NICHQ
National Institute for Children's Health Quality

Massachusetts's Efforts to Reduce Preterm Birth Rates

A Case Study Developed from NICHQ's Exploring State-Level Strategies to Improve Maternal Health and Birth Outcomes Initiative

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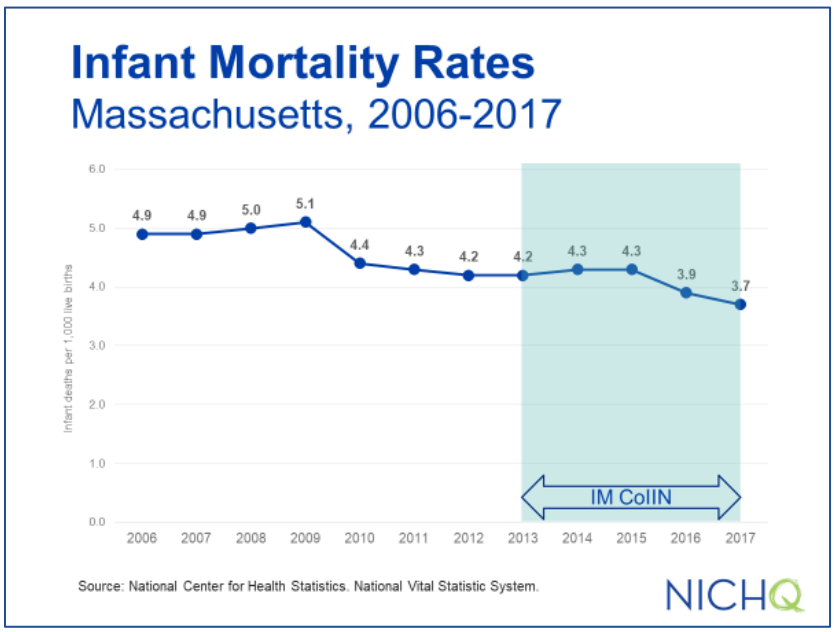
Introduction to Massachusetts

Following the 2013 introduction of the Infant Mortality Collaborative Improvement and Innovation Network (IM CoIIN), Massachusetts launched a series of collaborative and coordinated initiatives to address infant mortality. During participation in the Massachusetts IM CoIIN beginning in 2014, the state used a systemwide lens to address racial inequities in infant mortality and preterm birth with statewide programming, changes in state laws and policies, and increased perinatal data collection.

Case Study Background

As the birthplace of the American Revolution, Massachusetts has a proud history of championing progressive causes — in this spirit, the Commonwealth leads the nation in healthcare innovation. Two top-ranked academic medical centers, Massachusetts General Hospital and Brigham and Women's Hospital, both teaching institutions of Harvard Medical School in Boston, are national leaders in research and dissemination of clinical best practices in obstetrics.

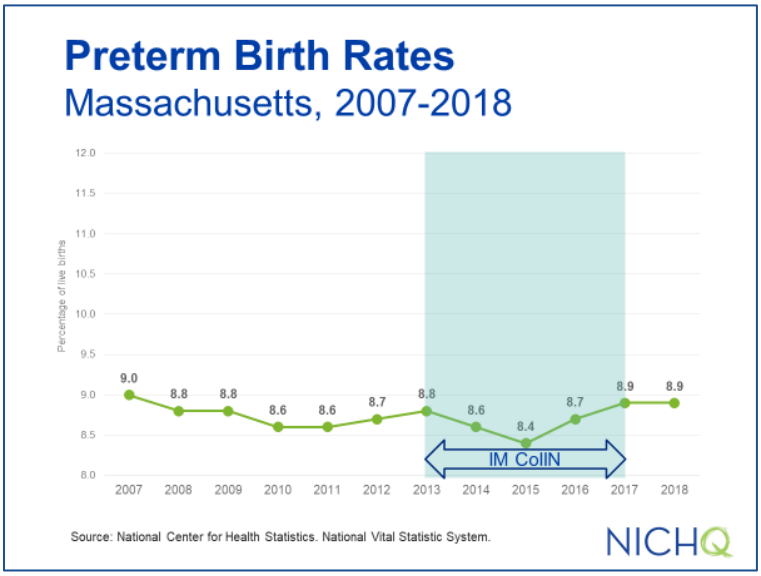
Massachusetts entered IM CoIIN with a wealth of advantages: the Commonwealth has nearly universal health coverage for all residents and a long-running status as one of the healthiest states in the nation.[1,2] When IM CoIIN began in 2013, Massachusetts's infant mortality rate was 4.2 per 1,000 live births and decreased to 3.7 per 1,000 live births in 2017.[3] The preterm birth rate (percent of live births before 37 weeks gestation) stayed relatively stable, rising slightly from 8.8% in 2013 to 8.9% in 2017.[4] These are both lower than the United States overall,



where infant mortality in 2017 was 5.8 births per 1,000 live births, and preterm birth was 9.9 % of live births.[5,6]

