ScienceDirect

Academic Pediatrics
Available online 16 September 2022
In Press, Corrected Proof

Factors Associated With Self-Reported Family Enrollment in Community Services After Referral by First Born Home Visitors

Andrew Breidenbach PhD [a], Hailey Heinz MA [a], Elizabeth Yakes Jimenez PhD, RDN [a, b]

Show more

Outline | Share Cite

https://doi.org/10.1016/j.acap.2022.09.008

Abstract

Objective

To examine factors associated with family enrollment in community services after receiving a referral from First Born home visiting staff in New Mexico.

Methods

Analyses of program administrative data from August 2010 to January 2020 for 1049 families with 5397 referrals were conducted in Stata 15.1 using mixed effects logistic regression; missing data were imputed. We examined the likelihood of a referral outcome being coded as "client enrolled in services" based on family self-report as a function of program, referral type and initiator, and staff and referral recipient characteristics.

Results

About one fourth of referrals resulted in enrollment in services, with the highest enrollment rate for early intervention (39%) and lower enrollment rates for behavioral health (18%) and domestic violence (14%) services. Reported enrollment in the referred-to service was significantly higher for older caseholders versus teens (odds ratio [OR]: 1.69, 95% confidence interval [CI] 1.07–2.67) and for children (OR: 1.33, 95% CI 1.06–1.67) and pregnant mothers (OR: 1.45, 95% CI 1.04–2.01) versus non-pregnant mothers and significantly lower for referrals initiated by home visitors (in discussion with family - OR: 0.62, 95% CI 0.49–0.79; based on screening results - OR: 0.52, 95% CI 0.37–0.72) versus family initiated referrals, for fathers versus non-pregnant mothers (OR: 0.49, 95% CI 0.32–0.75) and for Asian, Black, and multi-racial/ethnic group caseholders versus white caseholders (OR: 0.53, 95% CI 0.30–0.97).

Conclusions

Quality improvement efforts and home visitor training on making sensitive referrals, anti-racism, and motivational interviewing could potentially improve family engagement with community services via the First Born home visiting model.

Keywords

community services; early intervention; home visits; referral

What's New

This study finds that family enrollment in other community services after receiving a referral from First Born home visiting program staff is associated with referral type and referral recipient characteristics. It identifies quality improvement opportunities to improve family engagement with community supports.

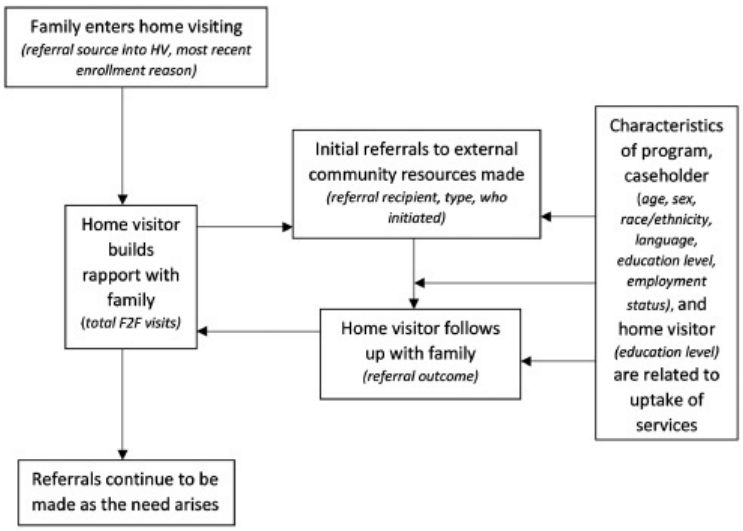
Home visiting programs offer families with pregnant individuals and children ages 0 to 5 years services focused on promoting nurturing, safe, and stable home environments. Services are provided in the family home or via video or phone visits and approaches include parental education and coaching, developmental and behavioral health screening, and support in identifying and accessing needed services.[1] Specifically, this involves connecting families with supports such as early intervention, childcare, or programs to address food security, housing stability, and transportation needs, and helping them to navigate the enrollment process, if desired.[1,2] Research shows families value referrals to other community resources as a useful part of home visiting[3] and that home visitors view referrals as an important strategy for engaging families.[4]

For 7 of 8 home visiting models where linkages and referrals have been examined and reviewed through the federal Home Visiting Evidence of Effectiveness (HomVEE) process,[5] which reviews studies of home visiting models' impacts on key family outcomes, studies have found evidence that interaction with home visiting staff can increase family use of community resources.[2] Findings for these models suggest that home visiting can increase the number of support services families access or are referred to, but outcomes vary across models and may depend referral type.[6,7] For example, in a randomized controlled trial of the Child FIRST model, which includes specific family support from a care coordinator with the primary role of connecting families with community services, families that received home visiting services accessed desired services after a referral 91% of the time, compared to only 33% of the time for families receiving usual care.[8] Child FIRST findings were positive across referral types (child development, adult mental health, medical services, and concrete family needs). In contrast, studies of the Healthy Families America home visiting model found that home visiting services increased aggregate family use of community resources and referrals to family planning services, but had no significant effect on referrals for early intervention, domestic violence services, adult education or nutrition programs.[9,10]

Additionally, factors like staff training, credentials and experience may influence the likelihood of families connecting with referred-to services.[11] In their randomized controlled trial of the Healthy Start Program in Hawaii, Duggan et al noted that home visitors rarely referred families to community resources and concluded that home visitor training did not adequately prepare them to identify family risks related to child maltreatment and to link families with appropriate community resources.[12] By contrast, Arbour et al found home visitors can effectively provide early detection and referrals to early intervention services, and that a focused, short-term quality improvement initiative was effective at increasing rates of screening and families' receipt of developmental supports.[13] Given the variation in findings about home visiting's specific effects on linkages and referrals, and the fact that only 8 of 50 programs reviewed by HomVEE have examined impact on this outcome, this area has been designated by HomVEE as a priority area for research.[2,14]

