

**Revised Design for the  
Mother and Infant Home Visiting Program Evaluation**

**OPRE Report 2013-18**

**April 2013**

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## Overview

Home visiting programs in the United States seek to improve maternal and child health, child development, and family economic self-sufficiency by supporting and educating families with young children. Today, home visiting is seen as an important strategy for high-risk families who may be difficult to engage in other services. The Patient Protection and Affordable Care Act (ACA) of 2010 included \$1.5 billion over five years for states to operate the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program. It also required a national evaluation of the programs. This document describes the design of that evaluation — the Mother and Infant Home Visiting Program Evaluation (MIHOPE). MIHOPE was launched in 2011 by the Administration for Children and Families and the Health Resources and Services Administration within the U.S. Department of Health and Human Services. The evaluation is being conducted by MDRC in partnership with Mathematica Policy Research, James Bell Associates, Johns Hopkins University, the University of Georgia, and Columbia University.

MIHOPE will include the following components:

- An *analysis of state needs assessments* will describe the communities that states chose to target with MIECHV program services
- An *implementation study* will collect information on the services provided by local programs as well as the factors that helped shape those programs.
- An *impact analysis* will estimate the effects of home visiting programs on family outcomes, both overall and for key subgroups of families.
- An *economic analysis* will assess program costs and savings.

The study will include approximately 5,100 families with a pregnant woman or a child under 6 months old. Families who enroll in the study will be randomly assigned to a home visiting group or to a comparison group that can use other services available in their community. Families will be spread across about 85 local programs in about 12 states. Sites must be operating one of four national models of home visiting: Early Head Start-Home Visiting Option, Healthy Families America, Nurse-Family Partnership, or Parents as Teachers. These four models were chosen because they are being implemented using MIECHV program funds in at least 10 states.

Data for the implementation and impact studies will be collected from a variety of sources, including interviews with parents; observations of the home environment; observed interactions of parents and children; direct assessments of children's development; observations of home visitors in their work with families during home visits; logs, observations, and interviews with home visitors, supervisors, and program administrators; program model documentation from program developers, grantees, and local sites; and administrative data on child abuse, health care use, maternal health, birth outcomes, and employment and earnings.

The study will produce a report to Congress in 2015 that includes information on families and sites included in the evaluation as well as information on how states made decisions about how to spend home visiting funds. Later reports will provide more information on program implementation, the effects of home visiting programs for families, and the features of programs that are associated with larger effects.

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The report also reflects suggestions made to the Health and Human Services secretary by the Advisory Committee on the Maternal, Infant, and Early Childhood Home Visiting Program's Evaluation at three meetings held from March to December 2011, as well as numerous ideas from the home visiting staff at the Administration for Children and Families and at the Health Resources and Services Administration.

Finally, Jennifer Somers at MDRC provided excellent assistance with all aspects of producing the report. Robert Weber edited the report, and it was prepared for production by David Sobel and Stephanie Cowell.

The Authors

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## Chapter 1

# Background on Home Visiting and Goals for the Evaluation

Home visiting programs in the United States grew from three major approaches that first became prominent in the 1960s: visits by public health nurses to promote infant and child health in disadvantaged families, Head Start home visiting to promote school readiness in hard-to-reach families, and home-based family support to promote positive parenting and prevent child abuse in high-risk families. All of these approaches sought to foster early childhood health and development by intervening in the home to support and improve socialization, health, and education practices.<sup>1</sup> Today, home visiting is seen as a particularly important strategy for high-risk families who may be difficult to engage in other services. A study by the Pew Center on the States found that, in Fiscal Year (FY) 2009-2010, states spent more than \$500 million to fund home visiting programs, and additional programs were funded by local governments and private foundations.<sup>2</sup>

On March 23, 2010, President Obama signed into law the Patient Protection and Affordable Care Act (PPACA; in this report, ACA). Through a provision that authorizes the creation of the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program, the act greatly expands federal funding of evidence-based home visiting programs.<sup>3</sup> According to the ACA, “this program is designed: (1) to strengthen and improve the programs and activities carried out under Title V; (2) to improve coordination of services for at-risk communities; and (3) to identify and provide comprehensive services to improve outcomes for families who reside in at-risk communities.” The legislation defines “at-risk communities” as communities with concentrations of:

- Premature birth, low-birth-weight infants, and infant mortality, including infant death due to neglect, or other indicators of at-risk prenatal, maternal, newborn, or child health
- Poverty
- Crime

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<sup>1</sup>Weiss (1993).

<sup>2</sup>Pew Center on the States (2010).

<sup>3</sup>Section 2951 of the ACA (H.R.3590) provides for MIECHV programs. Below, the quotation and the list of at-risk communities are on page 216 of the ACA and are cited as H.R.3590-216.

- Domestic violence
- High school dropouts
- Substance abuse
- Unemployment
- Child maltreatment

The ACA included \$1.5 billion in funding for home visiting programs over five years. Seventy-five percent of program funding must be used for home visiting models that have evidence of effectiveness. As of September 2012, a systematic review funded by the U.S. Department of Health and Human Services (HHS) and conducted by Mathematica Policy Research — the Home Visiting Evidence of Effectiveness (HomVEE) review — has found 13 models that meet the HHS criteria for evidence of effectiveness. These 13 models are referred to as “evidence-based models” in this report. In addition to the funds for evidence-based models, each state can use up to 25 percent of its funds for promising approaches that do not yet qualify as evidence-based. The ACA reserves 3 percent of the total \$1.5 billion for Tribes, tribal organizations, and urban Indian organizations and 3 percent of the funding for research and evaluation.<sup>4</sup>

The ACA also mandates an evaluation of the MIECHV program in its early years.<sup>5</sup> This report describes the design of that evaluation, which is called the “Mother and Infant Home Visiting Program Evaluation” (MIHOPE). MIHOPE was launched in 2011 by the Administration for Children and Families (ACF) and the Health Resources and Services Administration (HRSA) within the U.S. Department of Health and Human Services (HHS). The evaluation is being conducted by MDRC in partnership with Mathematica Policy Research, James Bell Associates, Johns Hopkins University, the University of Georgia, and Columbia University.

## **Needs Assessments and State Plans**

MIECHV program funds have been released in multiple segments since FY 2010, flowing through one grantee in each state. In FY 2010, \$91 million was allocated to states and territories according to a formula. To receive the bulk of their funds for that fiscal year, states submitted detailed plans for implementing their MIECHV program in June 2011 and revised those plans with guidance from HHS and technical assistance providers. Once state plans were approved, a

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<sup>4</sup>H.R.3590-225.

<sup>5</sup>H.R.3590-222.

number of states conducted a Request For Proposal (RFP) process to determine which programs and sites to fund. As of this writing, all states that are participating in the MIECHV program have begun serving families. In addition, Florida, North Dakota, and Wyoming declined participation in the MIECHV program, which resulted in the withdrawal of the respective state lead agencies from the MIECHV program.<sup>6</sup>

In FY 2011 and 2012, states received additional funds through continued formula funding and three waves of competitive funding, with the most recent competitive awards announced in October 2012. In many cases, states are using competitive funding to expand the number of sites (or families) funded under the MIECHV program. This rolling funding process, together with the state RFP processes noted above, means that the number of sites potentially eligible for MIHOPE is likely to grow.

## **The National Evaluation of Evidence-Based Home Visiting Programs**

The legislation requires a national evaluation of the MIECHV program, specifying that a Secretary's Advisory Committee should review and comment on the design and analysis of the national evaluation<sup>7</sup> and that the national evaluation must report findings to Congress in 2015.<sup>8</sup>

The ACA specifies four main components of the national evaluation:

- **Analysis of the needs assessments.** An analysis, on a state-by-state basis, of the results of assessments of state needs that are required by the legislation and state actions in response to the assessments.
- **Effectiveness study.** An assessment of the effects of early childhood home visiting programs on child and parent outcomes, with respect to each of the benchmark areas and participant outcomes specified in the legislation.
- **Subgroup analysis.** An assessment of the effectiveness of such programs on different populations, including the extent to which effects on participant outcomes vary across programs and populations.
- **Study of effects on the health care system.** An assessment of the potential for the activities conducted under such programs, if scaled broadly, to

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<sup>6</sup>Nonprofit organizations in these states can apply directly to HRSA for MIECHV program funds. In North Dakota, Prevent Child Abuse North Dakota did apply for and was awarded funds.

<sup>7</sup>H.R.3590-222. From March to December 2011, the Advisory Committee on the Maternal, Infant, and Early Childhood Home Visiting Program's Evaluation held three meetings to advise the HHS secretary.

<sup>8</sup>H.R.3590-219.

improve health care practices, eliminate health disparities, improve health care system quality, and reduce costs.

This report addresses each of these components, and it also extends the evaluation design to answer additional questions of interest to HHS. In addition to specifying components of the national evaluation listed above, the legislation delineates the following outcome domains that must be measured as part of the evaluation:

- Prenatal, maternal, and newborn health
- Child health and development
- Parenting skills
- School readiness and academic achievement
- Crime and domestic violence
- Family economic self-sufficiency
- Referrals and service coordination

## **Key Features of Evidence-Based Home Visiting Programs**

MIHOPE will focus on the four evidence-based home visiting models that have been selected by at least 10 states in their MIECHV program plans: Early Head Start-Home Visiting Option (EHS), Healthy Families America (HFA), Nurse-Family Partnership (NFP), and Parents as Teachers (PAT). While these models all include home visiting services, they differ in many respects. Tables 1.1 and 1.2 summarize some important features of the evidence-based models and their implementation systems, which include the following:

- **Program goals.** While all of the models try to improve child health and development as they are broadly conceived, specific goals differ among the models: some focus more directly on preventing child maltreatment; others focus on improving maternal and child health; and still others prioritize promoting positive parenting or increasing school readiness. Some models also explicitly aim to improve parental self-sufficiency and well-being.
- **Target population and age at enrollment.** Most of these models serve families whom they identify as being at risk of poor child outcomes, based on one or more family characteristics. Although the definition of “at risk” differs by model, most models target low-income families. They may also specifically target young, first-time mothers; parents with past negative

**The Mother and Infant Home Visiting Program Evaluation**

**Table 1.1**

**Key Components of Service Models for Evidence-Based Home Visiting Programs to Be Used in Evaluation**

Home Visiting Model	Program Goals	Target Population/ Age at Enrollment	Program Intensity/Duration	Home Visitor Qualifications
Early Head Start – Home Visiting Option	<p>Enhance the development of very young children</p> <p>Promote healthy family functioning</p>	<p>Low-income pregnant women and families with children from birth to age 3</p> <p>Families at or below the federal poverty level</p> <p>Children with disabilities who are eligible for Part C services under the Individuals with Disabilities Education Act in their state</p> <p>Services can begin prenatally</p>	<p>Weekly home visits last for a minimum of 90 minutes</p> <p>Minimum of 48 home visits and 22 group socialization activities per year</p> <p>Services can begin prenatally and are offered until the child is 3 years old</p>	<p>Require home visitors to have knowledge and experience in child development and early childhood education; principles of child health, safety, and nutrition; adult learning principles; and family dynamics</p> <p>Effectively communicate with children and families with no or limited English proficiency directly or through an interpreter; be familiar with the ethnic background of these families</p>
Healthy Families America (HFA)	<p>Systematically reach out to parents to offer resources and support</p> <p>Cultivate the growth of nurturing, responsive, parent-child relationships</p> <p>Promote healthy childhood growth and development</p> <p>Build the foundations for strong family functioning</p>	<p>Parents facing challenges such as single parenthood, low income, substance abuse, or domestic violence</p> <p>Individual programs select the specific characteristics of the target population they plan to serve</p> <p>Require that families are enrolled prenatally or within the first 3 months after a child’s birth</p>	<p>Home visits typically last a minimum of 60 minutes</p> <p>Minimum of weekly home visits for the first 6 months after the child’s birth; local programs determine the frequency of the visits after 6 months</p> <p>Begin to provide services prenatally or at birth and continue through the first 3 to 5 years of life</p>	<p>No specific educational requirements for direct service staff</p> <p>Recommend selecting staff based on personal characteristics and experience in working with families with multiple needs; experience working with or providing services to children and families; an ability to establish trusting relationships; acceptance of individual differences; experience in working with culturally diverse communities; knowledge of infant and child development; and ability to maintain boundaries between personal and professional life</p>

(continued)

**Table 1.1 (continued)**

Home Visiting Model	Program Goals	Target Population/ Age at Enrollment	Program Intensity/Duration	Home Visitor Qualifications
Nurse-Family Partnership (NFP)	<p>Improve prenatal health and outcomes</p> <p>Improve child health and development</p> <p>Improve families' economic self-sufficiency and maternal life-course development</p>	<p>First-time, low-income mothers and their children</p> <p>Require first home visit for occurrence no later than the end of week 28 of pregnancy; recommend that programs begin conducting visits in the second trimester (14 to 16 weeks of gestation)</p> <p>Children up to 2 years of age</p>	<p>Home visits typically last 60 to 75 minutes</p> <p>Weekly home visits for the first month after enrollment and then every other week until baby is born</p> <p>Weekly home visits for the first 6 weeks after the baby is born and then every other week until the baby is 20 months; last 4 visits are monthly until the child is 2 years old</p> <p>Visit schedule may be adjusted to meet client needs</p>	<p>Require nurse home visitors to be registered professional nurses with a minimum of a bachelor's degree in nursing</p>
Parents as Teachers (PAT)	<p>Provide parents with child development knowledge and parenting support</p>	<p>No eligibility requirements for participants</p> <p>Local programs select the specific characteristics of their target populations, such as children with special needs, families at risk for child abuse, income-based criteria, teen parents, first-time parents, immigrant families, low-literacy families, or parents with mental health or substance abuse issues</p> <p>May serve children and their families from pregnancy through kindergarten entry</p> <p>Target enrollment prenatally or soon after birth</p>	<p>Recommend that home visits last between 50 and 60 minutes</p> <p>Minimum of 10 to 12 annual visits and 20 to 24 annual visits for higher-need families on a monthly, biweekly, or weekly basis</p> <p>Programs offer monthly group connections (meetings)</p> <p>Local programs determine length and intensity of services</p>	<p>Require parent educators to have a high school diploma or GED certificate and a minimum of 2 years' previous supervised work experience with young children and/or parents; prefer that parent educators have at least a 4-year degree in early childhood education or a related field or at least a 2-year degree or 60 college hours in early childhood or a related field; recommend that parent educators have experience working with young children and/or parents</p>

**The Mother and Infant Home Visiting Program Evaluation**

**Table 1.2**

**Key Components of Implementation Systems for Evidence-Based Home Visiting Programs to Be Used in Evaluation**

Home Visiting Model	Model Requirements for Data Systems	Home Visitor and Supervisor Training Requirements
Early Head Start – Home Visiting Option	<p>No specific infrastructure or data system requirements</p> <p>Recommend programs use recordkeeping systems that provide accurate, timely data and generate reports</p>	<p>Require that all home visitors participate in preservice training on program goals and implementation; training aimed at improving ability of staff and volunteers to deliver services required by program regulations and policies</p> <p>Require programs to provide ongoing opportunities for training and professional development</p> <p>Programs implement structured staff training and development system, offering academic credit where possible</p>
Healthy Families America (HFA)	Recommend using a state-developed data system or the Program Information Management System (PIMS)	<p>Require that all direct service staff and their supervisors/program managers complete a mandatory training within 6 months of hire to instruct staff in their specific roles</p> <p>Home Visitor Core Training consists of a 5-day, formalized training on specific duties of the home visitor in their role; Core Assessment Training consists of a 5-day training for staff who make initial assessments and home visitors who want to advance their communication skills to address difficult situations with families; Advanced Supervisor Training consists of a 3-day, in-person training</p> <p>Offer sites 3-day prenatal trainings on strategies for supporting families during the prenatal period; offer sites on-site technical assistance and structured/customized additional training on topics necessary to support home visitation staff in their duties</p> <p>Recommend that staff devote one-third of their time (about 80 hours) to in-service training in the first 6 months of employment</p>

(continued)

**Table 1.2 (continued)**

Home Visiting Model	Model Requirements for Data Systems	Home Visitor and Supervisor Training Requirements
Nurse-Family Partnership (NFP)	Require implementing agencies to use a Web-based data system called “Efforts to Outcomes” (ETO)	<p>Require nurse home visitors to complete 3 core education sessions, in both distance and face-to-face training formats over a 9-month time frame</p> <p>Require supervisors to complete the same core education sessions as home visitors as well as 4 supervisor core education sessions, including 2 face-to-face sessions; require supervisors to participate in an annual education session to update skills and knowledge</p>
Parents as Teachers (PAT)	<p>No specific infrastructure or data system requirements</p> <p>Recommend programs use Web-based record-keeping systems for tracking service delivery</p>	<p>Require that all parent educators attend a 5-day training; offer separate trainings for programs that work with families prenatally until age 3 and for those that work with preschool-aged children; require additional training for parent educators, who will administer developmental, hearing, or vision screenings; parent educators receive a sixth day of training, held 3 to 6 months after their preservice training</p> <p>Require supervisors to complete a separate training; recommend that supervisors participate in a daylong, advanced training after they have been a supervisor for 6 months</p> <p>Offer 2- or 4-day professional development sessions for those who work with special populations</p> <p>Require parent educators to complete a minimum of 20 hours of professional development during their first year, 15 hours during their second, and 10 hours per year thereafter; Require supervisors to complete 10 hours of professional development annually</p>

SOURCES: Program model Web sites and the U.S. Department of Health and Human Services HomVEE Web site: <http://homvee.acf.hhs.gov/programs.aspx>.

school experiences; or families with maternal depression or substance abuse problems. PAT has historically served a broad array of families with children in its target age ranges, but programs funded by the MIECHV program will be required to focus on families in communities defined as at-risk by the legislation.<sup>9</sup> Many of the models begin to work with women when they are pregnant or when they have newborns. EHS and PAT accept pregnant mothers as well as families whose youngest child is up to age 3 or 5, respectively.

- **Home visitor qualifications.** The evidence-based models have a wide range of standards for home visitor qualifications. For example, NFP requires that home visitors be registered nurses, but HFA recommends selecting home visitors who they think will connect well with families, based on personal characteristics. Other models allow local programs to set the criteria. Many of the models require home visitors to have relevant experience or knowledge.
- **Requirements for data systems.** HFA and NFP have specific data systems that they require implementing agencies to use. Other models do not currently have explicit requirements for the data systems used by agencies implementing their models.
- **Home visitor and supervisor training requirements.** Most of the evidence-based models have training requirements for home visitors and supervisors, although the requirements differ in terms of timing and intensity. Many of the models require three to five days of preservice training. Many of the models also have ongoing training requirements. For example, NFP requires that nurse home visitors and supervisors complete three core education sessions that take place over a nine-month period. Nursing supervisors must also complete additional education sessions.

## Research on Home Visiting Programs

According to the HomVEE review, all of the evidence-based models have “at least one high- or moderate-quality study with at least two favorable, statistically significant impacts in two

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<sup>9</sup>While MIECHV will only fund programs providing services in at-risk communities, the funded programs would be allowed to serve families who do not fit in any of the specific at-risk categories, as long as those families are in the chosen at-risk communities.

different domains<sup>10</sup> or two or more high- or moderate-quality studies using non-overlapping analytic study samples with one or more statistically significant, favorable impacts in the same domain.”<sup>11</sup> While the evidence-based models have each been found to produce some positive effects, there are many remaining gaps in knowledge about home visiting programs.

**Inconsistent effects between different samples for a given model.** Even for the evidence-based models, effects have often been modest and inconsistent across different samples. Many times, findings of effects for certain outcomes and subgroups have not been replicated in later studies with different samples. For example, the HomVEE review found that most of the evidence-based models had studies that showed favorable effects on at least one primary outcome measure of child development and school readiness. At the same time, a number of other studies failed to find positive effects on any measures of child development and school readiness. This may have occurred in part because some studies had samples that were too small to detect modest effects. The national evaluation presents an opportunity to provide the field with clearer evidence on the effects of evidence-based home visiting programs by conducting a rigorous evaluation with enough families to detect modest effects.

**Different outcomes tested in different studies.** One difficulty in interpreting the home visiting research is that different studies measured different outcomes. In part this is because different home visiting models target different domains, and so studies of those models may have focused only on the targeted outcomes. In addition, different evaluators have looked at different measures within a given outcome domain. The national evaluation can add to knowledge about home visiting programs by collecting a consistent set of information across all relevant outcome domains for all of the evidence-based models.

**Insufficient evidence of effectiveness in subgroups.** The HomVEE review found that sample sizes are generally too small to conclude whether home visiting models worked for particular types of families, and it identified this as a gap in the home visiting research. Many studies of home visiting programs involve sample sizes that are too small to allow a precise analysis of subgroup effects, and those studies that have examined how effects differed by subgroup have often focused on different subgroups. This has led to thin evidence on some subgroups. The field would benefit from research that helps identify what works for different types of families.

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<sup>10</sup>HomVEE recategorized the outcome domains specific in the ACA. The review looked at the following eight domains: child health; child development and school readiness; family economic self-sufficiency; linkages and referrals; maternal health; positive parenting practices; reductions in child maltreatment; and reductions in juvenile delinquency, family violence, and crime.

<sup>11</sup>Paulsell, Avellar, Martin, and Del Grosso (2010).

**Lack of information on program implementation.** Prior studies of human service programs have found that program effects are associated with a number of factors, such as program maturity, clarity of program goals, and the extent to which services target specific outcomes.<sup>12</sup> However, evaluations of home visiting programs have rarely collected detailed information on the services actually delivered. This makes it difficult to know when weak impacts are due to problems of implementation rather than to features of the program model. The field could greatly benefit from a systematic examination of how program features are associated with service delivery and impacts.

**Program models have changed over time.** Although most of the evidence-based models have changed over time to reflect growing knowledge about best practices, the HomVEE review did not restrict its analysis to the current forms of these programs. Thus, results from HomVEE might not reflect the current effectiveness of those models. This makes it challenging to assess how current thinking and implementation of program models relate to outcomes for children and families. The field would benefit from an assessment of how program models currently operate and of whether they are effective in improving targeted outcomes.