As in the rest of the country, Black mothers in Massachusetts experienced a disproportionately high burden of infant mortality as compared to white or Asian mothers. Infants born to Black mothers in Massachusetts had a mortality rate of 7.8 per 1,000 live births in 2013, decreasing to 6.8 per 1,000 live births in 2017.[1] By contrast, infants born to white mothers had a mortality rate of 3.7 per 1,000 live births in 2013, decreasing to 3.2 per 1,000 live births in 2017.[1] Asian mothers in Massachusetts experienced the lowest rates of infant mortality, with 3.2 per 1,000 live births in 2013, decreasing to 2.7 per 1,000 live births in 2017.[1]

Preterm birth follows similar racial trends in Massachusetts: Between 2013-2015, Black mothers had a preterm birth rate of 10.4% compared to white mothers, whose preterm birth rate was 8.4%, and Asian mothers, whose preterm birth rate was 7.8 percent.[2] Between 2015-2017, preterm birth rates rose for Black mothers to 10.8 per 1,000 live births, fell slightly for white mothers to 8.3 per 1,000 live births, widening the disparity.[2]



Population Characteristics

With 6.9 million residents tucked into just 7,800 square miles, Massachusetts is the third most population-dense state in the nation, with nearly 840 people per square mile.[7] The state's population is heavily clustered on the eastern side, anchored by Boston and its network of suburbs. The Boston Metropolitan Statistical Area (which includes the southern tip of neighboring New Hampshire) has 4.9 million residents and a population density of 1,400 people per square mile.[8]

The population of Massachusetts is 70% White, 8% Black, 8% Asian, and 12% Hispanic (may include other races). Massachusetts's residents rank among the lowest nationwide on measures of poverty and highest in median income and education. However, as mirrored by racial trends around the country, white residents in Massachusetts are better off than any other racial group in the Commonwealth. One-quarter of Hispanic and Latino residents in Massachusetts live in poverty, along with 17.9% of Black residents and 15.7% of Asian residents. By contrast, only 6.8% of white residents live in poverty.[9]

However, these trends in poverty do not dovetail neatly with educational attainment: Almost two-thirds of Asian women (61%) in the Commonwealth have a bachelor's degree or higher, compared

to 48.1% of white women, 30% of Black women, and 23.4% for Hispanic/Latino women.[10] Similar race-based disparities are seen in median income. As of 2018, the median household yearly income in Massachusetts was $79,835. The median household yearly income for a Black household in Massachusetts was $53,270, compared with $83,090 for a white household in Massachusetts.

Consistent with population density, the eastern half of the Commonwealth is more diverse than the homogenous western half, both in racial makeup and varied socioeconomic status. IM CoIIN participants cited these differences as key to understanding the disparate birth outcomes for women.

Health Care Access

Massachusetts is one of few states in the nation where nearly every resident has universal health care coverage. More than 97% of residents are insured, the highest rate in the nation.[1] However, uninsured residents in the states live in what have been termed "hot spots," rather than distributed equally across the state. In some hot spots, 30% of residents are uninsured, though the average rate of uninsured is 5.7% across the entire community.[1] Residents in hot spot communities are more likely to be paying more than half of their income in housing, be living below the federal poverty line, or be living with undocumented legal status. Areas of highest rates of hot spots can be found in Southeast Massachusetts (27%) and Western Massachusetts (22.6%).[1]

Unique Impacts

Accounting for 4.7% of all the births in the state, Massachusetts has the highest rate of Assisted Reproductive Technology (ART) in the nation, which is a significant contributor to preterm birth risk. Massachusetts mandates insurance coverage for ART, including in vitro fertilization (IVF), gamete intra-fallopian transfer (GIFT), and zygote intrafallopian transfer (ZIFT).[11] More than 12% of preterm births in the state are linked to ART.[12]

Though ART is widely available in Massachusetts, women of all ethnicities do not utilize the service equally. Research shows that Black and Hispanic women are more likely to be in need of reproductive technology interventions but are less likely to utilize them, possibly due to differences in knowledge and cultural stigma against ART.[13] In Massachusetts, as in the nation, high-income white women with advanced degrees disproportionately utilize ART.[10]

Maternal Risk Factors for Infant Prematurity

Women in Massachusetts are healthier on average than those in the rest of the country and have fewer risk factors for preterm birth and infant mortality than women nationally.

