illicit opioids. At C4SEN hospitals, 84.1% of OEN births were exposed to MOUD and 63.4% were exclusively exposed to MOUD, as compared to 78% and 48%, respectively, at hospitals without a C4SEN program. The odds ratio for exclusive MOUD use at C4SEN versus non-C4SEN hospitals was 1.87 (1.33-2.64), indicating a statistically significantly higher likelihood of exclusive MOUD use at hospitals with a C4SEN program.

In addition to enrollment in MOUD, the C4SEN program required continued engagement with MOUD treatment specifically between 7-12 months postpartum. Research indicates that caregivers are at a higher risk of relapse and overdose during this time period, and the C4SEN program requirements worked to provide ongoing support.[1] Of those participants still engaged in a program at six months postpartum, 82.7% were participating in MOUD treatment, comparable to the rate of participants participating in MOUD at enrollment (79.2%). The overall population of engaged participants decreased significantly between enrollment and six and 12 months postpartum, while the proportion engaged in MOUD remained comparable or higher, suggesting this may not have been an impact of the C4SEN program but instead those who were reliably engaged in SUD treatment were also more likely to continue their engagement.

Two programs did not provide MOUD treatment themselves but instead worked with local SUD treatment clinics to refer patients for treatment. These clinics were also sometimes referral sources for C4SEN programs when their patients became pregnant. The other two programs had clinicians within their programs who could prescribe some types of MOUD, though many participants already receiving MOUD continued with their previous source of care. There were benefits and challenges to each approach. The logistical simplicity and knowledge of different dosing needs for pregnant individuals available with in-house prescribing were a benefit to participants, and staff appreciated being able to have close working relationships with these providers. However, there were limitations on the types of MOUD these programs could provide, which was especially challenging when participants were hospitalized post-birth and had to leave the hospital to obtain their MOUD. The ability to continue care with an existing provider outside the C4SEN program was preferred by some participants. Outside prescribers often worked in treatment clinics that provided participants with additional services, though some C4SEN staff felt this could impact their engagement with the C4SEN program. These outside prescribers were also not always familiar with the need to adjust dosing for pregnant individuals. Participants might need doses increased or to split their medication into two daily doses instead of one to account for changes in their metabolism during pregnancy. C4SEN program staff were sometimes called on to educate these outside providers.

viii PNQIN data used an earlier term, medication for addiction treatment (MAT), that is now less commonly used in favor of MOUD. This report will use MOUD as the terms are interchangeable and refer to the same medications.

As reflected in the strong evidence base for MOUD's role in treating opioid use disorder (OUD), staff felt ensuring participants were on MOUD was critical to their sobriety and recovery. For those not already on MOUD when joining an awardee program, staff felt a quick connection to treatment was important, and the programs that did not have in-house prescribing worked to establish strong relationships with local community MOUD providers. Staff observed that participants who did not want to receive MOUD were often more difficult to engage in their program.

A key consideration for patients with a history of OUD was the need for a tailored approach to pain management during labor and delivery because of the effects of the MOUD medication and its interaction with other pain management medications. The SHORE program at South Shore Hospital developed a strong partnership with anesthesiologists at their hospital to create appropriate plans for pain management for these patients.

Psychotherapy

Ensuring participants were connected to psychotherapy as a further evidence-based intervention for SUD proved slightly more challenging. Only 57% of participants were engaged in some type of psychotherapy treatment at enrollment and programs were only able to enroll enough additional participants during the program to bring the overall participation rate to 70%. Comparison data are not available for this measure as it is not collected by PNQIN. It should be noted that, in many cases, these data were collected via participant self-report as programs did not have access to records from outside providers. Data on engagement in psychotherapy by race and ethnicity were also included in collection, but due to small sample sizes were not included in analysis.

With regards to retention, at six and 12 months postpartum the rate of engagement in psychotherapy was 66.7% and 69%, respectively. This higher rate of engagement is again reflective of a smaller overall participant population, suggesting a connection between general engagement in treatment and engagement in a C4SEN program. However, there is not sufficient data to draw conclusions about the relationship between engagement in these programs and psychotherapy treatment as data on the retention of those who were already engaged in psychotherapy during enrollment versus those who began this treatment during the C4SEN program could not be collected.

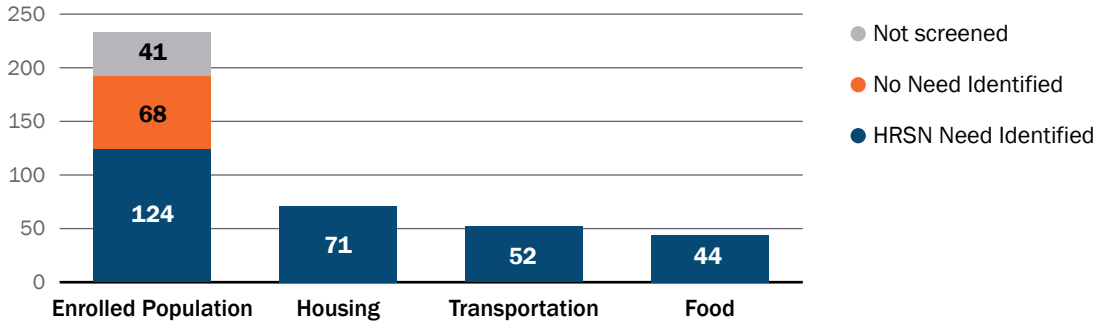
In most cases, the primary barrier to engagement in psychotherapy treatment was the availability of providers. The Commonwealth of Massachusetts has had an ongoing shortage of mental health providers for a number of years, with demand increasing following the Covid-19 pandemic.[10] Programs found that while some participants were engaged in care at OUD treatment clinics that also offered counseling or group therapy services, not all participants could successfully access therapy services through these providers. For these participants, a lack of available providers and long waitlists made accessing therapy difficult. This was particularly challenging for participants with MassHealth insurance. Many programs hired or expressed interest in hiring their own clinician to provide mental health counseling, though several emphasized that one provider could not be a fit for all participants or provide every therapeutic modality and was thus not a full solution to the problem. One program, SHORE, was based in the behavioral health department of the hospital and thus had access to multiple mental health clinicians for participants. Staff of SHORE appreciated having trusting relationships with these providers and streamlined participant referral. New Beginnings at Southcoast Health worked to establish memorandums of understanding with community partners who could provide behavioral health services to formalize their partnership and encourage quicker turnaround on referrals.

Despite access challenges, staff recognized that many participants had co-morbid mental health conditions or mental health conditions that played a role in the cause of their SUD and thus would benefit greatly from therapy. Some participants were reluctant to engage due to scheduling limitations, past negative experiences with mental health care, or a lack of interest in pursuing talk therapy or awareness of their need or the potential benefits of the treatment. However, program staff continued to encourage psychotherapy in conversations with participants and repeatedly offered support in finding a provider or referring to their internal providers. Staff additionally noted that they felt it necessary to refrain from insisting participants to receive psychotherapy out of respect for participants' autonomy and concern that participants would respond negatively to perceived pressure.

Health-Related Social Needs

The C4SEN program also required awardees to meet the non-medical needs, particularly HRSN, of participants. It is recognized that HRSN can often be a barrier to receiving care, and many HRSN, especially housing instability or food insecurity, can have significant impacts on young children's well-being.[11,12,13,14] C4SEN awardees were required to implement an HRSN screening tool which assessed housing, food, and transportation needs for all participants. Most programs conducted these screenings at enrollment with the caregivers, though one program, Baystate Franklin's EMPOWER+, conducted the screening at well-child visits and therefore the denominator is based on the number of enrolled SEN rather than caregivers. Overall, programs were successful with implementing screening, with an 82.4% screening completion rate (192 of 233), having missed screening some participants due to logistical challenges like a lack of time in appointments. A majority of enrolled participants had at least one HRSN need, with 53.2% of the total population screening positive. The Massachusetts Health Policy Commission asked for data reporting about three common HRSNs, and among these, housing needs were most common, at 57.3% (n=71) of those with any HRSN need, followed by food (n=52) and transportation (n=44). Some individuals had more than one need, and some may have screened positive for other needs awardees included in their screening tool, such as the ability to pay utility bills. **Exhibit 5** shows the screening breakdown and counts of those who had a specific need. These rates demonstrate the high level of need of the participants in these programs. While the needs within each category could range from housing that was insufficient for their needs or not in a good state of repair to participants who were fully homeless and slept in their cars or outdoors in encampments, all programs worked to address the needs of their patients.

Exhibit 5. HRSN Needs



Source: HPC compilation of awardee-reported data
Note: HRSN needs totals more than 100% of the population with an HRSN need identified as participants could screen positive for more than one need.

As noted above, EMPOWER+ conducted screenings based on the well-child visits for the SEN. Eventually, the family medicine clinic in which EMPOWER+ was located began universal HRSN screening conducted by medical assistants to increase consistency in collecting the data and to better understand needs. This program also eventually partnered with a medical-legal aid organization which worked to address some of the HRSN. This partnership provided the opportunity to address legal concerns that were often underlying the HRSN. Existing programs SHORE and New Beginnings that had been serving participants and working to address HRSN prior to receiving the C4SEN investment found that implementing this type of HRSN screening to meet C4SEN requirements was a more formalized method of assessing HRSN. They felt that by asking more comprehensive questions about participants' needs, participants were more likely to report needs and request help. These programs reported it also increased their focus on addressing HRSN and helped them better understand the barriers participants faced in connecting to outside resources. One staff member reflected,

> *It's been very eye opening. [...] Like really needing to realize, it's not that easy, you know, for us to say, just call WIC [Women, Infants, and Children Nutrition Program] or just call, you know, DTA [the Massachusetts Department of Transitional Assistance]. It's not that easy for a lot of people to just pick up the phone and do it, [it's] really made me realize, again, we say meet them where they're at, but sometimes it's like really very basic things that we need to help them with.*

All programs provided staff training specifically focused on addressing HRSN or educated staff about the local community-based resources for common HRSN. All programs also worked to build connections within the community to organizations that could support participants and address HRSN.

Programs reported that food-related needs were the easiest to address as there were more community resources available, including food pantries, the Supplemental Nutrition Assistance Program, and the WIC program, for which almost all participants were eligible given their pregnancy or early parenting status. In some cases, programs were able to provide ongoing support with supplies like formula, which was particularly necessary when a nationwide formula shortage occurred during program implementation.[15] Programs reported housing as the most difficult to address given the housing shortage and high rents and prices in Massachusetts, the continued strain of the Covid-19 pandemic on community-based organizations, and the unique needs of this population. Patients required family-based housing with room for their SEN and other children, if applicable, and were often seeking sober housing to support their recovery. A lack of access to housing posed a particular challenge given the number of care providers, programs, and services (such as EI) that had place-based catchment areas, meaning it was difficult for participants to keep a consistent care team or make it to appointments if they were frequently moving or in temporary housing situations as a result of housing instability. Many programs reported long waiting lists in their community or a lack of resources in the region.

In the case of transportation, access and service levels for public transportation were extremely limited in many of the areas where programs were located due to the rural nature and small scale of public transit networks in these areas. This meant many participants could not rely on public transportation for all of their transportation needs. Some regional transit authorities had removed fares during the Covid-19 pandemic and continued those policies, which may have helped with access. In some cases, however, patients were reluctant to use public transit, especially in the early months of the C4SEN program due to concerns about Covid-19. “Prescription for transportation”, a service provided to those with MassHealth insurance, could sometimes be used to arrange taxi transportation to medical appointments, but staff and participants found the process cumbersome for several reasons, including requirements for requesting and obtaining rides, which types of trips the service could cover, and the challenges of transporting an infant, so the program was sometimes of limited utility for their specific needs.

Domestic or intimate partner violence (IPV) was not included as a required component of HRSN screening, but many programs reported it was a consistent and significant need for a portion of their population. Program staff worked with these caregivers to provide resources on IPV and connect them to services and also worked to help them leave unsafe situations when they were ready. Some programs added IPV screening or sent their staff to trainings on supporting people experiencing IPV. Housing shortages increased the difficulty of supporting participants dealing with IPV, as it made it difficult to find them alternative lodging so they could leave an unsafe situation. Staff reported several challenging experiences working with participants experiencing IPV but also reported situations where they were able to provide support that allowed a participant to leave an unsafe situation, creating positive impacts for themselves and their family.

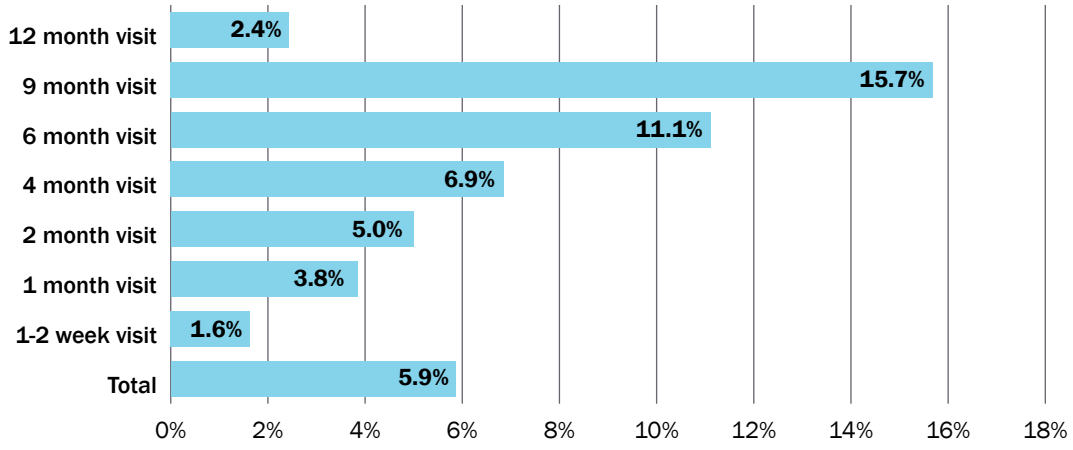
While the overall number of participants reporting IPV in C4SEN was fairly small, this is an important consideration for all programs serving this population. IPV and SUD can be related in many interwoven ways and several factors make this population more vulnerable in these situations. People who have experienced IPV can sometimes develop SUD as a result and may also find themselves in repeated relationships involving IPV, as SUD among partners can contribute to IPV. [16,17] IPV presents significant risks during pregnancy for both maternal and fetal outcomes.[18] Screening for IPV is often done in OB offices, but if this population does not receive the full complement of prenatal care or does not feel they can trust their provider with disclosure, patients may not be connected to supports for IPV.[19,20] While support regarding IPV was not a required component of C4SEN and programs were not required to collect quantitative data on it, the prevalence and seriousness of IPV as an HRSN points to the need for programs working with this population to be familiar with the skills and support services needed to address IPV in this population.

Staff of C4SEN programs were able to address a wide range of HRSN, including for participants with extremely high levels of need in vulnerable or challenging situations. Staff recognized the role of addressing HRSN in contributing to participants' overall ability to engage in their care, recovery, and parenting. Despite all their efforts, some structural barriers such as housing shortages and social service organization constraints limited their ability to fully address the HRSN of participants.

Well-Child Visits

In addition to MOUD, psychotherapy, and HRSN services, all of which were typically aimed at the needs of the caregiver, C4SEN also had required components that were focused on the needs of the infant. One component was attendance at well-child visits. These well-child visits, which occur on a defined schedule with a pediatric primary care provider, are an important opportunity to assess the health and development of young children. In the first year of life, they occur on a frequent basis to align with the rapid development of an infant. In Massachusetts, the defined schedule for these visits is as follows: 1-2 weeks of age, one month of age, two months of age, four months of age, six months of age, nine months of age, and 12 months of age.[ix] Programs were tasked with ensuring SEN were connected to a pediatric primary care provider and attempting to verify attendance at visits. Programs' strategies to collect these data varied, with some establishing data-sharing arrangements with local pediatricians' offices, while others were limited by the large number of providers in their catchment area. Instead, they relied on participant self-report, or verification through reviewing the visit history in a participants' patient portal if they were willing to show the information. Programs collected data on missed appointments by counting any visit that did not occur within 14 days of the designated time point for that visit (when the infant turns two months of age for the two-month visit, for example). However, one program experienced significant staffing challenges, which resulted in some visits occurring outside the designated window. Given that these visits often occurred very shortly after the appropriate time and the circumstances were in many cases beyond this program's control, these were counted as completed visits. Based on this data, the SEN achieved high rates of visit attendance with 94.1% of visits completed. The range of missed visits rates was from 1.6% for the 1-2-week visit to 15.7% for the 9-month visit.

Exhibit 6. Missed Visit Rates for SEN Well-Child Visits



Source: HPC analysis of C4SEN awardee-reported data
Note: These data show the percent of well-child visits missed in the first year for SEN enrolled in the C4SEN program at the time the visit was intended to take place. In this analysis, visits were not counted as "missed" even if they occurred outside a 14-day window after the target date, which is considered a "late" visit.

ix For the state-recommended well-child visit schedule, see: https://www.mass.gov/files/documents/2017/12/27/childwell-visit-schedule.pdf

Across nearly all programs, missed visit rates increased gradually then dropped off. The peak ranged depending on the program, but most commonly occurred at the 6- or 9-month visit. The first 1-2-week visit and the final tracked visit at 12 months consistently had the lowest missed visit rate, which likely points to the salience of these visits for parents. The peak of missed visits also aligned with some trends program staff observed related to engagement in the programs (see **Part 2, Section 1: Engagement**). These attendance rates compared favorably to rates found in the literature for this population.[21]

Programs had varied experiences with supporting and promoting attendance at well-child visits. Three of the programs found starting the conversation about the importance of these visits early and encouraging well-child visit attendance at regular check-ins sufficient to achieve high rates. One program, EMPOWER+, struggled with some visit attendance and with participants' hesitance to change their child's pediatrician to the program's family medicine clinic. A key provider left (see **Part 3: Program Care Models and Implementation Experiences**) and the clinic as a whole was under-staffed, which led to some missed visits due to the clinic's inability to schedule or reschedule visits within the C4SEN program's prescribed two-week window after the appointment was due. This program also had challenges coordinating the reminders for visit attendance due to staff shortages. The SHORE program achieved fairly high rates of attendance and found tracking missed visits allowed the team to focus on the infants and families needing additional support to attend subsequent visits.

Transportation to well-child visits could be an obstacle in some situations, and these visits could not be virtual due to the need to weigh infants and for providers to conduct detailed assessments. Staff of several programs noted they felt more confident that any developmental delays would be noted by pediatricians if infants were attending these visits. The visits also provided another opportunity to reinforce the importance of EI and ensure connection to those services.

Early Intervention

EI is a program of therapeutic services (physical therapy, occupational therapy, etc.) for children with any developmental delay or risk of a developmental delay from birth to three years to support families and enhance the development of these children.[x] Many SEN are at risk for developmental delays due to their exposure. A diagnosis of Neonatal Opioid Withdrawal Syndrome (NOWS), which can result from prenatal opioid exposure, automatically qualifies infants for EI services in MA. To receive EI services, a child must be referred by a medical professional and complete an initial visit to be evaluated for services. Both the initial visit and subsequent visits for therapeutic services typically take place in the child's home, with therapists coming to the house to provide sessions.

C4SEN programs were required to ensure that all eligible SEN were referred to EI and to encourage and track the completion of the initial visit for EI services intake. Most SEN were eligible, though some were not due to having already received a referral to EI outside of the C4SEN program or not having a diagnosis of NOWS or evidence of any qualifying developmental delay. Of the 212 SEN enrolled in the C4SEN program, 195 were eligible for EI referral and 75.9% of eligible SEN received a referral to EI. PNQIN data from non-C4SEN hospitals reports a large proportion of missing data (38.2%) on EI referrals. Due to this, no clear comparison between the C4SEN and non-C4SEN hospitals can be made. However, the C4SEN programs reported a relatively low rate of completion of an initial visit, at 44.6% among those who received a referral. PNQIN does not collect data on the completion of EI visits so no comparison can be made.

Programs found high levels of expressed participant interest in EI services and were able to achieve high levels of enrollment. However, programs also reported parental concern or resistance to first EI visits and some delays in the EI system that led to low overall completion of first EI visits. C4SEN programs found that having their staff or a close collaborator within the hospital be the one to refer to EI helped all enrolled infants receive a referral rather than relying on existing workflows wherein hospital social workers or nurses submitted referrals. Many programs reported parents were nervous about EI providers coming to their homes as they were strangers. The parents also had concerns they would be coming to evaluate their parenting, to report issues, or as an extension of DCF investigations (see **Part 1, Section 2: Extended Program Services**). In some cases, participants were not interested in receiving

x For more on early intervention see: https://www.mass.gov/orgs/early-intervention-division

EI services for their child because they expressed not seeing a need or benefit to the services. Staff reported some parents had concerns about the stigma of their baby needing EI, or felt these services were a requirement being put upon them because of their substance use rather than focused on the needs of their infant. By contrast, program staff noted clear benefits to infants receiving EI services and also felt it often gave parents tools to increase their confidence in parenting, such as teaching infant massage and offering advice on activities to improve their baby's development. When speaking with participants, program staff tried to emphasize these benefits and that these were free services designed to support the baby in achieving their full potential and health.

In order to address these issues, program staff found connection, conversation, education, and efforts at trust building, especially if done proactively, helpful in assuaging parental concerns. Programs worked to provide education on the benefits of EI prenatally and prior to the referral to encourage participation. They found starting these conversations early helped to increase comfort and uptake. A few programs had staff who had previously worked in EI, which allowed them to more clearly convey the potential benefits of their program. Some programs allowed use of their spaces for first meetings or visits with EI to help parents feel more comfortable. EMPOWER+ staff had initially planned to facilitate meetings between caregivers and EI in the hospital following delivery but given the other demands on the caregivers' time and barriers to access to the hospital for EI providers (both restrictions related to Covid-19 prevention and credentialing), they did not end up incorporating this practice. Berkshire Connections at Berkshire Medical Center planned for a future program iteration to fund prenatal visits with EI staff for participants outside of the typical EI services for the infant to increase parental comfort with the staff and services. A few programs noted pediatricians could be helpful allies in encouraging uptake of EI, as their recommendation or encouragement of using the service in addition to that of C4SEN program staff might provide additional motivation for parents.

