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Improving connections to early childhood systems of care via a universal home visiting program in Massachusetts

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Abstract

Welcome Family is a universal, short-term nurse home visiting program designed to promote optimal maternal and infant physical and mental well-being and provide an entry point into the early childhood system of care to all families with newborns up to 8 weeks old living in defined communities in Massachusetts. The present study examines whether: 1) Welcome Family meets its goal of successfully connecting families to two early childhood programs—evidence-based home visiting (EBHV) and early intervention (EI)—relative to families with similar background experiences who do not participate in Welcome Family, and 2) whether these impacts are conditional on families' race and ethnicity and their primary language—two characteristics that are related to structural racism and health inequities. The study used coarsened exact matching (CEM) based on birth certificate data to match Welcome Family participants who enrolled during 2013–2017 to mothers and their infants living in the home visiting catchment areas who did not receive home visiting during the study period. Primary study outcomes included enrollment in any EBHV program supported by the Massachusetts Maternal, Infant, and Early Childhood Home Visiting (MA MIECHV) program up to age 1 year, measured using MA MIECHV home visiting program data, and EI service receipt for children aged up to age 3 years, measured using EI program data. Impacts were assessed by fitting weighted regression models adjusted for

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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preterm birth, maternal depression, and substance use. Mothers' race, ethnicity, and language were included in the model as moderators of Welcome Family impacts on enrollment in EBHV and EI. Welcome Family participants (n = 3,866) had more than double the odds of EBHV enrollments up to age 1 and had 1.39 greater odds of receiving EI individualized family service plans (IFSPs) up to age 3 relative to the comparison group (n = 46,561). Mothers' primary language moderated Welcome Family impacts on EBHV enrollments. Universal, short-term programs such as Welcome Family may be an effective method of ensuring families who could benefit from more intensive early childhood services are identified, engaged, and enrolled.

Keywords

Home visiting; Early intervention; Early childhood system of care

1. Introduction

Existing evidence suggests that early childhood home visiting programs are effective in promoting the health and development of pregnant people and new parents and their infants, particularly for families who may experience poverty, child welfare involvement, and mental health challenges, among other factors that can affect parenting and family health and well-being (Avellar & Supplee, 2013; Duffee, Mendelsohn, Kuo, Legano, & Earls, 2017; Peacock, Konrad, Watson, Nickel, & Muhajarine, 2013). Although home visiting models and individual programs vary, home visiting typically provides voluntary, strengths-based, flexible, and individualized supports to pregnant people and families with young children; home visitors work to identify families' strengths and needs, offer parenting education, provide material supports, and promote health equity by helping families access healthcare and other community services (Azzi-Lessing, 2011; Goldberg, Winestone, Fauth,Colón, & Mingo, 2018). The present study examines whether Welcome Family, a universal, short-term nurse home visiting program available to all caregivers with newborns in defined communities in Massachusetts, connects families to evidence-based home visiting (EBHV) and early intervention (EI) at higher rates than families not participating in Welcome Family.

1.1. Advantages of universal approaches

Universal home visiting programs offer services to an entire population with the aim of supporting all families and identifying potential concerns before they become problems (Daro & Karter, 2019; Dodge, 2019). In contrast, selective programs direct services to segments of the population most in need of support and resources, according to established eligibility criteria (Dodge, 2019). One advantage of universal programs is they reduce the potential for stigma (Daro & Karter, 2019; Goodman, O'Donnell, Murphy, Dodge, & Duke, 2019). That is, families may lean away from enrolling in and participating in selective parenting and family support programs due to the common practice of identifying potentially eligible families based on demographic characteristics and involvement in systems such as the child welfare or criminal legal systems (Daro & Karter, 2019; Dodge, 2019). This practice presumes that all families who fit certain criteria face the same challenges and need additional support (Daro & Karter, 2019). Perceptions of stigma may intersect with people's racial and ethnic identities and their cultural practices including

language, with studies reporting higher levels of stigma related to program participation among Black (Garcia, Circo, DeNard, & Hernandez, 2015; Nadeem et al., 2007) and Hispanic (Nadeem et al., 2007; Young & Rabiner, 2015) people relative to White people (Garcia et al., 2015), and other studies showing hesitance among families who speak languages other than English to participate in programs (Park & Katsiaficas, 2019). Universal approaches, on the other hand, recognize that all families need some support and are designed to serve families regardless of income, age, past experiences, or other criteria. The universal approach may enhance program acceptability and reach, enabling more families to enroll and receive support (Dodge, Goodman, Bai, O'Donnell, & Murphy, 2019).

