A SUMMARY OF RESULTS FROM THE MIHOPE AND MIHOPE-STRONG START STUDIES OF EVIDENCE-BASED HOME VISITING

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OVERVIEW

A healthy birth and positive experiences in early childhood can promote health and development. One approach that has improved outcomes for children and their parents is home visiting, which provides individually tailored support, resources, and information to expectant parents and families with young children. This brief summarizes recently published reports from two national studies of evidence-based early childhood home visiting: the Mother and Infant Home Visiting Program Evaluation (MIHOPE) and MIHOPE-Strong Start.

MIHOPE included 88 local programs that were funded through the Maternal, Infant, and Early Childhood Home Visiting program and that were operating one of four evidence-based models of home visiting: Early Head Start — Home-based option, Healthy Families America, Nurse-Family Partnership, and Parents as Teachers. The analysis for MIHOPE-Strong Start included 66 local home visiting programs for two of these models: Healthy Families America and Nurse-Family Partnership. While MIHOPE-Strong Start is focused on prenatal care and birth outcomes, MIHOPE is examining a broad range of outcomes. To provide reliable estimates of the effects of home visiting programs, families were randomly assigned to a local home visiting program or a control group who received information on other community services.

The main findings include the following:

- **The home visiting programs in the studies were generally well implemented, with appropriate support in place to help home visitors administer the intended services.** This support included training for home visitors, supervision, structured parenting curricula, consultants to address specific family needs, and protocols for risk screening and referrals. However, the studies identified several ways that this support could be strengthened.
- **MIHOPE found positive effects on some family outcomes but MIHOPE-Strong Start found little effect on birth outcomes and prenatal behaviors.** MIHOPE found positive effects across multiple outcome areas through the time children were about 15 months old. In contrast, MIHOPE-Strong Start found that the two evidence-based models that were examined had little effect on birth outcomes and prenatal behaviors. The findings from both studies are broadly consistent with results from previous studies of the evidence-based models of home visiting.

Previous studies of the four evidence-based home visiting models have found improvements in family outcomes after families have stopped receiving home visiting services. MIHOPE is therefore continuing to follow families as children age through kindergarten. The findings described in this brief represent only the first installment of information from MIHOPE on how home visiting improves outcomes for families and children.

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A healthy birth and positive experiences in early childhood can set the stage for good health and development over the course of a person's life.

One approach that has been found to improve outcomes for children and their parents is home visiting, which provides individually tailored support, resources, and information to expectant parents and families with young children. Home visiting aims to support the healthy development of infants and toddlers and to work with families to help ensure their well-being.

For decades, home visiting programs have been involved in studies of their effectiveness, and have used the results of those studies to refine their practices.[1] The two national studies of early childhood home visiting programs highlighted in this brief — the Mother and Infant Home Visiting Program Evaluation (MIHOPE) and MIHOPE-Strong Start — represent some of the most recent research on home visiting programs, and are the first to examine the effects across multiple models at a national scale. This brief summarizes findings recently published in three reports from these two studies.[2] Figure 1 compares the features of the two studies, and Box 1 provides additional background on the two studies.

In the four commonly used evidence-based models of early childhood home visiting discussed in this brief,[3] home visitors and parents work together on three broad sets of activities: (1) identifying family strengths, needs, and interests; (2) ensuring that parents are informed and supported in areas of identified needs and interests; and (3) involving families in services available in the community by providing referrals to those services and coordinating with community service providers. Figure 2 summarizes the types of activities that home visitors and parents engage in during home visits and the outcomes that home visiting programs aim to affect.

The four models and the local agencies that implement them generally aim to improve outcomes in a wide range of areas, including maternal health, family economic self-sufficiency, intimate partner violence, positive parenting practices, and improved early childhood development. In addition, home visiting programs that serve pregnant women seek to improve birth outcomes by helping mothers receive adequate prenatal care and encouraging them to undertake healthy

1 One source of information on the past research is the Home Visiting Evidence of Effectiveness review commissioned by the U.S. Department of Health and Human Services. See U.S. Department of Health and Human Services, "Home Visiting Evidence of Effectiveness" (n.d.).

2 Duggan et al. (2018); Lee et al. (2019); Michalopoulos et al. (2019).

3 As shown in Figure 2 and noted in Box 1, the four models are Early Head Start — Home-based option, Healthy Families America, Nurse-Family Partnership, and Parents as Teachers. Also as shown in the figure, MIHOPE is the legislatively mandated evaluation of the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program and all local programs included in the study received some funding from the MIECHV program. MIHOPE-Strong Start included local programs that served primarily Medicaid recipients; they were not required to be receiving MIECHV funds to be in the study.

FIGURE 1. FEATURES OF MIHOPE AND MIHOPE-STRONG START

	MIHOPE Mother and Infant Home Visiting Program Evaluation	MIHOPE-STRONG START Mother and Infant Home Visiting Program Evaluation-Strong Start
Policy context	Legislatively mandated evaluation of the Maternal, Infant, and Early Childhood Home Visiting program	Part of the Center for Medicare and Medicaid Innovation's Strong Start for Mothers and Newborns Initiative
Evidence-based models	Early Head Start — Home-based option Healthy Families America Nurse-Family Partnership Parents as Teachers	Healthy Families America Nurse-Family Partnership
Targeted sample	Pregnant women or families with children less than 6 months of age, recruited from local programs funded through the MIECHV program	Pregnant women in the first 32 weeks of their pregnancies, recruited from local programs that served primarily Medicaid beneficiaries
Focuses of the impact analysis	• Maternal and child health • Child development • Parenting and the home environment • Child maltreatment • Intimate partner violence • Economic self-sufficiency	• Prenatal, maternal, and infant health
Scope and size of the study	12 states and 88 local programs receiving MIECHV funding, and 4,229 families	17 states and 66 local programs serving primarily Medicaid recipients, and 2,900 families*

*This total includes 1,845 families from 46 local programs who were recruited for MIHOPE but included in the MIHOPE-Strong Start impact analyses because they also met MIHOPE-Strong Start's eligibility criteria.