In addition to barriers related to participants' concerns or hesitations around EI, programs also reported delays and backlogs at local EI offices due to the continuing impacts of the Covid-19 pandemic, particularly in the early months of the C4SEN program. This led to long waitlists for services, difficulty reaching staff at offices that were understaffed, and some offices not always offering a full complement of services. Program staff worked to build stronger relationships with these offices where they could and often worked to follow up on referrals to try to facilitate scheduling and completion of initial visits. One program worked with a local EI provider to create a SEN-specific team to increase the level of familiarity and knowledge about this population within the office and willingness among this team to work with these families around their other services and appointments and to do so in a non-stigmatizing way. One additional barrier for families in working with EI was housing instability. EI services are assigned based on residence in a given office's catchment area, and for those who were moving between temporary housing arrangements, it could be difficult to stay within the catchment area for an office and have a stable location for visits. Program staff also noted it could be challenging if their patient population spanned several EI catchment areas as they had to work with a variety of offices, which took additional time to make connections, build relationships, and learn systems.

Overall, C4SEN programs undertook diligent efforts to implement all required components. They found significant success with connecting participants to MOUD and ensuring attendance at well-child visits but encountered more barriers in ensuring connection to psychotherapy and EI. When working to address HRSN, they found some HRSN, such as food insecurity, much easier to address than other needs such as housing. Programs worked effectively with participants through high levels of HRSN. In many cases, structural barriers such as a shortage of providers or system backlogs due to the pandemic, or HRSN barriers such as transportation and housing were key obstacles to accessing the treatments and fell mostly outside of the participants' and programs' control. In other cases, participant stigma or concerns were a more significant barrier. Despite this, participants and infants benefited from these core services and programs learned valuable lessons about the importance of close working relationships with outside providers and community-based organizations and starting education early to reduce concerns, stigma, or hesitance among participants. In particular, programs achieved higher levels of MOUD uptake than comparison hospital populations and extremely high levels of well-child visit attendance, which are supportive of receiving timely care and reduced acute care utilization.[22,23]

SECTION 2: EXTENDED PROGRAM SERVICES

In addition to required services, programs also identified other needs in their populations and provided services to address these needs.

KEY TAKEAWAYS FROM EVALUATION OF EXTENDED PROGRAM SERVICES

- A recent policy change will reduce—but not eliminate—the number of DCF filings for this population.
- Staff provided significant support to participants with DCF processes throughout the C4SEN program.
- Custody was a moderate theme in interviews, and some participants credited support from the program with their retention of custody.
- Criteria for inclusion in C4SEN data was specifically defined, though programs ended up working with several adjacent populations in need of support, especially non-birthing parents.
- Staff provided significant social support to some participants, especially those with few other close social or familial ties.
- Parenting support, including provision of supplies, education, support groups, and breastfeeding support, was also an important aspect of many programs and was highly appreciated by participants.
- Collaborating with a variety of community-based organizations, hospital departments, and other organizations was necessary for programs to meet goals and deliver comprehensive care.
- Having clear expectations and communication, starting early, and planning workflows were all key facilitators of successful collaborations.

Department of Children and Families Support

The most significant aspect of the care provided beyond required program components stemmed from the policy—based on Massachusetts law and interpretation of federal law—to require the filing of a form 51A (report of suspected child abuse or neglect) to the Department of Children and Families (DCF) upon the birth of a substance exposed newborn (SEN), based solely on the finding of substance exposure in utero, including medication for opioid use disorder (MOUD). This policy has since shifted with the passage of *An Act relative to treatments and coverage for substance use disorder and recovery coach licensure* in 2024, which directed that mandated reporters are no longer required to file these based solely on substance exposure, among other reforms.[xi]

During the C4SEN program, however, while some hospitals in Massachusetts had begun to shift their reporting practices, the prior policy was still in effect for the awardee hospitals.[24,25] Thus, a 51A had to be filed on every participant. Staff repeatedly noted this as a challenging aspect of their work, as a key part of their work with participants was building trusting and nonjudgmental relationships, but the filing of the form was often perceived by participants as a breach of that trust. Many participants who had been in recovery and stably taking MOUD for many years were surprised to learn about the policy. Participants and staff also spoke to participant fear of the experience of interacting with DCF and around whether they would maintain custody of their infant. Multiple participants in interviews shared these sentiments. One noted, *"Basically just the support of someone else as far as mentally, there was a lot of anxiety leading up to the birth because I knew I'd have to deal with DCF due to my recovery and being on methadone."* There is some evidence in outside research literature to suggest, and providers shared anecdotal evidence from community-based substance-use disorder (SUD) providers, that some eligible individuals did not present for prenatal care or enroll in programs like C4SEN out of a fear of the DCF process and the potential of losing custody.[26,27,28] Some also chose to forgo MOUD during pregnancy to avoid the filing of a 51A, even though this could increase the risk of a return to illicit opioid use.[29,30,31]

Program staff tended to take a proactive approach to this process, explaining the reporting policy early in their work with participants, and helping them to gather documentation and otherwise prepare for the inquiry following the 51A

xi For text of the law, see: https://malegislature.gov/Bills/193/H4758

that would determine whether DCF opened a formal case. A document called a Plan of Safe Care (now referred to in Massachusetts as a Family Care Plan[xii]) was an important part of this documentation which also included a list of relevant providers, drug test results during pregnancy, a safety plan for possible relapses, letters of support from C4SEN programs or other recovery programs, and other supportive documentation. Several programs helped participants compile this in a binder or folder to be brought to the hospital when the patient delivered so participants would have all documentation necessary to provide to DCF investigators, as it was typical practice for them to make a visit to the hospital while the participant and infant were still admitted. Many programs tried to arrange for program staff to be present during this visit to emotionally support the participant. In several cases, program staff were present for court proceedings that took place virtually from the hospital, often on short notice. They felt their presence, ability to vouch for the participant's work in their program and in their recovery, and guidance to investigators through the paperwork, was helpful. In cases where hospital staff such as a nurse or social worker from the labor and delivery unit was responsible for filing the 51A, one program arranged for participants to meet with the filer in advance to clarify the process and reduce distrust, while others worked to be sure the filer was informed about the participant and their progress in the program.

They also took a proactive approach to the DCF office itself, with staff from several programs meeting with and presenting their program to local DCF offices. Several programs also established a practice of requesting and attending team meetings for participants with DCF to discuss case progress. This most commonly happened postpartum for participants who had a case opened on them due to the 51A, whether or not they retained custody during the case. Staff were able to provide comfort and support to participants during what could be an intimidating experience, and to advocate on their behalf and share the progress they were making in recovery and through the services of the program. As one staff member from New Beginnings said, *"Stress and fear associated with DCF is something I commonly see but as a family advocate I am proud to be 'their person' who helps to advocate, and answer or ask any questions they may be hesitant to ask."* They often were able to clarify processes, procedures, and requirements from DCF that participants might have had a hard time understanding or navigating.

In some cases, participants were not yet in recovery when they entered the program, and this increased the chances of having a full investigation and case opened and losing custody, especially if they entered the program with a short time before their due date. Programs tried to be up front about this with participants. In some instances, Berkshire Connections offered participants in this situation the option to proactively name a kinship caregiver and complete documents in advance of the birth granting that individual custody of the infant in order to have more control over the situation and who would be caring for their child. This program also noted that participants who enrolled in residential treatment and recovery programs or who had places at recovery houses seemed to be more likely to keep custody due to the supervision available in those settings, so they sometimes recommended these programs to participants.

Participants spoke in patient experience interviews about the impacts of this support. Several interviewees shared that building knowledge about relevant laws and procedures and receiving support and advocacy to address their concerns related to DCF involvement, were key motivators for program enrollment. Overall, this emerged as a strong theme, with the majority of participants commenting on it during their interviews (for more on interview methodology, see **Appendix B**). The DCF-related support provided by the program met interviewees' expectations. Most interviewees said they appreciated the knowledge and assistance provided by program staff in navigating interactions with DCF, including understanding their rights and boundaries when dealing with inquiries from DCF. Interviewees highlighted the practical support they received, such as assistance with documentation, accessing resources, and guidance on attending court hearings. One interviewee shared,

> *They had this binder that you put together for DCF on showing what I've done to get clean, what progress I've made, drug tests, screenings, everything like that. And that if DCF did take the baby, then what options, they just had so much information and resources and support that I needed to support what I wanted to already do for myself, just filling in how to do so and the options, the resources and everything.*

xii For more information on Family Care Plans, see definition found in 105 CMR 272.000, available at: https://www.mass.gov/info-details/infants-affected-by-prenatal-substance-exposure

The presence of program staff during DCF evaluations and court dates offered reassurance and emotional support during stressful moments. The majority of interviewees reported feeling supported and empowered knowing they had resources, guidance, and a supportive team to assist them throughout the DCF process. Program support related to DCF intervention played a crucial role in the lives of participants, offering them guidance, advocacy, and emotional support during challenging circumstances.

Program staff spoke to the joy of being able to help participants retain or regain custody, but also of frustrations with perceived inconsistencies in DCF offices and handling of decisions or cases. In general, they felt the earlier they were able to begin work with the participants, the more likely they were to have success in DCF cases. They also found that over time if they were able to develop relationships with the local DCF office, they were more effectively able to advocate on behalf of their participants. However, for programs whose catchment areas spanned multiple DCF offices, this could also be challenging due to the need to build relationships with more offices and understand the nuanced processes of each. Staff also felt their presence, support, and advocacy could mitigate some of the stressors of the investigation process for families.

Several programs expressed a desire for the policy change that did occur after the C4SEN program ended. They cited the number of cases in which they would not need to spend time interacting with DCF offices or preparing participants for a DCF filing when MOUD was the sole substance exposure for their infant and there were no other concerns of abuse or neglect. They felt this would save program and hospital staff considerable time. In addition, it was noted that the possibility of not having a report filed with DCF would serve as a beneficial incentive for participants to remain on their MOUD and engaged in their recovery and simplify the trust-building process with participants. They also felt this might help participants be more accepting of other services that they had been wary of due to fears of reports to DCF, such as early intervention (see **Part 1, Section 1: Required Program Services**).

At the time of this report, proposed regulations have been promulgated to establish a system of deidentified reporting of infants exposed to MOUD and other substances prenatally to the Department of Public Health for the purposes of public health tracking.[xiii]

Serving an Extended Population

The enrolled population of the C4SEN program was birthing parents with opioid use disorder (OUD) and their SEN up to six months of age. However, due to the complexities of this population, overlap with other populations, and the intent to support the success of the enrolled dyad by supporting those around them, programs expanded their services to offer various supports and resources to other groups.

Several programs extended their services to participants with other forms of SUD or tracked polysubstance use among their enrolled population. Most commonly, programs were serving participants with alcohol use disorder in addition to OUD. Among those with polysubstance use, cannabis and stimulants were the most common substances used in addition to opioids.

There was also a small population of participants in the C4SEN program who were not on MOUD and were in recovery from OUD via abstinence. Although these participants did not meet the technical definition of eligibility, as their infant would not be born substance-exposed, many programs served them as they were birthing parents in recovery from OUD. They needed almost all the C4SEN program's other offered services and also benefited from providers who had a deep understanding of OUD and a destigmatized approach to the condition.

If SEN were removed from the custody of the birthing parent, programs often were not able to continue offering them services and these SEN were typically not included in further enrollment counts. However, some programs still attempted to stay connected and provide services to the SEN and whoever had custody of them. One program in particular, Berkshire Connections, saw a lot of kinship placements, where custody is removed or relinquished but given to a family member or other individual with a close relationship to the child as opposed to a state-appointed

xiii For more information on the proposed regulation, see: https://www.mass.gov/info-details/infants-affected-by-prenatal-substance-exposure

foster parent. They worked to maintain relationships with the kinship caregivers and continued to support the SEN. Others would continue to work with the caregiver throughout and include the SEN in services if they experienced reunification during program enrollment, although these SEN were not included in enrollment counts.

Some SEN had older siblings who had also been born substance-exposed. In cases where these children were in the custody of participants in a C4SEN program, supports such as connection to early intervention for those under three years of age, or connection to pediatric primary care, were provided. Many programs also served participants who had enrolled when their SEN was older than six months, as they did not want to exclude anyone from needed services when they had capacity. Most programs worked with participants past the required milestone of 12 months postpartum, so they still had significant time to work with these participants.

Finally, many programs found the fathers/non-birthing parents of the SEN or partners of the participants required support to promote the success of the caregiver-SEN dyad. In a number of cases, programs found these individuals were likely to also be in recovery from or experiencing OUD. They also found that those who were stably in recovery and engaged with supportive care were much more likely to be a positive factor in supporting the C4SEN participant in their recovery and parenting. To assist the birthing parents in maintaining their recovery and custody, as well as create a healthy environment for the SEN, programs found they needed to try to provide connections to recovery support, education, or other services to non-birthing parents or partners. This wraparound care for the entire family was an important and sometimes challenging part of the programs' work. As the Berkshire Connections program coordinator noted,

> *especially when we have people who are trying to remain in their relationships and remain in recovery, if one's doing well, but one wants to use, typically they both go out and take that negative path, so that has been our biggest challenge in finding resources to help that partner.*

Berkshire Connections eventually sought to secure additional funds to hire a male recovery coach specifically to provide this support. This was both to provide relatability for the fathers and so that other program staff were not trying to support two individuals from the same family, which could pose challenges if they had competing support needs.

Social and Parenting Support

In cases where the caregiver's partner was not able to be a positive and supportive force, many caregivers had already separated themselves and were facing pregnancy and parenting on their own. In other situations, birthing parents were informed by DCF that their relationship could be a barrier to retaining custody of their infant due to safety concerns about their partner, and in some cases that meant unexpectedly facing single parenthood. Programs tried to assess the partners so they could provide information about these situations and potential findings from DCF to participants. Some of these situations also involved safety concerns related to intimate partner violence (IPV) (see **Part 1, Section 1: Required Program Services**) or controlling behaviors where partners would attempt to limit contact with recovery program or C4SEN program staff. Especially in cases where participants had limited family and social support, program staff became a key source of mental and emotional support. Social support emerged in qualitative analysis of participant interviews as a very strong theme with 11 or more of 13 interview participants discussing aspects of this topic (for more on interview methodology, see **Appendix B**). In interviews, most participants cited the need for social support as a primary reason for joining a C4SEN program. Furthermore, some shared that they did not have much support from family or friends. In one interview, a participant stated, *"I don't have much family, so I'm kind of just myself. So, I figured any extra resources or support system, maybe having that option would help."* Others reported that they did not know what to expect in pregnancy and hoped a C4SEN program would help guide them. The vast majority of interviewees commented on feeling comfortable and accommodated within their respective programs. Patient centricity and attention to detail in care was strongly prevalent under this theme. Most expressed deep appreciation for program staff's support. They said staff provided encouragement, helped them with decision-making, and sometimes accompanied them to court or other health care appointments. Staff's consistent

dedication to their well-being throughout their pregnancy and postpartum period helped caregivers in building strong, trusting relationships with them.

In general, programs found that participants having a supportive family or other community around them could be important to their well-being with three programs remarking on this trend in qualitative data. Programs hoped to encourage this support, but in some cases, C4SEN program participants had strained relationships with family members due to the impact of their history of substance use. One program sent staff to a training on the topic of interacting with families of people with SUD. One program noted situations where these family members could be a helpful source of accountability around participants' SUD. Programs also found other ways to support participants in both the general aspects of parenting an infant, and the specific needs of infants born substance-exposed. Several programs established partnerships with local organizations or used their own funds in order to provide necessary baby supplies to participants. This ranged from diapers and wipes to strollers, clothing, and other items. Participants who were interviewed for the patient experience evaluation of the C4SEN program regularly commented on receiving these items from their program, with one noting, *"The director came in with two laundry baskets full of stuff for the baby which I literally broke down and cried because I didn't have much. So that was really helpful."* They also connected participants with local organizations providing parenting classes. All programs provided education on how to parent and care for a SEN in the first few weeks of life when they might experience the symptoms of neonatal opioid withdrawal syndrome. These programs taught expecting parents non-pharmacological strategies to manage the infants' symptoms and discomfort such as keeping sensory stimulation low, swaddling, frequent feeding, and other strategies.

One area not included in the requirements of the C4SEN program that was nevertheless an important program service was breastfeeding support for participants who chose to breastfeed their infants. Participating hospitals had standing policies regarding breastfeeding by a parent with a history or risk of substance use. However, these varied from hospital to hospital, with most incorporating recent guidance from various professional organizations. One hospital implemented an updated policy during the C4SEN program. Hospitals communicated and provided education on these policies to their staff, however in practice program staff sometimes had to advocate for participants who were eligible to breastfeed but received contradictory guidance from providers in the hospital. Programs also took a proactive approach and incorporated education about breastfeeding, and participant eligibility to breastfeed into their visits with participants. As support for breastfeeding was not a required component of the C4SEN program, awardees were not required to collect data, though one program, Berkshire Connections, collected some data and also had a referral relationship with a local breastfeeding support organization. This may have been a missed opportunity for program requirements or data collection in C4SEN given the importance of breastfeeding in infant care, the relevance for this population, and that breastfeeding is an area of racial disparity.[32]

Programs also supported SEN and their parents through typical and more rare health conditions that arose in their first year. As their program included a pediatrician, the EMPOWER+ clinic saw SEN and their siblings for all pediatric illnesses and symptoms. New Beginnings had an infant experience the diagnosis of a rare, unrelated birth defect and was able to support them as they navigated finding appropriate care and adjusting to the diagnosis and needs of their infant. The EMPOWER+ clinic also intended to track testing, referral, and follow-up for conditions that SEN needed to be monitored for, such as hepatitis and ophthalmological conditions. However, due to low SEN enrollment and staffing challenges, they were not able to track these data.

Partnerships and collaboration

While not a required component, partnerships or other collaborations with a variety of organizations were strongly encouraged for awardees. These collaborations were often in service of addressing the core requirements of the C4SEN program if the awardee site did not have that capacity in-house. C4SEN programs were structured in a variety of ways, including embedded in the outpatient obstetrics (OB) practices affiliated with the hospital or medical center, in a family medicine clinic, as part of the behavioral health department of the hospital, or as an independent entity under general supervision of the OB service line. Depending on where they were based, programs had to develop

close working relationships to provide the other aspects of required care for this population, including prenatal OB care, labor and delivery, behavioral health and addiction services, and outpatient pediatrics, in addition to services to address health-related social needs (HRSN). Awardees also utilized partnerships to provide wraparound supportive care to meet participant needs not covered by the core components of the C4SEN program. The funding of the C4SEN program provided the time and opportunity to build or deepen these partnerships.

All programs also developed close working relationships with clinical departments that were not a formal part of their program. These most commonly included the inpatient labor and delivery unit or anesthesia, and sometimes the behavioral health department. Typically, these collaborations involved education and communication about a programs' offerings and services, how best to work with these patients, what to be aware of when caring for them, and how to address concerns or questions about care for the patients, their needs, or any issues related to stigma. Programs also engaged in partnerships and collaborations with outpatient providers and services to meet program requirements. Some outpatient providers and services were affiliated with the awardee hospital or medical center, some were independent, and others worked with both (e.g., when programs spanned a broad catchment area with both affiliated and non-affiliated pediatrics providers). OB providers, MOUD and addiction services, and pediatrics providers were the typical types of organizations for these partnerships. OB and MOUD providers were often referral sources, and programs worked to improve and increase these connections to improve referrals (see **Part 2, Section 1: Engagement**). MOUD and recovery service providers were also often organizations to which programs referred participants, and they often tried to formalize these relationships to promote smooth access to services for their participants. One program, New Beginnings, established memoranda of understanding (MOU) that articulated expectations for the turnaround time on these types of referrals. All programs had to establish some level of working relationship with local EI offices due to program requirements, and though it wasn't explicitly required, many also worked to develop connections to local DCF offices.

The most common type of partnership for C4SEN programs was with community-based organizations that had expertise in addressing HRSN. These organizations ranged widely from housing-focused organizations to local WIC offices to those offering free infant supplies. Other types of collaborations included those with other programs that provided perinatal SUD support such as EMPOWER, the prenatal Moms Do Care program at Baystate Franklin Medical Center. This program connected patients with doulas who were important non-medical liaisons to the medical system, according to staff. There were also connections to organizations providing free infant supplies for SHORE and New Beginnings, a medical-legal partnership brought in to the EMPOWER+ program, a domestic violence support organization collaboration with the SHORE program, and connections made with a faith-based organization, local court system, and a breastfeeding support organization at Berkshire Connections. Programs found several important factors contributed to program success with regard to building connections with partners. First, connecting with potential partners early in the program planning process helped establish relationships and get valuable input from the organizations. In addition, having a shared vision and goals for their relationships, holding regular meetings to build and sustain relationships, and communicating regularly, all contributed to program success. Staff also felt that developing clear workflows with partners when the relationship involved referrals helped the partnership to operate more smoothly. Three programs created formal documentation of these working relationships and found these materials helped to set expectations. Two programs also participated in local collaboratives where multiple organizations who were working to address OUD in their communities came together for regular meetings, enabling them to spread the word about their programs and build valuable connections with other organizations that were providing services to the same populations.[xiv]

Programs encountered some challenges with partnerships and collaborations. At the outset of a partnership, it could be difficult to determine who within an organization to contact reach out to in order to make an initial connection. Communication challenges could arise, especially when clear expectations or regular meetings were not in place. In

xiv For more information on one of these collaboratives, see: Health Care Innovation Spotlight: Substance Exposed Newborns (SENSE) of Southeast Massachusetts Collaborative

many cases, the organizations programs wanted to partner with were under strain due to high volumes of need in their community, lack of funding, staff shortages, and other factors. This was particularly acute for housing-based organizations and inpatient substance use treatment facilities. For some HRSN, such as transportation, finding a partner to address the need was difficult, particularly for the two most rural programs, EMPOWER+ and Berkshire Connections. In the case of psychotherapy, finding providers with availability, especially those who accepted MassHealth, was challenging.

Many aspects of care coordination and wraparound services provided in the C4SEN programs were not directly required components or had additional dimensions that program staff discovered needed to be addressed in the course of their implementation. They were able to expand the scope of their work, or incorporate these aspects into existing programs, providing significant support with DCF processes, support to additional individuals outside the intended target population, and services to aid with parenting and feeding infants. They created a wide variety of collaborations to implement C4SEN program services.