While universal home visiting programs offer basic services to all families in a community, they also help to identify families who may need additional supports and would benefit from more intensive programs. Universal programs allow for an assessment of families' unique needs related to, for example, unmet healthcare needs, child development concerns, parenting stress, family violence, and parent mental and behavioral health challenges, rather than basing referrals to selective programs on families' demographic or background profiles (Cowley et al., 2015; Daro & Karter, 2019). This process of universal enrollment, assessment of family needs and preferences, and referral to selective programs as indicated may enable earlier detection of families with potential challenges, better matching of identified needs to services, and a smoother entry point into the early childhood system of care—the network of community-based services and supports organized to meet the needs of families with young children (Goodman et al., 2019; Kagan & Kauerz, 2012). For example, an evaluation of Family Connects—a universal newborn nurse home visiting program that approaches all birthing families in a specified community to participate in 1 to 3 postpartum home visits with trained nurses (Goodman et al., 2019)—found a positive impact on the number of family connections to community resources; these resources may have included other home visiting programs but this was not specified in the study (Dodge et al., 2014). Improving parenting outcomes and reducing child maltreatment are frequently the focal outcomes of home visiting programs, and evidence suggests that increasing connections to community supports and services may be a primary motivator for families to enroll and participate in home visiting (Beasley et al., 2018; Tandon, Parillo, Mercer, Keefer, & Duggan, 2008). Home visitors play a pivotal role in connecting families to their communities' early childhood systems of care through information provision, referrals to services, and concrete and emotional supports during the referral and connection process (Goldberg et al., 2018; Taylor & Minkovitz, 2021). Studying the referral and connection process to access home visiting services may be critical to understanding its potential impact and role in reducing inequities and improving outcomes for families (Duggan, Portilla, Filene, Crowne, Hill, Lee, & Knox, 2018; Goldberg, Fauth, Moosmann, Winestone, & Litovich, 2020).

1.2. Welcome Family

Welcome Family is a universal home visiting model for families with newborns that has been implemented in Massachusetts since 2014 through funding from the Massachusetts Maternal, Infant, and Early Childhood Home Visiting (MA MIECHV) program. The goals

of Welcome Family are to promote optimal maternal and infant physical and mental well-being and serve as an entry point into the system of care for families with newborns in Massachusetts. The program is partially modeled after Family Connects (Goodman et al., 2019). Welcome Family offers a one-time nurse visit to families with newborns in geographically defined communities. The vision for the universality of the program is that 1) all families with newborns are eligible regardless of income, age, or other criteria; 2) all families with newborns are offered the program; and 3) the program reaches families with diverse sociodemographic characteristics (Stetler et al., 2018). Families learn about Welcome Family prenatally and/or in the birth hospital prior to discharge, based on outreach and referral processes established in each community. While birth hospitals are the primary referral source, referrals also come from community health centers, community service providers, health care providers, and self-referrals. Nurses with maternal and child health expertise conduct a 90-minute visit up to 8 weeks postpartum, ideally between 2 and 4 weeks after birth, at the family's home, at a mutually agreed upon location, or, since March 2020, via telehealth. The Welcome Family nurse identifies and responds to family needs by screening for physical and emotional health and well-being, providing counseling, education, and support, and making referrals to community and clinical services. The program is required to make referrals on behalf of the family for EBHV and EI to meet the goal of serving as an entry point into the early childhood system of care. Nurses are encouraged to make other referrals on behalf of the family, where appropriate. During the visit, the nurse assesses six areas of health, safety, and well-being: 1) unmet health needs; 2) maternal and infant nutrition, including breastfeeding; 3) emotional health, including depression and social connectedness; 4) substance use; 5) domestic violence; and 6) clinical assessment of caregiver and infant. Families receive a single follow-up phone call 2 to 3 weeks after the visit to check on the family and assess the outcomes of referrals made during the visit (e.g., successful enrollment in services). The Massachusetts Department of Public Health (MDPH) administers Welcome Family through contracts with community-based agencies, and monitors outreach and enrollment, program operations, and linkages with community services and resources through its performance measurement framework.

One of Welcome Family's explicit goals is to serve as an entry point into the system of care for families with newborns in Massachusetts, which includes more intensive early childhood home-based services such as EBHV and EI. EBHV is available to families with young children through kindergarten entry and offer more frequent (e.g., weekly, biweekly) visits (Evidence, 2021). In Massachusetts, EBHV programs include Early Head Start (EHS), Healthy Families America (HFA), Healthy Families Massachusetts (HFM), and Parents as Teachers (PAT). Since 2010, the funding through the federal MIECHV program has increased the availability of EBHV to families with young children in Massachusetts. EI is funded through a federal grant program (Part C of the Individuals with Disabilities Education Act; IDEA, P.L. 108–446) that provides child development, nursing, speech and language, occupational and physical therapy, mental health and social work, and nutrition services and support for infants and toddlers up to 3 years with disabilities or developmental delays or who are at risk for delays due to biological risk factors (e.g., low birth weight, premature birth) or social and environmental factors (Fauth et al., 2022; Prenatal-to-3 Policy Impact Center, 2021).