MIHOPE included only local programs that received MIECHV funding from their states. MIHOPE-Strong Start included both MIECHV-funded and non-MIECHV-funded programs.

BOX 1. OVERVIEW OF MIHOPE AND MIHOPE-STRONG START

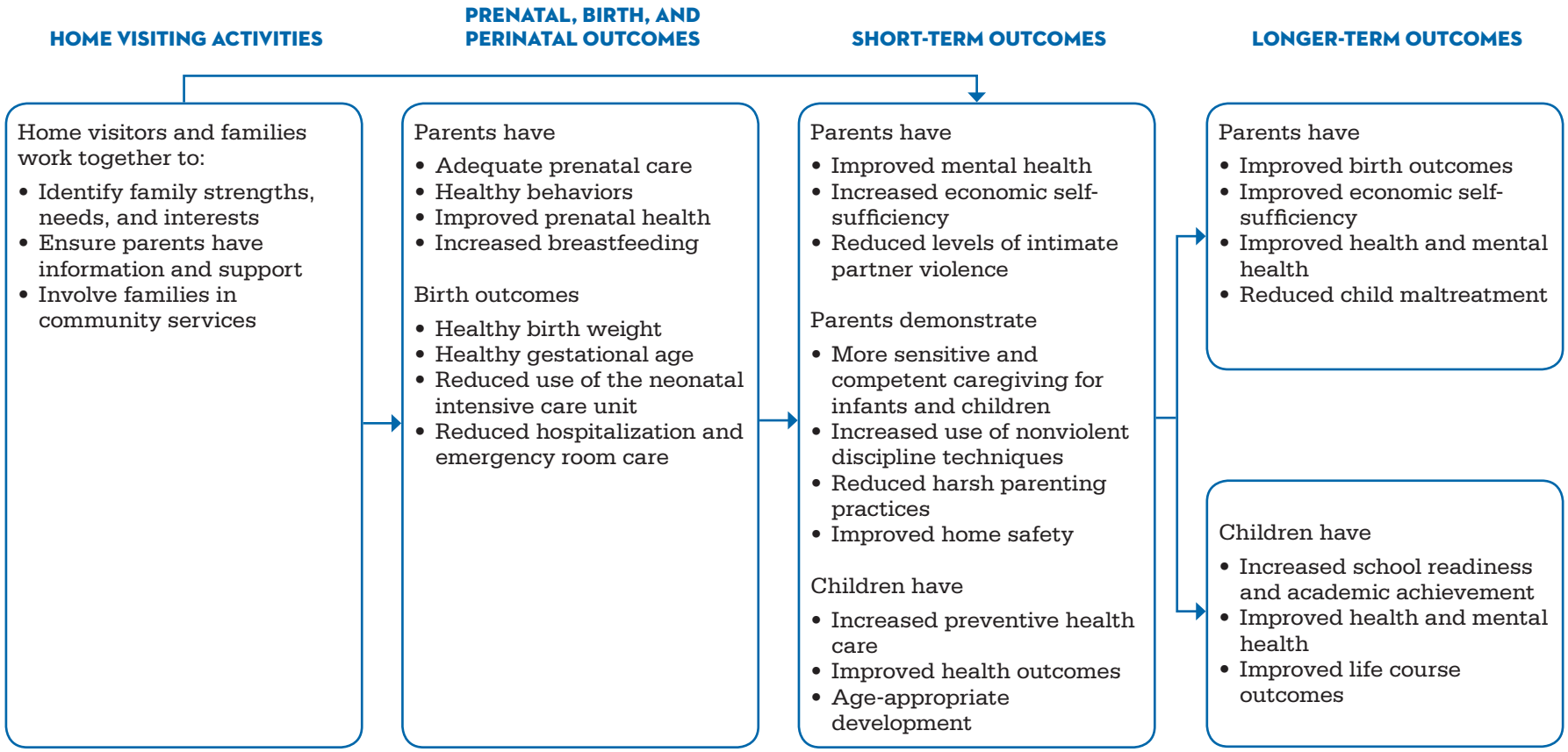
The Mother and Infant Home Visiting Program Evaluation (MIHOPE) and MIHOPE-Strong Start are national evaluations of evidence-based early childhood home visiting. MIHOPE was launched in 2011 by the Administration for Children and Families (ACF) within the U.S. Department of Health and Human Services, in collaboration with the Health Resources and Services Administration (HRSA). MIHOPE-Strong Start was launched in 2012 by ACF in collaboration with HRSA and the Center for Medicare and Medicaid Innovation of the Centers for Medicare and Medicaid Services. While MIHOPE is the legislatively mandated evaluation of the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program, MIHOPE-Strong Start was part of the Strong Start for Mothers and Newborns Initiative. MDRC is conducting both studies for the federal government in partnership with James Bell Associates, Johns Hopkins University, and Mathematica Policy Research. The University of Georgia and Columbia University are also collaborating on MIHOPE.