SECTION 3: PROGRAM BENEFITS AND LONG-TERM IMPACTS

Well, I'll say a big part of where I'm at today, I would not be here today if it weren't for [the C4SEN program staff]. I know ultimately it was my choice to turn my life around and show up for myself and my kids. But without the support of them and the encouragement and having them in my life, I really don't think I would be where I'm at today.

-C4SEN Participant

KEY TAKEAWAYS FROM PROGRAM BENEFITS AND LONG-TERM IMPACTS

- Survey respondents endorsed high levels of satisfaction with the programs and low levels of perceived stigma and bias in program services.
- In addition, high levels of participants indicated they would recommend a C4SEN program to someone needing its services, and programs received both word-of-mouth referrals and had participants return for services during subsequent pregnancies.
- Strong levels of MOUD participation, especially exclusive MOUD use, have a significant evidence base for maintenance of recovery which can support long-term well-being.
- The impact of avoided DCF investigations and custody loss through C4SEN program services has significant implications for families and for the DCF system, though the nature of this impact is likely to shift due to recent policy changes.
- The comprehensive nature of the programs and the targeted services for this population were praised by both participants and referring providers.
- Staff and participants spoke to improvements in overall well-being and life progress and accomplishments that occurred during their enrollment in the programs.

The C4SEN investment program had significant impacts on enrolled participants in a number of ways. While the aims of the C4SEN program were centered on concrete care delivery, the broader intent was to improve overall care for this high-risk population and to hopefully improve health outcomes and well-being over a longer time frame. Programs intended to provide care in a manner satisfactory to participants, ensuring a positive experience and setting them up for continued success in their recovery journeys, parenting, and lives. While the time frame for data collection was limited to the 21 months of program implementation, quantitative data and qualitative data from both staff and participants illustrate many positive impacts, including potential long-term positive impacts that can also be inferred.

In order to properly assess the impact of the programs on participants, it was essential to include their voices and opinions in this program evaluation. The Massachusetts Health Policy Commission (HPC) engaged a third-party contractor to conduct surveys and interviews with participants. Surveys focused on assessing overall satisfaction with the programs and their services, utilizing the Client Satisfaction Questionnaire eight-item (CSQ-8) and Discrimination in Medical Settings (DMS) survey tools.[33,34] Interviews focused on gaining a holistic understanding of the strengths and weaknesses of the C4SEN program in which a participant was enrolled, how they perceived its impact in their lives, and their experiences of pregnancy and parenting with the support of the programs through questions generated by the HPC, in collaboration with interviewers. For more on the methodology of surveys and interviews, see **Appendix B**. **Exhibit 7** describes the demographics and characteristics of the survey respondents (n=37) and the demographics and characteristics of interview participants (n=13).

Exhibit 7. C4SEN Patient Experience Survey Respondent and Interview Participant Characteristics

	NUMBER OF RESPONDENTS	PERCENT OF RESPONDENTS
Program (n=37)		
Berkshire Connections at Berkshire Medical Center	12	32%
New Beginnings at Southcoast Health	17	46%
EMPOWER+ at Baystate Franklin Medical Center	5	14%
SHORE at South Shore Hospital	3	8%
Length of enrollment in program (n=37)		
Less than 1 month	2	5%
1-4 months	4	11%
5-8 months	7	19%
9-10 months	4	11%
11-12 months	8	22%
Greater than 12 months	12	32%
Ethnicity (n=36)		
Hispanic	5	14%
Non-Hispanic	31	84%
Unknown	1	3%
Race (n=37)*		
Asian	0	N/A
Native Hawaiian or Other Pacific Islander	0	N/A
Native American, American Indian, or Alaskan Native	0	N/A
Black or African American	3	8%
Multi-Racial: 1. Native American, American Indian, or Alaskan Native and White 2. Native American, American Indian, or Alaskan Native and White 3. Native American, American Indian, or Alaskan Native, **and** Black or African American, **and** White	3	8%
White	29	78%
Other	2	5%
Prefer not to answer	0	N/A

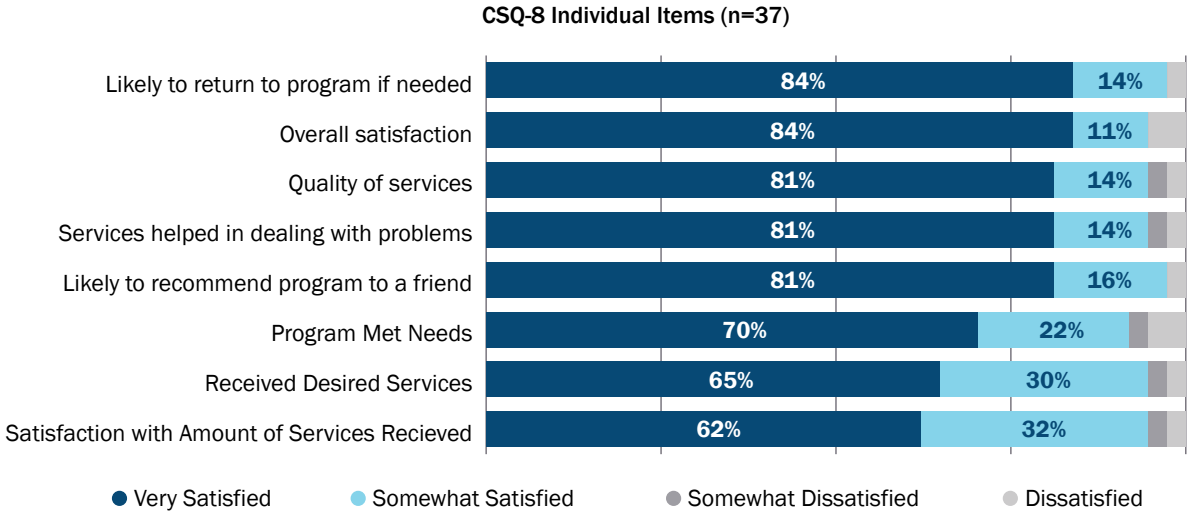
	NUMBER OF INTERVIEWEES	PERCENT OF INTERVIEWEES
Program (n=13)		
Berkshire Connections at Berkshire Medical Center	6	46%
New Beginnings at Southcoast Health	5	38%
EMPOWER+ at Baystate Franklin Medical Center	1	8%
SHORE at South Shore Hospital	1	8%
Length of enrollment in program (n=13)		
Less than 1 month	0	N/A
1-4 months	1	8%
5-8 months	1	8%
9-10 months	1	8%
11-12 months	5	38%
Greater than 12 months	5	38%
Number of Previous Births (n=13)		
None	4	31%
1	3	23%
2	0	N/A
More than 2	6	46%
Age (n=13)		
Younger than 18 years old	0	N/A
18-24 years old	0	N/A
25-34 years old	11	85%
35-44 years old	2	15%
45 years or older	0	N/A
Ethnicity (n=13)		
Hispanic or Latino/a	0	N/A
Not Hispanic or Latino/a	13	100%
Race (n=13)		
Asian	0	N/A
Native Hawaiian or Other Pacific Islander	0	N/A
Native American, American Indian, or Alaskan Native	0	N/A
Black or African American	0	N/A
Multi-Racial: 1. White **and** Other 2. White **and** Other 3. Native American, American Indian, or Alaskan Native, **and** Black or African American	3	23%
White	10	77%
Other	0	N/A
Prefer not to answer	0	N/A

Source: JSI compilation of patient experience data collected from C4SEN participants

While response rates were somewhat limited, interview participants in particular were concentrated at two program sites. Both survey and interview participants had less racial and ethnic diversity than the C4SEN program as a whole, yet these remain valuable results in that they speak directly to the experiences of at least a subset of participants.

Respondents reported overall high satisfaction and low rates of discriminatory experiences. **Exhibit 8 and 9** below show the survey results.

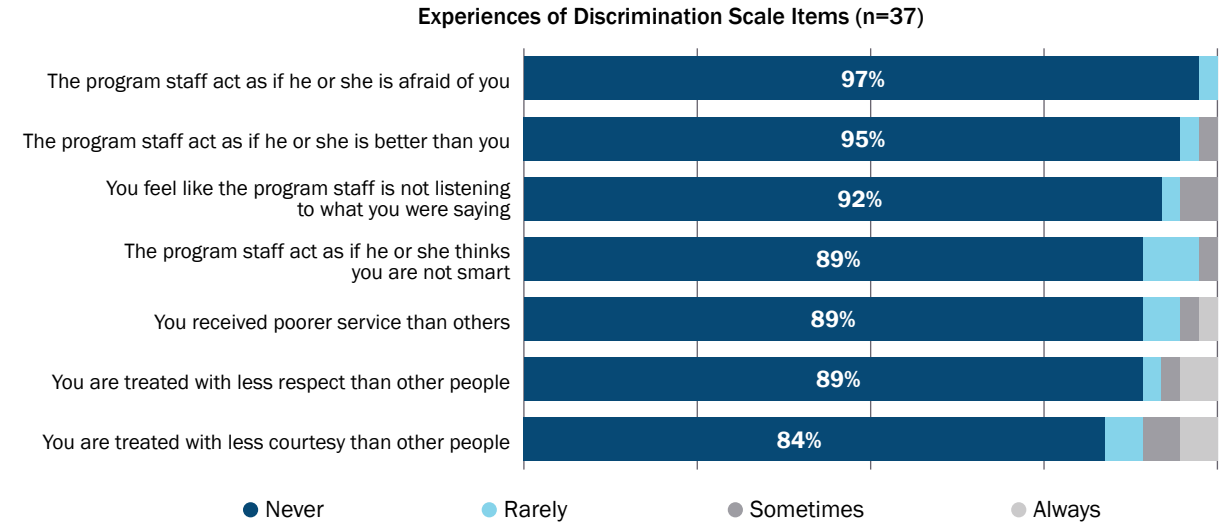
Exhibit 8. Patient Experience Survey Results—Client Satisfaction Questionnaire-8



Source: JSI analysis of patient experience survey data collected from C4SEN participants

Respondents were very or somewhat satisfied over 90% of the time on all survey items. However, rates of "very satisfied" were lower for satisfaction relating to programs' alignment with needs and the amount of services.

Exhibit 9. Patient Experience Survey Results—Discrimination in Medical Settings



Source: JSI analysis of patient experience survey data collected from C4SEN participants

The DMS survey tool was adapted from the Williams Everyday Discrimination Scale, which was originally developed based on qualitative research with Black adults about their lived experience and later expanded to include a wide range of identities that may be subject to the experiences named in the survey, such as being treated with less courtesy than

others based on identity or characteristic.[35] The DMS survey adapted the tool to ask specifically about treatment by medical professionals and validated this adapted instrument.[34] In the survey given to C4SEN participants, the DMS asked about C4SEN staff, and a question asking participants who endorsed experiences of discrimination to attribute to a characteristic or identity was included.

Survey responses were limited in number (n=37) but respondents had few reports of discriminatory treatment (n=8 answering something other than "Never" on DMS survey questions). The one example more than five respondents indicated experiencing was "You are treated with less courtesy than other people". In a follow-up question for those who reported discrimination, respondents who had indicated any discriminatory treatment (n=8) were asked to report their perception of the reason for this behavior and 75% (n=6) selected their history of SUD. This speaks to the high level of importance of efforts to combat stigma within programs. This limited level of reported discriminatory treatment was reinforced by interview data, where "nonjudgmental staff" emerged as a very strong theme, with almost all participants commenting on it. Despite the intent of understanding the role of racial equity in C4SEN, the ability of these results to document discrimination based on race/ethnicity is limited based on the lack of racial and ethnic diversity in the survey respondents, meaning there is insufficient data to draw any conclusions about discriminatory treatment based on race or ethnicity.

In addition to high overall satisfaction and low discrimination, there are a number of concrete areas in which the C4SEN program's impacts, and corresponding potential long-term impacts, were reported, such as medication for opioid use disorder (MOUD) use and child custody. MOUD is an evidence-based, highly effective treatment for opioid use disorder (OUD). MOUD is critically important to help patients remain in recovery as it reduces the chances of a return to illicit use and overdose.[36] Maintenance of recovery using medication has been demonstrated to have numerous positive health effects and most notably a reduction in mortality risk.[37,38] As noted in **Part 1, Section 1: Required Program Components**, some programs demonstrated extremely high levels of MOUD use and C4SEN hospitals had higher rates of exclusive MOUD exposure in their SEN population. In addition, because staff were aware they were working with participants in recovery, one site collaborated with hospital anesthesiologists to develop pain management plans for their C4SEN population in labor to promote adequate pain management while reducing the risk of triggering a return to illicit opioid use. These protocols likely improved outcomes by ensuring a tailored approach to pain management that mitigated both the risks of uncontrolled pain and the risks of opioid exposure for these patients. Thus, C4SEN programs were supportive of recovery and appropriate treatment for individuals with OUD, which is likely to create positive health impacts for these participants in the future.

As noted in **Part 2, Section 2: Extended Program Services**, programs devoted significant effort to supporting participants through the Department of Children and Families (DCF) investigation process. Both staff and participants interviewed about their experiences with a program tied this support to participants' ability to retain or regain custody of their infants. While quantitative data on custody for C4SEN participants is not available, DCF statistics note that in fiscal year 2023 (FY23)—which had full overlap with C4SEN implementation—there were 1,453 51As or other allegations filed for substance exposed newborns (SEN). Of these, 717, or 49.4%, were considered unsupported or unsubstantiated reports.[39] A portion of the filed 51A reports for SEN in FY23 were related to caregivers in the C4SEN program, many of whom were found to have unsubstantiated reports after DCF investigation due to exclusive MOUD use while pregnant or through the support and documentation which resulted from their involvement in the C4SEN program. While this is a small fraction of the over 90,000 reports DCF received in FY23, these unsubstantiated cases had noteworthy impacts on these children and families and the child welfare system. Available qualitative data suggests significant impacts in this area. "Retaining or regaining custody" emerged as a moderate theme in qualitative analysis of interviews, meaning it was discussed by 30-45% of interviewees. Several interviewees believed that their experience with DCF would have been vastly different without the support of the C4SEN program, including potentially longer separation from their children during custody removal, or not regaining custody at all. Supporting participants in maintaining or regaining custody and parenting has benefits to society through the avoided costs of fewer children being placed in the foster care system. Staff specifically spoke of their programs supporting participants who were still engaged in illicit use at enrollment to enter or reenter recovery, which gave them time

before the arrival of their infant to participate in services and supports that built beneficial habits and helped them prepare, which staff noted was very helpful with the DCF investigation process. Staff also emphasized the importance of emotional support throughout the often-stressful process of engaging with DCF during an investigation or while working to complete a case plan and attain reunification. Having C4SEN program staff available for practical and emotional support was noted as being important to participants. Some staff and referring providers also reported the support of the C4SEN program may have prevented overdoses or participants avoiding obstetric care out of fear.

Due to recent policy change in Massachusetts, cases of exclusive MOUD exposure will not require a 51A filing and will instead be reported anonymously to the Department of Public Health.[xv] (For more on this policy change, see **Part 1 Section 2: Extended Program Services**). This change will advance the impact from stress reductions seen in this population, and reduced cost and time for staff working with caregiver-infant dyads with only MOUD exposure which is likely to be 50-60% of opioid exposed newborn births, based on available data. (For more on this data, see **Part 1, Section 1: Required Program Services**).

Referring providers described the benefits of having more specialized and supportive care available for this population. They recognized that participants often needed a support person they could reach out to outside of scheduled clinical encounters, along with additional care coordination and services. This was reinforced by interview data, with every interviewee mentioning "connection to resources" as a strength of the programs. Participants appreciated that there seemed to be no limitations to the types of resources with which program staff were able to help them. Adjectives used to describe the reach of the assistance included "blanket" and "widespread." A couple of interviewees expressed appreciation for the offers to connect with resources even when they were not needed, as it was a comfort to know that program staff were there to help support all aspects of their care. This illustrates the degree to which the C4SEN investment program achieved its aim of providing comprehensive care coordination. Access to these supportive services was appreciated by participants and promoted connection to care that improved their health and supported their ability to continue in their recovery journey and parent. While this was a universal theme for interviewees, survey data indicates some participants may have felt they needed additional services or connections to resources beyond what was offered in C4SEN (see **Exhibit 8**).

Perhaps the clearest indication of the value and benefits of C4SEN programs is that multiple programs had participants return to their care for subsequent pregnancies. One nurse with the New Beginnings program commented,

> *We've had some moms pregnant on their second or third, you know, child and they're reaching out to us before they even have a chance to meet with the [obstetric] provider to say, 'hey, I'm pregnant again, I want to re-enroll.' So I think that says a lot as well.*

Similarly, as noted in **Part 2, Section 1 Contextual Factors in Program Implementation**, programs received word-of-mouth referrals from current or former participants who recommended it to others. This is reinforced by survey results, which showed more than 80% of respondents indicated they were very likely to return to the program if they needed its services again and that they were very likely to refer a friend to the program.

Staff and participants spoke to an improvement in overall well-being. This emerged as a strong theme in qualitative analysis, mentioned by more than half of participants who felt that with the support of their program they were able to make progress in their recovery and improve their ability to parent and achieve goals. One participant spoke to the motivation their program offered, stating,

> *I just was hoping to have that support network, that extra support, some guidance as to help me kind of make the next decisions to turn my life around and to keep my son safe and to make sure I did the right thing for my baby. I got to a point where I wasn't sure if I was going to be able to do it, but then I realized even if I didn't think I could, I still had to give my baby a fighting chance.*

xv For text of the law, see: https://malegislature.gov/Bills/193/H4758. For more information on the proposed regulation, see: https://www.mass.gov/info-details/infants-affected-by-prenatal-substance-exposure

They also felt that they were able to make healthy choices that improved their well-being and that the program they were in helped them reduce their stress, increase their attendance at clinical appointments, and improve their mental health. Several participants were able to compare their experience of the C4SEN program to previous pregnancies and births, emphasizing the difference made by having that program's support, including education, support groups, and psychotherapy. These impacts in particular have the potential to influence long-term health and well-being, as reduced stress and improved appointment attendance are protective factors for maternal and infant health.[40,41] A participant spoke to this impact of C4SEN in an interview, saying:

> *I was comparing it, actually, it was my last pregnancy with my seven-year-old, because when I was pregnant with him, I missed a lot of my appointments. I was really depressed. I didn't have a lot of support, nobody helping me like, "Hey, come on, get up, you got to go do this." And then compared to when I was with these pregnancies, it was like I didn't miss appointments. I had people that were right there helping me and I didn't feel like I was doing it alone. Huge importance."*

Another shared a direct perception of reduced stress from the program:

> *"I wouldn't have access to [staff name], so definitely a lot more worry [would be present without the program]. I probably would've ended up going into labor a lot more earlier because I wouldn't have had the peace of mind.*

Staff shared many success stories wherein participants had been able to reach important milestones such as maintaining recovery for a given period of time, obtaining stable and secure housing, achieving reunification and restoring custody, as well as pursuing employment and educational opportunities. In addition to improved well-being, staff described an increase in participants' confidence and empowerment, built from the skills they honed and successes they accumulated while facing challenges, which empowered them to confront new challenges. Staff efforts to build trust and address internalized stigma, combined with this sense of empowerment, encouraged participants to speak up for their needs and preferences for their care and understand they deserved high quality and compassionate health care. Staff also provided education in many practical areas in addition to skills and education that participants gained from recovery programs, support groups, psychotherapy, and other program services in which they participated.

These improvements and impacts for participants may be difficult to quantify but are observable by both staff and patients who felt they reflected well on program performance and impact. These types of improvements in a participant's skills, outlook, and quality of life could help to create the conditions for long-term increased well-being. And given these participants' roles as parents and, in many cases, heads of their households, these improvements are likely to have additional downstream impacts on their families. In patient experience interviews, participants were asked about their plans for the future and several shared new goals that reflected the support the C4SEN programs offered:

> *I would like to get back and get the proper licenses. I go to school and get the proper licenses to go back to doing that into that field. That's a goal for me. I don't know if it'll happen in a year, but that is my goal, is to go back and be an addiction counselor or a recovery coach or some sort of casework manager again.*

In addition to the individual impacts, systemic impacts on the health care system and child welfare systems in cost, quality, and overall health, with a possible reduction in custody removal and risk of overdose, have the potential to create significant long-term impacts for families and society.

PART 2:
CONTEXTUAL FACTORS IN PROGRAM IMPLEMENTATION

In order to deliver program services and supports, each C4SEN program had to find and enroll participants and create an atmosphere conducive to the engagement, comfort, and retention of those participants. While this was not stated as a required element of the C4SEN program as set by the Massachusetts Health Policy Commission (HPC), it was a prerequisite to providing services and any successes the programs had.

Two other key contextual elements—providing culturally competent care, free of stigma and bias and addressing health equity considerations—were program requirements. Stigma refers to the stigma attached to substance use disorder (SUD) and addiction, particularly in pregnant individuals. Program efforts to combat stigma typically centered on culture change within the hospital where a program was taking place, particularly with labor and delivery staff. According to the C4SEN program aims, bias captured differential treatment or barriers to participation in care. This was included alongside the health equity considerations due to known disparities in the treatment of individuals with substance use disorder based on race and ethnicity, including reduced access to medication for opioid use disorder among Black individuals and disparities in drug testing rates between Black and white pregnant people.[5,42,43] Programs were encouraged to develop an understanding of the root causes of health inequities, including structural racism, to acknowledge these effects in program activities, and work to improve outcomes for affected populations.[44] Calling attention to bias and health equity, specifically racial equity, and including these as program aims was intended to mitigate and counter the broader societal context in which C4SEN programs operated, which included a history of punitive approaches to individuals with SUD, particularly in pregnancy and with disproportionate criminalization of SUD in Black communities.[45,46] C4SEN programs were also operating in a broader context of known racial inequities in SUD treatment, and the history of racist and discriminatory practices in health care systems in many aspects of health care, particularly in maternal health.[5,47,48] Encouraging these efforts through program aims came from the recognition that addressing stigma, bias, and health equity in the context of C4SEN programs could help create an environment of safety and trust needed for participants to participate in these programs.