MA MIECHV serves 18 Massachusetts communities with the highest prevalence of socioeconomic, health, and psychosocial factors—including substance use, recent immigration, intimate partner violence, homelessness and housing instability, poverty, mental health concerns, and child maltreatment—that heighten families' vulnerability to poor health and developmental outcomes, as identified through a comprehensive needs assessment process (Goldberg et al., 2020). At the time of the present study, Welcome Family was implemented in four of the 18 MA MIECHV communities. The Welcome Family communities are racially and ethnically diverse, with three of the four communities home to majority Black, Hispanic, and Asian populations, many of whom were born outside of the U.S. (Goldberg et al., 2020). Each of the Welcome Family communities rank among the highest in the state in terms of poverty rates, housing instability, and teen births (Goldberg et al., 2020). To ensure that the Welcome Family program effectively serves this diverse population, the program strives to provide supports that are tailored to the unique identities, cultures, needs, and circumstance of each family. For example, programs take a broad view of what constitutes mental health support, including peer support and doulas in their repertoire of referrals in addition to more traditional therapists. This approach is supported by research with Black and Hispanic mothers experiencing postpartum depression that found that rigid formal mental health treatment and medications were unhelpful (Keefe, Brownstein-Evans, & Rouland Polmanteer, 2016). The universal approach paired with the tailoring of services may allow Welcome Family to serve as an entry point into the early childhood system of care for families with newborns, regardless of race and ethnicity, income, ability, or other factors.

Previous evaluations of Welcome Family assessed fidelity of implementation to the model during its initial roll-out (Stetler et al., 2018) and the community referral patterns between Welcome Family, EBHV, and other health and social services in a community (Goldberg, Fauth, & Citino, 2019). Findings from the latter study suggested that, among families referred to HFM in three Welcome Family communities, Welcome Family was a common referral source and that, when compared to families who were referred from other selected service providers, Welcome Family referrals were more likely to be eligible for HFM. But these findings were based on families who had already been referred to EBHV and did not include a comparison group (Goldberg et al., 2019). No studies to date, however, have explicitly examined whether participation in a universal home visiting program, such as Welcome Family, is associated with connections to EBHV and EI, both of which are critical components of comprehensive early childhood systems of care.

1.3. Study aims

The present study fills current gaps in our understanding of Welcome Family. It uses a quasi-experimental design to examine whether families who participated in Welcome Family were more likely than families with similar backgrounds in the same communities who did not participate in Welcome Family to enroll in two early childhood programs: EBHV and EI.

Given its universal offering, which may reduce stigma (Daro & Karter, 2019; Goodman et al., 2019) and increase program acceptability, combined with screenings and selective referrals based on families' needs, families who receive a referral from Welcome Family

may be more likely to enroll in EBHV and EI than families with similar background experiences who did not receive Welcome Family.

Based on evidence that perceptions of stigma and program acceptability may vary by families' race and ethnicity (Garcia et al., 2015; Keefe et al., 2016; Nadeem et al., 2007; Young & Rabiner, 2015) or language (Park & Katsiaficas, 2019), the present study also explores whether associations between participation in Welcome Family and families' enrollment in EBHV and EI differ based on families' race and ethnicity and their primary language. Specifically, we wished to assess whether universal programs like Welcome Family can reduce barriers to participation in early childhood programs for Black, Hispanic, Asian, and Native American people (compared to non-Hispanic White people) and people who speak a language other than English. As such, Welcome Family may play a role in reducing health inequities by connecting individuals facing structural barriers with services and supports to promote their health and well-being.

2. Method

2.1. Data sources

The present study examined effects of Welcome Family on EBHV and EI enrollments for families (mother and infant dyads) who enrolled in one of four Welcome Family programs implemented in the four corresponding communities that were operational during 2013–2017. The study relied entirely on secondary data sources, as follows: 1) enrollment and discharge data collected by Welcome Family nurses for families enrolled during 2013–2017; 2) birth certificates and hospital utilization records for mothers and their children born in Massachusetts during 2012–2017 (to align with the Welcome Family enrollments) from the Massachusetts Pregnancy to Early Life Longitudinal (PELL) data system; 3) home visiting program data for enrollments in MA MIECHV-funded EBHV programs (EHS, HFA, HFM, and PAT) during 2013–2017; and 4) EI program data for children referred to EI from 2013 to 2019.

2.2. Study design

To attribute differences in EBHV and EI enrollments to Welcome Family, we derived a matched comparison group of mothers and their infants based on birth records of more than 50,000 infants born to mothers living in the four Welcome Family program communities who did not enroll in the program. Matching was based on demographic and maternal health characteristics (referred to as "covariates") from birth records that are related to or are likely to influence Welcome Family eligibility and uptake. See Table 1 for details on the selected matching covariates. Using a large pool of potential comparison group participants is desirable to avoid discarding Welcome Family participants due to lack of adequate matches on the covariates (Rosenbaum & Rubin, 1985). Prior to matching, we excluded the following participants: 1) siblings of the identified infant (to avoid confounding with prior exposure to Welcome Family), 2) infants born before 12/1/12 and after 7/1/17, and 3) participants who were missing three or more of the matching covariates. Welcome Family is unable to collect information about families who decline the program; therefore, it is possible that families who declined a visit are included in the comparison group.