MIHOPE is studying the four evidence-based models chosen by 10 or more states in their fiscal year 2010-2011 plans for MIECHV funds. These models are Early Head Start — Home-based option, Healthy Families America, Nurse-Family Partnership, and Parents as Teachers. MIHOPE-Strong Start includes Healthy Families America and Nurse-Family Partnership, the models with evidence of improvements in birth outcomes when MIHOPE-Strong Start was launched. Both studies included women who had been identified by a local home visiting program as eligible and interested in home visiting services, who were 15 or older, and who spoke English or Spanish well enough to provide informed consent and complete a survey. While MIHOPE includes women who were pregnant or had children under 6 months old, MIHOPE-Strong Start was limited to pregnant women in the first 32 weeks of their pregnancies.

MIHOPE and MIHOPE-Strong Start used a rigorous research design to assess the effectiveness of home visiting services. Families recruited into the two studies were randomly assigned either to an evidence-based home visiting program or to a control group who was given information on other services available in the community. Random assignment was intended to ensure that the two groups were similar in all respects when they entered the studies except that one had immediate access to evidence-based home visiting. Following best practices in a random assignment study, the effects of being assigned to receive evidence-based home visiting are estimated by comparing outcomes for the entire program and control groups. Both studies also collected extensive information about home visiting service implementation to describe the families served, the policies and support in place for home visitors to provide services, the quantity and content of the actual services provided to families, and the ways those services varied.

For more information on MIHOPE, see U.S. Department of Health and Human Services (2017a). For more information on MIHOPE-Strong Start, see U.S. Department of Health and Human Services (2017b).

FIGURE 2. HOME VISITING ACTIVITIES AND OUTCOMES



SOURCES: Early Head Start Parent, Family, and Community Engagement (PFCE) Framework, Healthy Families America logic model, Nurse-Family Partnership logic model, and Parents as Teachers logic model

behaviors. By trying to improve a broad range of child and family outcomes in the short term, home visiting services are intended to lead to improvements in outcomes across a broad range of areas in the long term as well.

The findings from MIHOPE and MIHOPE-Strong Start include the following:

- **The home visiting programs that participated in the studies were generally implemented well, with appropriate support in place to help home visitors administer the intended services.** This support included training for home visitors in a wide range of relevant topics, supervision, structured parenting curricula, consultants for specialized services, protocols for risk screening and referrals, and administrative forms of support such as management information systems. In addition, the evaluations found that home visitors tailored services to families' needs to some extent. For example, they were more likely to discuss topics such as substance use, mental health, and intimate partner violence when families had needs in those areas, and were also more likely to provide referrals for relevant services in the community. But they did not have discussions with or make referrals for all families that the studies identified as having those needs.

- **MIHOPE found positive effects on some family outcomes, but MIHOPE-Strong Start found little effect on birth outcomes and prenatal health behaviors (see Table 1).** MIHOPE, which

TABLE 1. SUMMARY OF ESTIMATED EFFECTS ON MIHOPE AND MIHOPE-STRONG START CONFIRMATORY OUTCOMES, BY OUTCOME AREA

OUTCOME AREA	MIHOPE	MIHOPE-STRONG START
Prenatal, maternal, and infant health	1 outcome examined, 0 significant estimated effects	5 outcomes examined, 0 significant estimated effects
Family economic self-sufficiency	1 outcome examined, 0 significant estimated effects	Not examined
Intimate partner violence	No confirmatory outcomes	Not examined
Parenting skills	2 outcomes examined, 1 significant estimated effect	Not examined
Child maltreatment	2 outcomes examined, 1 significant estimated effect	Not examined
Child health	4 outcomes examined, 1 significant estimated effect	3 outcomes examined, 0 significant estimated effects
Child development	2 outcomes examined, 1 significant estimated effect	Not examined

examined a broad range of outcomes across four evidence-based models through the time children were 15 months old, found positive effects across multiple outcome areas. MIHOPE-Strong Start, however, found little effect on the more focused set of outcomes it examined (birth outcomes and prenatal behaviors) for the two evidence-based models it studied.

These findings are discussed in more detail in the next two sections. The brief concludes with some implications for the home visiting field.

Implementation Research

MIHOPE addressed gaps in the field's knowledge about evidence-based home visiting programs; for example, there was relatively little information on the implementation of the programs. Since past studies of home visiting have rarely reported detailed information on the support provided to home visitors and the services provided to families, it has been difficult to know when weak effects have been due to problems of implementation. The MIHOPE implementation research included information on home visitors and families enrolled in 88 local programs to describe who was served, the ways that home visitors were supported in providing services, the quantity and content of services provided to families, and the ways those services varied depending on the characteristics of families, home visitors, and local programs. The MIHOPE-Strong Start implementation research provided similar information on home visitors and families in 66 local programs (including 48 of the local programs studied in MIHOPE).[4] Both studies also provided information about the broader context in which these home visiting programs operated, such as the MIECHV program and states' efforts to promote prenatal health and positive birth outcomes.

Who Was Served?

- **Local programs participating in the studies served families with high levels of socioeconomic risk and other risks.** Most mothers were young, more than a third had not graduated from high school, and more than half had run out of food or had worried about running out of food in the previous year. Most lived in households that received public assistance. Mothers exhibited a variety of other risks that could affect their children's health and development; for example, over a third reported depressive symptoms and about one-fifth reported symptoms of anxiety.

How Were Home Visitors Supported in Their Work?

