Waiver Demonstration

Cost Evaluation Toolkit

Module B: Case-Level Cost Analysis

December 2017

The Children's Bureau within the Administration for Children and Families requires jurisdictions with a title IV-E waiver to conduct evaluations of their demonstrations using an independent third-party evaluator. The evaluation must include a cost evaluation in addition to process and outcome evaluations. This toolkit will help evaluators and program and financial staff to conduct a cost evaluation that meets the waiver requirements.

The toolkit contains four interrelated modules. Each module is divided into steps. The appendix provides tools such as worksheets and spreadsheets, resources, a glossary, and frequently asked questions (FAQs). Some of the tools are presented with mock data from a fictitious waiver program, "Wilson County," to illustrate their use.

Module B focuses on case-level cost analysis, which allocates program-level costs to individual cases. For an overview of cost analysis and an introduction to the entire toolkit, see Module A: Program-Level Case Analysis.

Module B: Case-Level Cost Analysis

Appendices

Waiver Demonstration Cost Evaluation Toolkit—Module B: Case-Level Cost Analysis

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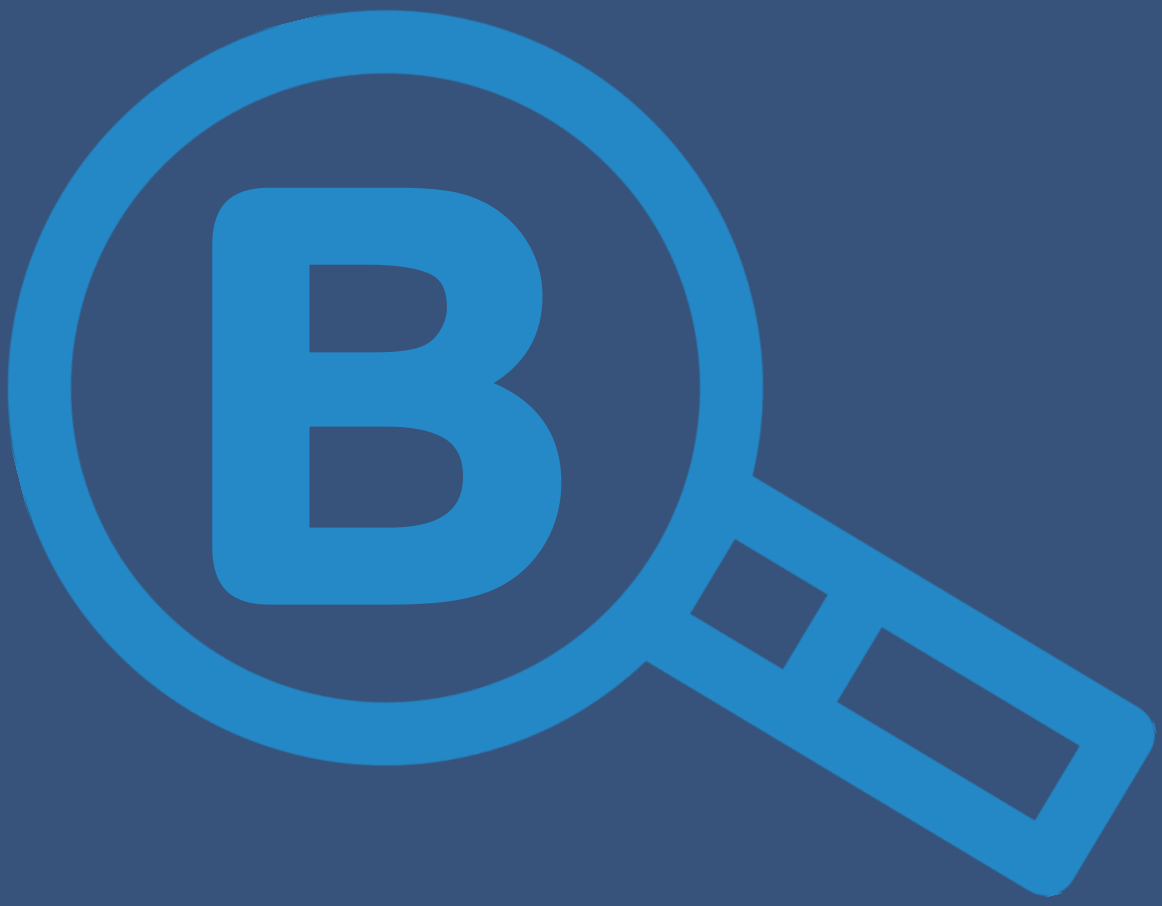
Suggested citation: James Bell Associates. *Waiver demonstration cost evaluation toolkit—Module B: Case-level cost analysis*. (2017). Arlington, VA: Author.

