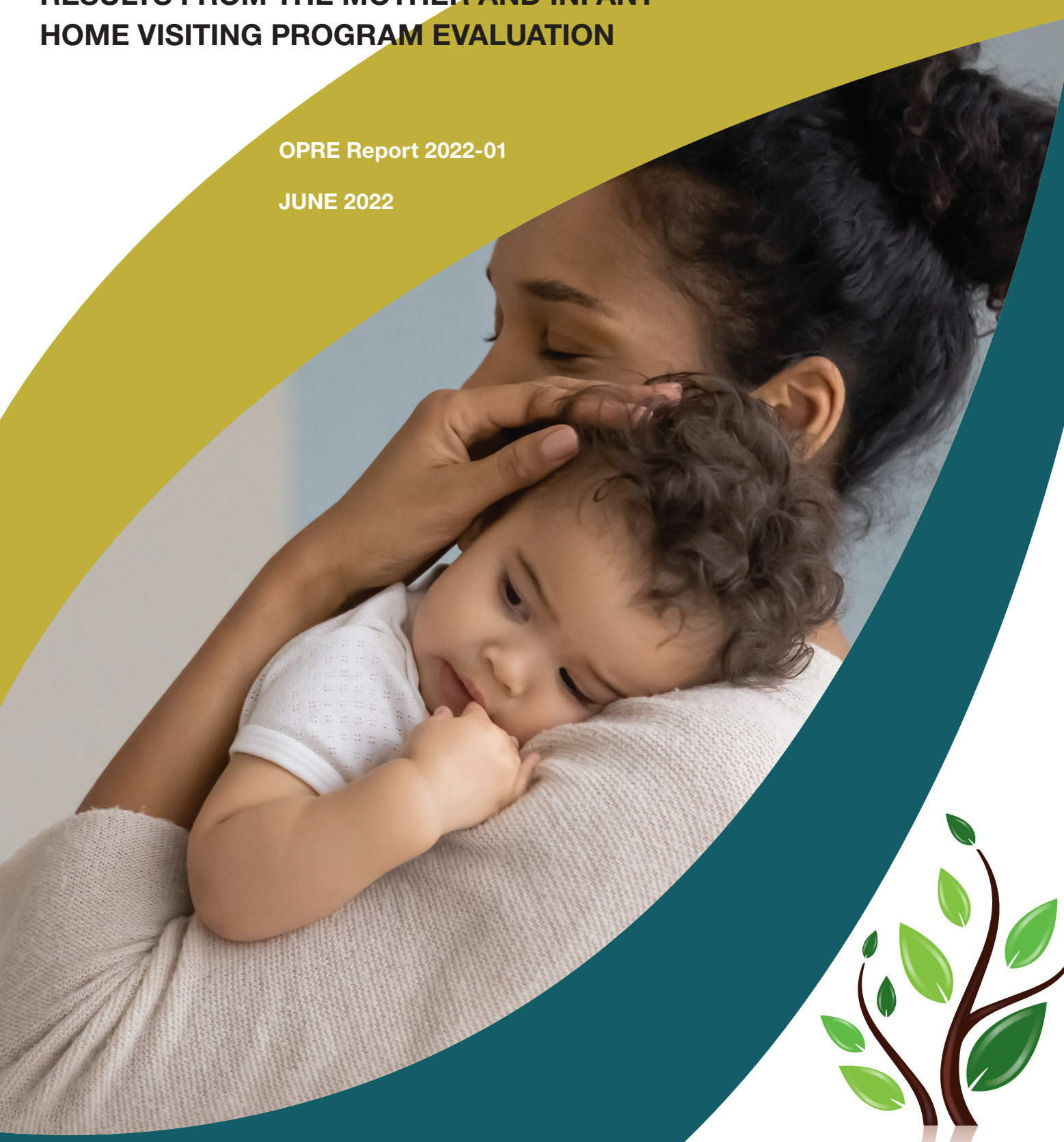
Costs of Evidence-Based Early Childhood Home Visiting

RESULTS FROM THE MOTHER AND INFANT HOME VISITING PROGRAM EVALUATION

OPRE Report 2022-01

JUNE 2022



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Overview

INTRODUCTION

Children develop fastest in their earliest years, and the skills and abilities they develop in those years lay the foundation for their future success. Similarly, early adverse experiences can contribute to poor social, emotional, cognitive, behavioral, and health outcomes in early childhood and later life. Children who grow up in families with lower incomes tend to be at greater risk of encountering adverse experiences that negatively affect their development. One approach that has helped parents and their young children is home visiting, which provides individually tailored support, resources, and information to expectant parents and families with young children. Many early childhood home visiting programs aim to support the healthy development of infants and toddlers, and work with families with lower incomes, in particular, to help ensure their well-being.

In 2010, Congress authorized the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program by enacting section 511 of the Social Security Act, 42 U.S.C. § 711, which also appropriated funding for fiscal years 2010 through 2014. Subsequent laws extended funding for the program through fiscal year 2022. The program is administered by the Health Resources and Services Administration (HRSA) in collaboration with the Administration for Children and Families, within the U.S. Department of Health and Human Services (HHS). The initiation of the MIECHV Program began a major expansion of evidence-based home visiting programs.

PRIMARY RESEARCH QUESTIONS

1. How are resources allocated at MIECHV-funded local home visiting programs?
2. How much does it cost to provide home visiting to the average family, and how do costs differ across families, local programs, and evidence-based models?

KEY FINDINGS AND HIGHLIGHTS

- **Local home visiting programs spent the largest share of their budgets on personnel.** Personnel expenditures accounted for nearly 80 percent of local program expenditures, on average, over one year. The percentage varied across local programs but was similar across the evidence-based models.
- **Two-thirds of personnel costs were for home visitor compensation.** This finding is not a result of high home visitor compensation but reflects the fact that home visitors typically comprise more than two-thirds of a program's personnel. However, costs varied across local programs and evidence-based models. Home visitor compensation made up a relatively smaller share of personnel costs for Early Head Start—Home-based option programs, whose staff provided a broad range

of services (not just home visiting) to families. Nurse-Family Partnership programs spent a higher proportion of personnel costs on home visitor compensation, consistent with the program's use of registered nurses as home visitors.

- **Local program costs for serving a family during its first year of home visiting varied considerably, with costs for half of the families between $1,304 and $5,788 per year.** Costs are linked to how many home visits a family received, the home visitor's compensation, and how the program allocated resources. Costs were similar for providing home visiting to younger and older mothers, women who were and were not pregnant at the time of study entry, and women who were and were not first-time mothers. There was considerable overlap across the models in the costs to serve families at individual local programs, but average program costs for serving a family were higher for Nurse-Family Partnership and Early Head Start—Home-based option ($5,351 and $4,808, respectively) and lower for Healthy Families America ($3,238) and Parents as Teachers ($2,568).

METHODS

MIHOPE focuses on the four evidence-based models that 10 or more states chose in their fiscal year 2010 plans for MIECHV funding: Early Head Start—Home-based option, Healthy Families America, Nurse-Family Partnership, and Parents as Teachers. It includes 88 local home visiting programs through which more than 4,200 women who were pregnant or had children less than 6 months old were randomly assigned to a MIECHV-funded home visiting program or a control group referred to other appropriate services in the community. Of these 88 local programs, 63 provided sufficient information on total program expenditures and service delivery data to be included in the cost analysis shown in this report.

Information on program costs comes from the following sources: total program expenditures for one calendar year, classified into cost categories such as personnel and supplies; service delivery data for the same time period as local program expenditures; and MIHOPE family service logs, completed weekly by home visitors for each family served.

The analysis presented in this report has some important limitations. First, it is limited to a subset of local programs that participated in MIHOPE and might not represent the costs of MIECHV-funded early childhood home visiting programs generally. Likewise, MIHOPE collected information during the first few years the MIECHV Program was being implemented, and costs presented in this report might not represent the current costs of providing MIECHV-funded home visiting. Third, the analysis excluded some types of costs, such as new-hire training costs, costs associated with staff attrition, and donated resources that were not available consistently across local home visiting programs. Fourth, estimates of family-specific costs may not capture costs for all services that might benefit families, such as the time a supervisor spends discussing a family with a home visitor.

Because it can take many years for the benefits of home visiting to accrue, this report does not include a full benefit-cost analysis, which might be conducted after further follow-up data are collected.

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Collection of cost-related information from local programs required efforts from a significant number of people across these organizations. This information was not always readily available and was a significant task for staff members at these local programs. We also appreciate the home visitors and other personnel who provided detailed accounting of their efforts, which was vital to creating the estimates in this analysis.

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The Authors

Executive Summary

Children develop fastest in their earliest years, and the skills and abilities they develop in those years lay the foundation for their future success.[1] Similarly, early adverse experiences can contribute to poor social, emotional, cognitive, behavioral, and health outcomes both in early childhood and later life. Children who grow up in families with lower incomes tend to be at greater risk of encountering adverse experiences that negatively affect their development. One approach that has helped parents and their young children is home visiting, which provides individually tailored support, resources, and information to expectant parents and families with young children. Many early childhood home visiting programs aim to support the healthy development of infants and toddlers, and work with families with low income, in particular, to help ensure their well-being.

In 2010, Congress authorized the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program by enacting section 511 of the Social Security Act, 42 U.S.C. § 711, which also appropriated funding for fiscal years 2010 through 2014.[2] Subsequent laws extended funding for the program through fiscal year 2022.[3] The program is administered by the Health Resources and Services Administration (HRSA) in collaboration with the Administration for Children and Families within the U.S. Department of Health and Human Services (HHS). The initiation of the MIECHV Program began a major expansion of evidence-based home visiting programs for families living in communities that states identified as "at risk."[4]

The legislation authorizing MIECHV required an evaluation of MIECHV in its early years,[5] which became the Mother and Infant Home Visiting Program Evaluation (MIHOPE). The evaluation, which is studying the effects of MIECHV-funded evidence-based home visiting, is being conducted for HHS by MDRC in partnership with James Bell Associates, Johns Hopkins University, Mathematica Policy Research, the University of Georgia, and Columbia University. The overarching goal of MIHOPE is to learn whether families and children benefit from MIECHV-funded early childhood home visiting programs as they operated from 2012 through 2017. In addition, MIHOPE includes a cost analysis to estimate the cost of providing evidence-based home visiting to families. This report describes local programs' home visiting costs for the year after families begin receiving services and how those costs are allocated between meeting specific families' needs and other home visiting program activities.

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[1]National Research Council and Institute of Medicine, *From Neurons to Neighborhoods: The Science of Early Childhood Development* (Washington, DC: National Academy Press, 2000).

[2]Social Security Act of 1935. SEC. 511 [42 U.S.C. 711] (j) (1) (2010).

[3]Funds for subsequent fiscal years were appropriated by section 209 of the Protecting Access to Medicare Act of 2014, Pub. L. 113-93 (fiscal year 2015); section 218 of the Medicare Access and Children's Health Insurance Program Reauthorization Act of 2015, Pub. L. 114-10 (fiscal years 2016-2017); and section 50601 of the Bipartisan Budget Act of 2018, Pub. L. 115-123 (fiscal years 2018-2022).

[4]Social Security Act of 1935. SEC 511 [42 U.S.C. 711] (b) (2010).

[5]Social Security Act of 1935. SEC 511 [42 U.S.C. 711] (g) (2) (2010).

OVERVIEW OF THE MIHOPE DESIGN

As mentioned previously, the cost analysis is just one part of MIHOPE. MIHOPE was designed to accomplish several goals:

1. learn about the effectiveness of MIECHV-funded, evidence-based home visiting programs;

2. systematically study how MIECHV-funded home visiting programs are implemented;

3. link information on communities, organizations, and families to program impacts to deepen understanding of the program features that are associated with greater benefits; and,

4. estimate the costs of providing MIECHV-funded home visiting services.

The legislation that authorized MIECHV called for awardees to devote the majority of MIECHV funding to home visiting models designated as evidence-based by HHS.[6] MIHOPE includes the four evidence-based models that 10 or more states chose in their fiscal year 2010-2011 plans for MIECHV funding. These include Early Head Start—Home-based option (EHS), Healthy Families America (HFA), Nurse-Family Partnership (NFP), and Parents as Teachers (PAT).

To provide reliable estimates of the effects of home visiting programs, families who enrolled in the study were randomly assigned in approximately equal numbers to a MIECHV-funded local home visiting program or a control group referred to other appropriate services in the community. From October 2012 to October 2015, 4,229 families entered the study through 88 local home visiting programs in 12 states. For each of the 88 local home visiting programs, MIHOPE studied how they were implemented using information collected from families, home visiting staff, and the four evidence-based models. The cost analysis supplemented this information with budgetary information collected from the local home visiting programs.

GOALS OF THIS REPORT

The analysis presented in this report has two main goals:

- **Examine the allocation of resources at MIECHV-funded programs in the MIHOPE cost analysis sample.**[7] Examining the ways in which the local home visiting programs participating in MIHOPE allocate resources can help inform current and future implementation of home visiting services.

[6]Social Security Act of 1935. SEC. 511 [42 U.S.C. 711] (d) (3) (A) (ii) (2010). To determine which home visiting models meet HHS criteria for evidence of effectiveness, HHS commissioned the Home Visiting Evidence of Effectiveness review. See U.S. Department of Health and Human Services, Administration for Children and Families, "Home Visiting Evidence of Effectiveness" (Website: homvee.acf.hhs.gov, 2022).

[7]The cost analysis sample consists of the 63 local home visiting programs included in MIHOPE that provided information on expenditures and the total number of home visits delivered during a one-year period.

- **Estimate the cost for each family served in MIHOPE and investigate how these costs differ across families, local programs, and evidence-based models.** Estimating costs for each family allows the study to examine how costs vary across different types of families, programs, and models, which might provide important information to program administrators and is necessary for comparing costs to benefits for MIHOPE families.

EVIDENCE-BASED HOME VISITING MODELS STUDIED IN MIHOPE

In general, home visiting consists of three types of activities:

- Assessing family needs
- Educating and supporting parents
- Referring families to needed services in the community and coordinating each family's use of those services.

Home visitors work with families using a variety of strategies to provide education and support to families, including setting goals with caregivers, working with caregivers to create plans for meeting those goals, and helping caregivers resolve problems. Other aspects of their work include helping parents and children build better relationships, intervening during crises, providing information on children's developmental stages and feedback on parenting, working to strengthen families' support networks, and providing emotional support. Home visitors also use methods such as positive reinforcement, direct comments, and motivational interviewing to promote parents' and children's positive attitudes and behaviors. Finally, home visitors provide referrals to community health and human service resources based on each family's identified needs.

Although the four evidence-based models all employed these strategies and shared a principal goal of improving outcomes for families and their young children during the periods they were studied in MIHOPE, they differed in important ways that have implications for home visiting costs.

- **Program intensity.** EHS scheduled weekly home visits, with a minimum visit duration of 90 minutes. HFA and NFP offered weekly visits of approximately 60 minutes during critical periods (for example, shortly after birth). PAT specified monthly, biweekly, or weekly visits lasting about 60 minutes, depending on families' needs.
- **Home visitor qualifications.** NFP required home visitors to be nurses with baccalaureate degrees, and EHS required home visitors to have knowledge and experience in child development, early childhood education, or other areas. PAT required home visitors to have at least a high school credential and a minimum of two years of supervised work experience with young children or parents. HFA required home visitors to have at least a high school credential and required local programs to look for relevant community-based experience and interpersonal characteristics.

DATA SOURCES

The cost analysis relied primarily on three data sources:

- **Total program expenditures for one calendar year, classified into cost categories such as personnel and supplies.** Local programs typically provided information on expenditures using an end-of-year financial report for the most recently completed fiscal year. All program expenditures identified by local programs were included except for trainings for new hires, which are likely to fluctuate from year to year, and artificially inflate these annual cost estimates. Program costs are reported in 2014 U.S. dollars.

- **Service delivery data for the same time period as local program expenditures.** These reports, provided by local programs, included the total number of home visits delivered by the local program, which was used to estimate travel costs to and from home visits.

- **MIHOPE family service logs, completed weekly by home visitors for each family served.** The logs provided information on the time home visitors spent working with each family in the study and any materials provided to the family.

Of the 88 local programs that participated in MIHOPE, 63 provided sufficient information on total program expenditures and service delivery data to be included in the cost analysis. Therefore, the analyses presented in this report are limited to those 63 local programs, and the information on family-specific costs is limited to the 1,215 families served by those 63 local programs. While the 63 local programs included a smaller proportion of those operating PAT than the full MIHOPE sample, they were similar to the full MIHOPE sample in other respects such as location and capacity.

THE ALLOCATION OF RESOURCES AT LOCAL HOME VISITING PROGRAMS

The analysis first examines the allocation of resources at each MIECHV-funded local program in the MIHOPE cost analysis sample. Key findings from this analysis include the following:

- **Local home visiting programs spent the largest share of their budgets on personnel.** Personnel expenditures, including home visitors and non-home visitor staff, accounted for nearly 80 percent of local program expenditures, on average, over one year. The percentage varied across local programs but was similar across the evidence-based models. Personnel being a large share of overall expenditures is consistent with expenditure patterns in other social service programs.[8]

- **Two-thirds of personnel costs were for home visitor compensation.** Home visitor compensation (which includes earnings and fringe benefits) comprised more than half of total expenditures on

[8]Brian T. Yates, *Analyzing Costs, Procedures, Processes, and Outcomes in Human Services: An Introduction* (Thousand Oaks, CA: Sage Publications, 1996).

average, although this varied across local programs and evidence-based models. This finding is not a result of high home visitor compensation but reflects the fact that home visitors typically comprise more than two-thirds of a program's personnel.

Home visitor compensation made up a smaller share of personnel costs for EHS programs, consistent with EHS practices of employing staff to provide a broad range of services (not just home visiting) to families. NFP programs, on the other hand, spent a higher proportion of personnel costs on home visitors, which is likely explained by the fact that NFP home visitors are registered nurses and thus tend to receive relatively higher salaries.

THE COST TO SERVE A FAMILY DURING THE FAMILY'S FIRST YEAR

The analysis then estimates the cost for each family served in the MIHOPE cost analysis sample and investigates how these costs differ across local programs, families, and evidence-based models. This analysis brings together the two general components of total costs: costs that can be tied to each family served in the home visiting program (for example, due to home visitor time spent with that family), and other general costs incurred by the local program that allow the program to serve families but that are not tied to specific families.

Key findings include:

- **Local program costs for serving a family during its first year of home visiting varied considerably, with the cost for the middle half of families ranging between $1,304 and $5,788 per year.** One-quarter of families had first-year costs below $1,304 and one quarter had first-year costs above $5,788. This wide variation in costs for families is associated with the variation in the number of home visits received over the time period, the salary of the home visitor delivering the visits, and the proportion of total expenditures dedicated to general program expenditures by the administering program. Home visiting costs were similar for providing home visiting to younger and older mothers, women who were and were not pregnant at the time of study entry, and women who were and were not first-time mothers. Average program costs did not differ by urbanicity of county or by enrollment capacity, but did differ across the types of local implementing agency, with higher costs of serving families when the home visiting program was located in a health department ($5,608, on average) than in community-based nonprofits ($3,764, on average), health care organizations ($3,347, on average), school districts ($1,781, on average), and other types of agencies ($3,704, on average). Regarding local implementing agencies, NFP represented most of the local programs that operated through local health departments, and also had higher costs than the other models for serving families (discussed below). Removing NFP from the analysis eliminated differences in costs by implementing agency.

- **Data from the MIHOPE family service logs reveal that total personnel time was highest for EHS program families on average while the total home visitor personnel costs were highest for NFP program families on average.** EHS home visitors spent more time with families than other evidence-

based models, following the model's guidelines for visit frequency and length. NFP nurse home visitors' average hourly compensation was twice as high as the average for home visitors of other evidence-based models, consistent with the professional qualifications required by NFP.

- **Average local program costs for serving a family were higher for NFP and EHS ($5,351 and $4,808, respectively) and lower for HFA ($3,238) and PAT ($2,568).** This variation in average costs per family by model is consistent with differences between the models' home visit guidelines, staffing requirements, and overall program structure. For example, the higher costs of NFP programs are consistent with the model's requirement that home visitors be nurses (who the analysis found are paid more than home visitors for the other three models), and the higher costs of EHS programs are consistent with the model's relatively intensive guidelines for visit frequency and length, as well as the higher proportion of non-home visitor program staff. Differences in costs across the models are also consistent with a finding from the MIHOPE implementation research that families participated in home visiting for more months on average for NFP and EHS than for HFA and PAT.[9] Although average costs varied across the four evidence-based models, there was considerable overlap across the models in the costs to serve families at individual local programs.

CONCLUSION

The cost analysis for MIHOPE provides insight into home visiting programs' operation, including the overall cost of implementing and sustaining a program, costs for specific program activities like personnel, and costs for serving a family. The analysis found that personnel costs comprise a large portion of local home visiting program expenditures, and home visitor compensation makes up the bulk of local programs' personnel expenditures. As a result, the total costs of serving families depend on how much time is spent on home visits (which is affected by the number of home visits and the time spent on each visit) and how much home visitors are paid.

The analysis presented in this report has some important limitations. First, the analysis is limited to a subset of local programs that participated in MIHOPE and might not represent the costs of MIECHV-funded early childhood home visiting programs generally. Likewise, MIHOPE collected information during the first few years the MIECHV Program was being implemented, and costs presented in this report might not represent the current costs of providing home visiting. Third, the analysis excluded some types of costs, such as new-hire training costs, costs associated with staff attrition, and donated resources that were not available consistently across local home visiting programs. Finally, estimates of family-specific costs may not capture costs for all services that might benefit families, such as the time a supervisor spends discussing a family with a home visitor.