- **Home visitors participating in these studies typically reported having many forms of support in place for program implementation.** This support included training and supervision, which are discussed in more detail below. It also included structured parenting cur-

4 Of the 66 local programs that participated in MIHOPE-Strong Start, 18 participated only in MIHOPE-Strong Start, 2 recruited families for both MIHOPE and MIHOPE-Strong Start, and 46 recruited families for MIHOPE who were included in the MIHOPE-Strong Start impact analyses because they met MIHOPE-Strong Start's eligibility criteria.

ricula to guide visits with families, access to professional consultants who provided advice to home visitors and direct services to families, protocols for screening families and making referrals to services in the community, and administrative forms of support such as management information systems. In MIHOPE, home visitors generally reported feeling more supported in the areas of child development and positive parenting than in areas such as maternal mental health or intimate partner violence. In both studies, home visitors working with pregnant women felt well supported in improving prenatal care and promoting healthy behaviors during pregnancy.

Past studies on human services programs have shown that well-structured support for program implementation improves service delivery and program effectiveness.[5] In MIHOPE, two important forms of support that were studied in depth were training and supervision.

- **Home visitors participating in MIHOPE reported receiving frequent training.** On average, home visitors reported spending more than 8 hours per month in training, which is more than was expected by the evidence-based models. (The models' expectations for training ranged from 3 to 36 hours per year, with some models specifying that less training was needed as home visitors grew more experienced.) The most common training topics were child development, positive parenting behavior, child maltreatment, child preventive care, and mental health or stress. Training typically did not include role playing to practice new skills, a feature that has been shown to be important for building skills and improving program effectiveness.[6]

- **Home visitors participating in MIHOPE received fewer hours of individual supervision than specified by the evidence-based models.** When specified, model expectations for supervision varied in both session length and frequency; they ranged from 2 hours per month to 1 to 1.5 hours per week. When sessions were held, they were typically as long as the models expected them to be, but they were not held as often as expected in some cases. In addition, over the course of a year, a third of home visitors were not directly observed in visits with families, even though the models expected them to be observed from one to three times per year. As a result, home visitors may not have received as many suggestions or comments from supervisors as anticipated to help them improve how they delivered services.

What Services Did Families Receive?[7]

- **More than 80 percent of mothers received at least one home visit.** In MIHOPE, 17 percent never participated in a visit and in MIHOPE-Strong Start, 14 percent never participated. These proportions are consistent with those seen in past studies.[8]

5 Casillas, Fauchier, Derkash, and Garrido (2016); Fixsen et al. (2005).

6 Casillas, Fauchier, Derkash, and Garrido (2016).

7 As noted in Box 1, families enrolled in the two studies were randomly assigned to a program group who could receive evidence-based home visiting or a control group who was given information on other community services. This section discusses services received by families in the program groups.

8 Duggan et al. (1999); Wagner et al. (2003).

- **Mothers participating in these studies discussed many outcome-specific topics with their home visitors in each visit.** The most frequently discussed topics were child development and positive parenting behavior. Prenatal health and birth outcomes were discussed with nearly every woman who enrolled during pregnancy.

- **Families participated in home visiting for less time and received fewer visits than expected by the evidence-based models, but received a similar number of visits as have been seen in past studies of the models.** In MIHOPE, families participated in home visiting for an average of eight months in the first year of services. In MIHOPE-Strong Start, families who received at least one home visit during pregnancy received an average of about eight home visits prenatally and participated for almost four months before the infant's birth, on average. Although the evidence-based models included in MIHOPE and MIHOPE-Strong Start expect families to stay enrolled until at least a child's second birthday, only about half of families were participating at the time of the child's first birthday in both studies. About 60 percent of families received at least half as many visits as their evidence-based models expected, which is a somewhat lower percentage than that seen in past studies.[9]

- **Families participating in MIHOPE stayed engaged in home visiting for varying lengths of time. The families who participated in home visiting for the shortest amount of time tended to be those with more socioeconomic and health-related risk factors.** About 28 percent of families left MIHOPE home visiting programs within six months, while about 55 percent of families were still receiving about two visits per month on average after a year. The families who left early tended to be younger, have poorer self-rated health, and be less educated, on average, than families who stayed in the programs.

- **Some home visitors said that it was especially challenging to address topics that may be perceived as sensitive, such as mental health and intimate partner violence.** Although most home visitors reported having received training in these areas, they also stated in qualitative interviews that often mothers would not open up about these problems until home visitors had earned their trust. In addition, when home visitors did identify these issues, they sometimes had difficulty engaging mothers in the full range of other home visiting services because these risks overshadowed other goals.

- **MIHOPE provides some evidence that home visitors are tailoring services to family needs to some extent.** Home visitors were more likely to discuss topics such as substance use, mental health, and intimate partner violence with families whom the study identified through surveys and assessments as likely to need services in these areas, compared with other families. They were also more likely to provide appropriate referrals to families with these needs. Other forms of support for implementation also influenced the delivery of services related to some of these sensitive topics. For example, home visitors who had received training in these areas or whose local programs had formal protocols for screening addressed these issues with families more often than home visitors without such training or whose local programs did not have formal screening protocols.

9 Boller et al. (2014).

What Was the Broader Context for Home Visiting Programs?

