Supporting Evidence-Based Home Visiting to Prevent Child Maltreatment

Supporting Evidence-Based Home Visiting to Prevent Child Maltreatment: Cross-Site Evaluation Cost Study Background and Design Update

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MATHEMATICA Policy Research

Children's Bureau

ChapinHall at the University of Chicago

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In 2008, the Children's Bureau (CB) within the Administration for Children and Families (ACF) at the U.S. Department of Health and Human Services awarded 17 grants with the goal of supporting the implementation of evidence-based home visiting (EBHV) programs that aim to prevent child maltreatment. Grantees are combining their grants with other funding sources to implement, scale up, and sustain home visiting programs, maintaining fidelity to their program models. Grantees must also conduct implementation, outcome, and economic evaluations.

The EBHV grant program was formally incorporated into the Maternal, Infant and Early Childhood Home Visiting Program (MIECHV) State Formula Grant Program in 2011. The Health Resources and Services Administration (HRSA) administers MIECHV. In collaboration with ACF, HRSA provided additional funding via the state MIECHV formula grant to each of the original ACF EBHV grantees for the continuation of these projects. HRSA made these funds available in recognition of the ACF EBHV program's potential to contribute to the knowledge base regarding supporting evidence-based home visiting programs.

CB/ACF funded Mathematica Policy Research and Chapin Hall at the University of Chicago to conduct a national cross-site evaluation of the EBHV initiative. The cross-site evaluation focuses on domains central to the implementation and monitoring of home visiting programs: systems change, fidelity to grantee-selected home visiting models, and costs of home visiting programs.[1]

The cross-site evaluation design report presented an initial design for assessing the costs of home visiting programs operated by EBHV grantees (Koball et al. 2009). In this update, we provide additional background and design information. The document is intended to ground key elements of the cost study design in the research literature, to describe plans for collection and analysis of cost study data, and to offer EBHV grantees information regarding their anticipated role in data collection.

The report is organized into four sections. The first section reviews the purpose of cost analyses and existing literature on the costs of home visiting program models selected by EBHV grantees, presents research objectives for the cost domain of the EBHV cross-site evaluation, and describes the scope of the study. The second section describes the study design, including the study perspective, types of costs to be considered, and program components to be analyzed. The third section summarizes approaches to collection of cost data and presents methods for the cross-site evaluation. In the fourth section, we describe plans for cost data analysis, covering estimation of overall program costs, costs per program component, and costs per family.

Cost Domain Research Objectives and Scope

Cost analysis is "the systematic collection, categorization, and analysis of program or intervention costs" (Corso and Lutzker 2009, pp. 79). Its data can be used to estimate the overall resources needed to implement a program, the costs of program activities or components, and the expenses associated with providing services to an average client or family. This type of analysis benefits policymakers and program administrators by enumerating the resources necessary to implement programs and helping identify how program components vary in cost. Cost analysis also provides the foundation for two additional approaches to economic evaluation—cost-benefit

[1] For more information, visit www.supportingebhv.org.

analysis and cost-effectiveness analysis—that examine the relationship between the value of resources required to implement a program and the value of benefits produced by a program (Corso and Lutzker 2006; Yates 2009). Cost-benefit analysis quantifies program benefits in monetary terms and assesses whether they exceed program costs. Cost-effectiveness analysis examines the relationship between a program's costs and a relevant unit of program effectiveness. For instance, a cost-effectiveness analysis might assess the programmatic cost per case of child maltreatment prevented.

Existing Estimates of the Costs of EBHV Program Models

Few economic analyses of family development and child maltreatment programs, including the EBHV program models, have been completed (Corso and Filene 2009). In addition, clear guidelines or principles for economic analysis of early childhood interventions have yet to be established and applied reliably (Karoly 2010). For instance, evaluators incorporate into their analyses different types of costs (Barnett 1993; Boulatoff and Jump 2007). Some estimates include only costs reflected in program accounting documents, whereas others also encompass the value of resources not itemized in expenditure records, such as donated office space or volunteer labor. Evaluators' approaches to including administrative or overhead costs also differ.

Estimates of the costs per family of providing home visiting models implemented by EBHV grantees come from previous research and national program offices of the model developers. Table 1 summarizes per-family cost estimates. At least one cost estimate is available for four of the five models EBHV grantees have implemented.[2] Not all cost estimates are the result of an economic evaluation, however, and none of the estimates appear to take into account costs that program budgets or expenditure reports may not reflect, such as donated resources. In addition, differences among estimates in the types of costs included and the period covered make comparisons difficult. The EBHV cross-site evaluation cost analysis will address some of these issues by applying a consistent cost analysis methodology, as described below.

Objectives for the Cross-Site Cost Analysis

The EBHV cross-site cost analysis aims to assess the full costs to EBHV implementing agencies (IAs) of delivering home visiting services during a "steady state" period of implementation (a typical operating year).[3] In addition to estimating the overall cost of providing direct services, the analysis will gauge the costs of essential supports for service delivery, such as ongoing training, supervision, and management. It will also examine the costs of individual program components or service delivery activities.