We used coarsened exact matching (CEM) as the primary matching method for this study. CEM groups participants with the same values (raw or coarsened) on each of the covariates into strata that include at least one Welcome Family and one comparison group participant. CEM generates analytic weights used to balance the distribution of the Welcome Family and comparison group participants within each stratum. Since strata assignment is based on exact matching of the covariates, the weights equalize the distribution of the covariates across the two groups. CEM is not dependent on regression model fit to create the weights, a limitation of other common matching methods (Blackwell, Iacus, King, & Porro, 2009). Missing data on covariates was negligible except for insurance payer type for delivery (9% missing) and Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) receipt (16% missing). CEM matches using missingness as an additional covariate category, such that a participant missing data on use of WIC, for example, will be matched with another participant who is also missing data on use of WIC. Using CEM, 92.3% of the Welcome Family sample was matched. The global imbalance of the selected covariates using L1 statistics was close to 0, suggesting near perfect covariate balance between the two groups (Iacus, King, & Porro, 2008). To verify the adequacy of the matching, we specified other matching algorithms including propensity score matching and entropy balance. The findings did not perceptibly shift using the alternate methods.

2.3. Sample

The flow chart in Fig. 1 illustrates the samples used to generate the Welcome Family (n = 3,866) and matched comparison groups (n = 46,561). Welcome Family participants received their home visit 25.52 days (SD = 14.38, median = 21, range = 0 to 91), on average, after birth.

2.4. Measures

2.4.1. Outcomes—We focus on two primary outcomes: enrollment in EBHV and EI. For EBHV, we created a binary indicator that represented whether families participated in any MA MIECHV-supported EBHV program (i.e., EHS, HFA, HFM, PAT) following Welcome Family enrollment (post-birth for the comparison group, since they do not have an enrollment date) within a year of birth, coded 1 if children enrolled in MA MIECHV-supported EBHV program, and 0 if there was no record of enrollment. The present study was part of a larger evaluation that included participants who were born until July 2017. While participants born 2017 may have had incomplete EBHV information for the full year post-birth (i.e., EBHV data were available through December 2017), almost all (94.0%) EBHV enrollments occurred within 6 months post-birth, for which full data are available. Findings did not substantively change when participants born in 2017 were excluded from the analysis.

Enrollment in EI was measured using receipt of individualized family service plans (IFSPs), which are the EI service plans developed by a multidisciplinary team and the child's parents. Receipt of IFSP was coded 1 if children received an IFSP following Welcome Family enrollment (post-birth for the comparison group, since they do not have an enrollment date) up to age 3 years (when EI services end), and 0 if not.

2.4.2. Program status—We created a program status indicator variable to examine differences between Welcome Family participants (=1) and the comparison group (=0), the main independent variable of interest.

2.4.3. Control variables—The final Welcome Family and comparison groups were matched exactly on the selected matching covariates, eliminating the need to control for these same covariates in the analytic model. To enhance the precision of estimates, analytic models incorporated several control variables that were not included in the matching: preterm birth (=1 if born before 37 weeks gestation, =0 if born at 37 weeks or after; n = 14 participants were missing data on preterm birth) and maternal depression and substance use. Proxies of maternal depression and substance use were calculated using PELL hospital utilization records to compute the sum of emergency department visits, observational stays, and inpatient hospitalizations that included an International Classification of Diseases, 9th (ICD-9) or 10th (ICD-10) diagnosis code for emergency care visit related to maternal depression and substance use (e.g., opioid dependence, adverse effect due to methadone; the full list of diagnosis codes used to create these variables are available from the authors upon request), respectively, for the year up to the child's birth. Sums were dichotomized to reflect any emergency visit or hospitalizations with depression or substance use codes (=1), respectively, or none (=0).

2.4.4. Moderators—Mother's race and ethnicity and their primary language were included as moderators of Welcome Family effects on enrollment in EBHV and EI. Mother's race and ethnicity was measured using birth records, which included six primary categories, including a separate category for people who identified as Hispanic regardless of their race: non-Hispanic White, non-Hispanic Black, Hispanic, non-Hispanic Asian/Pacific Islander, non-Hispanic Native American, and other. Given small sample sizes for the non-Hispanic Asian/Pacific Islander, non-Hispanic Native American, and other groups, they were combined for the moderation analyses. Three indicator variables representing Hispanic; non-Hispanic Black; and non-Hispanic Asian/Pacific Islander, non-Hispanic Native American, and other (non-Hispanic White was the omitted referent) were used in analytic models. Primary language was dichotomized into English (=1) and other language (=0).