These gaps in prior research suggest the importance of a national evaluation. To understand how the MIECHV program affects outcomes for families and children and to inform the field about what works best for whom, and on which outcomes, the national evaluation will need to gather systematic information that is consistent across all the evidence-based models. This national evaluation has enormous potential to contribute to the field by collecting common measures across several program models about not only the outcomes of interest but also the services actually provided to families and the community, organizational, and family characteristics that are associated with service delivery and impacts. Strengthening the field means helping states, communities, program developers, and program operators build programs that produce strong, consistent impacts across the full range of intended outcomes and targeted population subgroups. This report presents an evaluation that is designed to accomplish these goals.

## Overview of the Report

The remaining chapters each focus on one aspect of the proposed MIHOPE design:

- Chapter 2 gives a brief overview of research goals and questions, the conceptual framework used to guide the evaluation design, and some key challenges faced in conducting this evaluation. This chapter also discusses

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<sup>12</sup>Fixsen et al. (2005).

the basic design of the evaluation and presents the anticipated time line for the study.

- Chapter 3 discusses the sampling plan and presents details on the number of families and sites that will be included, as well as how sites will be chosen. This chapter also presents a design for conducting the analysis of the needs assessment data.
- Chapter 4 discusses the MIHOPE implementation study.
- Chapter 5 presents the measurement and analytic plan for the impact study, including how the evaluation will assess the ability of home visiting programs to affect health disparities and health care quality.
- Chapter 6 describes an economic evaluation, which will estimate the cost of achieving key outcomes through home visiting.

## Chapter 2

# Overview of the Proposed Design for the Evaluation

This chapter presents a brief overview of the proposed design for the Mother and Infant Home Visiting Program Evaluation (MIHOPE), which is elaborated on in the remainder of the report. Before presenting the overview, the chapter describes four foundations on which the design is based: the goals that the evaluation is intended to achieve, the conceptual framework of how home visiting programs achieve their effects, the research questions that stem from those goals and framework, and the unique challenges related to a study of home visiting programs.

## Goals of the National Evaluation

MIHOPE is designed to meet legislative requirements as well as a number of additional goals set forth by the U.S. Department of Health and Human Services (HHS) that reflect the background on home visiting that is presented in Chapter 1. Meeting legislative goals will require:

- **Using a rigorous design for assessing the effectiveness of home visiting services overall and the variations across programs and populations.** The evaluation seeks to obtain credible evidence of the effects of home visiting services, and it will be able to address questions about key subgroups of programs and families. This will require gathering information about characteristics of families and of programs.
- **Learning about the effectiveness of home visiting programs across all domains specified in the Patient Protection and Affordable Care Act (ACA) of 2010.** As noted in Chapter 1, prior studies of home visiting have varied in the domains that they analyzed and the outcomes examined within each domain. The national evaluation will improve what is known about home visiting by measuring outcomes consistently across all the sites included in the evaluation.
- **Reflecting the national diversity of communities and populations.** Home visiting currently takes place in thousands of communities involving many thousands of families. Under the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program, home visiting may be extended to even more places and may serve even more families with particular needs. The national evaluation will seek to represent this diversity.

In addition, the study aims to gain more information to strengthen future programs by:

- **Systematically studying program implementation.** Also as noted in Chapter 1, prior studies of home visiting programs have often included little information on the services actually provided to families and on the community, organizational, and family characteristics that influence service delivery and impacts. The national evaluation will explore these issues and provide valuable information about them.
- **Linking information on communities, organizations, and families to program impacts in order to deepen understanding of the program features that are associated with greater benefits.** This understanding can be used to expand the range of outcomes, strengthen impacts, and broaden populations in which home visiting improves child and family well-being and eliminates health disparities.

## A Conceptual Framework of Home Visiting Programs

The MIHOPE design is based on a conceptual framework for how home visiting programs operate and achieve their effects. (See Figure 2.1.) The framework has three broad aspects: inputs, outputs, and outcomes.

In discussing this framework and in the remainder of the report, the term *site* refers to the local implementation of home visiting, and each site in the national evaluation will operate a local home visiting program using one of the national evidence-based *service models*. Local sites will be administered by a state agency and may be implemented by a local agency. The term *implementation system* refers to the resources used to implement the home visiting model. (See Chapter 1, Tables 1.1 and 1.2, for the key components of the MIHOPE service models and implementation systems.)

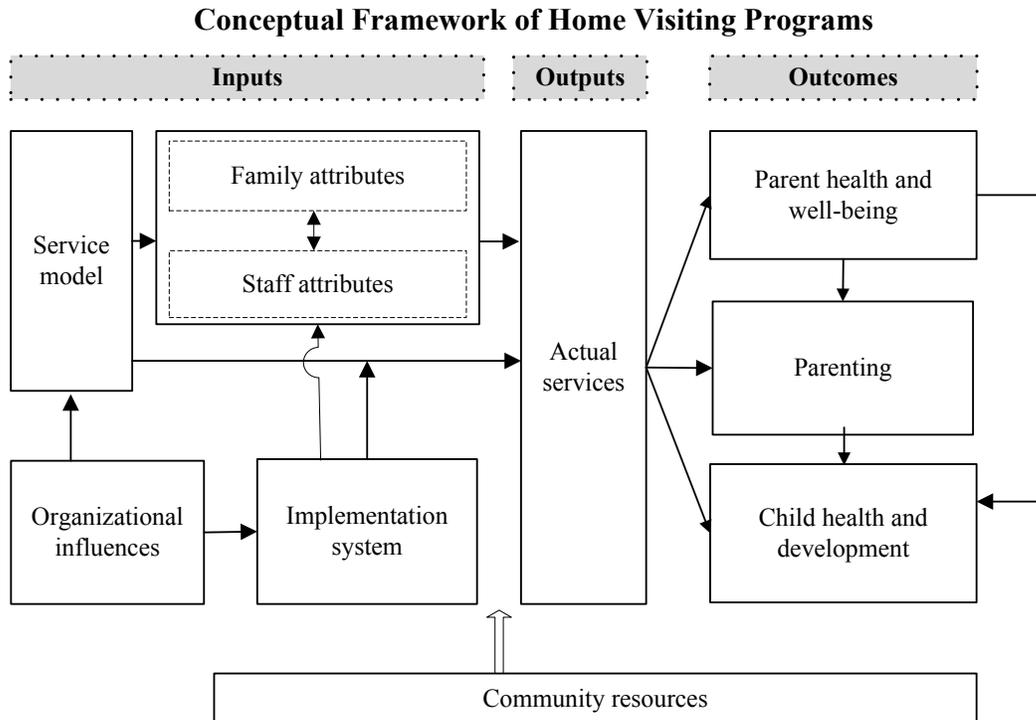
### Inputs

*Inputs* influence how services are provided to families and are shown on the left side of Figure 2.1. Starting at the bottom of the figure, *community resources* provide a foundation from which programs operate. This foundation sets the stage for home visiting by determining the resources available to home visiting program sites and the opportunities available to families.

*Multiple organizations* influence how a specific home visiting program defines its service model and its implementation system. These organizations may include the state agency that receives MIECHV program funds, the local agency that operates the home visiting program, the developer and purveyor of the evidence-based model that has been adopted, and

## The Mother and Infant Home Visiting Program Evaluation

Figure 2.1



other community organizations with which the implementing agency collaborates. Thus, the service model and the implementation system for any two sites will not be identical, even if they use the same evidence-based model. In many instances, these differences among sites will lead to differences in how they deliver services and in the outcomes they achieve.

The service model and the implementation system, in turn, affect the characteristics of home visitors in a given program. As noted in Chapter 1, some home visiting models specify the professional background that home visitors must have, while other models give local sites considerable discretion in this regard. The implementation system also shapes home visitors' attributes, including their competence in carrying out their responsibilities. Some programs have more intensive training and supervision than others. Furthermore, within a given site, staff training and supervision might be emphasized more for responsibilities related to some intended program outcomes than for other intended outcomes.

The service model and the implementation system also affect the characteristics of families who enroll in a given home visiting program. For example, most of the evidence-based models specify characteristics of the families who can be served: some models limit

enrollment to pregnant women; some limit enrollment to families with children above a certain age; and some serve a broader range of families. State and local agencies may further restrict or expand the eligibility requirements for home visiting in a particular program. This might be accomplished by limiting enrollment to families who have a particular need. Alternatively, a program might be required to include families with a particular need who fall outside the model developer's definition of eligible families. Sites will also vary in their procedures for family recruitment. This can include how staff explain the purpose and intended benefits of the program, which might influence families' understanding of and willingness to enroll in the program.

## **Outputs**

The service model, implementation system, and characteristics of home visitors and families all affect the actual services that families receive directly from the home visiting program and indirectly as a result of referrals to other services. These services are *outputs*, as shown near the middle of Figure 2.1. Services include program coverage of the target population and the quantity and quality of service delivery.

The service model influences actual service delivery by defining intended outcomes; expected frequency, duration, and content of home visits; and intended linkages with other services. Although these definitions are sometimes clear and coherent, they may also be underspecified or contain ambiguous or incongruent elements. As the service model's clarity and congruence increase, so does its fidelity.<sup>1</sup>

The implementation system includes the resources for carrying out the service model. It incorporates policies and procedures for staff recruitment, training, supervision, and evaluation; assessment tools, protocols, and curricula to guide service delivery; the use of administrative supports, such as a management information system, to monitor and promote staff adherence to the service model; organizational culture and climate regarding fidelity and the use of evidence-based practices; the availability of consultation to address issues beyond the home visitor's skills and expertise; and the home visiting program's relationships with other community-based organizations to facilitate coordination of referrals and services. As the adequacy of the implementation system increases, so does its fidelity.<sup>2</sup>

*Family attributes* also influence actual services in several ways. First, evidence-based home visiting models encourage the tailoring of services based on a family's strengths, needs, and concerns. Second, families can vary in their understanding of a program, the benefits that

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<sup>1</sup>Carroll et al. (2007).

<sup>2</sup>Carroll et al. (2007).

they are likely to derive from it, and what enrollment entails. Third, parents vary in their cognitive and emotional capacity to engage with services offered by the home visitor.

A range of *home visitor attributes* can also influence the actual services delivered. The home visitors' understanding of the program model and their roles and responsibilities will inform the services that they choose to deliver. Their beliefs about the relative importance of specific tasks and parenting risks, such as intimate partner violence, will also influence how they provide services. Their ability to ascertain family strengths, needs, and concerns will shape their relationship with the family and their decision-making about which services to provide. Their own psychological well-being, including whether they are depressed or experiencing burnout, will also influence how they approach their work with families.

Lastly, both *family and staff attributes* interact to influence service delivery. In short, the same home visitor might provide services differently for one family than another. This can happen not only because home visitors tailor those services but also because they deliver services in ways that are not intended by the model developers. Consider, for example, a home visitor's screening for and discussion of psychosocial risks for poor parenting. Home visitors might vary in their self-efficacy in carrying out this role. One might feel comfortable discussing these risks across all families. Another might discuss risks with families perceived to be comfortable with self-disclosure but might shy away from discussion with families who seem reluctant to disclose.

## **Outcomes**

The right side of Figure 2.1 shows outcomes that home visiting is designed to achieve for families. Programs aim to improve *parent health and well-being* (including ACA-noted domains of prenatal and maternal health, crime and domestic violence, and economic self-sufficiency), *parenting*, and *child health and development* (including the domains of child health, school readiness, and academic achievement).

## **Research Questions**

The goals and conceptual framework together suggest that the national evaluation address the following research questions:

- How do the funded home visiting programs actually operate? What organizations are involved as stakeholders? How are service models defined? How adequate are implementation systems? Who provides services? What families are enrolled? And what services are provided?

- How are the different types of inputs of home visiting programs related to one another? How do community context and organizations influence service model clarity and congruence? How do they influence the adequacy of the implementation system? How do the service model and implementation system influence the characteristics of the staff who provide services and the families who receive them?
- How is the full set of inputs related to the services provided to families through home visiting and through referrals to other services? Analyses can address several key questions across program sites: How do service model clarity and implementation system adequacy influence program coverage of the targeted population and service dosage, content, and quality? How do staff and family characteristics mediate these influences?
- What are the effects of home visiting programs across the range of outcomes specified in the ACA, both overall and for key subgroups?
- Which features of service models and implementation systems are associated with larger effects on key family outcomes? How can the evaluation’s assessment of both program effectiveness and program implementation “get inside the black box” to further explore the relationship between program features and program impacts at the site level?

## **The Evaluation Design**

To provide unbiased estimates of the effects of home visiting programs, families who are recruited into the study will be randomly assigned either to a MIECHV program or to a control group that could use other services available in the community. Although the feasibility of carrying out random assignment must be assessed community-by-community, the study team’s discussions with states and local programs thus far indicate that the need for home visiting services exceeds the capacity of local programs in most places, allowing for the ethical creation of a control group. When a program cannot serve all eligible families, a lottery can be a fair way to allocate scarce slots, rather than, for example, accepting all families only until slots are full and then creating a waiting list. Control group members will be eligible for other services available in the community for which they would normally be eligible. Control group members will receive referrals to such services. The evaluation will adhere to all ethical standards for program evaluation and has undergone human subjects review by the MDRC Institutional Review Board.

As discussed further in Chapter 3, the study will include approximately 5,100 families spread across about 85 sites (that is, 85 local programs). A typical site will include 30 families assigned to a MIECHV program and 30 control group families, although the exact number of families may vary from site to site. This number of families will provide enough statistical power to examine differences in impacts of home visiting across key subgroups of families. The large number of sites in part reflects the small capacity of most local home visiting programs but also creates an opportunity to learn about the relationship between local program features and the impacts of home visiting.

The 85 sites will be selected to include a diversity of program models, families, and geographic locations across the country. For example, the evaluation will seek to include a similar number of local programs for each of the four evidence-based home visiting models being included in the evaluation to ensure that the results do not primarily reflect one or two of them. Because the four evidence-based models have somewhat different goals and work with somewhat different target groups, the evaluation will also present estimated effects for each evidence-based model. Likewise, the evaluation will seek to include a diverse set of families to provide fairly precise estimates of the effects for subgroups of families. For example, the evaluation would seek to include enough families in such underserved groups as racial and ethnic minorities in order to investigate the effects of home visiting on health disparities.

Sites being chosen for the evaluation must meet several other criteria. Since new programs might take time to evolve to their full level of effectiveness, the evaluation is choosing only sites operating programs that have existed for at least two years. There must be enough demand for services at the site to allow for the ethical creation of a control group. Again, the design assumes that each site would include 30 families for the control group, although this number could be reduced to some extent without a substantial effect on the design's statistical power.

To reduce evaluation costs, sites are being concentrated in a few states. A review of state plans and discussions with state MIECHV program administrators suggest that 85 sites can be found in 12 states.

All four evidence-based models that have been chosen by a substantial number of states work with pregnant mothers or mothers of infants, but only two of the models enroll children age 2 and older. Since it can be difficult to compare many outcomes across a broad range of children's ages, and because few children older than infancy are expected to be included in MIECHV programs, the evaluation is including only families in which the mother is pregnant or the child is less than 6 months old. Follow-up data would be collected around the time the child is 15 months old.

An *impact analysis* will estimate the effects of home visiting programs across the range of domains specified in the ACA and for key subgroups of families. Results from the impact analysis will also be used to assess the potential of home visiting programs to reduce health disparities and improve health care quality.

An *implementation study* will collect information on community context, influential organizations, the service model, the implementation system, home visitors, families, and actual service delivery. The implementation study is designed to complement the impact study. It has three main goals: (1) to describe home visiting program inputs and outputs (services), (2) to determine the associations among inputs, and (3) to investigate how inputs are related to outputs (the services that families receive). In addition, the implementation study and the effectiveness study will jointly investigate which features of local programs are associated with larger effects for families.

Data for the implementation and impact studies will be collected from a variety of sources to provide the most reliable evidence possible about home visiting services and their effects on families and children. Data sources will include interviews with parents; observations of the home environment; observed interactions of parents and children; direct assessments of children's development and maternal health; observations of home visitors in their work with families during home visits; logs, observations, and interviews with home visitors, supervisors, and program administrators; program model documentation from program developers, grantees, and local sites; and administrative data on child abuse, health care use, maternal health, birth outcomes, and employment and earnings.

An *economic analysis* will estimate the cost of achieving key benefits to families. Although the ACA requires the evaluation to assess the ability of home visiting to reduce health care costs, the evaluation could extend the cost analysis to other key outcomes, such as child development and family economic self-sufficiency. This component of the evaluation will build on results from the impact analysis as well as from data on program costs.

## Chapter 3

# Sampling Plan for the Evaluation

This chapter discusses the sampling plan for the Mother and Infant Home Visiting Program Evaluation (MIHOPE). It describes the number of families and sites that will be included in the evaluation, the principles underlying how sites are being chosen, and the statistical power of the sampling plan.<sup>1</sup>

A number of considerations affected the choices described in this chapter. Perhaps foremost was designing a study that would have the statistical power to detect program impacts. In particular, the sampling plan was developed to provide enough statistical power to draw inferences about differences for subgroups of families, to provide reliable estimates of the effects of each of the four evidence-based models described in Chapter 1 (Table 1.1), and to investigate the relationships between program features and program impacts. These considerations are important because the unanswered questions about home visiting include the effects for families with particular needs who are served with new program funds and the association between program effects and program implementation. The statistical power of the designed evaluation is discussed later in this chapter.

The sampling plan was also affected by the resources available for the evaluation. Additional families, additional sites, and additional states all increase the costs of evaluation. For example, adding states increases the costs of collecting administrative data from state agencies. Likewise, adding states increases the time and resources required to explain the study to more grantees of the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program and to obtain their agreement to be involved in the evaluation. The design, therefore, will have sites concentrated in a relatively small number of states rather than being spread nationwide.

## Number of Sites and Families

The study will be conducted in approximately 85 sites. The large number of sites was chosen for several reasons. First, many home visiting programs serve a small number of families, so a greater number of sites is needed to obtain a sample large enough to detect program effects.

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<sup>1</sup>As noted in Chapter 2, the term *site* is used in this report to refer to the local implementation of home visiting, and each site in the national evaluation will operate a local home visiting program using one of the national evidence-based home visiting service models. Local sites will be administered by a state agency and may be implemented by a local agency.

Second, the relatively large number of sites will make it easier for the study to reflect the diversity of communities and families involved in the MIECHV program nationally. Third, many sites are included to enhance the ability of the evaluation to identify the features of local programs that are associated with stronger program effects.

A typical site will be asked to enroll 30 program group and 30 control group families, for a total sample of about 5,100 families across the 85 sites.<sup>2</sup> For a site with four home visitors, 30 program group families could be enrolled in a year if each home visitor serves between seven and eight new families each year. Where MIECHV program funds are used to expand programs, more slots may be available for new families to receive home visiting services, which would reduce the time needed to recruit families into the study. By contrast, smaller programs as well as Early Head Start (EHS) and Parents as Teachers (PAT) programs that also enroll families with children older than 6 months may take longer than a year to enroll 60 families.

## Minimum Detectable Effects

The statistical power of the sampling plan was assessed using a concept called “minimum detectable effect.” A *minimum detectable effect* is the smallest true effect that is likely to generate statistically significant estimated effects. For purposes of the design, calculations were performed to find the smallest effects that would generate statistically significant findings in 80 percent of studies with a similar design, using two-tailed t-tests with a 10 percent significance level.<sup>3</sup> As noted, families will be assigned in equal proportions to the program group and the control group, because this results in the greatest statistical power of the study.

## Impact Estimates Pooled Across Sites

Table 3.1 shows minimum detectable effects for results pooled across the 85 sites. All results are presented as effect sizes, that is, in terms of the number of standard deviations of the outcome being examined. Results are presented both for administrative data, which would be available for all families, and for data such as surveys and observed interactions between

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<sup>2</sup>A small number of sites will be allowed to enroll fewer than 60 families, but a site will not be included in the evaluation if it cannot be expected to be able to enroll at least 40 families.

<sup>3</sup>Although many disciplines assess statistical significance at the 5 percent level, the design uses the 10 percent level for two reasons. First, conventions about statistical significance are not universal, and many prior studies have assessed significance at the 10 percent level. More important, for making policy decisions, it can be useful to know that a result is significant at a level between 5 percent and 10 percent. To minimize the importance of deeming one specific level as being “significant,” the evaluation will report the exact significance of results using p-values or standard errors.

**The Mother and Infant Home Visiting Program Evaluation**

**Table 3.1**

**Minimum Detectable Effects  
of Planned Home Visiting Evaluation**

Scenario	Number of Families		Administrative Data	Survey or Observational Data
	Program Group	Control Group		
<b><u>85 sites serving pregnant women and families with infants</u></b>				
No baseline covariates	2,550	2,550	0.070	0.078
Covariates explain 30 percent of variation in outcomes			0.058	0.065

NOTES: Results are the smallest true impact that would generate statistically significant impact estimates in 80 percent of studies with a similar design using two-tailed t-tests with a 10 percent significance level. No adjustment for multiple comparisons is assumed. Results are based on fixed effects estimates.

Administrative data are assumed available for all families, while survey or observational data would be available for 80 percent of families.

parents and children, which are assumed to be available for 80 percent of families.<sup>4</sup> In addition, results are presented for the case in which baseline family characteristics do not increase the precision of estimated effects and for the case whereby those characteristics explain 30 percent of the variation in outcomes across families. This provides a range of estimates, since the ability of baseline characteristics to increase the precision of estimated effects may vary from outcome to outcome.