- **Home visiting programs operated in the context of activities supported by the federal government and state efforts to promote prenatal care and improve birth outcomes.** Local programs participating in MIHOPE were all funded by state programs that received awards through the MIECHV program. The legislation that authorized the MIECHV program specifies domains where home visiting should improve outcomes, such as prenatal, maternal, and newborn health.[10] Local programs participating in MIHOPE-Strong Start operated among the many state efforts that existed to promote prenatal health and positive birth outcomes, including Medicaid incentives to promote prenatal care attendance, initiatives to reduce racial disparities in rates of preterm birth, and prenatal smoking-cessation campaigns, as reported in a MIHOPE-Strong Start qualitative substudy.[11]

Estimated Effects on Family Outcomes

As shown in Figure 1, MIHOPE included 4,229 families and the MIHOPE-Strong Start analysis included 2,900 families (1,845 of whom were recruited for MIHOPE but who also met the criteria for being enrolled in MIHOPE-Strong Start). Families in both studies were randomly assigned either to an evidence-based home visiting program or to a control group who was given information about other relevant services in the community. Because families were randomly assigned to the two groups, they were expected to be similar in all respects other than their access to home visiting. As a result, any differences that emerged between them can reliably be attributed to the program group's access to evidence-based home visiting.[12]

Because home visiting services can affect a variety of outcomes, the studies examined many outcomes. To try to reduce the chance of a "false positive" finding (that is, a finding that suggests home visiting is effective when it is not), the studies emphasized a limited set of prespecified outcomes based on a review of the existing evidence, the policy relevance of those outcomes, and the instruments and data available to measure them.[13] These outcomes are referred to as "confirmatory." Other outcomes that were examined were considered "exploratory" because the past empirical evidence and theoretical links to home visiting did not clearly suggest that the home visiting models being studied would affect these outcomes. Because there are many exploratory outcomes, Figures 3 and 4 show results only for the confirmatory outcomes,

10 In 2010, Congress authorized the MIECHV program by enacting section 511 of the Social Security Act (42 U.S.C. § 711). Subsequently enacted laws extended funding for the program through fiscal year 2022.

11 Sparr et al. (2017).

12 Following best practices in a random assignment study, all estimates compare all program group members (including those who received no home visiting) with all control group members (even though some did receive home visiting). As a result, estimated effects represent the difference between having immediate access to evidence-based home visiting and having access to whatever other types of home visiting were available in the community.

13 The analysis plan for MIHOPE, including the prespecified outcomes, was reviewed by an advisory committee to the Secretary of Health and Human Services and is available online. See U.S. Department of Health and Human Services (2016). Both studies were also registered at ClinicalTrials.gov.

although results for some exploratory outcomes are discussed below where a pattern of results suggests a set of findings with potentially important implications. Box 2 explains how to read Figures 3 and 4.

Did Evidence-Based Early Childhood Home Visiting Improve Birth Outcomes?

- **MIHOPE-Strong Start found that home visiting did not improve any confirmatory outcomes related to birth, prenatal health behaviors, or neonatal care among families participating in the study.** For example, home visiting did not significantly decrease rates of low birth weight, preterm birth, or admission to a neonatal intensive care unit (Figure 3). Home visiting also had no statistically significant effects on breastfeeding at hospital discharge or on a child's health care use during the first year of life. It is important to note that only a

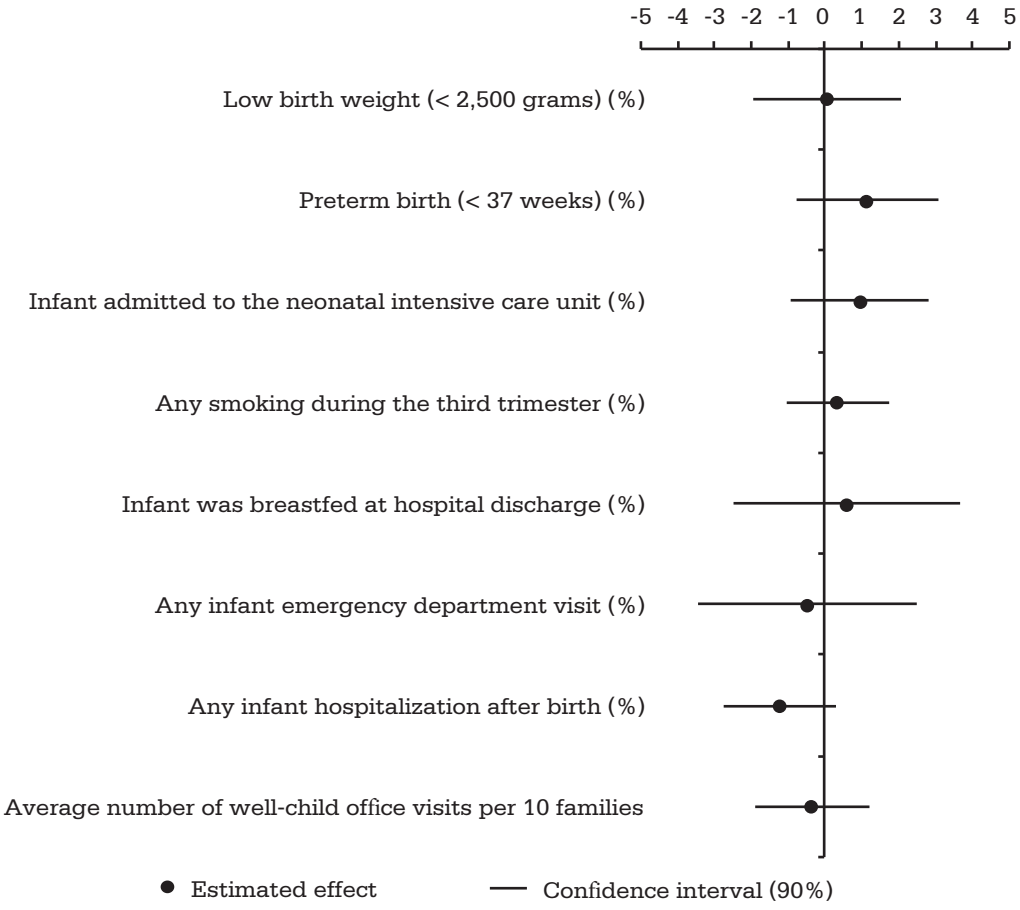
BOX 2. HOW TO READ THE FIGURES SHOWING ESTIMATED EFFECTS

Figures 3 and 4 provide a graphical representation of the estimated effects from MIHOPE and MIHOPE-Strong Start on outcomes the studies focused on. For each outcome, the dot shows the difference between the program and control group in the study.