SECTION 1: ENGAGEMENT

KEY TAKEAWAYS FROM ENGAGEMENT

- Staff agreed that engaging participants as early in pregnancy as possible was important.
- Care providers already working with participants were the strongest referral source and establishing clear and effective pathways for referral was a key program strategy.
- Staff also noted the importance of multiple referral pathways to create opportunities for every eligible individual to be in their program.
- Timely outreach, detailed education on program offerings, a slow pace to avoid feelings of pressure, and individuals being ready for change were all key factors in enrolling referred individuals.
- Retention could be challenging overall, though a relatively high percentage of those who remained in a program at six months postpartum stayed until 12 months.
- Nevertheless, programs felt extending services beyond 12 months postpartum was beneficial, with several suggesting that programs continue through three years.
- Flexible engagement options, in particular offering telehealth visits, were seen as key to engagement by both staff and participants.
- Participants highlighted the nonjudgmental attitudes of staff as highly notable and appreciated.

While not included as a required program component, engagement was a necessity for implementation. Engagement involved many strategies to create referral and identification pathways for those who might benefit from a program, to encourage enrollment, and to promote continued participation in that program. Programs found many commonalities regarding the strategies that most successfully built and sustained engagement with participants. Engagement was a critical area of focus and learning for program staff as it was a necessary first step for connecting participants to needed services. Several key aspects of engagement emerged as themes in program evaluation: timing, identification and referral, education and enrollment process, retention and program duration, flexible engagement offerings, service alignment, and a nonjudgmental approach. In addition, data was collected to evaluate enrollment and retention rates.

Timing

The most universal finding by the C4SEN programs was the benefit of starting program engagement as early as possible. Almost all programs began engagement in pregnancy and staff noted the impact of working with participants as early as possible. The only exception was the EMPOWER+ program, which was intended to be an extension of the EMPOWER program, which began working with participants in pregnancy. Program staff felt the time to prepare participants prior to the birth of their child was critically important to their success. For those who were not in recovery when they joined a program, early engagement provided additional, valuable time to reach recovery and demonstrate consistency with their recovery prior to birth. For all patients, regardless of their recovery status upon enrollment, early engagement allowed ample time to connect participants to all the services they might need.

Identification and referral

Before they could engage participants, programs needed to identify and enroll them, and they employed several strategies to do so. Several programs used their hospital's electronic health record (EHR) to identify participants who met program eligibility criteria through their diagnosis codes and medical history.

Referrals were a key source for many programs, and this was a more common way for participants to enter a program. Referrals could come from a variety of sources, including care providers in obstetrics (OB) offices, staff of the labor and delivery units, medication for opioid use disorder (MOUD) clinics, and others. Participants were also permitted to self-refer if they learned about a program from handouts and eventually some programs began to get word-of-mouth referrals wherein current or former program participants would recommend the program to other eligible individuals.

Program teams found that existing care relationships for participants (such as doulas, OBs, midwives) were the most successful referral pathway to get caregivers enrolled, especially when there were multiple touchpoints. Because participants already had relationships with those who were caring for them during pregnancy, providers had opportunities to inform participants about the program over multiple visits, building buy-in if participants were uncertain about enrolling. In many cases, there was an existing base level of trust established with these care teams, which program staff noted was key to building interest in a program. This was reinforced by participant interview data in which "referrals" emerged as a very strong theme, with the vast majority of interviewees discussing the topic. The majority of these individuals indicated their OB provider had been the source of the referral. As one participant stated,

> *The doctor that I had, also my OB/GYN, … asked me if I was set up with [the program] and I said no, and she told me a little bit about them and told me what they did and stuff like that. And so they said, 'You know, you should probably try it if you want. It's a good program. It'll help you understand what to expect with your baby when she's born'.*

Program staff did note that they engaged in ongoing education efforts to increase provider awareness about the programs and familiarize referral sources about program eligibility. They also worked to encourage these providers to engage in universal screening for opioid or other substance use and make appropriate referrals to the programs in a timely manner. Staff used a variety of strategies to encourage these practices such as educational sessions and regular meetings with clinical offices to sharing data about "missed opportunities" (when an eligible participant received

care from the office but was not referred). Many programs found this work challenging and at times frustrating as they did not always see immediate improvements in their referral rates, but felt they were making progress over the course of C4SEN implementation. Despite strengthened connections with internal and more traditional referral sources, staff felt strongly that multiple pathways for referrals were important so that no caregiver fell through the cracks. Programs found that new referral pathways from external organizations were important in expanding the reach of programs. The deepened relationships between C4SEN programs and both internal and external referral sources often reinforced positive impacts. The outreach and education provided by programs helped referral sources better understand the treatment options and services available through C4SEN programs. This experience and the knowledge that they had an effective program to which they could refer patients increased their comfort discussing the issue of substance use in pregnancy with patients/clients. The programs continued to share updates and success stories and build relationships with referral sources, which only increased their confidence in the benefits of these programs, making them more effective at describing the program to their patients/clients and increasing their respect for and eagerness to collaborate with programs and their staff.

Enrollment data

Programs identified 105 individuals as potential enrollees and received referrals for 280 additional individuals. Of these, 318 or 82.6% of identified and referred participants were eligible for the C4SEN program, demonstrating that programs had clearly communicated criteria to referral sources and created strong EHR reports to identify participants, though eligibility rate ranged from 44-100% between programs. Of those who were eligible, 221 or 69.5% became program enrollees. This also ranged significantly, in part due to the challenges in finding caregivers willing to switch providers as part of the EMPOWER+ program (see **Part 3: Program Models and Implementation Experiences**), along with some individuals identified before the Berkshire Connections program was operating with full enrollment capacity.

Education and enrollment process

Once referrals or identifications were made, programs felt it was beneficial to participant engagement to have an effective system to process new referrals and provide a timely response to caregivers. They also noted it was helpful to have an integrated program team, so participants felt there was a continuity of care and support. Several programs adjusted their intake process over the course of C4SEN implementation to better achieve this. One program, Berkshire Connections, noted their program's co-location with the hospital's OB office to be extremely helpful in establishing relationships with referring providers and allowing for warm handoffs because program staff could often come in to see an eligible participant at the end of their OB appointment and begin the enrollment process right then and there. Efficient referral processes were not only important to help participants feel supported, but they could also help to overcome any hesitation eligible caregivers might have about joining a program.

Staff that worked to enroll participants highlighted common themes in their approach to sharing information with participants that supported successful engagement. They created space and time for potential participants to consider the program and also emphasized the optional nature of their program so potential participants would not feel pressured. They also focused on meeting people where they were, emphasizing what their program could offer to participants. In this vein, having multiple services offered through one program was noted as a draw for potential participants and something staff informing individuals about a program often mentioned. One participant affirmed the high value of the wide variety of services offered, saying, *"I would just say the fact that they're there for almost any reason. It's widespread. It's not just one thing that they're doing. They're there to help you with whatever you need."*

Staff worked to provide lots of explanation about the available program services and often engaged in repeated outreach. Most programs developed printed materials with information about their program and its services, which could be distributed by referring providers or program staff. Each program established different roles for introducing their program and enrolling participants. Often there was an initial intake or other contact with a more supervisory

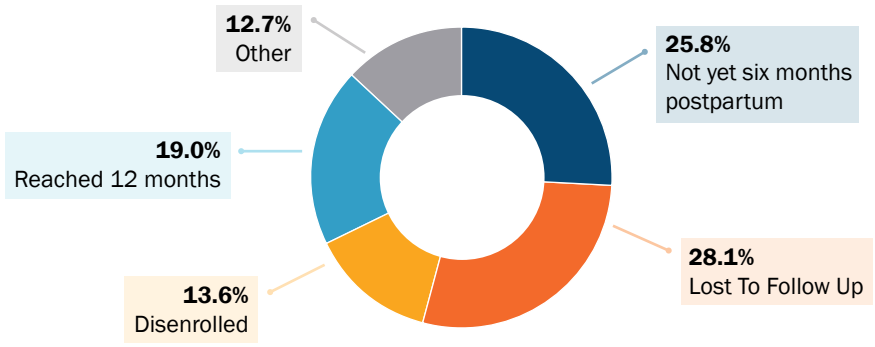
or coordinating member of the team and then the participant would be introduced to the staff member who did most of the day-to-day support and work with participants.

Staff noted some areas of common challenges in enrolling and engaging participants. First, some potential participants were likely unwilling to reveal their SUD or engage in programming around it. A lack of family support or shame imposed by family members and partners could magnify this effect (see **Part 1 Section 2: Extended Program Services** for more on family support). In addition, staff recognized that a potential participant's readiness for change was a critically important factor in their ability to engage. Some individuals were not ready to acknowledge or confront their SUD or were not ready to make significant changes to their lives, limiting their level of engagement. In particular, staff recognized that it could be extremely challenging to engage individuals who were still in active substance use. Finally, staff noted that participants referred late in their pregnancy or who were not referred prenatally and instead were identified at the time of delivery could also be challenging to engage. All of these trends also applied to retention and ongoing engagement in a program.

Retention and program duration

Data on program engagement and retention showed that the drop-off in engagement was significant, though those who remained in a program past six months postpartum became increasingly likely to remain engaged as time went on. When including only those who had reached six months postpartum by the end of the program, 49.7% of those who were available to remain engaged at six months postpartum were engaged, 67.9% of the available population remained engaged at nine months postpartum, and 76.4% at 12 months. This means that two-thirds of the participants who remained engaged at six months continued their engagement through nine months and three-quarters of those engaged at nine months remained engaged at 12 months. In actual terms, these numbers represented fairly small groups compared to the total enrollment of 221, with 81 individuals engaged at six months postpartum, and 42 individuals engaged at 12 months postpartum. The end disposition of all enrolled participants is shown below in **Exhibit 10**. These dispositions were captured at the end of participant engagement, with the exception of the category "not yet six months" which was captured at the end of program implementation. Lost to follow-up refers to those who disengaged without communication to the programs, while disenrolled captures those who communicated a desire to disengage. "Other" captures both those who were between six and 12 months postpartum when the C4SEN program implementation ended and those who were transferred to another source of care before reaching 12 months postpartum.

Exhibit 10. Participant Status at End of Engagement



Source: HPC analysis of C4SEN awardee-reported data

C4SEN programs were asked to provide support and track data specifically in the period seven to 12 months postpartum, as evidence suggested this was a time of heightened risk for overdose.[1] As previously discussed, many programs began engagement in pregnancy, sometimes very early in the pregnancy, leading to a term of engagement for some participants that could range from 18 months to two years. This may be responsible for some of the drop-off in

engagement during the postpartum period, as participants had received the services they needed or their interest in engaging with the program waned over time. Retention was tracked by the time of enrollment: in pregnancy, at birth, or postpartum. However, 74.2% of participants enrolled during pregnancy, leaving a small proportion who enrolled later, making comparison difficult due to small sample size. Overall, retention rates were similar for pregnancy and birth enrollment, but rates of individuals lost to follow-up were higher for those enrolled at birth and postpartum. Retention rates were also tracked by race and ethnicity, however, due to small sample size, the ability to draw conclusions is limited.

The New Beginnings program adjusted their care model as part of the C4SEN investment program to create a more longitudinal engagement in which participants worked with the same family advocate both prenatally and postpartum. Previously there had been a handoff between staff after delivery to provide postpartum support. Staff felt there were higher levels of engagement and retention with this new longitudinal model. They noted that this change in model felt like it was in better alignment with participant needs. At least one interview participant corroborated the importance of consistency, stating,

> *[I]t's nice to have the consistency because that's another thing that's hard in this kind of thing is you gain these relationships and then any slight change, it's like, "Oh, you got to find somebody else." And it's hard, it's hard to establish trust. It's hard to have to keep restarting. So I think it's really nice that they've stayed with us through our whole process.*

Extending program services until the substance exposed newborn was two or three years of age was common, though some programs were only able to provide that extension with the enhanced funding of C4SEN. The consensus among program staff was that support should extend until the SEN reached three years of age. This mirrored the support time frame for early intervention (EI) and allowed programs to work with participants through the most critical years of early childhood. Most programs attempted to offer this length of engagement during C4SEN funding. Program data did not track retention past 12 months postpartum. However, program staff felt that there were ongoing benefits to this engagement.

Staff wished they had additional data on program engagement and retention beyond what they were required to collect and report to the HPC. Staff noted that despite the attempted efforts of the C4SEN program to focus on the seven-to-12-month postpartum window, this was often a common time when participants' engagement in the program would decline. Six months postpartum was often a mark when participants were returning to work, and they often were juggling many different aspects of their lives along with program participation, which likely contributed to this decline. However, staff also noted that participants would sometimes reduce their engagement temporarily but come back to the program. The EMPOWER+ program in particular noted that a drop off in engagement tended to happen around one year. They also noted that, in addition to participants' busy lives, another factor that could contribute to their disengagement was feeling as though they had attained a stable level of recovery and had all the support and resources they needed. Besides these two factors, the other situation staff noted that often led to disengagement was remaining in active substance use. These participants could often be lost to follow up. Staff were quick to note, however, that none of these factors alone was wholly predictive of disengagement.

Flexible engagement options

In order to support and maintain ongoing engagement, most programs developed a planned schedule of program touchpoints, visits, or check-ins. Commonly, these were approximately once a month, though each program developed its own schedule, including one program that mirrored the cadence of prenatal appointments with the frequency of visits increasing as the participant approached their due date. Programs emphasized that extending flexibility to participants was key to their continued engagement. They often used text messaging or brief phone calls as a means to stay in contact with participants and often these types of contacts were utilized for the monthly check-in appointments. Programs also noted that this more flexible approach and engaging with staff who were viewed as more flexible

in their outreach and engagement, such as peer recovery coaches, tended to yield more positive results in terms of maintaining participant engagement. However, programs also noted that the structure of scheduled appointments was often helpful in providing scaffolding to individuals in recovery, ensuring there were clear expectations and allowing them to build a reliable schedule. There appeared to be some tension between participants' preference for flexibility and the benefits that structure could provide in program engagement. Staff noted that during an in-person appointment it was often easier to read body language and other cues as to a participant's state and well-being as opposed to via phone or text message. However, they also recognized potential barriers to attending in-person appointments, such as transportation and time. Notably, the EMPOWER+ program shared several occasions in which Covid-19 infections or concerns about exposure posed a barrier to program engagement and appointment attendance, especially because the EMPOWER+ program was structured around attendance at in-person well-child visits that could not occur via telemedicine. In recognition of the challenges and barriers that these families faced, EMPOWER+ staff often tried to extend additional flexibility for appointment cancellations, reschedules, and tardiness.

The topics of flexibility and the use of telehealth to communicate with the programs both emerged as very strong themes in participant interviews, underscoring the observations of staff. Nearly all interviewees reported on the ease of participating in appointments over the phone. This eliminated the need to travel and was particularly beneficial for those with newborns or busy schedules. Interviewees valued the flexibility in communication channels, such as using text messaging for quick check-ins and reminders. They also acknowledged the importance of virtual meetings in coordinating care and aligning with different stakeholders, such as Department of Children and Families (DCF) workers. Overall, interviewees reported that telehealth options made the programs more convenient and accessible for participants. One participant commented, *"It's usually over the phone, I don't actually have to get in a car and go to an office, and pack up my newborn to get there and be able to meet my appointment date and time... [I]t's a lot easier."* This was reflective of an overall perception of flexibility in the programs and staff. Participants lauded programs for their flexibility, consistently praising the accommodating nature of staff. The vast majority of interviewees reported that they valued the staff's accessibility across various aspects of the programs, including scheduling appointments and allowing them to receive help when they needed it. Staff members were commended for their responsiveness and willingness to adjust appointments as needed. Most interviewees felt that they could contact program staff at any time and staff would respond promptly. Furthermore, staff reached out proactively, checking in on participants' well-being frequently. As one participant put it, *"She's always trying to figure out what time works for me. And if it doesn't work, she helps me reschedule and it's been good."*

Program staff observed that the flexibility of their programs in terms of accessibility of care, patient preferences, and customizability of services enabled them to be responsive to patient needs as they emerged and to tailor services accordingly. While programs offered a wide range of supports and services, the number and intensity of services participants received was flexible and generally determined by participant requests, preferences, or demonstrated needs. This flexibility also meant that program staff felt they were able to fit the needs of participants with different types of SUD (e.g., alcohol use disorder, opioid use disorder) and different histories of substance use and recovery.

Service alignment

An important part of engagement and retention of participants was ensuring that program services were well aligned with participant needs. Program staff reported that overall, they felt the C4SEN-funded programs aligned well with patient needs. Due to the programs' focus on care coordination, they had multiple services available within one program, which was appealing to many participants. One participant, speaking about the range of services they had been connected to, stated *"They've helped me get into both of the programs I was in, the one I was in before and the program I'm in now... They've helped me find doctors, they've helped me find mental health care, just everything."* Referring providers also found this helpful in encouraging patients to join a C4SEN program. Program staff noted that patients seemed especially interested in and grateful for program supports, coordination, and connections to meet their non-medical needs (health related social needs, intimate partner violence supports, legal supports) and foster social connections with other parents in recovery.

These services often contributed to both initial enrollment and ongoing engagement. Oftentimes, small aspects of the services, such as the provision of baby supplies, created the initial buy-in for participants to enroll, and then teams were able to engage them in more services and supports. Support with the DCF process was another key motivation for individuals to join a program.

Two programs, Berkshire Connections and SHORE, facilitated support groups for participants, which staff noted filled an important niche as local recovery support groups often were not geared towards those parenting young children. Participants from these two sites commented on the importance of these support groups when interviewed about their experiences in the programs. One such participant described the focus groups as

> *[It's] just a really good support system to be able to have other women that had recently had babies and were going through the same things I was going through. And yeah, it's nice to be part of almost like a family that understands you and they're all on the same journey.*

Ensuring accessibility of support groups by offering them in the evening and providing food and childcare as part of the programming were key elements to fully meeting the needs of participants. Even so, limitations in the timing of support groups and transportation to the meeting location meant that barriers still existed for some participants.

Despite efforts to fit program offerings with participant needs, there were situations where staff recognized that certain program elements were not always in alignment with participants' availability or capacity. For some programs, especially those located in more rural areas, the location of the C4SEN program, other services participants required, and the travel between these sites could be a challenge. Some program staff shared frustration that their programs could not serve as a complete one-stop shop for all caregiver and infant needs (including directly prescribing and administering MOUD, directly providing housing, social work, and psychotherapy). Typically, this was due to limitations in staffing and expertise or scope of work policies.

In addition, staff observed that in cases where participants had been engaged quite stably in their recovery for many years, some services provided by the programs did not feel relevant or were not things they wanted or needed assistance with. In many of these cases, the primary need of this participant population was support with DCF. This was because policy at the time mandated reporting of the infant's exposure to MOUD regardless of an individual birthing parent's status in recovery. Recent policy changes (see **Part 1, Section 2: Extended Program Services**) would likely eliminate the need for this service. It is therefore possible that this subpopulation of pregnant and parenting individuals who are stable in their recovery might not seek out the support of a program like C4SEN in the future. It may be necessary for programs to create a system for these individuals to be made aware of their supports and services but not required to engage, or to create a "light touch" version of their program tailored to this population.

Nonjudgmental approach

Program staff reported that caregivers appreciated their nonjudgmental approach to providing support, care coordination, and connections to services. Participants also noted the importance of a nonjudgmental approach when interviewed about their experiences. They spoke about feeling respected and heard by program staff, which was often noted in contrast to other experiences with medical providers and the healthcare system. This praise arose organically as the interviewer asked them to describe their experiences with the programs. Patient experiences with the programs stood in stark contrast to interactions with staff in other health care or social service environments, which patients said had often been stigmatizing. Many interviewees praised program staff for treating patients with dignity and compassion. As one interviewee stated,

> *I was scared to go to my appointments because of where I was at. And there was just a lot of encouragement [from program staff]. [They said,] "We're not here to judge you, we're not here to look down on you. We're here to help you and figure out what we can do to help you live a clean, healthy lifestyle and care for yourself and your baby." So like I said, that's what helped me gain their trust.*

This illustrates a key approach to ensuring participant engagement and retention. The creation of trusting relationships between participants and program staff helped participants feel comfortable in disclosing their needs and being honest about their challenges. This also helped them to engage more deeply and actively in their care as they felt they had genuine support and compassion from program staff. Staff additionally noted that it was sometimes easier for participants to develop these trusting relationships with staff with lived experience and staff in nontraditional and less clinical roles such as doulas, recovery coaches, and family advocates.

SECTION 2: EFFORTS TO ADDRESS SUD STIGMA

KEY TAKEAWAYS FROM EFFORTS TO ADDRESS SUD STIGMA

- Staff of C4SEN programs were able to create nonjudgmental environments within their programs where participants reported not experiencing stigma.
- The hospital often did still have challenges with SUD stigma which programs had to address through education and continued conversations.
- Providing opportunities for both participants and providers to feel heard was important.
- Creating opportunities to communicate participant feedback was also important.
- Hospital leadership, staff stability, and trainings could help build a hospital-wide anti-stigma culture.

A key aim of the C4SEN program was care provided free of stigma. Stigma here referred to the stigma attached to substance use disorder (SUD) and addiction, particularly in pregnant individuals. While teams staffing the programs were largely made up of individuals with experience in the SUD field who already had adapted to nonjudgmental and harm-reduction care delivery or were hired for their interest and willingness in providing this care, other hospital staff did not always share these views or experiences. To improve the care participants received and reduce their experiences of stigma, program staff worked outside of their care teams to change attitudes regarding perinatal SUD and treatment.

Program staff encountered mixed views among the providers working with C4SEN participants. Some had already learned about the disease model of addiction and been educated in non-stigmatizing and trauma-informed care, while others held views on SUD as a choice or moral failing and the population in need of surveillance and extra scrutiny. Staff shared situations they witnessed or were relayed from participants during the program of providers exhibiting bias in screening for drug use or application of hospital policies, including recommending against breastfeeding despite a patient meeting criteria per hospital policy, and a provider stating they would file a report to the Department of Children and Families based solely on a participant declining to take a urine drug test. Many also commented on receiving reports of stigmatizing and hurtful language and comments from providers. This had significant impacts on participants' experiences of care, their desire to participate in or seek medical care, and their mental and emotional well-being. In addition to incidents occurring during the program, experiences in prior pregnancies or with outside providers had an emotional impact on participants they often carried with them into their time in C4SEN.