- **Smoking:** Between 2013 and 2017, the rate of smoking among childbearing women in Massachusetts dropped from 16.9% to 12.5%, compared to 16.7% for childbearing women nationally in 2017.[14]
- **Obesity:** Between 2013 and 2017, the number of women who reported a BMI of 30 or more rose from 17.2% to 19.6%, but still lower than national rate of 27.6% in 2017.[15]

Targeted Programs and Interventions to Reduce Preterm Birth

With a robust public health infrastructure at the state, county, and city/town levels, as well as strong networks of public and private healthcare organizations and teaching hospitals pioneering new techniques, Massachusetts is the strongest of the four IM CoIIN states in this case study in sheer infrastructure dedicated to maternal and child health.

However, IM CoIIN providers cited this wealth of resources as an unintentional barrier in addressing long-standing disparities in rates of infant mortality and preterm birth among communities of color and younger women. Many mentioned providers who adopt a "this is a problem individual" mindset, rather than seeing perinatal issues among women of color as systemic and intersectional.

To begin to address this mindset, Massachusetts IM CoIIN focused on improving systemwide perinatal programming in the Commonwealth in the following ways:

- Increasing training opportunities for providers using progesterone (17P
- Expanding the reach of group prenatal care in hospitals that primarily serve communities and families of color
- Increasing perinatal data collection on state-issued birth certificates

1. Broaden Provider Involvement in the Perinatal-Neonatal Quality Improvement Network of Massachusetts (PNQIN)

The Perinatal-Neonatal Quality Improvement Network of Massachusetts (PNQIN), which was very involved in leading the IM CoIIN work in Massachusetts, is a voluntary organization of perinatal providers and maternity facilities that promote best clinical practices across the state.[16] Based in our home state of Massachusetts, NICHQ serves on the PNQIN, which uses a collaborative learning model to address preterm birth, maternal hypertension, and early elective deliveries. PNQIN is an umbrella organization for two major perinatal-neonatal projects:

- ***Massachusetts Perinatal Quality Collaborative (MPQC)*:** The MPQC is "a cooperative voluntary program involving Massachusetts maternity facilities and key perinatal stakeholders, designed to promote the sharing of best practices of care."

  During IM CoIIN, MPQC focused their work on 1) reducing early elective deliveries (EED) and 2) increasing consistent treatment of maternal hypertension, a risk factor for preterm birth. MPQC partnered with March of Dimes and the American College of Obstetricians and Gynecologists (ACOG) to institute a hard stop on early elective deliveries before 39 weeks. The rate of EED fell from 14.8% of births in 2010 to 1.3% of births in 2013. MPQC is currently piloting a program to treat maternal hypertension at four hospitals around the Commonwealth: initial data show increased numbers of women receiving care for hypertension during pregnancy.

  MPQC is currently focused on improving maternal mortality and morbidity rates through a partnership with the Alliance for Innovation in Maternal Health (AIM), a national data-driven maternal safety and quality improvement initiative. The work that MPQC is doing as part of AIM is also focused on increasing provider education on use of progesterone (17P) to prevent preterm birth. During the project period, MPQC developed a progesterone pocket card for physicians and hosted a Progesterone Toolkit training that was attended by 113 medical providers.