[2] An estimate of the per-family costs of providing the Triple P program is not available. Foster et al. (2008) estimated the costs of the universal media and communication component of Triple P and of training service providers but not the costs of delivering the program.

[3] Some EBHV grantees provide home visiting, while others are coordinating their EBHV-related activities with other agencies that do so.

Table 1. Estimates of Per-Family Costs of EBHV Program Models

Home Visiting Model	Per-Family Cost (Range in Costs)	Year of Dollar Denomi-nation	Annual or Duration of Participation Cost	Types of Costs Included	Source
Healthy Families America	$3,348 ($1,950 to $5,768)	2004	Annual	NA	Survey of Health Families America programs in 15 states (Prevent Child Abuse America 2004)
	$3,074 ($2,465 to $3,836)	2000	Annual	Actual expenditures	Evaluation of Healthy Families New York (Dumont et al. 2010)
Nurse Family Partnership	$4,500 ($2,914 to $6,463)	2008	Annual	Nursing staff salaries, program materials, training, and data system access	Nurse Family Partnership National Program Office (Nurse Family Partnership 2009)
	$6,162[a] $9,140[b]	2002	Duration of participation[c]	NA	Evaluation of Nurse Family Partnership in Denver, CO (Olds et al. 2002)
	$3,227	1980	Duration of participation[c]	Salaries and fringe benefits, travel and supplies, overhead	Evaluation of Prenatal/Early Infancy Project in Elmira, NY (Olds et al. 1993)
Parents as Teachers	$2,621	2009	Annual	Salaries and fringe benefits, training, materials and supplies, transportation, data system access, evaluation and measurement tools	Sample budget for Parents as Teachers *Born to Learn* program (Parents as Teachers 2009)
	$1,450	2004	Duration of participation[d]	NA	Parents as Teachers national center (Aos et al. 2004)
	$5,125	1996	Duration of participation[e]	Budgeted costs, including overhead	Cost study of the Northern California Parents as Teachers Demonstration (Wagner et al. 1999; Montgomery and Duenas 1997)

Table 1 ***(continued)***

Home Visiting Model	Per-Family Cost (Range in Costs)	Year of Dollar Denomi-nation	Annual or Duration of Participation Cost	Types of Costs Included	Source
Triple P	NA[f]	--	--	--	--
SafeCare	$2,275		Duration of participation[g]	Personnel; office space; operating expenses; training; and materials, handouts, and home safety supplies	National SafeCare Training and Research Center (Georgia State University nd)

[a] Paraprofessional visited.
[b] Nurse visited.
[c] Approximately 2.5 years.
[d] 2.5 years.
[e] 30.1 months, on average.
[f] Foster et al. (2008) estimated the costs of the universal media and communication component of Triple P and of training service providers but not the costs of delivering the program.
[g] 18-20 weeks.

EBHV = evidence-based home visiting.

NA = not available.

This analysis will improve the knowledge base regarding the costs of home visiting programs by applying an accepted, uniform methodology and common time frame to cost analyses of multiple home visiting program models. This approach will provide comprehensive estimates of the resources required to implement the models, and facilitate various types of cost comparisons.

The research questions for the cross-site evaluation cost domain, as presented in the design report (Koball et al. 2009), are the following:

- ***What are the total costs of providing the home visiting programs during a typical operating year?*** What is the average aggregate cost and range in aggregate costs of the home visiting programs?
- ***How are costs allocated across key program components?*** What is their distribution between administration and direct services?
- ***What does each program cost per participating family?*** How do costs vary among families receiving different dosages of service (that is, different numbers of home visits)?
- ***How do costs vary by key program features?*** What is the range in costs observed among program models, programs at different stages of implementation, and programs targeting various populations?
- ***How do program costs vary by context?*** How do program costs vary by region of the country or urban/suburban/rural location?

Scope of the Cost Analysis

Ideally, information on the cost of home visiting programs would be combined with information about their benefits, to help policymakers allocate resources among alternative uses to best address child maltreatment or other societal goals. However, the cross-site evaluation will assess only the costs of delivering home visiting programs (Koball et al. 2009). Cost-benefit or cost-effectiveness analyses would require a comparison of the effects of home visiting programs against some alternative (for example, another service option or no program). An evaluation of program impacts, preferably with an experimental design (using random assignment), would be necessary to conduct this type of comparison. In addition, for the cross-site evaluation, comparison groups would need to be consistently defined across all grantees. If such studies identified positive impacts (or benefits) for participating families, these benefits could then be compared with costs in monetary terms (for cost-benefit analysis) or on a unit basis (for cost-effectiveness analysis). An impact study is outside the scope of the cross-site evaluation, which precludes conducting a cross-site cost-benefit or cost-effectiveness analysis. Nevertheless, some local EBHV evaluations may support these extended economic analyses, depending on their design and implementation. The data collected and shared with grantees may facilitate such analyses, as appropriate.