A separate but related literature has focused on "precision home visiting," which de-emphasizes evaluation of home visiting models' average effects to instead investigate which components of home visiting programs are effective for which populations, under what conditions.[15] These factors have not been studied for many home visiting models. To optimize family outcomes, it is important to understand how aspects of the referral scenario itself, the home visitor and the caseholder may predict whether a family will enroll in the intended services. For example, some evidence suggests that maternal age influences behavior related to accessing community services, as older mothers typically have increased maternal competence.[16]

Figure 1 includes our conceptual model of the characteristics of home visitors, caseholders, the process, and the referred-to services that may be associated with client enrollment, based on the literature. This model follows Duggan et al's Precision Paradigm, a framework that recognizes that contextual characteristics of individuals, families and organizations influence home visitors' attempts to intervene on behalf of a family.[17] It also recognizes the role of relationship building, positing that more visits provide more opportunities for the home visitor to build trust and rapport with the family and learn their needs.[18] Following this conceptual model, the aim of the present study is to examine home visitor, caseholder, process, and referred-to service factors associated with family reported enrollment in other community services after receiving a referral from First Born home visiting staff.



Download : Download high-res image (304KB) Download : Download full-size image

Figure 1. Conceptual model of analysis: characteristics of home visitors, families, and referrals associated with client enrollment in referred-to services.

Methods

Setting and Home Visiting Model

This study was conducted in NM, where more than thirty home visiting programs serve over 7000 families at any one time using a variety of models. We focused on programs using the First Born home visiting model, which was developed in NM more than 20 years ago and is described in detail by Kilburn et al.[19] In brief, the First Born home visiting model provides services to first-time parents with children prenatally through age 5 (as of 2021; through age 3 during years examined in this study). Since about 2018, the program has been offered as First Born and More in many communities, with services available to all pregnant parents and families with children meeting age criteria. First Born home visitors use a manualized curriculum designed to provide family education, identify family challenges, and make referrals and coordinate services for the family.[19] First Born's mission emphasizes development of healthy, nurturing relationships between children and their caregivers and helping families work toward personal goals and address challenges.[20] Home visitors initially offer weekly visits and adjust visit frequency to meet family needs. Referrals are typically information about the external service provider given to the family by the First Born home visitor, such as a name, phone number, email or physical address of the services. NM First Born programs are located in low-income rural communities, mixed-income urban areas, communities in and surrounding the Navajo Nation, and New Mexico's most affluent county.

Study Design

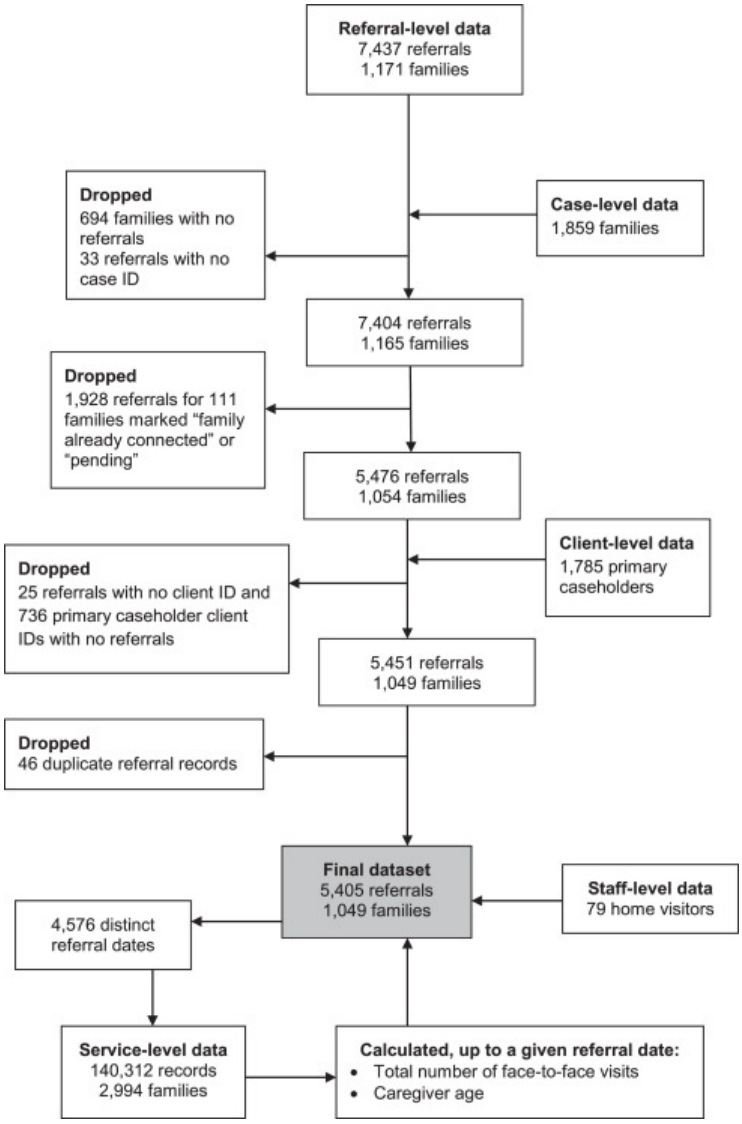
We conducted a multilevel regression analysis of program administrative records. The University of New Mexico Institutional Review Board approved the study protocol (IRB #04519). The manuscript was prepared according to guidance from the STROBE statement.[21]

Acquisition of Home Visiting Program Referral Data

We obtained a limited dataset including referral data from NM's home visiting database, maintained for the state by the University of New Mexico Early Childhood Services Center, for the period from August 2010 to January 2020. We received data for 7 First Born programs that were active and received state funding during the years of interest. Families served at the program level ranged from 142 families in the smallest program to 409 for the largest.