2.5. Analytic strategy

Welcome Family effects were assessed using weighted multivariable logistic regression models. We regressed each of the two binary outcomes on the program status indicator and the three control variables. Regression models incorporated the CEM weights and robust standard errors to account for clustering by family in the data since siblings of non-participating children could be included in the comparison group; all Welcome Family siblings were removed from both the Welcome Family and comparison groups as part of the exclusion criteria. We computed probabilities adjusted for the control variables for the Welcome Family and comparison groups for both outcomes.

Subsequent models included mothers' race and ethnicity and language as moderators of Welcome Family effects. An interaction term between the Welcome Family program status indicator variable and each of the two moderators was computed and entered in subsequent

regression models (each moderator examined in a separate regression model for each outcome). Significant interaction terms were interpreted by examining the marginal effect of Welcome Family within each racial/ethnic and language subgroup (e.g., Welcome Family vs. comparison group differences in EBHV enrollment for non-Hispanic Black participants) and by running separate logistic regression models for each subgroup. All analyses were conducted using Stata 17. MDPH's Institutional Review Board reviewed and approved the study.

3. Results

3.1. Characteristics of the matched sample

Table 1 displays the sample characteristics based on the matching covariates for the full analytic sample (n = 50,427; n = 3,866 Welcome Family; n = 46,561 comparison group). CEM matched the Welcome Family and comparison group participants exactly, so no covariate differences were observed between the two groups. The sample was racially and ethnically diverse with 20.4% of mothers identifying as non-Hispanic Black, 38.6% as Hispanic, 30.2% as non-Hispanic White, and the remaining 10.8% as non-Hispanic Asian/Pacific Islander, non-Hispanic Native American, or another non-Hispanic race and ethnicity. More than three-quarters (77.3%) of the sample was on Medicaid.

3.2. Welcome family effects

Relative to the matched comparison group, Welcome Family participants had more than double the odds of EBHV enrollments up to 12 months of age (adjusted odds ratio [aOR] = 2.19, 95% confidence interval [CI] = 1.71–2.81) (see Table 2). Based on regression adjusted probabilities, 3.1% of Welcome Family participants and 1.4% of comparison group participants enrolled in home visiting during infancy. Welcome Family participants also had greater odds of receiving EI IFSPs up to 3 years of age relative to the comparison group (aOR = 1.39, 95% CI = 1.28–1.50) (see Table 2)—28.2% of Welcome Family participants received an IFSP compared with 22.3% of comparison group participants.

3.2.1. Moderation of welcome family effects—Mothers' race and ethnicity did not moderate Welcome Family effects on EBHV and EI enrollments. More specifically, assessment of the logistic regression coefficients indicated that the previously reported Welcome Family effects for enrollment in EBHV and EI were true across the racial and ethnic groups; post-hoc pairwise comparisons comparing the odds of EBHV and EI, respectively, between Welcome Family and the comparison group within each racial and ethnic category confirmed the regression findings, such that Welcome Family participants were more likely to enroll in both EBHV and EI, regardless of their race and ethnicity (findings available from the authors upon request).

Mothers' primary language moderated Welcome Family effects on EBHV enrollments (p-value for Welcome Family*primary language interaction term = 0.04) (see Table 3). When stratified by primary language, a significant association between Welcome Family participation and enrollment in EBHV was observed for participants who spoke English as a primary language (aOR = 2.48, 95% CI = 1.89–3.25). The association between Welcome

Family participation and EBHV enrollment was not significant for people whose primary language was not English (aOR = 1.18, 95% CI = 0.61–2.27). The interaction between participation in Welcome Family and participants' primary language was not significant for EI receipt (findings available from the authors upon request).

4. Discussion

While previous evaluations of the universal newborn home visiting approach reported impacts on number of community connections (Dodge et al., 2014), this present study is unique in explicitly examining the role of universal home visiting in connecting families to EBHV and more intensive home-based services. Findings from this study confirmed our hypotheses that participation in Welcome Family would be positively associated with higher receipt of EI services and higher enrollment in EBHV. Rates of EI enrollments among Welcome Family participants were significantly higher when compared to EI enrollments for the comparison group, which were in line with the average for the focal communities (Goldberg et al., 2020). And families who participated in Welcome Family were more likely to be enrolled in a range of EBHV, including HFM, EHS, HFA, and PAT, a finding that expands on findings from our earlier work examining the effectiveness of Welcome Family as a referral source among families enrolled in HFM (Goldberg et al., 2019).