As noted, program participants interviewed about their experiences spoke positively of nonjudgmental staff and often contrasted this with the attitudes of other providers who had cared for them in the past, reinforcing the reports from staff that not all providers were non-stigmatizing. Participants shared stories of being stereotyped and looked down upon for having a history of addiction and/or being on medication for opioid use disorder. In contrast, they noted that the care and kindness they received from their C4SEN program helped them to feel valued. Speaking in an interview, one participant shared,

> *[T]here's been a lot of people that are a part of your care that treat you, [...] for example, I handed them a bunch of clean tests and they still looked at me like I was a disgrace, and since day one [the C4SEN program] treated me just like a person that needed help, not like a drug addict that was a bad person.*

This illustrated the importance of program efforts to combat stigma to promote respectful treatment and a trusting environment for participants.

C4SEN staff typically approached all hospital staff with a posture of education first and created repeated and ongoing opportunities for education. This often started with a presentation on their specific program at a department meeting but could extend to events like grand rounds and formal trainings on combatting stigma. Trainings often focused on the use of non-stigmatizing language, and education about the treatable nature of opioid use disorder. Staff also noted that they worked to use non-stigmatizing language throughout the programs.

The history and experience with SUD of the hospital and staff had a distinct influence on the attitudes and approaches of providers. Hospitals that had more experience with SUD tended to have more accepting and nonjudgmental approaches and attitudes among providers. One hospital, Berkshire Medical Center, noted that their chair of medicine oversaw care for a medical detox unit within the hospital and they felt this experience among leadership impacted the hospital's approach. Programs also noted that nurses who graduated more recently seemed more likely to have been educated and trained on SUD as a treatable condition. However, they also noted that staff turnover and rotation, particularly due to the presence of travel nurses during the C4SEN program time period, often contributed to a fluctuating staff culture and stigma around SUD.

Several programs also took a personal approach to addressing stigma and checked in with their participants on their experiences, offering to be advocates in case any issues arose. As a New Beginnings team member described,

> *that's one thing that we are encouraging our moms too, one way or another, and not trying to like, look for issues, but the family advocates kind of asking, like, 'how are things been going here? Any issues with the nurses? Any nurses that have gone above and beyond?' Trying to get the good and the bad and just kind of, let us know, [...] 'if anyone's, you know, if you feel like uncomfortable we can talk to the nurse manager and see if we can get you a new nurse.'*

Some programs also asked participants about any past negative experiences with the hospital, as many had had previous births at the hospital where their program was based. Oftentimes this feedback was provided to the labor and delivery unit staff, either by program staff or through a direct meeting with patients. C4SEN staff emphasized the need for hospital staff to proceed slowly and explain all care clearly to participants, treat pain promptly, and avoid making assumptions about participant behavior or reactions. At the same time, staff recognized that it was necessary to understand past negative experiences providers may have had, and the ways in which demands on their own time and energy could impact their approach to promote an open dialogue and productive conversations. Often a consistent, hands-on effort was necessary to help providers understand the patient population's needs and how to approach them to reduce stigma. For many participants, the stigma they experienced surrounding prior births or interactions with the hospital were traumatizing, so their sensitivities or reactions could be heightened. For example, nurses spending only a short time in a patient's room to perform a task might be interpreted as a negative attitude towards the participant, when in fact the nurse had to move quickly due to the unit being short-staffed or an emergency situation presenting elsewhere on the unit. Program staff felt it was important to listen to participants' concerns and help them feel heard, while also providing education and reassurance when necessary.

Program staff noted the variety of professional and personal experiences among their teams were helpful in creating a nonjudgmental and non-stigmatizing environment. Many had past clinical or personal experience with SUD, including some staff with lived experience. They often ended up working with participants on internalized stigma and tried to take a strengths-based approach in discussions with them. Staff recognized the importance of addressing stigma as a part of improving care quality for participants, as stigma was often a reason participants were hesitant to seek care or sought to leave care. In addition, stigma from a participant's family could have an enormous impact on their engagement in health care and SUD treatment.

Staff of the SHORE program noted that being located in the generalized behavioral health department led some participants to initially seek care for perinatal mental health concerns, and once they felt comfortable within SHORE, they would sometimes disclose their SUD.

Most program staff felt they were able to make some progress in addressing stigma in their hospitals, though there was still plenty of work to do to create a stigma-free care environment. One program suggested earlier assessment of stigma among clinical staff and close mentorship of those who needed education in this area would have been helpful, though they noted the size of their program staff limited their capacity to reach the entire clinical staff and posed a barrier to making further inroads.

Overall, both patients and referring staff remarked that program staff were successful in creating a nonjudgemental environment that avoided SUD stigma. When asked if the programs were meeting the goal of providing care that respects everyone's culture and background and is free of stigma or bias, all 13 interviewees said yes. There are limitations to this as the diversity of interview subjects is limited, and survey data with a larger sample indicates some participants did experience stigmatizing or discriminatory experiences (for more on survey data, see **Part 1, Section 3: Program Benefits and Long-Term Impacts**). While survey instructions asked participants to only consider experiences with members of program staff, it is possible they may have conflated program staff and other hospital staff.

SECTION 3: EFFORTS TO ADDRESS RACIAL/ETHNIC BIAS AND EQUITY

KEY TAKEAWAYS FROM EFFORTS TO ADDRESS RACIAL/ETHNIC BIAS AND EQUITY

- C4SEN program enrollees were not as racially diverse as the opioid-exposed newborn population at other hospitals in Massachusetts.
- Data limitations precluded analysis of program data stratified by race and ethnicity.
- Programs needed more specific guidance and technical assistance as well as ways to devote staff time and bandwidth to racial equity efforts than was available in the program.
- Some programs reflected on opportunities to improve equity and diversity.
- Programs engaged in trainings and reflections around racial equity that had positive impacts on staff.

Systemic racism in health care and histories of discriminatory practices are often barriers to seeking care, and these have historically been layered on top of substance use disorder (SUD)-related stigma.[45,47,48] This has had impacts on access to care, which communities sought care, and their ability to remain engaged in successful recovery.[5] In the years surrounding the C4SEN program, Massachusetts experienced a dramatic increase in overdose deaths by Black individuals, illustrating the urgency of this issue.[49] In addition, there have long been racial inequities in maternal morbidity and mortality, and these remained during the C4SEN time period.[50]

In addition to the aim of delivering a program free from stigma and bias, the C4SEN program encouraged applicants to consider racial equity principles when implementing their programs and provided each awardee with a copy of Department of Public Health (DPH) racial equity principles.[44] Otherwise, there was no significant guidance on equity provided by the Massachusetts Health Policy Commission (HPC) to the applicants in the design of their program. When asked about racial equity efforts in their program, many cited hospital-wide efforts at shifting language and responding to microaggressions in the course of clinical care, as well as hospital-level equity committees or Diversity, Equity, and Inclusion efforts.

Due to the broad nature of the original program expectations related to bias and equity, the HPC decided to create a narrower focus to help awardees channel their efforts during program implementation. Eventually, the HPC focused on the concept of improving and increasing outreach to diversify the enrolled population and used cohort-wide

training opportunities to provide some guidance and encouragement to awardees in these efforts. However, time and capacity for these efforts varied at awardee sites. There was not a dedicated role within program teams for addressing equity, limited capacity from the HPC to provide guidance or technical assistance in this area, and operational or other considerations often took precedence. Some program update questions and time in cohort-wide collaborative learning sessions were focused on racial equity and other health equity efforts.

Additional technical assistance and specificity may have been helpful in establishing a shared language and background knowledge on issues of equity in the awardee cohort. In program updates, program staff sometimes gave answers that conflated various terms in the aims related to stigma, bias, cultural humility, and health equity. The most common examples of this were answers on program updates that focused solely on SUD diagnosis or socioeconomic status when asked about issues of equity. While these are important drivers of health inequities, the program aims around stigma and bias were also intended to include race and ethnicity.

Some programs noted that they struggled to find relevance for racial equity efforts due to the geographic distribution of C4SEN hospitals. Many awardees were located in areas with less racial diversity, which was reflected in their enrollment demographics. Overall, racial and ethnic diversity in the enrolled population was somewhat low. Data on the race of mothers of opioid-exposed newborns reported to the Perinatal Neonatal Quality Improvement Network of Massachusetts (PNQIN) showed the proportion of white participants was higher in C4SEN programs compared to non-C4SEN hospitals (85.0% versus 79.5%) and the proportion of Black participants was lower (3.5% versus 9.8%). The same held true for Latino/Hispanic ethnicity, with 94% of C4SEN participants reporting they were not Hispanic/Latino as compared to 85% at non-C4SEN hospitals. While some of this may have been due to much higher levels of racial diversity in the catchment areas and patient populations at non-C4SEN hospitals, the enrollment of C4SEN programs did not always fully reflect the diversity of their communities. In addition to tracking the diversity of the enrolled population, these data were collected in the hopes of drawing conclusions about any disparities by race or ethnicity in program engagement, retention, and treatment access. However, the limited sample size restricted analysis utility.

This limitation also arose in survey and interview responses regarding bias and discrimination. Respondents to both surveys and interviews had similar racial identities with 78% and 77%, respectively selecting white, with the remainder selecting multi-racial or other. Survey respondents had a higher proportion of Hispanic respondents (14% versus 0% for interview respondents). The number of survey and interview respondents (37 and 13, respectively) along with the lack of racial and ethnic diversity precluded drawing conclusions. These results may therefore under- or over-estimate the extent of bias or discrimination in the program. For more on survey and interview results, see **Part 1, Section 3: Program Benefits and Long-Term Impacts.**

Two programs made introspective observations about the diversity of their enrolled population, noting that despite their "largely white" catchment areas, there were likely eligible participants they were missing. One program was able to cite data on the racial and ethnic diversity of their region, though this was not specific to the SUD population. They also reflected on options or opportunities to increase and diversify their enrollment, including offering program advertisements and education materials in a variety of languages, sharing these materials with local community organizations serving a diverse array of populations, and maintaining community partnerships to increase awareness of their programs. These efforts helped increase awareness of the programs among the community organizations, but most programs did not collect data about referral sources, or the race and ethnicity of individuals referred from various sources, which makes the impact of these efforts difficult to track. One program changed their approach to asking about participant needs to make participants more comfortable with disclosing needs to foster more equitable access to services.

A few programs reflected on the racial and ethnic makeup of their teams, which were largely white, and the impact this might have on their engagement of participants of color. One program tried to engage in hiring efforts to diversify their staff but had limited success as some job candidates declined offers and one joined the team with only a few months left before the funding ended. This is an area where opportunities for greater impact were likely missed. Programs

had a strong belief in the impact of staff with lived experience of SUD on participants, and the opportunity likely existed to extend this to the racial, ethnic, or linguistic diversity of the staff as a means to support a broader range of potential participants. However, most programs operated with very small teams and had challenges throughout implementation with hiring and staffing, which would have impacted their ability to pursue this strategy.

In addition, several sites began to explore other evidence from the literature regarding racial inequities and exploring the ways they might track them within their program in the future. These included medication for opioid use disorder (MOUD) adherence and breastfeeding rates. Both of these efforts, along with the requirement to stratify data by race and ethnicity, were in alignment with the DPH principle of "data-driven and evidence-informed efforts to examine inequities." The ability to observe these inequities in their population and act accordingly was limited by the small subpopulations and other constraints noted above. A next stage of growth for these programs could be deploying interventions to address these inequities with an evidence base in the literature, even while their enrolled populations may remain small.

Program staff participated in a variety of trainings centered around racial equity including *Speak Up* trainings offered by PNQIN in collaboration with the Institute for Perinatal Quality Improvement, trainings on the Dignity Model of care, and cultural humility training. The *Speak Up* program trainings covered a wide variety of topics, including designing anti-racism statements, data collection, and family debriefs. In several cases, these provided ideas for program staff to implement or affirmed ongoing practices, such as allowing participants to self-identify their race and ethnicity when collecting data. However, some staff noted that the trainings they attended were often organized or supported by the hospital for all staff and had more relevance for inpatient clinical care staff.

Each program did make at least one notable effort to improve their knowledge or skills in racial equity and in many cases the most powerful impacts came from staff discussing their experiences and learnings as a team. The EMPOWER+ program director attended a screening and discussion of the documentary Aftershock, focused on the Black maternal mortality crisis, hosted by the labor and delivery unit at Baystate Franklin. This had a notable emotional impact for staff, with the program director commenting,

> *The staff at the Birthplace recently watched the documentary film Aftershock which followed two families of color in NYC after the mother's postpartum deaths. It was gut wrenching to watch these beautiful young families be devastated with such loss. In the film they reviewed the [history] of Obstetrics in the U.S. and it was so hard to see African American women being portrayed during the early experimentations, [...] It made the hesitancy in engaging in the U.S. health care system so much more understand[able] for me.*

The SHORE program team spent time taking the Implicit Association Tests from Harvard University and discussing their results as a team. Members shared that seeing the evidence of their own implicit biases prompted significant reflections. The leadership of New Beginnings engaged in continued research and staff education on relevant evidence in the field, including the racial disparities in MOUD access. Finally, the Berkshire Connections program team met on several occasions with the diversity officer for their hospital system to learn more about equity.

Overall, the breadth of the program aim and multiple competing priorities for awardees contributed to the lack of progress in this program aim. This was a key learning for the HPC on the need for additional support, guidance, and specificity in health equity efforts by investment program awardees. However, program staff did focus attention on this issue, and in some cases generated important learnings for the programs that impacted their approach to outreach and engagement, as well as in other areas of program delivery. Going forward, this provides some valuable guidance for the implementation of programs intended to include a racial equity component, including the need for clear definitions of terms, setting of expectations and accountability measures if this will be a core program component, support and technical assistance as needed for program staff, and dedicated time and staffing to address issues of racial equity.

PART 3:
PROGRAM MODELS AND IMPLEMENTATION EXPERIENCES

While all C4SEN programs had required components and aims, they were offered significant flexibility in the design of their programs and implemented them in a variety of contexts. Some programs were modifying or building on existing programs for this population while others were starting brand new programs within their hospitals or systems. Each program created a staffing model specific to their program model. In a number of cases, programs made changes to their original care models to accommodate the circumstances of their implementation. Programs had varied experiences with implementing their programs, including successes and challenges.

BAYSTATE FRANKLIN MEDICAL CENTER: EMPOWER+

Program Model

Baystate Franklin Medical Center designed a C4SEN program called Engaging Mothers for Positive Outcomes through Early Referrals+ (EMPOWER+), which was a new program intended to complement their existing EMPOWER program that served pregnant people with substance use disorder (SUD) and their substance-exposed newborns (SEN) prenatally through six months postpartum.

The EMPOWER+ care model was designed to provide care to the dyad in the context of a family medicine clinic with a dedicated physician who could serve both parent and child for primary care and SUD treatment needs after six months postpartum. The family medicine clinic physician would provide care to the participants and a care coordinator would provide appointment scheduling and support. Both would collaborate with the newborn hospitalist program director who provided the connection between EMPOWER and EMPOWER+ and connection to the labor and delivery unit at the hospital. In addition to required C4SEN program services, this program also planned to provide parenting and mental health support through a social worker-led Mothering from the Inside Out (MIO) curriculum. Additionally, EMPOWER+ planned to partner with local early intervention (EI) providers to facilitate early introductions between caregivers and EI staff in addition to referrals.

Model Changes

Due to a severe shortage of social workers in the region, the program was unable to hire for the planned social worker position and had to eliminate the planned MIO course from the program. The program director was able to create a partnership with Community Legal Aid with the funds that had been budgeted for MIO, which helped to address participants' health-related social needs (HRSN). This addition to the program provided important support to many participants and was eventually extended to the entire patient population of the family medicine clinic. After delays in hiring due to administrative requirements and staffing shortages, a coordinator was hired but left the position after only a few months. The dedicated family medicine physician left the program partway through, leading to a transition of the patients to the resident panel within the family medicine clinic, under supervision of one of the attendings.

Staffing

The original design of the program used a staffing model with the program director/newborn hospitalist (0.1 FTE) making connections with families when they were on the labor and delivery floor and completing EI referrals; the program coordinator (0.5 FTE) providing scheduling and care coordination services as well as liaising with the EMPOWER program team; the family medicine physician (0.1 FTE) providing the health care services including physicals, sick visits, developmental assessments, and prescribing of medication for opioid use disorder (MOUD); and the social worker (0.5 FTE) providing the MIO educational sessions. The program was initially operated with all

roles except the social worker. Ultimately, after numerous staffing changes the family medicine residents and their supervising attending provided health care services, the program director/newborn hospitalist provided program data analysis in addition to the planned roles on the labor and delivery floor, and a local medical-legal partnership (MLP) devoted some time to address HRSN. Towards the end of program implementation, one of the EMPOWER doulas shifted to the EMPOWER+ program and provided some program and care coordinator services.

Program Implementation Themes

The EMPOWER+ program created a MLP in their program that eventually served all patients of the family medicine clinic.[xvi] This was a successful pivot after they were not able to hire a social worker to teach the MIO curriculum as originally planned. The MLP was able to be quite helpful to families, particularly in addressing housing needs, and physicians in the clinic found it helpful to be able to refer families. Overall, the MLP served 17 families. While the dedicated family medicine provider was present, referring providers reported participants had positive experiences with her care and that being able to recommend a program that had many services under one roof was a significant benefit. In particular, being able to receive prescriptions for MOUD and primary care services saved participants significant travel time in this rural region. Residents in the family medicine clinic enjoyed the opportunity to gain hands-on experience with this patient population. This program also achieved some success in a key program aim of providing care free of stigma and bias by engaging deeply in equity-focused training and learning opportunities. These included training in the Dignity Model[xvii] and a screening of the film *Aftershock* with an accompanying discussion of the Black maternal mortality crisis (See **Part 2, Section 3: Efforts to Address Racial/Ethnic Bias and Equity**).

As noted above, staffing shortages and complications were the primary driver of most of the program's challenges. Having insufficient staffing and working within a family medicine clinic and hospital that were themselves facing staffing challenges limited the program's ability to reach out to participants, recruit additional participants, and provide services. The program director had a hard time maintaining her protected time for the program due to a shortage of newborn hospitalists at the hospital and extremely high clinical time demands. This limited the ability to troubleshoot issues and work as closely as she would have liked with program staff and referral sources to grow and improve the program. It also made the hiring process more difficult as the hospital system was trying to hire for many positions. This meant no social worker could be hired as the shortage in the region was so dire the hospital was without any social workers for a time. It also limited appointment availability in the clinic, which meant sometimes infants could not be rescheduled quickly for well-child visits, leading to delays.

While the structure of the "clinic within a clinic" was a strong program design, some of the logistics of the EMPOWER+ clinic posed challenges. Patients of EMPOWER+ were intended to communicate only with the program coordinator for services, but the hours for this role were limited. The program coordinator also worked remotely for much of the time and then left the program after several months following a medical leave and was therefore not able to form connections to the rest of the family medicine clinic staff, which might have allowed for some cross-training to expand who participants could talk to when calling the clinic. The program director cited a shortage of in-person meetings and more limited interaction during in-person work due to Covid-19 as another source of this disconnect. The dedicated family medicine physician was new to the clinic and also left the program early, which resulted in similar challenges.

These staffing challenges highlight the importance of securing adequate staffing resources both within and surrounding the program so that staff have the time available to devote to the program. In addition, in a program where a single role carries outsized responsibility for the care model, having cross-training or a backup plan where possible can be very helpful in maintaining the level of services in the case of unforeseen staffing changes.

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xvi For more information on the use of medical-legal partnerships in other HPC investment programs, see: Health Care Innovation Spotlight: The Promise of Medical-Legal Partnerships

xvii For more information on the Dignity Model, see: https://organizingengagement.org/models/dignity-model/

Another key challenge for the program was the reluctance of some participants to change their primary care provider to the family medicine clinic. Without this transfer of care, participants could not be considered fully enrolled in the program as the model was based on receiving primary care at the family medicine clinic. In many cases, the prenatal EMPOWER program had helped participants to connect with providers they felt comfortable with and select pediatricians before the EMPOWER+ program launched. In other cases, the reason participants did not want to transfer their care was the distance to the clinic, though participants who did engage with the EMPOWER+ program found having one destination for many services very helpful. The program director felt the EMPOWER staff, which was mostly comprised of doulas, had done an excellent job building relationships with the participants and that their position outside of the traditional health care system likely aided in this trust and relationship building. But this may have complicated the handoff to EMPOWER+, as participants had built a strong bond with the doulas and were less interested in transferring to a different program, and the EMPOWER+ program staff lacked sufficient time to build connections. Over the course of the program, the program director/newborn hospitalist sought to increase the connection with EMPOWER and increase referrals. Bringing in an EMPOWER doula to serve as an EMPOWER+ program coordinator towards the end of the program was helpful in this regard. However, over the course of the program the clinic ended up receiving many of the eligible infants as patients but not the adult caregiver participants due to their choice not to transfer care to the clinic, which limited their ability to provide the full scope of supports. Ensuring close connection to programs or departments serving the same population is an important area of focus when building a new program, as noted in **Part 1, Section 2: Extended Program Services**.

The loss of the family medicine physician both exacerbated the lack of incentive to switch providers and disrupted the provision of services through the program. Following this departure, resident physicians in the clinic rotated through seeing the EMPOWER+ participants, supervised by an attending, though participant availability meant there were often not many individuals scheduled, and schedule changes often had to be accommodated. There was interest in potentially developing one of the residents to be an expert or champion for this population after the program ended as a means to find some kind of sustainability. Residents who stepped in to see the patients were interested in serving this population, but the volume of participants remained low.

Due to the staffing challenges and lack of robust services, some referring providers felt they were not able to recommend the program as readily once the dedicated family medicine physician had left. However, they still saw benefit in participants having a pediatrician who was more familiar with SUD and the needs of SEN and infants.

Covid-19 posed some problems early in the program for in-person visits, which are required for well-child visits and were a central part of the program. It also created some challenges with connection to EI, though the program director/newborn hospitalist was able to maintain a high level of referrals to EI for eligible SEN.

BERKSHIRE MEDICAL CENTER: BERKSHIRE CONNECTIONS

Program Model

Berkshire Medical Center implemented Berkshire Connections, a new program for substance exposed newborns (SEN) and their caregivers. The care model was based on embedding a program manager in three obstetric (OB) offices, one in Pittsfield, one in Lenox, and one in North Adams, for ease of referral and warm handoff to the program. From there, the program staff would provide intensive care coordination services to foster participant access to health care and services. The program planned to partner with a pediatrician, and this partnership would also provide the opportunity for data sharing with the program. Care coordination services would be provided by staff members to participants before or after their scheduled appointments with OB or pediatrics, bringing services to places participants were already attending appointments.

