Increasing Home Visiting Enrollment through Enhanced Outreach

Short title: Home Visiting Outreach

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**ABSTRACT**

We explore whether enhanced outreach to a randomly selected subset of individuals referred to Michigan's Maternal Infant Health Program (MIHP) can increase enrollment in the home visiting program. We randomly assigned 824 study-eligible families in three MIHP sites to a treatment group, which received enhanced outreach by locally hired community health workers (CHWs), or to a control group, which received standard outreach from the agency's enrollment specialist. Families who received enhanced services were more likely to be reached and were more likely to enroll in MIHP. However, conditional on being reached, we find that the CHWs were no more effective than agency staff in persuading families to enroll, suggesting that the power of the intervention was primarily in the additional time and effort CHWs were able to

devote to contacting families, not in their ability to provide more authentic and trusted information or to reduce other barriers.

***Key words:*** community health worker, home visiting, outreach, randomized control trial

## INTRODUCTION

Many social programs are chronically underused, often despite evidence of effectiveness and substantial investments by state and local governments. For example, in 2019 (the most recent year for which data is available), participation by eligible families in the Supplemental Nutrition Assistance Program (SNAP) was as low as 56 percent in some states (Food and Nutrition Service 2023a). Nationally, in that same year, the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) served an estimated 57.4 percent of those eligible (Food and Nutrition Service 2023b). Several factors contribute to low participation in these programs, including lack of transportation, scheduling problems, child-care limitations, stigma, excessive paperwork, and administrative burdens during eligibility verification (Bertrand, Mullainathan, and Shafir 2004; Moffitt 1983; Currie 2004; Ingoldsby 2010). Program providers have tried numerous ways of overcoming these barriers, with varying degrees of success, including enhanced outreach and canvassing, use of social media and other advertising, culturally relevant outreach, and a reduction in logistical barriers (e.g., Brooks et al. 2013; Callejo and Geer 2012; Duggan et al. 2000; Jones, Lacroix, and Porcher 2017).

This study focuses on strategies to increase participation in a maternal and infant home visiting program. Home visiting is an evidence-based strategy for promoting the health and well-being of pregnant people, new parents, and babies (Stoltzfus and Lynch 2009).

Research demonstrates that home visiting positively affects families in many ways, including reducing adverse birth outcomes in infants and health problems in older children,

improving language and cognitive development in children, preventing child maltreatment, increasing health-care usage, and improving the quality of parenting and the home environment (Avellar and Supplee 2013; Kendrick et al. 2000; Kendrick et al. 2013; Kitzman et al. 1997; Kitzman et al. 2019; Olds et al. 1986; Peacock et al. 2013; Roman et al. 2014). Although there are different models of home visiting (e.g., Nurse-Family Partnership, Healthy Families America, Parents as Teachers), outcomes remain positive across different provider and model types (Avellar and Supplee 2013; Kendrick et al. 2000; Michalopoulos et al. 2019; Peacock et al. 2013).

Yet, despite the large body of evidence pointing to their effectiveness, home visiting programs across the nation are persistently underused. The National Home Visiting Resource Center (2018) estimates that current programs reach only 6 percent of an estimated 18 million pregnant people and families with children under age 6. Many (if not most) home visiting programs target pregnant people based on specific criteria (e.g., income, geographic location, prior history of risk factors, insurance type) in an effort to concentrate resources on those most in need. Even so, their reach has been limited.

Strategies designed to encourage participation in home visiting have met with mixed results. Efforts to increase awareness of home visiting programs via print, radio or television advertising, text messaging, and social media outreach, for example, have been somewhat successful, but often do not reach families with the highest levels of need (Whitaker, Stevelink, and Fear 2017). Other approaches to increasing home visiting participation have included providing a personalized introduction to service providers, flexibility in program delivery (e.g., timing, frequency, location of visits), or or material incentives (Folger et al. 2016; Ingoldsby et al. 2013; O'Brien et al. 2012). However, these interventions are often complex and time-

consuming to implement, may be redundant or occur in a piecemeal fashion, or do not appear to demonstrate widespread success (Sandstrom et al. 2015; Whitaker et al. 2017).

Given the challenges in conducting broad outreach campaigns to boost enrollment in home visiting programs, the study team set out to explore the impact of narrower, more targeted types of enhanced outreach to families eligible to enroll in home visiting programs. After reviewing the literature on barriers to participation, we set out to test whether enhanced outreach provided by community health workers (CHWs) could be an effective method for increasing participation in the state of Michigan's Maternal and Infant Health Program (MIHP).

In the context of public health, many programs have employed CHWs to help with outreach and enrollment (e.g., Jack et al. 2017; Mannan et al. 2008; Rotheram-Borus et al. 2011). CHWs are allied health positions with a broad range of responsibilities, centered on community outreach and education. They are typically recruited from the community being served; their firsthand, lived experience helps them to build strong, trusting relationships with individuals (American Public Health Association 2009). CHWs can help people enroll in health insurance and other public programs, refer them to resources in their community, and help them navigate health-care and social service systems (Jack et al. 2017; Lehmann and Sanders 2007).

A large body of evidence suggests that CHWs can be valuable members of an interdisciplinary care team and help reduce barriers to care (Balcazar et al. 2011; Snyder 2016). Multiple studies have demonstrated the effectiveness of CHWs in improving service uptake and health outcomes for patients in the United States and globally. Across the world, interventions by CHWs have seen success in improving maternal and infant health and increasing child survival rates (Haines et al. 2007; Mannan et al. 2008; Rotheram-Borus et al. 2011). In the United States, reports on CHWs have primarily focused on interventions that sought to increase use of

preventive services, such as cancer screenings. A systematic review of randomized controlled trials, for example, showed that interventions by CHWs increased mammography screening rates by a statistically significant amount (Wells et al. 2011).