The minimum detectable effect is 0.070 standard deviation for the pooled sample for administrative records and 0.078 standard deviation for surveys or other data types that are provided for 80 percent of families. For example, if a site had a rate of child abuse and neglect of 20 percent in the control group, this design has an 80 percent chance of finding a statistically significant impact if the true impact is a reduction of 2.8 percentage points (from 20.0 percent of the control group to 17.2 percent of the program group).<sup>5</sup> This calculation assumes that

<sup>4</sup>A response rate of 80 percent is assumed for surveys because the federal Office of Management and Budget suggests a nonresponse bias analysis if the expected response rate is below 80 percent. Response rates of 80 percent have been achieved in numerous studies of home visiting and other evaluations with similar target populations.

<sup>5</sup>A rate of 20 percent was chosen because home visiting is unlikely to find statistically significant impacts if substantiated cases of child abuse and neglect are rare. In addition, 20 percent is a reasonable rate, given studies such as Duggan et al. (2007), which found substantiated cases of child abuse and neglect for 17 percent of control group families.

information on baseline family characteristics will have no effect on the precision of the estimated effect, which is a very conservative assumption. If baseline family characteristics explain 30 percent of the variation in outcomes across families — which can be the case when information on the same outcome is collected at both baseline and follow-up — the minimum detectable effects decrease by about 16 percent, to 0.058 standard deviation for outcomes measured using administrative data and to 0.065 standard deviation for outcomes measured using survey data. Using this less conservative assumption, the study has an 80 percent chance of finding a statistically significant effect on substantiated cases of child abuse and neglect if the true impact is a reduction of 2.3 percentage points (to 17.7 percent of the program group).

These pooled minimum detectable effects provide reasonable statistical power for the evaluation, given prior evidence of effectiveness from Home Visiting Evidence of Effectiveness (HomVEE). Table 3.2 shows the range of effects across studies and outcome measures for only the four models that will be examined as part of the evaluation; the average effect in each domain, weighted by sample size; and the number of effects included in the calculation. The range and average are presented as effect sizes, or number of standard deviations for the given outcome.

Results summarized in Table 3.2 were restricted to those that were considered primary by HomVEE. This means that the results are limited to direct observations, direct assessments, administrative records, and self-reported data using standardized instruments. In addition, results were restricted to those for which an effect size was available, either from the original study or as calculated by HomVEE.<sup>6</sup> Because effect sizes were not available for most Nurse-Family Partnership (NFP) studies and many Healthy Families America (HFA) studies, the results presented here may understate the true average effects of studies included in the HomVEE review.

As noted in Chapter 1, prior results vary substantially from study to study and sample to sample. For most domains, the results range from roughly  $-0.5$  standard deviation to  $0.5$  standard deviation, although the ranges are much larger for positive parenting practices and

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<sup>6</sup>For parenting practices, results from PAT on days attended were excluded. Results for child development and school readiness were limited to measures that are likely to be relevant to the national evaluation: the Bayley, the Peabody Picture Vocabulary Test, the MacArthur Communicative Development Inventories, Woodcock-Johnson Social Skills Rating System, Bracken, MacArthur Story Stem Battery, Test of Early Reading Ability-2, Child Behavior Checklist (CBCL), Preschool Language Scale-3, Development Profile-II for communication, self-help and social development, and Security of Attachment Q-Sort. The outcomes removed by this restriction measured cognitive outcomes and academic achievement of school-age children, who would not be represented in the national evaluation as it is currently designed.

## The Mother and Infant Home Visiting Program Evaluation

**Table 3.2**

### **Summary of Results from Home Visiting Evidence of Effectiveness (HomVEE) Review**

Domain	Range	Average	Number of Effects
Positive parenting practices	-2.43 to 3.00	0.03	50
Child maltreatment	-0.45 to 0.34	-0.02	25
Child health	-0.45 to 0.50	-0.01	13
Child development and school readiness	-0.45 to 0.35	-0.01	68
Maternal health	-0.40 to 4.32	0.03	25
Referrals and coordination <sup>a</sup>	-0.62 to 0.67	0.14	18

NOTES: Results are limited to outcomes that were defined as primary by the HomVEE review.

No results met these criteria for the domains of juvenile delinquency, family violence, and crime or for the domain of family economic self-sufficiency.

Results are weighted by sample size to obtain the average.

<sup>a</sup>The effects for referrals and coordination all come from Anisfeld, Sandy, and Guterman (2004).

maternal health. In part, the wide range stems from the small samples used to calculate many of the effects. For example, the effect of  $-0.45$  standard deviation on child development and school readiness is from a study with 406 families, while the effect of  $0.35$  standard deviation is from a study with 249 families. The effect of  $-2.43$  standard deviations on positive parenting practices is from a study with 168 families, while the effect of  $3.00$  standard deviations is from a study with 180 children.

When results are averaged across studies and outcomes and are weighted so that larger samples have more influence on the results, the average estimated effect is  $0.14$  standard deviation for referrals and coordination. By contrast, the average effects for other domains are all close to zero. While the national evaluation would easily detect the larger effect, it probably would not generate statistically significant effects if the true effect of home visiting is close to zero.

### **Differences in Estimated Effects Across Subgroups**

In addition to looking at the average effect across sites, the evaluation would assess whether home visiting had larger effects for some subgroups. For purposes of investigating the statistical

power of subgroup estimates, it is assumed that the evaluation would be interested in detecting significant differences across subgroups.<sup>7</sup> For example, if the estimated effect on parenting practices were 0.20 standard deviation for women who entered the study while pregnant and 0.10 standard deviation for women who entered the study soon after childbirth, the evaluation would ask whether those two estimates are significantly different from one another. If they are not significantly different from one another, the evaluation would not have strong evidence of a larger effect for either.

Table 3.3 presents minimum detectable differences between subgroups for cases where families in the 85 sites are divided into two groups (for example, mothers who are pregnant when they enter the study compared with those who enter the study when their child is an infant). Since statistical power depends on the number of families in each subgroup, minimum detectable differences are presented for four cases: (1) 50 percent of the sample are in each subgroup; (2) 60 percent of the sample are in one subgroup; (3) 70 percent of the sample are in one subgroup; and (4) 80 percent of the sample are in one subgroup. As in Table 3.1, results are presented once using the assumption that baseline information does not improve the precision of estimated effects and once assuming that baseline information explains 30 percent of the variation in outcomes across families.

Consider a subgroup that divides the sample in half. The minimum detectable differences range from 0.117 standard deviation using administrative data when baseline information is useful to 0.156 standard deviation for outcomes measured using survey data when baseline information does not increase statistical precision. If 20 percent of control group families had a substantiated case of child abuse and neglect, the study would have an 80 percent chance of finding significantly larger effects for one subgroup than for another if the difference in true effects was 4.7 percentage points (for example, reducing child abuse and neglect by 4.7 percentage points for one subgroup but having no effect for the other subgroup).

These minimum detectable differences increase gradually as the proportion of families in one subgroup increases. They are quite similar if 60 percent of families are in one subgroup, but they increase by 25 percent if 80 percent of families are in one subgroup.

## **Differences in Estimated Effects, by Evidence-Based Model**

Because the four evidence-based models have somewhat different goals and work with somewhat different target groups, the evaluation will also present estimated effects for each evidence-based model. Site recruitment is attempting to include about one-quarter of the overall sample for each model, which would provide fairly precise impact estimates. The steps of the

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<sup>7</sup>Bloom and Michalopoulos (2011).

The Mother and Infant Home Visiting Program Evaluation

Table 3.3

Minimum Detectable Differences Between Subgroups of Families for 85 Sites

Scenario	Percentage of Sample in One Subgroup	Administrative Data	Survey or Observational Data
<b><u>Baseline family characteristics do not improve statistical precision</u></b>			
	50	0.139	0.156
	60	0.142	0.159
	70	0.152	0.170
	80	0.174	0.195
<b><u>Baseline family characteristics explain 30 percent of variation in outcomes across families</u></b>			
	50	0.117	0.130
	60	0.119	0.133
	70	0.127	0.142
	80	0.146	0.163

NOTES: Results are the smallest true impact that would generate statistically significant impact estimates in 80 percent of studies with a similar design using two-tailed t-tests with a 10 percent significance level. No adjustment for multiple comparisons is assumed. Results are based on fixed effects estimates.

Administrative data are assumed available for all families, while survey or observational data would be available for 80 percent of families.

analysis would be the same as for subgroups, described above. In particular, the results would show whether impacts are significantly larger for one model than for another. Although the evaluation does not intend to conduct a “horse race” with the four models, presenting results for each model without comparing impacts for the models could lead readers to inappropriate conclusions about the relative effectiveness of the four models. Of particular concern is the possibility that estimates for the models will be similar but that one is marginally statistically significant while the others are not statistically significant by a very small margin. The correct interpretation for such a set of findings is that the two models work about equally well, but a focus on statistical significance levels for each model might lead some readers to conclude that only one of the models is effective.

Before comparing results across national models, the study team will develop a set of hypotheses about which outcomes are expected to be affected by each national model. Some models may be more focused on health outcomes, others on child maltreatment, and still others on child development. Expected differences in impacts will be an important piece of information in interpreting results.

## **Exploring the Relationships Between Program Features and Program Impacts**

In addition to estimating the average effect of home visiting programs and the effects by subgroup, the evaluation will include 85 sites so that it could explore the relationships between program features and program impacts. Program features could include any aspects of the community context, implementation system, service models, organizational influences, or home visitor characteristics that are described in Chapter 4. For example, this analysis could explore how program impacts vary with the duration of home visits, the background and training of home visitors, the support provided by supervisors for home visitors, the clarity of the goals of the local program, the intended targets of the national model being used, and so on.

A framework for exploring the links between program features and program impacts is described by Greenberg and others.<sup>8</sup> Within this framework, the precision of the estimated relationships between program features and program impacts depends on a number of factors, including (1) the number of sites in the evaluation, (2) the precision of impact estimates within each site (which will increase with the number of families in the site), (3) the variation in characteristics across sites, (4) the number of program features to be investigated, and (5) how related the various program features are to each other. It is easier to detect differences by program feature if there are more sites, if there are more families in each site, if different sites vary more across the program feature being examined, if fewer program features are being examined at any one time, and if the program features are not closely related to one another. As an example of the last point, it may be very difficult to distinguish the effect of planned duration of home visits from the effect of actual duration, since the two are likely to be closely related in a particular site.

Table 3.4 shows the minimum detectable effects of program features for several scenarios. The upper panel of the table shows results for a program feature that is binary and takes on one value in half the sites and a different value in half the sites. For example, half the sites might plan to visit families weekly, while half would visit only every other week. The lower panel of the table shows results for a continuous program feature, such as how many weeks home visits would take place. In each panel, results are presented depending on whether 10, 20, or 30 program features would be examined at one time. As noted above, the ability to detect the effects of program features will worsen as more features are examined. Finally, results for each scenario are presented for three assumptions about how highly correlated various program features are with one another. As noted above, the ability to detect the effects of program features worsens as features become more highly correlated with one another.

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<sup>8</sup>Greenberg, Meyer, Michalopoulos, and Wiseman (2003).

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Table 3.4

Minimum Detectable Differences of Program Features for 85 Sites

Type of Variable	Number of Variables Representing Program Features	Correlation Across Program Features	Administrative Data	Survey or Observational Data
<b><u>Binary: half of sites have the feature</u></b>	10	Low	0.203	0.231
		Medium	0.213	0.243
		High	0.226	0.258
	20	Low	0.231	0.263
		Medium	0.264	0.300
		High	0.317	0.361
	30	Low	0.268	0.305
		Medium	0.348	0.397
		High	0.626	0.713
<b><u>Continuous</u></b>	10	Low	0.101	0.115
		Medium	0.107	0.122
		High	0.113	0.129
	20	Low	0.115	0.131
		Medium	0.132	0.150
		High	0.158	0.180
	30	Low	0.134	0.153
		Medium	0.174	0.198
		High	0.313	0.356

NOTES: Results are the smallest true impact that would generate statistically significant impact estimates in 80 percent of studies with a similar design using two-tailed t-tests with a 10 percent significance level. No adjustment for multiple comparisons is assumed. Results are based on fixed effects estimates.

Administrative data are assumed available for all families, while survey or observational data would be available for 80 percent of families.

The correlation across program features is based on the R<sup>2</sup> statistic when one program feature is regressed on all other program features. For purposes of the calculations, a low correlation means that the R<sup>2</sup> increases by 0.01 with every added feature, by 0.02 with every added program feature for a medium correlation, and by 0.03 for a high correlation.

Consider the first row of Table 3.4, which shows the case where 10 program features are being examined simultaneously and there is a low correlation across them. For outcomes measured using administrative data, the model would be able to detect differences of 0.203 standard deviation between sites of one type and sites of another type. If the overall effect on an outcome were 0.15 standard deviation, for example, the study would have an 80 percent chance of finding a statistically significant relationship between the program feature and impacts if the

true impact were 0.252 standard deviation in one set of sites and 0.048 standard deviation in the other set of sites.

The ability to detect an effect of a program feature is only slightly worse if the features are more highly correlated or if 20 program features are being examined. The statistical power gets considerably worse, however, if more features are being examined and the correlation across features is high. For example, the minimum detectable difference is 0.317 standard deviation (for example, for an effect of 0.309 standard deviation in one set of sites, compared with  $-0.009$  standard deviation in the second set of sites) if 20 program features are being examined and the correlation across them is high; the minimum detectable difference is 0.348 standard deviation if 30 features are being examined and the correlation across them is medium.

Although it is not shown in Table 3.4, minimum detectable effects increase fairly modestly if sites are not equally divided by the program feature. For example, they would increase by about 2 percent if 60 percent of the programs fall into one category, by about 9 percent if 70 percent of the programs fall into one category, and by about 25 percent if 80 percent of the programs fall into one category.

The lower panel of Table 3.4 shows minimum detectable effects if the program feature is continuous and normalized to have a variance of 1.0 standard deviation across sites. Because there can be greater variability in continuous variables than in binary ones, the design would have a greater ability to detect differences for such measures. For example, for a study examining 10 program features that are not highly correlated, the minimum detectable effect size of the program feature would be 0.101 standard deviation using administrative data and 0.115 standard deviation using survey data. Even for the most extreme case shown in the table — 30 highly correlated program features — the design could detect differences in impacts of 0.313 standard deviation using administrative data and 0.356 standard deviation using survey data.

## **Choosing Sites**

States are being selected for the national evaluation based on a variety of characteristics, including type of home visiting model, geography, urbanicity, target population, and research feasibility. Specifically, states have been classified in terms of which of four broad geographic clusters of regions the state is in, as defined by the Administration for Children and Families (ACF) and the Health Resources and Services Administration (HRSA); the number of local sites that appear to be eligible for the evaluation; the urbanicity of the potential program sites; and the national service model of the potential program sites. Using this information, the study team selected a group of high-priority states that meet the following criteria: each of four geographic regions of the United State are represented; the group of states allows the study to

include a similar number of sites for each of the four evidence-based models; and sites are as representative as possible of the urbanicity of all potential sites.

As noted in Chapter 2, sites must meet a number of criteria to be eligible to be included in MIHOPE. In particular, when they enter the study, sites must have been operating local programs for at least two years (as opposed to creating new programs); they will be able to recruit enough families to fill program slots and to allow for a randomly chosen control group; they will be located where fewer control group members would be expected to receive home visiting services; finally, they will contribute to the diversity of program models and family characteristics in the study. For example, the evaluation will aim to include enough Latino and African-American families to obtain precise estimates of home visiting effects on health care use and health outcomes. To ensure that estimated effects are not dominated by one or two program models and to maximize what the field learns about how variation in program inputs is associated with variation in program impacts, the evaluation is seeking to include a similar number of sites for each of the four evidence-based program models identified in Chapter 1.

Preference is being given to states implementing two or more different program models. This will avoid the possibility that a particular program model appears to be effective because it is adopted by a state with a well-run administering agency. Having multiple program models being used in a state will allow the evaluation to look for differences across program models, holding constant the characteristics of the state administering agency.

## **Analysis of Needs Assessment Data**

As described in Chapter 1, states had to submit state plans — including a detailed needs assessment for their identified at-risk communities — in order to receive MIECHV program funding for Fiscal Year (FY) 2010. In addition to fulfilling one of the requirements of the Patient Protection and Affordable Care Act (ACA), the analysis of state needs assessments and state plans have provided information for choosing sites for the evaluation.<sup>9</sup>

The state plans were critical to the site selection process because they provided information on where home visiting programs are operating, the national program models that are being used, and the number and types of families that each state expects to be served. In addition to informing the site selection process, the state plans and detailed needs assessments will be used to fulfill the ACA requirement for an analysis of the needs assessment data. The legislation requires “an analysis, on a State-by-State basis, of the results of such assessments, including indicators of maternal and prenatal health and infant health and mortality, and State

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<sup>9</sup>In addition to state plans for FY 2010 MIECHV program funding, to help with site selection, the evaluator will have state plans for FY 2011 funding.

actions in response to the assessments.” To fulfill this requirement, the evaluation will include the following:

1. A set of state-by-state charts that summarize community needs reported in the needs assessments, existing services in those communities, and plans to fill the gap between needs and services. The charts will show (a) each of the 16 indicators of at-risk communities that states are required to report on in their needs assessments for their targeted counties, (b) information on the quality and capacity of programs and initiatives for early childhood home visiting that existed in the states before the MIECHV program, and (c) summarized information on the sites and models that states proposed to fund in their state plans.
2. A narrative that will provide (a) a summary of target communities chosen for MIECHV program funding, (b) a description of home visiting services available in the state before the MIECHV program, (c) a description of how select states developed and used their needs assessments,<sup>10</sup> and (d) a summary of how states planned to use MIECHV program funding.
3. Individual state-level summaries that will provide (a) information on states’ processes for putting together and using the needs assessments (for states in which state administrators were interviewed), (b) states’ biggest self-identified needs, (c) a summary of the types of communities that states decided to fund, (d) states’ primary goals for MIECHV funding, and (e) a list of home visiting models that states’ selected and their primary reasons for selecting those models.

In addition to informing the sampling plan for other components of the national evaluation, the design described above would organize and summarize the needs assessment and state plan data, creating a user-friendly summary that would help policymakers understand the types and conditions of home visiting programs in the United States and that would compare the home visiting landscape across states. In addition, this design could reveal common needs that a number of states have — information that could be used to inform later federal funding for home visiting programs.

To satisfy a request from the Secretary’s Advisory Committee that the evaluation link state needs assessments to state decision-making, the implementation research — described in Chapter 4 — will include qualitative interviews with staff from the 12 grantees in the national

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<sup>10</sup>This information would come from interviews with state administrators that would be conducted as part of MIHOPE.

evaluation to discuss how the needs assessments affected decisions about where to use MIECHV program funds, which families to serve, and which evidence-based models to use. These interviews will be designed to answer questions such as:

- How were the needs assessments used to identify communities that would benefit from additional home visiting services and to make decisions about which communities would receive MIECHV program funds?
- How were the needs assessments used in deciding which evidence-based models to use?
- Were the needs assessments used in deciding which groups of families to target for services?
- What other information was used in decision-making processes, outside of the needs assessments?

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## Chapter 4

# MIHOPE Implementation Study

As discussed in Chapter 2, the goals of the Mother and Infant Home Visiting Program Evaluation (MIHOPE) include the systematic study of program implementation to describe what services are delivered and to provide information to strengthen future home visiting programs. This chapter describes the design of this part of the evaluation. After discussing why implementation research is relevant to home visiting, the chapter introduces the overall design of the implementation study before providing details on specific research questions and how key constructs will be measured and analyzed.

### Relevance of Implementation Research for Home Visiting

Prior studies of home visiting programs have found modest and variable impacts, but the reasons for this are unclear. One possibility is that programs generate substantial effects only when well implemented. This is consistent with a review of over 500 studies of prevention and health promotion programs for children and adolescents that found that effects were at least two to three times greater when programs were carefully implemented and free of serious implementation problems.<sup>1</sup>

Existing evidence about the quality of implementation of home visiting programs suggests high levels of unintended variability.<sup>2</sup> MIHOPE can advance the field by more thoroughly studying the degree to which actual services deviate from intended services and why there is unintended variability. Study results may suggest ways of limiting unintended variability and thus achieving more consistent effects across programs.

In addition to the quality of implementation, the effects of home visiting are presumably linked to the services that families receive. However, most published reports of home visiting programs do not describe the actual services that families receive. Instead, researchers such as Sweet and Appelbaum have been restricted to examining the relative influence of such factors as “planned” duration and activities.<sup>3</sup> Given empirical evidence of the gap between planned and actual services,<sup>4</sup> an important goal of the study is to understand how services are actually

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<sup>1</sup>Durlak and DuPre (2008).

<sup>2</sup>Duggan et al. (2007); Duggan et al. (2004); Duggan et al. (1999); Stavrakos, Summerville, and Johnson (2009).

<sup>3</sup>Sweet and Appelbaum (2004).

<sup>4</sup>Elliot and Mihalic (2004); Ennett et al. (2003); Hallfors and Cho (2007).

provided and the specific services that are most strongly associated with positive impacts for each outcome.

MIHOPE can also advance the field by providing information on how home visiting service models and implementation systems are linked to how services are provided. For example, the effects of parent training programs on parenting behavior and children's externalizing behavior have been linked to specific program components and service delivery strategies.<sup>5</sup> In addition, the implementation science literature supports the importance of specific implementation system components, such as training, supervision, and technical assistance.<sup>6</sup> What is lacking is a systematic approach to measuring and testing the associations of features of service models and implementation systems with actual service delivery and program impacts on outcomes across the nationally disseminated evidence-based home visiting models.

Lastly, effects of home visiting reported in prior studies may be related to the control group's receipt of similar services. Thus, implementation research can be used to measure services received by control group families in national evaluation sites.

## **Overall Design of the Implementation Study and Broad Research Questions**

The conceptual framework of home visiting programs and their inputs, outputs, and outcomes are discussed in Chapter 2 (Figure 2.1). Within that framework, the implementation study addresses three broad research questions:

1. How do programs actually operate?
2. How do inputs relate to one another?
3. How are inputs related to outputs (the services that families receive)?

Table 4.1 describes how inputs and outputs are conceptualized and measured by MIHOPE.