[9]Anne Duggan, Ximena A. Portilla, Jill H. Filene, Sarah Shea Crowne, Carolyn J. Hill, Helen Lee, and Virginia Knox, *Implementation of Evidence-Based Early Child-hood Home Visiting: Results from the Mother and Infant Home Visiting Program Evaluation*, OPRE Report 2018-76 (Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, 2018).

Decisions based on program costs cannot be fully informed without knowing what benefits the programs generate for families and society. Because it can take many years for the benefits of home visiting to accrue, a full benefit-cost analysis might be conducted after further follow-up data are collected, a process that is currently underway with MIHOPE families when the children are in kindergarten.

1

Introduction

Children develop fastest in their earliest years, and the skills and abilities they develop in those years help lay the foundation for future success in school and life.[1] For that reason, the most cost-effective time to intervene for families, government budgets, and society may be early in a child's life.[2] Because parents play a critical role in shaping children's early development, early interventions with parents have the potential to produce long-term benefits.[3]

One approach that has helped parents and their young children is home visiting, which provides individually tailored information, resources, and support to pregnant women and parents with young children. Since the 1970s, many models of home visiting have been developed that address multiple aspects of parenting and early child well-being, though the models often originated in specific service sectors, including health, early education, and child welfare.[4] Concurrently, a substantial literature has provided evidence of home visiting impacts on family functioning, parenting, and child outcomes.[5] The literature also provides evidence of various challenges in designing and implementing services so that home visiting achieves its potential as a part of the early childhood system of care.[6]

In 2010, Congress authorized the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program by enacting section 511 of the Social Security Act, 42 U.S.C. § 711, which also appropriated funding for fiscal years 2010 through 2014.[7] Subsequent laws extended funding for the program through fiscal year 2022.[8] The program is administered by the Health Resources and Services Administration (HRSA) in collaboration with the Administration for Children and Families (ACF) within

[1]National Research Council and Institute of Medicine (2000).

[2]Doyle, Harmon, Heckman, and Tremblay (2009).

[3]Brooks-Gunn and Markman (2005).

[4]Weiss (1993); Duggan (2015).

[5]U.S. Department of Health and Human Services (2017).

[6]See, for example, Boller et al. (2014). An early childhood system of care refers to a network of strong, coordinated, and responsive organizations that aim to improve outcomes for children ages 0 to 5.

[7]Social Security Act of 1935. SEC 511 [42 U.S.C. 711] (j) (1).

[8]Funds for subsequent years were appropriated by section 209 of the Protecting Access to Medicare Act of 2014, Pub. L. 113-93 (fiscal year 2015); section 218 of the Medicare Access and Children's Health Insurance Program Reauthorization Act, Pub. L. 114-10 (fiscal years 2016 and 2017); and section 50601 of the Bipartisan Budget Act of 2018, Pub. L. 115-123 (fiscal years 2018-2022).

the U.S. Department of Health and Human Services (HHS).[9] The initiation of the MIECHV Program began a major expansion of evidence-based home visiting programs for families living in communities that states identified as "at risk."[10]

The legislation authorizing MIECHV required a program evaluation, which became the Mother and Infant Home Visiting Program Evaluation (MIHOPE).[11] The evaluation is being conducted for HHS by MDRC in collaboration with James Bell Associates, Johns Hopkins University, Mathematica Policy Research, the University of Georgia, and Columbia University.

The overarching goal of MIHOPE is to learn whether and how families and children benefit from MIECHV-funded early childhood home visiting programs across a broad range of outcome areas specified in the legislation that authorized MIECHV. These areas include: (1) prenatal, maternal, and newborn health; (2) child health and development, including child maltreatment; (3) parenting skills; (4) school readiness and child academic achievement; (5) crime or intimate partner violence; (6) family economic self-sufficiency; and (7) referrals and service coordination.[12]

In addition to assessing the effects of home visiting programs on family outcomes, MIHOPE includes a cost analysis to estimate the cost of providing evidence-based home visiting to families. Specifically, the cost analysis had two main goals:

1. describe local programs' allocation of resources, and

2. examine local programs' costs to serve a family during their first year in a program.

This report presents the findings from this cost analysis. Specifically, this report includes information about:

- the local programs' costs of providing MIECHV-funded, evidence-based home visiting services for the year after families begin receiving services;
- how those costs are allocated across various program elements;
- what those costs look like when separated into "personnel" and "non-personnel" categories; and,
- the variation in those costs across different local programs.

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[9]HRSA distributes funds from the MIECHV Program to state, territory, and nonprofit awardees. In 2021, HRSA provided awards to 56 awardees, including 47 state agencies, three nonprofit organizations (serving Florida, North Dakota, and South Carolina), the District of Columbia, and five U.S. territories. Awardees distribute funds to local implementing agencies—also commonly referred to as local programs—who work directly with families. ACF also oversees the tribal MIECHV Program, which as of 2021 distributes funds to 23 tribes, consortia of tribes, tribal organizations, and urban Indian organizations across 12 states.

[10]Social Security Act of 1935. SEC 511 [42 U.S.C. 711] (b).

[11]Social Security Act of 1935. SEC. 511 [42 U.S.C. 711] (g) (2).

[12]Social Security Act of 1935. SEC. 511 [42 U.S.C. 711] (d) (2) (B) (i-vii).

It is important to note that this report does not include (1) a cost-effectiveness analysis or (2) a benefit-cost analysis.

- A cost-effectiveness analysis shows a ratio of the net cost of being assigned to the program group to the estimated effect for each individual outcome. The MIHOPE analysis plan specified including a cost-effectiveness analysis; as noted in Chapter 5 of the MIHOPE analysis plan, "This set of results is likely to be of particular interest if costs or impacts vary considerably for different subgroups of families, providers, or national models." However, because MIHOPE has so far not found statistically significant differences in effects across subgroups of families and did find that the models differed in which outcomes they affected (making comparisons across the models inappropriate),[13] this report does not include a cost-effectiveness analysis. Instead, a cost-consequence analysis is presented in Appendix A.

- The benefits of home visiting may include longer-term impacts such as children's improved school performance and increased parental employment and earnings. However, such impacts do not typically occur within the first year after enrollment in home visiting, which was the time frame for the data collected for this cost analysis. A benefit-cost analysis was therefore not conducted because it was unlikely to provide reliable results given the data available for this cost analysis.

This is one of several MIHOPE reports. Other reports include:

- A design report that provided a detailed description of the study design, including a discussion of the planned cost analysis.[14]

- A report to Congress that provided early information on local programs and families in the study as well as an analysis of states' assessments of needs related to home visiting and plans for use of initial MIECHV funding.[15]

- An implementation research report that provided detailed information on implementation of home visiting services in the local programs participating in MIHOPE.[16]

- An impact report that presented estimated effects on family and child outcomes when the participating children were approximately 15 months old across the broad range of outcome areas specified in legislation. The report also analyzed variations in program impacts across different family characteristics and local program implementation methods.[17]

[13]Results by subgroup are presented in Chapter 4 and results by model are presented in Chapter 5 of Michalopoulos et al. (2019).

[14]Michalopoulos et al. (2013).

[15]Michalopoulos et al. (2015).

[16]Duggan et al. (2018).

[17]Michalopoulos et al. (2019).

OVERVIEW OF THE MIHOPE DESIGN

MIHOPE was designed to accomplish several goals:

1. learn about the effectiveness of MIECHV-funded, evidence-based home visiting programs,

2. systematically study how MIECHV-funded home visiting programs are implemented,

3. link information on communities, organizations, and families to program impacts to deepen our understanding of the program features that are associated with greater benefits, and

4. estimate the costs of providing MIECHV-funded, evidence-based home visiting services.[18]

The legislation that authorized MIECHV called for awardees to devote the majority of MIECHV funding to home visiting models designated as evidence-based by HHS.[19] MIHOPE includes the four evidence-based models that 10 or more states chose in their fiscal year 2010-2011 plans for MIECHV funding. These include Early Head Start—Home-based option (EHS), Healthy Families America (HFA), Nurse-Family Partnership (NFP), and Parents as Teachers (PAT).

MIHOPE included families who were interested in receiving and eligible for home visiting services. However, not all such families were eligible to participate in MIHOPE. Because most home visiting programs enroll women, the study limited enrollment to women. Because it can be difficult to compare many outcomes across a broad range of children's ages, the study included only women who were pregnant or had children less than 6 months old when they entered the study, a group that is served by most MIECHV-funded local programs. Women were also excluded from the study if they were under 15 years old,[20] if they were assessed as unable to provide consent and complete a survey in English or Spanish when they entered the study, or if they were already receiving home visiting services from a participating local program. Finally, the team allowed each local program to exempt a small number of families (typically three) from the study (and thereby from random assignment, meaning they could be offered services at the program's discretion).[21]

To provide reliable estimates of the effects of MIECHV-funded home visiting programs, families who enrolled in the study were randomly assigned to a MIECHV-funded local home visiting program or

[18]The evaluation design is described in detail in Michalopoulos et al. (2013).

[19]SEC. 511 [42 U.S.C. 711] (d) (3) (A) (ii). To determine which home visiting models are defined as evidence-based, HHS commissioned the Home Visiting Evidence of Effectiveness review. See U.S. Department of Health and Human Services (2017).

[20]During its initial review of MIHOPE, the MDRC Institutional Review Board suggested an age cutoff because of a concern that younger individuals would represent a more vulnerable population. The study team chose age 15 based on an estimate that it would exclude fewer than 3 percent of eligible individuals from the study and a concern that local home visiting programs would have concerns about randomly assigning younger individuals. As an additional step in protecting the rights of this potentially more vulnerable group, the study also required a legal guardian to consent to each minor's participation in the study.

[21]Characteristics of all families in the MIHOPE program group are described in detail in the MIHOPE implementation research report (Duggan et al., 2018).

a control group that was referred to other appropriate services in the community that did not include evidence-based home visiting. From October 2012 to October 2015, a total of 4,229 families entered the study through 88 local home visiting programs in 12 states (with one local program enrolling no families in the study).[22] Although the team sought to include a similar number of local programs for each evidence-based model, the 88 local programs included 19 operating EHS, 26 operating HFA, 22 operating NFP, and 21 operating PAT.

To accomplish the goals mentioned above, MIHOPE used a variety of methods to collect data from multiple sources. The cost analysis draws on the following data sources, which are described in more detail in the MIHOPE implementation research report and in Appendix B:[23]

- Surveys conducted at baseline and 12 months later with program managers, supervisors, and home visitors at each local home visiting program.
- Weekly, web-based logs completed by home visitors and supervisors to provide information on training and supervisory activities.
- Weekly, web-based logs completed by home visitors and supervisors to provide information on services delivered to families during home visits and on training and supervisory activities.
- Qualitative, semi-structured interviews with all 12 MIHOPE state MIECHV administrators and with home visiting staff in a subset of local programs.

In addition, information on home visiting program costs were collected from several sources, including:

- Reports from local programs on expenditures for a one-year period.
- Reports from local programs on the total number of families served and the total number of home visits delivered, over the same time period as reported expenditures.
- Reports from local programs of home visitor salaries.

Chapter 2 provides details on each of these data sources—including those collected for the MIHOPE implementation research and those collected solely for the cost analysis—and how the cost analysis incorporates each source.

[22]Through the time of the 15-month follow-up survey, 11 families withdrew from the study for a final analytical sample of 4,218 families (2,104 in the program group; 2,114 in the control group).

[23]Duggan et al. (2018). Box 1.1 in the MIHOPE implementation research report provides a complete description of all data sources.

THE EVIDENCE-BASED HOME VISITING MODELS STUDIED IN MIHOPE

In general, home visiting consists of three types of activities:

- **Assessing family needs.** To identify family strengths, needs, concerns, and interests, home visitors gather information from families through formal screening and assessment and through informal means that include reading cues provided by family members.

- **Educating and supporting parents.** Having identified family needs, home visitors devote the majority of their time to providing education and support to families. For example, home visitors educate parents on topics such as children's developmental stages and provide feedback on parenting. Home visitors can also intervene during crises such as the threat of being evicted from housing or incidents of family violence. Home visitors also work to strengthen families' support networks. Home visitors use methods such as positive reinforcement, direct feedback, and motivational interviewing to encourage parents to change attitudes and behaviors.

- **Referral and coordination.** For some family needs, home visitors may think the family will benefit from receiving more specialized services in the community. Referrals are most commonly made to address breastfeeding and nutrition, economic self-sufficiency, and public assistance or health insurance.[24] This aspect of home visiting highlights the place of home visiting as one component in the early childhood comprehensive system of care.

Although the four evidence-based models share these major components as well as the overall goal of improving outcomes for at-risk families and their young children, they differ in several important ways. To provide context for the analyses and results presented in this report, this section summarizes differences in the models intended services and highlights some results from the MIHOPE implementation research report.[25] Several features relevant to home visiting costs are discussed below.

- **Target population and age at enrollment.** Most of these models served families they identified as being at risk of poor child outcomes, based on one or more family characteristics. Although the indicators used to identify families at risk differed among the models, most models targeted families with low income. NFP specifically targeted women early in their first pregnancies, while HFA targeted families during any pregnancy or shortly after birth who faced a variety of risk factors for child maltreatment or other negative childhood experiences (risk factors such as histories of trauma or intimate partner violence, behavioral health issues, and single parenthood). PAT has historically served a broad array of families with children in its target age range. All models could enroll women who met the MIHOPE eligibility criteria, although EHS and PAT accepted families whose youngest children were up to 3 years old and through kindergarten entry, respectively. In

[24]Duggan et al. (2018).

[25]Duggan et al. (2018).

other words, EHS and PAT enrolled a much broader range of families than are being studied in MIHOPE, which includes only families with children under 6 months old at enrollment.

- **Program intensity and duration.** The evidence-based models also varied somewhat in the frequency of their home visits. EHS had weekly 90-minute home visits, while HFA and NFP offered hour-long weekly visits during critical periods (for example, shortly after birth) and PAT specified monthly, biweekly, or weekly visits depending on families' needs. The four models also differed in how long they provided services, although all continued to provide services past the child's fifteenth month, which is the period for which effects are estimated in this report.

- **Home visitor training.** Because the current report focuses on costs incurred during a family's first year receiving home visiting, the analysis of training costs is limited to ongoing training during that year rather than one-time trainings, such as initial training or curriculum training. These types of trainings are likely to fluctuate from year to year, so including them may artificially inflate the estimates of costs incurred during a typical year.[26] The models varied considerably in the required number of hours of ongoing training per year. For example, HFA required a minimum of 36 hours of ongoing training for home visitors in their first year and recommended 15 hours per year in subsequent years, while NFP required 3 to 5 hours of online education each year after the initial training.[27] All of the models provided resources to meet the ongoing training requirements but also relied on outside entities to provide trainings to home visitors. For instance, local programs often provided their own trainings that were tailored to meet the needs of the community and may have also required that home visitors attend trainings provided by other training providers or networks in their community or state.

- **Supervision of home visitors.** The evidence-based models varied in whether and how they specified the frequency and duration of group and individual supervision. Neither EHS nor HFA specified requirements for group supervision, and EHS did not have specific requirements for individual supervision. NFP required the most time for group and individual supervision combined, but HFA had the highest requirement for individual supervision. Consistent with these expectations, the MIHOPE implementation research report found that group supervision was more frequent for NFP and PAT and home visitors took part in weekly individual supervision much more often in HFA and NFP than in PAT or EHS. Moreover, HFA home visitors spent the longest time in individual supervision (an average of 72 minutes per week) and EHS home visitors spent the shortest time (an average of 17 minutes per week).[28]

- **Home visitor qualifications.** The four evidence-based models required different qualifications of their home visitors. NFP required home visitors to be registered nurses with baccalaureate

[26]Many local home visiting programs reported more new-hire training than normal due to program expansion from the addition of MIECHV funding, and new-hire costs varied widely among the sample of local programs. It is possible that a portion of the new-hire training costs were due to home visitor attrition (which could be considered an ongoing cost), but the data provided by local programs did not distinguish between these two reasons for new-hire training costs.

[27]See Table 3.1 in Duggan et al. (2018).

[28]See Table 3.5 in Duggan et al. (2018).

degrees. EHS required home visitors to have knowledge and experience in child development, early childhood education, or other areas.[29] PAT required home visitors to have at least a high school credential and a minimum of two years of supervised work experience with young children or parents. HFA required home visitors to have at least a high school credential and required local programs to look for relevant community-based experience and interpersonal characteristics.

ORGANIZATION OF THE REPORT

The chapters of this report provide detailed information about the cost analysis' goals, data, analytic approach, and results as follows:

Chapter 2: Cost Analysis Goals, Data, and Analysis Approach. This chapter describes the goals of the cost analysis, the data sources used, and an overview of the methodological approach.

Chapter 3: The Allocation of Resources at Home Visiting Programs. This chapter examines the allocation of resources in the local programs that participated in MIHOPE. It also describes the variation in resource allocation by evidence-based model and by local program characteristics.

Chapter 4: The Cost to Serve a Family During the First Year. This chapter presents estimates of local programs' costs for each family served in MIHOPE and investigates the differences in these costs per family. It examines variation in local programs' cost per family by evidence-based model, by local program characteristics, and by family characteristics.

Chapter 5: Conclusion. The final chapter summarizes the findings and discusses their implications.

[29]The other areas include principles of child health, safety, and nutrition; adult learning principles; and family dynamics.

2

MIHOPE Cost Analysis Goals, Data, and Analysis Approach

This chapter outlines the goals of the Mother and Infant Home Visiting Program Evaluation (MIHOPE) cost analysis, then presents a description of the data sources used to estimate costs. It provides an overview of the methodological approach used to achieve the cost analysis goals, including the methods used for the cost analyses presented in Chapters 3 and 4 of this report. This chapter concludes by discussing some limitations of the approach and how it compares with previous reports on the cost estimates of home visiting.

GOALS OF THE MIHOPE COST ANALYSIS

As mentioned previously, the cost analysis had two main goals:

- **Describe the allocation of resources for the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program-funded local programs in the MIHOPE cost analysis sample.**[1] Examining how home visiting programs allocate resources can provide valuable information to decision-makers about the implementation of home visiting services. Additionally, this analysis allows other home visiting programs to compare their resource allocation with the local programs in the sample. (However, caution should be observed with any direct comparisons because measurement methods may not be the same and there are various contextual factors that need to be considered when making comparisons.) Chapter 3 presents the results of this analysis.

- **Examine the local programs' costs to serve a family during their first year in the program and investigate how these costs differ across families, local programs, and evidence-based models for the MIHOPE cost analysis sample.** Estimating costs for each family allows the study to examine cost variations across different types of programs and families, which might provide important information to program operators and is necessary for comparing costs to outcomes for MIHOPE families and across different levels of service provision. Chapter 4 of this report contains the results of this analysis.

[1]The MIHOPE cost analysis sample is described in the next section.

As noted in Chapter 1, the report does not include a benefit-cost analysis or a cost effectiveness analysis, since neither was appropriate with the data available for this cost analysis.

COST ANALYSIS SAMPLE AND DATA SOURCES

The cost analysis sample includes the 63 local programs that provided information on expenditures (of the 88 local programs that participated in MIHOPE) and the total number of home visits each logged in a one-year period.[2]

The cost analyses relied primarily on three data sources:[3]

1. **Total program expenditures for one calendar year, classified into cost categories such as personnel and supplies.** Local programs typically provided information on expenditures using an end-of-year financial report for the most recently completed fiscal year.[4] Research staff reviewed the information submitted by local programs and conducted follow-up phone calls to clarify questions and to ensure accuracy to the extent possible. These efforts helped ensure that local programs used the same operational definitions for expenditure categories, that they valued resources consistently, and that they used consistent time periods for expenditures and activities. These aggregate expenditure reports were used to address both goals of the cost analysis. (See Chapters 3 and 4.)

2. **Service delivery data for the same time period as local program expenditures.** These reports included the total number of home visits delivered by the local program, which, when combined with the travel reimbursements reported in the expenditure data, were used to estimate the costs of travel to and from home visits. This information was used to address the second goal of the cost analysis and explains how travel costs were estimated. (See Chapter 4.)

3. **MIHOPE family service logs, completed weekly by home visitors for each family served.** The analysis used information from these family service logs to compute the amount of time spent on various activities for each individual family (valued at a later stage of the analysis) and the cost of materials provided to the family. The detailed accounting of personnel time in these logs is a best

[2]Appendix C describes the process used to collect data for the cost analysis as well as limitations of the cost data. An aggregate summary of the data received from the 63 local programs is available in Appendix D.

[3]The cost analysis also used data from other sources to describe local program characteristics and to explore variation in costs. These data sources, described fully in the MIHOPE implementation research report and listed in Appendix B, include information collected about sites by the MIHOPE research team, surveys of program managers, structured interviews with primary caregivers, evidence-based model-level data, and census tract data.