Model Changes

The program ultimately had to limit their co-location to the Pittsfield office until additional staff were hired with other funding and was not able to partner as intended with pediatrics offices. Berkshire Connections staff still relied on warm handoffs from OBs to identify and enroll participants and conducted care coordination work through either these offices or their own times and spaces for appointments and meeting with participants.

Partway through the program, Berkshire Connections implemented a support group for participants. This support group met weekly and included food and childcare for participants. The program sought additional funding for additional staff and service capacity but did not receive or utilize the funding until the final month of program implementation.

Staffing

Berkshire Connections employed a program manager (0.5 FTE), an outreach coordinator (1.0 FTE) who had training as a recovery coach, and a data coordinator (0.05 FTE). There was originally a program administrator role (0.1 FTE), but this person left the organization in December 2022, and the program manager assumed their responsibilities. There had been a medical director associated with the program during the application process, but this person left the organization before contracting was completed. Though the role was not replaced formally, program staff worked to maintain connections with OB leadership, physicians, and midwives. The program model was that both the program manager and outreach coordinator provided care coordination services to participants, with each being assigned primarily to some of the participant panel, while also covering for each other when needs arose in the participants outside of typical hours. The intended model was for the program manager to provide less hands-on care after hiring and onboarding the outreach coordinator but in practice both maintained roles with coordinating care for participants until the additional recovery coach was added to the team. Both also had roles in data collection and reporting.

Program Implementation Themes

This program was one of the first in the cohort to identify the need to provide support services to the fathers and non-birthing parents of the SEN. In many cases, these individuals had also experienced substance use disorder (SUD) and were in need of services in order to be a positive support to the caregivers and SEN. Program staff found that a relapse or continued use by the caregiver's partner/father of the baby could often lead the caregiver to resume use or engage in other negative behaviors. However, staff could not easily provide care coordination services to both partners due to bandwidth constraints and the challenges of navigating situations where the two individuals might have competing needs. Eventually, Berkshire Connections partnered with a local organization to offer recovery coach services for partners of the program's participants.

There was a lack of behavioral health providers in the region, which is in the most rural part of western Massachusetts, complicating program efforts to get caregivers engaged in psychotherapy. The program eventually secured additional funding for a social worker to alleviate this problem.

The program intended to hire a person with lived experience of SUD and parenting for the outreach coordinator role. Initially it was difficult to find someone for the position, but once the outreach coordinator was hired, the program saw significant benefit from the lived experience she brought to the role and felt it was integral to their success.

Berkshire Connections had budgeted for payments to pediatricians' offices to help fund data reporting and coordinating services. However, most pediatricians' offices were too busy to fully engage with the program, and several did not sign the agreements for payment. Most SEN well-child visit data had to be self-reported by participants, as was the case for all C4SEN programs.

The standard preparatory period for programs was three months but the staff of Berkshire Connections extended this period by one month and worked for an additional six months before enrolling their first participant. They felt this additional time was important to make more progress in their referral pathways and hiring, and to generally be more prepared for working with participants. They felt this was critical to their success and was a key learning for them and the program.

Overall, the program became well known within the community and developed a strong reputation including participant referrals through word of mouth and garnering the trust and confidence of local OB providers. Program staff repeatedly went above and beyond for participants and achieved high rates of success in connecting them to services and sustained engagement. They achieved many successes in helping participants enter detox or residential treatment programs or maintain their recovery and keep custody of their infants. They felt their care model of embedding the program in the OB offices was essential as it allowed them to be introduced to patients immediately after OB providers noted their eligibility. They also worked to introduce early intervention (EI) early in participants' program engagement and achieved high rates of success in connecting SEN to EI services relative to overall rates in the program. They encountered challenges with transportation and spent program funds on taxi vouchers to help participants get to appointments. Program staff felt that in the future they wanted to secure their own means of transportation to remove this barrier for participants.

Staff worked to improve the experience and care for these patients in labor and delivery by asking for feedback from participants and having debrief meetings with relevant staff when issues arose. They also arranged proactive meetings to make changes to the hospital's approach to anesthesia and pain management for these patients and to verify hospital breastfeeding policy was clearly communicated. These efforts were combined with hospital and OB trainings on stigma. They also worked with local SUD treatment providers to try to introduce staggered dosing of methadone to help avoid withdrawal symptoms in pregnant participants.

Finally, they counted their support group as a critical component of their success. It was held once a week with childcare, food, and transportation assistance for those who needed it. The group provided an opportunity for participants to connect, share their experiences, and get support from those in similar positions. It provided encouragement and reassurance while offering a unique opportunity for the caregivers to spend time with people going through similar situations, something neither typical parenting groups nor more general recovery groups could provide.

SOUTH SHORE HOSPITAL: SHORE PROGRAM

Program Model

South Shore Hospital implemented an expansion of its existing program, Supporting: Hope – Opportunity – Resilience – Empowerment (SHORE) program which was embedded within the Perinatal Behavioral Health Program (PBHP) at the hospital. The care model consisted of an intake process involving screening by a nurse, an appointment with a provider who could prescribe medications, and a meeting with social workers. Ongoing care with the medication prescriber and behavioral health clinicians within the PBHP—mostly nurse practitioners—were the central features of the care model. In addition, an inpatient care coordinator provided education about what to expect during labor and delivery and immediately postpartum. The expanded model for C4SEN added additional staff, including a doula and peer recovery coach who could provide services in-house, as well as a care manager role to foster connection to services identified during the initial enrollment process.

Model Changes

They made a change to their intake process by having the nurse instead of receptionist staff make the initial calls to participants, allowing for a much more in-depth screening process to take place right away. This change also broke up the initial intake and eased the enrollment process by allowing for more explanation of the program and time for participants' questions. In addition, more screening responsibilities were shifted to the peer and RN and away from behavioral health providers so the providers could focus on using the time in the clinical appointment effectively and the peer and RN could use data and experiences with other participants to address needs more effectively.

The program implemented pregnancy and lactation support groups facilitated by a doula, and a recovery and relapse prevention support group. They funded training for a behavioral health provider to be able to provide eye movement desensitization and reprocessing therapy (EMDR), which is an evidence-based modality for trauma, which was a need and interest of participants in the program.

Staffing

SHORE staffing consisted of an RN Case Manager (0.8 FTE) who worked to provide appropriate care coordination for participants and referral to services for HRSN, an inpatient/peripartum care coordinator (0.25 FTE) who helped prepare participants for the labor and delivery process, a childbirth educator/doula (0.1 FTE) who provided education to participants, ran support groups and supported participants during birth on an as-needed basis. The program also had a program manager (0.2 FTE) who supported staff and oversaw day-to-day operations and data collection. This was in addition to the in-kind support of the behavioral health clinicians who worked within the PBHP and provided their clinical services to participants in the program, including one who initially served as the award manager for the program. During the program they hired a peer recovery coach (0.5 FTE) who provided recovery support to participants. There was turnover in the award manager role on two occasions during the program and a new award manager was designated to handle administration of the grant, with other responsibilities including day-to-day program management given to remaining staff.

Program Implementation Themes

The staff felt the changes they made to their program workflow and care model as a result of the C4SEN grant strengthened the program and expanded its capacity to support participants. The program had some participants go on to work in the recovery space themselves, which was a key indicator of success for the staff.

They felt the program helped the hospital system develop more competence in handling SEN cases and also had a positive impact on stigma through intentional education to nurses and providers. The program implemented strong connections with the anesthesiologists who served the labor and delivery unit to establish appropriate pain management plans for SHORE participants.

Staff noted that the presence of EMDR services in the program was a key success, as it enabled many participants to address trauma that was co-occurring with their substance use disorder (SUD), a common phenomenon. However, they noted the limitations of only having a single provider with training in a single modality, as participants could not receive other modalities or have a choice of therapists.

One key challenge was the large catchment area the program served. It was located in an area where multiple counties and service areas for other systems, especially the Department of Children and Families (DCF), overlap. In addition, there were few other programs or resources in the area, so participants often had to travel significant distances to reach the SHORE program, and the program had to collaborate with a larger number of partners to coordinate care for participants. The program staff felt this most acutely with DCF offices as each had different staff they needed to develop relationships with and slightly different procedures for handling cases. This engagement was often intensive in order to address the needs of participants who were going through DCF assessment or investigation processes. More on this work can be found in **Part 1, Section 2: Extended Program Services**.

The team experienced challenges with hiring and staff turnover. Some of this was reflective of larger staffing challenges within the hospital. In addition to direct impacts on SHORE staffing, these hospital-level challenges also reduced staff bandwidth and increased the presence of travel nurses. As a result, staff had less time to interface with SHORE program participants and staff and this created obstacles in SHORE staff's efforts to combat stigma. The increased demands on staff time were also magnified when the maternity ward at nearby Brockton Hospital closed temporarily in February 2023 following an electrical fire in the building, leading to a higher census at South Shore Hospital.

Due to Covid-19, the program had to reduce plans for implementing support groups as they only had small spaces available, and participants were concerned about meeting in-person. It also presented general challenges for the stress on both participants and staff/providers, as well as strain on local organizations providing services participants needed. Staff turnover and challenges with childcare access were also exacerbated. However, staff also felt switching to virtual appointments helped to increase access and decrease barriers to care as they worked across a large catchment area served by many different organizations.

Another challenge for this program was the institution's high level of sensitivity around federal privacy regulations for people with SUD. This made implementing some features such as virtual visits and support groups more challenging. In part, this was a result of the program's focus on SUD patients being a new endeavor for the health system. The PBHP had existed for a number of years, but its director had begun the focus on individuals with SUD only a few years before the C4SEN program.

SOUTHCOAST HEALTH: NEW BEGINNINGS

Program Model

Southcoast Health's New Beginnings program was a new iteration of an existing program. Through the C4SEN funding, they hired additional staff and expanded their offerings. The care model of this new iteration shifted so participants would work with one care coordinator, called a family advocate, for the duration of their time in the program, prenatal to postpartum, as opposed to earlier iterations which had initially offered solely postpartum support and then a model involving a handoff between prenatal and postpartum care coordinators. This family advocate would work with the participant to complete a Plan of Safe Care, connect them to any resources they needed, and to provide social support. Participants would also receive education on what to expect during labor and delivery, as well as with non-pharmacological care for the infant after birth from another staff member. An RN Team Lead primarily supervised the program and the family advocates but served in the family advocate role for a few particularly high-risk participants.

Model Changes

The program's physical location and access to space for visits with participants shifted several times due to Covid-19 restrictions and impacts within the hospital campus where their offices were located. New Beginnings found it necessary to develop and sign memorandums of understanding (MOU) with community partners and care providers they referred to in order to assure participants could access all needed services in a timely manner.

The New Beginnings team adjusted their intake process to make it more in-depth, which allowed them to connect participants to resources more quickly.

Staffing

The New Beginnings staffing model consisted of a program coordinator (1.0 FTE) who facilitated partnerships with community providers and was also the first point of contact for participants, conducting outreach following referrals to explain and introduce the program. Family advocates (two at 0.5 FTE) worked with an assigned panel of participants to provide the care coordination services and wraparound supports, including completion of a Plan of Safe Care. The Inpatient RN Care Coordinator (0.4 FTE) met with all participants to provide education on what to expect at delivery and immediately postpartum. The RN Team Lead (1.0 FTE) managed program operations, provided overall supervision to the team, and offered additional postpartum support to participants as needed.

Program Implementation Themes

New Beginnings program staff reconvened a local committee formed to address the challenges of the opioid crisis. This group was made up of representatives from various organizations serving infants, children, and their families and was called the Substance Exposed Newborns of Southeast Massachusetts (SENSE) Collaborative.[xviii] This group had originally been convened in 2015 and paused meetings during the Covid-19 pandemic. The New Beginnings staff helped restart their meetings, with the New Beginnings Team Lead serving as chair of the SENSE Collaborative. The group met monthly to discuss observed gaps in care and share information, aiming to establish better coordination of care for pregnant and postpartum caregivers and their infants and promote referrals to services. The SENSE

xviii For more information on one of these collaboratives, see: Health Care Innovation Spotlight: Substance Exposed Newborns (SENSE) of Southeast Massachusetts Collaborative

Collaborative helped increase connection and communication between different organizations and providers, and improved care and processes throughout the region.

The program put a strong focus on increasing referrals from local providers and encouraging earlier referrals, seeing notable progress in both areas. In particular, they focused on what they called "missed opportunities" where an obstetrics provider had seen an eligible patient but not made a referral to the program. During the program, these instances decreased significantly. Staff had observed that earlier prenatal engagement was supportive of positive outcomes.

In addition, the program staff felt—and had data to suggest—that participants stayed more engaged in the program for a longer period of time, particularly postpartum, following the shift to the new program model in C4SEN. They attributed this to the relationship-building with the family advocate and the increased continuity in the new program model.

The program had shifted to virtual visits prior to the start of C4SEN due to Covid-19 and also used text messaging for participant contact, which continued during the C4SEN program. Staff felt there were benefits to the opportunity to have a "light touch" and participants were sometimes more responsive via text and more likely to attend virtual visits. However, they also felt that meeting face-to-face could be a better way to assess how participants were doing.

Despite challenges with data collection, particularly given the large participant panel, the program embraced taking a more data-driven approach and used data for process improvements around "missed opportunities," early intervention (EI) referral, and other aspects of the program, as well as sharing data with hospital leadership to help make the case for the program.

Referrals to community-based organizations were an area of challenge for the program, as New Beginnings worked across a large catchment area and many organizations were lacking in staff or resources due to a variety of factors, including the Covid-19 pandemic. Housing, behavioral health care, and EI providers were the biggest challenge areas. Establishing MOUs with some community partners helped New Beginnings obtain a more consistent response time for a referral and standard of care for their participants. However, larger systemic issues made affordable housing for participants difficult to secure and staff felt the participants would benefit from a program-dedicated behavioral health provider to help participants more quickly access a variety of treatment modalities for both substance use disorder and co-occurring diagnoses.

Staff also thought their team was key to the success of the program. They had varying levels and types of experiences which brought diversity to the team, but all shared a deep level of dedication to their participants and the population. They worked closely together and supported each other by collaborating to address participants' needs and to support each other's morale. They also recognized that while their team was local to the community, they were not representative of the racial and ethnic diversity of the community, nor did they include staff with lived experience. Addressing these aspects of their team membership was a goal for future growth of the program and a high priority when the program eventually obtained additional funding.

COHORT-LEVEL IMPLEMENTATION THEMES AND REFLECTIONS

Common themes in program successes and challenges highlight areas where any program serving this population should place focus and attention during implementation. Staffing was a critical factor in the success of programs, with Berkshire Connections highlighting the value of lived experience among staff and New Beginnings noting that this was a dimension they would like to add to their staff, along with increased diversity to reflect the local community. EMPOWER+ and SHORE both reflected on challenges related to staff turnover.

Collaboration and connections outside the programs were other critical areas that emerged. New Beginnings' work with the regional SENSE Collaborative was immensely helpful to their program as was their work to develop stronger referral pathways from local providers. However, they also cited challenges in finding and developing relationships with local community organizations, though they eventually found some success with certain organizations by

documenting clear expectations. Berkshire Connections emphasized being embedded in an obstetrics (OB) office and their strong relationships within the hospital system. The SHORE program worked hard to develop relationships despite the challenge of their catchment area spanning several regions for organizations like the Department of Children and Families and early intervention (EI). EMPOWER+ reflected that a stronger relationship with the EMPOWER program would have been beneficial, but also benefitted greatly from the strong connection to the labor and delivery floor by means of a newborn hospitalist serving as program director and were able to create a successful medical-legal partnership program in the family medicine clinic.

The importance of collaboration points to another key highlight: the expansiveness and comprehensiveness of program offerings. From adding support groups to supporting non-birthing parents, to attempting a one-stop-shop model embedded in a primary care clinic, programs sought to centralize care and support for this population, which helped with engagement and access. This was also reflected in the challenges with behavioral health and transportation access and programs' desires to find new ways to work around obstacles to provide these services.

Relatedly, thoughtful and responsive care model changes, such as those undertaken by SHORE and New Beginnings, helped to clarify staff roles and reduce handoffs for participants, both of which created positive results.

Programs were asked to offer advice to other organizations or teams implementing similar programs. All programs emphasized having the right people and connections to support their program—this included careful hiring and thoughtful work to connect staff, as well as having community partnerships and relationships with relevant providers within the hospital. The Berkshire Connections team felt strongly that being embedded in the OB offices was crucial to their success and recommended it as a model for other programs. They also recognized that supporting participants' family members and partners was crucial to success. They also advised a focus on bringing different organizations and providers together around participants' needs, including working to resolve past negative experiences. EMPOWER+ emphasized building trust with participants, and New Beginnings strongly endorsed early prenatal engagement, while SHORE advised that patients be included in designing support groups or program events. These strategies were all viewed as essential to strong engagement, care management, and care coordination, which was the foundation of these programs.

Program staff were asked to reflect on program activities they would have wanted to approach differently or change. Several mentioned making changes to their data collection practices, training and preparation to improve the data collected. They also reflected on additional data measures they would have liked to collect or data measures they would have liked to analyze in more detail including those on engagement, breastfeeding, immunizations, further EI data, exclusive use of medication for opioid use disorder (with no use of other opioids), and medication that was used to treat infants with neonatal opioid withdrawal syndrome. Programs also reflected on additional staff roles that would have been helpful additions to their teams, including peer recovery coaches, staff with lived experience, behavioral health providers, childcare providers, and doulas. Awardees reflected on a desire for additional training on stigma and bias shared across the cohort to unify the C4SEN programs in their care provision, more time to create a roster of community resources for health-related social needs, and earlier action on establishing agreements with some partners. Based on other experiences and data, they would have preferred to increase their work on EI referrals and receipt of EI services. All noted that a longer preparation period prior to program implementation would have been beneficial (the scheduled preparation period for C4SEN was three months; one awardee, Berkshire Connections, chose to continue preparations into the early implementation period prior to enrolling their first participant).

PART 4:
SUSTAINABILITY OF C4SEN PROGRAMS AND OVERALL CONCLUSIONS

SECTION 1: SUSTAINABILITY

Given the time-limited nature of C4SEN program funding, awardees were encouraged to focus on opportunities to amplify the impact of their program and the funding they received through various sustainment efforts. In some cases, this meant finding ways to continue program operations in full or in part after the end of C4SEN funding. It could also encompass creating changes in culture or practices within the hospital that would continue regardless of whether program operations sustained. Finally, program staff were encouraged to reflect on their experiences of the C4SEN program for insights that might help their program if sustained, and themselves or others doing similar work if it did not.

Sustaining program operations and services

Awardees took a variety of approaches to sustaining or continuing their work and programs beyond C4SEN. Two programs, Berkshire Connections and New Beginnings, applied for and received funding from the Department of Public Health's Bureau of Substance Abuse Services as part of the Moms Do Care program,[xix] which allowed them to expand their programs. These awards were based in part on their demonstrated experience and success during C4SEN funding. One program, SHORE, had to scale back their services to a level that resembled their program prior to C4SEN to accommodate the available funding, which was a combination of philanthropy, hospital budget, and reimbursable services from the behavioral health providers that were a key part of their program. They hoped to also explore additional opportunities for grant funding. And finally, EMPOWER+ sustained some of the collaborations and learnings that emerged during C4SEN, but ceased formal operations when C4SEN funding ended. While there was interest in continuing to include residents in the care of caregiver-infant dyads and building the expertise within the clinic to provide care for these families, there was not a sustainable plan for this by the end of the program due to a lack of clinical leaders to manage it and lack of additional funding.

All these outcomes are reflective of the challenges of creating and sustaining programs focused on complex, cross-sector care that includes care coordination and non-clinical care and supports in a largely fee-for-service health care industry. Particularly given the relatively low levels of reimbursement for behavioral health and addiction services relative to other procedures or services, these models are challenging to sustain with fee-for-service payment. Programs also noted the length and intensity of services necessary to serve this population, which were often not fully appreciated by hospital leadership, who might believe that once a patient was in recovery they could be seen infrequently, whereas the programs knew from experience the importance of continued engagement. Communication with organizational leadership to share the importance of the programs and their impacts was strongly encouraged throughout the C4SEN program and many programs engaged directly with leadership at different levels of the hospital to share their work. This was an important part of building support for either the budgetary allocations or the applications to external funding sources that were essential to continue the programs. These efforts also allowed for continued culture change within the hospitals and cultivation of more champions for the work.

Programs that were continuing, Berkshire Connections and New Beginnings, had plans to expand and add services to their programs that were directly related to their experiences in C4SEN. For New Beginnings, this included adding staff, including an additional family advocate, a social worker, and another staff member with lived experience, enhancing collaboration with early intervention (EI), and securing dedicated physical space for their program in a location away from the hospital campus and more centrally located in one of the cities in their catchment area.

xix For more information on the Moms Do Care program, see: https://www.momsdocare.org/

Their services would also now be available for up to three years postpartum. Berkshire Connections planned to hire a social worker to ensure access to psychotherapy, further expand their team to serve more families, and build out plans to provide program-specific transportation to participants. They also intended to hire a peer recovery coach specifically to serve the fathers or partners of the participants.

Sustaining program practices or impacts

In addition to the formal continuation of these programs or aspects of the services, other aspects of the programs left a lasting impact, through collaborations that were built, and in experiences and lessons attained by the staff. Other impacts across the cohort that resulted from C4SEN led to a shift in the operations or focus of a program while not substantially changing offerings or staffing. The switch to a hybrid model of care, with some appointments occurring virtually or through electronic communication, was a change likely to stay for several programs. A hybrid model allowed for increased flexibility and was viewed positively by the teams. Increased focus on aspects of care for the substance exposed newborns, such as EI and pediatric visits, were cited as an important shift by several programs who felt they had attained new understanding of the efforts needed to facilitate access to infant care. Teams intended to build on C4SEN efforts to ensure infants received this care.

The increased data collection required by the C4SEN program, though at times challenging, was cited as an important experience by several programs and spurred them to continue and refine their data collection efforts after the end of the C4SEN funding period.

While the C4SEN funding that supported doulas in the SHORE program was ending, MassHealth began reimbursing for doula services a short time after the end of the C4SEN program.[xx] SHORE staff expressed an intent to work with patients to secure doula support through their insurance coverage for those who qualified.