In addition to assessing the costs of direct provision of home visiting services, the cost analysis will explore the costs to implementing agencies of infrastructure-building activities that support evidence-based home visiting models. Though their chosen area of emphasis differs, EBHV grantees are aiming to implement, scale up, and sustain high-fidelity programs to reduce child maltreatment by building infrastructure capacity in eight areas: (1) planning, (2) collaboration, (3) operations, (4) workforce development, (5) fiscal capacity, (6) community and political support, (7) communications, and (8) evaluation. These types of infrastructure can be grouped into three categories: (1) foundation, (2) implementation, and (3) sustaining (Table 2). The cost analysis will

estimate the resources that IAs affiliated with grantees expend toward developing these infrastrucuture areas in a year of steady-state operation. The cost of systems change efforts more broadly is beyond the scope of the cross-site cost analysis, however. Although systems change efforts are an important element of grantees' activities, the broad reach and variety of these activities, the numerous agencies and entities that tend to be involved, and the fact that they cannot be associated with the delivery of specific services to specific clients present substantial barriers to measuring and analyzing their costs.

Table 2. EBHV Infrastructure Capacity Categories

Infrastructure Categories	Types of Activities
Foundation	
Planning	Strategic planning, tactical planning, decision making
Collaboration	Leadership, alignment of goals and strategies, development of relationships, working through existing relationships
Implementation	
Operations	Outreach, intake, screening, assessment, home visiting, and referral services
Workforce Development	Training, coaching, supervision, technical assistance, and staff recruitment and retention
Sustaining	
Fiscal Capacity	Fiscal partnering, planning, fundraising, researching funding sources, and leveraging funding to support direct services
Community and Political Support	Building community awareness or political support for EBHV programs and policies
Communications	Communication of EBHV information, lessons learned, and research findings, or policy advocacy to program partners, stakeholders, or the public
Evaluation	Data collection, storage, retrieval, and analysis for program evaluation, monitoring, or quality improvement

Note: EBHV = Evidence-Based Home Visiting

Sources: Flashpohler et. al 2008 and Coffman 2007.

The sample for the cross-site cost analysis will be all IAs that have provided data on the number of participants receiving services and the duration of their participation as part of the cross-site evaluation fidelity domain study. These data are necessary for calculations of per-family costs, as described below. [4]

Key Elements of the Cross-Site Evaluation Cost Study Design

Plans for the cross-site cost analysis address three key design elements: (1) the perspective for the analysis, (2) the time period and stage of implementation for assessing program costs, and (3) the

[4] Approximately 27 IAs are currently providing these data.

definition of program components (that is, the activities used for categorizing program costs). These elements help frame the cost study and provide a basis for specifying approaches to data collection and analysis.

Identifying the Study Perspective

Program costs may be viewed from at least four perspectives (Corso and Filene 2009; Foster et al. 2007; Corso and Lutzker 2006; Gold et al. 1996):

1. ***Costs to a funding agency.*** From the *funder* perspective, costs include explicit expenditures on program-related activities, as reflected in accounting or financial records. This perspective allows funders to understand how financial resources they have contributed have been used to support programs.

2. ***Costs to implementing agencies.*** From an *implementing agency* perspective, costs comprise the resources needed to deliver a program. Cost estimates calculated from this perspective represent the resources that an agency would need to access to replicate the program at a similar scale.

3. ***Costs to participants.*** For *participants*, the costs of a program include out-of-pocket expenses related to accessing services and the value of time spent participating in the intervention. This perspective can be employed to understand the burden of program participation or potential barriers for participants.

4. ***Costs to society.*** The *societal* perspective is the most comprehensive, capturing all resources used by the program, including program implementation, costs of participant time (if possible), and costs that may accrue to the community at large if, for example, participants access more services through referrals than they would otherwise (Gold et al. 1996). Calculating costs from the perspective of society can be helpful for estimating a program's overall influence on public expenditures (Barnett 1993).

The implementing agency, participant, and societal perspectives include costs not captured by accounting records (Gold et al. 1996). These include, for example, volunteers working with a program, or in-kind services or contributions.

We have proposed to conduct the cross-site evaluation cost analysis from the implementing agency perspective (Koball et al. 2009). Using this perspective, we will address the evaluation's key cost-related questions and provide useful information for grantees and policymakers. It is also the most feasible perspective for analysis, given that assessing costs to society would require data on such topics as participants' use of government services and earnings over time, which may not be available from all IAs.

We will estimate the total resources used for delivering home visiting services by examining accounting costs (actual expenditures on such items as salaries and supplies), and replacement costs, such as the value of in-kind contributions of volunteer time or other donations to the programs. This approach is beneficial for providers considering replicating programs, because it provides a more comprehensive picture of all resources necessary for program implementation (Corso and Filene 2009; Corso and Lutzker 2006).

To reflect the full cost of service provision, the cross-site cost analysis will employ the "ingredient" method (also known as the resource cost method) for calculating program costs. This

approach entails itemizing the resources (or ingredients) necessary to provide services, calculating or estimating their costs, and aggregating these costs to estimate overall program cost (Levin and McEwan 2001). Researchers have advocated this method as a means to develop cost estimates that reflect the value of all resources required for delivering an intervention (Plotnik and Deppman 1999; Boulatoff and Jump 2007; Corso and Lutzker 2006; Levin and McEwan 2001). Calculating total costs is the first step in estimating costs per participant and costs per program component.