[4]For most local home visiting programs in the MIHOPE cost analysis sample, MIECHV provided less than half of the site's funding. Including all costs, instead of just MIECHV-funded costs, provided the best representation of the costs to deliver home visiting services, because the participating programs reported that their home visiting service provision did not differ by funding source.

practice of cost analysis, and the analysis used these data to estimate the family-specific costs discussed in Chapter 4. Specific information from the family service logs used in the analysis includes:

- Total number of home visits the family received (face-to-face contact)
- Total number of attempted visits with the family that were not completed[5]
- Total number of minutes of face-to-face contact with the family during home visits
- Total number of minutes of remote communication with the family (including phone, email, text, and social networking)
- Total number of minutes on travel to and from home visits (including completed home visits, cancelled home visits, and no-shows)
- Total number of minutes spent preparing or following up on home visits and other contact with families
- Total number of minutes that staff other than the home visitor spent in face-to-face interactions with the family
- Type of materials provided to the family (for example, baby formula, transportation assistance, and medical supplies) and the approximate dollar value

ANALYSIS APPROACH

This section provides an overview of the methodological approach used for the two goals of the cost analysis, the results of which are presented in Chapters 3 and 4, respectively.

The approach for the two goals focuses on describing local program costs for delivering home visiting services. It is important to note that some broad cost categories that may be of interest are outside the scope of this analysis, such as costs to the families themselves, costs to other organizations (such as the organizations to which families were referred for further services), and the value of donated resources such as labor, supplies, or space. The analysis adjusted all costs for inflation to a base year of 2014 using the Consumer Price Index, All Items for the United States.[6] The year 2014 was chosen as the base year because most local programs reported costs in 2014 U.S. dollars.

[5]This includes cancelled visits, visits where the mother was not home or did not come to the visit, or other cases where the scheduled in-person home visit did not occur.

[6]U.S. Department of Labor (2014). Between 2014 and 2020, costs increased about 9 percent more using this index.

Goal 1: Examine the Allocation of Resources at MIECHV-Funded Local Programs in the MIHOPE Cost Analysis Sample

As described above, local programs reported itemized, one-year expenditures. To examine the allocation of resources, the Goal 1 analysis divided these expenditures into resource categories, which are labeled and defined in the first two columns of Table 2.1. The analysis then calculated the average distribution of resources across these categories among local programs. Chapter 3 presents the results of these analyses and describes the variation in resource allocation across these categories by evidence-based model.

Table 2.1

Cost Categories, Descriptions, and Classifications in the MIHOPE Cost Analysis

Cost Category	Description	Family-Specific Activities	General Program Activities
Personnel			
Home visitor compensation	Salaries and benefits paid to home visitors based on annual salary and fringe benefits for each position and the percentage of time allocated to the home visiting program.	√[a]	√[a]
Non-home visitor compensation	Salaries and benefits paid to non-home visitor personnel based on annual salary and fringe benefits for each position and the percentage of time allocated to the home visiting program.		√
Non-Personnel			
Program supplies	Expenditures for supplies and materials given to families (that is, home visit materials).	√	
Travel to home visits	Mileage reimbursements or agency vehicle costs for travel of staff to home visits.	√	
Durable equipment	Annuitized cost of durable equipment or capital assets used by the home visiting program for more than one year. Examples include computer systems, automobiles, or office furniture.		√
Office space and other facilities	Value of annual rent/lease/mortgage payments for space or facility and proportion used by the home visiting program.		√

(continued)

Table 2.1 (continued)

Cost Category	Description	Family-Specific Activities	General Program Activities
Training costs	The costs of annual booster trainings, professional development seminars, conferences, or related activities, including travel costs when available.		√
Miscellaneous costs	Local program fees (for example, membership fees, professional fees, licensing fees, and affiliation fees), as well as expenditures such as liability insurance and background checks for employees. All other categories of costs.		√
Office supplies	All other supplies and materials.		√

NOTES: For any shared resources under the non-personnel category, local programs indicated the appropriate allocation to the home visiting program.

[a]Home visitor salaries and fringe benefits are split between family-specific activities (60 percent) and general program activities (40 percent), based on results presented in Burwick and Zaveri (2014).

Table 2.1 further groups these categories into personnel costs (different types of program staff) and non-personnel costs (such as office supplies). Comparing personnel to non-personnel costs can shed light on the different ways home visiting programs allocate resources, and Chapter 3 reports on this comparison.

Goal 2: Estimate the Cost of Serving a Family for a Year

To achieve the second goal, costs were estimated for each family in the MIHOPE cost analysis sample for a time period of one calendar year from the families' first home visit.[7] This period was chosen because family service logs—which provide detailed information on the home visiting services that individual families received—were available for one year for most families included in the cost analysis. The level of detail in these family service logs (describing the amount of time home visitors spent working with each family) enables MIHOPE to estimate family-level costs with greater accuracy than more traditional approaches using aggregate expenditure data. Collecting information at the family level allows the analysis to examine how costs vary among families and could later be tied to family-level outcomes in an economic evaluation of benefits and costs.

[7]As for some analyses in the implementation research report, the MIHOPE cost analysis limited the analysis to families who received at least one home visit. The one-year time period may include periods in which the family might not have received services. The study stopped collecting costs for families who stopped receiving services.

The Goal 2 analysis followed best practice guidelines for cost analysis.[8] It estimated the cost of providing home visiting services by identifying all resources necessary to provide services and placing a value on each resource.[9] These resources include family-specific costs, such as face-to-face time with a home visitor, as well as general costs necessary for program implementation, such as training costs and office supplies. The final two columns of Table 2.1 indicate whether each resource category can be tied to specific families in the MIHOPE family service logs, or if the resource provided an aggregate benefit to all families in the program in the form of a general program expenditure.

For each family in the MIHOPE cost analysis sample, the family-specific costs were estimated using that family's service logs. Because the family service logs do not account for general program resources, the costs of general program expenditures were calculated using data from the administering program's expenditure report. Those costs were then proportionally assigned to each family based on the family's amount of family-specific costs. The resulting total costs per family are thus comprehensive and highly specific to each family.[10]

LIMITATIONS OF THE MIHOPE COST ANALYSIS

This cost analysis required local programs in MIHOPE to submit detailed information about program expenditures. Not all local programs provided the same level of detail, leading to the following study limitations.[11]

- **The MIHOPE cost analysis sample is a subset of MIHOPE local programs.** As described in Chapter 1, MIHOPE enrolled 88 local home visiting programs, but the cost analysis included only the 63 programs that provided enough information to allow the study team to calculate program costs. As a subset of local programs, the cost analysis sample is not necessarily representative of either the larger set of local programs that participated in MIHOPE or MIECHV-funded programs nationally. Like most studies that are not nationally representative, results may not be generalizable to local programs nationally. However, the cost analysis sample does include the diversity of the MIHOPE study, including diversity across evidence-based model, state, and type of implementing agency. Table 2.2 shows the difference in the number of local programs in the MIHOPE study and in the MIHOPE cost analysis, both overall and by evidence-based model. Appendix Table C.1 shows the distribution of local programs by evidence-based model and by local program characteristics in the MIHOPE cost analysis, compared with the full MIHOPE study.

[8]Steuerle et al. (2016); Workgroup (2013); Haddix et al. (2003).

[9]This approach is often referred to as "micro-costing" and is recommended by the National Academies of Sciences, Engineering, and Medicine. Steuerle et al. (2016); Workgroup (2013); Haddix, Teutsch, and Corso (2003).

[10]Appendix E includes an example of this process, as well as a flowchart illustration.

[11]Appendix C includes further explanation and potential limitations encountered during data collection.

Table 2.2

Number of Local Programs in MIHOPE and in the MIHOPE Cost Analysis, by Evidence-Based Model

Evidence-Based Model	Full MIHOPE Sample (N)	Local Programs in MIHOPE Cost Analysis (N)
Early Head Start—Home-based option	19	12
Healthy Families America	26	23
Nurse-Family Partnership	22	17
Parents as Teachers	21	11
Sample size	88	63

SOURCE: Calculations based on data from the aggregate cost collection.

- **Program-level data were limited to aggregate expenditures.** The analysis did not include donated resources, such as labor, supplies, or space. Ideally, the analysis would include the value of donated resources because it would provide a more complete picture of the resources that a local program needs to deliver its home visiting program.[12] However, local programs in MIHOPE did not provide consistent information on donated resources. For the few sites that did report donated goods, these goods accounted for a very small percentage of expenditures.[13]

- **Methods for annuitization were not standardized across local programs.** The costs for some resources occur during the year of expenditure reporting while the use of these resources continues for several years. Typical examples are capital expenditures (such as a building, computer, or vehicle) and training of new staff members. The costs for these resources should be presented as annual amounts over their useful life to spread the investment over time and more accurately reflect costs over time.[14] The MIHOPE cost analysis relied on the accounting practices of local programs to provide those annualized values. The analysis ensured that the full costs of capital expenditures were not included in the expenditure reports. However, the lack of a standardized annuitization process across all local programs could have resulted in minor differences (a few percentage points, at most) in the analysis of resource allocation.

- **New-hire training costs and costs associated with attrition are not included.** Because MIECHV funding allowed many programs to expand, many local programs trained more newly hired home visitors than is typical. Because it was not possible to distinguish between home

[12]Steuerle et al. (2016).

[13]Home visitors could show donated goods for specific families by entering items with zero cost into the family service log. Based on the categories of those goods (for example, food or formula, bus tokens for transportation, and medical supplies), the study team estimated that the average family received about $33 per year in these donated goods. In addition, program staff told the study team during data collection that donated goods represented little or no part of their program costs.

[14]Workgroup (2013).

visitors hired for program expansion and home visitors hired due to attrition, this report includes training only for ongoing professional development. By leaving out costs of attrition, this analysis risks understating the costs of program implementation; however, including all new-hire training costs during this period of expansion would largely overstate the costs of operating a home visiting program on an ongoing basis. In addition, the costs of training new staff varied widely among the sample of local programs because some sites paid to have their home visitors trained while others had this cost covered by the state-level administering body. Focusing the cost analysis on ongoing professional development placed the programs on more equal footing.

- **Estimates of family-specific costs do not capture all services that might benefit families.** As noted above, total costs for each family are a combination of (1) costs that can be linked to specific families based on information in the family service logs and (2) the family's share of general program expenditures. Although the family service logs provide accurate information on time and materials used directly with families, they might understate the costs for providing family-specific services. For example, the time that a supervisor spends discussing a family with the home visitor was not captured in the family service logs and therefore could not be allocated to that family. In addition, costs classified as general program expenditures might benefit specific families. For example, training is included in general program expenditures but presumably helps the home visitor better serve the specific families on that home visitor's caseload.

HOW THE MIHOPE COST ANALYSIS COMPARES WITH OTHER HOME VISITING COST ANALYSES

Since cost estimates may not be directly comparable across different studies or sources, it is important to know the differences in study goals, data sources, analysis approaches, and time periods. Table 2.3 describes how the MIHOPE cost analysis differs from the cost analysis for the Supporting Evidence-Based Home Visiting to Prevent Child Maltreatment (EBHV) initiative, which is the only other cost comparison of home visiting programs with data collected at the local program level, and which collected information on costs from July 1, 2011, through June 30, 2012.[15]

The MIHOPE cost estimates also differ from those available in the Washington State Institute for Public Policy (WSIPP) review and in the U.S. Department of Health and Human Services' Home Visiting Evidence of Effectiveness (HomVEE) database. Specifically, the MIHOPE cost analysis differs from these two reviews in terms of the data used to estimate cost per family. MIHOPE used the MIHOPE weekly service logs, while WSIPP used average costs provided by national and regional offices for the evidence-based models, supplemented with information on average program

[15]Burwick and Zaveri (2014).

Table 2.3

Comparison of Cost Estimation Approaches in MIHOPE and EBHV

Study Characteristic	MIHOPE Cost Analysis	EBHV Cost Analysis
Key question	How much does it cost to serve a family for the initial 12 months of participation?	How much does it cost to serve a family for the average duration of program participation?
Type of study	Cohort; sample of families that were followed for 12 months after enrollment.	Cross-sectional; local program-level average weekly costs per participating family (not limited to the first year of enrollment) were estimated.
Method for estimating family-level costs	Individual service delivery to families tracked using the MIHOPE weekly service logs, which allowed for individual family cost estimates.	Average weekly cost to serve a family at local programs multiplied by the average duration of participation at the local program to produce an average cost to serve a family.
Evidence-based models included in study	Early Head Start—Home-based option, Healthy Families America (HFA), Nurse-Family Partnership (NFP), and Parents as Teachers (PAT).	HFA, NFP, PAT, SafeCare, and the Positive Parenting Program (Triple P).
Cost per-family estimates for HFA, NFP, and PAT	$3,244 for HFA, $5,360 for NFP, $2,592 for PAT per family for the first year of participation.	$5,615 for 33 weeks of participation in HFA, $8,003 for 55 weeks of participation in NFP, and $2,372 for 36 weeks of participation in PAT per family.

SOURCES: MIHOPE cost analysis estimates based on data from the aggregate cost collection; EBHV cost estimates based on Burwick and Zaveri (2014).

duration, and HomVEE reports on cost estimates found in the research literature and reported to HomVEE by the models.

SUMMARY

This chapter has described the goals and methods used in the analyses presented in Chapters 3 and 4 of this report. In sum, local program expenditure reports are used to compare resource allocation across programs, and the family-specific activities cost analysis takes advantage of the rich information collected by MIHOPE to provide insight into home visiting program activities and the costs across different types of families and different evidence-based models. The next two chapters present the report's main findings, first presenting information on how local programs allocate costs across the different resource categories and then discussing how much it costs to provide each MIHOPE family with home visiting services for a year and how that varies across families and local programs.

3

The Allocation of Resources at Home Visiting Programs

This chapter describes how local programs in the Mother and Infant Home Visiting Program Evaluation (MIHOPE) allocated expenditures over a one-year period.[1] The chapter examines personnel costs compared with non-personnel costs. The chapter also investigates the types of expenditures within each category, providing the average distribution of resources among local programs and describing the variation in resource allocation by evidence-based model.

KEY FINDINGS

- **Local home visiting programs spent the largest share of their budgets on personnel.** Personnel compensation, which includes salaries and benefits for home visitors as well as for non-home visitor staff (such as supervisors, program administrators, and specialists), accounted for nearly 80 percent of local program expenditures, on average, over a one-year period.[2] The percentage varied across local programs but was similar across the evidence-based models.

- **Two-thirds of personnel costs were for home visitor compensation, while the remaining one-third covered compensation for non-home visitor staff such as supervisors, program administrators, and specialists.** Based on the data provided to MIHOPE by local home visiting programs, home visitors typically account for more than two-thirds of a program's personnel, so, not surprisingly, their compensation comprised more than half of total expenditures (personnel and non-personnel costs) on average, although this amount varied across local programs and across evidence-based models.

[1]Appendix Table D.1 reports an aggregate summary of local program expenditures and service delivery, by evidence-based model.

[2]Throughout the report, the term "compensation" includes salaries and benefits.

CLASSIFICATION INTO PERSONNEL AND NON-PERSONNEL CATEGORIES

Table 3.1 shows how home visiting costs were allocated for the average local program in the MIHOPE cost analysis sample over a one-year period.[3] It also shows the range of allocations across the local programs.[4]

Table 3.1

Variation in Allocation of Personnel and Non-Personnel Costs Among Local Programs in the MIHOPE Cost Analysis

Resource Category (%)	Mean	Minimum	Maximum
Personnel	79.1	48.2	95.4
Home visitor compensation	53.1	20.0	88.3
Non-home visitor compensation	26.0	1.2	65.5
Non-personnel	20.9	4.6	51.8
Program supplies	2.6	0.0	14.8
Travel to home visits	2.7	0.4	10.4
Office supplies	2.5	0.0	10.9
Durable equipment	1.1	0.0	16.4
Office space and other facilities	2.8	0.0	8.9
Training	0.9	0.0	6.1
Other	8.3	0.0	45.9
Sample size	63		

SOURCE: Calculations based on data from the aggregate cost collection.

NOTE: Percentages may not sum to 100 due to rounding.

Personnel Costs

Home visiting programs employ many types of staff, including home visitors, supervisors, program directors, early education coordinators, interpreters, special needs coordinators, mental health coordinators, and administrative support staff.[5] The MIHOPE cost analysis found that expenditures for personnel account for nearly 80 percent of local program expenditures, on average. Personnel costs include salary and fringe benefits for home visitors and for other program staff, such as supervisors

[3]Appendix Table F.1 shows the allocation of spending by evidence-based model.

[4]Several local programs did not conduct training or purchase equipment or supplies during the year the expenditure data was collected. Ten programs reported no facilities costs. As discussed in the limitations section of Chapter 2, the lack of accounting for donated resources (like space) and standardized annuitization is unlikely to affect the estimates of total expenditures presented in this report by more than a few percent.

[5]For staff members who split their time among multiple programs, site administrators indicated the proportion of time that should be allocated to home visiting program personnel costs.

and administrative staff. This large share of overall expenditures is consistent with expenditure patterns in other social service programs.[6]

Table 3.1 indicates that local program allocations for personnel compensation range from a low of 48.2 percent to a high of 95.4 percent, while Figure 3.1 shows the range of amounts allocated to personnel by local programs. In Figure 3.1, each local program's personnel allocation is represented by a circle, and the average personnel allocation for each of the four evidence-based models is shown by the vertical lines. Results are shown by evidence-based model to demonstrate that the proportion of expenditures on personnel is similar across the four models. Despite the wide range in personnel allocation overall, nearly three-fourths of the circles are between 70 percent and 90 percent, showing that most local programs, regardless of evidence-based model, allocate similar amounts to personnel.[7]

Compensation for home visitors (including salaries and benefits) accounts for most of local programs' personnel costs. Specifically, the MIHOPE cost analysis found that home visitor compensation accounts for about 67 percent of personnel costs and more than half (53 percent) of all expenditures (personnel and non-personnel) over a one-year period. Home visitor full-time employees (FTEs) make up over 66 percent of all home visiting program FTEs on average. Home visitor compensation is not higher, on average, than for other program staff.

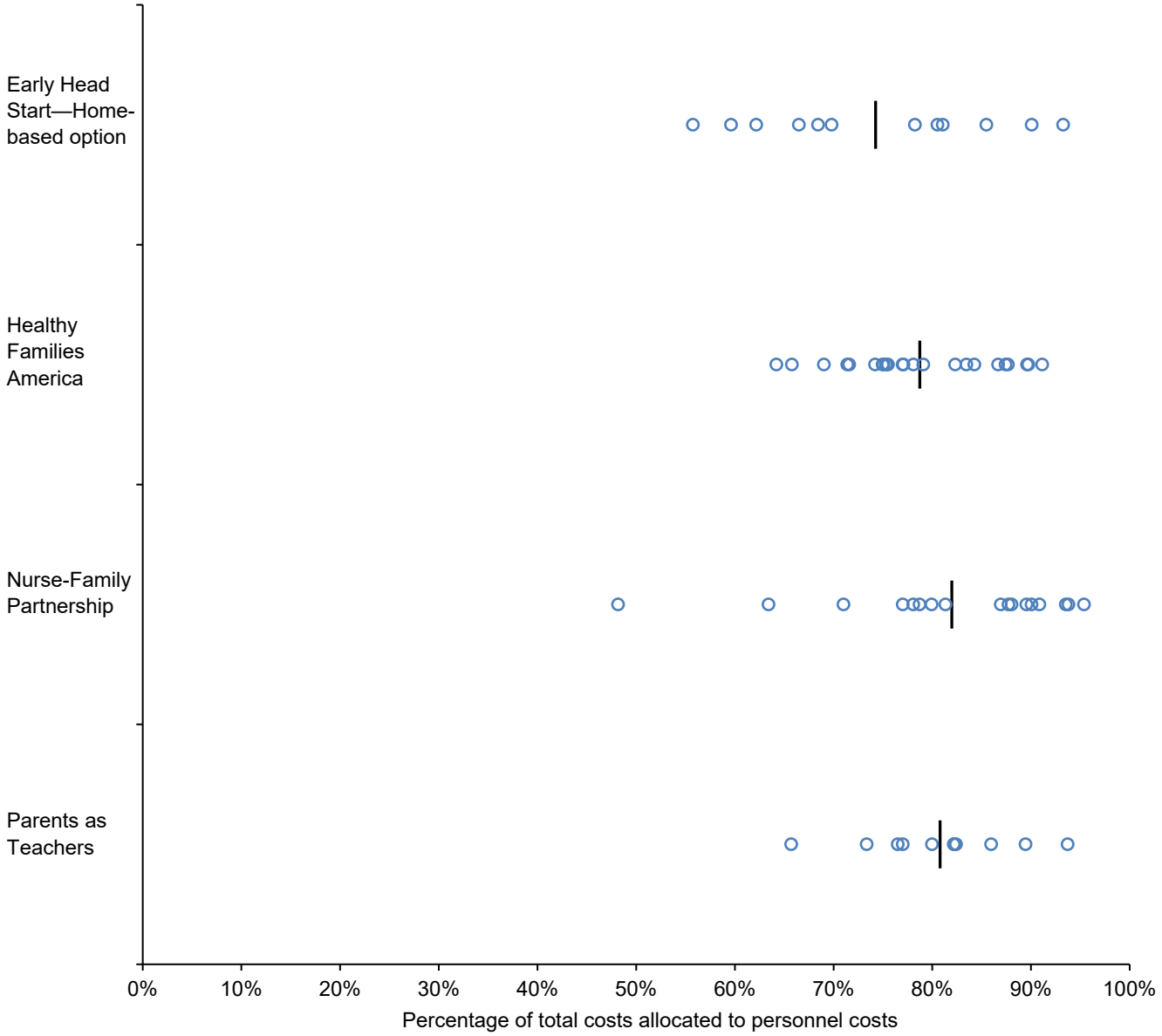
Figure 3.2 shows the average allocation of personnel costs to home visitor compensation for each evidence-based model. Home visitor compensation made up most personnel costs, on average, for all four models; however, differences remained in the proportion of personnel costs dedicated to home visitors. Home visitor compensation made up a smaller share of personnel costs (57 percent) for Early Head Start—Home-based option (EHS) programs than for other evidence-based programs. This finding is consistent with expectations for EHS, as its non-home visitor staff provide a broad range of other services (not just home visiting) to families, while other evidence-based models more frequently focus their contact with families on home visiting and refer externally for other services. Nurse-Family Partnership (NFP) programs, on the other hand, spent a higher proportion of personnel costs on home visitors (76 percent). This finding is consistent with the fact that NFP home visitors receive higher hourly compensation on average than some NFP non-home visitor personnel as well as higher average hourly compensation than home visitors in other evidence-based models. (Information on home visitor compensation is presented in Chapter 4.) Higher average hourly compensation for NFP home visitors might be due to their being registered nurses, although the analysis did not assess whether being registered nurses is why NFP home visitor hourly compensation is higher. On average, home visitor compensation accounted for 64 percent and 67 percent of personnel costs in Healthy Families America and Parents as Teachers programs, respectively.