Many home visiting programs, and notably the federal Healthy Start program, use CHWs or other family support workers, parent educators, or paraprofessionals to help support their programs or provide services (e.g., Raffo et al. 2017; DeAngelis et al. 2017). In Michigan's Kent County, for example, the Strong Beginnings program employs CHWs to improve the health and well-being of Black and Latinx parents and infants. A recent quasi-experimental analysis of the program finds that it helped reduce preterm birth and low birth weight and increased the use of both prenatal and postnatal care among participants (Meghea et al. 2023). However, few studies have examined the effects of outreach by CHWs on participation in maternal and infant health programs and, to our knowledge, none has done so via a randomized control trial. This study explores whether enhanced outreach by CHWs to a randomly selected subset of individuals referred to MIHP, the largest maternal and infant home visiting program in Michigan, can increase enrollment in the program.

## Intervention Context: Michigan's Maternal and Infant Health Program

The state of Michigan has made a substantial investment in maternal and infant home visiting through MIHP. The program is available to all Medicaid-eligible pregnant people and infants. It is the largest home visiting program in the state and it works to promote healthy pregnancies, birth outcomes, and infant growth and development. Program providers employ multidisciplinary teams of nurses, social workers, lactation consultants, and nutritionists who provide comprehensive information and coaching on nutrition, exercise, prenatal care, and breastfeeding and educate parents on child development and positive parenting practices so that they can

develop positive relationships and help their children form good habits at an early age. Home visitors also help identify and address health and social risk factors, work with parents to create a safe home environment, and link families to community-based resources to help meet their basic needs, such as food, housing, and other assistance. Although some home visiting programs employ community health workers to conduct home visits, MIHP does not; it utilizes licensed nurses, social workers, and nutritionists to provide these services.

MIHP is available during pregnancy and through a child's first year of life. A variety of service providers (county health departments, federally qualified health centers, health systems, independent freestanding agencies) administer the program and are reimbursed by the state for providing home visiting services. Research indicates that MIHP has positive effects, including a reduction in the rates of preterm birth and low birth weight and an increase in pre- and postnatal and well-child visits among participants who enroll by the end of the second trimester and receive at least three home visits (Balcazar et al. 2011; Meghea et al. 2013). MIHP has been designated an evidence-based program by the US Department of Health and Human Services and is one of eight similar models operating in Michigan. These include Early Head Start, Family Spirit, Healthy Families America, Infant Mental Health, Maternal Infant Health Program, Nurse-Family Partnership (NFP), Parents as Teachers, and Play and Learn Strategies (PALS). While many of these home visiting programs (e.g., Parents as Teachers, Early Head Start, PALS) focus primarily on supporting children's health and development, the MIHP program also places an emphasis on supporting birthing parents during pregnancy. Like the Nurse-Family Partnership program, MIHP focuses on the health and well-being of the birthing parent and works to encourage a healthy pregnancy and birth, as well to provide support to the family after the infant is born. However, unlike NFP, which only enrolls pregnant individuals during their first trimester

and is exclusively for first-time parents, participants can enroll in MIHP at any time, regardless of birth order.

MIHP agencies receive referrals through a variety of sources, including Medicaid health plans, physicians, and WIC providers. Families who are eligible to participate are typically referred to a specific MIHP provider, and the provider then reaches out to schedule an initial appointment. At the appointment, the assigned nurse or social worker visits the home and completes a risk assessment profile and creates a plan of care for the individual that will be used in subsequent home visits.

The MIHP program reaches just 30 percent of the approximately 41,000 Medicaid-eligible pregnant people in the state who are qualified to participate each year, based on our own and others' analyses of state administrative data (Jacob and Foster Friedman 2020; Kaiser Family Foundation 2020). By some measures, home visiting participation in Michigan is high, compared to national averages. According to the Prenatal-to-3 Policy Impact Center (2022), as of 2019, Michigan's home visiting programs collectively served 21.4 percent of children under age 3 in low-income families, which places Michigan among the top 5 states on this indicator. Nevertheless, nearly 30,000 eligible pregnant people in Michigan each year could be served by MIHP but are not.

Potential barriers to enrollment arise at multiple points in the referral-to-enrollment pipeline. As shown in figure 1, our review of the literature suggests that these barriers typically fall into one of four broad categories—awareness, trust, stigma, and fit. First, awareness: families may not know about home visiting programs, may know about the program but not realize they are eligible, or may not understand the services provided or the potential benefits of participating (Jacob et al. 2022; Kleinman et al. 2023; Cruz, Woelk, and Cervantes 2017). In a review of over

30 articles about engagement in home visiting programs, Kleinman and colleagues (2023) conclude that many families do not feel fully informed about what home visiting programs entail or can provide. Similarly, Cruz and colleagues (2017) find that many referrals to home visiting are not made because providers do not have sufficient knowledge about the program to inform their patients.

Research also suggests that trust is a major barrier to participation. Families may be reluctant to participate because they have had past negative experiences with social programs, fear involvement of immigration or child protective services, perceive the program as invasive, or worry that they will be judged by their home visitor (Jacob et al. 2022; Kleinman et al. 2023; Park and Katsiaficas 2019; Stevens et al. 2005; Grange et al. 2015). Stigma can also play a role. People may be concerned that participating in a home visiting program will signal to others that they are not a good parent or make others think they are lacking in some way (Grange et al. 2015; Cruz et al. 2017).