While many aspects of the EMPOWER+ program had to cease, improved EI referral processes, health-related social needs (HRSN) screening on the labor and delivery unit, and dyad-based care in the family medicine office were in place with plans to continue these practices.

All programs intended to continue the partnerships and collaborations they developed during the C4SEN program. While EMPOWER+ was ending, there was a plan to continue collaboration with the medical-legal partnership (MLP) through the family medicine clinic where the program was based, though it would shift to virtual referrals rather than having MLP staff on site. Other programs pointed to stronger relationships with local Department of Children and Families offices and EI providers, community obstetric (OB) and substance use disorder treatment providers, and community-based organizations.

The training and education provided to program staff as a result of C4SEN funding was a key element that would have a sustained impact on care. One program sent a behavioral health provider for eye movement desensitization and reprocessing training, and all programs completed trainings on combating stigma and racial bias. Several also had done work to increase use of best practices including reducing missed referrals from OB providers or universally screening for HRSN. These changes to care workflows would remain in place.

SECTION 2: CONCLUSIONS FROM THE PROGRAM

Program staff insights

Teams felt their work had a significant impact on care for pregnant individuals with substance use disorder (SUD) in their communities and there was a sense that some changes, including increased awareness of the issue and need for specialized services for the population, were going to continue. They also pointed to the need and demand for program services, as well as positive participant experiences and word-of-mouth referrals, to illustrate the staying power of these programs within their communities. Overall, they felt the quality and patient-centeredness of care

xx For announcement of MassHealth doula coverage, see: https://www.mass.gov/news/masshealth-announces-coverage-of-doula-services

had improved through the C4SEN program and that many of the changes would be sustained, thanks in part to these improved experiences and outcomes.

Awardees reflected on some key learnings about effective engagement, including having multiple opportunities for participants to hear about their program and/or multiple people endorsing their program, conducting consistent outreach, distributing information about their program, providing education about referrals to organizations other than obstetrics (OB) offices, and allowing self-referral (for more on participant engagement, see **Part 2, Section 1: Engagement**).

When asked about policy changes that would help their programs succeed or make them easier to implement and manage, program staff cited the policy changes around the 51A reporting process that were subsequently implemented (see **Part 1, Section 2: Extended Program Services**), funding support or improved reimbursement for program services, housing support specifically designed for people who are both parenting and in recovery, more long-acting medication for opioid use disorder (MOUD) access, and the ability for patients to more easily access MOUD while inpatient, as some participants had to leave the hospital in order to receive doses. Universal substance use screening in clinical guidelines was also cited as a key policy change, as programs felt that encouraging this practice had an impact on their health systems, but they were not able to achieve full universal uptake. They also felt it would decrease stigma.

Evaluation conclusions

Overall programs achieved success with the required elements of the C4SEN program. Programs achieved high rates of MOUD use and C4SEN hospitals achieved a higher rate of exclusive MOUD use than non-C4SEN hospitals that was statistically significant. While rates of psychotherapy participation were lower, programs made efforts to connect patients and ultimately over two-thirds of participants received psychotherapy care. There were high rates of early intervention (EI) referrals, though participant hesitancy contributed to lower than hoped for levels of EI visit completion. Well-child visit attendance was high overall and was higher compared to the rate reported in the literature. Health-related social needs were prevalent and in some cases were difficult to address but program staff worked hard and were able to support participants with an enormous range of needs.

Programs also surfaced areas not addressed by the C4SEN program design that are key considerations for this population. These included support for a wider range of individuals outside the targeted population for C4SEN, especially non-birthing parents. In addition, support for breastfeeding and pain management in labor had specific considerations for this population, as did intimate partner violence. Offering support groups and parenting supplies were services that were highly valued by participants and staff felt they aided engagement.

Programs devoted significant time to supporting patients through the Department of Children and Families (DCF) process during C4SEN. Recent policy changes in DCF reporting will have a significant impact on programs for this population.

Programs developed strategies for engagement and retention including flexible and nonjudgmental approaches to participants. However, retention especially in the 7–12-month postpartum range was not as strong as was initially hoped, though once a participant remained engaged past six months postpartum retention remained relatively high.

Additional guidance and technical assistance from the Massachusetts Health Policy Commission may have been helpful in increasing awardee capacity and efforts in the area of health equity, and tailoring their programs to enroll and engage a racially and ethnically diverse population. Programs made some successful efforts towards training in equity and reflecting on these issues, but were limited in their application of this work to their program implementation.

Throughout the programs, staff and participants worked incredibly hard and achieved major successes in a number of individual cases. Overall patient satisfaction was high, with 95% of participants who completed a survey indicating

they were "very" or "somewhat" satisfied with the programs, and 81% indicating they were very likely to recommend the programs to a friend. Participants in surveys and interviews spoke to the significant impacts of the programs:

> *The staff. Hands down the best professionals in the field I have ever had the pleasure of working with.* [...] *Since January I have been in a women's safe shelter, started* [recovery coaching] *classes, got my license, got an apartment, and a job in this field myself. I would not have been able to do any one of those things if it wasn't for all of them. They go above and beyond their call of duty and it shows in the progress of myself and others I know that are in the program.* [...] *Whatever their pay, it will never be enough; they are true superhero's in this dark world. I became a Recovery Coach myself because of them, because I hope to become even half the woman they are.*

> *I feel like I can't say enough good things and that never happens. I've never had that. Like I said, I've worked with people and services that are supposed to be there and supportive ... but I really feel like* [the staff are] *actually dedicated to what they do and that makes a big difference.*

Staff also spoke to the enormous positive impacts the programs has had on participants:

> *We've seen a huge difference in moms and the engagement and treatment and the support that we're able to offer them, so I'm hopeful that we'll be able to be doing this for a long time. And there's definitely been, you know, an impact. We've had some moms pregnant on their second or third, you know, child and they're reaching out to us before they even have a chance to meet with the OB provider to say, 'hey, I'm pregnant again, I want to re-enroll.' So I think that says a lot as well.*

> *We've had so many moms that have come into the program that have been really, like, really struggling and in like a really tough place and had such success where they have completely turned their lives around, established sobriety and they have, you know, gotten an apartment, had reunification.*

> *I think every single mom that came into the program and got to leverage any of those resources was, it was huge. I mean, it changed the lives of so many of the moms and families and folks who are part of the program.* [...] *a lot of these moms have gone through a lot right, and they've been doubted, they've been cast off, they've been, you know, just ignored.* [...] *a lot of people in their lives have just lost faith in them. So then to show them that like, you know, we still care*

These testimonies along with the data on the successes of the C4SEN program in fulfilling both the stated requirements and going beyond them to provide patient-centered, heartfelt, high-level and high-impact care, demonstrate the enormous accomplishments of the C4SEN program. Care for pregnant and parenting individuals with SUD and their infants remains an important area of need as the opioid crisis continues. The models and lessons from C4SEN serve as both a demonstration of what is possible for these families with sufficient support and a guide for ongoing efforts. The 433 individuals served by this program all experienced the benefits of nonjudgmental, supportive care and in many cases received support that facilitated improved health and long-term prospects. Further efforts to support this population, including the expansion of comprehensive care coordination and support programs like C4SEN, should continue across the Commonwealth to ensure all families impacted by opioid use disorder can receive this transformative care.

APPENDIX A:
MERCY MEDICAL CENTER

As noted in the **Introduction** of this report, Mercy Medical Center's C4SEN program ceased operation in November 2022 with a contract end date in December 2022 due to operational challenges and low enrollment. As a result, this program was not included as part of the main analyses of the evaluation report. A brief summary of this program based on available data through the end of the awardee's contract is presented below.

PROGRAM DESIGN AND CARE MODEL

Mercy Medical Center originally proposed a program called Mothers and Newborns' Treatment and Recovery Alignment (MANTRA) aimed at increasing cross-disciplinary collaboration and care coordination for pregnant individuals with substance use disorder (SUD) and their infants. This proposed program was designed to focus on the care and services already present in the health system for this population. It was centered on a software tool which would allow providers from different departments and care settings within the Mercy Medical Center system to document and share relevant information enabling increased care coordination. The proposed program also included a committee of representatives from relevant departments and service lines convene and collaborate to design and improve care coordination processes for these participants within the system as part of the program model.

CARE MODEL CHANGES

The program team ended up having to make significant changes to the proposed model. Due to contractual and budgetary challenges, the care coordination software could not be implemented. In addition, Mercy Medical Center sold its behavioral health provider in February 2021, removing a key stakeholder, referral source, and care provider from the originally proposed model. To adjust to these circumstances the program created a care coordinator role, which was the only dedicated staff role for the program. This care coordinator took on a role similar to that of participant-facing staff in other C4SEN programs, using the electronic health record (EHR) to identify potentially eligible participants, receiving referrals, enrolling participants in the program, coordinating care and referrals to appropriate supports and services, supporting participants in the Department of Children and Families (DCF) process and ensuring infants received referrals to early intervention (EI).

In the fall of 2022, the care coordinator accepted a new position outside of Mercy. Mercy Medical Center attempted to find an alternate staffing arrangement in order to proceed with the MANTRA program but were unable to determine a model sufficient to meet the Massachusetts Health Policy Commission's provisions for maintenance of a C4SEN program. It was therefore determined that the MANTRA program would cease participant-facing operations as of November 11, 2022, and that Mercy Medical Center's contract for the program would terminate as of December 31, 2022. The investment director and other staff who had been involved in the steering committee worked to complete close-out activities for the program.

STAFFING

In addition to the care coordinator staff role (0.25 FTE), and award manager (0.15 FTE during planning period and 0.1 FTE during implementation), Mercy Medical Center utilized C4SEN program funds to support dedicated time for a steering committee to support the program, with members ranging from 0.025 FTE to 0.1 FTE. This group was comprised of clinical team members from behavioral health, pediatrics, labor and delivery, and addiction medicine, as well as technological and informatic support from another member of the medical center staff. They also protected time for the behavioral health clinician to provide training to providers across the system regarding culturally sensitive

and non-stigmatizing care for individuals with SUD. They additionally funded a liaison role for a staff member from a local family support services organization (0.05 FTE) as well as the typically required investment director (0.05 FTE) and financial designee (0.025 FTE).

PROGRAM IMPLEMENTATION THEMES

Due to the missing connection with the health systems' behavioral health provider following its sale, the high likelihood of pregnant individuals with SUD seeking care at another nearby hospital, and high proportion of eligible individuals declining enrollment, Mercy Medical Center's MANTRA program faced significant challenges with enrollment. Many of those who declined were stably engaged in recovery and felt they did not need additional services. Although the program identified or received referrals for 41 individuals, of whom 39 were eligible, the program enrolled six participants. Support in navigating the DCF process and addressing health related social needs (HRSN) were significant foci of the program's internal support services. This was because a high proportion of enrolled participants were already engaged in active recovery and connected to medication for opioid use disorder (MOUD) services, and MOUD providers in the program's geographic area tended to provide psychotherapy and other support services as well. The program was largely referral-based, pointing participants to other parts of the hospital system or external providers for services. The presence of a community health worker program within Mercy Medical Center meant the MANTRA care coordinator could refer participants for help in addressing HRSN.

The MANTRA program had a high level of participants with alcohol use disorder, which posed some challenges as it meant program services for opioid use disorder were not always relevant to these participants. The care coordinator worked to build relationships with local alcohol detoxification facilities to support these participants if needed. The nature of the program as referral-based, the high level of services already provided and stability in recovery of participants, and the extensive changes that had to be made to the original technology-based program model all contributed to challenges for the program.

Despite these significant challenges for the time the MANTRA program was operational, it was able to provide meaningful supportive services to participants and the program's implementation surfaced themes similar to other C4SEN programs. This included intimate partner violence emerging as an issue with which some participants needed support. Similarly to other programs, many services were offered virtually, which participants enjoyed for the flexibility, but the care coordinator noted challenges with obtaining documents such as signed information release forms from participants when conducting virtual appointments. The care coordinator felt that adding program staff with lived experience would have been beneficial. The program staff also spoke to challenges in educating providers on the referral process for eligible participants. However, this was likely exacerbated at Mercy relative to other sites due to an overall low volume of patients eligible for and interested in a referral. In alignment with reports from staff in other programs, the care coordinator highlighted the need for providing detailed explanation of program services, flexibility, transparency, and a nonjudgmental approach.

The MANTRA program also noted themes that were specific to its context and experiences, including the issue of the rate of false positives for fentanyl on urine toxicology tests (described in some sources in the literature at rates as high as 14.3%).[51] On one occasion when this occurred, the care coordinator was able to support a participant through the process of repeat testing to ensure the screening was reported accurately, and the participant was grateful for the trust and nonjudgmental approach of the care coordinator.

The clinical care coordinator noted that more outpatient care providers, such as primary care and obstetrics should have embedded behavioral health providers in their offices, as it was challenging to ask these providers to conduct mental health screenings when no immediate remedy could be offered for positive screenings. They also noted some challenges with the configuration of their institution's EHR, which made the patient identification and referral processes and collection of patient race and ethnicity data more challenging.

Despite attempts to implement broad training programs for providers within the health system, particularly to address stigma and bias, scheduling was difficult, and interest was often low regarding trainings that were not required by the system or other institutions such as the licensing board. One additional unique aspect of the MANTRA program is that the care coordinator provided support to several individuals with SUD who either experienced a miscarriage or made the decision to terminate a pregnancy, even though they were not eligible for formal enrollment in the program. The care coordinator noted that these individuals were likely to experience a wide variety of emotions around these events and that they could lead to a potentially increased risk of overdose particularly in the absence of emotional support. The care coordinator was able, in her capacity as a clinical social worker, to provide some support to these individuals despite them not being fully enrolled in the program.

PROGRAM DATA

Data from this program is extremely limited due to the very small enrollment size. This leads to a high likelihood of small variations or outliers affecting the data and thus it is not possible to make statistical comparisons. In general, the program performed similarly on well-child visit attendance to other programs, with a somewhat lower EI referral rate. All enrolled participants were engaged in MOUD at enrollment. The rate of participant attendance at visits was higher than other C4SEN programs, and 5 of six enrollees screened positive for unmet HRSN. Overall retention in the program was also comparable to other C4SEN programs. Due to the early termination of the program, no participants from the MANTRA program engaged in patient experience surveys or interviews and program staff interviews were not conducted.

POST-PROGRAM INSIGHTS AND SUSTAINMENT

Although the care coordinator departed, the role was not filled, and the program ended, remaining staff who had been involved in the MANTRA steering committee felt that there would nevertheless be some lasting impacts from the program's presence. Through the program, education on perinatal SUD and substance-exposed newborns had been provided to the leadership and staff of the labor and delivery unit. Steering committee members felt that this increased awareness of the need for supportive services would lead to continuing referrals to the social work department, addiction medicine, or peer recovery coaches within the system depending on a patient's needs. The staff also felt that the educational effort to increase training on services available within the system to support this population, non-stigmatizing approaches to discussing SUD, cultural sensitivity, and implicit bias were likely to continue past the program's endpoint, due in large part to the connections forged through the steering committee. In addition, as part of the program a training on the 51A process had been implemented for social workers in the hospital who typically filed these reports. The training included a question-and-answer session with a staff member from a local DCF office, helped social work staff develop a deeper understanding of the process and learn best practices for filing the reports. Although, as noted in the body of this report, recent policy change stipulating that exposure solely to MOUD no longer necessitates the filing of a 51A, there are nevertheless other patients who may continue to have 51A reports filed and they are likely to benefit from the education for the social workers that resulted as part of C4SEN.

APPENDIX B:
EVALUATION METHODOLOGY

OVERVIEW

The C4SEN investment program evaluation was developed based on the aims of the C4SEN program, an adapted evaluation framework in use by the Massachusetts Health Policy Commission (HPC), and a logic model based on the stated goals of the program. The HPC conducted a mixed-methods evaluation of the C4SEN program consisting of several categorized sources of data with multiple components. Patient experience data was collected from enrolled participants by a contractor and consisted of quantitative survey data and qualitative interview data. Staff experience/implementation data was collected by the HPC. This consisted of qualitative data in the form of quarterly written deliverables called program updates in which staff of C4SEN programs responded to questions and prompts developed by the HPC, and semi-structured interviews with both funded staff members of C4SEN programs and non-funded staff who referred participants to the programs. Interviews were conducted by the HPC in June and July 2023, at the end of program implementation. Finally, implementation and outcomes data also included quantitative data which was collected by staff of the programs on participants from either program records, participant report, or the electronic health record and reported via templates designed by the HPC. Most measures were set and defined by the HPC, though each awardee was asked to select three measures of their choosing to track specific to their program. More details on each category of data which informed this evaluation report can be found below.

Employing a mixed-methods evaluation was important to convey the full scope of the evaluation's goals, including key insights from the implementation and the experiences of staff and participants that may inform future programs or research. Additionally, recognizing the importance of ensuring improvements in care delivery transformation centering the lived experiences of enrolled patients, the HPC employed a robust patient experience evaluation that included qualitative data and sought reviewers with lived experience to provide feedback on portions of the evaluation report so that this evaluation could include patient voice as directly as possible.

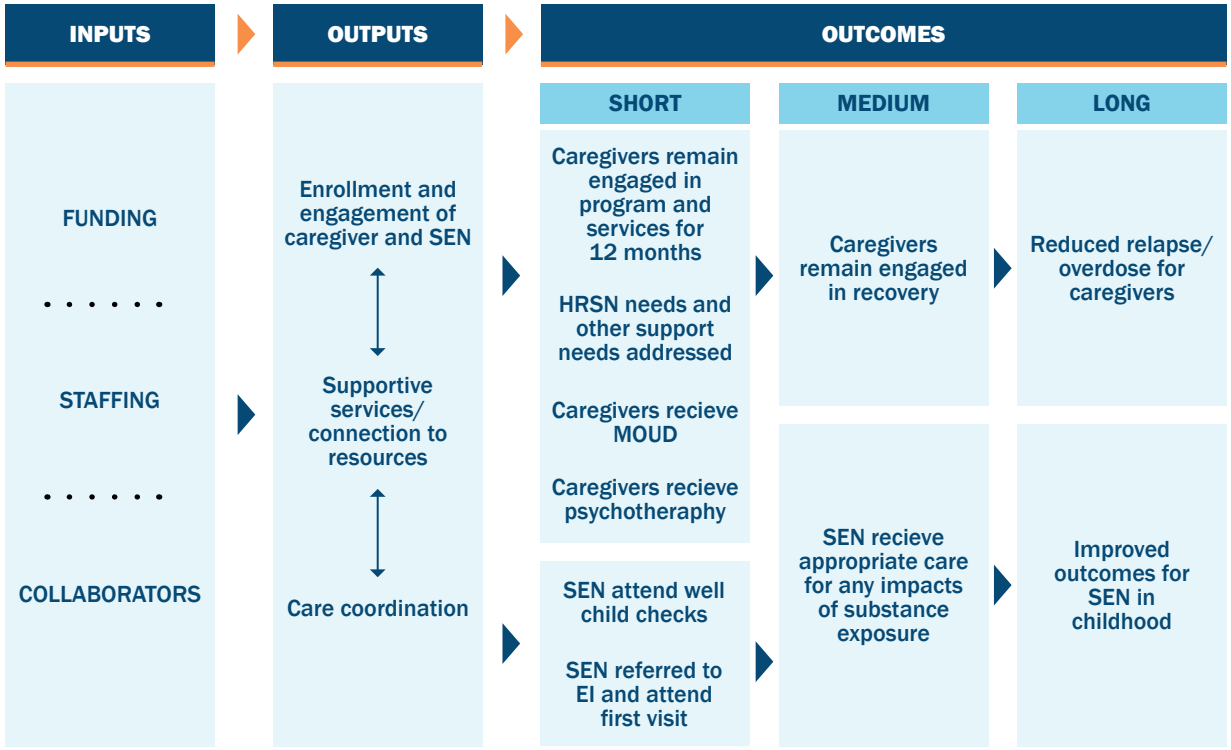
FRAMEWORK, LOGIC MODEL, AND EVALUATION QUESTIONS

All evaluations by the HPC seek to ensure accountability for the provided funding, and to assess the impact of the investment program. To those ends, a broad framework of objectives for the evaluation was outlined as follows:

- Surface important lessons learned in the implementation of the C4SEN program
- Determine the extent to which awardees achieved program goals and the impact of the C4SEN program on participant outcomes, including inferences based on literature on long-term outcomes for substance-exposed newborns (SEN)
- Document any sustained changes to hospital workflows, care for this population, or provider knowledge/attitudes due to the C4SEN program

Building from this framework, the evaluation plan for C4SEN was created in direct response to the investment program aims, requirements, and purpose as stated in the Request for Proposals.[46] Based on the investment program's structure—providing funding for staff and collaborating organizations to provide care coordination of health care services such as behavioral health and medication for opioid use disorder (MOUD) and supportive services with the intent to improve the health and outcomes of the SEN-caregiver dyad — the logic model shown in **Exhibit 11** was created:

Exhibit 11. C4SEN Evaluation Logic Model



In order to ascertain if the elements of the logic model were implemented and functioned as intended with concrete evidence of the short- and medium-term outcomes, as well as indicators of the potential realization of the long-term outcomes, and to assess each program's performance against the stated aims and requirements, the following evaluation questions were developed:

a. Was the program implemented as designed/intended?

- **i.** Was the program design aligned with the needs of pregnant individuals with a history of substance use disorder and their infants?
- **ii.** Was the program design not well aligned with the needs of any subpopulations? Was the program design particularly well aligned with the needs of any subpopulations?

b. Did awardees make any significant modifications to the program implementation based on circumstances present during implementation?

- **i.** Did awardees make significant modifications to the program implementation or was the implementation otherwise impacted by known challenges such as: the Covid-19 pandemic and public health/policy response to the pandemic, and/or workforce shortages?

c. Did the program reach the intended target population?

- **i.** Did awardees ensure broad outreach and demonstrate cultural humility to enroll and engage a diverse patient population?
- **ii.** Are there populations related to or adjacent to the target population who may have benefitted from this program or similar services but were not eligible to receive program services or to be included in program data?

d. Did the program produce or contribute to the required and intended impacts/outcomes?