[6]Yates (1996).

[7]Appendix G includes a sensitivity analysis that examines the influence of geographic variation in costs on home visiting personnel costs.

Figure 3.1

Variation in Allocation of Personnel Costs Among Local Programs in the MIHOPE Cost Analysis, by Evidence-Based Model

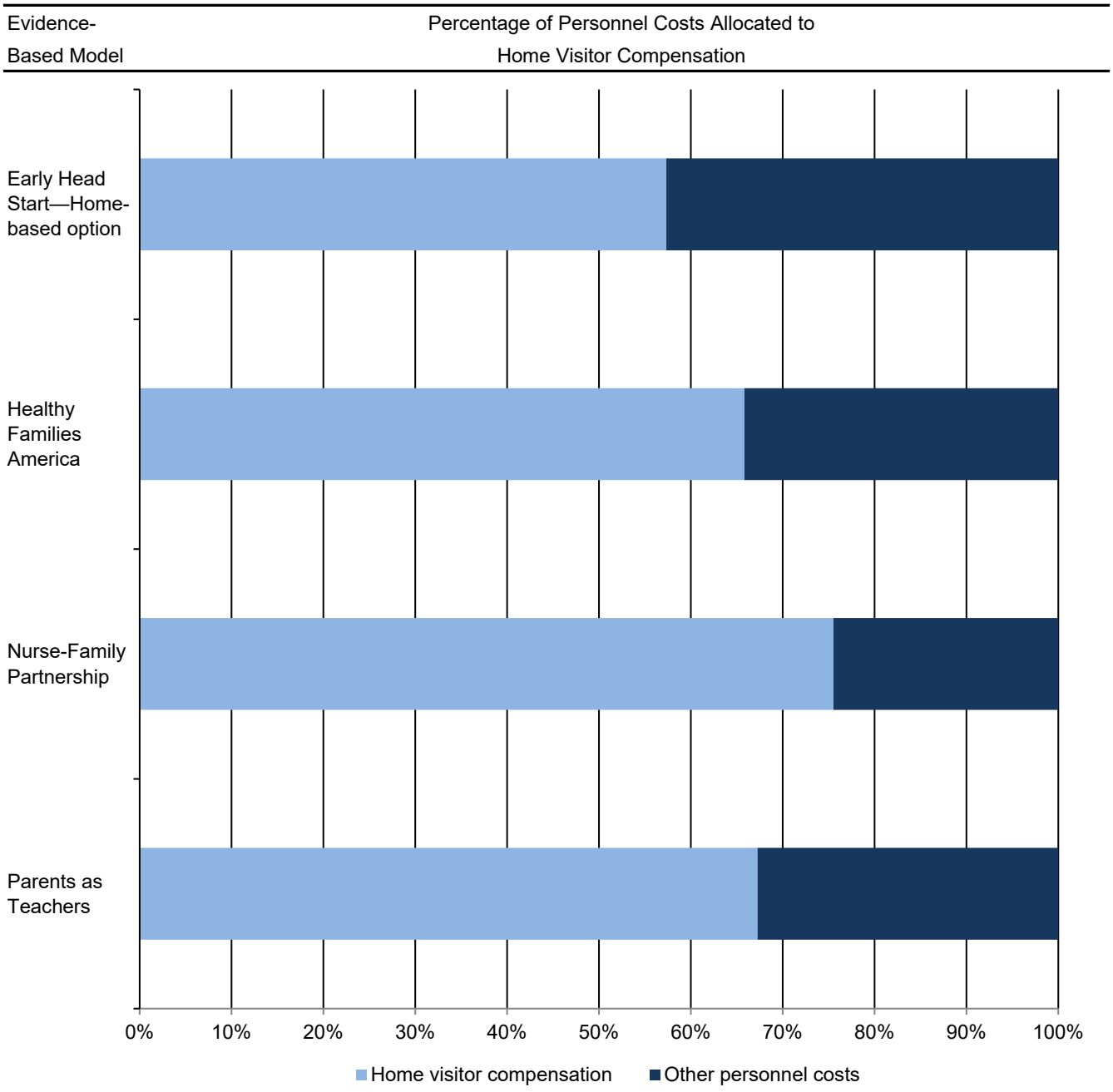


SOURCE: Calculations based on data from the aggregate cost collection.

NOTES: The vertical line (|) in each distribution denotes the mean for that evidence-based model.
Sample of local programs (overall sample size = 63, Early Head Start—Home-based option sample size = 12, Healthy Families America sample size = 23, Nurse-Family Partnership sample size = 17, and Parents as Teachers sample size = 11) is limited to those that provided sufficient information to calculate costs. (See Table 2.1.)

Figure 3.2

Allocation of Personnel Costs to Home Visitor Compensation Among Local Programs in the MIHOPE Cost Analysis, by Evidence-Based Model



SOURCE: Calculations based on data from the aggregate cost collection.

NOTE: Sample of local programs (overall sample size = 63, Early Head Start—Home-based option = 12, Healthy Families America = 23, Nurse-Family Partnership = 17, and Parents as Teachers = 11) is limited to those that provided sufficient information to calculate costs. (See Table 2.1.)

Non-Personnel Costs

Because personnel costs account for nearly 80 percent of local program expenditures overall, non-personnel costs account for about 20 percent of their expenditures. Applying categorizations of non-personnel costs typically used in cost analyses, the MIHOPE cost analysis further divided up non-personnel costs into the following sub-categories (also shown in Table 3.1 and Figure 3.3):

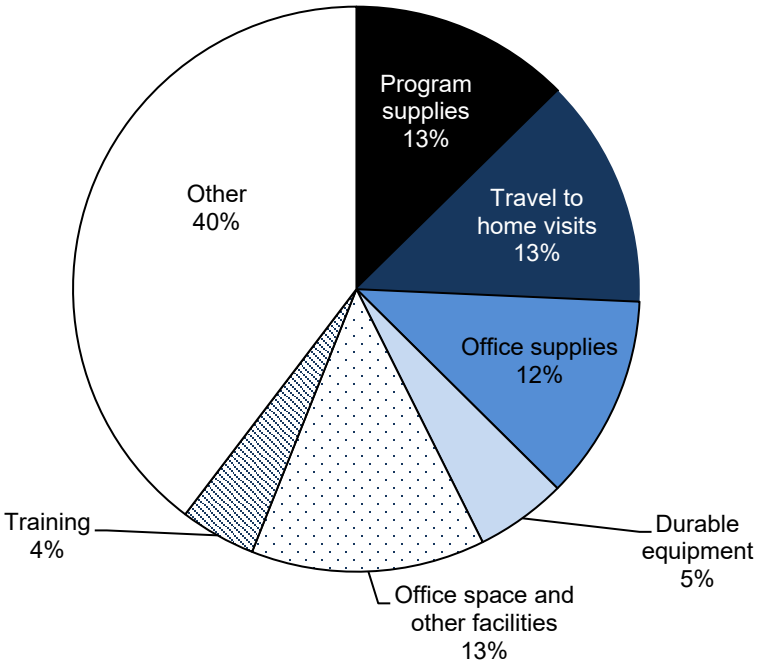
- Program supplies
- Travel to and from home visits[8]
- Office supplies
- Durable equipment
- Office space and other facilities
- Training for ongoing professional development
- Other[9]

[8]Travel costs to and from home visits include mileage reimbursements or agency vehicle costs. Home visitor time related to travel to and from home visits is included under home visitor personnel costs.

[9]Examples of other costs include local program fees (for example, membership fees, professional fees, licensing fees, affiliation fees), as well as expenditures such as liability insurance and background checks for employees.

Figure 3.3

Average Non-Personnel Resource Allocation for Local Programs in the MIHOPE Cost Analysis



SOURCE: Calculations based on data from the aggregate cost collection.

NOTE: Sample of local programs (sample size = 63) is limited to those that provided sufficient information to calculate costs. (See Table 2.1.)

SUMMARY

This chapter has shown that staff compensation accounted for the majority of spending by home visiting programs, and that local programs were relatively uniform in how much they spent on personnel. The next chapter presents estimates of the cost to local programs for serving a family during the family's first year of home visiting. It provides information on the costs of serving individual families, how those costs are divided into different activities, and how costs vary across local programs and types of families.

4

The Cost to Serve a Family During the Family's First Year

Chapter 3 described the allocation of program expenditures by categories of types of spending for home visiting programs included in the Mother and Infant Home Visiting Program Evaluation (MIHOPE) cost analysis sample. This chapter presents how much is spent by local programs to provide each family with home visiting services over the first year a family is enrolled in the home visiting program.[1] This chapter also explores how these costs vary by evidence-based model and with the characteristics of families and local home visiting programs. Finally, the chapter provides details on the costs that can be tied to each family served in the home visiting program (for example, face-to-face time with home visitors).

KEY FINDINGS

- **Local program costs for serving a family during its first year of home visiting varied considerably, with the cost for the middle half of families between $1,304 and $5,788 per year.[2]** Twenty-five percent of families had first-year costs below $1,304 and 25 percent had first-year costs above $5,788. This wide variation in costs for families is associated with the variation in the number of home visits received over the time period, the compensation of the home visitor delivering the visits, and the proportion of total expenditures dedicated to general program expenditures by the administering program.[3]

- **Data from the MIHOPE family service logs reveal that total home visitor personnel time was highest for Early Head Start—Home-based option (EHS) program families on average, while total home visitor personnel costs were highest for Nurse-Family Partnership (NFP) program families on average.** EHS home visitors spent more time with families on average than those of other evidence-based models, as expected based on the model's guidelines for visit frequency and length. The average hourly compensation of NFP nurse home visitors was twice

[1]The analysis included only families that received at least one home visit.

[2]In other words, costs for these families were between the 25th and 75th percentile of costs for all families.

[3]Programs with a higher relative allocation to "general" expenditures than to "family-specific" expenditures (usually meaning more non-home visitor staff) have additional service costs reflected in the costs per family.

as high as for home visitors of other evidence-based models, which is consistent with the professional qualifications required by NFP.

- **Average local program costs for serving a family were higher for NFP and EHS ($5,351 and $4,808, respectively), and lower for Healthy Families America (HFA) and Parents as Teachers (PAT) ($3,238 and $2,568, respectively).** This variation in average costs per family by model is consistent with differences between the models' home visit guidelines, staffing requirements, and overall program structure. For example, the higher costs of NFP programs are consistent with the model's requirement that home visitors be nurses (who are paid more than other types of home visitors, as discussed below, although the analysis did not explore whether requiring that home visitors be nurses is why NFP home visitor compensation is higher), and the higher costs of EHS programs are consistent with the model's relatively intensive guidelines for visit frequency and length, as well as the higher proportion of non-home visitor program staff. Differences in costs across the models are also consistent with a finding from the MIHOPE implementation research that families participated in home visiting for more months on average for NFP and EHS than for HFA and PAT.[4] Although average costs varied across the four evidence-based models, there was considerable overlap across the models in the costs to serve families at individual local programs.

TOTAL COSTS OF SERVING A FAMILY DURING THE FIRST YEAR

As discussed in Chapter 3, home visiting programs incur many types of expenses in providing home visiting services, particularly personnel costs.[5] Because personnel costs are such a large component of program costs, the cost to serve a family tends to vary across local programs according to the amount of time home visitors spend with families (including frequency and length of individual home visits as well as how long a family remains in a program) and how much home visitors are paid (which might depend on their professional qualifications and experience). The number of non-home visitor staff serving families would also influence how much costs vary across local programs. The amount that programs spend providing services could also be influenced by family risk levels, the size of the area a program serves, and the type of agency where the local program is housed.

As described in the MIHOPE implementation research report, families varied in how long they participated in home visiting.[6] This resulted in a wide range of costs per family. To demonstrate this range, the MIHOPE cost analysis reports the cost per family for the middle half of families (that is, the families that fell between the 25th and the 75th percentiles of costs, also called the "interquartile

[4]Duggan et al. (2018).

[5]The sensitivity analysis in Appendix G includes a geographic adjustment to personnel costs to identify any influence of geographical variation in the cost of living on home visiting personnel costs.

[6]Duggan et al. (2018).

range of cost per family").[7] Specifically, the cost per family for the middle half of families was between $1,304 and $5,788. Conversely, this means that the cost per family for one-fourth of families fell below $1,304 (the 25th percentile) while the cost per family for one-fourth of families was greater than $5,788 (the 75th percentile).

Costs Per Family by Evidence-Based Model

Figure 4.1 depicts the variation in cost per family by evidence-based model, providing the range of first-year costs for the middle half of families as well as the average cost per family within each model.[8]

As seen in Figure 4.1, the range of costs per family for the middle half of families (25th to 75th percentiles) is at least $2,500 for each evidence-based model. There is also considerable overlap across models (as represented by the blue bars in Figure 4.1). For example, costs for the middle half of families range from about $1,500 to $6,400 for EHS, from about $1,000 to $4,700 for HFA, from about $2,900 to $7,400 for NFP, and from about $1,150 to $3,650 for PAT. However, the average local program costs per family (as represented by the black lines in Figure 4.1) are statistically significantly different across the models (as shown in Appendix Table H.1).[9] Specifically, average first-year costs were higher for families served in local programs that implemented NFP ($5,351) and EHS ($4,808), and lower for families served in local programs that implemented HFA ($3,238) and PAT ($2,568).[10]

The model-specific differences in average costs per family are likely due to the ways in which the evidence-based models differ in home visit guidelines, staffing requirements, and overall program

[7]The report does not present the average cost per family for the full MIHOPE cost analysis sample because average costs vary substantially across evidence-based models and because the composition of evidence-based models in the MIHOPE cost analysis sample differs from the national composition of MIECHV-funded local programs. For those reasons, average cost per family across the full MIHOPE cost analysis sample would not accurately reflect costs of home visiting services funded through MIECHV. However, the report presents average costs by evidence-based model because costs vary less within a model and average costs by model are more likely to reflect real differences across the models. For example, as discussed in the text, average costs are higher for NFP and EHS than for HFA and PAT, which is consistent with NFP's use of nurses as home visitors and the greater frequency and length of home visits in EHS. Nonetheless, it is possible that average costs by evidence-based model do not reflect average costs nationally for those models since the MIHOPE sample included a particular set of local programs. For example, MIHOPE included local programs that were more likely to be in urban areas.

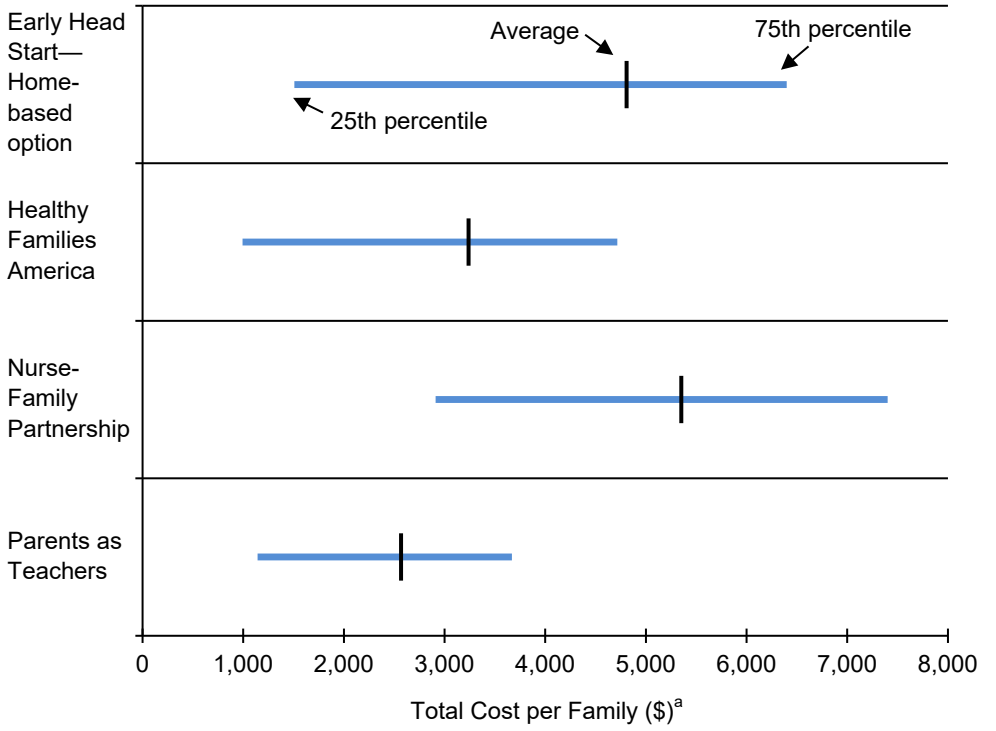
[8]Figure 4.1 summarizes information from 1,215 families in the 63 local MIHOPE programs that provided information to the study team on program costs (described in Chapter 2). Appendix Table H.1 provides further detail on the cost per family by evidence-based model.

[9]Appendix Table H.1 contains the average cost per family and interquartile range for each evidence-based model.

[10]The analysis tested whether average costs differed across the four evidence-based models, but it did not conduct significance tests across pairs of models. That is, the analysis did not test whether estimated costs for any one model were significantly different than estimated costs for any other model.

Figure 4.1

Variation in the Total Cost of Serving a Family During the First Year of Home Visiting, by Evidence-Based Model



SOURCE: Calculations based on data from the MIHOPE family service logs and aggregate cost collection.

NOTES: Sample includes families at local programs that provided sufficient information to calculate costs. (See Table 2.1.) Overall sample size = 1,215 families, Early Head Start—Home-based option sample size = 137, Healthy Families America sample size = 511, Nurse-Family Partnership sample size = 386, and Parents as Teachers sample size = 181. Tabulated results are shown in Appendix Table E.5.

[a]Costs are reported as 2014 US dollars.

structure, as well as differences in how many home visits were received in the family's first year, as discussed below.[11]

Intended frequency and length of home visits. The models that participated in MIHOPE differ in their guidance concerning frequency and length of home visits:

- EHS schedules weekly home visits for a minimum of 90 minutes throughout a family's participation in the program.

[11]The analysis focused on a subset of characteristics described in the MIHOPE implementation research report that were most likely associated with costs.

- HFA and NFP recommend visits of approximately 60 minutes, with weekly visits after the child's birth, and less frequent visits during other times for most families.

- PAT specifies monthly, biweekly, or weekly visits lasting approximately 60 minutes, depending on families' needs.

The higher average costs for EHS are consistent with these differences in model guidance.

Home visitor qualifications. As discussed in Chapter 1, NFP requires that home visitors be nurses while the other three evidence-based models allow local programs to establish hiring criteria, but most require home visitors to have relevant experience or knowledge. In general, home visitors with more education and credentials can command higher wages in the labor market, and the higher hourly compensation of NFP nurse home visitors is the primary contributor to the higher costs for NFP programs.

The local program's resource allocation. As discussed in the analysis approach section of Chapter 2, the cost to serve a family includes both family-specific costs and general program costs. The analysis used the MIHOPE family service logs to directly assign family-specific costs, and then the analysis proportionally assigned the general program costs to individual families using data from the administering program's expenditure report. Families at local programs with a higher proportion of expenditures dedicated to general program expenditures (the ratio discussed in Appendix E) thus had higher total costs when family-specific costs were equal. For example, if Program A employs more non-home visitor personnel and has relatively higher operating costs than Program B, then families participating in Program A will have higher total costs than those in Program B if the family-specific costs are equal. Therefore, the relatively higher proportion of general program expenditures at EHS programs, due in part to the higher proportion of non-home visitor personnel at these programs, is reflected in the total cost per EHS family.[12]

Family participation in home visits in the first year. Families served by EHS and NFP programs in MIHOPE received more home visiting services in the first year than did families in HFA and PAT in several dimensions such as receiving any home visit, number of months receiving home visits, number of home visits, and length of home visits.[13] For example, 93.5 percent of families served by EHS received at least one home visit compared with about 80 percent for the other three models. Families received home visiting services for more months if they were served by EHS (8.0 months) and NFP (8.9 months) than if they were served by HFA (7.6) or PAT (7.4), and they were more likely to still be enrolled in services after one year if they were served by NFP (55.7 percent) than if served by the other models (42.2 percent to 45.6 percent). Finally, families received more visits in the first year if they were served by EHS than if they were served by one of the other models. These differences help explain why average costs were higher for serving families in EHS and NFP.