Our analysis will also conform with the ingredient method by using market prices—the amount that would be paid for a resource in the marketplace—to estimate a monetary value for resources that a program's accounting costs do not reflect (Levin and McEwan 2001). Information on market prices for similar resources can be used to create these estimates. For instance, the value of office space that is donated to a program may be estimated using commercial lease rates in a local area. Similarly, the value of volunteer labor may be estimated using typical wages for the position held by a volunteer. This approach is appropriate because another program may, in fact, have to pay these costs if donations are not available.

Establishing the Study Time Frame

Operations and costs are likely to differ across phases in a program's development and implementation; it is therefore important to define the time frame for the study at its outset (Corso and Filene 2009). In cross-site evaluations, establishing a similar time frame for analysis—in terms of both length and status of program implementation—helps ensure meaningful comparisons of program costs (Corso and Filene 2009).

Length of analysis period. Program activities that affect costs may vary over the year; for example, the frequency of service delivery may fluctuate seasonally. Thus, analyses should cover a time period of at least one year. In economic evaluations of the Nurse-Family Partnership program, program costs have been calculated for a family's average period of participation, about two-and-a-half years (Olds et al. 1993, 2002). Corso et al. (2009) measured program costs for the Family Connections program for a preimplementation year and years one and three of the implementation phase. For the EBHV cross-site evaluation, we have proposed that the cost analysis focus on a one-year period of steady-state operation (Koball et al. 2009). A one-year time frame facilitates standardized data collection across programs, particularly because the expected length of interventions varies among models grantees have implemented.

Status of program implementation. The time frame of a cost analysis can cover specific phases of a program's development and operation or a particular time period during a program's ongoing implementation. A program may serve fewer clients during a start-up phase, for instance, than during a period of full implementation, once it has had time to conduct outreach and build caseloads. Evaluators frequently estimate costs when the program is in a steady-state implementation and caseloads are relatively stable (Boulatoff and Jump 2007; Meckstroth et al. 2008; Perez-Johnson et al. 2002). As of spring 2011, many IAs were operating with typical caseloads, according to information gathered for the cross-site evaluation. We thus propose that the cost analysis time frame cover the 12 months beginning July 1, 2011 and extending through June 30, 2012. Although it is preferable to use a consistent time frame across IAs, we may adjust the beginning and end dates of the 12-month period for some IAs, to conform to their fiscal years or other reporting periods.

Defining Program Components

Cost analysis can provide useful information regarding how resources are used in providing services by apportioning costs in two ways: (1) among resource categories and (2) among program components or activities. Program costs can be allocated across such resource categories as personnel; space and utilities; supplies, materials, and equipment; and travel. Often, it is informative to further disaggregate costs according to components or activities, particularly for programs in which personnel costs account for a large proportion of costs. Costs can be allocated among components based on reports of how staff members use their time (Meckstroth et al. 2008; Perez-Johnson et al. 2002; Ohls and Rosenberg 1999). Other types of costs, such as materials, may also be allocated among components (either by determining whether costs are associated with specific activities or allocating them in the same proportions as personnel time), or they may be considered separately. Costs related to program evaluation should be excluded from the analysis if evaluation is not an expected part of program replication (Corso and Filene 2009; Foster and Jones 2006).

Program components should be clearly defined and mutually exclusive. In their cost study of the Family Connections program, Corso and Filene (2009) analyzed personnel costs by dividing them into two broad categories: (1) service-related costs and (2) administrative costs. These two categories were then further disaggregated into specific activities. Activities related to services included, for example, working directly with clients, making referrals, and conducting case management. Administrative activities included provision and receipt of supervision, training, and outreach, among other activities. Boulatoff and Jump (2007) took a similar approach in their cost analysis of a universal home visiting program, dividing costs into "direct" and "indirect" service categories; direct service included only the salaries and benefits of staff working directly with clients.

During the planning phase of the EBHV cross-site evaluation, the Mathematica-Chapin Hall team worked with grantees to identify and define program components that are relevant to the EBHV models grantees have adopted (Koball et al. 2009). Table 3 presents an updated set of components and definitions, developed after further consultation with grantees and local evaluators. The table indicates whether the components are related to direct services or management and administration, as well as the infrastrucuture capacity categories related to each program component. Although the components are intended to be broadly applicable, not all components will necessarily be relevant to all programs.

Collecting Cost Data

The cost analysis will rely on two types of data collected from IAs: (1) data on resources used for program operations, to estimate total costs (cost data), and (2) data on staff time allocations among program components, to allocate costs among program components (time use data).

Approach to Collecting Data on Aggregate Costs

To collect aggregate cost data for the EBHV cross-site evaluation, we must first identify the types of resources used for delivering home visiting services. Table 4 presents a list of anticipated resource categories, along with methods that previous studies have used to estimate the annual costs or market values of these resources. We expect that the cross-site evaluation cost study instrument will address each of these resources and contain individual items that gather information necessary to apply the estimation method noted.