### **Data Sources for the Implementation Study**

The primary sources of data for the implementation study include reviews of program policies and procedures, semi-structured interviews with program leaders and staff, structured surveys of program staff and families, observations of home visits and neighborhood characteristics, and logs of implementation system activities and service delivery. Table 4.2 lists

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<sup>5</sup>Kaminski, Valle, Filene, and Boyle (2008).

<sup>6</sup>Durlak and DuPre (2008); Fixsen et al. (2005).

## The Mother and Infant Home Visiting Program Evaluation

Table 4.1

### Broad Research Questions, Components of Framework, and Design for Implementation Study

Research Question	Components of Framework	Design
How do programs actually operate?	Inputs and outputs	Descriptive
How do inputs relate to one another?	Inputs	Analytic, cross-sectional
How are inputs related to outputs?	Inputs and outputs	Analytic, longitudinal

NOTE: Figure 2.1 in Chapter 2 presents the conceptual framework of home visiting programs.

the data sources for each component of inputs and outputs. The following sections describe the major constructs to be measured for the implementation study.

### Community Context

The communities in which home visiting programs operate can influence how programs function and their ability to affect outcomes. For example, home visiting programs operating in communities with a rich mix of services and resources should be better able to meet the needs of families through referrals to other service providers than those programs operating in communities with fewer resources. However, this does not necessarily mean that program impacts will be larger given more resources, because control group members may have access to some of the same services in the community. Furthermore, research has established links between neighborhood characteristics and a range of child and family outcomes, such as that children have worse outcomes in high-poverty communities, over and above the influence of families' individual characteristics.<sup>7</sup> Thus, while community characteristics are likely to be important, it is difficult to predict a priori whether being in a highly disadvantaged community will lead to larger impacts on outcomes.

The conceptualization of community context in MIHOPE includes two main constructs: neighborhood characteristics and service availability and accessibility.

#### *Neighborhood Characteristics*

The evaluation will collect information on neighborhood characteristics from two primary sources: (1) ratings of the neighborhood environment made by field staff conducting baseline data collection visits and (2) the Twenty-Third United States Census, or Census 2010. The neighborhood environment will be rated using items adapted from the Homelife

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<sup>7</sup>Kling, Liebman, and Katz (2007); Leventhal and Brooks-Gunn (2000, 2003, 2004).

## The Mother and Infant Home Visiting Program Evaluation

**Table 4.2**

### Constructs and Data Collection Strategies for Implementation Study

Construct	<u>Review of Materials</u>		Staff Surveys	Individual and Group Interviews	Parent Survey	Web-Based Logs	Home Visit Video- Recording	Observer Ratings of Neighborhood
	National Model	Site						
<b><u>Community context</u></b>								
Neighborhood characteristics					X <sup>a</sup>			X
Service availability and accessibility		X	M, HV, CP	M, S, HV				
<b><u>Inputs</u></b>								
Influential organizations			M, S	D, SA, M, S				
Service model	X	X	M, S, HV	D, SA, M, S, HV				
Implementation system	X	X	M, S, HV, CP	D, SA, M, S, HV		S		
Staff characteristics			M, S, HV			HV		
Family characteristics					X			
<b><u>Outputs-service delivery</u></b>								
Dosage			HV	M, S, HV		HV	X	
Content			HV	M, S, HV		HV	X	
Techniques			HV	M, S, HV			X	
Quality			HV	M, S, HV			X	
Family responsiveness					X	HV	X	

NOTES: D = developer; SA = state administrator; M = program manager; S = supervisor; HV = home visitor; CP = community service provider.

<sup>a</sup>Home address is geocoded and linked to census data.

observational scales of the Project on Human Development in Chicago Neighborhoods. The items ask the observer to report on the condition of houses and buildings, the street, the volume of traffic, whether there are children playing, and whether there are teenagers or adults behaving in a hostile manner. These items are associated with child and family outcomes.<sup>8</sup> Census items will include measures of income and poverty, household characteristics, housing, and residential stability for the census tracts in which sample members reside.

### *Service Availability and Accessibility*

Because home visiting programs rely on other services in the community to meet the needs of the families in home visiting, the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program emphasizes the importance of creating strong referral and coordination relationships. An important aspect of local program implementation, then, is the availability of service providers in MIECHV program communities with whom home visiting programs can build such networks. Table 4.3 shows that availability and accessibility of relevant community services are measured by surveying home visiting program staff and community service providers about services, including prenatal care, family planning and reproductive health, substance use (alcohol and other drugs), mental health, domestic violence shelter, domestic violence counseling, adult education, employment services, pediatric primary care, child care, and early intervention services. This information will be used to create a measure of service availability and accessibility for each outcome, as well as measures of coordination with the home visiting program. (Coordination is discussed below; see the section “Service Model.”)

### **Inputs**

As described in Chapter 2, the MIHOPE conceptual framework conceptualizes several types of inputs that could affect home visiting services, including influential organizations, service model, implementation system, and the characteristics of program staff and families served by the program.

### *Influential Organizations*

Although the implementing agency is the nexus for defining the service model and establishing the implementation system, it does not operate independently. Table 4.4 lists six types of influential organizations: the national model developer, service delivery organizations, public agencies, philanthropic organizations, education and advocacy organizations, and professional organizations. The influence that each one exerts might be in sync or in conflict with that of other organizations. When influential organizations are in conflict in how to define

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<sup>8</sup>Leventhal et al. (2004); Raudenbusch and Sampson (1999).

**The Mother and Infant Home Visiting Program Evaluation**

**Table 4.3**

**Measurement of Community Service  
Availability, Accessibility, and Coordination  
Collected Through Staff Surveys**

Construct	Home Visitor Survey	Manager Survey	Community Provider Survey
<b><u>Rating of service availability in each category</u></b>	X	X	X
<b><u>Primary community service providers to which program site refers families</u></b>			
For each service provider named:			
Confirmation of service relationship			X
Frequency of referrals from program site to community		X	X
Number of referrals from program site in past 3 months		X	X
Rating of capacity to serve families referred and meet their needs	X	X	X
Use and length of waiting lists		X	X
Rating of service quality	X	X	
Rating of relationship between service provider and program site	X	X	
Type and frequency of communication/joint activities		X	X
<b><u>Other community service providers in each category</u></b>			
Reasons program site does not refer to these providers		X	

NOTE: Services include prenatal care, family planning and reproductive health care, substance use (alcohol and other drugs), mental health treatment, domestic violence shelter, domestic violence counseling/anger management, adult education, employment services, pediatric primary care, child care, and early intervention services.

the service model or implementation system for a specific program site, it increases the model's complexity and decreases its clarity and coherence. As a result, program managers and home visitors may become confused about how to reconcile contradictions in the model, and service quality may suffer. The table also lists ways that each type of organization might influence a service model and implementation system; the rightmost columns show the data collection strategy for obtaining this information. Data sources include interviews with national model developers, state administrators, and program managers; review of national model developer documents and program site managerial forms; and surveys of program managers, community service providers, and home visitors.

Together, the implementing agency and the other organizations with which it works adopt and adapt an evidence-based home visiting model for a specific site. Thus, a given program is influenced not only by its service model but also by the implementation system.

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**Table 4.4**

### **Influential Organizations and Their Functions in Relation to the Home Visiting Program**

Type of Organization	Functional Influence on Service Model and Implementation System	Data Source		
		Interview	Review of Materials	Survey
National model developer	Specification of core elements of model	D	D	M
	Implementation system infrastructure, such as curricula	D	D	M
	Training and technical assistance	D, M	D	M
	Requirements for staff certification and program accreditation	D	D	M
Service delivery organizations	Referrals to home visiting	M		CP, M
	Provision of services to families referred from home visiting	M		CP, M, HV
	Coordination of services for families enrolled in home visiting	M	M	CP, M, HV
Public agencies at the federal, state, and local levels	Financial support via contracts and reimbursement for services	D, SA		M
	Training and technical assistance	D, SA		M
	Staff licensing	D, SA		
	Regulations governing program operations and service delivery	D, SA		
Philanthropic organizations	Financial support through grants	D, SA		M
	Training and technical assistance	D, SA		M
	Staff licensing	D, SA		
	Regulations governing program operations and service delivery	D, SA		
Education and advocacy organizations	Training	D, SA		
Professional organizations	Training	D, SA		
	Staff certification and program accreditation	D, SA		

NOTE: D = developer; SA = state administrator; M = program manager; HV = home visitor; CP = community service provider.

Table 4.5 provides information on the aspects of the service model and implementation system that will be measured in MIHOPE. The evaluation will assess each of these constructs to understand intended service delivery and how intended service and implementation systems differ from actual services delivered and the implementation systems actually used.

### *Service Model*

The service model defines the intended program plan. The defining features of the intended service model are its specifications for (1) goals and outcomes, (2) recipients, (3) service delivery and linkages with other services, and (4) staffing. Each of the national model developers has defined its service model. The national model developers vary in how prescriptive they are versus how and what decisions they delegate to local implementing agencies for specifying the service model. It is the intent of the MIECHV program that local agencies implement evidence-based models faithfully. To the extent that a national model developer delegates decision-making about specifics of the service model to the local implementing agency, service models will vary across local program sites using a national model.

Beyond delegated specification of service model features, local implementing agencies might choose to adapt the national model they have adopted to fit their local contexts. Such adaptation might strengthen the service model; alternatively, adaptations might decrease model clarity, increase complexity, and detract from coherence.

It is important to consider variation in service delivery in the context of the local service model — to distinguish whether variation in service delivery reflects intended departures from the national service model or unintended departures from the local model. The defining features of the service model are measured for each local program site in order to make this distinction in explaining variability in service delivery. The defining features of the service model are measured through staff surveys, staff interviews, and review of programmatic documents at both the national and the site level.

To assess intended goals and outcomes at the national level, model developers will be asked to name the three or four primary goals of their program. They will also be asked to rate the importance of each of a set of predefined outcomes reflecting the benchmark domains specified in the ACA. Within intended service delivery, developers will be asked to define intended service dosage, including visit frequency and length and the duration of family enrollment. The intended service content will be assessed by examining program developer curricular materials and by interviewing developers to determine what is to be covered during home visits, specific activities that should be carried out, referrals to and from other services, and coordination of home visiting with other services. The intended approach of each home visiting model will be assessed through examination of materials and conduct of model

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**Table 4.5**

**Defining Features of a Program Site's  
Service Model and Implementation System**

	Data Source		
	Survey	Interview	Review of Materials
<b><u>Service model</u></b>			
Intended goals and outcomes	M, S, HV	M, S	
Intended recipients, including eligibility criteria	M	M, S	
Intended service delivery			
Dosage (visit frequency, length, duration of enrollment)	M	M, S	
Content (assessment, education, referrals, coordination)	M	M, S, HV	
Techniques (for example, role-playing, modeling)	M, S, HV	S, HV	
Approach (for example, family empowerment, shared decision-making)	M, S, HV	S, HV	
Intended staffing			
Qualifications for hire		M	M
Roles and responsibilities	M	M	M
Required competencies		M	M
Caseload limits	M	M	
<b><u>Implementation system</u></b>			
Staff development supports, such as policies and procedures			
Staff recruitment and hiring	M	M, S	M
Staff training	M	M, S, HV	M
Staff supervision	M, S	M, S, HV	M
Staff evaluation and feedback	M, S	M, S, HV	
Facilitative clinical supports, such as:			
Screening and assessment tools, protocols, curricula	M, S, HV	M, S, HV	
Peer support and learning	M	S, HV	
Access to professional consultation and experts	M, S, HV	S, HV	
Facilitative administrative supports, such as:			
Management information systems and electronic records	M, S, HV	M, S	M
Program monitoring and continuous quality improvement	M	M, S	
System interventions, such as:			
Formal agreements for referrals	M		
Formal agreements and technologies for information sharing	M, CP		
Organizational culture and climate	S, HV		

NOTE: D = developer; SA = state administrator; M = program manager; S = supervisor; HV= home visitor; CP = community service provider.

developer interviews to determine the extent to which the model specifies techniques for service delivery. Such techniques may include the strengths-based, family empowerment, and shared decision-making approaches. To assess intended staffing, developers will report on qualifications for hiring staff, staff roles and responsibilities, required competencies, and caseload limits.

The parallel components of each site's service model will be generated through review of site policies and procedures and from surveys and interviews of staff at the local site. To assess intended goals and outcomes at the local level, program managers will be asked to rate the fit of the goals identified by the national model with the mission of their local implementing agency. They will also be asked to rate the importance of each on a set of predefined outcomes reflecting the benchmark domains specified in the ACA. Within intended service delivery, managers will be asked to define service dosage, including visit frequency and length and the duration of family enrollment. Local intended service content will be assessed by survey and interview questions, as well as analysis of policies or forms, to identify what is to be covered during home visits, specific activities that should be carried out, referrals to and from other services, and coordination of home visiting with other services. The intended approach of the local site's home visiting model will be assessed through survey and interview questions to assess the techniques by which services are to be delivered. To assess intended staffing, managers will be asked about the local policies regarding qualifications for hiring staff, staff roles and responsibilities, required staff competencies, and caseload limits.

Implementation science suggests that more complex service models reduce fidelity, while clearer and more coherent service models increase fidelity.<sup>9</sup> National models and local sites with clear service models fully define intended outcomes, recipients, services and staffing. National models and sites with more complex service models involve broader, more heterogeneous sets of intended outcomes, recipients, services, and staffing. National models and local sites with more coherent service models explicitly and logically specify the links from intended recipients, services, and providers to each intended outcome. In addition, because the service model's clarity, complexity, and coherence may vary by outcome, MIHOPE is collecting information on these aspects of the service model for a number of domains. For example, to measure service model complexity, MIHOPE asks program managers how much a site's intended outcomes extend beyond those specified by the ACA.

### *Implementation System*

The implementation system includes the policies, procedures, and resources needed to implement the service model. The defining features of the implementation system can be

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<sup>9</sup>Carroll et al. (2007).

categorized as (1) policies and procedures for staff selection, training, supervision, and evaluation; (2) facilitative clinical supports; (3) facilitative administrative supports; (4) systems interventions; and (5) organizational culture and climate. Facilitative clinical supports include screening and assessment tools, protocols, and curricula, the availability of peer support, and the availability of professional consultation to home visitors for situations that require expertise beyond that of the home visitor. Facilitative administrative supports include the availability and use of a management information system and continuous quality improvement procedures to monitor and promote adherence to the service model. Systems interventions include formal agreements and shared information systems that make it easier for staff to link families with needed services and to coordinate services.

As part of the implementation system, an implementing agency's organizational culture and climate influence adherence to the service model.<sup>10</sup> In MIHOPE, home visitors and supervisors are being asked to complete the Organizational Social Context (OSC) scales<sup>11</sup> to measure two major organization-level domains: culture (proficiency, rigidity, resistance) and climate (engagement, functionality, stress). Within a specific site, individual staff members' responses are combined to yield overall measures for each subscale for the site. The subscale scores for an organization can be used individually and as a profile. The norms can be used to develop OSC profiles of home visiting program sites and to examine the association of organizational culture and climate with providers' work attitudes. In the context of this study, home visitors and supervisors complete the instrument, and their responses are aggregated to derive subscale scores and a profile of their program site's culture and climate.

The adequacy of the implementation systems also influences program impacts. In particular, impacts are expected to be greater if (1) staff development supports are adequate to ensure that staff understand the service model, embrace their roles, and acquire and maintain the competencies needed to carry out their roles skillfully; (2) clinical and administrative supports are adequate to enable frontline, supervisory, administrative, and management staff to carry out their roles; and (3) systems interventions are adequate to link home visiting with other community resources for referrals and coordination. As outlined above, these aspects of implementation systems are measured using staff surveys, staff interviews, surveys of community service providers, and review of programmatic documents.

### *Staff Characteristics*

In addition to organizational influences, home visiting services are affected by the individuals who participate in programs, including home visitors and supervisors. Home visitors

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<sup>10</sup>Bond et al. (2009).

<sup>11</sup>Glisson et al. (2008).

vary in their understanding and acceptance of each of the responsibilities of their role. They also vary in their actual and perceived capacity to carry out each responsibility, both in general and in the context of challenging situations. Home visitors vary in their responsiveness to training, supervision, and evaluation activities. In turn, home visitors' views and abilities are affected by supervision and feedback on performance. Thus, home visitors and supervisors influence actual service delivery.

Attachment theory, social cognitive theory, and organizational theory suggest that home visitor characteristics directly influence home visitor behavior. These characteristics can be divided into three types. *Predisposing factors* are antecedents to behavior that provide the rationale or motivation for the behavior.<sup>12</sup> These include demographic characteristics; educational and employment background; psychological well-being; and beliefs, attitudes, knowledge, and skills. *Reinforcing factors* are characteristics of interpersonal relations, including supervisor actions that affect specific home visitor behaviors and actions by home visitors and mothers that affect the other's behavior. *Enabling factors* — such as home visitor training activities, administrative supports, and clinical supports — make it easier for program staff to carry out their roles.

These factors will be measured for different types of individuals, including home visitors and supervisors. For example, the assessment of supervisor predisposing, reinforcing, and enabling factors is closely aligned with the assessment of the same factors in home visitors. The baseline and 12-month surveys were designed to be parallel; they measure home visitor and supervisor characteristics that are malleable and for which it will be important to assess change over time.

### *Staff Predisposing Factors*

Table 4.6 shows the predisposing factors of staff that affect service delivery. These will be measured using a variety of data sources, including surveys of home visitors and supervisors at baseline and one year later.

**Demographic characteristics.** Demographics and educational and employment history will be measured for both home visitors and supervisors using items from existing large-scale studies and prior home visiting research.

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<sup>12</sup>Glanz, Rimer, and Viswanath (2008).

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Table 4.6

Measurement of Staff Characteristics Affecting Service Delivery

Construct	Data Source				
	Baseline Survey	12-Month Survey	Weekly Web-Based Logs	Monthly Training Logs	Home Visit Video-Recording
<b><u>Predisposing factors</u></b>					
Demographics					
Age, race/ethnicity	HV, S				
Employment and educational history	HV, S				
Psychological well-being					
Depressive symptoms, relationship security, morale, burnout	HV, S	HV, S			
Outcome- and activity-specific beliefs and perception					
<i>For each outcome domain:</i>					
Perceived importance to agency	HV, S	HV, S			
Personal belief of importance	HV, S	HV, S			
<i>For specific activities to achieve outcomes:</i>					
Perceived importance to agency	HV, S	HV, S			
Perceived competence to carry out	HV	HV			
Self-efficacy in challenging situations	HV	HV			
Expectations for home visitors to carry out an activity	HV, S	HV, S			
Capacity to carry out specific activities					
<i>For making referrals:</i>					
Knowledge of community resources	HV	HV			
Perceptions of community resources	HV	HV			

(continued)

**Table 4.6 (continued)**

Construct	Data Source				
	Baseline Survey	12-Month Survey	Web-Based Logs	Weekly Training Logs	Monthly Home Visit Video-Recording
<b><u>Reinforcing factors</u></b>					
Ongoing supervision and feedback					
Supervisory feedback provided	HV	HV			
Ratings of supervision received	HV, S	HV, S			
<b><u>Enabling factors</u></b>					
Training activities					
<i>For each outcome domain:</i>					
Trainings completed	M	M			HV, S
Content and methods of each training					HV, S
Administrative supports					
<i>For each outcome domain:</i>					
Usefulness of supports received	HV, S	HV, S			
Clinical supports					
<i>For each outcome domain:</i>					
Timeliness and usefulness of supports received	HV, S	HV, S			

NOTE: HV = home visitor; S = supervisor; M = program manager.

**Psychological well-being.** Because a home visitor's psychological well-being has been shown to influence family engagement and home visit content,<sup>13</sup> MIHOPE will measure both home visitor's and supervisor's depression symptoms using the 10-item short form of the CES-D;<sup>14</sup> relationship security using a 29-item form of the Attachment Style Questionnaire;<sup>15</sup> and morale using the Organizational Social Context scales (OSC; described above). The OSC also assesses three dimensions of staff burnout: emotional exhaustion, personalization, and personal accomplishment.

**Outcome- and activity-specific beliefs, perceptions, and self-efficacy.** Home visitors' beliefs, attitudes, and self-efficacy will influence how they deliver services. For example, home visitors may be more likely to carry out activities if they believe that the program views the outcome as a top priority, that the outcome is important, that the program expects them to carry out the activity, that the activity is important, and that they are competent to carry out the activity well. To measure these constructs, MIHOPE has adapted items from an evaluation of home visiting programs in New Jersey.<sup>16</sup> For each specific outcome domain, the home visitor survey asks home visitors to prioritize the outcome relative to other outcomes, to rate the strength of their beliefs about the impact of specific role activities on family outcomes, and to rate the degree which they believe that their supervisor expects them to carry out each activity. In addition, as a measure of self-efficacy, home visitors will be asked to rank their confidence in carrying out specific activities under challenging situations (such as when a client seems unmotivated).

Similarly, supervisors' beliefs and attitudes are expected to influence how they supervise home visitors. For each specific outcome domain, the supervisor survey asks supervisors to prioritize the outcome relative to other outcomes, to rate the degree to which each activity impacts families, and to rate the degree to which they expect home visitors to carry out each activity.

**Home visitor capacity to carry out specific activities.** Home visitors' capacity to perform specific activities may influence how they carry them out. The survey of home visitors is assessing home visitors' capacity in making referrals. MIHOPE has adapted items used in evaluations of home visiting in Hawaii, Alaska, Baltimore, and New Jersey.<sup>17</sup> To gauge home visitors' ability to make referrals, the home visitor survey asks whether or not a home visitor has

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<sup>13</sup>Burrell et al. (2009).

<sup>14</sup>Radloff (1977).

<sup>15</sup>Feeney, Noller, and Hanrahan (1994).

<sup>16</sup>Duggan, Gustin, Breitwieser, and Hernandez (2012).

<sup>17</sup>Duggan et al. (2007); Duggan, Gustin, Breitwieser, and Hernandez (2012); Duggan et al. (2004); Tandon, Parillo, Jenkins, and Duggan (2005).

made referrals for services in each outcome domain and asks home visitors to name the organization to which they most often make referrals.