The horizontal line shows the 90 percent confidence interval, which is an estimate of the statistical imprecision of the effects of the home visiting program. Specifically, there is a 90 percent chance that the true effect would fall within the 90 percent confidence interval for any given study. A narrower confidence interval suggests a more precise estimate than a wider confidence interval (which indicates greater variability and thus greater uncertainty). Confidence intervals that do not contain zero indicate that the impact estimate is significantly different from zero at the 10 percent level of statistical significance, which means there is less than a 10 percent chance this estimate would have been seen if the home visiting programs made no difference.

Results in Figure 3 are shown in their natural units. For example, the impact on low birth weight represents the difference in the proportion of the program and control groups with low-birth-weight babies. Results in Figure 4 are shown as effect sizes. An effect size is calculated by dividing the estimated effect by the standard deviation of the outcome in the study sample. The interpretation of an effect size will vary with the outcome and the context, so it is difficult to characterize the magnitude of effect sizes in general. A standard intelligence quotient (IQ) test has a standard deviation of 10, for example, so an effect size of 0.10 would represent a 1-point change in IQ. For an outcome expressed as a percentage, such as the percentage of mothers with subsequent pregnancies, an effect size of 0.10 would represent a change of about 3 percentage points to 5 percentage points in the outcome.

FIGURE 3. ESTIMATED EFFECTS ON MIHOPE-STRONG START CONFIRMATORY OUTCOMES



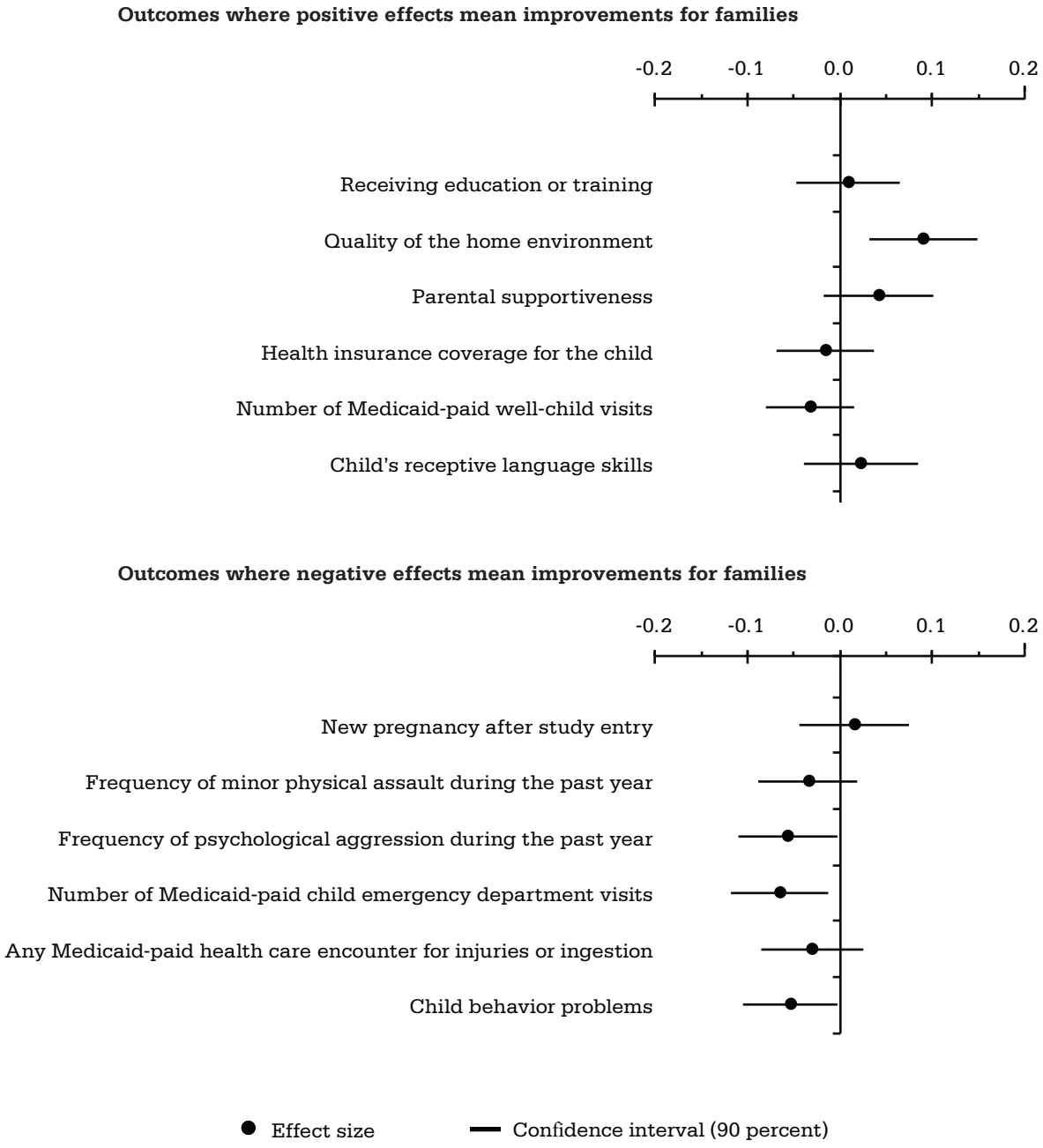
SOURCES: Calculations based on state vital records and Medicaid enrollment and claims data.