[12]The ratio of general program expenditures to family-specific activities by evidence-based model is shown in Appendix Table H.2.

[13]Duggan et al.(2018).

Examining Variation in Costs by Family Characteristics

A key feature of home visiting programs funded by the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program is targeting services to families based on their needs. Therefore, it could be helpful to know whether specific family characteristics are associated with higher resource use. To provide some information on this, the cost analysis chose to analyze costs for three family characteristics: age of the mother, whether the mother was pregnant at the time of study entry, and whether the mother was a first-time mother. The team chose these family characteristics because they arose as key dimensions in which costs potentially varied across families, based on the MIHOPE implementation research finding variation in home visiting dosage for these groups, and because these groups are relevant to MIECHV policy.

- **Maternal age.** The MIHOPE implementation research found younger mothers participated in home visiting for less time, suggesting costs might be lower for serving this group.[14] In addition, pregnant women under the age of 21 are identified as a targeted population for MIECHV-funded home visiting programs.[15]

- **Pregnancy status.** The MIHOPE implementation research found that pregnant women served by EHS and HFA were more likely than other mothers served by these evidence-based models to participate in home visiting for a year.[16] As mentioned above, pregnant women under the age of 21 are identified as a target population for MIECHV-funded home visiting programs.[17]

- **First-time mother.** The MIHOPE implementation research found that first-time mothers were less likely than other mothers in MIHOPE to receive any home visits, suggesting costs might be lower for this group of women.[18]

Contrary to these hypotheses, as shown in Figure 4.2, costs were similar for providing home visiting to younger and older mothers during the first year ($4,155 versus $3,883, on average); to women who were and were not pregnant at the time of study entry ($3,371 versus $3,328, on average); and to women who were and were not first-time mothers ($3,172 versus $3,532, on average).[19]

[14]Duggan et al. (2018).

[15]SEC 511 [42 U.S.C. 711] (d) (4) (C).

[16]Duggan et al. (2018).

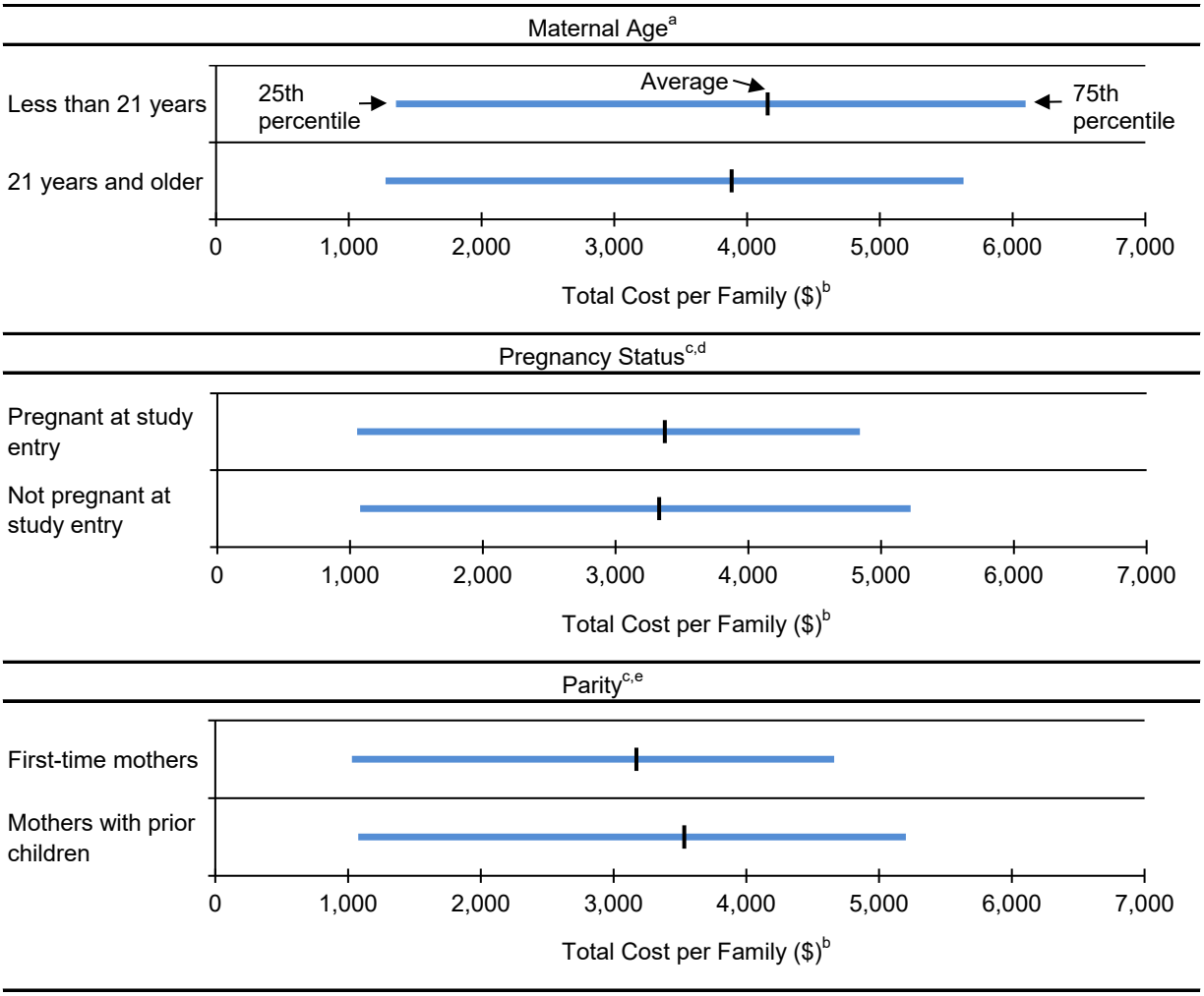
[17]Since NFP serves only pregnant women, it is not possible to examine how the costs of NFP compare for pregnant women and other women. For that reason, the analysis used information on costs only for the other three evidence-based models.

[18]Duggan et al. (2018).

[19]Appendix Table H.4 shows results stratified by evidence-based model.

Figure 4.2

Variation in Total Costs of Serving a Family During the First Year of Home Visiting, by Maternal Characteristics at Study Entry



SOURCES: Calculations based on data from the MIHOPE family service logs, the MIHOPE family baseline survey, and aggregate cost collection.

NOTES: Sample includes families at local programs that provided sufficient information to calculate costs. (See Table 2.1.) Overall sample size = 1,215 families. Tabulated results are shown in Appendix Table E.6.

[a]Less than 21 years sample size = 462; 21 years and older sample size = 753.

[b]Costs are reported as 2014 US dollars.

[c]Since all mothers in Nurse-Family Partnership are required to be pregnant at enrollment and first-time mothers, results for these characteristics are only shown among families in Early Head Start—Home-based option, Healthy Families America, and Parents as Teachers (overall sample size = 829).

[d]Pregnant at study entry sample size = 448; not pregnant at study entry sample size = 381.

[e]First-time mothers sample size = 416; mothers with prior children sample size = 401.

Examining Variation in Costs by Local Program Characteristics

Characteristics of the local program or its context may also be related to costs of serving families. The analysis examined three characteristics of local programs:

- **The urbanicity of the county in which local programs operate.**[20] Costs of resources such as labor and rent tend to be higher in metropolitan areas, so the costs of home visiting may be higher as well.

- **The type of agency delivering home visiting services.**[21] Variations in the organizational structure across agency type may have implications for how costs are allocated to provide home visiting services within different types of agencies. In addition, the completeness of cost information provided by local home visiting programs may have varied by agency type, contributing to this variation.

- **The enrollment capacity of the home visiting program.** Larger programs may be able to spread fixed costs across a larger number of families, which would reduce the average cost to serve families.

Figure 4.3 shows there is some variation in costs of local programs for serving a family across each of these dimensions, but the differences in average costs for serving families by urbanicity of county and by enrollment capacity are not statistically significant.[22] There were statistically significant differences, however, based on the type of local implementing agency, with higher costs of serving families when the home visiting program was located in a health department ($5,608, on average) than in community-based nonprofits ($3,764, on average), health care organizations ($3,347, on average), school districts ($1,781, on average), and other types of agencies ($3,704, on average).[23] Because NFP served 188 of the 240 families served through local health departments, the study team also ran analyses with only families in EHS, HFA, and PAT to determine if the higher costs associated with health departments were found when NFP costs were removed from the sample. The results, shown in Appendix Table H.6, indicate that HFA was the only other evidence-based model in MIHOPE that operated programs through local health departments. For HFA, costs per family were higher, on average, for programs that operated in local health departments, and these

[20]Consistent with other parts of MIHOPE, the analysis classified the county served by the local program as metropolitan, non-metropolitan, or both.

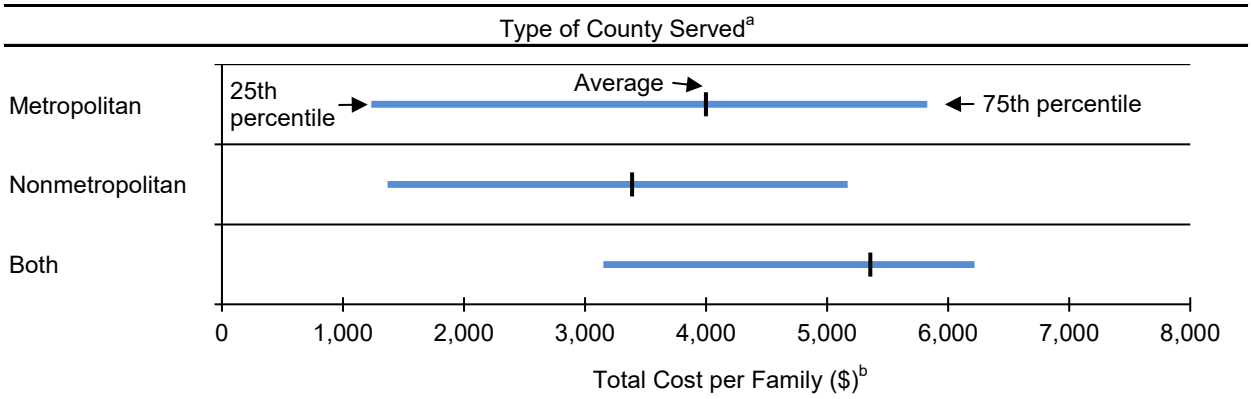
[21]The types of agencies in the sample included nonprofit organizations, local health departments, local school districts, health care organizations, and other types of agencies (local government and cooperative extensions, universities, and social service nonprofit agencies).

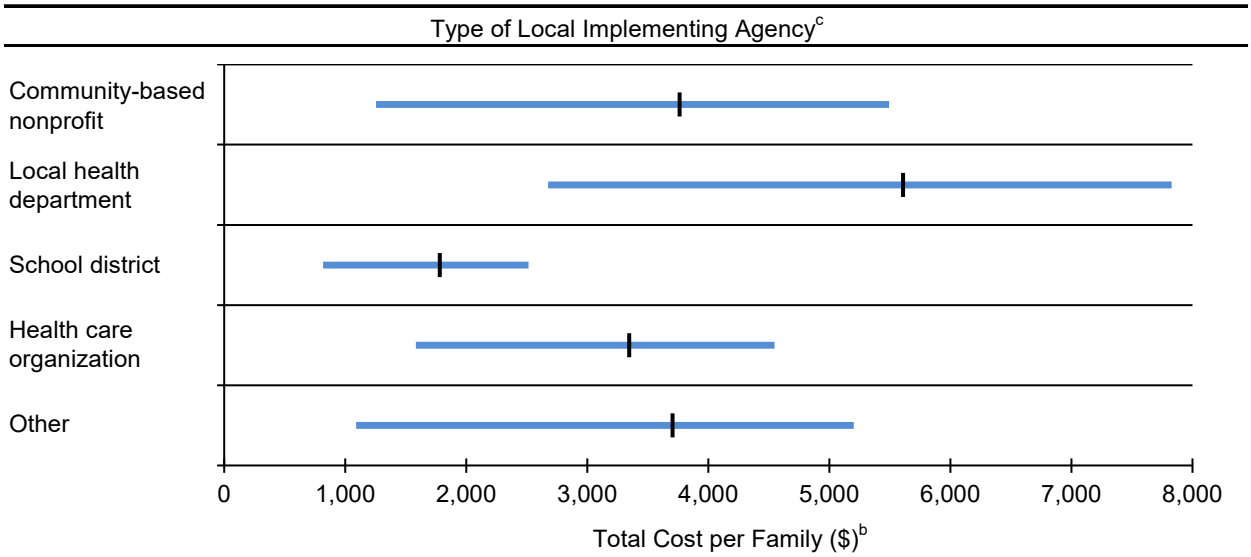
[22]Appendix Table H.1 shows results by evidence-based model.

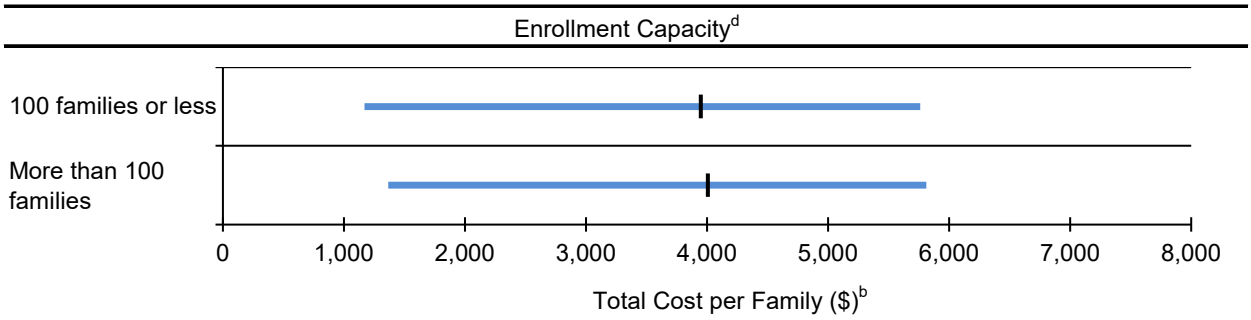
[23]In other words, average costs differed significantly by type of implementing agency, and average estimated costs were highest for health departments and lowest for school districts. However, significance tests were not conducted between pairs of types of implementing agencies, such as between health departments and school districts or community nonprofits and health care organizations.

Figure 4.3

Variation in Total Costs of Serving a Family During the First Year of Home Visiting, by Local Program Characteristics







(continued)

Figure 4.3 (continued)

SOURCES: Calculations based on data from the MIHOPE family service logs, aggregate cost collection, MIHOPE program manager baseline survey, and the MIHOPE site-selection team.

NOTES: Sample includes families at local programs that provided sufficient information to calculate costs. (See Table 2.1.) Overall sample size = 1,215 families. Tabulated results are shown in Appendix Table E.7.

[a]To designate counties as metropolitan or nonmetropolitan, this report follows the Department of Agriculture Economic Research Service's Rural-Urban Continuum Codes classification scheme (Economic Research Service, 2013). Metropolitan sample size = 980; nonmetropolitan sample size = 169; both sample size = 66.

[b]Costs are reported as 2014 US dollars.

[c]Other types of organizations include state-funded institution of higher education, local governments and cooperative extension, university, social service nonprofit, and Community Action Agency. Community-based non-profit sample size = 726; local health department sample size= 240; school district sample size = 58; health care organization sample size = 126; other sample size = 65.

[d]Enrollment capacity is the number of families that can be served at any one time. One hundred families or less sample size = 406; more than 100 families sample size = 809.

costs differed significantly by type of agency. Additionally, costs for serving families in the first year were $1,781 on average for home visiting programs located in school districts; however, because almost all (54 of the 58) families in school district programs were served by PAT, it is difficult to say whether the lower costs are attributable to the PAT model or to implementation in a school district.

FAMILY-SPECIFIC FIRST-YEAR COSTS[24]

This section examines the costs of family-specific activities to investigate variations in direct resource provision to families. As described in Chapter 2, the total cost to serve a family includes both family-specific costs and general program costs. General program costs are proportionally assigned to each family using data from the administering program's expenditure report, and costs for family-specific activities are directly assigned to each family based on information in the MIHOPE family service logs. Specifically, the MIHOPE family service logs include:[25]

- Total number of home visits the family received (face-to-face contact)
- Total number of attempted visits with the family that were not completed[26]
- Total number of minutes of face-to-face contact with the family during home visits

[24]First-year costs that could be linked to specific families were available for the MIHOPE sample of 1,671 families in 88 local programs that received at least one home visit; however, investigation of the variation in these costs for the sample of families that received at least one home visit did not change the conclusions reached for the analysis of the MIHOPE cost analysis sample of 1,215 families from 63 local programs. Appendix G compares results for the full MIHOPE sample to those for the MIHOPE cost analysis sample.

[25]Appendix E describes how information from the MIHOPE family service logs was used to calculate individual cost components.

[26]These include cancelled visits, visits where the mother was not home or did not come to the visit, and other cases where the scheduled in-person home visit did not occur.

- Total number of minutes of non-face-to-face communication with the family (including phone, email, text, and social networking)
- Total number of minutes traveling to and from home visits (including completed home visits, cancelled home visits, and no-shows)[27]
- Total number of minutes spent preparing or following up on home visits and other contact with families
- Total number of minutes that staff other than the home visitor spent in face-to-face interactions with the family
- Types of materials provided to the family (for example, baby formula, transportation assistance, and medical supplies) and the approximate dollar value

This section examines these family-specific costs in more detail, investigating variation by evidence-based model, family characteristics, and local program characteristics. Appendix Table H.2 examines variation in the ratio of general program costs to the costs of family-specific activities by evidence-based model and local program characteristics.

The primary cost derived from the MIHOPE family service logs is the amount of home visitor time dedicated to each family. Components of the home visitor's time include time spent conducting visits, traveling to and from visits, and otherwise preparing for visits. Therefore, family-specific costs vary based on how much time a home visitor dedicated to that family (includes receiving visits and the length of visits) and how much the home visitor was paid.

Table 4.1 examines each component of family-specific costs, by evidence-based model. The average home visitor compensation per hour is presented in the top row, and the average amount of personnel time dedicated to each family during the first year is reported by component. The bottom two panels provide averages of the number of trips made by home visitors, and the average cost of materials provided to a family during the first year.

NFP home visitors are required to be nurses, which might be why NFP programs in the study reported home visitor hourly compensation almost twice as large as other evidence-based models. This relatively higher rate of compensation for NFP home visitors is the primary contributor to the higher family-specific costs for NFP programs.

[27]Appendix E describes how the analysis also includes travel reimbursements for home visits, typically in the form of mileage reimbursements from the local program.

Table 4.1

Variation in Family-Specific Cost Components of Serving a Family During the First Year of Home Visiting, by Evidence-Based Model

Family-Specific Cost Component	Overall		EHS	HFA	NFP	PAT
Home visitor compensation per hour ($)[a]	26.6	***	19.2	20.3	40.6	20.1
Local program personnel time (hours)						
Total personnel time	47.7	*	62.1	46.7	47.6	40.0
Completed home visits						
Home visitor time	21.4	***	33.0	20.7	20.3	16.8
Travel time	8.9		9.7	9.1	9.2	7.3
Other staff time at home visit	0.4	***	0.7	0.5	0.1	0.3
Scheduled but incomplete home visits[b]						
Travel and wait time	0.5	***	0.4	0.8	0.4	0.2
Other						
Phone, text, or remote online communication	3.6	*	4.8	3.8	2.9	3.5
Preparation and follow-up	12.9		13.3	11.8	14.7	11.7
Home visitor travel cost components						
Number of home visits where the home visitor traveled to the family						
Completed visits	18.6	***	23.5	20.3	16.3	15.2
Scheduled but incomplete home visits[b]	1.8	***	1.6	2.5	1.2	1.0
Cost per trip ($)[a,c]	8.1	**	5.6	7.5	10.2	8.5
Cost of materials given to family ($)[a]	55.3		41.6	60.5	57.2	47.2
Sample size[d]	1,215		137	511	386	181

SOURCES: Calculations based on data from the MIHOPE family service logs and aggregate cost collection.

NOTES: Rounding may cause slight discrepancies in sums. EHS = Early Head Start—Home-based option, HFA = Healthy Families America, NFP = Nurse-Family Partnership, PAT = Parents as Teachers.

Differences across evidence-based models were tested for statistical significance using a one-way ANOVA, accounting for clustering of families within local programs. Statistical significance levels are indicated as follows: ***=1 percent, **=5 percent, *=10 percent. The analysis did not conduct significance tests across pairs of models. That is, the analysis did not test whether estimated costs for any one model were significantly different than estimated costs for any other model.

[a]Costs are reported as 2014 U.S. dollars. Home visitor compensation includes salary and fringe benefits.

[b]These include cancelled visits, visits where the mother was not home or did not come to the visit, or other cases where the scheduled in-person home visit did not occur.

[c]This measure comes from aggregate cost selection; therefore, the averages for this measure are calculated among local programs overall and among each evidence-based model. Overall local program sample size = 53, EHS = 9, NFP = 20, HFA = 16, and PAT = 8.

[d]This comprises families at local programs that provided sufficient information to calculate costs. (See Table 2.1.)

Consistent with model standards regarding recommended visit length and frequency, families served by local programs that implemented EHS had a higher number of personnel hours per family for the first year (62.1 hours, on average) compared with families served by HFA (46.7 hours), NFP (47.6 hours), and PAT (40 hours). These data on EHS personnel time reveal that the relatively low allocation of EHS personnel expenditures to home visitor compensation (Appendix Table F.1) are attributable to the EHS hourly rate of compensation and not to decreased service provision to families.