Table 3. Program Components for Categorization of Costs for the Cross-Site Evaluation Cost Study

Program Component	Definition	Infrastructure Category
Direct Services to Enrolled Clients		
Initial Screening and Assessment	Assessing clients' needs, analyzing family situations, and collecting information needed to develop service delivery plans (includes any initial screening and assessment conducted in the client's home).	Operations
Home Visit Preparation and Delivery	– Preparing for future home visits, including developing service delivery plans and communicating with clients to schedule visits. – Delivery of services to families and children through home visits, including providing counseling and support, demonstrating or modeling skills, conducting periodic screenings and assessments, and other activities during visits.	Operations
Case Management and Service Linkage	Arranging and coordinating services on behalf of a family or child, including advocacy on behalf of the client, consultations with other staff and providers, and identifying appropriate resources.	Operations
Services/Activities Other than Home Visits	Providing or participating in program services other than home visits, such as parent group meetings or meetings with clients outside their homes.	Operations
Case Documentation	Completing case notes and recording data to document services provided and client status.	Operations
Travel/Transportation	Traveling to clients' homes or other locations to provide services. Transporting clients to locations outside their home.	Operations
Management and Administration		
Outreach and Recruitment	Communication with other agencies/groups/providers and people (such as potential participants) to inform them about services available through the EBHV program in order to promote referrals or applications to the program.	Operations
Eligibility Determination and Referral	Determining eligibility for the program (including conducting screenings and assessments related to eligibility determination) and enrolling clients. Referring clients who cannot be served to other agencies.	Operations
Staff Recruitment	Recruiting and hiring program staff.	Workforce Development
Training	Providing or attending in-house or outside trainings that support delivery of services or program operations.	Workforce Development
Staff Supervision and Consultation	Providing or receiving feedback and supervision, individually or in groups, related to delivery of services or program operations. Participating in staff meetings or consultations related to service delivery.	Workforce Development

Table 3 ***(continued)***

Program Component	Definition	Infrastructure Category
Fundraising	Grantwriting, fundraising, researching funding sources, and leveraging funding to support direct services	Fiscal Capacity
Planning and Collaboration	– Strategic planning and decision making – Participating in professional/ organizational/ community committees that support program operations – Developing relationships and working through existing relationships to align goals and strategies with partners	Planning Collaboration
External Communication	– Communicating information about evidence-based home visiting, including lessons learned and research findings to partners, stakeholders, or the public – Building awareness or support for evidence-based home visiting programs and policies within the community and among policymakers.	Communication Community and Political Support
Continuous Quality Improvement	Analyzing data to monitor program implementation and assess fidelity to the EBHV program model. Using data to support program improvement.	Evaluation
General Management and Administration	Budgeting and financial reporting, managing or negotiating contracts, and other management or administrative activities that do not fall into other categories provided.	Operations
Evaluation[a]	Planning program evaluation activities, such as those conducted for the EBHV local or cross-site evaluation or as required by other funders, providing or collecting data required for program evaluation, or traveling for evaluation-related purposes.	Evaluation

Sources: EBHV cross-site evaluation team, Corso and Filene 2009.

[a] These costs will be excluded from the estimate of total annual program costs.

Examples of cost data collection instruments and modes. Once resource categories are established, instruments to collect cost data can be developed, and a mode for data collection selected. Several data collection instruments and modes have been developed to support the ingredient method of cost analysis. Practical examples from the areas of substance abuse treatment, welfare-to-work programs, and school-based health-care include the following:

- ***The Drug Abuse Treatment Cost Analysis Program*** (DATCAP) (French 2003). The DATCAP is a widely used data collection instrument designed to collect cost data from substance abuse treatment programs in a variety of settings. It is divided into sections addressing annual costs of personnel, buildings and facilities, supplies and materials, major equipment and contracted services, and other items, and can be a useful tool in estimating the value of donated resources. The DATCAP can be completed with paper and pencil or a spreadsheet and was designed for face-to-face meetings with clinic directors conducted by a trained interviewer, ideally with a background in economics.

- ***Protocols for the Rural Welfare-to-Work Strategies Demonstration and the U.S. Department of Labor Welfare-to-Work Grants*** (Meckstroth et al. 2008; Perez-Johnson et al. 2002). For this analysis, Mathematica developed interview protocols, tables, and spreadsheets that guided research team members in collecting and compiling data during site visits and follow-up communications with program directors and administrators. Researchers also reviewed program accounting documents and records to gather information necessary for the analysis. The types of resources captured through the protocols include the full range of budgeted and off-budgeted costs associated with operating the program.
- ***National Assembly on School Based Health Care cost survey*** (NASBHC 2007). The NASBHC cost survey guides respondents through key program cost areas (salary expenses, fringe benefits, supplies and materials, and so on), providing step-by-step instructions for the calculation of costs and estimation of values for donated services or goods. It is a self-administered Internet based survey.