  In October 2019 amid conflicting new study results, the FDA Advisory Board recommended withdrawal of approval for 17P, with seven of the committee's members voting to leave the product under accelerated approval and to require a new confirmatory trial. Although both the 2003 and 2019 trials had the same eligibility criteria, women in the original government-sponsored trial had more risk factors for preterm birth, including smoking, being unmarried, being Black, and having multiple previous preterm deliveries. Some panel members who voted to order a new trial said 17P helps a subset of women that has yet to be defined.[34] While the Society of Maternal-Fetal Medicine released new guidelines suggesting that doctors assess the patient's level of risk before recommending hydroxyprogesterone shots, the American College of Obstetricians and Gynecologists (AGOC) said it had reviewed the results and wasn't changing its guidance.[34]

- ***Neonatal Quality Improvement Collaborative of Massachusetts (NeoQIC)*:** NeoQIC is a voluntary organization of newborn health care providers that support quality improvement through the open sharing of information and practices. NeoQIC seeks to foster a culture of continuous quality improvement among its members through the development of joint quality improvement projects and initiatives, promotion of evidence-based best practices, and support of education and training. NeoQIC currently supports four ongoing collaborative quality improvement initiatives:
  - Increasing the use of mother's own milk in very low birth weight infants
  - Increasing safe sleep practices in high-risk infants

- Improving the care of newborns and families impacted by perinatal opioid use and neonatal abstinence syndrome
- Eliminating hospital-acquired infections and using antibiotics wisely in the neonatal intensive care unit

2. Expansion of Group Prenatal Care Using CenteringPregnancy® Program

During IM CoIIN, Massachusetts expanded group prenatal care options around the state. Group prenatal care is increasingly recommended for women who may be in greater need for social support and prenatal education. Women who participate in group prenatal care report greater satisfaction with their care, increased comfort with labor and delivery, and are more likely to initiate breastfeeding.[17] Though outcomes research for group prenatal care is growing, initial data suggest that women in group prenatal care are less likely to deliver preterm, less likely to use emergency care in the third trimester, and less likely to deliver low birthweight infants.[17]

Established in the 1990s, CenteringPregnancy®, operated by Centering Healthcare Institute (CHI) located in Boston, is the most well-established model of group prenatal care in the country. The program provides prenatal care to groups of eight to 12 women in a two-hour monthly format, providing mothers with 10x more time with their provider than if they were seen individually.[32] Massachusetts currently has 12 obstetric practices that host CenteringPregnancy® programs, six of which are accredited by CHI, a designation achieved after two years of implementation with fidelity to the program model. IM CoIIN participants noted the high patient satisfaction for women in group prenatal care, citing increased parenting skills, feelings of comfort and safety with the prenatal caregiver, and increased knowledge of postpartum stressors and how to address them (e.g. sleep deprivation, stress, nutrition).

3. Statewide Increase in Perinatal Data Collection for Mothers and Infants

IM CoIIN participants identified a focus on data collection as key to galvanizing support for preterm birth and infant mortality initiatives in Massachusetts. Two statewide data collection efforts were instituted during IM CoIIN:

- ***Pregnancy to Early Life Longitudinal Data System (PELL):*** PELL is a joint project between the Massachusetts Department of Public Health, Boston University School of Public Health, and the Centers for Disease Control and Prevention. PELL links maternal delivery and birth records (as well as fetal death records) collected at hospital discharge to program and state agency data from Early Intervention, Birth Defects, WIC, Newborn Hearing Screening, Substance Abuse Services, and Assisted Reproductive Technology. This unique data system allows researchers and public health professionals the ability to track outcomes over time and see the impact of specific programs on births across the state.
- ***Standard Collection of Maternal Progesterone Use on Certificate of Live Birth:*** In 2018, Massachusetts added two questions about maternal use of progesterone (17P) to the certificate of live birth.[18]
    - *Were you offered progesterone to prevent an early delivery during this pregnancy?* Answer options include "Yes, because of a prior early delivery"; "Yes, because of short cervix"; "No" and "I don't know"
    - *Did you receive progesterone during this pregnancy?* Answer options include delivery methods in pill form, as a shot, or vaginally. Also includes "No for lack of insurance coverage," "No because I declined," and "I don't know."

Collecting this information for every baby issued a birth certificate in Massachusetts will allow the state the better understand practice patterns and treatment access for women, as well as outcomes among women who received the treatment.

Policy Efforts

Massachusetts is unique among the four IM CoIIN states in this case study in its use of statewide legislation and state agency policies to address preterm birth and infant mortality. IM CoIIN participants leveraged the power of statewide policy work to increase access to housing for mothers in need, lobby for increasing the state Earned Income Tax Credit rate, and address issues of racial equity in maternal health care as part of federal Title V funding. The Title V Maternal and Child Health Service Block Grant is a key source of support for promoting and improving the health and well-being of the nation's mothers, children, including children with special needs, and their families. Since IM CoIIN, Massachusetts has continued to focus on policy solutions to improve maternal and infant outcomes that can impact preterm birth rates across the state. Recent policy successes are described below.