In some respects, however, the four evidence-based models look similar to one another. For example, home visitors spent a similar amount of time on average traveling to and from home visits (ranging from 7.3 hours for PAT to 9.7 hours for EHS) and spent similar amounts of time on average in preparation and follow-up (ranging from 11.7 hours for PAT to 14.7 hours for NFP). The average cost of materials was also similar across the models, ranging from $41.6 for EHS to $60.5 for HFA).

The analysis also examined associations between family-specific costs and family characteristics (a woman's age, whether she was pregnant when she entered the study, and whether she was a first-time mother) and local program characteristics (type of county, type of local implementing agency, and enrollment capacity). There were no discernable differences in family-specific costs according to family characteristics. (See Appendix G.1.) There was, however, statistically significant variation in family-specific costs by type of local implementing agency. (See Appendix Table G.2.) Similar to the analysis of total costs, family-specific costs tended to be higher in health departments and community-based nonprofits.[28] Appendix Table G.2 also shows that costs varied significantly by evidence-based model, with family-specific costs highest for NFP and lowest for PAT.

SUMMARY

This chapter has shown that the total costs for each MIHOPE family varied primarily according to the evidence-based model being implemented and by the type of implementing agency. Characteristics of evidence-based models, such as average home visitor compensation, intended visit frequency and length, and average expenditures on general program resources, were strongly associated with costs. The primary contributors to family-specific costs were home visitor time and home visitor hourly rate of compensation.

[28]Appendix Table H.3 shows associations between average total costs per family and family characteristics. Appendix Table H.5 shows associations between average total costs per family and local program characteristics.

5

Conclusion

The cost analysis of the Mother and Infant Home Visiting Program Evaluation (MIHOPE) provides insight into the fiscal operation of local home visiting programs, including the overall ongoing cost to implement and sustain a program, cost of specific program activities, and cost of serving a family for an initial 12 months.[1] It serves as a companion to previous results from MIHOPE on how home visiting programs funded through the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program were implemented and how the programs affected family outcomes through the child's fifteenth month.[2]

Specifically, the cost analysis sought to achieve two research goals:

- Examine the allocation of resources at local programs participating in MIHOPE.
- Estimate the cost of serving MIHOPE families during the first year and investigate the differences in these costs per family.

Concerning the first goal, the analysis found, not surprisingly, that personnel costs compose a large portion of local home visiting program expenditures, and home visitor compensation makes up the bulk of local programs' personnel expenditures.

Concerning the second goal, results showed that local programs varied in how much it costs to serve a family for the first year. Because personnel costs are so important, the total cost of serving a family depends quite a bit on how much time is spent on home visits (which is affected by both the number of home visits and the time spent on each visit) and how much home visitors are paid. That is, families working with higher paid home visitors are likely to incur higher costs, as are those who receive more visits.

These factors (home visitor time and home visitor compensation) help explain why home visiting programs differed in their costs for providing families with services by evidence-based model. Specifically, the average costs were highest for Nurse-Family Partnership (NFP), which requires home visitors to be nurses, who are paid on average at least twice what home visitors in the other three

[1]The cost analysis examined overall program expenditures for one year of service provision. Costs do not include startup costs or one-time training costs.

[2]Duggan et al. (2018); Michalopoulos et al. (2019).

evidence-based models are paid. Average costs were also relatively higher for Early Head Start—Home-based option (EHS), which delivers more and longer home visits than the other three evidence-based models participating in MIHOPE, and which has local programs with higher costs allocated to general program expenditures than non-EHS local programs. Despite these differences in average costs across evidence-based models, it is important to note that there was considerable overlap in local program costs across the models.

The analysis also found that costs differed by type of agency delivering home visiting services. Programs operating in local health departments tended to incur the highest total costs per family; community-based nonprofit organizations tended to allocate more to general program expenditures; and costs per family were lowest, on average, for programs embedded within school districts. However, most programs operating in local health departments ran NFP, which had higher total costs per family than the other models; costs did not differ significantly by agency type when the analysis was limited to the other three evidence-based models. In addition, specific family characteristics analyzed in this study—maternal age, pregnancy status at study entry, and maternal parity—were not associated with costs in this analysis. Other features of the local programs, including the number of families served by the local program and the urbanicity of the county where the local program operates, were also not associated with costs in this analysis.

Decisions based on program costs cannot be fully informed without knowing what benefits the programs generate for families and society. Because it can take many years for the benefits of home visiting to accrue, a benefit-cost analysis might be conducted after further follow-up data are collected, a process that is currently underway with MIHOPE families when the children are in kindergarten.[3]

[3]Faucetta et al. (2021) describes the design of the MIHOPE kindergarten data collection.

Appendix A

Cost-Consequence Analysis: Net Costs and Estimated Effects When Participating Children Were Approximately 15 Months Old

The MIHOPE analysis plan specified including a cost-effectiveness analysis, which would show a ratio of the net cost of being assigned to the program group to the estimated effect for each statistically significant individual outcome. As noted in the MIHOPE analysis plan, "This set of results is likely to be of particular interest if costs and/or impacts vary considerably for different subgroups of families, providers, or national models."[1] However, as stated in Chapter 1, cost-effectiveness analyses are not presented in this report because the models differed in which outcomes they affected—so comparisons across the models are not appropriate—and because MIHOPE did not find statistically significant differences in effects across subgroups of families.

Instead, a cost-consequence analysis was conducted, which shows the net costs of providing home visiting services in the local programs included in the MIHOPE cost analysis and the estimated effects on family outcomes for those programs around the time children in the MIHOPE sample were 15 months old. Since the impacts MIHOPE found when the children were approximately 15 months old were spread across multiple outcomes, cost-consequence analysis was more appropriate than cost-effectiveness analysis because it compares the costs of home visiting to the full scope of program outcomes rather than to the effects for any individual outcome.

This appendix presents the results of the cost-consequence analysis that was conducted. By presenting the net costs of home visiting next to the impacts on MIHOPE's confirmatory outcomes, the cost-consequence analysis provides a concise way of showing the range of impacts produced for the program cost overall and by evidence-based model.

NET COSTS OF HOME VISITING SERVICES

The cost-consequence analysis first presents the net costs of providing home visiting over a 15-month period in the MIHOPE sites included in the MIHOPE cost analysis sample, both overall and by evidence-based model. (See Appendix Table A.1.) These net costs include the costs of family-specific activities, such as time spent and materials provided during home visits, as well as the cost of general program activities necessary to provide home visiting services, such as administration, supervision, and planning. (See Chapter 2 for an explanation of how total costs are calculated.) The costs presented in Appendix Table A.1 differ from those presented in Chapter 4 because they use information on home visits through the child's fifteenth month of age while results in Chapter 4 use information through the child's twelfth month of age.

[1]Materials presented to the Secretary's Advisory Committee are available at www.acf.hhs.gov/opre/resource/secretarys-advisory-committee-maternal-infant-early-childhood-home-visiting-evaluation-9-21-2015. The quoted sentence appears on page 7 of the memo on cost analyses.

Appendix Table A.1

Total and Net Home Visiting Costs per Family at 15 Months, by Evidence-Based Model

Outcome	Average cost per program family[a]	Average cost per control family[a]	Net cost per family[a]
All families	4,054	1,098	2,957
Evidence-based model			
Early Head Start—Home-based option	4,902	1,025	3,877
Healthy Families America	3,071	1,099	1,972
Nurse-Family Partnership	6,095	1,110	4,984
Parents as Teachers	2,442	1,123	1,319
Sample size	1,521	2,040	

SOURCES: Calculations based on the MIHOPE family service logs, aggregate cost collection, and the MIHOPE 15-month follow-up survey.

NOTE: [a]Costs are reported as 2014 U.S. dollars.

For control group families, estimated costs are based on survey responses about receipt of home visiting services in the year prior to the 15-month follow-up survey. To derive the home visiting costs for control group families, the average total cost per home visit delivered to Parents as Teachers (PAT) families based on program group information (including both family-level costs from the logs and the cost of general program activities) was multiplied by the number of home visits implied by survey responses. PAT was selected because it had the lowest average cost, and control group families were likely to have received home visiting from less expensive home visiting models.

Results in Appendix Table A.1 show that home visiting costs for MIHOPE program group families were estimated to be $2,957 more per family than for control group families, on average. This net cost reflects the cost of evidence-based home visiting received by MIHOPE program group families minus the cost of any home visiting services that control group families received in their communities. Although 20 percent of MIHOPE control group families indicated on the 15-month survey that they did receive some level of home visiting or parenting services and 17 percent of MIHOPE program group families did not receive services from the evidence-based program to which they were assigned, overall, as expected, the MIHOPE program group families received more home visiting services than the control group.

NET MEDICAID COSTS

Home visiting may also affect the health care families use, and the MIHOPE 15-month impact report found that children in program group families had fewer emergency department visits and were less likely to have been hospitalized than children in control group families.[2] To explore whether these reductions in emergency department visits and hospitalizations produced health care cost savings, Appendix Table A.2 compares the costs of Medicaid services received for program and control group families—including both the mother and focal child—both overall and by evidence-based model. Results are shown separately for preventive care and for all other care (such as emergency department care and hospitalization).

Appendix Table A.2

Total and Net Health Care Utilization Costs per Family at 15 Months, by Evidence-Based Model

Outcome	Average Costs Per Program Family[a]	Average Costs Per Control Family[a]	Net Costs Per Family[a]	90% Confidence Interval	
				Lower Bound[a]	Upper Bound[a]
All families					
Preventive	793	766	-27	-66	16
Other	1,062	996	-66	-349	224
Evidence-based model					
Early Head Start—Home-based option					
Preventive	819	812	-7	-130	109
Other	1,131	504	-627	-1,503	-60
Healthy Families America					
Preventive	825	816	-9	-68	55
Other	862	1,064	202	-272	832
Nurse-Family Partnership					
Preventive	765	705	-60	-138	21
Other	1,387	1,079	-308	-880	258
Parents as Teachers					
Preventive	764	741	-22	-104	63
Other	927	1,068	141	-330	682
Sample size	1,941	1,918			

SOURCE: Calculations based on the Medicaid enrollment and claims data.

NOTES: Participants dropped when total of Preventive and Other Health Care costs are greater than $81,262 (N=10). Differences are from a two-part regression model (Logistic + Gamma) and confidence intervals using 500 bootstrap iterations, and then bias-corrected.

Differences in Medicaid health care costs between the program and control groups are not statistically significant at the 10 percent significance level.

[a]Costs are reported as 2014 U.S. dollars.

[2]Michalopoulos et al. (2019), Table 3.8.

As seen in Appendix Table A.2, Medicaid health care costs did not differ significantly between the program and control groups.

COMPARING NET COSTS TO ESTIMATED EFFECTS WHEN PARTICIPATING CHILDREN WERE APPROXIMATELY 15 MONTHS OLD

The next step of the analysis compared the net costs of providing home visiting services and the net estimated Medicaid costs for families through when the children participating in MIHOPE were 15 months old (presented above) to the estimated effects for eight of the confirmatory outcomes presented in the MIHOPE 15-month impact report.[3] Appendix Figure A.1 illustrates this comparison, by showing the incremental costs and impacts for every 100 families in the MIHOPE program group.

The eight outcomes are divided into two groups, based on how each outcome is measured:

- The first group includes outcomes that can be measured in counts or frequencies (for example, number of Medicaid-paid emergency department visits for the child).

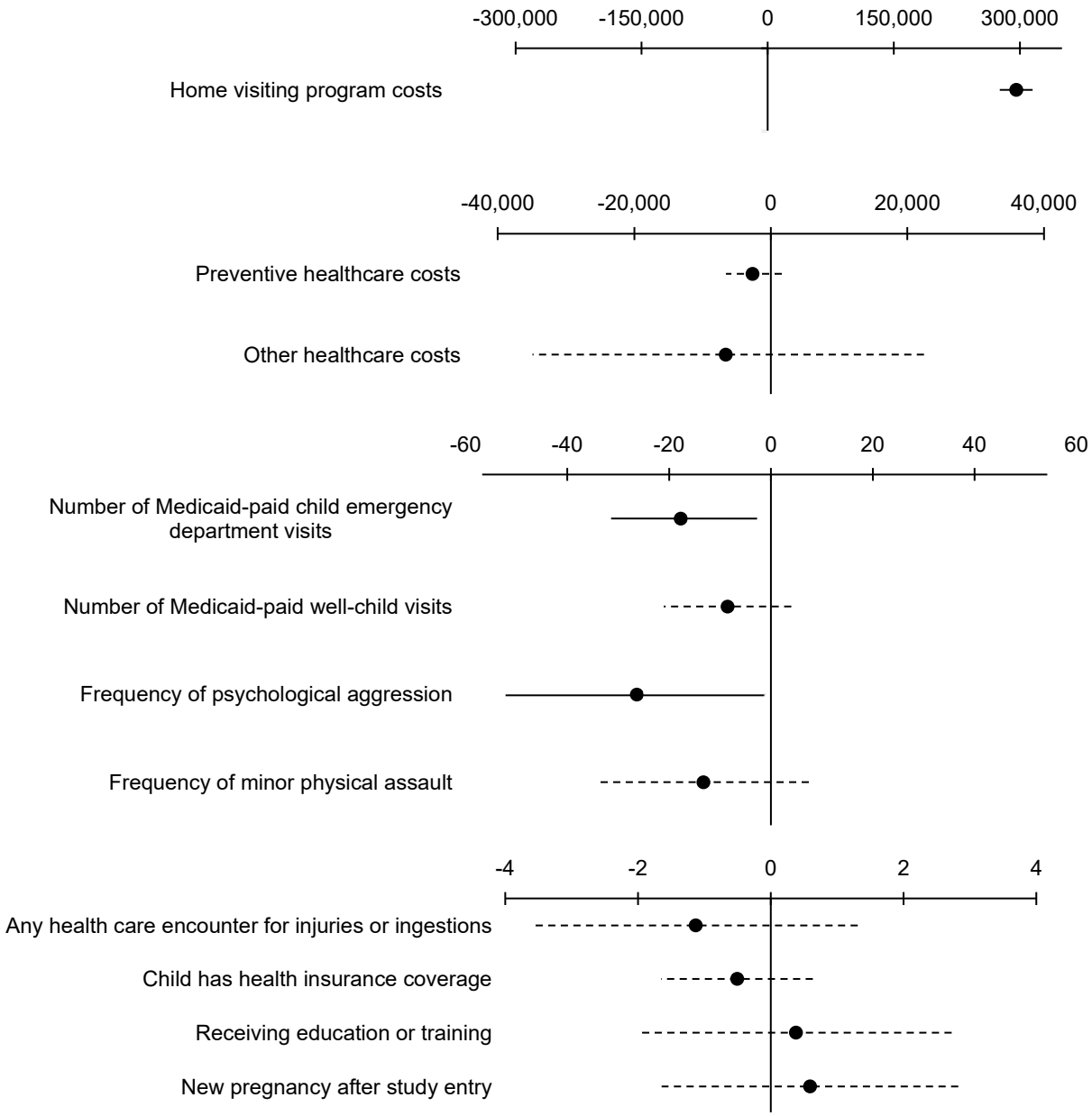
- The second group includes outcomes that can be presented as percentages (for example, whether the child is covered by health insurance). For these outcomes, a 1 percentage point reduction indicates 1 less child experienced that outcome for every 100 children included in the sample.

Similar to how impacts were presented in the executive summary of the MIHOPE 15-month impact report, the circles represent the mean difference between program and control groups. The lines represent the 90 percent confidence intervals, which is an estimate of the variability (or statistical imprecision) of the effects of the home visiting program. Confidence intervals that do not contain zero indicate that the impact estimate is statistically significant at the 10 percent level of statistical significance. These outcomes are shown as solid lines, while outcomes that were not statistically significant are represented by dashed lines. Statistically significant estimated effects were found at 15 months for four outcomes: the number of emergency department visits for the child, the frequency of psychological aggression toward the child, the quality of the home environment, and child behavior problems. Because the latter two outcomes were expressed using scale scores, they are not shown in Appendix Figure A.1.

[3]Michalopoulos et al. (2019). MIHOPE estimated impacts on four additional confirmatory outcomes. Those outcomes are not presented in the table because they are expressed in scale scores that do not have a natural interpretation.

Appendix Figure A.1

Incremental Costs and Impacts Expected Through 15 Months Per Every 100 Children Receiving Home Visiting Services



SOURCES: Calculations based on the MIHOPE family service logs, aggregate cost collection, MIHOPE program manager baseline survey, the MIHOPE site-selection team, the MIHOPE 15-month follow-up survey, the in-home assessment, the parent-child videotaped interaction, and Medicaid enrollment and claims data.

NOTE: Costs and effects are considered statistically significant if the 90 percent confidence interval does not intersect with 0.

As shown in Appendix Figure A.1, the average incremental cost of enrolling 100 families in home visiting services is estimated to be $291,000, and the aggregated expected effects through 15 months for those 100 families include 26 fewer instances of psychological aggression toward the child and 18 fewer Medicaid-paid child emergency department visits.

Although the costs of providing home visiting are fairly precisely estimated, there is considerable uncertainty about the estimated effects. For example, the costs are likely to range between $276,000 and $315,000 (the 90 percent confidence interval) for 100 families, but this may "buy" as many as 35 fewer emergency department visits or as few as 2, and it may "buy" nearly 60 fewer incidents of psychological aggression or as few as 1.

In conclusion, the costs of providing families access to evidence-based home visiting resulted in improved outcomes for families when their children were 15 months old. However, these improvements were recorded in several different areas, making it difficult to say how much it cost to achieve each individual outcome.

Appendix B

Data Sources for the Mother and Infant Home Visiting Program Evaluation Implementation Research

The implementation research of the Mother and Infant Home Visiting Program Evaluation (MIHOPE) drew on data from several sources.

Family Characteristics

- A **family baseline survey** with the child's mother provides data on 2,104 women assigned to the program group, and the 675 children who were already born at the time of the family baseline survey. Surveys were completed between October 2012 and September 2015.

- **Observation ratings of the family home and neighborhood environment**, conducted by field interviewers between October 2012 and September 2015.

Home Visiting Staff Characteristics and Experiences

- **Staff surveys** of 521 home visitors and 138 supervisors provide data on their demographic and psychosocial characteristics and their perceptions, attitudes, and beliefs regarding work. Surveys were completed between September 2012 and July 2015.

- **Training logs,** completed monthly by 600 home visitors and 142 supervisors, provide data on the dosage, content, and modality of training each received. Training logs were completed between November 2012 and May 2016.

- **Supervision logs,** completed weekly by supervisors, provide data on the dosage, topics, and methods of supervision provided to 596 individual home visitors. Supervision logs were completed between November 2012 and February 2016.

- **Qualitative semi-structured interviews** with a subsample of 104 home visitors in 24 local programs across seven states provide information on staff perspectives on implementation processes. Interviews were conducted between March 2014 and December 2014.

Local Program Characteristics

- **Program manager surveys** at 88 local programs provide data on key characteristics of local programs, such as service plan components, policies and protocols, presence and types of implementation system supports, and networks of referral agencies. Surveys were completed between September 2012 and June 2015.

- **Reviews of program documents** from 83 local programs provide additional detail on implementation system components for staff recruitment (such as home visitor and supervisor job descriptions).

- **Reviews of the three most commonly used parenting curricula,** as reported in the program manager surveys.

Evidence-Based Models

- **Evidence-based model developer surveys, interviews, and document reviews (such as home visitor and supervisor job descriptions)** of the four evidence-based models included in MIHOPE provide information on the service plan and the implementation system. Training materials were also available for some evidence-based models. Primary interviews with model developers were completed between December 2012 and August 2013. Supplemental interviews were completed in June 2017.

Community Characteristics

- **Community services inventories** with program managers at 86 local programs provide data on service availability of and coordination with community service providers. Community services inventories were completed between December 2012 and March 2015.

- **Census tract data from the 2014 American Community Survey five-year estimates** for the geocoded addresses of 4,195 families (2,092 in the program group; 2,103 in the control group) provide data on the sociodemographic characteristics of the communities in which families lived.

Services for Individual Families

- **Family service logs,** completed weekly by home visitors for 2,021 families assigned to the program group, provide information on frequency, type, and duration of contacts with the family. For a subsample of 1,671 families who received at least one visit, family service logs also provide information on topics discussed, referrals provided, and levels of family responsiveness. Family service logs were completed between November 2012 and June 2016.

- **Observations of home visitor-family interactions,** collected via videos and analyzed for a subsample of 200 home visitor program group family dyads, provide data on what occurred during home visits. Observations were conducted between March 2013 and July 2015.

Appendix C

Cost Data Collection and Limitations

All 88 local programs in the Mother and Infant Home Visiting Program Evaluation (MIHOPE) study were asked to submit expenditure reports as part of the cost data collection for MIHOPE. While the MIHOPE cost study team received expenditure reports from 81 local programs (92 percent), only 63 local programs (72 percent) provided sufficient detail in their expenditure reports to conduct the analyses presented in this report.[1] Common reasons for excluding expenditure reports from the analysis included a lack of resource categorization (making it impossible to appropriately distinguish between family-specific costs and general program expenditures) or exclusion of cost categories necessary for the analyses (such as materials or facilities costs).