Table 4. Resources for Delivering EBHV Programs and Methods for Estimating Their Annual Values

Resource	Estimation Methods
Salary Expenses	For each staff position relevant to EBHV program, multiply full-time annual salary by percentage full-time equivalent (FTE), and then by the percentage charged to EBHV program.
Fringe Benefits	Calculate fringe benefits as a percentage of total salaries; or sum total fringe benefits by type of benefit; or sum total fringe expense by position. Alternatively, use total fringe benefit expenditures reported by IA.
Volunteer/Donated Labor	For each volunteer position, multiply number of hours worked per week by the number of weeks worked per year, and then by the estimated average hourly wage for position.
Contracted Services[a]	Sum expenditures reported by IA for contracted services related to the EBHV program (for example, consulting).
Office Space[a]	Multiply percentage of building or facility used by EBHV program by annual rent/lease/mortgage payments for building, or by the annual fair market rent or lease amount. For donated space, multiply square footage used by EBHV program by market value per square foot for equivalent space.
Supplies and Materials[a]	Sum expenditures reported by IA for specific types of supplies and materials used for the EBHV program (for example, office supplies, educational materials, and so on). For donated supplies and materials, use estimated values reported by IA.
Utilities[a]	Use total utilities expenditures reported by IA. For shared and donated facilities, multiply utilities expenditures for entire building by percentage of building or facility space used by EBHV program.
Durable Equipment[a]	Calculate annual depreciation for each asset used by the EBHV program using original purchase cost and estimated life. Assume no scrap value at end of estimated life.
Travel	Use travel expenditures reported by IA.
Other Direct Costs	Sum other EBHV-related expenditures reported by IA and not included in above categories (for example, payments to EBHV model developers).
Other Indirect (Shared) Costs[a]	Sum other indirect costs reported by IAs (for example, insurance premiums or building maintenance).

Sources: National Assembly on School Based Health Care 2007, Corso and Filene 2009.

[a] These resources may be included in an organization's indirect costs and allocated to individual programs or projects through an established indirect cost rate. We will use the IA's audited indirect cost rate, if applicable, to estimate the value of these resources.

IA = implementing agency

Potential modes for collecting EBHV aggregate cost data. As indicated above, previous cost surveys have employed various modes to gather aggregate cost data, including face-to-face interviews, telephone interviews and reviews of accounting documents, and an Internet-based survey. In selecting a mode for the EBHV cross-site evaluation, the potential advantages and disadvantages of alternative modes must be considered. For example, face-to-face or telephone interviews offer an opportunity to explain directly to respondents the definitions of resource categories and to confirm the accuracy of information needed to produce cost estimates. However, interviews may require a lengthy and extensive follow-up with multiple respondents in each IA. A self-administered instrument, such as an Internet-based survey or spreadsheet, reduces the burden associated with participating in interviews and allows respondents to enter information at their own pace. It may also provide immediate feedback to respondents by, for example, performing some cost calculations. Potential drawbacks of this mode are the time and resources required to develop the survey instrument and the possibility of inconsistencies in data collection if questions are not precisely worded or cost categories are not clearly defined.

Caffray and Chatterji (2009), describing their experience conducting the NASBHC cost survey, note that an Internet-based survey is "an efficient and practical way to collect comprehensive data" (pp. 71). Among the lessons that they highlight is the importance of conducting a pilot test to determine how respondents will use the instrument and gather recommendations about improving it. They also note the challenge of capturing data on some resources, including donated space and indirect costs. An important feature of the NASBHC survey with respect to utilization-focused evaluation is its ability to immediately produce financial summaries, including estimated costs for individual resource categories and total estimated costs. Respondents reported using this information for their own purposes (Caffray and Chatterji 2009).

We recommend using computer-based, self-administered methods to collect aggregate cost data from IAs, given the anticipated number of IAs responding to the survey, the positive experience that other researchers report with this data collection mode, and the potential for immediate feedback to respondents. We plan to collect data through an spreadsheet-based instrument unless cost limitations or other constraints preclude doing so.

Approach to Collecting Data on Staff Time Allocation

We will use information on how staff members allocate their time to distribute costs among program components. These data can be collected prospectively or retrospectively, using several modes.

Prospective versus retrospective data collection. Data for allocating staff time across program activities can be collected prospectively through the use of time diaries or retrospectively through the use of stylized questions (Gold et al. 1996; Hargreaves et al. 1998). Prospective data collection typically requires that respondents record regularly how they spend their time during a specific period or throughout the length of an intervention (Anderson et al. 1998; Corso et al. 2009; Yates 1999). In contrast, retrospective data collection asks respondents to recall how they spent their time during a particular period (such as the previous day or week) or how they generally spend their time. Time diaries may use pre-defined activity categories or be open-ended (with responses coded later for analysis), while stylized questions typically identify specific activities (Ver Ploeg et al. 2000).

Data accuracy and burden on program staff are considerations in selecting prospective or retrospective cost data collection. The strength of the prospective approach is its potential to provide a highly accurate portrayal of each staff member's time use. It is generally believed that retrospective reports of time use are less accurate (Foster et al. 2003; Juster et al. 2003; Ver Ploeg et al. 2000), because responses to stylized questions are thought to be more sucesptible to error. In particular, respondents may overreport time spent in socially desirable activities, have difficulty recalling their activities during the reference period, or find it challenging to report how they spend their time "on average". For this reason, some researchers have adopted prospective data collection for cost studies (Corso and Filene 2009).