In other instances, the program may be a poor fit for families. The program offerings may not match their priorities—for example, families may need additional resources, but the program primarily focuses on education (e.g., Holland et al. 2014; Institute for Child and Family Well-Being 2016; Korfmacher et al. 2008). Providers and program beneficiaries may not mesh, either—providers might not have the appropriate cultural background or knowledge to meet families' needs (Park and Katsiaficas 2019; Stevens et al. 2005; Holland et al. 2013; Korfmacher et al. 2008). Sometimes, the program structure does not match family circumstances; for example, the program may only offer services during regular business hours when families are working, or a lack of housing stability might make it difficult for a family to host a home visitor (Jacob et al. 2022; Kleinman et al. 2023).

The current study grows out of a long partnership with the Michigan Department of Health and Human Services to try to identify and remove barriers to enrollment in MIHP. In 2019, prior to launching this study, we conducted a survey with 801 eligible beneficiaries in southeast Michigan to understand their experiences and identify barriers to enrollment (Jacob and Foster Friedman 2020). A year later, we conducted interviews with 18 MIHP providers across the state to understand enrollment processes and to identify barriers that they encounter. Our work suggests that awareness is the biggest barrier to participation. Over half of MIHP-eligible nonparticipants we surveyed said they did not enroll in MIHP because they were not aware of the program. Nearly 70 percent said that no one had reached out to them about MIHP during their most recent pregnancy (Jacob and Foster Friedman 2020). In our interviews, providers across the state consistently said that they lacked the time and resources for persistent outreach to eligible families, that contact information for potential beneficiaries was often outdated or inaccurate, and that service providers had a limited understanding of the program and its offerings and did not regularly refer their patients.

According to our findings, trust was the next most salient barrier to MIHP participation. We found that many families felt uneasy about the prospect of letting a stranger into their homes for a home visit. Nearly 32 percent of nonparticipants who responded to our 2019 survey identified this barrier (Jacob and Foster Friedman, 2020). These responses may reflect fears about involvement of both immigration and child protective services, as well as concerns about being judged by the home visitor. It may also reflect safety concerns, or simply concerns about needing to clean up and prepare to "host" someone in the home, especially while caring for a newborn. Interestingly, concern about having a stranger in the home was higher among White women than among Black women in our sample (Jacob and Foster Friedman, 2020).

We also found some evidence that fit was a concern for some families. Logistical barriers, such as scheduling appointments during the day or workweek, made participation difficult for some families (Jacob and Foster Friedman 2020). Among beneficiaries who ended participation in the program early, 69 percent said that their "home visitor could meet at times that worked for me," compared to 88 percent of beneficiaries who fully participated in the program. We found more limited evidence that stigma posed a substantial barrier to participation. Only 7 percent of eligible beneficiaries responded in the affirmative when asked whether they agreed with the statement, "Home visiting programs are not for people like me."

Given this background, we set out to develop and test an intervention that would address the biggest barriers we identified—awareness and trust. The third column in figure 1 shows the strategies we identified in the literature for overcoming these barriers, including giving parents examples of what happens during home visits, reassuring parents that they are doing a good job (Mom, Holm-Hansen, and Thomsen 2017), setting up multiple opportunities to join a home visiting program, providing quick and frequent contact, and engaging with families in a welcoming and nonstigmatizing way (Tirilis, Yao, and Chang 2018). We identified outreach by CHWs as one way to help develop trust, since prior studies have demonstrated their ability to build levels of trust by forging authentic and respectful personal connections with potential patients (e.g., Boyd et al. 2021; Rafizadeh et al. 2021).

Based on this review of the literature and information obtained from both provider agencies and beneficiaries, we decided to employ CHWs to provide the initial outreach to eligible families and to target specific identified barriers to enrollment. In reaching out to share information about the program and attempt to schedule and appointment, we encouraged these workers to use multiple modes of outreach—and to make multiple contact attempts over an

extended period—to help increase awareness of the program. They were also trained and encouraged to search for up-to-date contact information for the referrals they received. To help remove barriers related to trust, we taught CHWs to provide information about the program in a welcoming, nonstigmatizing way, use motivational interviewing to help uncover concerns and identify barriers, and to provide a personalized introduction to the MIHP social worker or nurse who was scheduled to visit the home. This study tests whether these activities were able to increase enrollment in the program.

## METHODS

### SAMPLE

The study team worked with three MIHP provider agencies to hire CHWs to conduct enhanced outreach to a randomly assigned subset of individuals referred to each agency. The agencies who provided services were of three types—a county health department, a health system, and a private provider. The three agencies were each located in different regions of the state: one in metropolitan Detroit (site A), one in southeast Michigan (site B), and one in mid-Michigan (site C). Table 1 shows the background characteristics of each site. All three were selected because, prior to the intervention, they had relatively low enrollment rates (fewer than 50 percent of those who were referred ended up enrolling) and all three served at least 100 pregnant people each year. Only sites that indicated that they had sufficient capacity and a desire to serve more beneficiaries were eligible to participate in the study. Site C was the largest of the three and employed two CHWs, while sites A and B each employed one CHW. Site A also experienced turnover in their CHW position and hired a new CHW during the pilot. Although the pilot began with four participating MIHP agencies, one agency ended its involvement early because of staffing issues.

Overall, 1,153 referrals were received by the three participating sites between March and September 2021. Of those, 824, or 71 percent, were determined to be eligible for the study. Parents were eligible for the study if they were enrolled in Medicaid, pregnant at the time of referral, over the age of 18, residing in the service area of the receiving agency, and not enrolled in another state home visiting program. All other people who had been referred, including duplicate referrals for the same beneficiary, were deemed ineligible and left out of the analysis. Most of those not eligible were either not on Medicaid or were not pregnant at the time of referral. Table 2 shows descriptive statistics for the 824 participants. A majority (58 percent) was White and 18 percent were Black. The remaining 24% of the sample identified as American Indian or Alaskan Native, Asian, Multiracial, or did not provide information on their race/ethnicity. The average age of the study participants was 26 years. Approximately half the sample came from site C; the remainder was evenly split between the other two sites. Among the study participants, 399 received enhanced outreach, and the remaining 425 received typical outreach. We conducted a Wald test to assess whether the two groups differed along the baseline characteristics included in table 2. As a result of small sample sizes, for this test, the following variables were combined into a single Other Race variable; American Indian or Alaskan Native, Asian, Multiracial, and Missing (no answer). The joint *F*-test indicates that the two groups do not differ statistically from one another at the $p \leq .05$ level.