This toolkit was developed by James Bell Associates under Contract No. HHSP23320095612WC, Task No. HHSP23337003T. It does not necessarily reflect the views or policies of the Children's Bureau, the Administration for Children and Families, or the U.S. Department of Health and Human Services.



Module B

Case-Level Cost Analysis

Introduction

In Module A, you learned that program-level cost analysis is the foundation for other types of cost analysis. If you stop there, you will not yet have answers to some important questions. Program-level cost analysis looks at the cost of a program, but case-level cost analysis looks at the cost of serving individual families. It provides valuable information for decision making and program improvement. It also sets the stage for the more advanced types of cost analysis described in Modules C and D: cost-effectiveness analysis and benefit-cost or return on investment (ROI) analysis, respectively.

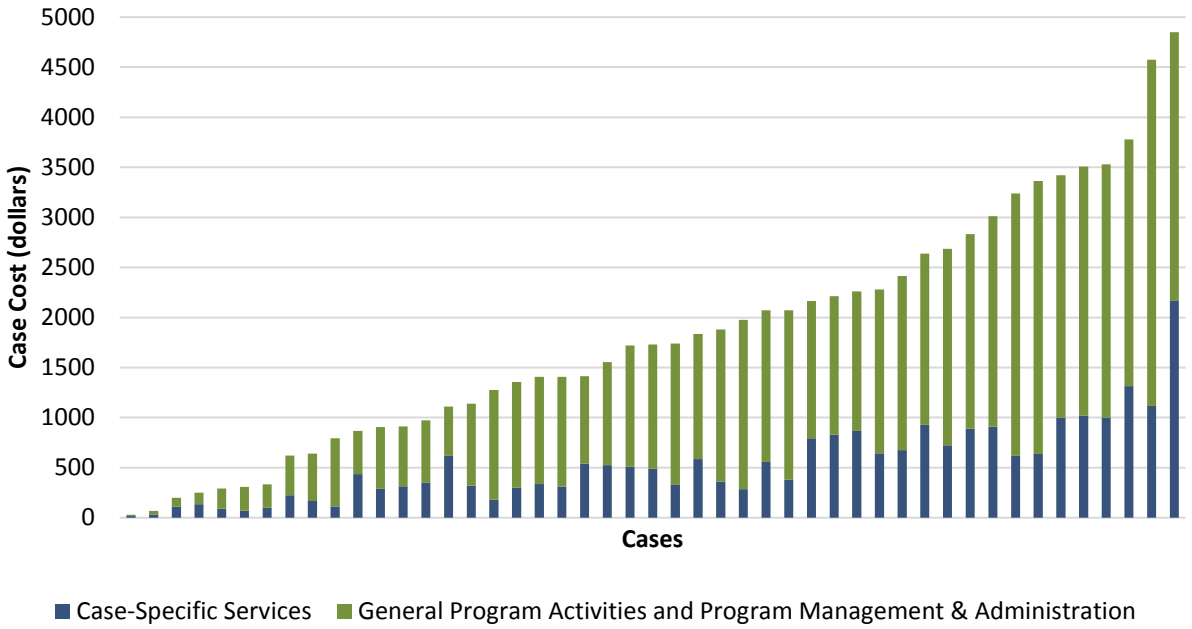
There is a range of approaches to case-level cost analysis (Children's Bureau, 2013). The approaches fall into two general categories.