Merging of Home Visiting Program Administrative Data

Separate Excel (2016; Microsoft; Redmond, Wash) files were provided for referral-level, case-level, client-level, service-level and staff-level information. Datasets were managed and merged in Stata (version 15.1; Statacorp; College Station, Tex). Within each file type, data were appended together across programs and then merged across file type, using common variables such as case ID and date. The steps in this process are depicted in detail in Figure 2. The merging process resulted in a dataset that included 5405 unique referrals for 1049 families.



Download : Download high-res image (507KB) Download : Download full-size image

Figure 2. Merging of First Born home visiting program administrative data.

Cleaning and Processing of Home Visiting Program Referral Data

Numeric variables were created from all string variables, maintaining ordering as appropriate. Outliers, such as caregiver ages <13 and >100, were recoded as missing. We used service-level data and referral dates to compute the number of face-to-face home visits that had been completed by a given referral date. Client-level data and referral dates were used to calculate caregiver age at a given referral date.

In some cases, substantial percentages of the data were missing for key variables (Table 1). There were 1733 referrals for 636

families with missing data for at least one key variable. To address missing data, the *mi estimate* suite in Stata was used to impute, when necessary: referral recipient; who initiated the referral; primary caseholder age at referral date, sex, race/ethnicity, most recent reason for enrolling in home visiting, referral source into home visiting, preferred language, education level, employment status; and home visitor education level. Prior to running the multiple imputation procedure, the variable for number of face-to-face visits was transformed with a square root function to improve assumptions of normality, and categories were collapsed for all categorical variables except age at referral date, referral initiation scenario, and caseholder sex, to account for small cell sizes. Trace plots of these estimated values for each imputed variable show no clear trending and fairly constant noise, and imputed data were included in the final model.

Table 1. Referral Disposition as Coded in Administrative Data for the First Born Home Visiting Program From 2010 to 2020

Outcome	Freq.	Percent
Client enrolled in service	1446	26.75
Client inquired	934	17.28
Client not interested in service	1107	20.48
Difficulty accessing service	91	1.68
Home visiting service included in early intervention service plan	3	0.06
Lack of resources in NM	1	0.02
Lack of resources in community	23	0.43
Other result	630	11.66
Para-professional home visitor provided resource/information	249	4.61
Provider not responsive	13	0.24
Provider unable to meet clients needs	29	0.54
Unable to access service	69	1.28
Missing	810	14.99
Total	5405	100.00

NM indicates New Mexico.

Analysis of Home Visiting Program Referral Data

Data analyses were conducted in Stata (version 15.1; Statacorp; College Station, Tex). Analyses were conducted using mixed effects logistic regression. Because referrals are nested in families and families are nested in home visitors, we specified random intercepts at the family and home visitor levels. Program was modeled as an individual-level fixed effect instead of a random intercept to produce odds ratios for this variable. Specifying the different levels of nesting appropriately adjusts standard errors on the estimates of covariate coefficient sizes.[22,23] Each level of this hierarchy was checked, and there was adequate correlation of successful referrals at each level, meriting inclusion of both levels as random effects.

The dependent variable used for analyses was referral disposition ("1" if the client enrolled in the service and "0" otherwise). This variable was based on home visitor interpretation of parent report and was not linked with community program data. Home visitors were trained to use the code "client enrolled in services" that formed the basis for this variable when families reported that they had accessed the intended services. In limited cases, home visitors would verify whether a family had contacted or engaged with referred-to services, but this was not typical. Other possible referral outcomes are listed in Table 1. The dependent variable did not include proximal outcomes that represent steps toward receiving services, such as "client inquired" or "home visitor provided information."

Independent variables include indicators for a family's entry into home visiting based on home visitor interpretation of family self-report (referral source into home visiting, most recent enrollment reason), treatment exposure (total face-to-face visits a family had experienced by a given referral date), aspects of the referral scenario (referral year, referral recipient, referral type, and who initiated the referral discussion), and background characteristics of the caseholder (age at referral date, sex, race/ethnicity, preferred language, education level, employment status) and the home visitor (education level). Referral types were divided into early intervention, behavioral health, domestic violence, and other based on the way they are recorded in the administrative data entry system. The education level for the staff member that had the largest number of face-to-face visits with the family was used for analysis. Variance inflation factor values from preliminary ordinary least squares regression models showed no concerns about multicollinearity for this set of predictors. These variables were included in the models in stages as fixed effects, with the final model including all variables represented in Table 2. The final model with imputed data included 5397 of the 5405 referrals in the original, nonimputed data.