On the other hand, prospective data collection can place a high burden on program staff members, who must complete logs or diaries regularly over an extended period. In addition, some studies indicate that retrospective reporting of time use can be reasonably accurate compared to diary-based estimates (Juster et al. 2003). Frazis and Stewart (2004), for instance, found that retrospective reports of hours worked provided for the Current Population Survey are similar to those generated from the American Time Use Survey time diaries. Data from other countries also suggest that aggregate estimates of self-reported time in work are similar to work time reported in diaries (Bonke 2005).

The EBHV cross-site evaluation will collect time use data retrospectively. This approach minimizes the burden on program staff while maintaining the potential to collect reasonably accurate estimates of time use. In addition, previous cost studies have successfully employed retrospective data collection through stylized questions (Meckstroth et al. 2008; Perez-Johnson et al. 2002; Zarkin et al. 2004). But respondents must receive clear instructions for providing information, and activity categories must be clearly defined.

Potential modes for collecting EBHV time use data. Several survey modes could be used to collect time use data: face-to-face interviews, telephone interviews, an Internet-based survey, a spreadsheet completed by program staff, or some combination. The Mathematica-Chapin Hall team proposes to explore further the options of an Internet- or spreadsheet-based survey instrument to collect data efficiently from IA staff members. The instrument will ask respondents to estimate the proportion of time spent in key activity areas over the course of the past week or month. We propose collecting time use data once or twice during the cost analysis time frame.

To support accurate estimates of time allocations, the instrument will be accompanied by clear instructions, as well as guidance regarding the definitions of program components. We will provide additional information to familiarize staff with the purpose and content of the instrument through written materials and webinars. Members of the evaluation team also will also offer technical assistance related to the survey by phone.

Promoting Consistency and Accuracy in Data Collection

The research literature provides useful suggestions for promoting consistent and accurate data collection on costs and time use for cost studies. We will apply the following lessons in the context of the EBHV cross-site evaluation:

- ***Standardized data collection tools and definitions of activity categories reduce inconsistency in cost data reporting across multiple sites (Corso and Filene 2009).*** We will use uniform instruments to collect cost data from all IAs and staff members to establish standard cost and component categories and to facilitate comparisons across

sites. Definitions of program components will also be refined in consultation with grantees, if necessary, to ensure that the components are generally relevant across programs and easily understood by survey respondents.

- ***A pretest of survey instruments can gather valuable feedback from respondents (Caffray and Chatterji 2009).*** Development of the EBHV cost and time use surveys will include a pretest to gather feedback on survey functionality from a small number of respondents. We also expect to verify the accuracy of data collected from pretest respondents using accounting records, such as budget documents and expenditure reports.
- ***Incorporating logic and validity checks into a cost survey is helpful (Caffray and Chatterji 2009).*** The accuracy of data collection can be enhanced by creating an instrument that automatically performs checks, such as calculating values for users, verifying entries for double-counting of expenses, or refusing values that are out of range. We will explore building these types of functions into the EBHV cost and time use surveys.

In addition, we will support accurate completion of the EBHV cost surveys by providing detailed instructions for respondents. We expect to conduct a webinar describing the instruments before fielding them widely and to have evaluation team members make followup phone calls to promote participation and offer technical support to IAs completing the surveys, as needed. As an option to validate aggregate cost estimates provided through survey responses, we may conduct in-depth telephone interviews and reviews of IA financial documents.

Analysis and Reporting of Cost Data

The research questions for the cross-site evaluation cost study demand four general types of analysis: (1) estimation of the total annual cost of providing a home visiting program, (2) estimation of the annual cost per program component, (3) estimation of the cost per participant, and (4) comparison of costs among programs by key features and contextual factors. In this section, we describe plans for conducting these types of analyses.

Estimating Total Annual Costs

For each IA, we will build up an estimate of total costs by summing the costs of individual resources applicable to each IA (Table 3). The analysis may require adjustment of some reported costs. For example, IAs may estimate the value of donated office space using information on commercial rental rates from a period other than the 12-month cost study time frame. In this case, we will work with IAs to adjust values to the appropriate time frame using a consumer price inflator, such as the Consumer Price Index (Corso and Filene 2009).

We will calculate averages, median values, and ranges for total annual costs among all IAs and for subgroups of IAs. In reporting total costs, we expect to provide a level of detail that best facilitates use of the data, such as presenting total personnel costs or breaking out salaries and benefits.

Estimating Costs per Program Component

Estimates of program component costs (Table 3) will be based on staff time allocations and compensation. For each staff position, we will multiply the percentage of time that relevant staff

members report spending on each program component by the compensation for each position. These values will be summed across staff positions to produce total personnel-related cost per program component.

Nonpersonnel costs that are clearly related to a specific component (for example, travel required to attend a training) will be allocated to the relevant component. Costs that we cannot directly link to a specific program component will be allocated in the same proportions as personnel-related program component costs.