### *Staff Reinforcing and Enabling Factors*

Table 4.6 also presents factors that enable and reinforce home visitors in carrying out specific activities. These will be measured through baseline and 12-month surveys of home visitors and supervisors, weekly supervision and monthly training logs, and surveys of program managers. These measures have been adapted from other home visiting evaluative research. For example, the ongoing evaluation of New Jersey's Evidence-Based Home Visiting (EBHV) Initiative<sup>18</sup> provided prototypes for many of these measures.

**Ongoing supervision and feedback.** In logs completed weekly, home visitors will be asked to report on the supervision they have received from their supervisor. In the baseline and annual surveys, staff will rate various aspects of the supervision that they have received, including attributes of their supervisor, such as communication style. Home visitors will also be asked to rate their supervisor's feedback in all the outcome domains.

Supervisors will be asked to report weekly on all the supervision that they provide to home visitors. This includes scheduled one-on-one supervision, group supervision, and informal supervision (including conversations, phone calls, text messaging, and other communication about program families that occurs outside formal supervision).

**Training activities.** In logs completed monthly, home visitors and supervisors will be asked to report on the amount of time that they have spent in training, the core content areas that were covered, and the method of delivery in each training (for example, lecture format, Webinar). In the baseline and 12-month surveys, program managers will report on the proportions of home visitors and supervisors who are up to date on training. Program managers will also report on whether they have ever sat in on their national program model's home visitor and/or supervisor training.

**Administrative supports.** Both the home visitor and the supervisor surveys ask program staff about their access to certain technology resources (such as computers, the Internet). Home visitors are further asked a series of questions regarding how they document what happens in each home visit, including questions about their use of paper forms and electronic record systems for documentation, the ease with which they are able to complete this documentation, and the ease with which they can access their documentation as needed. Supervisors are asked a series of questions regarding how they document what happens during supervisory sessions with home visitors, including questions about their use of paper forms and

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<sup>18</sup>Duggan, Gustin, Breitwieser, and Hernandez (2012).

electronic record systems for documentation, the ease with which they are able to complete this documentation, and the ease with which they can access their documentation as needed.

**Clinical supports.** The home visitor survey asks home visitors to rate the timeliness and helpfulness of their supervisor’s guidance in each outcome domain area. Additionally, both home visitors and supervisors are asked about the availability, accessibility, and helpfulness of professional consultation for each outcome domain.

### *Family Characteristics*

Baseline family attributes also influence service delivery and outcomes. These include the family’s demographic characteristics, risks and strengths (relationship security, depression, substance use, and parenting beliefs), reasons for enrolling in home visiting, and expectations of what enrollment entails. Another important attribute is the encouragement or discouragement to enroll in home visiting by influential family members, health care providers, or friends. Chapter 5 discusses some of the baseline family attributes in greater detail.

### **Outputs (Service Delivery)**

In addition to intended program features, the degree to which and manner in which program features are implemented — or actual service delivery — are critical mediators in determining program outcomes.<sup>19</sup>

MIHOPE is examining five aspects of service delivery: dosage, content, techniques, quality, and family responsiveness.

- **Dosage.** This refers to the frequency, intensity, and duration of services to which a family is exposed. Dosage will be measured in MIHOPE by indicators including the number of visits, the length of each visit, and the duration of family enrollment in a program.
- **Content and techniques.** This refers to the information conveyed in home visits as well as the methods used to convey that information and the set of activities carried out in home visits. For a specific intended outcome, content can be measured as the information provided and the activities carried out to achieve the outcome. For promoting child development, for example, content might include parenting education on child developmental milestones; periodic developmental screening; and modeling, role-playing, and

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<sup>19</sup>Durlak and DuPre (2008); Elliot and Mihalic (2004); Ennett et al. (2003); Hallfors and Cho (2007).

reinforcement of positive parenting techniques. For a given service model, some of these activities might be specified as core components.

- **Quality of delivery.** This refers to the manner in which a home visitor provides services. It includes such characteristics as the home visitor's interaction style, responsiveness to family members' questions and concerns, adherence to program protocols in challenging situations, ability to tailor services and to motivate behavior change, and cultural appropriateness.
- **Family responsiveness.** This refers to how family members (especially parents) react to or engage in program activities. This includes their level of interest, willingness to engage in discussion, and willingness to follow through on suggested behaviors. Family responsiveness relates both to activities occurring during home visits and to other activities, such as following through on referrals or suggested parenting behaviors.

Table 4.7 displays how MIHOPE will collect information to measure actual services. The variables include the dosage of services provided (that is, the duration and frequency of services), the content and techniques used by home visitors, the quality of home visiting (such as interaction style), and information on the family's responsiveness. Information will be collected directly from the home visitor through home visit logs and videotapes of home visitors interacting with the families during home visits.

Home visitors will complete a log each week to report all attempted and completed home visits. The log will be designed to allow MIHOPE to assess adherence to dosage and content as described by the service model. The log will collect the dates of each attempted and completed visit. Information for each completed visit will include visit length, content discussed, activities conducted, referrals made to other resources or services, and family engagement and responsiveness. The response categories will allow MIHOPE to examine the extent to which visit content focuses on each of the outcome domains.

To assess aspects of home visits that are difficult to measure through home visitors' self-reports, MIHOPE will rely on observational data of home visitor interactions. Videotapes will be the primary data source for the quality of delivery of actual services and will provide four types of vital information of particular interest: (1) the content and activities specified in theories of change for each outcome domain and the quality in which they are delivered, (2) service delivery techniques used to convey information or to train parents and the quality in which they are performed, (3) the interactional style of the home visitor, and (4) the responsiveness of the family. These aspects of service delivery will be assessed using observational measures to be selected after pilot-testing candidate measures using an early sample of video recordings of home visits.

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**Table 4.7**

**Measurement of Service Delivery**

Construct	Weekly Web-Based Logs	Home Visit Video-Recording <sup>a</sup>
<b>Dosage</b>		
Duration of enrollment	X	
Reasons for disenrollment	X	
Date, length, distribution of time	X	X
Participants	X	X
<b>Content</b>		
Visit content/activities	X	X
<b>Techniques</b>		
Techniques used		X
<b>Quality of delivery</b>		
Visit content/activities		X
Techniques used		X
Interaction style		X
<b>Family responsiveness</b>		
Engagement in activities	X	X

NOTE: <sup>a</sup>Video-recording will be used for selected home visits.

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## Chapter 5

# MIHOPE Impact Analysis and Analysis of Health Systems Outcomes

As discussed in Chapter 1, one provision of the Patient Protection and Affordable Care Act (ACA) of 2010 authorizes the creation of the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program, which greatly expands federal funding of evidence-based home visiting programs. Because these programs have the potential to affect health care use and health outcomes, the ACA also calls for a national evaluation to assess the potential for home visiting to reduce health disparities and improve health care quality and practices, both overall and for subgroups of families. In response, the Mother and Infant Home Visiting Program Evaluation (MIHOPE) was launched in 2011.

Here are the research questions addressed by this area of the evaluation:

- What are the effects of home visiting programs across the domains of outcomes mentioned in the ACA?
- Do the effects of home visiting programs vary across subgroups of families?
- What is the relationship between the features of home visiting programs and their effects on family outcomes?
- What are the effects of home visiting program on health disparities, health care quality, and health care practices?

This chapter describes these analyses and presents a plan for collecting information to inform the impact analysis.

### **Measurement Plan for the Impact Analysis**

The MIHOPE impact analysis will use baseline information collected through surveys of parents; observations of the home environment and parenting practices; and administrative records on child abuse and neglect, birth outcomes, Medicaid claims, and employment and earnings. It will also include outcomes from a range of data sources collected when the child is approximately 15 months old to assess the short-term effects of home visiting programs. These sources include surveys of parents, observations of parents interacting with their children, observations of the home environment, direct assessments of children's cognitive development,

direct physical measurements from the mother and child, and the four types of administrative data listed above.<sup>1</sup>

### **Overview of Data Collection**

The legislation indicates that the evaluation should assess the effects of home visiting on a number of domains, including prenatal, maternal, and newborn health; child health and development; parenting; school readiness and academic achievement; crime and domestic violence; family economic self-sufficiency; and referrals and service coordination.

The first wave of data collection is occurring at baseline, when study participants enter the evaluation. Baseline data collection provides information needed to describe the population of families and children targeted by home visiting programs. Baseline data are also used to identify subgroups of the population for the impact analysis and to provide covariates to improve the precision of estimated effects. Some components of the baseline data may vary, depending on whether the family is enrolled before or after the birth of a child.

The second wave of data collection will be used to assess program impacts on parents and children and will occur for all children when they are approximately 15 months of age. It will include assessments of the domains described in the legislation as benchmarks and outcomes for families and children: (1) maternal and newborn health; (2) prevention of child injuries and of child abuse, neglect, or maltreatment and the reduction of emergency department visits; (3) improved parenting; (4) improvement in early child development, school readiness, and achievement; (5) reductions in crime and domestic violence; (6) improved family self-sufficiency; and (7) greater coordination of referrals to community resources.

### **The Process of Identifying Constructs for the Impact Study**

#### **Crosswalk between legislative benchmark areas and evaluation outcome domains.**

The impact study for the national evaluation needs to address all the domains of participant outcomes described in the legislative benchmarks. For purposes of conceptualizing the measurement work, the benchmark domains and participant outcomes were grouped into four distinct domains: parent health and well-being, parenting, child health and development, and

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<sup>1</sup>The proposed 15-month data collection efforts that are described here are pending approval by the Office of Management and Budget, which, under the Paperwork Reduction Act, reviews all research activities that place a burden on study participants.

actual services.<sup>2</sup> As Table 5.1 shows, in some cases, a given domain or outcome may include specific outcomes that fall into more than one domain in this framework. For example, the benchmark area “prenatal, maternal, and newborn health” includes the maternal health and child health (prenatal and newborn health) domains. In the rest of the chapter, constructs and measures are organized into these four domains.

### The Mother and Infant Home Visiting Program Evaluation

**Table 5.1**

#### **Benchmark Outcomes and Organization in Conceptual Framework**

Benchmark/ Participant Outcome	Conceptual Framework/Domain
Prenatal, maternal, and newborn health	Parent health and parent well-being, child health and child development
Child health and development (including injuries, hospitalizations, emergency department visits, maltreatment)	Child health and child development
Parenting skills	Parenting
School readiness and academic achievement	Child health and child development
Crime and domestic violence	Parent health and parent well-being
Family economic self-sufficiency	Parent health and parent well-being
Referrals and coordination	Actual services

**Identify key constructs within each domain.** After identifying the critical domains, the next step in the process was to identify the key baseline and outcome constructs within each domain that should be measured to gauge the direct effects of the home visiting programs, as well as the constructs that may be key moderators or mediators of impacts. Important constructs were identified by drawing from the following resources: (1) the conceptual models and theories of change underlying the ways in which evidence-based home visiting models are hypothesized to affect maternal and child well-being and development; (2) the results of prior evaluations of these programs, particularly the constructs and measures that were included in impact analyses; and (3) early input from staff in the U.S. Department of Health and Human Services (HHS) and from other stakeholders about high-priority

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<sup>2</sup>Appendix A includes a set of “generic” logic models designed by the MIHOPE study team. The logic models focus on outcomes designated as “priority outcomes” by the team, and they include the MIECHV program indicators that states are to use in monitoring their progress in achieving benchmarks and participant outcomes.

constructs to measure in light of the goals of the initiative and the range of evidence-based programs to be included in the evaluation.

### **Baseline Constructs for the Impact Study**

As with any large, random assignment study, MIHOPE will measure key baseline constructs. These constructs have two purposes in the impact analysis: they serve as covariates to increase the statistical precision of impact estimates, and they are used to identify subgroups. Table 5.2 presents a list of possible baseline and follow-up constructs, by domain.

**Family demographics, baseline parent health, parent well-being, and family economic self-sufficiency.** Baseline covariates include such demographic information as maternal and paternal age, race and ethnicity, number of other living children, the respondent's dominant language, and a measure of acculturation. Other useful demographic information includes age and relations of other household members, a measure of housing mobility, and the dominant language spoken in the household. The baseline survey also includes measures of family economic self-sufficiency, such as maternal earned income, total household income, maternal employment, maternal highest grade completed and current schooling, maternal educational aspirations, current public assistance receipt, and maternal monetary assistance from the father (material support). All of these are key variables for understanding the characteristics of the population served by home visiting programs and for identifying subgroups of interest.

The baseline interview also assesses key aspects of the mother's health, including physical health (global health, illness, nutrition, and quality of life), mental health (depression, other mental illness, and social support), substance use (tobacco use, substance use, and problem alcohol use), and psychological resources. Baseline data also include an assessment of the mother's desired timing of future subsequent births. Finally, measures of maternal prior arrests are collected at baseline. Again, these maternal risk factors may be used to identify important subgroups of interest.

**Baseline child health and child development constructs for children born prior to random assignment.** Birth outcomes for children who have already been born at the time of random assignment include the following: birth weight, gestational age, length of stay in the hospital, and use of the neonatal intensive care unit. These newborn health indicators are associated with long-term health and development and, therefore, serve as key baseline covariates and variables to identify at-risk subgroups of children. Baseline data also include measures of the child's current health status, height and weight, special health care needs, any prior substantiated claims of abuse and neglect, prior injuries, and the child's temperament in infancy.

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**Table 5.2**

**Key Baseline and Outcome Domains:  
Timing and Constructs**

	Baseline	15-Month Follow-Up
<b><u>Child health and development</u></b>		
<b>Health</b>		
<i>Newborn health<sup>a</sup></i>		
Birth weight	X	X
Gestational age	X	X
Size for gestational age	X	
Length of hospital stay	X	X
<i>Infant and child health and physical development</i>		
Overall health	X	X
Height and weight <sup>b</sup>	X	X
Developmental milestones		X
Injuries		X
Infant temperament <sup>c</sup>	X	
<b>School readiness and precursors to school readiness</b>		
Language development		X
Social-emotional development and behavior		X
<b><u>Parenting<sup>d</sup></u></b>		
<b>Parenting behavior</b>		
Cognitive stimulation		X
Social-emotional responsivity		X
Negative parenting behaviors (negative regard, intrusiveness, detachment)		X
Positive regard		X
Breastfeeding, nutrition		X
Sleep routines, arrangement		X
Harsh parenting and discipline		X
<b>Child maltreatment</b>		
Neglect		X
Substantiated reports		X
Involvement of Child Protective Services		X
<b>Home safety environment</b>		
		X
<b>Parenting attitudes/beliefs</b>	X	
<b>Parenting stress</b>	X	X
<b>Attachment style</b>	X	

(continued)

**Table 5.2 (continued)**

	Baseline	15-Month Follow-Up
<b><u>Parenting (continued)</u></b>		
<b>Parents' relationship and father involvement</b>		
Paternity established	X	
Father involvement		X
Parents' relationship quality	X	
<b><u>Parent health and well-being</u></b>		
<b>Maternal health (including prenatal)</b>		
<i>Physical health</i>		
Global health	X	X
Illness	X	X
Nutrition	X	
Quality of life	X	
<i>Mental health</i>		
Depression	X	X
Other mental illness	X	X
Social support	X	
<i>Substance use</i>		
Tobacco use	X	X
Substance use	X	X
Problem alcohol use	X	X
<b>Maternal reproductive health</b>		
Subsequent pregnancies		X
Subsequent births (date of birth, gestational age, birthweight, overall health)		X
Desired timing of subsequent births	X	X
<b>Intimate partner violence</b>		
Emotional, physical, and sexual victimization and perpetration	X	X
<b>Crime</b>		
<i>Maternal crime</i>		
Prior arrests	X	
Subsequent arrests		X
<b>Family self-sufficiency</b>		
<i>Income</i>		
Maternal earned income	X	X
Household income	X	X
<i>Maternal employment</i>		
	X	X

(continued)

**Table 5.2 (continued)**

	Baseline	15-Month Follow-Up
<b>Family self-sufficiency (continued)</b>		
<i>Maternal education</i>		
Highest grade completed	X	X
Current schooling	X	X
Educational aspirations	X	X
<b>Current public Assistance (TANF, SNAP, WIC, UI)</b>	X	X
<b>Food security</b>	X	X
<b>Housing and household composition</b>		
Age and relations of other members	X	X
Mobility	X	X
<b>Demographics of index child's parents</b>		
Parents' ages	X	
Parents' race/ethnicity	X	
Parents' relationship	X	X
Parents' other living children	X	X
Language spoken at home	X	X
Acculturation	X	
<b><u>Actual services</u></b>		
<b>Child-related services: screenings, referral, coordination, and use</b>		
Insurance coverage	X	X
<i>Preventive/primary care<sup>e</sup></i>		
Usual source of care	X	X
Immunizations	X	X
Developmental screening	X	X
Early intervention services	X	X
Receipt of well-child care	X	X
Subspecialist health care	X	X
Hospitalizations	X	X
Injuries requiring health care	X	X
Emergency department visits	X	X
Prescription drug use	X	X
Child care	X	X

(continued)

**Table 5.2 (continued)**

	Baseline	15-Month Follow-Up
<b><u>Actual services (continued)</u></b>		
<b>Mother-related services: screenings, referral, coordination, and use</b>		
Insurance coverage	X	X
Prenatal/postpartum care	X	X
<i>Preventive/primary care</i>	X	X
Usual source of care	X	X
Receipt of primary care	X	X
Reproductive health care	X	X
Mental/substance use care	X	X
Hospitalizations	X	X
Injuries requiring health care	X	X
Emergency department visits	X	X
Services for intimate partner violence	X	X

NOTES: <sup>a</sup>Newborn health will be collected as an impact measure for families enrolled prenatally. For all other children, it will be collected as a baseline covariate.

<sup>b</sup>Height and weight and selected other health measures will be measured at baseline for families enrolled postnatally.

<sup>c</sup>Infant temperament will be measured at follow-up for families enrolled prenatally and at baseline for families enrolled postnatally.

<sup>d</sup>Selected parenting measures may be collected at baseline.

<sup>e</sup>Preventive/primary care will be measured at baseline only for families enrolled postnatally.

**Baseline parenting constructs for families with children born prior to random assignment.** For families who enroll postnatally, various parenting constructs will be measured at baseline. These include such parenting behaviors as cognitive stimulation, social-emotional responsiveness, harsh parenting, discipline strategies, breast-feeding and nutrition, sleep routines, prior child maltreatment, safety of the home environment, parenting knowledge and attitudes, attachment style, and aspects of the mother-father relationship (establishment of paternity, father’s involvement, and quality of parents’ relationship).

### **Outcome Constructs for the Impact Study**

#### *Child Health and Development*

Outcomes related to child health and development can be further classified as being related to birth outcomes, postnatal health outcomes, and school readiness.

For those families who enrolled prenatally, birth outcomes are key outcomes of interest for the evaluation. Prior research suggests that birth weight, gestational age, size for gestational age, and health status at birth are linked to children's short- and long-term health and development as well as to family well-being and health system costs. A low-birth-weight infant can be born too small, too early, or both. Compared with infants of normal weight, low-birth-weight infants may have an increased risk for many negative outcomes. The negative outcomes can be immediate, such as infection or perinatal morbidity (illness through the first week of life) or mortality. Longer-term consequences of impaired development can be delayed social development or learning disabilities. These constructs — birth weight, gestational age, size for gestational age, and health status at birth — will be measured using state birth records. It will be critical to measure these as important pregnancy-related program outcomes that are ultimately linked to other aspects of children's development; these outcomes will also be important for the cost-effectiveness analysis.

Children's physical health and development are key areas for most home visiting programs. Physical health problems can be harmful to other domains of a child's development, as well as being financial stressors on families and broader health systems. Because of this, follow-up data will be collected on children's height and weight, physical delays and motor development, special health care needs, and injuries and on whether the child has been determined to be eligible for early intervention services. This information will come from a variety of sources, including physical measurement by the study team (height and weight) and parent reports.

### *Parenting*

Researchers have identified many different ways to describe parenting capacity and behaviors that are important to young children's development. MIHOPE is collecting information on parenting that influences development of two broad types: social-emotional responsivity and cognitive responsivity. *Social-emotional responsivity* refers to the parent's ability to quickly, appropriately, and sensitively read and respond to an infant's or young child's needs and cues and to provide a secure source of attachment, supportiveness, and warmth. This type of responsivity is crucial in infancy for healthy development, but it remains important throughout preschool and beyond. *Cognitive stimulation* refers to a parent's quantity and quality of verbal and cognitive attention toward the child, including providing learning materials in the home. It has been linked to cognitive development in infancy and early childhood. The evaluation will also include a measure of *harsh parenting*, as it has been linked to poor child outcomes. These outcomes will be collected through observed interactions of parents and children, observations of parenting and the home environment, and parent reports.

Many home visiting programs promote health-related parenting practices, such as nutrition and healthy sleep habits. Both of these have been linked to children's short- and long-term health and physical development and even to school readiness. Therefore, the evaluation is measuring nutrition practices, such as breast-feeding, as well as sleep habits, including sleeping routines and sleeping arrangements.

Reduction of child maltreatment is a major targeted outcome of home visiting programs. The evaluation will, therefore, measure substantiated reports of neglect and abuse through administrative records.

Finally, the evaluation will include measures of the quality of the home environment. Two aspects of the home environment that are strongly linked to children's development are the quality of the home learning environment and the physical safety of the home. The quality of the home learning environment is an important target of many home visiting programs and has also been linked to children's long-term outcomes, particularly cognitive outcomes. The physical safety of the home is also a primary target for many home visiting programs and has been linked to children's health outcomes, including risk for injury and long-term health outcomes; other safety hazards (for example, lead paint) are also associated with long-term cognitive and behavioral outcomes.

### *Parent Health, Parent Well-Being, and Family Economic Self-Sufficiency*

Improving parent health and well-being is also a goal of many home visiting programs and, therefore, a significant focus of the evaluation. These outcomes can be classified as being related to maternal health, domestic violence and crime, and family self-sufficiency.