1. Health Equity Initiative (Massachusetts Department of Public Health)

In 2017, the Massachusetts Department of Public Health created the Office of Population Health (OPH), charged with a mandate to "accelerate the use and dissemination of data and advanced analytics to identify disparities in health outcomes, risk factors, and the social determinants of health."[19] The OPH has focused on creating engaging and accessible data presentations about infant mortality in Massachusetts, specifically highlighting racial inequities in birth outcomes and mortality. IM CoIIN participants welcomed these presentations as a way of increasing visibility for maternal and child health inequities in the Commonwealth and look forward to partnering with the office in their own work.

2. Priority Housing Status for Women and Children

Massachusetts changed its Emergency Family Shelter policy to fast-track pregnant women and mothers with minor children into housing due to unsafe living conditions or homelessness.[20] In addition to state-level policies that make it easier for mothers to find housing, two hospitals in Boston as part of IM CoIIN, Brigham and Women's Hospital and Boston Medical Center, expanded their social services to provide assistance with housing for pregnant women and mothers. Both hospitals are also currently focusing on providing additional social supports to pregnant women and mothers, including help finding affordable childcare and applying for state vouchers for free or reduced-price childcare.

3. State Increase in Earned Income Tax Credit Rate

The Earned Income Tax Credit (EITC) is a federal tax credit for people who earn low income that provides a return on taxes paid based on the number of children in the household. As low and moderate-income people pay proportionately more of their income in taxes than higher earners, the EITC returns income to families in need. EITC has been shown to be associated with improved birth outcomes across all racial and ethnic groups, thus improving the outlook for children in low-income households.[21]

Massachusetts is one of 28 states that also has a state-based EITC program. The Massachusetts EITC is based on the federal EITC: For taxable years between 2016 and 2018, the Massachusetts credit is limited to 23% of the federal credit. For taxable years starting after January 1, 2019, the Massachusetts credit is limited to 30% of the federal credit.[22] As part of IM CoIIN, Boston Medical Center social workers showed lower income women during prenatal and pediatric appointments how to apply for and follow up on the state EITC program after finding that many of the women were not receiving benefits.

4. Massachusetts Paid Family Medical Leave (PFML)

In 2018, Massachusetts passed legislation mandating comprehensive Paid Family Medical Leave (PFML).[23] The law establishes a system to allow family members to care for one another for up to 12 weeks and to take up to 20 weeks to recover from their own illness. The program is paid for by a tax increase that began in 2019; the PFML program will begin in 2021. While not enacted during the IM CoIIN project period, this legislation has been advocated for well earlier than 2018, and many partners and stakeholders that were deeply engaged with IM CoIIN contributed to its success.

5. Title V Block Grant Program Prioritizing Racial Equity for Maternal and Child Health (2019)

Massachusetts Title V Block Grant Program undergoes a strategic planning session every five years. With representation from IM CoIIN participants, the 2019 strategic plan included a focus on addressing issues of racial equity in maternal and child health care as a primary priority.[2]

Looking Forward

Future Policy Priorities

In Massachusetts, stakeholders identified a clear priority to address the needs of mothers and assist in reducing the rising preterm birth rates.

Priority Populations

As in many states, immigrants and foreign-born people make up an increasing percentage of the population. In the wake of a Supreme Court decision that considers public benefits in federal immigration decisions (the Public Charge Rule), IM CoIIN participants stressed the need to partner with immigrant rights' organizations to ensure that immigrants and undocumented mothers felt safe accessing perinatal care.

Spotlight On: Stronger Generations

At Brigham and Women's Hospital in Boston, a new model of perinatal care, *Stronger Generations*, focuses on resolving racial inequities in birth outcomes. Drawing on their connections with the diverse neighborhoods of Mission Hill and Roxbury, which border the hospital, *Stronger Generations* provides women with support and care in the perinatal setting. Using a framework called the Birth Inequity Initiative (BEI), providers in the *Stronger Generations* program focus on health throughout the lifespan, with the understanding that "a lifetime of health equity begins at birth."[26] Providers work with pregnant mothers to establish trust in the medical setting, and then support mothers through pediatric care for their children, provide housing support and domestic violence counseling as needed, and expand access to educational programs that support learning goals both in high school and beyond using a throughout-the-lifespan, integrated care approach.