Table 2. Characteristics of Referrals, Clients, and Home Visitors Based on Administrative Records for First Born Home Visiting Programs From 2010 to 2020*

Variable	N (referrals)	% Or Mean†	Std. Dev.	Min	Max
Referral information					
Referral outcome: family enrolled in service	5405	27			
Referral year	5405	2016.15	1.64	2010	2020
First Born program					
Program A	513	9			
Program B	187	3			
Program C	927	17			
Program D	572	11			
Program E	2683	50			
Program F	404	7			
Program G	119	2			
Primary caseholder age at referral date					
13–17	251	5			
18–24	1692	31			
25–34	2286	42			
35–44	1008	19			
45–55	69	1			
Missing	99	2			
Referral recipient‡					
Child	1258	23			
Family	1621	30			
Father	219	4			
Mother	1335	25			

Variable	N (referrals)	% Or Mean[†]	Std. Dev.	Min	Max
Other family member	58	1			
Pregnant mother	347	6			
Missing	567	10			
Referral type[‡]					
Behavioral health	930	17			
Domestic violence	140	3			
Early intervention	412	8			
Other[§]	3923	73			
Referral initiation scenario[‡]					
Family initiated referral discussion with home visitor[‖]	486	9			
Home visitor initiated based on discussion	3801	70			
Home visitor initiated based on screening	573	11			
Missing	545	10			
Family information (n = 1049 families)					
Primary caseholder sex, woman	5384[¶]	99			
Primary caseholder race and ethnicity[#]					
Asian, Black, or multiple race and ethnic groups	173	3			
Hispanic/Latino/a	1526	28			
Native American	524	10			
White	1459	27			
Missing	1723	32			
Most recent reason to enroll in home visiting[**]					
First time parent	2527	47			
Pregnant mom	2425	45			
Subsequent child	334	6			
Missing	119	2			
Referral source into home visiting[**]					
Hospital/medical setting	2222	41			
Self-referral	721	13			
Coded as “other” by home visitor	1276	24			
Coded as “other” by research team[††]	862	16			
Missing	324	6			
Primary caseholder preferred language					
English	3095	57			
Spanish	462	9			

Variable	N (referrals)	% Or Mean†	Std. Dev.	Min	Max
Other	441	8			
Missing	1407	26			
Primary caseholder education level					
HS Diploma/GED or lower	1672	31			
Some college	1070	20			
Tech training certificate or associates	444	8			
Bachelor's degree or higher	1921	36			
Missing	298	6			
Primary caseholder employment status					
Not working	2356	44			
Part-time work	1227	23			
Full-time work	1626	30			
Missing	196	4			
Home visitor information (n = 79 home visitors)					
Total face-to-face visits received by referral date‡‡	5405	4.33	2.69	0	15.23
Education level of home visitor the family saw most frequently					
HS Diploma	1136	21			
Associates degree	557	10			
Bachelor's degree	1436	27			
Master's degree	1784	33			
Missing	492	9			

* Based on original, non-imputed data.

† Mean included for continuous variables. Percentage indicated for categorical variables.

‡ Based on home visitor interpretation.

§ Includes, but is not limited to, referrals for recreational resources, childcare/early education, nutrition or breastfeeding support, parenting programs, medical or dental providers or insurance, legal assistance and employment assistance. This variable is pre-categorized by data administrators and is primarily used to track behavioral health, domestic violence, and early intervention referrals, which can be triggered by risk scores on screenings. All other referrals not related to screenings come categorized as “other.”

‖ Family initiated means the home visitor interpreted request for services or resources as coming from family themselves, not from discussion with staff or a screening. The home visitor would still be involved in offering the family information about where to find and receive services or resources.

¶

Missing data for 21 referrals.

#
Individuals could select all options that applied and could select Hispanic/Latino/a without indicating a race.

**
Based on home visitor interpretation of family self-report.

††
This included referrals into home visiting from Child Protective Services, Early Intervention, judicial/law enforcement, mental health/substance abuse programs, public health, schools, social services, another home visiting program, and individuals. Due to the numerous small cells in unimputed data, these were collapsed and simplified into a new "other" category by the researchers.

‡‡
These data are square-root transformed.

Sensitivity analyses were conducted. The final model was run with the non-imputed and imputed datasets, and results were consistent. Additionally, one home visiting program encompassed almost half of the referrals. Separate models were run for that program versus the other programs.

Results

Characteristics of Home Visiting Clients and the Home Visits They Received

Table 2 summarizes descriptive characteristics for non-imputed data for families and the home visits they received. Most primary case holders were women (99%) that identified as Hispanic/Latina (28%) or white (27%) with English as a preferred language (57%). About half (51%) had not completed a college degree and were working full- or part-time (53%). Families were served by 79 home visitors. About 60% of home visitors had a bachelor's degree or master's degree. On average, families had received 4 face-to-face visits by the referral date.

Characteristics of Referrals Provided to Families by Home Visitors

Table 2 also includes descriptive information for non-imputed data related to referral characteristics. Referrals were most frequently done for a pregnant person or mother (31% of referrals) and were most often initiated by the home visitor based on discussion with the family (70%). A detailed distribution of referral types is included in Table 3. Family and social support services and behavioral health services were the most common referrals.

Table 3. Specific Referral Types Based on Administrative Records for First Born Home Visiting Programs From 2010 to 2020

Service/Activity	Freq.	Percent
Family and social support services	1099	20.33
Behavioral health services	930	17.21
Recreational resources	480	8.88
Early intervention services	412	7.62
Parenting program/classes	387	7.16
Other	278	5.14
Nutrition	242	4.48
Basic needs	216	4.00

Service/Activity	Freq.	Percent
Childcare and early education	209	3.87
Education	201	3.72
Public assistance	181	3.35
Breastfeeding support	154	2.85
Domestic violence services	140	2.59
Medical services	105	1.94
Health care (child or family)	91	1.68
Legal	72	1.33
Employment	60	1.11
Medicaid (child or family)	40	0.74
Pediatrician	30	0.56
Dental services	21	0.39
Primary care physician	19	0.35
Substance abuse counseling	18	0.33
Child protective services	10	0.19
Community assistance	3	0.06
Prenatal services	3	0.06
Tobacco cessation	2	0.04
Specialists out of area	1	0.02
Transportation	1	0.02
Total	5405	100.00

Referral Disposition

About 1 in 4 referrals resulted in families reporting that they enrolled in the service. Overall enrollment rates ranged from 10 to 33% across home visiting programs (mean = 24%, standard deviation = 8%), with the highest enrollment rate for early intervention referrals (39%) and lower enrollment rates for behavioral health (18%) and domestic violence (14%) referrals.