### CHWs

Combined, the three sites hired four CHWs to participate in the study. Two CHWs were existing employees of their MIHP agency before the pilot and were both serving in peer counselor roles; each devoted approximately 50 percent of their time to this pilot while also continuing to perform their existing jobs. The other two CHWs did not have previous experience working with

MIHP; however, one had extensive experience conducting outreach for local child welfare and social service systems. All four CHWs identified as women; three were White and one was Black. According to 2020 census data, in the counties where the three White CHWs were employed, White residents made up over 75 percent of the total county population. In the county where the Black CHW was employed, Black residents comprised nearly 20 percent of the total county population, which is the second-highest share of Black residents across all 83 counties in the state.

### Randomization

New referrals to MIHP occur daily, and outreach needs to happen in a timely manner, so the system for randomly assigning study participants needed to be easy—both for the sites to implement and for researchers to monitor. Random assignment to the intervention group was conducted based on the individual's date of birth. People born on an even day of the month were assigned to receive enhanced outreach; those born on an odd day were assigned to the control condition and received typical outreach. Following training from the study team, each site managed the random assignment process and maintained a record of who was referred to the CHW and who was contacted by the agency's usual enrollment coordinator. They also maintained records of enrollment status. The study team reviewed these records monthly to ensure that random assignment was occurring as intended.

We randomly assigned around half of the referred families (48 percent) to the treatment condition, where they received enhanced outreach and intensive recruitment from the site's CHW; remaining families (52 percent) were assigned to the control condition, where they received standard outreach and recruitment from the enrollment specialist. We attribute the slightly uneven assignment ratio, in part, to the fact that there are more odd days than even days

in the calendar (an ordinary year has 186 odd days and 179 even days, thus any non–leap year has 51 percent odd days).

### CHW Intervention

As described above, surveys of eligible beneficiaries and interviews with MIHP provider agencies informed the development of the CHW role for the study and identified several points in the referral-to-enrollment pipeline for CHWs to intervene and provide enhanced outreach. Specifically, the study team trained and encouraged CHWs to do the following:

1) Verify and seek out correct contact information for each family
2) Attempt to contact the family using a variety of methods (e.g., letter, phone calls, texts, emails)
3) Use motivational interviewing techniques (Miller and Rollnick 2013) to encourage the family to enroll in MIHP, helping address barriers to enrollment
4) Help prepare for the enrollment appointment, offering a warm handoff to the family's home visitor

To support the CHWs' work, the study team developed a comprehensive CHW manual with step-by-step guidance for all phases of the CHW's work, including tips for reaching eligible families, using motivational interviewing techniques to understand families' goals, and addressing any potential barriers to MIHP enrollment. In conjunction with the written manual, the study team also delivered an intensive two-session training for CHWs during their onboarding process. During the training, CHWs had the opportunity to learn more about study protocols, hone their outreach approaches, and practice motivational interviewing techniques.

The study team established regular meetings with CHWs across pilot sites to provide a forum for discussing implementation issues and sharing best practices. We used feedback from

these meetings to ensure fidelity of implementation and to make real-time course corrections as needed. Via these conversations and weekly log submissions, the study team was able to document that the CHWs hired for the study were adhering to intervention guidelines. They were making outreach attempts to all referrals assigned to them, seeking updated contact information if the contact information provided was not current, making attempts to reach referrals using multiple modalities, and making multiple attempts to contact families over an extended period of time. Discussion during biweekly meetings with CHWs indicated that they were using core principles of motivational interviewing to identify, explore, and address barriers or concerns families may have had about enrolling in MIHP. CHWs reported using the core processes of motivational interviewing (Miller and Rollnick 2013) in their conversations. First, they engaged with the family to build rapport ("I get to know the person just a tiny bit on the phone call, asking questions about them and their pregnancy"). Second, they focused conversations on why the family may be interested in home visiting ("I listen for nuggets of info about mom's health and talk about resources that can help"). Third, they evoked families' motivations for change through open-ended questions ("I ask how their pregnancy has been, and how they feel about participating in the program"). Finally, they planned with the family to prepare for enrollment ("I let them know who will be there, prep them for the appointment, and encourage the mom that there is a team to support her").

### Control Condition

Study participants in the control condition received the typical outreach provided by the agency to which they were referred. Outreach at most MIHP agencies (and at all agencies participating in this study) is provided by an enrollment specialist, an administrative position akin to a scheduler in a medical environment, although at some agencies a home visitor conducts

outreach. Enrollment specialists work during regular business hours and typically have other administrative duties, including record keeping, scheduling, billing, and helping to comply with state reporting requirements. Combined, the three sites used four enrollment specialists. All four identified as women, and all four identified as White.

Among the 18 agencies that we interviewed for potential inclusion in the study, no agency indicated that they provided additional training for their enrollment specialists—or for home visitors conducting outreach—on motivational techniques or other methods to encourage families to enroll in the program. Michigan Department of Health and Human Services (MDHHS) indicates that all referrals to MIHP receive a contact attempt within two weeks of referral and recommends that agencies reach out to families at least twice. Outreach is typically conducted only by phone. The agencies in the study (and a majority of the agencies we interviewed as part of the planning process for the study) said they did not have resources to conduct more outreach than this. These organizations' perception of their capacity is consistent with our observations on the outreach the control group received, which is described in the findings below.