An extension of our analysis of program component costs will be calculating the proportions of costs related to two broader categories: (1) direct services and (2) management and administration. Each of these categories comprises several individual program components, as indicated in Table 3. This type of analysis will provide information on the relative costs of a program at two levels being examined in the system change domain of the cross-site analysis (Hargreaves and Paulsell 2009). These are the core operations and organizational support levels. "Core operations" includes provision of direct home visiting services, daily management of core home visiting services, and ground-level implementation. Core operations are carried out within organizations that establish administrative structures and processes to select, train, coach, and evaluate the performance of home visitors. The "organizational support" level includes administrative support for home visiting operations, external coordination with other local social service agencies, and organizational cultural elements such as leadership and staff commitment to the program.[5]

Finally, we will use our analysis of program component costs to estimate the costs to implementing agencies of foundation, implementation, and sustaining infrastructure development. Agencies' use of resources for infrastructure development may differ based on their programs' stage of development and the scope of their infrastructure building activity. Some agencies are implementing one or more home visiting models for the first time, while others support ongoing home visiting programs, adapting them for new populations or expanding them to new geographic areas. Agencies also vary in whether they are building infrastructure at the community, regional, or statewide level (Hargreaves et al. 2011).

Each program component is associated with one or more infrastructure capacities.[6] (The infrastructure capacities of operations, workforce development, and evaluation are associated with multiple program components.) By estimating the costs of program components associated with specific infrastrucuture capacities (summing multiple components, as appropriate), we will develop an estimate of the resources implementing agencies devote to infrastructure development.

Estimating Costs per Participating Family

Estimates of costs per participating family are critical to analytic comparisons—whether across grantees or program models, within models across different target populations or geographic

[5] Remaining levels are community, state, and national.

[6] The program components of "planning and collaboration" and "external communication" each represent two infrastructure capacities. We merged infrastructure capacities under these components to maintain a manageable number of program components for staff time allocation. Our analysis thus will examine combined costs for two pairs of infrastructure capacities: (1) planning and collaboration, and (2) communication and building community support.

settings, or by other factors. These costs may differ depending on how a participant is defined and whether dosage of services or length of participation is taken into account.

A participant may be defined as a family who was enrolled in the program and received at least one home visit during the cost analysis period. Total program costs would then be divided by the number of participants to produce an estimated cost per participant. Estimates of per-participant costs using this method do not take into account such factors as service intensity or duration.

Two alternative approaches to calculating average per-participant costs rely on fidelity data to produce estimates that reflect average service intensity or duration:

1. ***The average-cost-per-home-visit method.*** This approach, applied by Boulatoff and Jump (2009) in their analysis of the costs of a universal home visiting program, is based on the average cost per home visit delivered during the cost period. Total program costs are divided by the number of home visits delivered during the cost period, producing a cost per home visit delivered. This value is then multiplied by the average number of home visits received by a family (including visits occurring outside the cost period) to calculate the average cost per family.
2. ***The average-cost-per-participant-month method.*** A second approach uses the number of "participant months"—a sum across all families of the number of months each family participates in the program during the cost period. Total program costs are divided by the number of participant months, producing a cost per participant month. This amount is then multiplied by the average number of months a family participates in the program (including months outside the cost analysis period) to calculate the average cost per family. Meckstroth et al. (2008) and Perez-Johnson et al. (2002) used this method to calculate per-participant costs in studies of welfare-to-work programs.

We will examine fidelity data reported by IAs to determine which methods of calculating per-participant costs are feasible. At a minimum, per-participant costs will be calculated using the number of families served during the cost period.

An issue to consider in calculating and comparing per-participant costs, whatever method is used, is variation in expected dosage *within* program models. Under some program models, participants are enrolled in service levels of varying intensity depending on their progress through the program or current needs. Calculations of per-participant costs for a program as a whole would not reflect differences among these service levels. It will be important to consider this context when interpreting and reporting per-participant costs.

Variation in Costs by Program Features

Many factors can contribute to differences in total, component, and unit costs. For instance, regional variation in average salaries for similar jobs may affect the costs of implementing a program model in different locations. Differences in populations served might influence service intensity or duration. An analysis of variation in costs should explore factors such as these that are likely to influence program costs and are relevant to policymakers and program operators.

To analyze cost variation, we will compare per-family costs and the proportion of costs allocated to specific program components among subgroups of IAs. We will establish subgroups through analyses of data from the cross-site process, systems, and fidelity studies. Subgroups may be defined by program model, target population, location, and length of time since implementation,

among other program characteristics. We also will investigate the feasibility of assessing variation in costs by level of fidelity to the program model.

To facilitate comparisons of costs across subgroups unrelated to geographic location, we will adjust cost estimates to account for systematic differences in compensation levels across regions or localities. These adjustments will be made using an appropriate index—for example, "pay relatives" developed by the Bureau of Labor Statistics using National Compensation Survey data. Pay relatives indicate the average pay for an occupation group in a specific metropolitan area as a percentage of average pay for that occupation in the United States as a whole (Bureau of Labor Statistics 2011).

In general, we will be cautious about selecting subgroups for analysis and interpreting variation in costs, given the small sample sizes expected for individual subgroups. Our ability to conduct subgroup analyses will depend on the number of programs in each subgroup, the number of participants they serve, and contextual factors that may have affected implementation in a particular location or program subgroup. Although we will not be able to directly attribute differences in costs among programs to specific program features, our analysis will aim to identify key features that appear to influence cost variation.

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