NOTES: The scale represents the difference in percentage points between the program group and the control group for the first seven outcomes and the difference in number of visits for the last outcome.

Estimates were regression-adjusted using generalized least squares, controlling for pre-random assignment characteristics of sample members weighted to adjust for differing random assignment ratios used in MIHOPE and MIHOPE-Strong Start. Sample sizes vary depending on the data source and measure.

Infant emergency department visits, hospitalizations, and well-child visits are based on Medicaid-paid health care use from birth until the first birthday.

FIGURE 4. ESTIMATED EFFECTS ON MIHOPE CONFIRMATORY OUTCOMES (ALL RESULTS SHOWN AS EFFECT SIZES)



SOURCES: Calculations based on the MIHOPE 15-month follow-up survey, the in-home assessment, the parent-child videotaped interaction, and Medicaid enrollment and claims data.

NOTES: All results are presented in effect sizes, which normalize effects by dividing them by the standard deviations of the outcomes. Estimates were regression-adjusted using generalized least squares, controlling for pre-random assignment characteristics of sample members. Sample sizes vary depending on the data source and measure.

few previous studies of home visiting have found improvements in birth outcomes, and in some instances the effects were found only among subgroups of families. The lack of effects in MIHOPE-Strong Start may reflect the fact that most families in the study had adequate prenatal care even without receiving home visiting and few women in the study were engaged in risky behaviors such as smoking. Thus, a question for future research is whether the home visiting programs would have greater effects on these outcomes if they served an even higher-risk group of families, such as mothers who smoked or those who were not receiving prenatal care.

Did Home Visiting Improve Outcomes After Children Were Born?

- **Around the time children were 15 months old, MIHOPE found positive effects for families on some confirmatory outcomes.** Estimated effects were statistically significant for 4 of 12 confirmatory outcomes, indicating improved quality of the home environment, reduced frequency of psychological aggression toward the child, fewer emergency department visits for the child, and fewer child behavior problems (Figure 4).[14] The finding of statistically significant estimates in several outcome areas is consistent with the broad scope of program services. The effects MIHOPE found on these outcomes are generally somewhat smaller than the average effects found in past studies, although MIHOPE differs from those studies in a number of important ways. For example, many of those studies were of individual models of home visiting, took place in a limited number of locations, and occurred in a time when control group families had access to fewer services in their communities. In addition to the four outcomes where home visiting had statistically significant effects, there were five other confirmatory outcomes where program group families had better results on average than control group families, though the differences were not statistically significant. This pattern of results further suggests that home visiting had generally positive and broad effects through 15 months.[15]

- **The home visiting programs studied in MIHOPE might be reducing household aggression.** Results for a set of confirmatory and exploratory outcomes suggest that home visiting services may be reducing household aggression. For example, there are statistically significant reductions in the frequency of psychological aggression toward children (a confirmatory outcome) as well as mothers' experience with intimate partner violence and mothers' use of domestic violence services (exploratory outcomes). These effects may be associated with the statistically significant reductions in parental depression and parental stress (ex-

14 After adjusting for the number of confirmatory outcomes, none of the 12 estimated effects is statistically significant. This finding reduces the study team's confidence that any individual outcome was improved by the home visiting services that were studied but, as discussed in footnote 15, the evidence indicates there are positive effects for families.

15 A statistical test of the number of outcomes for which estimated effects would be positive resulted in a p-value of 0.096 for having 9 or more positive findings out of 12, meaning there is less than a 10 percent probability that this pattern of results would have resulted if home visiting had no effect on any of the 12 outcomes. A statistical test suggested by Caughey, Dafoe, and Seawright (2017) that also takes into account the magnitude of the estimated effects has a p-value of 0.025, meaning there is a 2.5 percent probability this pattern of results would have been found if home visiting had no effects on the 12 outcomes. Neither test was prespecified in the study's analysis plan.

ploratory outcomes) that MIHOPE found, as well as with the positive changes in parenting practices, including increased parental discipline using gentle guidance (an exploratory outcome). Reduced household aggression and improved parenting behaviors could also help explain observed reductions in child behavior problems (a confirmatory outcome). Because adverse childhood experiences such as child abuse and intimate partner violence have been shown to be associated with negative long-term outcomes, reducing household aggression could continue to benefit children as they grow older.

- **Results from MIHOPE for several exploratory outcomes suggest home visiting may improve maternal health.** MIHOPE found that home visiting resulted in improvements in women's general health, increases in health insurance coverage, and reductions in depressive symptoms. Improving maternal mental health could be especially important since it could result in improvements in many other areas, such as child development and economic self-sufficiency, although given the exploratory designation of these outcomes, additional research to confirm the findings is needed.

- **Even though most estimated effects in these studies are not statistically significant, more estimates in MIHOPE are statistically significant than would be expected by chance.** The results discussed above indicate that home visiting is benefiting families with young children. Nevertheless, it is important to note that most effects on both confirmatory and exploratory outcomes examined in the two studies are not statistically significant and are generally small. At the same time, more estimates in MIHOPE are statistically significant than would be expected by chance, supporting the notion that home visiting is improving outcomes for families with young children.