- **i.** Did awardees maintain engagement of caregivers for a minimum of 12 months following birth?
- **ii.** Were those who left the program prior to completion substantively different from those who remained enrolled until graduation?
- **iii.** Did awardees ensure appropriate connection to early intervention (EI) for SEN?
- **iv.** Did awardees ensure attendance at well-child checks for SEN?
- **v.** Did awardees successfully engage caregivers in MOUD when appropriate and appropriate psychotherapy treatment?
- **vi.** Did awardees screen for health-related social needs (HRSN) and address needs?
- **vii.** Did awardees successfully engage and partner with obstetricians, primary care, pediatrics, MOUD providers, EI providers, and other relevant community-based organizations to coordinate care and meet the needs of participants?
- **viii.** Did awardees provide a positive patient experience that was free of stigma, bias, and discrimination?
- **ix.** Did the services awardees provided to participants create impacts with the potential to improve long-term outcomes for SEN, caregivers, and families?
- **x.** Were participants satisfied with the program? Did participants find the program valuable?

e. Did the practices and services implemented in the C4SEN program create lasting changes within the awardees' organizations or within their collaborators' organizations?

f. Did any of the practices or services implemented in the C4SEN program persist beyond the funding period of the program?

g. Did any changes in the approach, culture, knowledge, or attitudes of program staff or associated clinicians occur as a result of the program?

Program data collection was designed around these questions to attempt to address each question with data collected from the programs, and, where possible, to collect data of multiple types or sources to address each question.

PATIENT EXPERIENCE DATA

An evaluation of patient experience was an essential component of the C4SEN program evaluation. Key aims of the C4SEN program included care that was free of sigma, bias, and discrimination, which could only be assessed via the participant's perception of their care. In addition, understanding participants' perceptions of the benefits, strengths, and weaknesses of a program is essential to understanding if it was effective and how it could be improved. Gathering this information directly from the participants themselves was especially important given the marginalization of individuals with substance use disorder, particularly those who experience pregnancy while living with substance use disorder (SUD) or in recovery.

The HPC contracted with JSI Research and Training Institute, Inc. (JSI) for the collection, analysis, and reporting of patient experience data.

The patient experience evaluation employed a mixed-method approach, using both quantitative and qualitative methods. There were two main activities:

1. An electronic survey with caregivers participating in the C4SEN program to assess their satisfaction with the programs and experiences of discrimination;
2. One-on-one interviews with caregivers participating in the C4SEN program to provide additional context to the survey and measure the impact of C4SEN programs.

The original project protocol and all modifications were approved by the JSI Institutional Review Board (IRB) as the IRB of record and South Shore IRB. Three hospitals (Baystate Franklin Medical Center, Berkshire Medical Center, and Southcoast Health) signed IRB Authorization Agreements to use a single IRB (JSI), and one hospital–South Shore Hospital–decided to use its own IRB. While the study team originally received approval from Mercy Medical Center's IRB, their C4SEN program was discontinued before data collection began and therefore is not included in this report. **Exhibit 12** provides detailed information on the IRB activities and data collection timeline.

Exhibit 12. Timeline of IRB Activities and Initiation of Data Collection

ORGANIZATION	IRB APPROVAL	OUTCOME OF APPROVAL	BEGAN DATA COLLECTION
JSI	6/6/22	Initial approval of study protocol to send to hospitals for review	N/A
JSI	7/8/22	Approval of amended consent documents required by South Shore	N/A
JSI	8/8/22	Approval of hospital-recommended changes and fully-designed and translated study materials	N/A
Berkshire Medical Center	8/19/22	Fully executed IRB Authorization Agreement	11/4/22*
Southcoast Health	9/29/22	Fully executed IRB Authorization Agreement	9/30/22
South Shore Hospital	10/21/22	South Shore IRB approval	11/4/22
Baystate Franklin Medical Center	12/19/22	Fully executed IRB Authorization Agreement	1/3/23*

Source: JSI records

*__Note:__ Berkshire Medical Center did not have participants eligible for the patient experience evaluation until November; Baystate Franklin Medical Center experienced staff turnover in key positions that delayed IRB review and initiation of data collection.

Recruitment Methods

JSI used a multi-stage, multi-modal method of recruitment for participants, as described in detail below. Training and scripts were provided to each program site to ensure consistency in methods and language across caregivers and sites. The study team allowed for some flexibility in how participants were contacted (e.g., text, email, patient portal) given differences in program site policies and the already established mode of communication between program staff and caregivers. All recruitment materials were provided in English and Spanish, as program staff identified these as the primary language needs.

The following steps detail the recruitment methods:

Step 1: Permission to Contact. At the caregiver's six-month postpartum visit with the C4SEN program,[xxi] program staff provided an electronic "Permission to Contact" form (PTC) via tablet (in-person visits) or via electronic link (virtual visits). The PTC form included a brief summary of the study and caregivers had the option to indicate if they were willing to be contacted regarding the survey and/or the interview. If willing, caregivers provided their telephone number and/or email address, and their information was provided directly to JSI. Program staff did not know if caregivers provided permission to be contacted. The contact information was only used to send a follow-up thank you message, survey reminders, and subsequent invitations to participate in an interview.

xxi One program completed this step at a 7-month postpartum visit.

Step 2: Patient Experience Survey Administration. At the end of the caregiver's nine-month postpartum visit, program staff informed caregivers of the opportunity to participate in the patient experience survey and provided the materials to complete the survey (tablet or survey link, depending on in-person or virtual visit). Program staff then left the room/virtual visit to give caregivers the opportunity to complete the survey confidentially. Program staff also gave the caregiver a postcard with a quick response (QR) code (or a link sent via text or email immediately after virtual visits, depending on caregiver's preferred mode of contact). Providing the survey in coordination with a caregiver visit gave all caregivers the opportunity to participate regardless of whether they provided JSI with permission to contact them directly.

Step 3: Follow-Up Survey Reminder. JSI followed up with one text/email at 9.5 months postpartum with a reminder to complete the survey. This reminder went to all caregivers who provided permission to be contacted (Step 1) and had the added benefit of including any caregivers who were no longer involved with a program at nine months postpartum. The reminder message was specifically worded to avoid confusion or duplication if the caregiver had missed their monthly visit with clinical staff or already completed the survey. For those who had not yet completed the survey, one final reminder was provided at 10 months postpartum.

Step 4: Outreach and Screener for Interview. JSI sent a text/email at 10 months postpartum inviting caregivers to participate in the interviews. This invitation was sent to all caregivers who gave permission to be contacted, and included those still involved with C4SEN at 10 months postpartum as well as those who may have left a program early. The invitation provided a brief description of the project, information on interview activities and incentives, and contact information for questions or additional details. It also asked the caregiver to complete a screener if interested in participating. The screener included questions about how long they had been involved in their program, at which hospital site they were participating, number of previous births, their age, race, and ethnicity. While this was originally intended as a method of ensuring representation across hospital sites and a racially diverse sample, delays and lower than expected recruitment meant that the study team ultimately used these data to better understand the sample of interview participants.

Step 5: Schedule Interviews. JSI reached out to eligible caregivers to schedule virtual or telephone interviews when caregivers were about 11 months postpartum. While an in-person interview was a possibility, all caregivers were able to complete the interview by telephone. Caregivers were eligible to participate regardless of whether or not they completed the survey.

Due to lower-than-expected participation in the survey and delays in data collection initiation, recruitment methods evolved throughout the study. In February 2023, the study team added an opportunity to take the survey, if caregivers had not already done so, at the end of completing the one-on-one interview. This was offered for caregivers to either complete verbally with the interviewer or on their own via a link provided. This extended survey recruitment to those that were 11-12 months postpartum. In August 2023, the study team introduced supplementary recruitment activities conducted by program staff. Program staff were given a script and the option to reach out directly to their patients in October 2023 and December 2023 to inform them of the opportunity to participate in the C4SEN Patient Experience Evaluation. This supplemental recruitment activity opened eligibility to all caregivers who were 4-18 months postpartum at that time. Recognizing the level of effort involved with this activity and the strained capacity of all program site staff, this recruitment activity was presented as optional. However, all sites chose to participate in this additional recruitment activity.

Data Collection and Analysis

Survey

The electronic survey was administered via a tablet (provided by study staff), postcard with QR code, or hyperlink in an email or text message. The survey measured client satisfaction and experiences of discrimination using two validated instruments.

- **Client Satisfaction Questionnaire (CSQ-8).** The eight-item CSQ measures satisfaction with services received by individuals and families. The scale has been broadly adopted and the validity and reliability of the CSQ-8 as a satisfaction measure is well-established (Cronbach's alpha ranges from 0.83-0.93).[xxxiv]
- **Discrimination in Medical Settings (DMS) Scale.** Based on the Williams Everyday Discrimination Scale.[xxxvi] The DMS Scale was designed to measure routine experiences of discrimination with health care providers and staff. This discrimination scale is multi-item and includes a range of possible experiences. The DMS Scale has been shown to have a single factor solution, and good internal consistency (Cronbach's alpha=0.89-0.85) and test-retest reliability (0.58; $p<0.001$).[xxxv] The study team adapted the language slightly in the DMS scale to ensure valid responses in asking them to reflect specifically on their experiences with the C4SEN program. Specifically, the study team changed question wording from "a doctor or nurse" to "the program staff."

The survey also included demographic questions about race and ethnicity, length of time enrolled in the C4SEN program, and two open-ended questions to provide additional information on experiences of discrimination and satisfaction with the programs. The survey took approximately 15 minutes to complete. It was programmed into Alchemer, an online survey development platform, and was available in English and Spanish. No identifiable personal information was collected; however, caregivers were asked to answer a series of questions—the first letter of their middle name, the first letter of their parent's first name, and month they were born—to generate a unique code that was used to help identify and minimize duplicate responses. Caregivers were given information about the survey prior to consenting and received a $20 gift card for their participation. A link at the end of the survey took them to a separate webpage that was not linked to their survey responses so that they could provide their contact information to receive the $20 electronic gift card. Physical gift cards were available, if preferred.

Anonymous responses were recorded in the online platform from which JSI was able to download an SPSS file to complete data monitoring, cleaning, and analysis. Specifically, JSI staff cleaned the survey data by assessing for invalid responses, removing duplicate responses, labeling all variables, and assigning missing values where appropriate. For the analysis, JSI completed the following:

- Ran frequencies of demographic variables, including race, ethnicity, and time enrolled in the program.
- For the CSQ-8 scale: Ran measures of central tendency (mean and standard deviation) for each item; calculated total score across all items for each respondent and reported on measures of central tendency (mean and standard deviation) for the total scale score across all respondents; analyzed total score distributions across groups based on race and time enrolled in program.
- For the DMS scale: Ran measures of central tendency (mean and standard deviation) for each item; calculated total score across all items for each respondent and reported on measures of central tendency (mean and standard deviation) for the total scale score across all respondents; analyzed total score distributions across groups based on race and time enrolled in program.
- Conducted a thematic analysis of open-ended responses related to program satisfaction.

Interview

JSI used a narrative inquiry approach to qualitative data collection, which seeks to understand and then present lived experiences through people's stories. The narrative inquiry semi-structured interview guide included broad questions that asked caregivers to describe their experiences, including when their child was a newborn, significant experiences as part of the C4SEN program, and imagining what it might have been like raising their child without the

C4SEN program. The interviewer also asked caregivers to talk about moments of joy, difficult times, and dreams for the future. The guide also included standardized introductory language for reviewing the informed consent (which was also emailed to participants ahead of the interview). Caregivers were required to provide verbal consent before beginning the recording.

All interviews were conducted virtually. Interviews lasted approximately 60 minutes, which included 15 minutes at the beginning for reviewing the consent and about 45 minutes of discussion. Caregivers received a $50 electronic gift card as a thank you for participating in the interview. Physical gift cards were available, if preferred.

All interviews were recorded (with the caregiver's consent), and transcripts/field notes were entered into qualitative data analysis software (Dedoose).[52] In order to reduce bias, three study staff independently coded a random sample of transcripts and met as a team to discuss codes, come to consensus, and create an agreed-upon codebook. Coders remained open to the emergence of new codes as two study staff independently coded the remainder of the interviews. Study staff routinely met as a team to iteratively build the codebook.

Once coding was complete, the team reviewed code frequency, considering the number of interviews in which a particular code was applied. They examined excerpts sharing the same code to identify overarching theme statements, narratives, and representative quotes for each theme. Priority was given to reviewing excerpts for codes that were mentioned in at least four interviews. Narratives included subthemes, perspectives, or examples mentioned by fewer than four interviewees when they provided additional context for the theme. Identified themes were organized into an overall framework and triangulated with the survey results.

Each theme included in the report was categorized as "very strong", "strong" or "moderate" based upon the number of interviewees that mentioned it. Weak themes were not included in the report, with the exception of program challenges. A couple of program challenge themes were noted to facilitate quality improvement opportunities. Theme narratives included language to indicate the relative strength of the theme. **Exhibit 13** provides a summary of criteria and language used to indicate theme strength.

Exhibit 13. Theme Strength Criteria and Narrative Language

NUMBER OF INTERVIEWS WITH THE CODE	THEME STRENGTH	NARRATIVE LANGUAGE
1-3	Weak	Not included in the report*
4-6	Moderate	Several; Some
7 or more	Strong	Most; Majority
11 or 12	Very Strong	Vast majority
13	Very Strong	All; Every

Source: JSI analysis of patient experience interview data collected from C4SEN participants
*__Note:__ A couple of weak program challenge themes were noted to facilitate quality improvement opportunities.

Response Rate

JSI asked program staff to respond to the following questions at two timepoints (October 2023 and January 2024) to best understand response rates:

1. How many individual patients have you offered the PTC?
2. How many individual patients have you offered the patient experience evaluation survey?
3. How many individual patients have you offered the patient experience evaluation interview opportunity?

The study team specified that in their response staff should only count a patient once within each question regardless of how the opportunity was offered (e.g., tablet versus electronic link), and in January 2024 to only count new patients that were offered the opportunities since the last time numbers were reported (October 2023).

With this information the study team was able to calculate a response rate based on the number of responses to the survey/interview out of the number of caregivers eligible (i.e., those that were offered the opportunity to complete the PTC, survey, and/or interview). **Exhibit 14** provides detailed information on the response rates for each program as well as the overall response rate.

Exhibit 14. Detail on Response Rate by C4SEN Program and Overall

	NEW BEGINNINGS (Southcoast Health)	SHORE (South Shore Hospital)	BERKSHIRE CONNECTIONS (Berkshire Medical Center)	EMPOWER+ (Baystate Franklin Medical Center)	OVERALL
PTC					
Offered	13	13	9	1	36
Responded Affirmatively	6	1	7	0	14
Response Rate	46.2%	7.7%	77.8%	0.0%	38.9%
Survey					
Offered	27	21	9	15	72
Responded	17	3	12	5	37
Response Rate	63.0%	14.3%	133.3%*	33.3%	51.4%
Interview					
Offered	30	17	9	15	71
Responded	5	1	6	1	13
Response Rate	16.7%	5.9%	66.7%	6.7%	18.3%

Source: JSI compilation of C4SEN awardee records

Note: It is suspected that the response rate is above 100% because three surveys were completed with JSI staff after the interview and therefore not offered by Berkshire directly.

Staff Experience/Implementation Data

Written deliverables called Program Updates were developed by the HPC, asking a series of questions on topics related to program implementation. These were completed by program staff and turned in to the HPC on a quarterly basis throughout the implementation of the C4SEN program. Interviews were conducted with staff of C4SEN programs as well as providers within their hospital systems who provided referrals to C4SEN programs. Semi-structured interviews were conducted in June and July of 2023. Questions were developed by the HPC to cover key topics germane to core evaluation questions. Interviews were recorded and transcribed for analysis.

Qualitative data from these deliverables and interviews was thematically analyzed by the HPC using NVIVO software and a codebook developed by the HPC.[53] Qualitative data was further organized by code and summarized to identify key points.

Program Measures

Program measures were created to address the evaluation questions most specifically amendable to quantitative assessment. A list of these measures utilized for this evaluation can be found in **Exhibit 15**, below, along with brief general descriptions of what was measured. All measures were shared across awardees, with the exception of awardee-specific measures, not listed here.

Exhibit 15. List of C4SEN Quantitative Measures

MEASURE CATEGORY	MEASURE NAME	MEASURE DESCRIPTION	STRATIFIED BY
Enrollment Measures	Identified	Number of individuals identified as potentially eligible	Month, Race, Ethnicity
	Referred	Number of individuals referred to a program	Month, Race, Ethnicity
	Eligible	Number of individuals eligible for a program	Month, Race, Ethnicity
	Enrolled	Number of individuals enrolled in a program	Month, Race, Ethnicity
	Re-Enrolled	Number of individuals who left a program and then re-enrolled	Month, Race, Ethnicity
Demographic/ Descriptive Measures	Caregiver Age		N/A
	SEN Enrolled	Number of individual SEN enrolled. SEN were considered enrolled at birth if caregiver enrolled prenatally, otherwise were considered enrolled on same date as caregiver.	N/A
	Children Enrolled	Number of individual children age 7 months-3 years enrolled.	N/A
	SEN Age at Enrollment	Whether SEN was enrolled at birth, 0-3 months, or 4-6 months postpartum	N/A
	SEN Gestational Age at Birth		N/A
	SEN NAS/NOWS diagnosis	Number of individual SEN who met hospital criteria for diagnosis of Neonatal Abstinence Syndrome/Neonatal Opioid Withdrawal Syndrome (NAS/NOWS).	N/A
Engagement/ Retention Measures	Enrollment Stage	Whether participants enrolled in pregnancy, during delivery admission, or postpartum	N/A
	Program Discharge	Mode in which caregivers left a program: Lost to Follow Up, Disenrolled by choice, Continuing with program after 12 months postpartum, or transferring to another source of care	Month, Race, Ethnicity, Enrollment Stage
	Retention	Caregivers remaining engaged in the program at six, nine, 12 months postpartum	Race, Ethnicity, Enrollment Stage
Treatment Measures	MOUD	Caregiver history of MOUD, Current use of MOUD, and Engagement in MOUD by program	Race, Ethnicity
	Psychotherapy	Caregiver history of psychotherapy, Current engagement in psychotherapy, and Engagement in psychotherapy by program	Race, Ethnicity
	MOUD Retention	Caregivers remaining engaged in MOUD treatment at six, nine, 12 months postpartum	Race, Ethnicity
	Psychotherapy Retention	Caregivers remaining engaged in psychotherapy at six, nine, 12 months postpartum	Race, Ethnicity
	EI Referral	Eligible SEN receiving a referral for EI	N/A
	EI First Appointment	Eligible SEN receiving first visit from EI	N/A
Program Service Measures	HRSN	Rates of HRSN screening in program, presence of positive screen for any HRSN, and presence of positive screen for housing, food, transportation needs	N/A
	Appointment Attendance–SEN	SEN attendance at Well-Child Visits in first year of life according to standard schedule	N/A

Data definitions were created to facilitate uniform data collection and reporting and were shared with awardees with the opportunity for feedback and some planned customization based on their program elements. For awardee-specific measures, data definitions were created in collaboration between the HPC and awardees.

The HPC developed a data reporting template in Excel which was shared with awardees in order to facilitate standardized, aggregated, and accurate data reporting. Awardees reported data three times throughout the C4SEN program in April 2022 (covering data from October 2021-March 2022, except for one awardee who submitted data in May 2022 covering data generated from November 2021-April 2022), October 2022 (one awardee submitted in November), and June 2023 (one awardee submitted in July). This reporting cadence was created to balance the administrative burden of data aggregation and reporting against the ability to track the program's progress during implementation. After data submission, the HPC would review data for completeness and accuracy, noting any concerns or errors for awardee review and resubmission. After the end of the C4SEN program (in October or November 2023, depending on the program), awardees resubmitted data for the entire program having reviewed previous data templates to ensure accuracy. This final data submission was also reviewed by the HPC which worked with awardees to make any needed corrections.

Data for comparison was obtained via a request to the Perinatal Neonatal Quality Improvement Network (PNQIN) of Massachusetts staff. This data came from the Perinatal Opioid Project wherein a subset of Massachusetts birthing hospitals voluntarily reports a number of data measures on the births of opioid-exposed newborns. This data is aggregated at the level of the hospital and the hospital is not identified when data is reported or shared. Data was requested for relevant measures on birthing parent demographics, MOUD use, and EI referral that aligned with C4SEN program measures and was requested for the time period of the C4SEN program. Data was segmented and shared in two categories: hospitals that were participating in C4SEN and those that were not. Some data comparisons were made between these two segments of PNQIN data, and some between PNQIN data for non-participating hospitals and C4SEN program data.

The HPC combined program-reported data into one unified data set, with the exception of awardee-selected measures, and analyzed data using Excel. As Mercy Medical Center only submitted the first and second data submission, they are not included in this data set or analysis. See **Appendix A** for a summary of Mercy's data.

Report Development

Based on qualitative codes and program measures, along with the structure of program aims and requirements, a report outline was developed which organized topics and interwove qualitative and quantitative data to guide drafting.

Peer Review

To further advance the HPC's commitment to equitable inclusion of lived experience in program evaluation, and in recognition of the impact of stigma on this C4SEN participant population which may have been conveyed in unconscious ways in this evaluation report or data shared by program staff, the HPC sought the perspective of two individuals with lived experience to review key sections of this evaluation report prior to publication. These individuals provided feedback which contained affirmation that the themes and topics discussed resonated with their lived experience where relevant and shared no concerns regarding potential for inadvertent SUD stigma in the report contents or language that they reviewed. This process and the feedback were reviewed by several members of the program and evaluation teams and ultimately resulted in no editorial changes to the report. This process allowed for additional inclusion of individuals with lived experience to help shape the understanding of this program as conveyed in this report.

Limitations

It is important to note the limitations of the evaluation findings. The evaluation framework may not have captured all relevant aspects of the C4SEN program or may have lacked nuance. The programs served relatively small samples

of participants and often experienced sizeable numbers of participants lost to follow-up. This evaluation also did not universally employ baseline or comparison group data, and some empirical quantitative data elements had to be collected as participant self-report due to lack of access to data by programs. Analyses of those who did not enroll or who left a program early were not conducted, which may have missed issues relevant to the evaluation. All of these factors impacted the reliability of the data, statistical efficacy, and ability to draw conclusion from the data. Sample sizes for the patient experience components of the evaluation were small and obtained through convenience sampling which may lead to response bias and have impacted the conclusions drawn. In particular, the racial and ethnic diversity of respondents was limited, which likely had significant impacts on responses to questions regarding bias and discrimination.

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