Findings related to participation in EI suggest that Welcome Family serves as an effective Child Find program within those communities. Child Find is a key component of Part C of the Individuals with Disabilities Education Act (IDEA, P.L. 108–446), the federal grant program that helps states develop and operate comprehensive coordinated systems of EI services for infants and toddlers with disabilities or developmental delays from birth up to 3 years. The success of EI relies on early identification of families who can benefit from the program, and programs that offer universal developmental surveillance play a critical role in facilitating this early identification (Lipkin & Macias, 2020).

The significant finding related to participation in the array of EBHV offered through MA MIECHV provides evidence that Welcome Family facilitates multiple pathways into the early childhood system of care. EBHV cannot improve outcomes if the services do not reach families who could benefit from these services, and nationally, home visiting programs tend to be under-enrolled relative to their capacity (Center, 2022). Strengthening early childhood systems, including the referral networks that comprise the critical infrastructure of these systems, is one of the primary goals of MIECHV (Minkovitz, O'Neill, & Duggan, 2016). Findings from this study suggest that universal light touch programs such as Welcome Family may be an effective route to ensuring that families who are eligible for more intensive (e.g., longer duration, more frequent visits) home-based services are identified, engaged, and enrolled.

We hypothesized that families' connections to EBHV and EI may be moderated by race and ethnicity or language. Access to services and intervention may vary across different cultural groups due to both psychological (e.g., stigma) and more concrete barriers (e.g., language). Like Welcome Family, universal programs aim to mitigate some of these barriers by offering services to all families in a community while also tailoring services to enhance

program acceptability, which allows identification of more families who need additional support (Dodge, 2019). In the present study, Welcome Family participants were more likely to enroll in both EBHV and EI, regardless of their race and ethnicity. This lack of moderated findings may imply that Welcome Family is able to equally reach and serve families with diverse racial and ethnic backgrounds, thus playing a potential role in reducing barriers and inequities in service access among families in communities facing socioeconomic and other challenges. Although race and ethnicity did not moderate findings in this study, examining differential outcomes by race and ethnicity can help to ensure that important inequities in access and usage are not masked by examining outcomes for the full sample.

Moderation results suggested that effects on EBHV enrollment were stronger for participants who spoke English as a primary language. Language is one of the prominent barriers families face when accessing services (Park & Katsiaficas, 2019). Some home visiting programs hire bilingual staff, but many do not have the resources to fully match families and home visitors based on preferred language (Jones Harden, Denmark, & Saul, 2010). While we do not know for certain, it is possible that, relative to EI, EBHV may have more limited capacity to serve families who speak a language other than English. This hypothesis needs further testing and assessment. Even if programs have adequate interpreters, some studies have found that use of interpreters can unfavorably affect program quality in terms of accuracy of information sharing, interjecting opinions, or minimizing the prominence of the home visitor–family relationship (Barnes, Ball, & Niven, 2011; Pugh & Vetere, 2009).

Since 2018, after the period covered in this evaluation, MDPH has endeavored to center racial equity and cultural responsiveness in all aspects of the program, such as re-envisioning staff recruitment and hiring practices to ensure nurses reflect the cultural and linguistic diversity of the community they serve. Efforts included collaborating with local community colleges to increase the awareness of nursing students about the field of community-based nursing, naming the commitment to equity in Welcome Family job postings, and hiring individuals who are residents of Welcome Family communities, so that Welcome Family participants are supported by staff who understand their cultural and community context.

MDPH also took a closer look at its data collection practices within Welcome Family to improve completeness of race and ethnicity data among families participating in the program by understanding how, when, and by whom those data were collected (Manning et al., 2022). Having more complete data allows the program to stratify its performance measures by race and ethnicity to identify and address inequities using continuous quality improvement (CQI) methods. This work is foundational to enhancing the program’s capacity to serve as an entry point into the early childhood system of care for families with newborns and ensure equitable access to home visiting services. To effectively use program data as a tool towards addressing racial and ethnic inequities in program outcomes, detailed racial and ethnic data are needed. For example, understanding the myriad cultures, ancestries, and identities reflected under the “Hispanic” ethnicity or “Asian” race categories would allow the program to better tailor services and supports.

To be a truly universal program—one in which all families with newborns are eligible, all families with newborns are offered the program, and the program reaches families with diverse sociodemographic characteristics—Welcome Family needs to serve more families within the host communities. Even though the goal of prevention in a public health framework is population impact, Welcome Family is grant-funded and funding may not be sufficient to serve all families with a newborn from the community (Dodge, 2019). MDPH is pursuing additional sources of sustainable funding to ensure that, as the program grows, Welcome Family can be offered to all people giving birth.

4.1. Limitations

As noted previously, the study was limited to assessment of the largest racial and ethnic categories due to small sample sizes among some groups. There is a strong call in the field for more nuanced data on families' self-identities, and more deliberate efforts to disaggregate data (Kauh, Read, & Scheitler, 2021). Lack of representation of some populations in extant data is a missed opportunity to assess potential benefits, or lack thereof, for these groups (Manning et al., 2022). More indepth qualitative studies or more descriptive quantitative analyses that do not require large samples sizes may be useful to unpack how families' self-identified race and ethnicity influences their access to and uptake of services including Welcome Family.