As mentioned in Chapter 2, the subsample of sites that contributed data to the MIHOPE cost analysis is not representative of the full sample of local programs participating in MIHOPE. Specifically, as shown in Appendix Table C.1, the MIHOPE cost analysis sample has a smaller proportion of Parents as Teachers (PAT) programs than the full MIHOPE sample. The distribution of local programs also differs slightly (but not significantly) by the type of agency, with fewer home visiting programs in the cost analyses located within local school districts than for all of MIHOPE. These two findings may be related, since the PAT programs made up a relatively large portion—seven out of eight—of local programs located within school districts. And it is possible that providing cost information was especially difficult for home visiting programs embedded within larger organizations, such as school districts, as many of these programs did not have independent mechanisms for expenditure tracking.

It is also important to note that there were no local programs included in MIHOPE that were exclusively funded by the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program—meaning all local programs received some funding from additional sources. Policies and practices at the local program level dictated whether the expenditure data (and service delivery data) provided to MIHOPE included all home visiting activities or was limited to MIECHV-funded families. As noted in Chapter 2, the participating programs reported that their home visiting service provision did not differ by funding source.

[1]The MIHOPE cost study research team communicated with all local programs in an effort to clarify expenditure reports. Local programs were excluded when these communication efforts were unsuccessful.

Appendix Table C.1

Number of Local Programs in MIHOPE and in the MIHOPE Cost Analysis, by Evidence-Based Model and Local Program Characteristics

Characteristic	All Local Programs in the MIHOPE Study (N)	Local Programs in MIHOPE Cost Study (N)
Evidence-based model		**
Early Head Start—Home-based option	19	12
Healthy Families America	26	23
Nurse-Family Partnership	22	17
Parents as Teachers	21	11
Local program characteristics		
Type of county served[a]		
Metropolitan	69	48
Nonmetropolitan	12	11
Both	7	4
Type of local implementing agency[b]		
Community-based non-profit	55	39
Local health department	14	11
School district	8	4
Health care organization	5	5
Other	6	4
Enrollment capacity[c]		
100 families or less	35	25
More than 100 families	53	38
Sample size	88	63

SOURCES: Calculations based on data from the aggregate cost collection, the MIHOPE program manager survey, and the MIHOPE site selection team.

NOTES: Differences in the distribution of categories across samples were tested for statistical significance using a Fisher's exact test. Statistical significance levels are indicated as follows: ***=1 percent, **=5 percent, *=10 percent.

[a]To designate counties as metropolitan or nonmetropolitan, this report follows the Department of Agriculture Economic Research Service's Rural-Urban Continuum Codes classification scheme (Economic Research Service, 2013).

[b]Other types of organizations include state-funded institutions of higher education, local governments and cooperative extension, university, social service nonprofit, and Community Action Agency.

[c]Enrollment capacity is the number of families that can be served at any one time.

Appendix D

Aggregate Summary of Local Program Expenditures and Service Delivery

Appendix Table D.1 presents an aggregate summary of the total program expenditures, family-specific costs, and home visits delivered over a 12-month period.[1]

- The values in the Total Program Expenditures column represent the sum of program expenditures from all local programs within each evidence-based model.
- Values in the Family-Specific Costs column represent the subset of total program expenditures allocated to resource categories that the study team could tie to specific families. Because some activities or resources for specific families might not be represented in this total, it represents a lower bound on family-specific costs.
- The final column, Home Visits Delivered, indicates the sum of all home visits delivered in a 12-month period for the local programs in each evidence-based model. This information can be used to estimate an average cost per home visit for each evidence-based model, as well as the average family-specific cost per home visit.

Appendix Table D.1

12-Month Aggregate Summary of Program Expenditures and Service Delivery Across Local Programs in the MIHOPE Cost Analysis, by Evidence-Based Model

Evidence-Based Model	Number of Local Programs (N)	Total Program Expenditures ($)[a]	Family-Specific Costs ($)[a]	Home Visits Delivered (N)
Early Head Start—Home-based option	12	10,471,204	3,197,642	31,230
Healthy Families America	23	12,123,213	4,452,974	42,081
Nurse-Family Partnership	17	23,094,897	9,075,014	52,597
Parents as Teachers	11	3,813,944	1,675,002	17,972
Sample size[b]	63			

SOURCE: Calculations based on data from the aggregate cost collection.

NOTES: [a]Costs are reported as 2014 U.S. dollars.
[b]This comprises all local programs that provided sufficient information to calculate costs. (See Table 2.1.)

[1]This 12-month period may not be the same for each local program, and it includes families at all stages of the home visiting process (not just those in their first year). Differences in the 12-month period include both differences in fiscal year start and end and cost availability from programs.

Appendix E

Overview of Methods

Chapter 2 provides an overview of the process used to estimate costs in the Mother and Infant Home Visiting Program Evaluation (MIHOPE) cost analysis. This appendix provides further methodological detail, including an example using hypothetical values to show how total costs to serve a family were estimated, and information about the process used to value individual cost components of family-specific costs.

PROCESS USED TO ESTIMATE COSTS OF SERVING A FAMILY DURING ITS FIRST YEAR OF HOME VISITING

Appendix Figure E.1 shows the steps used to estimate the cost of serving a family during its first year of home visiting. In the figure, light blue-shaded boxes show information drawn from family service logs, while dark blue-shaded boxes show information from expenditure reports.

The top half of the figure shows that the analysis estimated family-specific costs for each family by adding together three types of costs: home visitor time, travel costs for home visitors, and costs of materials received by families. These three components are estimated using the following steps.

- The top of the figure shows that the cost of home visitor time spent on family-specific activities is the product of the time the home visitor spends on activities for a family and the home visitor's hourly compensation (equal to salary plus fringe benefits).

- Next, the figure shows that travel costs per family are the product of the number of home visits for a family and the travel costs per home visit.

- The total family-specific costs are the sum of these two costs and the costs of materials received by each family.

The total cost for a family includes the family-specific costs described above and general program expenditures allocated to that family. Allocating general program expenditures to a family consists of the following steps:

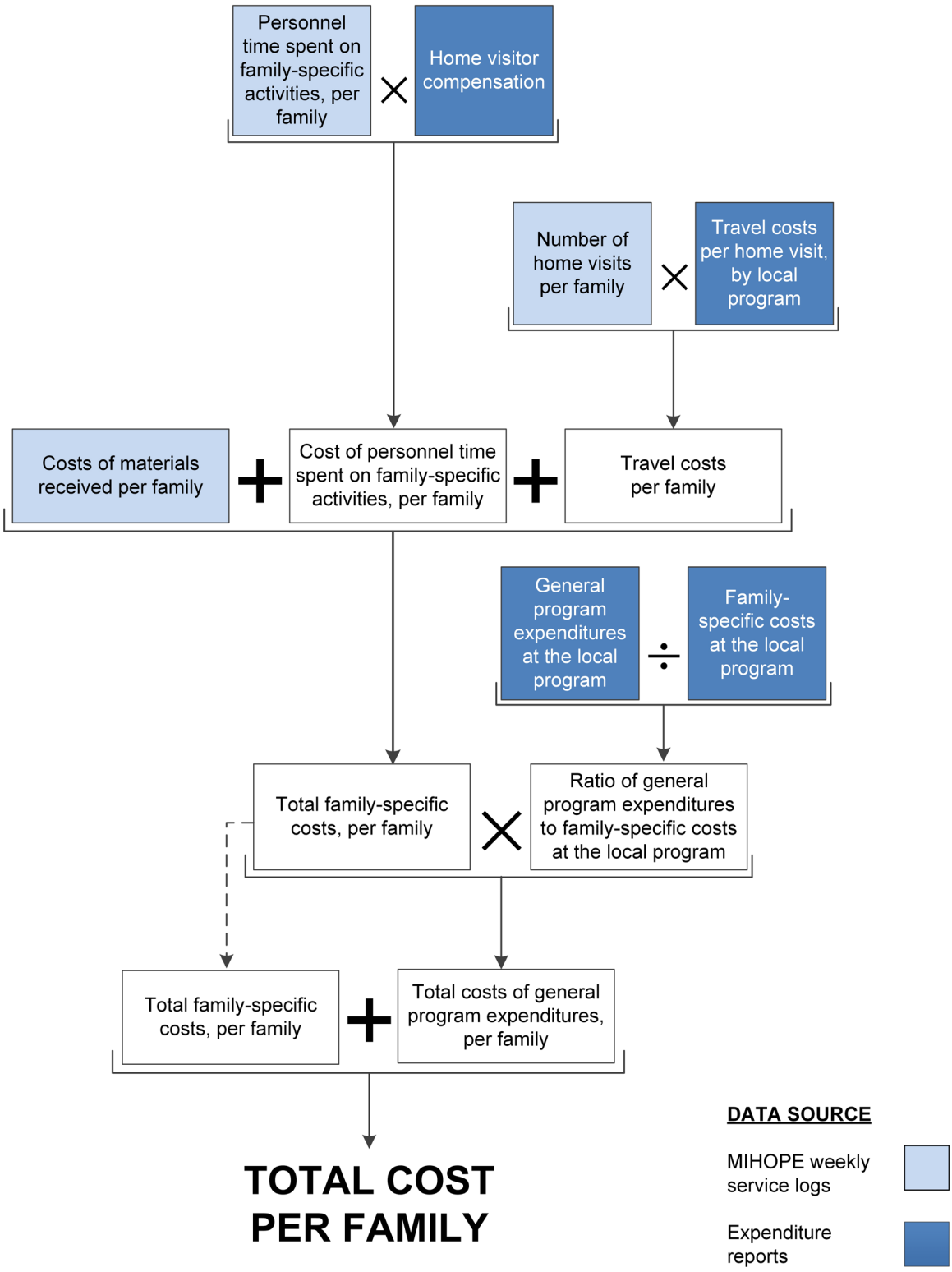
- As illustrated by the two dark blue boxes near the middle of the figure, a program's general program expenditures for a year were divided by its total family-specific costs to estimate the ratio between the two.

- To estimate general program expenditures for a specific family, the ratio for a local program was multiplied by total family-specific costs for that family.

The total cost for a family is the sum of family specific costs for the family and general program expenditures allocated to that family.

Appendix Figure E.1

MIHOPE Cost Analysis Methodology for Calculating Total Cost Per Family



EXAMPLE

Local program "Z" has annual program expenditures totaling $140,000, with $50,000 in activities that could be tied to individual families plus $90,000 in general program costs. The ratio of general program costs to family-specific costs for local program "Z" is 1.8 ($90,000/$50,000); that is, for every dollar spent on family-specific activities, local program Z spends $1.80 on general home visiting program costs.

Estimated from activities reported in the MIHOPE family service logs, family "Y" receiving home visiting services from local program "Z" incurs $1,500 in family-specific costs. Using the ratio of general program costs to family-specific costs calculated above, the amount of general program costs allocated to family "Y" is estimated to be $2,700 ($1,500 x 1.8). Therefore, family "Y's" total costs are estimated to be $1,500 + $2,700 = $4,200.

VALUING INDIVIDUAL COST COMPONENTS OF FAMILY-SPECIFIC COSTS

This section describes the method used to value personnel time, trips made by home visitors to visit families, and materials given to families.

The MIHOPE family service logs measured these components as quantities such as time or counts. Therefore, to arrive at a cost for each family, each quantity was multiplied by an appropriate value assigned to that component, specifically:

1. For personnel time, an hourly rate of compensation for each home visitor

2. For trips to visit families, an average cost per trip by home visitor

3. For materials given to families, an estimated average cost for each item in the material list

Personnel Costs per Hour. During the collection of cost data, local programs were asked to provide compensation (equal to salary plus fringe benefits) and typical weekly hours worked for all home visitors completing the MIHOPE family service logs. These data were used to derive an hourly rate for each home visitor, which was then used to value the home visitor's time with each family. Each home visitor's hourly rate was multiplied by the total number of hours reported for each family in the MIHOPE family service logs.

Travel Costs per Home Visit. Cost per trip to visit families refers to the non-personnel cost that local programs incurred related to travel for each home visit. It includes travel reimbursements made for home visits from the local program, such as mileage reimbursements or reimbursements made

at a flat rate for each trip.[1] It does not include the home visitor's time. The home visitor's time spent traveling to and from home visits is included under personnel costs.

To estimate travel costs per home visit, the analysis divided information provided by the programs on the aggregate non-personnel costs of travel for *all* home visits—both completed visits and attempted visits that were not successfully completed—by an estimate of the number of completed and unsuccessful home visits (total number of visits). Because each program reported only the total number of completed visits, the team had to estimate the total number of visits. This was done by first using the family service logs to calculate the ratio of all visits for which any travel occurred to completed visits. This ratio was applied to the number of completed home visits reported by the program to estimate the total number of visits for that program.

Materials Given to Families. In the MIHOPE family service logs, home visitors indicated materials given to families during home visits or through other contact with families. These materials were provided within categories, and home visitors had the option of providing the value of the items. When a value was not provided, the median value of other items within the category was imputed.

[1]MIHOPE did not collect data on the form of the reimbursement.

Appendix F

Local Program Resource Allocation, by Evidence-Based Model

Appendix Table F.1 expands on the information shared in Table 3.1, by reporting the proportions of personnel and non-personnel costs by evidence-based model, as well as for the full MIHOPE cost sample. It also shows how personnel and non-personnel costs are allocated across several categories of costs. (Note that the "Overall" column in Appendix Table F.1 is the same as the "Mean" column in Table 3.1.)

Appendix Table F.1

Variation in Allocation of Personnel and Non-Personnel Costs Among Local Programs in the MIHOPE Cost Analysis, by Evidence-Based Model

Resource Category (%)	Overall		EHS	HFA	NFP	PAT
Personnel	79.1		74.2	78.7	82.0	80.8
Home visitor compensation	53.1		41.9	51.5	62.2	54.6
Non-home visitor compensation	26.0		32.3	28.5	19.8	26.1
Non-personnel	20.9		25.9	21.6	18.0	18.4
Program supplies	2.6	**	4.6	2.3	1.6	2.8
Travel to home visits	2.7	**	2.4	2.6	2.5	3.8
Office supplies	2.5	**	2.5	2.8	1.5	3.0
Durable equipment	1.1	***	2.5	1.2	0.3	0.6
Office space and other facilities	2.8	**	3.0	3.1	1.8	3.3
Training	0.9	**	0.8	0.8	1.0	1.0
Other	8.3		10.1	8.6	9.4	3.9
Sample size[a]	63		12	23	17	11

SOURCE: Calculations based on data from the aggregate cost collection.

NOTES: Percentages may not sum to 100 due to rounding. EHS = Early Head Start—Home-based option, HFA = Healthy Families America, NFP = Nurse-Family Partnership, PAT = Parents as Teachers.

Differences across evidence-based models were tested for statistical significance using a one-way ANOVA, accounting for clustering of families within local programs. Statistical significance levels are indicated as follows: ***=1 percent, **=5 percent, *=10 percent. The analysis did not conduct significance tests across pairs of models. That is, the analysis did not test whether estimated costs for any one model were significantly different than estimated costs for any other model.

[a]This comprises all local programs that provided sufficient information to calculate costs. (See Table 2.1.)

Appendix G

Sensitivity Analyses

This appendix presents two sets of sensitivity analyses conducted to check results presented in the report:

1. The first sensitivity analysis checked whether there was a difference in family-specific costs for the families included in the Mother and Infant Home Visiting Program Evaluation (MIHOPE) cost sample compared to families in the MIHOPE program group that received at least one home visit. The comparison suggests that excluding 25 local programs and their 456 MIHOPE program group families from the MIHOPE cost sample did not substantially alter the estimated family-specific costs.

2. The second sensitivity analysis examined how home visiting costs would have changed if personnel costs had been adjusted for geographical variation in the cost of living. It found that the geographical diversity of the local programs in MIHOPE did not affect the generalizability of cost estimates by evidence-based model presented in the cost analysis.

COMPARISON OF THE MIHOPE COST ANALYSIS SAMPLE TO THE MIHOPE PROGRAM GROUP MEMBERS WITH AT LEAST ONE HOME VISIT

MIHOPE includes 1,671 families at 88 local programs who were assigned to the program group and received at least one home visit according to the family service logs. For reasons discussed in Appendix C, the cost analysis was limited to the 63 local programs that provided enough detail in their expenditure reports to conduct the analyses presented in this report. The MIHOPE cost analysis sample is comprised of the 1,215 families who were assigned to the program group and received at least one home visit from one of these 63 local programs.

Because family-specific costs are estimated from data that come from the MIHOPE family service logs, those costs can be estimated for the 456 program group families that received at least one home visit but were not included in the cost analyses. Thus, a sensitivity analysis was done to compare costs for the 1,215 families in the MIHOPE cost sample to the estimated costs for the part of the MIHOPE program group that received at least one home visit.

Appendix Table G.1 shows side by side the family-specific costs, by maternal characteristics, for the cost analysis sample and MIHOPE program group members with at least one home visit. The table shows there is little variation of family-specific costs according to maternal characteristics between the two samples. For example, family-specific costs for the average family with a mother less than 21 years old at study entry were $1,507 for the cost analysis sample and $1,474 for the full MIHOPE sample. In all comparisons shown in Appendix Table G.1, differences in annual family-specific costs between the cost analysis sample and MIHOPE program group members with at least one home visit are less than $100.

Appendix Table G.1

Family-Specific Costs During the First Year of Home Visiting for the MIHOPE Cost Sample and for MIHOPE Program Group Members with at Least One Home Visit, by Maternal Characteristics at Study Entry

Characteristic	Number of Families in Cost Sample[a]	Average Family-Specific Costs per Family in Cost Sample ($)[b]	Number of Families in Full Sample	Average Family-Specific Costs per Family in Full Sample ($)[b]	
Maternal age					**
Less than 21 years	462	1,507	598	1,474	
21 years and older	753	1,405	1,073	1,331	
Pregnancy status[c]					*
Pregnant at study entry	448	1,117	648	1,042	
Not pregnant at study entry	381	1,171	528	1,159	
Parity[c]					
First-time mothers	416	1,107	559	1,065	
Mothers with prior children	401	1,173	599	1,124	
Sample size	1,215		1,671		

SOURCES: Calculations based on data from the MIHOPE family service logs, aggregate cost collection, and the MIHOPE family baseline survey.

NOTES: Differences in average costs by maternal characteristics were tested for statistical significance using two-tailed t tests. Statistical significance levels are indicated as follows: ***=1 percent, **=5 percent, *=10 percent.

[a]This comprises families at local programs that provided sufficient information to estimate the ratio. (See Table 2.1.)

[b]Costs are reported as 2014 U.S. dollars.

[c]Since all mothers in Nurse-Family Partnership are required to be pregnant at enrollment and first-time mothers, results for these characteristics are only shown among families in Early Head Start—Home-based option, Healthy Families America, and Parents as Teachers (cost sample size = 829, full sample size = 1,176).

Appendix Table G.2 compares average family-specific costs for the cost analysis sample and the MIHOPE program group members with at least one home visit, by evidence-based model and local program characteristics. As in Appendix Table G.1, the two sets of costs are similar; all but one difference is less than $100.[1] This suggests limiting family-specific costs to the 63 local programs included in the cost analysis sample did not substantially affect the estimate of those costs in the first year.

[1]For families served by programs that served both metropolitan and nonmetropolitan counties, average family-specific costs were $1,598 for the MIHOPE cost sample and $1,248 for members of the MIHOPE program group that received at least one home visit. This group represented less than 10 percent of the samples.

Appendix Table G.2

Family-Specific Costs During the First Year of Home Visiting for the MIHOPE Cost Sample and for MIHOPE Program Group Members with at Least One Home Visit, by Evidence-Based Model and Local Program Characteristics

Characteristic	Number of Families in Cost Sample[a]	Average Family-Specific Costs per Family in Cost Sample ($)[b]		Number of Families in Full Sample	Average Family-Specific Costs per Family Full Sample ($)[b]	
Evidence-based model			***			***
Early Head Start—Home-based option	137	1,340		243	1,280	
Healthy Families America	511	1,164		578	1,161	
Nurse-Family Partnership	386	2,092		495	2,066	
Parents as Teachers	181	928		355	859	
Type of county served[c]						
Metropolitan	980	1,451		1,362	1,401	
Nonmetropolitan	169	1,341		176	1,333	
Both	66	1,598		133	1,248	
Type of local implementing agency[d]			***			***
Community-based nonprofit	726	1,261		1,030	1,229	
Local health department	240	2,119		301	2,065	
School district	58	872		117	873	
Health care organization	126	1,592		126	1,595	
Other	65	1,206		97	1,220	
Enrollment capacity[e]						*
100 families or less	406	1,262		546	1,222	
More than 100 families	809	1,535		1,125	1,460	
Sample size	1,215			1,671		

SOURCES: Calculations based on data from the MIHOPE family service logs, aggregate cost collection, MIHOPE program manager survey, and the MIHOPE site selection team.

NOTES: Differences in average costs by local program characteristics were tested for statistical significance. Statistical significance levels are indicated as follows: ***=1 percent, **=5 percent, *=10 percent.

[a]This comprises families at local programs that provided sufficient information to calculate costs. (See Table 2.1.)

[b]Costs are reported as 2014 U.S. dollars.

[c]To designate counties as metropolitan or nonmetropolitan, this report follows the Department of Agriculture Economic Research Service's Rural-Urban Continuum Codes classification scheme (Economic Research Service, 2013).

[d]Other types of organizations include state-funded institution of higher education, local governments and cooperative extension, university, social service nonprofit, and Community Action Agency.

[e]Enrollment capacity is the number of families that can be served at any one time.