Odds Ratios for the Likelihood of Families Self-Reporting That They Received Services

Table 4 presents our final model with odds ratios for the likelihood of a referral being coded as “client enrolled in services” for specific covariates. Compared with referrals for “other” resources, referrals for early intervention resulted in significantly higher odds of enrollment in services (odds ratio [OR]: 1.45, 95% confidence interval [CI] 1.08–1.95) while referrals for behavioral health (OR: 0.53, 95% CI 0.41–0.67) and domestic violence (OR: 0.38, 95% CI 0.22–0.66) had significantly lower odds. Caseholders in their mid-20s through their mid-30s had significantly higher odds of enrolling in services compared with caseholders younger than 18 (OR: 1.69, 95% CI 1.07–2.67). Compared to referrals for non-pregnant mothers, those for children (OR: 1.33, 95% CI 1.06–1.67) and pregnant individuals (OR: 1.45, 95% CI 1.04–2.01) had significantly higher odds of resulting in enrollment in services, while referrals for fathers had significantly lower odds (OR: 0.49, 95% CI 0.32–0.75). Referrals initiated by home visitors, either in discussion with the family (OR: 0.62, 95% CI 0.49–0.79) or based on screening results (OR: 0.52, 95% CI 0.37–0.72), had significantly lower odds of families enrolling in services compared with referrals that the family requested from the home visitor. Compared to white primary caseholders, individuals who were Asian, Black, or selected multiple race/ethnic groups had significantly lower odds of enrolling in services (OR: 0.53, 95% CI 0.30–0.97).

Table 4. Results of a Mixed Effects Logistic Regression Model Examining Likelihood of the Family Enrolling in the Program or Service to Which They Were Referred by a First Born Home Visitor (n = 5397 Referrals)*

Variable	Odds Ratio	Std.err	95% confidence interval		p-value
Age at referral date					
13-17	*(base)*				
18-24	1.20	0.27	0.77	1.86	0.421
25-34	1.69	0.39	**1.07**	**2.67**	0.024
35-44	1.25	0.32	0.76	2.07	0.38
45-55	1.80	0.79	0.76	4.25	0.184
Referral year	1.00	0.03	0.94	1.06	0.953
First Born Program					
E	*(base)*				
A	1.24	0.34	0.73	2.12	0.429
B	0.52	0.25	0.20	1.33	0.172
C	0.61	0.19	0.33	1.12	0.108
D	0.59	0.19	0.31	1.12	0.107
F	0.96	0.33	0.48	1.89	0.900
G	0.22	0.09	**0.09**	**0.49**	0.000
Referral: who for					
Mom	*(base)*				
Child	1.33	0.16	**1.06**	**1.67**	0.014
Dad	0.49	0.11	**0.32**	**0.75**	0.001
Family	0.92	0.10	0.74	1.14	0.458
Other family member	0.57	0.21	0.28	1.16	0.118
Pregnant mom	1.45	0.24	**1.04**	**2.01**	0.027
Referral grouping					
Other†	*(base)*				
Behavioral health	0.53	0.06	**0.41**	**0.67**	0.000
Domestic violence	0.38	0.11	**0.22**	**0.66**	0.001
Early intervention	1.45	0.22	**1.08**	**1.95**	0.013
Referral initiation scenario					
Family initiates referral	*(base)*				
Home visitor initiates based on discussion with family	0.62	0.08	**0.49**	**0.79**	0.000
Home visitor initiates based on screening	0.52	0.09	**0.37**	**0.72**	0.000
Female	1.84	0.77	0.81	4.17	0.143

Variable	Odds Ratio	Std.err	95% confidence interval		p-value
Race and ethnicity					
Caucasian/White	*(base)*				
Hispanic/Latino	0.85	0.13	0.63	1.14	0.275
Native American	0.65	0.15	0.41	1.03	0.063
Other (Asian, multi-racial, black)	0.53	0.16	**0.30**	**0.97**	0.038
Most recent enrollment reason					
First-time parent	*(base)*				
Pregnant mom	1.12	0.12	0.91	1.38	0.287
Subsequent child	1.15	0.23	0.78	1.71	0.483
Referral into home visiting source					
Hospital/medical setting	*(base)*				
Self-referral	0.83	0.12	0.62	1.10	0.194
Originally coded other	0.78	0.10	0.61	1.01	0.063
Newly coded other[§]	0.98	0.14	0.75	1.28	0.868
Language					
English	*(base)*				
Spanish	1.35	0.25	0.94	1.95	0.108
Other	1.44	0.31	0.94	2.20	0.093
Education					
HS diploma or less	*(base)*				
Some college	1.06	0.14	0.82	1.38	0.637
Tech training certificate or associates	0.77	0.15	0.53	1.13	0.187
Bachelor's degree or higher	0.89	0.14	0.65	1.20	0.434
Employment status					
Not employed	*(base)*				
Part-time work	1.19	0.14	0.94	1.51	0.157
Full-time work	1.01	0.11	0.82	1.25	0.921
Total visits by referral date[‖]	1.00	0.02	0.97	1.04	0.795
Highest education of staff member					
HS diploma	*(base)*				
Associates degree	0.70	0.23	0.36	1.35	0.285
Bachelor's degree	0.74	0.22	0.42	1.32	0.308
Master's degree	0.81	0.21	0.49	1.34	0.412
Intercept	13.81	902.39	0	5.73E+56	0.968
Variance of staff intercept	0.30	0.10	0.15	0.59	
Variance of case intercept	0.34	0.08	0.22	0.54	

* Eight observations were missing on home visiting staff, which could not be imputed.