### Outcomes and Data

We begin by descriptively exploring the following outcomes: the number of contact attempts, the modality of contact attempts (e.g., phone, text message, email), and the duration of the outreach. We obtained this information from agency administrative records. Two of the three agencies kept more detailed logs of their contact attempts that included whether contact information for the birthing parent was valid or needed to be updated, reasons a birthing parent did not want to enroll in the program, and additional details about the timing and outcome of each contact attempt.[1]

[1] The data collection we asked of our sites originally proved to be overly burdensome for enrollment specialists and CHWs, occasionally detracting from the time they had available to perform the outreach itself. Our third study site

The primary impact analysis focuses on two outcomes—whether the agency or CHW was able to contact the birthing parent and whether the birthing parent enrolled in the MIHP program. The study team considered a birthing parent "reached" if someone from the agency or the CHW spoke to the birthing parent on the phone or received an active response from the birthing parent to a text or email. Reached birthing parents also include those who were contacted by other staff members, those who had previously enrolled or declined, or those who contacted the agency proactively (among the 280 treatment families with whom contact was made, 19 cases fell into one of these categories).

The MIHP program considers a birthing parent to have enrolled in the program if they complete an enrollment appointment, which is typically the first home visit. We obtained data on contacts and enrollment from agency and program administrative records. Demographic data were obtained from Medicaid.

### Analysis

Because this study uses random assignment, in expectation, the two groups will be identical on both observable and nonobservable characteristics, and we could obtain unbiased estimates of program impacts by simply comparing the mean outcomes for the treatment group to the mean outcomes for the control group. Using a regression framework that includes background characteristics increase the precision of the model (i.e., helps reduce the standard error on the treatment variable) and accounts for any imbalance between the treatment group and the control group that may have occurred by chance (Athey and Imbens 2017). We estimate the effects of

began implementation a few months after other sites, so we revised their data collection instrument so that it captured only the most necessary details for the study. This modification meant sacrificing some details on outreach methods.

the enhanced outreach by comparing average outcomes for the intervention group to those in the control group, with a regression adjustment for the following selected background characteristics: age, race and ethnicity, and MIHP provider. We estimate the following linear probability model using a dichotomous outcome variable to indicate whether a family was reached or whether the family enrolled:

$$(1) \qquad Y_i = \beta_0 + \beta_1 T_i + \sum_2^k \beta_{ki} X_i + \varepsilon_{i,}$$

where $Y_i$ is equal to 1 if the family was reached (or kept their enrollment appointment) and 0 otherwise, $T_i$ is equal to 1 if the individual was born on an odd day of the month and received the enhanced outreach and 0 otherwise, and $X_i$ is a vector of covariates including race, age, and MIHP provider. Race and MIHP provider were entered into the regression as dichotomous indicators. Controlling for provider accounts for the nesting of participants within site and any imbalance in the assignment ratio, and it also accounts for any other provider-specific characteristics that may have affected the results. As noted above, including race also accounts for any imbalance between the treatment and control groups with respect to these variables.

The study team used mean imputation for all missing covariate data and included an indicator variable for missingness in the regression. For categorical variables, this method means imputing the proportion of the sample that had this characteristic. For example, if 18 percent of the sample identified as Black, we included a value of 0.18 for all individuals who were missing an indication of whether they were Black (i.e., where there was missing information on race). Since an indicator variable is included in the regression model to control for the imputation, this imputation does not affect the estimated impact but retains the largest possible sample for analysis (Little and Rubin 2002).

## RESULTS

## Contact Attempts and Modalities

As shown in figure 2, CHWs used more modalities, made more contact attempts, and were more persistent than typical MIHP agency outreach. The median number of contact attempts for treatment group families was three compared to the control group's two. As shown in figure 2, 56 percent of treatment group families (223 of 399) received 3 or more contact attempts, a rate nearly twice as high as that of the control group (132 of 425, or 31 percent). At the two pilot sites with detailed contact logs, we found evidence that the additional attempts paid off: among families in the treatment group who were reached, 29 percent (56 of 194) were reached after the second attempt.

CHWs also employed a wider range of contact methods, or modalities, to reach their assigned families. While MIHP agencies typically rely on phone calls to reach families, CHWs were encouraged to use additional modalities, including an introductory mailed letter, text messages, email, and residential visits. According to feedback from CHWs, families indicated that the introductory letter was often a helpful way to warm them up to receive further outreach. Among the treatment families, 235 received an introductory letter (59 percent) compared to 20 percent in the control group. As a result of COVID-19 restrictions, we did not use residential visits for the majority of the pilot. Only 19 families had residential contact attempts. CHWs across all three sites reported that they also did not use email very often because addresses were not commonly available in referral information. Only 14 percent (56 out of 399) of treatment group families were sent an email.

As shown in figure 2, among eligible treatment group families, nearly half (45 percent) received contact attempts from at least three modalities (e.g., letter, phone call, text message) versus 1 percent of the control group. CHWs used text messaging, in particular, more frequently

than their control group counterparts: 53 percent (210 of 399) of treatment group families were texted versus 19 percent (80 of 425) in the control group. In biweekly CHW meetings, CHWs highlighted text messaging as an effective way to reach families, particularly younger parents.

Finally, CHWs were more persistent in their outreach effort over time. As part of the intervention, CHWs were encouraged to continue following up with families for weeks or months after the agency received the initial referral. We emphasized this information in the training and reinforced it in the biweekly meetings the team had with the CHWs. As noted above, at two sites, CHWs collected more detailed information about their contact attempts. At these two sites, we found that 45 percent of eligible treatment group families (121 of 270) received contact attempts 2 weeks or more after they were first contacted; 19 percent (51 of 270) continued receiving attempts 1 month after attempts began. The data from these two sites suggests the CHWs' persistence helped reach more families: nearly 1 in 4 (23 percent) of the reached treatment group families were initially reached two weeks or more after the first attempt was made. According to CHWs, some families who were initially resistant or nonresponsive were more open to the program later in their pregnancy. While we do not have exact data on the timing and persistence of contact attempts in the control group, anecdotal evidence suggested that standard outreach typically spanned a week or two.