How Do the Effects of Home Visiting Vary Across Evidence-Based Models, Local Programs, and Subgroups of Families?

- **In MIHOPE, there are some statistically significant differences in effects on the confirmatory outcomes across the evidence-based models.** These differences are generally consistent with the models' focuses. For example, Parents as Teachers produced the largest increase in parental supportiveness and the Nurse-Family Partnership had the largest effect on reducing emergency department visits for children, although the differences are somewhat sensitive to the statistical method used to examine them.

- **The effects of home visiting did not vary much across local programs in the studies.** Differences in how local programs were implemented were generally not associated with differences in effects, although the studies could only examine implementation features that varied substantially among local programs. As a result, it is possible that implementation features that were used by most local programs are responsible for the effects that were observed. One exception from MIHOPE-Strong Start is that local programs located in areas with a higher density of primary care providers reduced infant emergency department visits and low-weight births more than other local programs. This finding may suggest that families were better able to take advantage of referrals for health care in areas where there was an adequate supply of primary care providers.

- **Differences in estimated effects among subgroups of families in both studies generally are small.** Since home visiting services are intended to be tailored to family needs, an important question is whether effects are larger for some groups of families than for others. These studies found that estimated effects were similar across a number of types of families, including groups defined by race and ethnicity, by maternal age, and by the age of the child when the mother entered the study.[16]

Implications

As discussed above, MIHOPE and MIHOPE-Strong Start found that home visitors generally felt well supported in working with families across a broad range of outcomes. The studies also found that families received a number of home visits that, while fewer than expected by the models, was similar to the number seen in previous studies.[17] While MIHOPE-Strong Start found that home visiting programs in the study did not improve birth outcomes, home visiting programs in MIHOPE did improve outcomes for families after children were born, although the effects were generally smaller than the average effects from past studies. MIHOPE's findings suggest that home visiting is improving outcomes for families with young children, while findings from both studies suggest several possible ways to strengthen the effects of home visiting services.

Home visiting programs might be better able to improve birth outcomes if they targeted families exhibiting health behaviors associated with poor birth outcomes, such as smoking and not receiving adequate prenatal care. The lack of effects in MIHOPE-Strong Start might reflect the fact that few women in the study smoked and nearly all were receiving prenatal care when they entered the study. Even so, previous studies have found that home visiting resulted in fewer subsequent pregnancies with poor birth outcomes, perhaps by reducing stress and improving maternal health and economic self-sufficiency.

Tailoring services more might make home visiting more effective. For example, MIHOPE found that not all women with needs or risks such as mental health problems discussed those topics with home visitors or received referrals for relevant services, even though those services were available in most communities.

Another challenge home visiting programs face is keeping families engaged in services. In MIHOPE, families experiencing the most risk factors for poor child well-being (such as the mother

16 MIHOPE examined effects for subgroups defined by race and ethnicity, gestational age (for pregnant women) or child age (for others), maternal parity (whether or not the mother had other children), the presence of intimate partner violence, the mother's level of emotional functioning, the mother's level of psychological resources, and demographic risk (based on public assistance receipt, age, education, and whether the child's biological father lived in the home), all measured at the time the family entered the study. MIHOPE-Strong Start examined effects for subgroups defined by race and ethnicity, maternal age, trimester of pregnancy when a mother entered the study, and whether the mother smoked before pregnancy.

17 Boller et al. (2014); Duggan et al. (2007).

being younger, not living with a child's biological father, or exhibiting relationship avoidance)[18] participated in home visiting less than families experiencing fewer risk factors. When interviewed, home visitors said that it was difficult to engage families who exhibited a high degree of risk. Two hard-to-engage groups are families who have moved more than once in the past year and women with difficulty trusting others. These groups were likely to stop receiving services early. It may be particularly important to track families when they move and to help home visitors find novel ways to engage the trust of mothers who have difficulty trusting others.

These suggestions for program implementation are consistent with ongoing efforts to strengthen home visiting. For example, the Health Resources and Services Administration in the U.S. Department of Health and Human Services recently launched the Innovation Toward Precision Home Visiting national research and development platform. The purpose of this platform is to better define and test which aspects of home visiting models lead to improved outcomes for particular types of families, which will help programs better understand what works, for whom, and in what contexts.[19] Further, the national offices of the evidence-based models, state and tribal MIECHV awardees, and local implementing agencies all continue to make changes in programs to improve services.

The effects found in MIHOPE on the quality of the home environment, children's behavior problems, maternal mental health, and household aggression may lead to longer-term effects on child outcomes. Such longer-term effects would be consistent with past studies that have found effects in areas such as child development, child maltreatment, and parental earnings long after families have stopped receiving home visiting services.[20] For that reason, MIHOPE is conducting short surveys with parents when their children are 2.5 and 3.5 years old and more extensive data collection with families when children are in kindergarten.

Taken together, the findings from MIHOPE and MIHOPE-Strong Start provide important information about how home visiting is being implemented and about the effects home visiting can have on families when their children are young, setting the stage for future research to examine the potential long-term effects as well.

18 "Relationship avoidance" reflects the extent to which an individual avoids intimacy and distrusts others.

19 For more information, see funding opportunity number HRSA-17-101 at U.S. Department of Health and Human Services, "MCHB Funding Opportunities" (n.d.), and Home Visiting Applied Research Collaborative (n.d.).

20 Michalopoulos, Faucetta, Warren, and Mitchell (2017).

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