- **Top-down methods** start with overall program costs. For example, you could find the average cost per case by dividing program costs by the number of cases in the program. Averages are sufficient for some purposes, such as estimating how much the program would spend or save if it increased or reduced the number of cases. However, they do not tell you anything about a key aspect of the program: the variation among cases.
- **Bottom-up methods** start with the program's frontline workers. You collect information on their labor use as you track activities with and on behalf of individual families and then calculate the labor costs. All other program costs are layered on top of the frontline labor costs to arrive at a total cost per case. The results provide significantly more precise case-level cost information than top-down methods.

In cost analysis, the precision of the data determines the accuracy and usefulness of the results. This module outlines a bottom-up approach to case-level cost analysis that examines cost for individual cases based upon the resources allocated to them. It strikes a good balance by providing accurate, useful results with a moderate degree of effort and resources from program staff and the evaluation team.

You know that families come to a program with various histories and needs, so their "dosage"—or the mix, intensity, and duration of services provided—is not the same. Neither are the costs. This is illustrated in exhibit 1, which shows data from a real case-level cost analysis. Each bar represents a specific family. The color coding distinguishes case-specific services provided with or on behalf of a family from general program activities (i.e., non-case-specific activities conducted by frontline workers).

Exhibit 1. Example of Distribution of Cost per Case



This module will help you understand the relationship between case characteristics, dosage, and costs. You will determine costs per case and examine how costs vary among different kinds of cases receiving different kinds and amounts of services. You will be able to see how case characteristics predict cost per case. You might find, for example, that cases with certain characteristics (e.g., parental substance abuse) tend to be higher cost. Model B provides case-level cost analysis examples from four fictitious child welfare agencies: Wilson County, which tracked labor using a case management information system; Smith County, which tracked labor using weekly surveys; Washington County, which tracked labor using a one-time survey; and Jackson County, which only tracked activity frequency.

You can complete a program-level cost analysis (Module A) before beginning the case-level analysis, or you can conduct both concurrently.

As noted in the toolkit's introduction, you can complete a program-level cost analysis (Module A) before beginning the case-level analysis, or you can conduct both concurrently. If you conduct the program-level analysis first, you will have some of the information you need to allocate program costs to cases in the case-level analysis. However, if time has passed or significant program changes have occurred since the program-level analysis was conducted, you may need to update the costs. Concurrent analyses make planning more efficient and less burdensome for program staff, and they eliminate the need to update the program-level costs.

Navigating Module B: Case-Level Cost Analysis

Case-level cost analysis examines the cost of serving individual families. You can use the results to inform decision making and improve programs. This module describes a four-step process for planning, implementing, and reporting on a case-level cost analysis:

Step 1: Preplanning

Step 2: Data Collection Planning

Step 3: Data Collection and Quality Assurance

Step 4: Analysis and Reporting

Step 1: Preplanning

If you have completed a program-level cost analysis (Module A), you have already done some of the preplanning for the case-level cost analysis, such as assembling a cost evaluation team and determining nonlabor program costs.

Some of the preplanning will be new. For example, your case-level cost analysis may have a different audience, perspective, and purpose than the program-level cost analysis. Perhaps the program-level findings were intended primarily for funders, but the case-level findings will be used primarily by program management or to set the stage for cost-effectiveness or benefit-cost/ROI analysis (FAQ B-1). The evaluation parameters and the resources available for the evaluation may also be different. Certainly, the research questions will be different. Articulating your objectives early will help guide data collection planning so you can meet the analytical requirements to answer your research questions.

Articulating your objectives early will help guide data collection planning.

To complete preplanning, review step 1 in Module A, and then use the *Cost Analysis Preplanning Worksheet: Wilson County* (Tool B-1-1).

Next, you will need to determine which data collection methods match your needs and resources:

- What information will you need in order to answer your research questions?
- What is feasible with the resources available to you?