‡ Includes, but is not limited to, referrals for recreational resources, childcare/early education, nutrition or breastfeeding support, parenting programs, medical or dental providers or insurance, legal assistance and employment assistance.

§ Includes referrals into home visiting from Child Protective Services, Early Intervention, judicial/law enforcement, mental health/substance abuse programs, public health, schools, social services, another home visiting program, and individuals.

‖ Variable is square-root transformed.

Findings were generally consistent when the largest home visiting program was modeled separately, although the significantly lower enrollment rate for fathers, as well as the significantly greater odds of EI enrollment over "other" referral types, only seemed to be present for the large program. Conversely, only in the smaller programs were the odds of enrollment in domestic violence referrals significantly lower compared with "other" referrals.

Discussion and Conclusions for Practice

Connecting families to supports and services in their communities is a crucial goal of home visiting. Ten years of referral data from the First Born program in NM demonstrate that factors related to who and what a referral is for and the source of the referral may be associated with referral disposition. In particular, referrals initiated by home visitors versus the family, for fathers, for Asian, Black, and multiple race/ethnic group families, and for sensitive topics such as domestic violence are less likely to result in families reporting enrollment in intended services. Overall, our findings are consistent with studies of other home visiting models that have indicated that referral disposition may depend on type and whether participants were specifically looking for a referral[9,10,18] and demonstrate influence of some factors highlighted by precision home visiting paradigms.[15,17]

Professional development focusing on the types of referrals that are less engaged with by families, on average, may help to improve equity in referral outcomes. This is consistent with previous research that found home visitors would benefit from more training in identifying family risks and strategies, including formation of a therapeutic alliance and persistence, required to make successful connections to services, especially in sensitive areas such as child maltreatment,[12] perinatal depression,[24] domestic violence, and behavioral health and substance misuse.[18,25,26] Studies also found that home visitors desire enhanced training, particularly around addressing mental health, substance use, and domestic violence.27, 28, 29 Evidence from the Home Visiting Collaborative Improvement and Innovation Network also suggests that focused quality improvement efforts translating evidence to practice can effectively increase rates of developmental risk detection and connection to appropriate services.[13]

Professional development that assists home visitors in identifying and mitigating implicit bias may address the lower rate of referral success for Asian, Black, and multiple race/ethnic group families in NM.[30] Since this study, the First Born model has adopted a new professional development module for home visitors focused on anti-racist practices and serving families with diverse identities. Given the structure of program administrative records, we were not able to assess racial/ethnic concordance between home visitors and clients for each referral, and this deserves future study. It may be important to ensure that the racial/ethnic diversity of the home visiting workforce reflects that of the population being served, as racial discordance between patients and providers has been associated with poorer communication quality and less participatory decision-making in the medical field[31] and these aspects of a home visiting interaction may be key to referral success.

Findings that referrals for fathers were less likely to result in service enrollment indicate a need for professional development or curriculum focused on engaging fathers. Past studies have found that paternal engagement in home visiting promotes healthy relationships and family retention in programs.[32] However, research has also found barriers to paternal engagement, including resistance from fathers who do not perceive that home visiting services are aimed at them, resistance from home visitors concerned about domestic violence, and resistance from mothers who may act as "gatekeepers" between fathers and home visitors.[33] Programs can overcome some of these challenges by developing resources focused explicitly on fatherhood supports.[33] Some home visiting programs focus on integrating fathers meaningfully into a home visiting practice that is still centered on the mother, while others hire separate, male, fatherhood coordinators who deliver father-focused home visits.[33] Low referral uptake

among fathers signals that paternal engagement in First Born may deserve future attention.

Training for home visitors on counseling techniques focused on building motivation and non-judgmental, collaborative goal setting, such as motivational interviewing,[34] may also be helpful. There is evidence that home visitor training in motivational interviewing increases client uptake of referrals[35] and is associated with increased skills and confidence in discussing sensitive topics with families.[36] Both studies concluded that home visitors need on-going support to implement new counseling approaches, as effects from initial training attenuate over time.[35,36]