Maternal health is a key outcome domain of interest. Home visiting programs can provide mothers with information on health-related practices, health conditions, and guidance during pregnancy and after the child's birth. For mothers enrolled prenatally, the evaluation will assess key pregnancy-related health constructs, such as presence of prenatal health problems (for example, gestational diabetes and high blood pressure), healthy weight gain during pregnancy, and pregnancy-related nutritional practices. These outcomes will be measured through either state birth records or parent reports.

In addition to promoting physical health, home visiting programs may also identify treatment needs and options for mothers who experience mental health or substance abuse conditions. Programs may also provide preventive mental health interventions or other services that aim to improve parental psychological well-being, in order to improve both parenting outcomes and child development outcomes. Although most mothers in home visiting programs

do not experience elevated depressive symptoms or substance abuse, those who do are found to struggle more with the parenting behaviors that home visiting programs target.<sup>3</sup> Parents with mental and behavioral health problems are at increased risk for poor parenting, committing child maltreatment, and providing lower-quality home environments. Other major mental health issues — including bipolar disorder, anxiety, and schizophrenia — are also associated with marked reductions in the quality of parenting and the home environment. It should be noted that maternal substance abuse and mental health conditions are often comorbid, further increasing the risk to impacts on child outcomes. To assess the impact of home visiting on improving parental psychological health and well-being, as well as to assess the mitigating role that these characteristics may have on and targeted outcomes, the evaluation is collecting parent reports of maternal depression, anxiety, and presence of other mental illness as well as parent reports of maternal substance use, including tobacco, other substances, and problem alcohol use.

Prior studies of home visiting programs have found treatment impacts on maternal reproductive health, including reductions in the number of subsequent pregnancies as well as the distance between subsequent pregnancies, with long-term implications for family self-sufficiency and health care system expenditures. Therefore, the evaluation includes measures of the desired and actual timing of subsequent pregnancies.

Intimate partner violence and the risk for intimate partner violence are primary targets of many home visiting programs. For this reason, the evaluation is measuring maternal victimization and perpetration. The evaluation will also measure maternal arrests since baseline (when prior arrests are to be measured).

Key outcome constructs in the domain of family economic self-sufficiency include maternal income, total income for the household in which the child resides, maternal employment, maternal highest grade completed since baseline, maternal current schooling, maternal educational aspirations, current public assistance receipt, and maternal monetary assistance from the father (material support and amount contributed to household income).

#### *Actual Services: Referral and Coordination with Other Services*

Many home visiting programs aim to improve the access, efficiency, and quality of services available to families. It will be critical for the evaluation to measure the adequacy of screenings, referrals, and receipt of referred services as a result of the home visiting services.

The evaluation will assess impacts on use of various services for children enrolled in the study. These include medical insurance status, usual source of care, well-child visits,

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<sup>3</sup>Administration on Children, Youth and Families (2002); Duggan et al. (2004); Gardner, DeCerchio, and Kass (2011).

immunizations, specialist health care, hospitalizations, injury care, visits to the emergency department, and use of prescription drugs. Finally, the evaluation may include measures assessing whether the child has been screened, received referrals from the home visiting services, and received help with accessing and coordinating supplemental nutrition programs, child care services, early intervention services (for children with disabilities and delays), and early education or preschool services.

The evaluation will also assess impacts on screenings, referrals, service coordination, and service usage for mothers enrolled in the study. For those mothers enrolled prenatally, mothers' screenings, referrals, and coordination and use of standard prenatal and postpartum care services will be assessed. For all mothers, the evaluation will assess the following: health insurance; a regular source of care; primary, reproductive, mental, and substance use services; hospitalizations; injuries requiring health care; visits to the emergency department; domestic violence services; education and workforce services; and public benefits.

## **Impact Analysis**

As described above, the MIHOPE impact analysis will assess the effectiveness of home visiting programs in improving the outcomes of families and children, both overall and across key subgroups of families and programs. In addition, the impact analysis and implementation research will be linked, in order to explore the program features that are associated with larger impacts. This section describes some principles for conducting the impact analysis.

### **Intent-to-Treat Impact Estimates**

The proposed starting point for the impact analysis is to estimate *intent-to-treat effects*, whereby all program group members — regardless of whether they actually received home visiting services — are compared with all control group members, some of whom may have received home visiting outside the MIECHV program. Random assignment ensures that these estimates are the unbiased effects of allowing program group families to be eligible for home visiting services.

Intent-to-treat impact estimates could be calculated for a number of comparisons. First, there may be some outcomes that can be pooled across all sites to get the most precise estimates of effects across the range of domains. Examples might include the degree of economic self-sufficiency, evidence of child abuse and neglect, and whether the children are receiving appropriate preventive health care.

Impact estimates would be regression adjusted, controlling for baseline characteristics of families and home visitors. In notation, regression-adjusted impacts would be calculated according to Equation (1):<sup>4</sup>

$$y_{ij} = \alpha_j + \beta E_{ij} + \gamma X_{ij} + \varepsilon_{ij} \quad (1)$$

In Equation (1),  $y_{ij}$  indicates an outcome for family  $i$  in site  $j$ ;  $E_{ij}$  is an indicator of whether the family was assigned to the program (home visiting) group or the control group; and  $X_{ij}$  are baseline characteristics of the family. A separate intercept would be estimated for each site and is represented by  $\alpha_j$ , while the program effect is captured by the parameter  $\beta$ . The term  $\varepsilon_{ij}$  captures all parts of the outcome that are not explained by the baseline characteristics, the program group assignment, or the site that the family comes from. Regression adjustment is intended to increase the precision of estimated impacts by reducing the unexplained variation in outcomes across families. Covariates would consequently be chosen, because they are expected to be correlated with key outcomes; for example, maternal depression and maternal age at the time of enrollment may be predictive of a range of subsequent maternal and child outcomes.

To address the question of whether home visiting programs have larger effects for some groups of families, intent-to-treat estimates will also be calculated for key subgroups of families. The subgroups might be based on findings from prior studies, such as the larger effects for women with low psychological resources in studies of the Nurse Family Partnership.<sup>5</sup> They might also be based on policy interest in a particular subgroup, such as impacts by race and ethnicity. The ACA places priority on serving a number of subgroups of families through MIECHV program funding. These include pregnant women under 21 years old, those with a history of child abuse and neglect, parents with a history of substance abuse, and families with a child with development delay or disabilities. Other subgroups of policy interest include families who enrolled before the child is born, first-time mothers, and families with depressed mothers.

The main question for these subgroup calculations is whether impacts differ across subgroups. For example, in estimating the effects for mothers who were pregnant when they entered the study and the effects for those whose children were infants, the impact analysis would investigate whether estimated effects were larger for one group than for another. If there are not statistically significant differences across subgroups and the pooled effects are significantly different from zero, the presumption would be that home visiting is effective for all subgroups. This approach is recommended because estimated effects for subgroups are less precise than estimated effects for the full sample. Consequently, it is likely that estimated effects

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<sup>4</sup>Equation (1) assumes a linear regression, but the approach also can be used for other methods, such as logistic regression for binary outcomes or Poisson regression for count data.

<sup>5</sup>Olds et al. (2002).

for some subgroups would not be statistically significant even if the program were modestly effective for that subgroup.

To draw conclusions about the effectiveness of home visiting by subgroup, the evaluation will specify which subgroups will be examined before the analysis begins. Subgroups will be chosen based on prior evidence of differential effects across subgroups, on theory suggesting that effects should be larger for one subgroup than another, or on policy interest in understanding the effects across subgroups. The evaluation will conduct such analyses across a limited number of subgroups, to reduce the possibility that a chance result leads to a conclusion that impacts are different for one particular subgroup.

Impacts would also be estimated for groups of programs. Different subgroups might be relevant, depending on the analysis being conducted, and there will be numerous subgroups to consider. Examples of such variables could include national home visiting model; site urbanicity; major characteristics of the local service model or community; implementing agency affiliation; home visitor psychosocial well-being; and maternal age, psychological resources, education level, or race and ethnicity. To learn as much as possible about the specific features of programs that affect the direct experiences of families, this analysis would be designed to highlight individual measureable features that are hypothesized to affect program impacts (either directly or through the content, dosage, or quality of home visits). Examples of such groups include maturity of the program, whether the program is highly networked with other community programs, and the clarity and complexity of program goals.

The evaluation will monitor participation rates in home visiting services by site and for both the program and the control group. In most random assignment studies, some families assigned to the program group receive no program services. Often this is because families volunteer for services, consent to be in the study, and are randomized but later decide that they do not want to receive services. Families also move and cannot be located by the programs. In addition, in an evaluation of home visiting, it is likely that some control group members will receive similar home visiting services. The information gained by monitoring participation rates will be used in a second set of analyses to adjust impact estimates for differences in the proportion of program and control group members who received home visiting services.<sup>6</sup>

### **Exploring the Relationship Between Program Features and Impacts**

The legislation requires examining how impacts vary across home visiting programs. An in-depth interpretation of this requirement would meet the HHS goal of informing policy,

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<sup>6</sup>Bloom (1984); Gennetian, Morris, Bos, and Bloom (2005); Angrist, Imbens, and Rubin (1996); Duncan, Ludwig, and Hirschfield (2001); Peck (2003).

programmatic, and implementation decision-making through examining how the features of communities, service models, implementation systems, and home visitors are associated with program impacts. The next stage of the impact analysis would explore how various inputs into home visiting programs are related to impacts of those programs. Because sites would not be randomized to have different program features, a finding that sites with certain program features had larger effects would not necessarily mean that those features are responsible for the larger effects. Instead, those program features might be related to aspects of the program that were not measured or were not included in the analysis. Unbiased estimates generated through random assignment of the effects of home visiting at each site would be linked to program features of that site, but the associations uncovered through the analysis might not be causal.

The idea behind this analysis is expressed in notation in Equation (2):

$$\beta_j = A + \Gamma Z_j + u_j \quad (2)$$

In Equation (2), impacts in site  $j$  are related to site characteristics and program features, as represented by  $Z_j$ . Site characteristics could include any of the implementation factors described in Chapter 4, including features of the service models, implementation systems, and community context. They could also include characteristics of the home visitors and other program staff.

Because sites would not be assigned to have different features of their home visiting models or communities, results of this analysis would be less rigorous than the intent-to-treat analysis. For example, a finding that sites with higher intended dosage around parenting had larger effects on parenting than other sites would not necessarily mean that higher intended dosage caused the larger effects. Instead, it is possible that other features of the local program or local implementation system are responsible. Thus, this type of analysis may suffer from the biases that can affect any regression framework, such as omitted variable bias — in which estimated effects are biased if important program features are omitted from the analysis — and selection bias.

For this reason, care is needed in choosing which program features to examine and in interpreting results. In terms of providing unbiased estimates of the relationship between program features and program impacts, the best candidates are those features that are unlikely to be directly related to unobserved characteristics of families or sites. Features that are further away from families seem more likely to meet this criterion. For example, characteristics of the national model, such as the intended frequency of home visits, are unlikely to be related to who receives services in the local program. Likewise, characteristics of the implementation system — such as ratings of the training used for home visitors, the quality of the supervision of home visitors, and the supports that are available for facilitating program administration — are unlikely to be related to unobserved characteristics of families and, therefore, should provide

unbiased estimates of the relationship between these features and program impacts. By contrast, the actual dosage received by families in a particular site may be related to family motivation and other unobserved characteristics. Trying to directly relate dosage to impacts is, therefore, likely to overstate the relationship between the two.

To explore the relationship between program features and program impacts, the evaluation will proceed in steps. For example, the first step could be to estimate the relationship between impacts and features of service models, controlling for the relationship between program features and family characteristics. Features of service models include the frequency of planned visits (for example, weekly or biweekly), whether the program directly targets maternal and child health or economic outcomes (for analyses that include those outcomes), and so on. This step is likely to provide the most rigorous causal conclusions because the features being examined are typically defined by the program model *before* the sample family has entered the study, similar to the family's baseline characteristics.

The regression model could then be expanded by adding features of the implementation system, such as ratings of the training used for home visitors, the quality of the supervision of home visitors, what supports are available for facilitating program administration, and so on. These features are likely to be somewhat independent of features of the service model, so that both groups of features could easily be included in one regression. The results of this step would need to be interpreted somewhat more cautiously because these features of the system can theoretically be influenced by characteristics of the home visitors and families in the study site and by their responses to the program as it is implemented.

The regression model could then be further expanded by adding information about what actually happens in the home. Although this set of program features is likely to be most closely linked to program effectiveness, it is mentioned last for several reasons. First, what a home visitor does for a specific family will depend on that family's needs. For that reason, estimates of the relationship between what happens in the home and impacts are less likely to represent causal relationships, compared with the "black box" related to program model, implementation systems, and home visitor characteristics. Second, what happens in the home might be closely related to the program model being used in a site. For example, home visits will presumably happen more frequently in sites that use program models with weekly visits than in sites that use program models with biweekly visits. From a statistical point of view, this would make it difficult to distinguish the independent effects of what happens in the home visits from what is intended to happen in the home visits. Because there is likely to be widespread variation in program implementation across sites, this might not be a problem in practice. Despite these potential problems, understanding the role of what happens during home visits is important, and the evaluation would certainly explore this question.

In addition, priority would be given to program features that are determined at the site level rather than on a family-by-family basis. For example, the planned intensity and duration of home visiting services would be preferred over the actual intensity and duration for a specific family, because the latter would be influenced by unobserved family attributes and may consequently provide biased estimates of the effects of actual intensity and duration on family outcomes.

In investigating the link between program features and program impacts, the evaluator will need to be parsimonious about inclusion of features, in order to preserve statistical power. Because the statistical power of this analysis depends on how closely related program features are to one another, final decisions about the analysis might not be made until after data are collected. If the data suggest that many program features are unrelated to one another, a more expansive analysis could be conducted. If, as is more likely, program features are highly related within a site, the analysis will have to choose a small number of features or combine features while minimizing the possibility that the results would be biased by the exclusion of important features.

## **Analysis of Health Disparities and Health Care System Efficiencies**

Because of the potential for home visiting programs to affect health care use and health outcomes, the ACA calls for the federal evaluation of home visiting programs to include an assessment of the “potential, if scaled broadly, for improved health care practices, elimination of health disparities, and improved health care system quality, efficiencies, and cost reduction.” This section describes proposed methods for defining outcomes related to the health care system and investigating the effects of home visiting programs on that system.

Home visiting might affect health disparities and the health care system in several ways. First, by working with families to address such issues as maternal and child health, positive parenting practices, safe home environments, and access to services, home visiting programs may improve the use of health care and health outcomes. Second, home visiting programs may affect families’ interactions with health care providers. For example, a home visitor might seek information from a provider on behalf of the families or might advocate for families to ensure that all of their needs are met. By doing so, the home visitor may influence the quality and intensity of care provided to the family, which, in turn, may reflect greater delivery system efficiencies. Finally, home visiting might indirectly affect health care practices by changing families’ information about and use of health care services. For example, if more families with similar needs go to a particular practice, that organization might change the way that it provides care to accommodate the needs of these families.

This section is organized into two subsections. The first subsection describes health disparities and discusses the home visiting programs' potential to reduce them. The second subsection includes a similar discussion of health care quality and efficiency

### **Health Disparities**

*Health disparities* are differences in the presence of disease, health outcomes, or access to health care between segments of the population, which may be defined by social, demographic, environmental, and geographic attributes.<sup>7</sup> Socioeconomic disparities for children and adults have been documented for access to and use of health care and for health outcomes.<sup>8</sup> It is particularly important to examine the issue of disparities as it relates to the home visiting population because studies have shown that children's experiences and environment early in life influence their entire life course. Research shows that early child development — including the physical, social-emotional, and language-cognitive domains — strongly influences basic learning, school success, economic participation, and health.<sup>9</sup> There is a consistent association between socioeconomic status and a variety of developmental and health outcomes throughout the life course.

One approach for setting goals is the federal government's Healthy People initiative, which sets achievable but ambitious benchmarks for the nation's health. A stated goal of the Healthy People 2020<sup>10</sup> objectives, as well as an underlying principle of the ACA, is to eliminate health disparities and improve population health. Health disparities among population groups — including by socioeconomic status, family structure, racial and ethnic background, community resources, and geographic location — are manifested across different domains: health status and outcomes (for example, small-for-gestational age at birth, presence of at least one chronic condition, global health ratings); health-related behaviors (such as smoking, substance use, breast-feeding, nutrition); access to and appropriate use of health care services (for example, adequate prenatal care, up-to-date well-child visits, immunizations); and quality and timeliness of health care services received.<sup>11</sup>

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<sup>7</sup>Carter-Pokras and Baquet (2002); Truman et al. (2011).

<sup>8</sup>Agency for Healthcare Research and Quality (2010, 2011b).

<sup>9</sup>Irwin, Siddiqi, and Herzman (2007).

<sup>10</sup>The setting of health objectives by Healthy People is the result of a multiyear process that reflects input from a diverse group of individuals and organizations both within HHS agencies and in departments outside HHS. To track and measure progress over time, Healthy People relies on data sources derived from a national census of events (such as the National Vital Statistics System) and from nationally representative sample surveys (such as the National Health Interview survey). For more information, see <http://www.healthypeople.gov/>.

<sup>11</sup>Agency for Healthcare Research and Quality (2010a); Truman et al. (2011); U.S. Department of Health and Human Services (2000).

In particular, racial and ethnic and socioeconomic gaps in health status at birth continue to be large and persistent, despite overall secular declines in child mortality for the nation. Infants born to low-income, less educated, very young, and African-American and Puerto Rican women are significantly more likely to be low birth weight or small for gestational age. Low socioeconomic status and African-American minority infants are also at higher risk of developmental delays, inadequate receipt of well-child visits, and child mortality.<sup>12</sup> These disparities in infant health in large part reflect differences in maternal health status, health behaviors, and adequate use of health care, to varying degrees. To the extent that home visiting programs target multiple facets of these dynamics (maternal and child health, parenting behaviors, access to and use of services), the evaluation will assess the effects on improving health disparities across several areas: health outcomes, health behaviors, and use of health care services.

### *Health Outcomes*

To assess whether home visiting reduces disparities in the domain of health outcomes, the evaluation will examine a number of the maternal and infant health outcomes, as shown in Table 5.2. Many of these are parallel to the Healthy People 2020 objectives and include measures of child health, such as birth weight and overall child health; prevalence of health-promoting behaviors; and measures of maternal health, including depression and mental health.

Using this method, the effects of home visiting on health disparities will be estimated by comparing the estimated effects for an underserved subgroup with the gap in outcome levels between that group and a reference group as suggested by prior research. For example, the estimated effect on child health at follow-up for African-American families in MIHOPE will be expressed as a percentage of the difference in child health between African-American and white families as indicated in the literature or published statistics. Similarly, the effect on disparities can also be measured by infant gender, maternal education level, family income level, and geographic location. For example, estimated effects on health outcomes for the subgroup of families below the poverty level in the evaluation could be compared with the gap in outcomes between poor families and families with income above 400 percent of the federal poverty level. Because child health outcomes, including child height and weight, are observed at different time points (both at birth from vital records and at the 15-month follow-up survey), differences in healthy growth trajectories can be observed, and estimates of increase or reduction in disparities among subgroups can be examined for the home visiting models.

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<sup>12</sup>Aber, Bennett, Conley, and Li (1997); Howell et al. (2010); Singh and Kogan (2007).

### *Health Behaviors*

Similar to estimating impacts on health outcomes, to estimate the impact of home visiting programs on mitigating disparities in health-promoting or protective behaviors — including abstinence from smoking, low alcohol consumption, breast-feeding initiation and duration, use of the supine sleep position for infants — prevalence of the behavior will be estimated for the subgroup most at risk (for example, families below the poverty level), and this will be compared with the gap in prevalence between poor families and families with higher incomes based on prior research. Comparing baseline survey data and information collected at the follow-up survey, this evaluation will also allow for a comparison of changes in health-related behaviors throughout the study time period and an estimation of the impact of home visiting programs on those changes, overall and for subgroups.

### *Use of Health Care Services*

Disparities are also observed in almost all aspects of health care, including health care coverage, access to and use of care, and treatment of many clinical conditions. Furthermore, health disparities are large for certain diagnoses that are particularly sensitive to delays in medical care, such as asthma and diabetes, as well as others that are consistent with social stress, such as intentional injuries. Disparities also exist in stability of health care coverage across income and racial and ethnic groups, as well as use of preventive health and dental care services. There is still insufficient evidence on the effectiveness of particular interventions in reducing specific disparities among particular populations, but addressing differences in health care use may be one important home visiting strategy for reducing health disparities.

To assess impacts of home visiting on use of health services, similar analyses will be conducted as described above for health outcomes and behaviors. Salient indicators of access to and appropriate use of health care services might include having a continuous source of health care coverage (an important factor for promoting use of health care services); adequacy of prenatal care for mothers; following recommended guidelines for well-child visits for infants, as recommended by the American Academy of Pediatrics; and preventive dental checkups, which should start as early as age 1.

### **Health Care System Efficiencies**

By improving the appropriate use of health care services and health outcomes and by coordinating both health and social services for families, home visiting programs could also affect the broader health care delivery system, including the quality of care provided and the efficiency with which it is provided. The Agency for Healthcare Research and Quality (AHRQ)

defines “quality of health care” as getting care that is effective, safe, timely, patient centered, equitable, and efficient.<sup>13</sup> Health care quality can be measured by examining how well providers deliver needed services or by outcome measures that may be affected by the quality of health care received. It can also be assessed from the patients’ perspective on how well providers meet the patients’ health care needs.

Childhood is a unique period of life with unique health care needs. Children undergo rapid and continuous cognitive, social, and physical developmental change, which requires different health systems than adults and different approaches to measuring quality.<sup>14</sup> The child health system has a greater reliance on public health, community clinics, and other safety net providers, and this implies a potential for fragmentation of care and discontinuity (for example, not having a medical home). Children also get their care from multiple sites (for example, the health system, schools, juvenile justice, social services, community clinics), implying a greater potential for problems with coordination of care.