Emerging Issues in Massachusetts

With their steady focus on addressing system-based inequities, IM CoIIN participants in Massachusetts cited a number of emerging issues to address, from access to housing to immigration laws, which are crucial in realizing equity in birth outcomes.

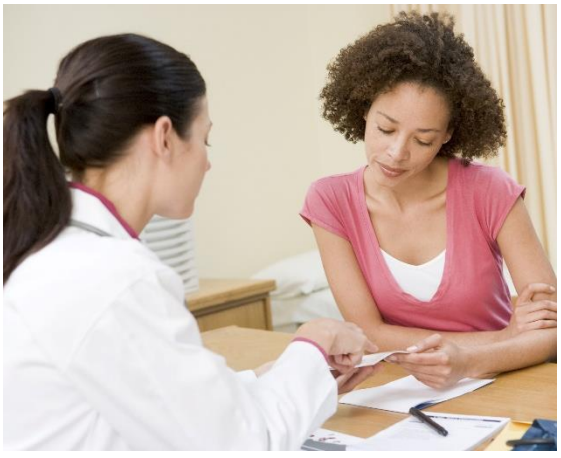
1. Impact of Housing Crisis on Perinatal Care

Massachusetts is in the midst of a housing shortage, with Boston being the fifth most expensive city in the country for housing.[27] The housing stock in the state is heavily weighted toward single-family housing and in many cities and towns, prohibitions on building multifamily units and apartments effectively block lower and moderate-income families from moving in.[26] Even in Boston, which provides incentives for builders who create multi-family residences, the pace of building is too slow to keep up with demand.[26]

As a result, families are increasingly part of the homeless population, necessitating immediate housing support. Many lower and moderate-income families are forced to move further away from Boston, where as IM CoIIN participants point out, health care is harder to access. Boston's many hospitals and clinics are accessible by public transportation, but in the far-flung suburbs, cars are needed to get to clinics, which families may not have.

2. Diversity of Immigrant Population and Challenges to Quality of Perinatal Care

More than 1 in 6 residents of Massachusetts is an immigrant.[28] Though as a collective, there is no dominant country of origin, the top countries of origin for immigrants in Massachusetts are China, India, Brazil, Portugal, Haiti, Cape Verde, the Dominican Republic, Vietnam, El Salvador, and Canada.[27] This rich diversity is a strength for the economy, with 20% of the workforce foreign-born and almost 60% employed in medical and life sciences.[27]



This diverse immigrant population creates unique challenges in delivering consistent, quality perinatal care, according to IM CoIIN participants. They cited an increasing need for translation services, multilingual staff and providers, and prioritized efforts to provide culturally sensitive perinatal care.

3. Impact of Opioid Epidemic on Perinatal Health and Child Health

As in the rest of the country, Massachusetts has been affected by the opioid crisis, which has spawned a greater focus on substance use care in the perinatal setting. At Massachusetts General Hospital, Project HOPE is an integrated care perinatal model that provides women with quality perinatal care, substance use care, social worker support, mental health care, and psychosocial support within the timeframe of a typical prenatal appointment.[29] Project HOPE follows women for two years post-birth, providing pediatric care for children up to two years of age, including those born with Neonatal Abstinence Syndrome (NAS). IM CoIIN participants called for more integrated programs for women with substance use disorders, citing the urgent need for more attention to care for children born with NAS.

4. Updated Focus on Maternal Mortality

Massachusetts Department of Public Health has a dedicated Maternal Mortality and Morbidity Review Committee, though the last public report was in 2014.[30] IM CoIIN participants noted that the committee needed a reboot, particularly given the Title V focus on resolving racial inequities in maternal and child health.

5. Refinement of Transportation Access Programs to Increase Access to Perinatal Care

As in many cities, Boston residents increasingly rely on rideshare services for transportation. IM CoIIN participants cited the impact of these services on health care access: For women without access to their own private transportation, these services are often safe, affordable, and easy to access. Accordingly, IM CoIIN participants pointed to programs in prenatal clinics that provide vouchers to women for rideshare apps, but then highlighted problems that need to be resolved to ensure women can consistently access perinatal care. Primary problems were inconsistent acceptance of vouchers by rideshare apps and inconsistent enforcement of car seat laws by drivers. Resolving transportation access issues remains a priority for IM CoIIN participants as they work to ensure consistent prenatal care is available to all women.

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