Strengths of this study are that it reflects nearly a decade of practice and included administrative data tracking thousands of referrals from First Born home visiting programs. This study also has some limitations. The structure of the administrative data entry system limited our ability to compare referral disposition for specific types beyond early intervention, behavioral health, and domestic violence. Administrative data may not fully capture the referrals that were provided to families or their outcomes. It is likely that there are at least small variations in coding practices across programs and across home visitors, although training around coding of administrative data is standardized and centralized. Referral outcomes were self-reported by families, raising potential concerns about social desirability bias; however, reported enrollment in services might be much higher if families felt pressured to report enrollment. As referral outcomes were self-reported during a subsequent contact with a home visitor, our findings may disproportionately reflect outcomes for families that remained engaged over time with home visiting. There were substantial missing data in the program administrative records. Although we used imputation to address missing data and conducted a sensitivity analysis that found the findings were stable across non-imputed and imputed datasets, it is possible that data may have been missing in a systematic way that could influence interpretation of the results. Findings related to variables with significant missing data (eg, race/ethnicity) should be interpreted with caution. We had limited information about home visitor training beyond their education level, which prevented us from exploring whether factors like the extent of their maternal-child health experience or area of study were associated with family enrollment in services. We were not able to integrate specific information about structural barriers to family enrollment in services (eg, availability, accessibility, and integration of community services) into the analysis; these structural barriers may have influenced family enrollment independent of other factors considered, and likely vary geographically and over time. In addition, all data for this study were obtained or collected before the coronavirus disease 2019 pandemic, and home visiting programs in NM and most of the nation started offering telehealth delivery of home visiting care during the public health emergency. As it is likely that telehealth home visiting delivery will persist, especially for rural families, it will be important to identify whether family enrollment in services varies with telehealth delivery of home visiting. Finally, the study was focused on referral outcomes within one type of home visiting model in one state, and thus the findings may not be widely generalizable. However, we believe that some of the findings may apply in other contexts.

Acknowledgments

The authors would like to thank First Born Model Office Director Tekla Johnson and the First Born home visiting programs for their partnership in conducting this study. The authors thank Blythe Maunders, Hannah Pangallo, and Alma Tolaymat for their assistance with manuscript formatting. They also thank Dana Bell for her review of study instruments, protocols, and findings.

Financial statement: This study was supported by the Thornburg Foundation. Thornburg Foundation funds were awarded to the First Born home visiting program, and the research team contracted with First Born to conduct these analyses. Neither the First Born program nor the funder had any role in the study design; collection, analysis, or interpretation of data; writing of the report; or decision to submit the article for publication.

Recommended articles

References

1 JH Duffee, AL Mendelsohn, AA Kuo, *et al.*
Early childhood home visiting
Pediatrics, 140 (2017), Article e20172150, 10.1542/peds.2017-2150
Google Scholar

2 Home Visiting Evidence of Effectiveness—Linkages and Referrals. Available at: https://homvee.acf.hhs.gov/outcomes

/linkages%20and%20referrals/In%20Brief Accessed September 2, 2022.
Google Scholar

3 S Allen
Parents' perceptions of intervention practices in home visiting programs
Infants Young Child, 20 (2007), pp. 266-281, 10.1097/01.IYC.0000277757.95099.47
View Record in Scopus Google Scholar

4 M Wagner, D Spiker, S Gerlach-Downie, *et al.*
Parental Engagement in Home Visiting Programs – Findings from the Parents as Teachers Multisite Evaluation
SRI International, Menlo Park, Calif (2000)
Google Scholar

5 Sama-Miller E, Lugo-Gil J, Harding J, et al. Home Visiting Evidence of Effectiveness (HomVEE) systematic review: Handbook of Procedures and Evidence Standards - Version 2.1. Available at:https://homvee.acf.hhs.gov/sites/default/files/2021-11/HomVEE-Handbook-v2.1-Nov-2021.pdf Accessed September 2, 2022.
Google Scholar

6 KA Dodge, WB Goodman, RA Murphy, *et al.*
Implementation and randomized controlled trial evaluation of universal postnatal nurse home visiting
Am J Public Health, 104 (suppl 1) (2014), pp. S136-S143, 10.2105/AJPH.2013.301361
View Record in Scopus Google Scholar

7 M Lutenbacher, T Elkins, MS Dietrich, *et al.*
The efficacy of using peer mentors to improve maternal and infant health outcomes in Hispanic families: findings from a randomized clinical trial
Matern Child Health J, 22 (2018), pp. 92-104, 10.1007/s10995-018-2532-z
View Record in Scopus Google Scholar

8 DI Lowell, AS Carter, L Godoy, *et al.*
A randomized controlled trial of Child FIRST: a comprehensive home-based intervention translating research into early childhood practice
Child Dev, 82 (2011), pp. 193-208, 10.1111/j.1467-8624.2010.01550.x
View Record in Scopus Google Scholar

9 CW LeCroy, D. Lopez
A randomized controlled trial of healthy families: 6-month and 1-year follow-up
Prev Sci, 21 (2020), pp. 25-35, 10.1007/s11121-018-0931-4
View Record in Scopus Google Scholar

10 Home Visiting Evidence of Effectiveness. Manuscript Detail - Healthy Families America. Available at:https://homvee.acf.hhs.gov/study-detail?title=WWHV014570%20%20%20%20%20 Accessed September 2, 2022.
Google Scholar

11 J Korfmacher, B Green, F Staerkel, *et al.*
Parent involvement in early childhood home visiting
Child Youth Care Forum, 37 (2008), pp. 171-196, 10.1007/s10566-008-9057-3
View Record in Scopus Google Scholar

12 A Duggan, L Fuddy, L Burrell, *et al.*
Randomized trial of a statewide home visiting program to prevent child abuse: impact in reducing parental risk factors
Child Abuse Negl, 28 (2004), pp. 623-643, 10.1016/j.chiabu.2003.08.008
Article Download PDF View Record in Scopus Google Scholar

13 M Arbour, M Mackrain, C Cano, *et al.*
National home visiting collaborative improves developmental risk detection and service linkage

Acad Pediatr, 21 (2021), pp. 809-817, 10.1016/j.acap.2020.08.020
Article Download PDF View Record in Scopus Google Scholar

14 Home Visiting Evidence of Effectiveness Review: Executive Summary 2019. Available at:https://homvee.acf.hhs.gov/sites/default/files/2019-09/HomeVEE_Executive_Summary_2019_B508.pdf Accessed September 2, 2022.
Google Scholar