Pediatric health care quality should include a focus on primary care activities, such as preventive services and anticipatory guidance. Furthermore, preventive care is an essential part of the American Academy of Pediatrics’ (AAP) Medical Home policy statement. Specifically, the AAP states that primary care services should include “growth and developmental assessments, appropriate screening, health care supervision, and patient and parent counseling about health, nutrition, and safety.”<sup>15</sup>

Another approach to thinking about health care quality is through the current AHRQ recommendations to improve quality of care. These items suggest examining a variety of health care practices related to prevention and health promotion (for example, screenings and immunizations), availability of services (for example, having a usual primary care provider, having access to a dentist), the management of acute conditions (for example, by examining appropriate use of antibiotics and dental care), management of chronic conditions, and family experiences of care (for example, as indicated by communication between health care providers and families).

To analyze the effects of home visiting programs on health care quality, the evaluation will estimate the impacts of home visiting on actual services received, as described above. These include parent reports on having a usual source of care, use of the emergency department to treat urgent needs versus nonurgent or preventable conditions, up-to-date immunizations, developmental screening, and use of other early intervention services. In

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<sup>13</sup>Agency for Healthcare Research and Quality (2011b).

<sup>14</sup>Seid, Varni, and Kurtin (2000).

<sup>15</sup>American Academy of Pediatrics (2002).

addition, collecting state Medicaid claims data, as described above, could provide more detailed information on the receipt of primary and preventive care, as well as on the frequency and use of costly emergency departments for health care visits (which might indicate lack of coordination and poor quality of care).

## Chapter 6

# MIHOPE Economic Evaluation

As discussed in Chapter 1 (Table 1.1), the four national service models included in the Mother and Infant Home Visiting Program Evaluation (MIHOPE) have some prior evidence of effectiveness. However, prior studies provide little information regarding the costs of such programs or how much is spent to achieve key outcomes. MIHOPE will therefore include an economic evaluation to provide information on the costs of home visiting programs using these models. The research questions underlying the economic evaluation include the following:

- What is the cost to deliver home visiting services that use the evidence-based models, and how do these costs vary across groups of families and local programs?
- What is the cost to achieve key impacts for families and children, and how do these costs vary across groups of families and local programs?
- What are the returns on investment for home visiting programs in terms of Medicaid savings and other health care use?

The information from the economic evaluation will play an important role in supporting the implementation of evidence-based programs by helping organizations that implement home visiting programs make decisions regarding the allocation of their resources. This is especially significant because preventive and early intervention services do not typically receive the level of funding received by programs that work with individuals after they have been diagnosed with a disease.<sup>1</sup>

Collecting information on program costs and program impacts together allows the analysis to compare costs with impacts in a rigorous way — for example, by investigating the features of local programs that lead to more cost-effective programs.

### Programmatic Cost Analysis

The first step in conducting the analysis will be to estimate program costs, both overall and by site. Program costs, in this case, are the value of all resources necessary to provide a home visiting program, before and during implementation. The costs of these programs are expected to be very different, as each program provides a different array of services, not just

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<sup>1</sup>Barnett (1993).

the visits to clients' homes. Table 6.1 shows common categories of costs and the sources for data on costs. The evaluation is collecting information on the cost of home visiting services in several areas, including the costs of home visits based on information provided through weekly logs and total operating costs through site budgets. These two pieces of information will allow for an aggregate cost analysis of program operating costs and a person-level cost analysis for direct service provision. Additionally, these two analyses could feed into a return on investment (ROI) analysis of home visiting programs and a cost-effectiveness analysis of the study's key outcomes.

### **Aggregate Cost Analysis**

Each site participating in MIHOPE will be asked to provide a program budget covering all of the site's expenditures over a specific fiscal year. This budget will typically cover personnel, travel, equipment, supplies, contracts, and indirect costs (that is, overhead and other related costs). An aggregate cost form will be completed using these budgets to provide an estimate of the total costs to provide the home visiting services. The cost estimates will be paired with information on the number of families served by each site over the same year for which the budgets were provided. These two pieces of information (costs and clients served) will allow for a comparison of the aggregated costs across home visiting sites and models.

### **Cost Analysis of Home Visiting Service Provision**

The weekly log data provided by home visitors and supervisors at each site will collect information from home visiting programs regarding direct service provision to participants in the study. The information collected includes the following: (1) the time spent at the home visit, (2) the travel costs and time for travel required for the home visit, (3) the number of attempts and time to schedule the home visit, (4) the time and other resources required to prepare for the home visit, (5) the supplies and materials required for the home visit, (6) community referrals resulting from the home visit, (7) any time or resources required to follow-up on the home visit, and (8) supervision of the family's home visitor. This information will be used to estimate average costs of home visits for subgroups of families, home visitors, and providers.

### **Health Care Costs**

The other major cost category that will be collected for the economic evaluation is the cost of health care services used by participating families. Health care costs can include inpatient services, emergency department services, outpatient services, mental health services, drug and alcohol treatment or prevention services, medications, medical devices, and so on. The main sources of health care costs are administrative data collected from Medicaid. Because most families in the evaluation will be low-income, the majority of their health care resource

**Table 6.1**  
**Common Categories and Types of Costs**  
**Present in Home Visiting Models**  
**and Sources of Data**

	Weekly Service Delivery Logs	Budgets/Invoices
<b><u>Home visiting costs</u></b>		
Personnel		
Home visitor	X	
Other direct service staff	X	
Transportation to visits		
Mileage	X	
Program vehicles	X	
Supplies and materials		
Family support materials	X	X
Books and brochures	X	X
Screening materials and tools	X	X
Medical supplies	X	X
<b><u>Participant costs</u></b>		
Time at home visit	X	
<b><u>Non-home visiting administrative costs</u></b>		
Personnel		
Program manager		X
Supervisor		X
Support personnel		X
Administrative personnel		X
Data entry person		X
Supplies and materials		
Paper		X
Office supplies		X
Postage		X
Equipment		
Computers/printers		X
Cell phones/service		X
Copiers		X
Training and education		
Training costs		X
Professional development		X
Conferences		X
Transportation		X
Buildings and facilities		
Rent/lease		X
Utilities		X
Phones		X
Internet-provider fees		X
Miscellaneous		
Data management systems		X
Certification/recertification		X

usage will be captured through Medicaid and SCHIP records. Information for families who are not on Medicaid will come from the follow-up interview, which will ask parents whether their child spent time in the neonatal intensive care unit, was admitted to the hospital, or was taken to the emergency department during the first 15 months. A given intervention might reduce the costs of many of these types of high-cost services for the program group relative to the control group. Any cost savings would be subtracted from the programmatic costs, to represent the savings from illness averted, effectively decreasing the difference in programmatic costs between the two groups (when the treatment costs more than the control condition). At the same time, since one goal of many home visiting models is to connect participant families with such basic services as primary health care providers, the home visiting group may also experience increases in health care costs, especially in the first year or two of the program and to the extent that the family has delayed health care needs. Thus, including health care costs could either increase or decrease the effective costs of home visiting programs in the short term.

## Economic Evaluation

### Cost-Effectiveness Analysis

In addition to providing information on the costs of providing home visiting services and how those costs vary with the features of local programs, the economic evaluation can link program costs to program impacts in a cost-effectiveness analysis.<sup>2</sup>

The cost-effectiveness analysis will compare the costs of providing an intervention with the effects that it achieves, resulting in a “cost per unit of effect.”<sup>3</sup> By expressing results in these terms, costs can be compared across programs designed to affect similar outcomes. For example, the cost to reduce child maltreatment through home visiting can be compared with the cost of reducing child maltreatment through other means. The cost-effectiveness analysis will be done at two levels. A *micro-level* cost-effectiveness analysis will compare the net costs of operating programs in the study with important impacts. In contrast, a *macro-level* cost-effectiveness analysis will compare the total costs of the MIECHV program legislation with the aggregate impacts of the legislation on key outcomes, providing policymakers with an overall understanding of the return on investment in home visiting programs.

Direct service program costs can be linked to program impacts at the site level to determine the cost-effectiveness of the program relative to a control group. The comparison will be made for individual impact estimates that are deemed of most interest, which will be

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<sup>2</sup>This section presents one method of using the cost data, but final decisions about these analyses have not yet been made.

<sup>3</sup>Gold, Siegel, Russell, and Weinstein (1996).

specified in the analysis plan being developed for MIHOPE. A cost-effectiveness analysis allows a comparison of home visiting with other programs that target similar outcomes or a comparison of populations participating in a home visiting program and populations not participating in a home visiting program. The cost-effectiveness analyses can also be carried out on different subgroups of families or providers, such as the subgroups analyzed in the impact analysis. All such subgroups will be prespecified in the MIHOPE analysis plan.

The relevant summary measure takes into account program costs and any cost savings for the control group, costs of services in the community and any cost savings for the control group, and the impact of the program on outcomes for the program group relative to the control group.

### **Direct Service Program Costs Collected from the Sites' Weekly Logs**

Costs averted will include reductions in medical and nonmedical costs and can also include reductions in productivity losses, as might happen if home visiting helps parents avoid missing work. Outcomes can include any short-term or long-term outcomes that are directly collected in the evaluation study. For each outcome deemed key in the impact analysis, separate cost-effectiveness ratios comparing the evidence-based program and the control condition can be determined. Separate ratios can also be determined for analyses of subgroups of providers or families.

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## Appendix A

# MIHOPE Priority Outcomes and Logic Models

### Table

- A.1 MIHOPE: Components of Conceptual Framework, Priority Outcomes, and Logic Models That Include Each Priority Outcome
- A.2 ACA Benchmarks and Associated MIECHV Program Indicators for States

### Logic Model

- A Maternal Health – Prenatal Health
- B Maternal Postnatal Health
- C Maternal Health – Substance Use
- D Maternal Health – Stress and Mental Health
- E Parent Well-Being – Healthy Adult Relationships
- F Family Economic Self-Sufficiency
- G Parenting to Support Child Development
- H Parenting to Support Child Health

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The Patient Protection and Affordable Care Act (ACA) of 2011 requires that the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program be evaluated. Toward that end, the Mother and Infant Home Visiting Program Evaluation (MIHOPE) is designed around a set of generic logic models that focus on outcomes that are designated as “priority outcomes” by the evaluation team. The following outline explains how the tables and logic models in Appendix A relate to each other.

1. Overview of the logic model pathways to priority outcomes
  - a. Appendix Table A.1 lists the four major outcome components of the MIHOPE conceptual framework.
  - b. The table lists the priority outcomes for each component.
  - c. It shows which logic models pertain to each outcome.
  - d. Because the priority outcomes are interdependent, many are listed in more than one logic model.
2. How the MIHOPE logic models relate to the MIECHV program
  - a. As a group, the priority outcomes represent all the benchmarks and participant outcomes in the ACA legislation regarding the MIECHV program.
  - b. The logic models include the MIECHV program indicators that states are to use in monitoring their progress in achieving benchmarks and participant outcomes.
  - c. Appendix Table A.2 lists the MIECHV program indicators for each benchmark and participant outcome. It also gives a code for each indicator.
3. Logic models
  - a. The logic models are shown after Appendix Table A.2.
  - b. In each logic model, the MIECHV program indicators are in bold type and show each indicator’s code number as given in Appendix Table A.2.

The Mother and Infant Home Visiting Evaluation

Appendix Table A.1

MIHOPE: Components of Conceptual Framework, Priority Outcomes, and Logic Models That Include Each Priority Outcome

Component	Priority Outcome	Logic Model							
		A	B	C	D	E	F	G	H
Parent health and well-being	Maternal health - prenatal health	X							
	Maternal health - postnatal health		X						
	Maternal health - substance use			X	X				
	Maternal health - stress and mental health			X	X	X	X		
	Parent well-being - healthy adult relationships					X			
	Family economic self-sufficiency		X				X		
Parenting	Parenting to support child development		X	X	X	X	X	X	
	Parenting to promote child health		X	X	X	X	X		X
Child health	Birth outcomes	X		X			X		
	Injury			X			X		X
	Illness			X			X		X
	Physical growth						X		X
Child development	Communication, language and literacy		X	X	X		X	X	X
	General cognitive skills		X	X	X		X	X	X
	Approaches to learning		X	X	X		X	X	X
	Social behavior and emotional well-being		X	X	X	X	X	X	X

## The Mother and Infant Home Visiting Evaluation

### Appendix Table A.2

#### ACA Benchmarks and Associated MIECHV Program Indicators for States

<b><u>Improved maternal and newborn health<sup>a</sup></u></b>		<b><u>Reduction in crime or domestic violence (DV)</u></b>	
1-1	Prenatal care	4-1	Arrests
1-2	Parental use of alcohol, tobacco, illicit drugs	4-2	Convictions
1-3	Preconception care	4-3	Screening for DV
1-4	Interbirth intervals	4-4	Referrals for DV services
1-5	Screening for maternal depressive symptoms	4-5	Development of safety plan
1-6	Breast-feeding		
1-7	Well-child visits		
1-8	Maternal and child health insurance status		
		<b><u>Improvements in family economic self-sufficiency</u></b>	
		5-1	Household income and benefits
		5-2	Employment or education
		5-3	Health insurance status
<b><u>Prevention of child injuries, abuse, and neglect; reduced visits to emergency department (ED)</u></b>		<b><u>Improvements in the coordination and referrals for other community resources and supports<sup>d</sup></u></b>	
2-1	ED visits by child, all causes	6-1	Families identified for necessary services
2-2	ED visits by mother, all causes	6-2	Of families identified, those referred
2-3	Information provided about preventing child injury	6-3	Memoranda of Understanding (MOUs) with community resources
2-4	Child injuries requiring medical care	6-4	Information sharing - clear contact point
2-5	Reported suspected maltreatment	6-5	Completed referrals
2-6	Reported substantiated maltreatment		
2-7	First-time victims of maltreatment		
<b><u>Improvements in school readiness and achievement<sup>b,c</sup></u></b>			
3-1	Parent support for child's learning		
3-2	Parent knowledge of child development		
3-3	Parenting behavior, relationship with child		
3-4	Parent emotional well-being, stress		
3-5	Child communication, language, literacy		
3-6	Child general cognitive skills		
3-7	Child approaches to learning		
3-8	Child social behavior, emotional well-being		
3-9	Child physical health and development		

NOTES: To the extent possible, these indicators are incorporated into the logic models.

<sup>a</sup>Later in the Affordable Care Act (ACA), this is expanded under Participant Outcomes to "Improvements in prenatal, maternal, and newborn health, including improved pregnancy outcomes."

<sup>b</sup>Under Participant Outcomes in the ACA, this was expanded to "Improvements in child health and development, including the prevention of injuries and maltreatment and improvements in cognitive, language, social-emotional, and physical developmental indicators."

<sup>c</sup>Under Participant Outcomes in the ACA, this was expanded to "Improvements in parenting skills."

<sup>d</sup>Under Participant Outcomes in the ACA, this was expanded to "Improvements in the coordination of referrals for, and the provision of, other community resources and supports for eligible families, consistent with State child welfare agency training."

**Logic Model A: Maternal Health – Prenatal Health**

**MIECHV program indicators:** (1-1) prenatal care; (1-8) maternal and child health insurance status; (6-1) families identified for necessary services; (6-2) families in need who received a referral; (6-3) MOU for accessing prenatal and substance use; (6-4) clear point of contact at prenatal and substance use sites

<b>Inputs</b> (Definitions specific to main pathway)	<b>Intervention</b> (Service Delivery) (Home visiting content and approaches)	<b>Outcomes (Mother)</b>	<b>Outcomes (Child)</b>
<p><b><u>Service model for these outcomes</u></b></p> <p><i>Intended goals and outcomes</i>                      Relative importance of these specific outcomes</p> <p><i>Intended service delivery</i>                      Dosage                      Priorities among visit content areas                      Use of specific approaches</p> <p><i>Intended staffing</i>                      Qualifications for hire                      Roles and responsibilities                      Competencies                      Caseload limits</p> <p><b><u>Implementation system for these outcomes</u></b></p> <p><i>Staff development supports</i>                      Recruitment and hiring                      Training                      Supervision, evaluation, and feedback</p> <p><i>Clinical supports</i>                      Screening and assessment tools, protocols, curricula                      Peer support and learning                      Access to professional consultation and experts</p> <p><i>Administrative supports</i>                      MIS and electronic records                      Distance supervision and distance learning                      Program monitoring, continuous quality improvement (CQI)                      Organizational culture and climate</p> <p><i>Systems interventions</i>  <b>MOU for referral/coordination (6-3)</b>  <b>Point of contact for referral, coordination (6-4)</b></p> <p><b><u>Community resources for these outcomes</u></b></p>	<p><u>Assessment of:</u></p> <p><b><i>Prenatal care (1-1; 6-1)</i></b>                      Current prenatal care site and use                      Current prenatal care provider’s recommendations</p> <p><i>Predisposing and enabling factors:</i>                      Mother’s knowledge, attitudes, beliefs about prenatal care                      Mother’s current health care coverage                      Barriers to prenatal care access beyond lack of health care coverage</p> <p><u>Education of mother regarding:</u></p> <p><i>Predisposing factors:</i>                      Benefits of prenatal care for mother and child</p> <p><i>Enabling factors:</i>                      Available sources of health care coverage/care for the uninsured                      Available sources of prenatal care and ways to access them</p> <p><u>Referrals to:</u>  <b>Health care coverage/sites for the uninsured (6-2)</b>  <b>Regular source of prenatal care (6-2)</b></p> <p><u>Coordination:</u>                      Reinforce and facilitate adherence to prenatal care recommendations</p>	<p><b><u>Health and well-being</u></b></p> <p><b>Prenatal health care coverage (1-8)</b></p> <p><b>Prenatal care visits per guidelines of the American Congress of Obstetricians and Gynecologists (1-1)</b></p>	<p><u>Birth outcomes</u></p> <ul style="list-style-type: none"> <li>- Weight</li> <li>- Gestational age</li> <li>- Size for gestational age</li> <li>- Use of neonatal intensive care unit (NICU)</li> </ul>

**Logic Model B: Maternal Postnatal Health**

**MIECHV program indicators:** (1-4) interbirth intervals; (1-8) maternal and child health insurance status; (2-5, 2-6, 2-7) reported suspected, substantiated, and first-time victims of maltreatment; (3-1) parent support for child’s learning; (3-3) parenting behavior, relationship with child; (3-4) parental well-being or parenting stress; (3-5, 3-6, 3-7, 3-8) child communication, language, literacy; child general cognitive skills; child approaches to learning; child social behavior, emotional well-being; (6-1) families identified for necessary services; (6-2) families in need who received a referral; (6-3) MOU for accessing family planning resources; (6-4) clear point of contact at family planning sites

<b>Inputs</b> (Definitions specific to main pathway)	<b>Intervention</b> (Service Delivery) (Home visiting content and approaches)	<b>Outcomes (Mother)</b>	<b>Outcomes (Child)</b>
<p><b><u>Service model for these outcomes</u></b></p> <p><i>Intended goals and outcomes</i> Relative importance of these specific outcomes</p> <p><i>Intended service delivery</i> Dosage Priorities among visit content areas Use of specific approaches</p> <p><i>Intended staffing</i> Qualifications for hire Roles and responsibilities Competencies Caseload limits</p> <p><b><u>Implementation system for these outcomes</u></b></p> <p><i>Staff development supports</i> Recruitment and hiring Training Supervision, evaluation, and feedback</p> <p><i>Clinical supports</i> Screening and assessment tools, protocols, curricula Peer support and learning Access to professional consultation and experts</p> <p><i>Administrative supports</i> MIS and electronic records Distance supervision and distance learning Program monitoring and CQI Organizational culture and climate</p> <p><i>Systems interventions</i> <b>MOU for referral/coordination (6-3)</b> <b>Point of contact for referral, coordination (6-4)</b></p> <p><b><u>Community resources for these outcomes</u></b></p>	<p><u>Assessment of:</u></p> <p><b>Family planning (6-1)</b> Current family planning site and use Current family planning provider’s recommendations</p> <p><i>Predisposing and enabling factors:</i> Mother’s knowledge, attitudes, beliefs about birth spacing Mother’s current health care coverage Barriers to family planning access beyond lack of health care coverage</p> <p><u>Education of mother regarding:</u></p> <p><i>Predisposing factors:</i> Benefits of birth spacing for mother, index child, subsequent child Advantages and disadvantages of available family planning methods</p> <p><i>Enabling factors:</i> Available sources of family planning coverage/care for the uninsured Available community resources for specific family planning methods Ways to overcome barriers to effective family planning</p> <p><u>Referrals to:</u></p> <p><b>Health care coverage/sites for the uninsured (6-2)</b> <b>Resources for family planning (6-2)</b></p> <p><u>Coordination:</u> Reinforce and facilitate adherence to family planning provider recommendations</p>	<p><b><u>Health and well-being</u></b></p> <p><b>Maternal health care coverage (1-8)</b> Consistent use of effective family planning strategies</p> <p><b>Interbirth interval (1-4)</b></p> <p><b>Emotional well-being, stress (3-4)</b></p> <p><b><u>Parenting</u></b></p> <p><b>Parenting support for child learning (3-1)</b></p> <p><b>Parenting behavior and relationship with child (3-3)</b></p> <p><b>Child maltreatment (2-5, 2-6, 2-7)</b></p>	<p>Birth outcomes of subsequent child</p> <p><b>Developmental outcomes of index child (3-5, 3-6, 3-7, 3-8)</b></p>

## **Logic Model C: Maternal Health – Substance Use**

**MIECHV program indicators:** (1-2) maternal use of alcohol, tobacco, illicit drugs; (1-8) maternal health insurance status; (2-1, 2-4) child visits to the emergency department (ED) and injuries requiring medical care; (2-2) maternal ED visits; (2-5, 2-6, 2-7) reported suspected, substantiated, first-time victim maltreatment; (3-3) parenting behavior and relationship with child; (3-4) parent emotional well-being, stress; (3-5, 3-6, 3-7) child communication, language, literacy; child general cognitive skills; child approaches to learning; (3-8) child social behavior and emotional well-being; (6-1) families identified for necessary services; (6-2) families in need who received a referral; (6-3) MOU for accessing substance use services; (6-4) clear point of contact at substance use treatment sites