### Impact on Reaching Eligible Families

As shown in table 3, the enhanced outreach performed by CHWs was associated with a higher rate of success in reaching eligible beneficiaries. The first two columns in table 3 show the effect of the enhanced outreach on the probability of achieving contact. The first column shows an unconditional model without covariates; the second controls for covariates. Results did not vary meaningfully after the addition of the covariates, suggesting that any observed imbalance did not

affect the results. We estimated a linear probability model, so the coefficient on the treatment group variable represents the proportional increase in the outcome over the control group. Among the control group, agencies reached 0.508, or approximately 51 percent, of eligible beneficiaries. The impact of the enhanced outreach was 0.193, or an approximately 19-percentage-point increase—meaning that CHWs reached around 70 percent of the families in the treatment group. This 19-percentage-point boost was statistically significant ($p < .001$). However, despite the enhanced outreach described here, CHWs were unable to reach approximately 30 percent of eligible families.

### Impact on Enrollment

As shown in the second set of columns in table 3, CHWs were also more likely to enroll eligible families. Again, the third column shows an unconditional model without covariates; the fourth controls for covariates. Results did not vary meaningfully between the two. The impact was 0.106, or approximately 11 percentage points (statistically significant at $p < .001$), compared to an average enrollment rate of approximately 24.5 percent among the control group. This result means that, among treatment group families who received the enhanced outreach and recruitment from CHWs, approximately 35 percent ultimately enrolled in the program.

### Enrollment among Those Who Were Successfully Reached

While CHWs were more likely to enroll the eligible families assigned to them, the data suggest that this boost in enrollment comes from the higher likelihood of reaching families and not from a higher conversion rate once families had been reached. As shown in table 4, among reached families, 48 percent of control group families ultimately enrolled. Among those who were successfully reached, the effect of being assigned to the treatment group was only 1.9 percentage points and not statistically significant, indicating that the impact on enrollment is operating

entirely through the increased likelihood of reaching a family, and not through persuasion after contact.

### Variation among Providers

This study was not sufficiently powered to conduct subgroup analyses. However, we did descriptively explore whether the impact of the program varied across the three sites. The results are shown in figure 3. Despite the different contexts in which the providers operated, the enhanced outreach was successful in increasing enrollment in all three sites. The largest effect (17 percentage points) was in site B, which also had the lowest enrollment rate prior to the intervention. The smallest impact was in site C (8 percentage points), which had the highest enrollment rate prior to the intervention, suggesting that the intervention was most effective in sites with the most room to grow.

## Discussion

The findings from this study indicate that enhanced outreach can increase social program enrollment. Families assigned to receive the enhanced outreach were approximately 11 percentage points more likely to enroll in the program than the control group. However, in this study, the increase in enrollment was driven almost exclusively by CHWs' efforts to make more contact attempts, use more modalities, and persist over a longer period than the standard outreach provided at participating agencies. Once contacted, the CHWs were not substantially better than typical agency staff in persuading families to enroll in the program. This finding goes against conventional wisdom about the potential benefits of employing CHWs—that they may be better able to establish a trusting relationship with families, help identify barriers, and highlight the benefits of program participation in an authentic way. In this study, it appears that the increase in enrollment was driven by the additional time that CHWs had to conduct outreach to potential

participants and not by the relationship they were able to establish with families after they made contact. Similarly, the motivational interviewing techniques that the CHWs employed did not appear to have a meaningful effect. In other words, the intervention was successful in reducing one identified barrier—awareness—by increasing the likelihood that a birthing parent would be contacted and invited to participate in the program but does not appear to have increased trust, the other barrier we sought to address. In addition, while it is possible that CHWs were able to leave messages that were more authentic or persuasive than what is typically provided by enrollment specialists at MIHP agencies, our conversations with the CHWs suggest that their communications were fairly standard.

There are several reasons why the CHWs in this study may not have helped reduce barriers and increase trust. First, not all agencies employed CHWs who were directly from the communities they served, and the CHWs hired for this study did not always share their background characteristics. In addition, to our knowledge, none of the CHWs employed for this study had previously participated in MIHP as a beneficiary. Previous studies have indicated an increase in efficacy when CHWs reside in or share a common identity with the community they are serving (Reinschmidt et al. 2006; Guenther et al. 2019).

Second, this study was implemented during the COVID-19 pandemic, and as a result, CHWs were somewhat limited in their ability to engage directly with families in the community and, in particular, were typically not able to make residential visits to families as part of the recruitment process. Had CHWs been able to visit families regularly at their homes, they may have been able to establish stronger relationships, which in turn may have helped them to persuade more families to enroll. One site's CHW did conduct a few residential visits in the summer of 2021 and found it to be an effective strategy for reaching families that could not be

reached via other contact methods. Prior research supports this finding. A study by Bungay and colleagues (2013) showed that repeated visits from CHWs contributed to the establishment of trusting relationships with patients, which ultimately contributed to an increase in patients completing screenings for sexually transmitted infections.

Third, one important role of CHWs can be to engage in community-based outreach—providing general information about the program at resource fairs and similar public events to increase overall awareness among community members. However, because this study was randomized, meaning that people in the same community were assigned to different treatment conditions, CHWs were precluded from conducting this type of broad outreach—they could not know, a priori, who would be assigned to the treatment group. This fact may also have affected their ability to engage fully and become visible and trusted community members.