15 Home Visiting Applied Research Collaborative (HARC). Introduction to precision home visiting. Available at: https://www.hvresearch.org/precision-home-visiting/introduction-to-precision-home-visiting/ Accessed September 2, 2022.
Google Scholar

16 DF Schwarz, AL O'Sullivan, J Guinn, *et al.*
Promoting early intervention referral through a randomized controlled home-visiting program
J Early Interv, 34 (2012), pp. 20-39, 10.1177/1053815112451849
View Record in Scopus Google Scholar

17 AK Duggan, KM Bower, CZ Spinosa, *et al.*
Changing the home visiting research paradigm: models' perspectives on behavioral pathways and intervention techniques to promote good birth outcomes
BMC Public Health, 22 (2022), p. 1024, 10.1186/s12889-022-13010-5
View Record in Scopus Google Scholar

18 J Goldberg, J Greenstone Winestone, R Fauth, *et al.*
Getting to the warm hand-off: a study of home visitor referral activities
Matern Child Health J, 22 (2018), pp. 22-32, 10.1007/s10995-018-2529-7
View Record in Scopus Google Scholar

19 MR Kilburn, JS. Cannon
Home visiting and use of infant health care: a randomized clinical trial
Pediatrics, 139 (2017), Article e20161274, 10.1542/peds.2016-1274
View Record in Scopus Google Scholar

20 Essential Program Elements - First Born Program. Available at: https://firstbornprogram.org/essential-program-elements/ Accessed September 2, 2022.
Google Scholar

21 E von Elm, DG Altman, M Egger, *et al.*
The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies
PLoS Med, 4 (2007), p. e296, 10.1371/journal.pmed.0040296
Google Scholar

22 SW Raudenbush, AS. Bryk
Hierarchical Linear Models: Applications and Data Analysis Methods
SAGE Publications, Thousand Oaks, Calif (2002)
Google Scholar

23 S Rabe-Hesketh, A Skrondal
Multilevel and Longitudinal Modeling Using Stata, Second Edition
Stata Press, College Station, Tex (2008)
Google Scholar

24 JJ Doering, K Maletta, A Laszewski, *et al.*
Needs and challenges of home visitors conducting perinatal depression screening
Infant Ment Health J, 38 (2017), pp. 523-535, 10.1002/imhj.21656

View Record in Scopus Google Scholar

25 B Jones Harden, N Denmark, D Saul
Understanding the needs of staff in Head Start programs: the characteristics, perceptions, and experiences of home visitors
Child Youth Serv Rev, 32 (2010), pp. 371-379, 10.1016/j.childyouth.2009.10.008
Article Download PDF View Record in Scopus Google Scholar

26 SD Tandon, KM Parillo, C Jenkins, *et al.*
Formative evaluation of home visitors' role in addressing poor mental health, domestic violence, and substance abuse among low-income pregnant and parenting women
Matern Child Health J, 9 (2005), pp. 273-283, 10.1007/s10995-005-0012-8
View Record in Scopus Google Scholar

27 S Dauber, F Ferayorni, C Henderson, *et al.*
Substance use and depression in home visiting clients: home visitor perspectives on addressing clients' needs
J Community Psychol, 45 (2017), pp. 396-412, 10.1002/jcop.21855
View Record in Scopus Google Scholar

28 S Gill, MT Greenberg, C Moon, *et al.*
Home visitor competence, burnout, support, and client engagement
J Hum Behav Soc Environ, 15 (2007), pp. 23-44, 10.1300/J137v15n01_02
View Record in Scopus Google Scholar

29 SD Tandon, CD Mercer, EL Saylor, *et al.*
Paraprofessional home visitors' perspectives on addressing poor mental health, substance abuse, and domestic violence: a qualitative study
Early Child Res Q, 23 (2008), pp. 419-428, 10.1016/j.ecresq.2008.02.002
Article Download PDF View Record in Scopus Google Scholar

30 Administration for Children and Families, U.S. Department of Health and Human Services. Resources and strategies to promote anti-bias teaching and home visiting practices. 2020. Available at:https://eclkc.ohs.acf.hhs.gov/video/resources-strategies-promote-anti-bias-teaching-home-visiting-practices Accessed September 2, 2022.
Google Scholar

31 MJ Shen, EB Peterson, R Costas-Muñiz, *et al.*
The effects of race and racial concordance on patient-physician communication: a systematic review of the literature
J Racial Ethn Health Disparities, 5 (2018), pp. 117-140, 10.1007/s40615-017-0350-4
View Record in Scopus Google Scholar

32 SA Burcher, LA Corey, KM Mentzer, *et al.*
Family home visiting and fathers: a scoping review
Child Youth Serv Rev, 128 (2021), Article 106132, 10.1016/j.childyouth.2021.106132
Article Download PDF Google Scholar

33 Gearing ME, Peters HE, Sandstrom H, et al. Engaging low-income fathers in home visiting: approaches, challenges, and strategies. Available at:https://www.urban.org/sites/default/files/publication/76121/2000538-Engaging-Low-Income-Fathers-in-Home-Visiting-Approaches-Challenges-and-Strategies.pdf Accessed September 2, 2022.
Google Scholar

34 W Miller, S. Rollnick
Motivational Interviewing: Helping People Change
(3rd ed.), Guilford Press, New York, NY (2013)
Google Scholar

35 J Biggs, J Sprague-Jones, T Garstka, *et al.*

Brief motivational interviewing training for home visitors: results for caregiver retention and referral engagement

Cited by (0)

The authors have no conflicts of interest to declare.

View Abstract