<b>Inputs</b> (Definitions specific to main pathway)	<b>Intervention</b> (Service Delivery) (Home visiting content and approaches)	<b>Outcomes (Mother)</b>	<b>Outcomes (Child)</b>
<p><b><u>Service model for these outcomes</u></b> <i>Intended goals and outcomes</i> Relative importance of these specific outcomes <i>Intended service delivery</i> Dosage Priorities among visit content areas Use of specific approaches <i>Intended staffing</i> Qualifications for hire Roles and responsibilities Competencies Caseload limits</p> <p><b><u>Implementation system for these outcomes</u></b> <i>Staff development supports</i> Recruitment and hiring Training Supervision, evaluation and feedback <i>Clinical supports</i> Screening and assessment tools, protocols, curricula Peer support and learning Access to professional consultation and experts <i>Administrative supports</i> MIS and electronic records Distance supervision and distance learning Program monitoring and CQI Organizational culture and climate <i>Systems interventions</i> <b>MOU for referral/coordination (6-3)</b> <b>Point of contact for referral, coordination (6-4)</b></p> <p><b><u>Community resources for these outcomes</u></b></p>	<p><u>Assessment of:</u> <b>Substance use (SU) (6-1)</b> Current SU treatment site and use Current SU treatment provider’s recommendations</p> <p><i>Predisposing and enabling factors:</i> Mother’s understanding of SU effects on parenting Mother’s knowledge, attitudes, beliefs about SU treatment Mother’s current health care coverage Barriers to SU treatment access beyond lack of health care coverage</p> <p><u>Education of mother regarding:</u> <i>Predisposing factors:</i> Benefits of ending SU for mother and fetus/child Advantages and disadvantages of available SU treatment options</p> <p><i>Enabling factors:</i> Available sources of SU treatment coverage/care for the uninsured Available community resources for specific SU treatment options Ways to overcome barriers to effective SU treatment options</p> <p><u>Referrals to:</u> <b>SU health care coverage / SU treatment sites for the uninsured (6-2)</b> <b>SU treatment options (6-2)</b></p> <p><u>Coordination:</u> Reinforce and facilitate adherence to SU treatment recommendations</p>	<p><b><u>Health and well-being</u></b> <b>Maternal health care coverage (1-8)</b> <b>Use of alcohol, tobacco, illicit drugs (1-2)</b> <b>Emotional well-being, stress (3-4)</b></p> <p><b><u>Parenting</u></b> <b>Parenting behavior and relationship with child (3-3)</b> <b>Child maltreatment (2-5, 2-6, 2-7)</b></p>	<p><u>Birth outcomes</u> - Weight - Gestational age - Size for gestational age -NICU use</p> <p><u>Injury</u> <b>ED visits for all causes (2-1)</b> <b>Injuries requiring medical care (2-4)</b></p> <p><u>Development</u> <b>Communication, language and literacy (3-5)</b> <b>General cognitive skills (3-6)</b> <b>Approaches to learning (3-7)</b> <b>Social behavior and emotional well-being (3-8)</b></p>

**Logic Model D: Maternal Health – Stress and Mental Health**

**MIECHV program indicators:** (1-5) screening for maternal depressive symptoms; (1-8) maternal health insurance status; (2-2) ED visits by mother, all causes; (2-5, 2-6, 2-7) reported suspected, substantiated, first-time victim of maltreatment; (3-4) parent emotional well-being, stress; (3-3) parenting behavior/relationship with child; (3-5, 3-6, 3-7) child communication, language, and literacy; child general cognitive skills; child approaches to learning; (3-8) child social behavior and emotional well-being; (6-1) families identified for necessary services; (6-2) families in need who received a referral; (6-3) MOU for accessing mental health services; (6-4) clear point of contact at mental health treatment sites

<b>Inputs</b> (Definitions specific to main pathway)	<b>Intervention</b> (Service Delivery) (Home visiting content and approaches)	<b>Outcomes (Mother)</b>	<b>Outcomes (Child)</b>
<p><b><u>Service model for these outcomes</u></b></p> <p><i>Intended goals and outcomes</i> Relative importance of these specific outcomes</p> <p><i>Intended service delivery</i> Dosage Priorities among visit content areas Use of specific approaches</p> <p><i>Intended staffing</i> Qualifications for hire Roles and responsibilities Competencies Caseload limits</p> <p><b><u>Implementation system for these outcomes</u></b></p> <p><i>Staff development supports</i> Recruitment and hiring Training Supervision, evaluation, and feedback</p> <p><i>Clinical supports</i> Screening and assessment tools, protocols, curricula Peer support and learning Access to professional consultation and experts</p> <p><i>Administrative supports</i> MIS and electronic records Distance supervision and distance learning Program monitoring and CQI Organizational culture and climate</p> <p><i>Systems interventions</i> <b>MOU for referral/coordination (6-3)</b> <b>Point of contact for referral, coordination (6-4)</b></p> <p><b><u>Community resources for these outcomes</u></b></p>	<p><b><u>Assessment of:</u></b> <b>Stress and mental health (MH) (6-1)</b> <b>Screening for maternal depressive symptoms (1-5)</b> Current MH treatment site and use Current MH treatment provider’s recommendations</p> <p><i>Predisposing and enabling factors:</i> Mother’s understanding of effects of stress and MH on the fetus/child Mother’s knowledge, attitudes, beliefs about coping strategies and treatment Mother’s current health care coverage Barriers to MH treatment access beyond lack of health care coverage</p> <p><b><u>Education of mother regarding:</u></b> <i>Predisposing factors:</i> Benefits of effective stress management and of good MH for self and fetus/child Advantages and disadvantages of available coping strategies and MH treatment options</p> <p><i>Enabling factors:</i> Available sources of MH treatment coverage/care for the uninsured Available community resources to build coping strategies Available community resources for MH treatment Ways to overcome barriers to effective coping strategies and MH treatment</p> <p><b><u>Referrals to:</u></b> <b>MH health care coverage / MH treatment sites for the uninsured (6-2)</b> <b>Resources for MH treatment (6-2)</b></p> <p><b><u>Coordination:</u></b> Reinforce and facilitate adherence to - Recommendations for coping strategies - MH provider recommendations</p>	<p><b><u>Health and well-being</u></b></p> <p><b>Maternal health care coverage (1-8)</b></p> <p><b>Emotional well-being, stress (3-4)</b></p> <p><b><u>Parenting</u></b></p> <p><b>Parenting behavior, relationship with child (3-3)</b></p> <p><b>Child maltreatment (2-5, 2-6, 2-7)</b></p>	<p><b><u>Development</u></b></p> <p><b>Communication, language, and literacy (3-5)</b></p> <p><b>General cognitive skills (3-6)</b></p> <p><b>Approaches to learning (3-7)</b></p> <p><b>Social behavior and emotional well-being (3-8)</b></p>

**Logic Model E: Parent Well-Being – Healthy Adult Relationships**

**MIECHV program indicators:** (1-8) maternal health insurance status; (2-2) ED visits by mother, all causes; (2-5, 2-6, 2-7) reported suspected, substantiated, first-time victim of maltreatment; (3-3) parenting behavior/relationship with child; (3-4) parent emotional well-being, stress; (3-8) child social behavior and emotional well-being; (4-3) screenings for domestic violence; (4-4) referrals for DV services; (4-5) development of safety plan; (6-1) families identified for necessary services; (6-2) families in need who received a referral; (6-3) MOU for accessing mental health services; (6-4) clear point of contact at mental health treatment sites

<b>Inputs</b> (Definitions specific to main pathway)	<b>Intervention</b> (Service Delivery) (Home visiting content and approaches)	<b>Outcomes (Mother)</b>	<b>Outcomes (Child)</b>
<p><b><u>Service model for these outcomes</u></b></p> <p><i>Intended goals and outcomes</i>                      Relative importance of these specific outcomes</p> <p><i>Intended service delivery</i>                      Dosage                      Priorities among visit content areas                      Use of specific approaches</p> <p><i>Intended staffing</i>                      Qualifications for hire                      Roles and responsibilities                      Competencies                      Caseload limits</p> <p><b><u>Implementation system for these outcomes</u></b></p> <p><i>Staff development supports</i>                      Recruitment and hiring                      Training                      Supervision, evaluation and feedback</p> <p><i>Clinical supports</i>                      Screening and assessment tools, protocols, curricula                      Peer support and learning                      Access to professional consultation and experts</p> <p><i>Administrative supports</i>                      MIS and electronic records                      Distance supervision and distance learning                      Program monitoring and CQI                      Organizational culture and climate</p> <p><i>Systems interventions</i>  <b>MOU for referral/coordination (6-3)</b>  <b>Point of contact for referral, coordination (6-4)</b></p> <p><b><u>Community resources for these outcomes</u></b></p>	<p><u>Assessment of:</u>  <b>Healthy relationships and domestic violence (DV) (6-1)</b>  <b>Screening for DV (4-3)</b>                      Current DV service site and use                      Current DV service provider’s recommendations</p> <p><i>Predisposing and enabling factors:</i>                      Mother’s understanding of social isolation effects on parenting, self                      Mother’s knowledge, attitudes, beliefs about social supports                      Barriers to social support access                      Mother’s understanding of DV effects on parenting, self, and child                      Mother’s knowledge, attitudes, beliefs about DV services                      Mother’s current health care coverage                      Barriers to DV service access beyond lack of health care coverage</p> <p><u>Education of mother regarding:</u>  <i>Predisposing factors:</i>                      Benefits of addressing DV for self, fetus, child                      Advantages and disadvantages of available DV services</p> <p><i>Enabling factors:</i>  <b>Development of safety plan (4-5)</b>                      Available sources of DV service coverage/care for the uninsured                      Available community resources for specific DV services                      Ways to overcome barriers to effective DV services</p> <p><u>Referrals to:</u>  <b>DV service coverage/sites for the uninsured (6-2)</b>  <b>Resources for DV services (4-4, 6-2)</b></p> <p><u>Coordination:</u>                      Reinforce and facilitate adherence to DV service provider recommendations</p>	<p><b><u>Health and well-being</u></b></p> <p><b>Maternal health care coverage (1-8)</b></p> <p><b>Maternal emotional well-being, stress (3-4)</b></p> <p><b><u>Parenting</u></b></p> <p><b>Parenting behavior, relationship with child (3-3)</b></p> <p><b>Child maltreatment (2-5, 2-6, 2-7)</b></p>	<p><b>Social behavior and emotional well-being (3-8)</b></p>

## Logic Model F: Family Economic Self-Sufficiency

**MIECHV Indicators:** (2-1) ED visits by child, all causes; (2-4) child injuries requiring medical care; (2-5, 2-6, 2-7) reported suspected, substantiated, first-time victim of maltreatment; (3-1) parent support for child learning; (3-3) parenting behavior and relationship with child; (3-5, 3-6, 3-7, 3-8) child communication, language, and literacy; child general cognitive skills; child approaches to learning; child social behavior and emotional well-being; (5-1) household income and benefits; (5-2) employment or education of adult members of the household; (5-3) health insurance status; (6-1) families identified for necessary services; (6-2) families in need who received a referral; (6-3) MOU; (6-4) clear point of contact

<b>Inputs</b> (Definitions specific to main pathway)	<b>Intervention</b> (Service Delivery) (Home visiting content and approaches)	<b>Outcomes (Mother)</b>	<b>Outcomes (Child)</b>
<p><b><u>Service model for these outcomes</u></b></p> <p><i>Intended goals and outcomes</i> Relative importance of these specific outcomes</p> <p><i>Intended service delivery</i> Dosage Priorities among visit content areas Use of specific approaches</p> <p><i>Intended staffing</i> Qualifications for hire Roles and responsibilities Competencies Caseload limits</p> <p><b><u>Implementation system for these outcomes</u></b></p> <p><i>Staff development supports</i> Recruitment and hiring Training Supervision, evaluation, and feedback</p> <p><i>Clinical supports</i> Screening and assessment tools, protocols, curricula Peer support and learning Access to professional consultation and experts</p> <p><i>Administrative supports</i> MIS and electronic records Distance supervision and distance learning Program monitoring and CQI Organizational culture and climate</p> <p><i>Systems interventions</i> <b>MOU for referral/coordination (6-3)</b> <b>Point of contact for referral, coordination (6-4)</b></p> <p><b><u>Community resources for these outcomes</u></b></p>	<p><u>Assessment of:</u> <b>Family economic self-sufficiency (6-1)</b> Recommendations of - Current local HHS service provider - Current local educational provider - Current local job counselor</p> <p><i>Predisposing and enabling factors:</i> Mother’s understanding of unmet basic needs of self, fetus/child Mother’s knowledge, attitudes, beliefs about public benefits Barriers to public benefits access Mother’s understanding of benefits of own education for self and child Mother’s knowledge, attitudes, beliefs about continued education Barriers to educational services Mother’s understanding of benefits of own work for self and child Mother’s knowledge, attitudes, beliefs about work Barriers to accessing employment</p> <p><u>Education of mother regarding:</u> <i>Predisposing factors:</i> Benefits of public benefits, own education and employment for self and child <i>Enabling factors:</i> Available public benefits, educational and employment resources Ways to overcome barriers to public benefits, education, and employment</p> <p><u>Referrals to:</u> <b>Health care coverage/sites for the uninsured (6-2)</b> <b>Public benefits (6-2)</b> <b>Employment resources (6-2)</b> <b>Educational resources (6-2)</b></p> <p><u>Coordination:</u> Reinforce and facilitate access to - Public benefits and health care - Work and education goals</p>	<p><b><u>Health and well-being</u></b></p> <p><b>Household income and benefits (5-1)</b></p> <p><b>Employment and/or education of adult members of household (5-2)</b></p> <p><b>Health insurance status (5-3)</b> Families become independent from TANF</p> <p><b><u>Parenting</u></b></p> <p><b>Parent support for child learning (3-1)</b></p> <p><b>Parenting behavior, relationship with child (3-3)</b></p> <p><b>Child maltreatment (2-5, 2-6, 2-7)</b></p>	<p><u>Birth outcomes</u> - Weight - Gestational age - Size for gestational age - NICU use</p> <p><u>Injury</u> <b>ED visits for all causes (2-1)</b> <b>Injuries requiring medical care (2-4)</b></p> <p><u>Development</u> <b>Communication, language, and literacy (3-5)</b> <b>General cognitive skills (3-6)</b> <b>Approaches to learning (3-7)</b> <b>Social behavior and emotional well-being (3-8)</b></p>

## Logic Model G: Parenting to Support Child Development

**MIECHV Indicators:** (1-6) breast-feeding; (1-7) well-child visits; (1-8) child health insurance status; (2-5, 2-6, 2-7) child maltreatment; (3-1) parent support for child's learning; (3-2) parent knowledge of child development; (3-3) parenting behavior, relationship with child; (3-4) parent emotional well-being, stress; (3-5, 3-6, 3-7, 3-8, 3-9) child communication, language and literacy; child general cognitive skills; child approaches to learning; child social behavior and emotional well-being; child physical health and development ; (6-1) families identified for necessary services; (6-2) families in need who received a referral; (6-3) MOU; (6-4) clear point of contact

<b>Inputs</b> (Definitions specific to main pathway)	<b>Intervention</b> (Service Delivery) (Home visiting content and approaches)	<b>Outcomes (Mother)</b>	<b>Outcomes (Child)</b>
<p><b><u>Service model for these outcomes</u></b></p> <p><i>Intended goals and outcomes</i> Relative importance of these specific outcomes</p> <p><i>Intended service delivery</i> Dosage Priorities among visit content areas Use of specific approaches</p> <p><i>Intended staffing</i> Qualifications for hire Roles and responsibilities Competencies Caseload limits</p> <p><b><u>Implementation system for these outcomes</u></b></p> <p><i>Staff development supports</i> Recruitment and hiring Training Supervision, evaluation, and feedback</p> <p><i>Clinical supports</i> Screening and assessment tools, protocols, curricula Peer support and learning Access to professional consultation and experts</p> <p><i>Administrative supports</i> MIS and electronic records Distance supervision and distance learning Program monitoring and CQI Organizational culture and climate</p> <p><i>Systems interventions</i> <b>MOU for referral/coordination (6-3)</b> <b>Point of contact for referral, coordination (6-4)</b></p> <p><b><u>Community resources for these outcomes</u></b></p>	<p><b><u>Assessment of:</u></b></p> <p><b><i>Child development and breast-feeding (6-1)</i></b> Child's development (potential delays) Mother-child attachment Mother's responsiveness to child's cues Mother's behavior management skills Quality of home learning environment Current pediatric primary care site and use Current providers' recommendations about breast-feeding</p> <p><i>Predisposing and enabling factors:</i> Mother's understanding of benefits of breast-feeding Mother's knowledge, attitudes, beliefs about breast-feeding Child's current health care coverage Barriers to breast-feeding</p> <p><b><u>Education of mother:</u></b></p> <p><i>Predisposing factors:</i> Appropriate developmental expectations for child</p> <p><i>Enabling factors:</i> Suggest, model, practice, reinforce: - Activities to support children's learning and development - Activities to promote the mother-child relationship</p> <p><b><u>Referrals to:</u></b> <b>Pediatric primary care (6-1)</b> <b>Developmental services if child screens positive for delay (6-2)</b> <b>Attachment services if attachment is poor (6-2)</b></p> <p><b><u>Coordination:</u></b> Reinforce and facilitate adherence to service provider recommendations</p>	<p><b><u>Parenting</u></b></p> <p><b>Child health insurance status (1-8)</b></p> <p><b>Well-child visits (1-7)</b></p> <p><b>Breast-feeding (1-6)</b></p> <p><b>Maternal support for learning (3-1)</b></p> <p><b>Knowledge of child development (3-2)</b></p> <p><b>Parenting behavior and relationship with child (3-3)</b></p> <p><b>Parent emotional well-being, stress (3-4)</b></p> <p><b>Child maltreatment (2-5, 2-6, 2-7)</b></p>	<p><b><u>Development</u></b></p> <p><b>Communication, language, and emergent literacy (3-5)</b></p> <p><b>General cognitive skills (3-6)</b></p> <p><b>Approaches to learning (3-7)</b></p> <p><b>Social behavior and emotional well-being (3-8)</b></p> <p><b>Gross and fine motor development (3-9)</b></p>

## Logic Model H: Parenting to Support Child Health

**MIECHV program indicators:** (1-6) breast-feeding; (1-7) well-child visits; (1-8) child health care coverage; (2-1) ED visits by children for all causes; (2-3) information or training on child injury prevention; (2-4) child injuries requiring medical care; (2-5) reported suspected maltreatment; (2-6) reported substantiated maltreatment; (2-7) first-time victims of maltreatment; (3-9) child physical health and development; (6-1) families identified for necessary services; (6-2) families in need who received a referral; (6-3) MOU; (6-4) clear point of contact

<b>Inputs</b> (Definitions specific to main pathway)	<b>Intervention</b> (Service Delivery) (Home visiting content and approaches)	<b>Outcomes (Mother)</b>	<b>Outcomes (Child)</b>
<p><b><u>Service model for these outcomes</u></b></p> <p><i>Intended goals and outcomes</i> Relative importance of these specific outcomes</p> <p><i>Intended service delivery</i> Dosage Priorities among visit content areas Use of specific approaches</p> <p><i>Intended staffing</i> Qualifications for hire Roles and responsibilities Competencies Caseload limits</p> <p><b><u>Implementation system for these outcomes</u></b></p> <p><i>Staff development supports</i> Recruitment and hiring Training Supervision, evaluation, and feedback</p> <p><i>Clinical supports</i> Screening and assessment tools, protocols, curricula Peer support and learning Access to professional consultation and experts</p> <p><i>Administrative supports</i> MIS and electronic records Distance supervision and distance learning Program monitoring and CQI Organizational culture and climate</p> <p><i>Systems interventions</i> <b>MOU for referral/coordination (6-3)</b> <b>Point of contact for referral, coordination (6-4)</b></p> <p><b><u>Community resources for these outcomes</u></b></p>	<p><u>Assessment of:</u> <b>Child health (6-1)</b> Current pediatric primary care site and use Pediatric primary care providers' recommendations about home safety</p> <p><i>Predisposing and enabling factors:</i> Mother's understanding of benefits of home safety Mother's knowledge, attitudes, beliefs about home safety Child's current health care coverage Barriers to home safety actions</p> <p><u>Education of mother regarding:</u> <i>Predisposing factors:</i> <b>Information on child injury prevention (2-3)</b> Benefits of baby-proofing the home Benefits of having a regular source of primary care Advantages and disadvantages of available baby-proofing strategies</p> <p><i>Enabling factors:</i> Available sources of child health care coverage / care for the uninsured Available sources of pediatric primary care and ways to overcome barriers to it Suggest, model, practice, and reinforce positive behavior management approaches</p> <p><u>Referrals to:</u> <b>Health care coverage/sites for the uninsured (6-2)</b> <b>Pediatric primary care provider (6-2)</b> Accessible sources of home safety equipment</p> <p><u>Coordination:</u> Reinforce and facilitate adherence to pediatric health care provider's recommendations for child safety</p>	<p><b><u>Parenting</u></b></p> <p><b>Child health care coverage (1-8)</b></p> <p><b>Well-child visits and immunizations per AAP guidelines (1-7)</b></p> <p><b>Breast-feeding (1-6)</b></p> <p><b>Receipt of injury prevention guidance (2-3)</b></p> <p>Home safety precautions adopted</p> <p><b>Child maltreatment (2-5, 2-6, 2-7)</b></p>	<p><u>Health</u></p> <p><b>ED visits for all causes (2-1)</b></p> <p><b>Injuries requiring medical care (2-4)</b></p> <p><b>Physical growth (height, weight, Body Mass Index [BMI]) (3-9)</b></p>

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