At the same time, this study suggests that there may be substantial benefits to devoting more staff time (via CHWs or others) to outreach activities, as well as attempting to contact families referred to or eligible for participation in health and other social programs multiple times, in multiple ways, over an extended period of time. Although we initially conceived of this study as one in which CHWs—recruited from the community being served, and with firsthand, lived experience in the community of interest—would build strong, trusting relationships with individuals, the findings from this study suggest that a variety of professionals and paraprofessionals employed by home visiting programs could effectively help increase participation by conducting additional outreach activities.

The extra effort CHWs devoted to outreach resulted in an almost 11-percentage-point increase in enrollment overall, and at one site, it increased enrollment by 17 percentage points over typical practice. While the CHWs in this study devoted approximately 20 hours per week to

the project, at least a portion of this time was spent on recordkeeping and other activities directly related to the study. They likely could have conducted the same quantity of outreach in fewer hours. Agencies might also automate any of the CHWs' activities. Introductory letters, robocalls, and autogenerated text messages could be used by agencies as a first contact attempt for families, which would leave additional time available for staff to reach out individually to families who do not respond to initial, automated contacts. Designating staff time for additional rounds of follow-up for referrals could help agencies convert more families to enrollees—many families were reached more than two weeks after they were referred, and simply extending the length of time staff continue to attempt contact could help. Providers could implement any of these approaches at a relatively low cost. Given the substantial resources devoted to social programs that are underused, entities at the federal, state, and local levels should consider setting aside resources to help increase enrollment. This study suggests that additional resources could meaningfully improve participation rates.

Despite the enhanced outreach and the increase in the number of families contacted, many families still declined to participate in the program. Overall, only 36 percent of the treatment group ultimately enrolled. Among those reached by a CHW, the enrollment rate was around 50 percent. The families who declined services were generally not interested in MIHP or indicated that they already had sufficient support. Some also cited scheduling conflicts as a reason for declining program participation. In addition to greater efforts to increase enrollment, program administrators and providers should also consider the fit of the program—whether the it is providing the types of resources and supports most needed and wanted by families. Increased flexibility in scheduling (e.g., offering evening or weekend visits) might help to increase enrollment overall.

## CONCLUSIONS

The findings from this study suggest that enhanced outreach has the potential to increase program uptake of health-related programs among eligible families. Reaching out more often, in more ways, and over a longer period, resulted in an increased likelihood of reaching eligible MIHP beneficiaries. Once reached, many of these individuals enrolled in the program. Future research should explore whether, under different conditions, CHWs are also more effective at increasing trust and persuading people to enroll in health-related programs.

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Table 1. Barriers to MIHP Enrollment

| Barrier | Description | Ways to Address | Study Intervention Approach |
|---|---|---|---|
| **Awareness** | Families do not know the program exists or are never referred to it, do not know they are eligible, and/or do not know the services provided | Provide multiple opportunities to engage | CHWs encouraged to use multiple modes of contact over an extended period of time |
| | | Follow up with referrals quickly and frequently | CHWs encouraged to search for up-to-date contact information |
| | | Provide training, education; add alerts or reminders to EMRs | *Not addressed by this intervention* |
| **Trust** | Families perceive the program as invasive, have had bad prior experiences with social programs, or worry about negative consequences if they enroll | Give parents examples of what happens in home visits | CHWs encouraged to provide a warm hand-off to the MIHP nurse or social worker who will visit the home |
| | | Build trusting relationships with families | CHWs trained in motivational interviewing to help uncover concerns and identify barriers |
| | | Reassure parents they are doing a good job | CHWs trained to provide information in a welcoming, non stigmatizing way, and emphasize that participation is voluntary |
| **Stigma** | Fear of judgment or poor treatment if others learn about their participation in MIHP | Shift narrative around the program away from focus on "at-risk" populations | *Not directly addressed by this intervention* |
| **Fit** | Mismatch between family needs and HV offerings | Connect parents with local resources | *Not addressed by this intervention* |
| | Mismatch between MIHP structure and family circumstances | Offer flexible scheduling and meeting locations to accommodate family schedules | *Not addressed by this intervention* |
| | Mismatch between home visitor and family | Ask for feedback regularly<br>Provide culturally competent programming | *Not addressed by this intervention* |

Table 2. Study Site Characteristics

| | Agency Type | Locations Served | Preintervention Reach | CHWs | Enrollment Specialists |
|---|---|---|---|---|---|
| *Site A* | Independent freestanding agency | One suburban county in the Detroit metropolitan region | Enrolled 146 maternal beneficiaries in 2020 (avg. 12 enrollees/month) | 1 | 1 |
| *Site B* | Hospital system | One county metropolitan area in southeast Michigan | Enrolled 144 maternal beneficiaries in 2020 (avg. 12 enrollees/month) | 1 | 1 |
| *Site C* | Local health department | Six mostly rural counties in mid-Michigan | Enrolled 296 maternal beneficiaries in 2020 (avg. 25 enrollees/month) | 2 | 2 |

Table 3. Sample Demographics and Baseline Equivalence

| | CHW Group | | Control Group | | Total | |
|---|---|---|---|---|---|---|
| | *N* | Col (%) | *N* | Col (%) | *N* | Col (%) |
| **Race/Ethnicity** | | | | | | |
| White | 232 | 58 | 244 | 57 | 476 | 58 |
| Black | 81 | 20 | 65 | 15 | 146 | 18 |
| American Indian or Alaskan Native | 2 | 1 | 2 | 0 | 4 | 0 |
| Asian | 1 | 0 | 0 | 0 | 1 | 0 |
| Multiracial | 11 | 3 | 8 | 2 | 19 | 2 |
| Missing | 72 | 18 | 106 | 25 | 178 | 22 |
| Total | 399 | | 425 | | 824 | |
| **MIHP Agency** | | | | | | |
| Site A | 104 | 26 | 129 | 30 | 233 | 28 |
| Site B | 114 | 29 | 91 | 21 | 205 | 25 |
| Site C | 181 | 45 | 205 | 48 | 386 | 47 |
| Total | 399 | | 425 | | 824 | |
| **Age (years)** | | | | | | |
| Mean | 26.89 | | 26.98 | | 26.93 | |
| Missing | 71 | | 106 | | 177 | |
| Total | 399 | | 425 | | 824 | |

*Note.* CHW = community health worker; MIHP = Maternal Infant Health Program. A joint *F*-test indicates the differences between the CHW and control groups are not statistically significant at $p <= .05$. $F = 2.05$ ($p = .07$).