Our study used a matched design with secondary data sources. This approach reduces costs for data collection but has limitations. The study was limited to using data available in birth records to match the Welcome Family and potential comparison group participants. Birth records included a range of data, including participants' demographic characteristics, proxies of poverty and socioeconomic status, community of residence, and prenatal care receipt, among other variables, that align with eligibility for Welcome Family (i.e., community of residence) and the outcomes of interest. Matching participants on these covariates likely attenuated bias. Yet, the birth records do not include data on important psychosocial characteristics such as parents' mental health and substance use or prior involvement with child protective services. We aimed to minimize bias by including indicators of depression and substance use as control variables in analytic models and ran multiple iterations of the matching algorithm. It is possible, however, that the program and comparison samples were not entirely equivalent based on unmeasured characteristics, which could bias results. Furthermore, the shift in the coding between ICD and 9 and ICD-10 may have captured and identified the substance use cases differently over time (Ko, Hirai, Owens, Stocks, & Patrick, 2021). Finally, it is possible that the comparison group included families that declined Welcome Family services and differ from Welcome Family participants for reasons we are unable to assess and, thus, account for. While the study methods helped control for bias, it is not a randomized trial of effectiveness and uncontrolled confounding may still exist.

The present study included four communities that implemented Welcome Family during the study period from 2013 to 2017. These communities represent a subset of the 18 MA MIECHV communities. Collectively, the MA MIECHV communities were selected based on rankings across 42 indicators embedded within nine domains including socioeconomic

status and poverty, housing, substance use, crime, child unintentional injuries, child maltreatment, adverse perinatal outcomes, and child development and health and school outcomes (Goldberg et al., 2020). While the findings summarized in this paper show the potential value of Welcome Family for many families living in communities experiencing significant racial and ethnic, regional, socioeconomic, and health-related inequities, further research will be needed as Welcome Family spreads to new communities.

Finally, the findings from the present study provide a detailed look at the effects of a home visiting program on families' enrollment in EBHV and use of EI. Yet, the study was unable to explore whether these service connections led to detectable improvements in families' outcomes, such as child development, parenting, and health, focal outcomes of both programs. Thus, while the reported findings are favorable for Welcome Family as an effective resource linking families to the early childhood system of care, the wider benefits on children's development and family well-being are not known. Data on child and family outcomes using additional data linkages would be useful to understand long-term effects of Welcome Family on families' outcomes.

5. Conclusion

Participation in Welcome Family, a universal program that offers a single nurse home visit to families with newborns in MA MIECHV communities, was associated with families' enrollment in MA MIECHV-supported EBHV and EI services. Universal, high-penetration programs such as Welcome Family may be an effective route to identifying families who need additional supports and engaging them in longer-term home visiting and EI services. Findings from this study suggest that Welcome Family serves as a key entry point into a continuum of care for families with infants and young children. Wider adaptation of universal approaches such as Welcome Family may support and strengthen the important role MIECHV and EI has in helping families gain broader access to early childhood systems of care.

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Data availability

The authors do not have permission to share data.

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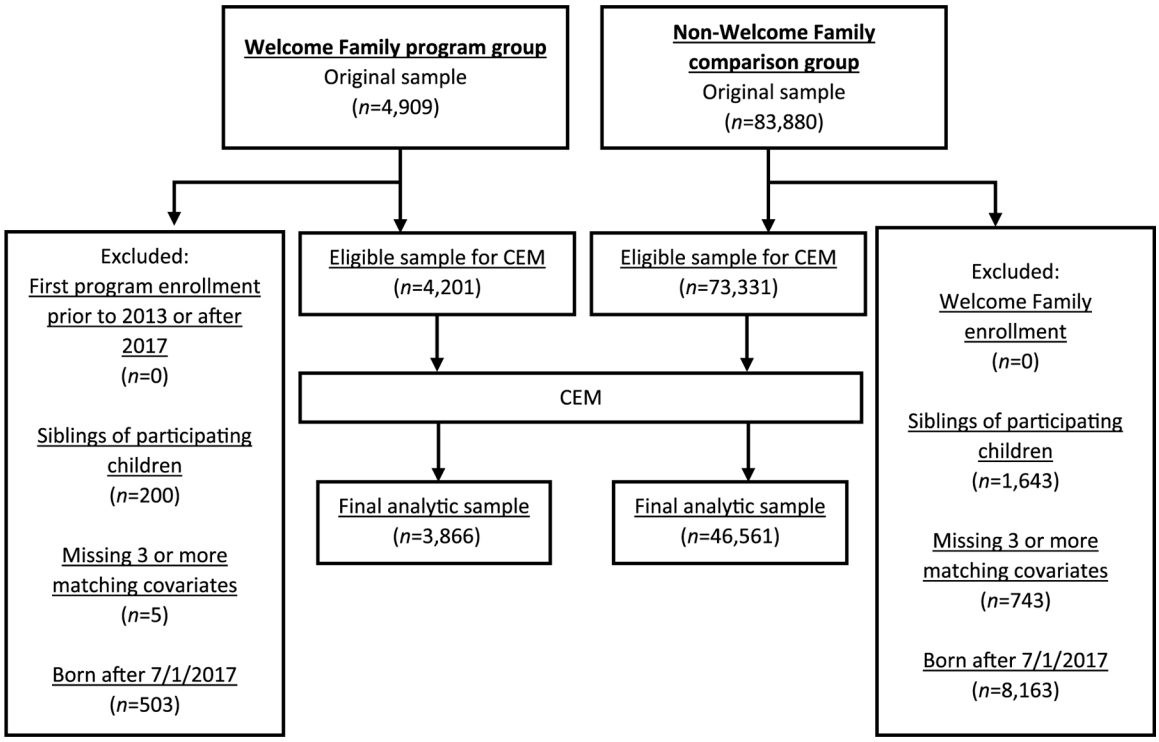