GEOGRAPHIC ADJUSTMENT TO PERSONNEL WAGES

The cost analysis did not adjust personnel costs for the local cost of living. Making such an adjustment requires several assumptions that can introduce complexity and uncertainty to the estimates. Moreover, the unadjusted personnel costs represent costs as observed at the local programs included in the cost analysis sample.

To ensure this was the correct decision, another sensitivity analysis was conducted to examine how home visiting costs would have changed if personnel costs had been adjusted for cost of living. To conduct this analysis, data from the Bureau of Labor Statistics were used to inflate average hourly wages of local programs in areas with cost of living below the national average and to deflate the average hourly wages of local programs in areas with cost of living above the national average. For example, if the average hourly wage in a local program's metropolitan area is $20 and the national average is $25, the reported personnel wages at that local program are multiplied by 1.25 ($25 divided by $20), resulting in a 25 percent increase in the personnel costs for that local program. For the sensitivity analysis, this method of adjustment was applied to all the local programs in the MIHOPE cost analysis, and the resulting total costs per family were compared with the unadjusted costs presented in the body of the report.

Appendix Table G.3 and Appendix Table G.4 compare average total costs of serving a family in the first year with and without adjusting personnel costs for the local cost of living. Appendix Table G.3 shows how costs would have changed by different sets of maternal characteristics, and Appendix Table G.4 shows how costs would have changed by evidence-based model and other local program characteristics.

According to Appendix Table G.3, the cost-of-living adjustment resulted in only small changes to total costs per family when examined by maternal characteristics. The adjusted costs were about 5 to 7 percent higher than the unadjusted costs.

Similarly, the cost-of-living adjustment resulted in only small changes to total costs per family when examined by evidence-based model and local program characteristics. (See Appendix Table G.4.) In addition, there was no change in the order of costs among evidence-based models.

Appendix Table G.3

Total Costs of Serving a Family During the First Year of Home Visiting with Geographic Adjustment of Hourly Wages, by Maternal Characteristics at Study Entry

Characteristic	Number of Families[a]	Average Total Costs per Family, Not Adjusted ($)[b]	Average Total Costs per Family, Adjusted ($)[b]
Maternal age			
Less than 21 years	462	4,155	4,342
21 years and older	753	3,883	4,075
Pregnancy status[c]			
Pregnant at study entry	448	3,371	3,523
Not pregnant at study entry	381	3,328	3,570
Parity[c]			
First-time mothers	416	3,172	3,317
Mothers with prior children	401	3,532	3,775
Sample size[a]	1,215		

SOURCES: Calculations based on data from the MIHOPE family service logs, aggregate cost collection, and the MIHOPE family baseline survey.

NOTES: Differences in average total costs by maternal characteristics were tested for statistical significance using two-tailed t tests. No differences were statistically significant at the 10 percent level.

[a] This comprises families at local programs that provided sufficient information to calculate costs. (See Table 2.1.)

[b] Costs are reported as 2014 U.S. dollars.

[c] Since all mothers in Nurse-Family Partnership are required to be pregnant at enrollment and first-time mothers, results for these characteristics are only shown among families in Early Head Start—Home-based option, Healthy Families America, and Parents as Teachers (sample size = 829).

Appendix Table G.4

Total Costs of Serving a Family During the First Year of Home Visiting with Geographic Adjustment of Hourly Wages, by Evidence-Based Model and Local Program Characteristics

Characteristic	Number of Families[a]	Average Total Costs per Family, Not Adjusted ($)[b]	Average Total Costs per Family, Adjusted ($)[b]
Evidence-based model		***	***
Early Head Start—Home-based option	137	4,808	5,219
Healthy Families America	511	3,238	3,346
Nurse-Family Partnership	386	5,351	5,533
Parents as Teachers	181	2,568	2,837
Type of county served[c]			*
Metropolitan	980	3,998	4,092
Nonmetropolitan	169	3,388	3,633
Both	66	5,356	6,823
Type of local implementing agency[d]		***	***
Community-based nonprofit	726	3,764	3,941
Local health department	240	5,608	5,755
School district	58	1,781	1,837
Health care organization	126	3,347	3,564
Other	65	3,704	4,249
Enrollment capacity[e]			
100 families or less	406	3,948	4,257
More than 100 families	809	4,006	4,136
Sample size[a]	1,215		

SOURCES: Calculations based on data from the MIHOPE family service logs, aggregate cost collection, MIHOPE program manager survey, and the MIHOPE site-selection team.

NOTES: Differences in average costs by local program characteristics were tested for statistical significance. Statistical significance levels are indicated as follows: ***=1 percent, **=5 percent, *=10 percent.

[a]This comprises families at local programs that provided sufficient information to calculate costs. (See Table 2.1.)

[b]Costs are reported as 2014 U.S. dollars.

[c]To designate counties as metropolitan or nonmetropolitan, this report follows the Department of Agriculture Economic Research Service's Rural-Urban Continuum Codes classification scheme (Economic Research Service, 2013).

[d]Other types of organizations include state-funded institution of higher education, local governments and cooperative extension, university, social service nonprofit, and Community Action Agency.

[e]Enrollment capacity is the number of families that can be served at any one time.

Appendix H

Supplementary Information
for Chapter 4

This appendix provides several results that supplement Chapter 4, which examined the cost of serving a family in the first year by evidence-based model, by family characteristic, and by local program characteristic.

VARIATION IN TOTAL COSTS BY EVIDENCE-BASED MODEL

Figure 4.1 illustrated the variation in total costs to serve a family in a year by evidence-based model. Appendix Table H.1 presents the results that were used to create Figure 4.1. Specifically, Appendix Table H.1 reports, for each evidence-based model, the number of families served, the average total costs per family, and the 25th and 75th percentiles of total costs per family.

Appendix Table H.1

Variation in the Total Costs of Serving a Family During the First Year of Home Visiting, by Evidence-Based Model

Characteristic	Number of Families[a]	Average Total Costs per Family[b]	Total Costs per Family, 25th Percentile[b]	Total Costs per Family, 75th Percentile[b]
Evidence-based model				***
Early Head Start—Home-based option	137	4,808	1,507	6,400
Healthy Families America	511	3,238	993	4,716
Nurse-Family Partnership	386	5,351	2,910	7,402
Parents as Teachers	181	2,568	1,142	3,669
Sample size[a]	1,215			

SOURCES: Calculations based on data from the MIHOPE family service logs and aggregate cost collection.

NOTES: Differences in the average total costs per family across evidence-based models were tested for statistical significance using a one-way ANOVA, accounting for clustering of families within local programs. Statistical significance levels are indicated as follows: ***=1 percent, **=5 percent, *=10 percent. The analysis did not conduct significance tests across pairs of models.

[a]This comprises families at local programs that provided sufficient information to calculate costs. (See Table 2.1.)

[b]Costs are reported as 2014 US dollars.

As shown in the table, the average total costs to serve a family in the first year were significantly different across the four evidence-based models, ranging from $2,568 for Parents as Teachers (PAT) to $5,351 for Nurse-Family Partnership (NFP).

The 25th and 75th percentile estimates provide the range of costs for the middle 50 percent of families. For example, the middle 50 percent of PAT families had costs between $1,142 and $3,669 in the first year, while the middle 50 percent of NFP families had first-year costs between $2,910 and $7,402. The overlap in the percentile estimates ranges does not suggest that there is not a

significant difference in average costs by evidence-based model, but, rather, that there was a fairly wide variation in the utilization and cost of services received by families in the first year.

COST RATIOS BY EVIDENCE-BASED MODELS AND LOCAL PROGRAM CHARACTERISTICS

Calculating total costs shown in Appendix Table H.1 requires calculating the ratios of general program expenditures to family-specific activities, as described in Appendix E. Appendix Table H.2 reports the average, 25th percentile, and 75th percentile of the ratio of the general activities costs to family-specific activities costs for a variety of local program characteristics including evidence-based model.

Interpreting the ratio: If a local program's spending on general activities equals its spending on family-specific activities, the ratio equals one. If the ratio is larger than one, then general program expenditures are greater than costs on family-specific activities derived from the family service logs. If the ratio is smaller than one, then general program expenditures are less than costs on family-specific activities derived from the family service logs. The size of the ratio is not a measure of program efficiency; rather, larger ratios may signify a more robust support infrastructure for direct service delivery.

As seen in Appendix Table H.2, the average ratio for each program characteristic examined is at least one, meaning that local programs tended to spend more on general program activities than on family-specific activities. There were statistically significant differences in the ratios by model, type of agency, and total program capacity. Specifically, Early Head Start—Home-based option (EHS) programs in the MIHOPE cost analysis tended to have higher ratios, spending $2.48 on general home visiting program expenditures for every dollar spent on family-specific activities, on average. This higher ratio is consistent with expectations for EHS, as EHS programs employ several types of non-home visitor personnel, such as early education coordinators, coordinators of family development, curriculum supervisors, and special needs and mental health coordinators. The analysis included costs for these staff in the category for general program activities, as the activities of these staff were not reported on the MIHOPE family service logs and therefore could not be tied to specific families.[1]

Additionally, the cost ratio of general program activities to family-specific activities varied by the type of implementing agency, with lower ratios for local programs implemented in school districts

[1]When available in the MIHOPE family service logs, the non-home visitor personnel time was included in the estimates as a family-specific activity cost. However, non-home visitor personnel time was rarely reported in the family service logs, so most of these costs were, by default, included in the cost estimates as general program expenditures.

Appendix Table H.2

General Program Activities to Family-Specific Activities Cost Ratio, by Evidence-Based Model and Local Program Characteristics

Characteristic	Number of Local Programs[a]	Average Ratio	Ratio 25th Percentile	Ratio 75th Percentile
Evidence-based model		***		
Early Head Start—Home-based option	12	2.48	1.91	2.50
Healthy Families America	23	1.80	1.54	2.04
Nurse-Family Partnership	17	1.51	1.10	1.74
Parents as Teachers	11	1.60	1.13	1.98
Local program characteristics				
Type of county served[b]				
Metropolitan	48	1.74	1.25	2.11
Nonmetropolitan	11	1.69	1.34	1.90
Both	4	3.07	1.91	3.49
Type of local implementing agency[c]		***		
Community-based nonprofit	39	2.02	1.51	2.30
Local health department	11	1.57	1.15	1.76
School district	4	1.00	0.92	1.08
Health care organization	5	1.26	0.98	1.31
Other	4	2.01	1.67	2.16
Enrollment capacity[d]		**		
100 families or less	25	2.10	1.57	2.27
More than 100 families	38	1.63	1.12	2.00
Sample size[a]	63			

SOURCES: Calculations based on data from the MIHOPE program manager baseline survey, the MIHOPE site selection team, and the aggregate cost collection.

NOTES: Differences in average ratios across samples were tested for statistical significance using a Kruskal-Wallis rank sum test. Statistical significance levels are indicated as follows: ***=1 percent, **=5 percent, *=10 percent. The analysis did not conduct significance tests across pairs of models, county types, or agency types.

[a]This comprises all local programs that provided sufficient information to calculate costs. (See Table 2.1.)

[b]To designate counties as metropolitan or nonmetropolitan, this report follows the Department of Agriculture Economic Research Service's Rural-Urban Continuum Codes classification scheme (Economic Research Service, 2013).

[c]Other types of organizations include state-funded institution of higher education, local governments and cooperative extension, university, social service nonprofit, and Community Action Agency.

[d]Enrollment capacity is the number of families that can be served at any one time.

and higher ratios for local programs implemented in community-based nonprofits. Finally, the analysis found that the ratio was lower for programs with higher enrollment capacities, which may be explained by economies of scale.

VARIATION IN TOTAL COSTS BY MATERNAL CHARACTERISTICS

Appendix Table H.3 supplements Figure 4.2, which showed variation in total costs to serve a family in a year by several family characteristics; namely, whether the woman was 21 years or older, whether she was pregnant at study entry, or whether she was giving birth for the first time. Appendix Table H.4 shows results for the same family characteristics, stratified by evidence-based model.

Appendix Table H.3

Variation in the Total Costs of Serving a Family During the First Year of Home Visiting, by Maternal Characteristics at Study Entry

Characteristic	Number of Families[a]	Average Total Costs per Family[b]	Total Costs per Family, 25th Percentile[b]	Total Costs per Family, 75th Percentile[b]
Maternal age				
Less than 21 years	462	4,155	1,356	6,098
21 years and older	753	3,883	1,276	5,630
Pregnancy status[c]				
Pregnant at study entry	448	3,371	1,053	4,840
Not pregnant at study entry	381	3,328	1,077	5,223
Parity[c]				
First-time mothers	416	3,172	1,029	4,662
Mothers with prior children	401	3,532	1,077	5,202
Sample size[a]	1,215			

SOURCES: Calculations based on data from the MIHOPE family service logs, the MIHOPE family baseline survey, and aggregate cost collection.

NOTES: Differences in average total costs per family across samples were tested for statistical significance using a one-way ANOVA, accounting for clustering of families within local programs. Statistical significance levels are indicated as follows: ***=1 percent, **=5 percent, *=10 percent.

[a] This comprises families at local programs that provided sufficient information to calculate costs. (See Table 2.1.)

[b] Costs are reported as 2014 U.S. dollars.

[c] Since all mothers in Nurse-Family Partnership are required to be pregnant at enrollment and first-time mothers, results for these characteristics are only shown among families in Early Head Start—Home-based option, Healthy Families America, and Parents as Teachers (sample size = 829).

Appendix Table H.4

Total Costs of Serving a Family During the First Year of Home Visiting, by Evidence-Based Model and Maternal Characteristics at Study Entry

Characteristic	EHS		HFA		NFP		PAT	
	Number of Families	Average Total Costs per Family ($)[a]	Number of Families	Average Total Costs per Family ($)[a]	Number of Families	Average Total Costs per Family ($)[a]	Number of Families	Average Total Costs per Family ($)[a]
Maternal age		***						
Less than 21 years	34	3,316	178	3,412	203	5,247	47	2,863
21 years and older	103	5,300	333	3,146	183	5,467	134	2,465
Pregnancy status								
Pregnant at study entry	72	4,719	281	3,270	386	5,351	95	2,650
Not pregnant at study entry	65	4,906	230	3,200	0	NA	86	2,478
Parity		**						
First-time mothers	56	4,074	292	3,152	371	5,354	68	2,512
Mothers with prior children	81	5,315	208	3,341	5	3,832	112	2,599
Sample size[b]	137		511		386		181	

SOURCES: Calculations based on data from the MIHOPE family service logs, aggregate cost collection, and the MIHOPE family baseline survey.

NOTES: EHS = Early Head Start—Home-based option, HFA = Healthy Families America, NFP = Nurse-Family Partnership, PAT = Parents as Teachers, NA = not applicable.

Differences in the average total costs per family by maternal characteristics were tested for statistical significance for each evidence-based model. Statistical significance levels are indicated as follows: ***=1 percent, **=5 percent, *=10 percent. The analysis did not conduct significance tests across pairs of models.

[a]Costs are reported as 2014 U.S. dollars.

[b]This comprises families at local programs that provided sufficient information to calculate costs. (See Table 2.1.)

Appendix Table H.3 reports average total costs for each maternal characteristic as well as the 25th and 75th percentile of these costs. Because all mothers in NFP are required to be pregnant at enrollment and first-time mothers, results in Appendix Table H.3 by pregnancy status and parity reflect only costs among families served by the other three evidence-based models. Average total costs for families served by NFP local programs are significantly larger than the average total costs for the other three evidence-based models. As a result, inclusion of NFP families in these comparisons strongly biases the comparisons toward the categories of "Pregnant at study entry" and "First-time mothers."

Appendix Table H.4 shows that average costs by maternal characteristics generally do not vary for any evidence-based model. The relatively large average cost of NFP families and skewed distribution of families toward specific characteristics illustrate how the inclusion of NFP families in the total average cost can lead to erroneous conclusions. For example, all NFP mothers were pregnant at study entry; therefore, inclusion of NFP in an average cost across the evidence-based models would drive up the average cost per family for those pregnant at study entry while leaving the average cost for those not pregnant at study entry unchanged. In addition, although average costs for EHS vary somewhat by maternal age and whether the mother had prior children, those differences are not precisely estimated because of the relatively small number of EHS families in the study, and the differences are not statistically significant.

VARIATION IN COSTS BY LOCAL PROGRAM CHARACTERISTICS

Appendix Tables H.5 and H.6 supplement Figure 4.3, which showed variation in total costs to serve a family in a year by several local program characteristics, specifically whether the local program was in a metropolitan area, the type of local implementing agency, and whether the program served more than 100 families. Appendix Table H.5 shows the average total cost and the 25th and 75th percentile of these costs for each program characteristic, while Appendix Table H.6 shows this information for each program characteristic by evidence-based model.

As seen in Appendix Table H.5, the only local program characteristic for which costs were statistically significantly different was type of agency. Average cost per family was highest for programs run by local health departments and lowest for programs run by school districts.

Results shown in Appendix Table H.6 suggest that the relatively large average costs seen for programs in local health departments may have been driven by the large number of NFP families receiving services from these agencies. As a result, including NFP families in these comparisons would make costs look higher for pregnant women and first-time mothers than for other mothers even if there are no differences by pregnancy status and parity for the other three evidence-based models.

Appendix Table H.5

Variation in the Total Costs of Serving a Family During the First Year of Home Visiting, by Local Program Characteristics

Characteristic	Number of Families[a]	Average Total Costs per Family[b]	Total Costs per Family, 25th Percentile[b]	Total Costs per Family, 75th Percentile[b]
Type of county served[c]				
Metropolitan	980	3,998	1,235	5,826
Nonmetropolitan	169	3,388	1,367	5,170
Both	66	5,356	3,150	6,216
Type of local implementing agency[d]		***		
Community-based nonprofit	726	3,764	1,254	5,493
Local health department	240	5,608	2,676	7,829
School district	58	1,781	816	2,515
Health care organization	126	3,347	1,583	4,547
Other	65	3,704	1,090	5,202
Enrollment capacity[e]				
100 families or less	406	3,948	1,171	5,762
More than 100 families	809	4,006	1,367	5,813
Sample size[a]	1,215			

SOURCES: Calculations based on data from the MIHOPE family service logs, aggregate cost collection, MIHOPE program manager survey, and the MIHOPE site-selection team.

NOTES: Differences in average total costs per family across samples were tested for statistical significance using a one-way ANOVA, accounting for clustering of families within local programs. Statistical significance levels are indicated as follows: ***=1 percent, **=5 percent, *=10 percent. The analysis did not conduct significance tests across pairs of models, county types, or agency types. The difference by type of local implementing agency was no longer statistically significant when NFP—which accounts for most programs run by local health departments—was removed from the analysis.

[a]This comprises families at local programs that provided sufficient information to calculate costs. (See Table 2.1.)

[b]Costs are reported as 2014 U.S. dollars.

[c]To designate counties as metropolitan or nonmetropolitan, this report follows the Department of Agriculture Economic Research Service's Rural-Urban Continuum Codes classification scheme (Economic Research Service, 2013).

[d]Other types of organizations include state-funded institution of higher education, local governments and cooperative extension, university, social service nonprofit, and Community Action Agency.

[e]Enrollment capacity is the number of families that can be served at any one time.

Appendix Table H.6

Total Costs of Serving a Family During the First Year of Home Visiting, by Evidence-Based Model and Local Program Characteristics

Characteristic	EHS Number of Families	EHS Average Total Costs per Family ($)[a]	HFA Number of Families	HFA Average Total Costs per Family ($)[a]	NFP Number of Families	NFP Average Total Costs per Family ($)[a]	PAT Number of Families	PAT Average Total Costs per Family ($)[a]
Type of county served[b]		***		***				***
Metropolitan	80	3,662	444	3,368	339	5,455	117	2,393
Nonmetropolitan	38	5,715	67	2,378	25	4,607	39	2,076
Both	19	7,817	0	NA	22	4,593	25	4,156
Type of local implementing agency[c]				***		***		
Community-based nonprofit	122	4,610	369	3,349	120	4,945	115	2,964
Local health department	0	NA	52	3,701	188	6,135	0	NA
School district	4	2,369	0	NA	0	NA	54	1,738
Health care organization	0	NA	48	2,144	78	4,088	0	NA
Other	11	7,886	42	2,947	NA	NA	12	2,520
Enrollment capacity[d]		***						
100 families or less	50	6,692	260	3,154	40	7,853	56	2,399
More than 100 families	87	3,725	251	3,326	346	5,062	125	2,644
Sample size[e]	137		511		386		181	

SOURCES: Calculations based on data from the MIHOPE family service logs, aggregate cost collection, MIHOPE program manager survey, and the MIHOPE site selection team.

NOTES: EHS = Early Head Start—Home-based option, HFA = Healthy Families America, NFP = Nurse-Family Partnership, PAT = Parents as Teachers, NA = not applicable.

Differences in the average total costs per family by local program characteristics were tested for statistical significance for each evidence-based model. Statistical significance levels are indicated as follows: ***=1 percent, **=5 percent, *=10 percent. The analysis did not conduct significance tests across pairs of models.

[a] Costs are reported as 2014 U.S. dollars.

[b] To designate counties as metropolitan or nonmetropolitan, this report follows the Department of Agriculture Economic Research Service's Rural-Urban Continuum Codes classification scheme (Economic Research Service, 2013).

[c] Other types of organizations include state-funded institution of higher education, local governments and cooperative extension, university, social service nonprofit, and Community Action Agency.

[d] Enrollment capacity is the number of families that can be served at any one time.

[f] This comprises families at local programs that provided sufficient information to calculate costs. (See Table 2.1.)

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