Table 4. Impact of CHW Outreach on Reaching and Enrolling Referred Beneficiaries: Full Sample

| | **Successfully Reached by Agency** | | **Enrolled in MIHP** | |
|---|---|---|---|---|
| | Unconditional | Conditional | Unconditional | Conditional |
| Impact | 0.204*** | 0.193*** | 0.114*** | 0.106*** |
| (SE) | (0.033) | (0.033) | (0.032) | (0.031) |
| Covariates | | Included | | Included |
| Control group average | 0.508*** | 0.508*** | 0.245*** | 0.245*** |
| (SE) | (0.023) | (0.023) | (0.022) | (0.022) |
| $R^2$ | 0.043 | 0.066 | 0.015 | 0.054 |

*Note.* MIHP = Maternal Infant Health Program. $N = 824$. Conditional model includes covariates to control for any imbalance between treatment and control groups and to increase the precision of impact estimates. Reference category is a White pregnant parent enrolled at site C because that represents the largest group of individuals in our sample. Covariates include *Black, Missing_or_other_race, Site_a, Site_b, Mother_age, Age_missing*. Missing covariates were imputed using mean imputation and an indicator for missingness.

***$p < .001$

Table 5. Impact of Enrollment among Families Successfully Reached by Agency

| | **Enrolled in MIHP** | |
|---|---|---|
| | Unconditional | Conditional |
| Impact | 0.019 | 0.019 |
| (SE) | (0.045) | (0.045) |
| Covariates | | Included |
| Control group average | 0.481*** | 0.481*** |
| (SE) | (0.034) | (0.034) |
| $R^2$ | 0.0003 | 0.0407 |

*Note.* MIHP = Maternal Infant Health Program. $N = 500$. Conditional model includes covariates to control for any imbalance between treatment and control groups and to increase the precision of impact estimates. Covariates include *Black*, *Missing_or_other_race, Site_a*, *Site_b*, *Mother_age*, *Age_missing.* Missing covariates were imputed using mean imputation and an indicator for missingness.

*** p < .001

Figure 1. Impact of CHW outreach on contact attempts and contact modalities

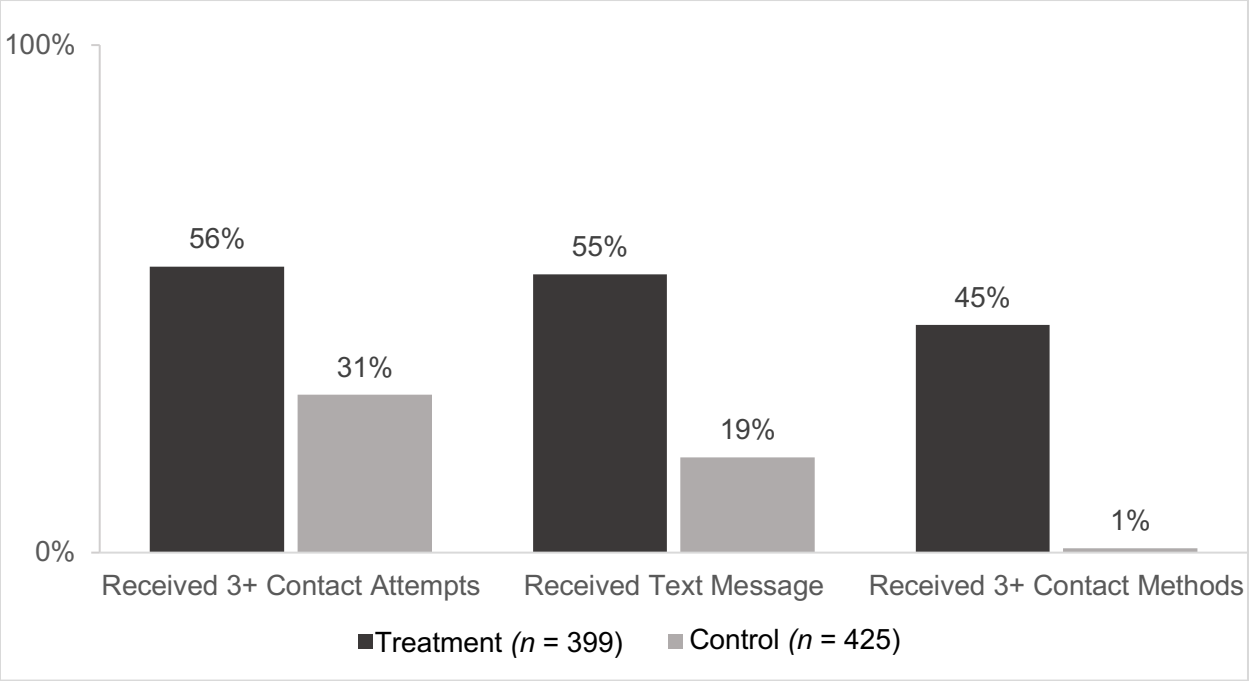

Figure 2. Impact of CHW outreach on MIHP enrollment, by study site