Fig. 1.

Welcome Family Program Quasi-Experimental Study Sample Diagram: Original Sample, Excluded Sample, Eligible Sample, and Final Analytic Sample for Welcome Family Participants during 2013–2017 and a Matched Comparison Group.

Table 1

Maternal Demographic Characteristics of Massachusetts Welcome Family Evaluation Study Sample (Welcome Family Participants during 2013–2017 and a Matched Comparison Group).

Characteristic	Study Sample (*n* = 50,427)
Program community	
Community 1	28.8%
Community 2	23.1%
Community 3	24.9%
Community 4	23.3%
Maternal age at delivery (years)	
19 and under	7.4%
Age 20–24	22.3%
Age 25 or more	70.3%
Maternal race and ethnicity	
Non-Hispanic Black	20.4%
Hispanic	38.6%
Non-Hispanic White	30.2%
Other races, non-Hispanic[a]	10.8%
Mother born in U.S.	53.9%
Mother completed high school or equivalent	82.4%
Mother married	42.2%
Parity (two or more births)	51.5%
Received adequate prenatal care[b]	76.0%
Birth by Cesarean delivery	23.8%
WIC recipient[c]	69.2%
Medicaid recipient	77.3%
Father named on birth certificate[d]	77.3%

Note. Table reports weighted proportions. Due to exact matching, the sample characteristics are identical between the Welcome Family participants and the matched comparison group.

[a]This category included participants who identified as non-Hispanic Asian/Pacific Islander, non-Hispanic Native American, and people who identified as any other non-Hispanic race.

[b]Adequate or adequate plus vs. intermediate or inadequate using the Prenatal Care Utilization Index (Kotelchuck, 1994).

[c]Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

[d]This variable may be a proxy of father involvement in family living arrangements.

Table 2

Logistic Regressions Results for Associations between Welcome Family Program Participation and Enrollment in Evidence-Based Home Visiting (EBHV) up to 12 Months of Age and Receipt of Early Intervention (EI) Individualized Family Service Plans up to 3 Years of Age Among Welcome Family Participants during 2013–2017 and a Matched Comparison Group.

	EBHV Enrollment		EI IFSP	
	aOR	**95% CI**	**aOR**	**95% CI**
Welcome Family	2.19***	1.71–2.81	1.39***	1.28–1.50
Maternal depression	3.85***	1.98–7.47	1.43***	1.17–1.76
Maternal substance use	0.93	0.56–1.53	1.56***	1.34–1.80
Preterm birth[a]	1.23	0.73–2.07	2.79***	2.47–3.16

Note. n = 50,413 (n = 14 participants were missing data on preterm birth).

aOR = adjusted odds ratio; CI = confidence interval.

*** $p < 0.001$.

[a]Born before 37 weeks of gestation.

Table 3

Logistic Regression Results for the Association between Welcome Family Program Participation and Enrollment in Evidence-Based Home Visiting (EBHV) up to 12 Months of Age, Stratified by Primary Language.

	English speaking		Non-English speaking	
aOR	**95% CI**	**aOR**	**95% CI**	
Welcome Family	2.48***	1.89–3.25	1.18	0.61–2.27
Maternal depression	3.48***	1.68–7.21	7.03*	1.47–33.73
Maternal substance use	1.02	0.60–1.73	0.32	0.04–2.74
Preterm birth[a]	1.22	0.67–2.23	1.29	0.53–3.15

Note. n = 50,413 (n = 14 participants were missing data on preterm birth).

aOR = adjusted odds ratio; CI = confidence interval.

*** $p < 0.001$

* $p < 0.05$.

[a] Born before 37 weeks of gestation.