The more precise information you need, the more resources it will take to get that information (FAQ B-2). In other words, consider the burden on program staff. For example, staff could complete weekly surveys about their activities for each family, or they could complete a one-time survey. Weekly surveys take more staff time but provide more precise information, while one-time surveys take less staff time but provide less precise information. See exhibit 2 for details.

Including all of the program's frontline workers and cases (i.e., a census approach) provides the most precise cost estimates, but it is not always feasible. Consider your organization's resources and capacity as you design your cost study. Sampling techniques can provide accurate cost estimates that are generalizable across the full population of cases, and they are more economical than census approaches. For details, see *Cost Data Collection: Sampling* (Tool B-1-2).

Be sure to strike a balance. Only collect the information you need, and avoid burdening program staff unnecessarily. If you don't have a lot of resources, it is okay to start small. Even the simplest bottom-up method will provide much more useful information than a top-down method that relies on broad averages and does not account for differences in characteristics and costs by family.

Exhibit 2. Labor Data Collection Methods

Labor data collection methods feature the following components, sometimes in combination. Each has its pros and cons.

- **Focus groups.** As discussed in Module A, focus groups help lay the groundwork for collecting labor data for cost analysis. Staff meet in focus groups to define program activity types and estimate the time it takes to conduct each activity (FAQ B-3). Focus groups are a necessary first step before collecting data using a survey or case management information system. You will use the information from the focus groups to develop the survey or system. Use the *Case-level Focus Group Protocol: Wilson County* (Tool B-1-3) to plan your focus group.
- **Surveys.** Next, staff complete a paper or online survey to report the number of times they conducted each activity identified by the focus group for each family over a brief period, such as the previous week or month, and estimate their total labor devoted to each family during the period. The look-back period for the surveys should match case activity patterns (FAQ B-4). For example, if frontline program staff usually interact with each family every 2 or 3 weeks, a weekly survey would be needlessly burdensome. Surveys may be administered once or repeatedly. The one-time survey approach provides a snapshot of costs at a specific point in time and requires the least staff time, but it produces the least precise case-level results. By administering surveys repeatedly over an extended period, you can increase the precision of the data and the accuracy of the results.
- **Case management information system.** This method represents the "gold standard" for gathering labor use data in case-level cost analysis. Program staff record their activities in a case management information system as they occur. They may also enter the actual time they spent conducting each activity for each family. Like surveys, case management information systems may be informed by focus groups to estimate the time it takes to conduct each activity. This lessens the burden on staff by requiring them to record only the case number, activity, and staff identification number. This approach is very accurate; staff do not have to recall their activities over time, so there are fewer errors. The most demanding but most precise version of this approach integrates data collection with day-to-day workflow using a customized case management information system (e.g., a child welfare information system). Such a system provides the ability to enter case-specific data into the system's database via mobile devices. Resources are required to build the system and to ensure that staff use it properly (FAQ B-5). You may choose this approach if your research questions require very precise data, you have ample resources, or you want to build case-level cost monitoring into your ongoing operations.

Exhibit 3 provides an overview of three methods of labor data collection for case-level cost analysis, each representing a different level of precision and resource burden (FAQ B-6). The total estimated burdens are based on the experiences of three real programs described below, scaled to the same program size and observation period.

- The high precision/high burden method recorded direct labor data daily over a 34-month observation period using a case management information system. It featured an experimental design, with families randomly assigned to either a control group that received standard care or an experimental group that received standard care plus additional intervention services.
- The medium precision/medium burden method included a weekly activity survey over a 7-month observation period.
- The low precision/low burden method included a one-time survey over a 1-month look-back period.

Exhibit 3. Examples of Labor Data Collection Methods for Case-Level Cost Analysis

	High Precision/ High Burden	Medium Precision/ Medium Burden	Low Precision/Low Burden
Description	Focus groups and case management information system	Focus groups and multiple surveys	Focus groups and one-time survey
Total Estimated Burden	• 377.5 hours for frontline staff • 1,791.7 hours for management and administrative staff	• 620.8 hours for frontline staff • 311.7 hours for management and administrative staff	• 100.8 hours for frontline staff • 51.7 hours for management and administrative staff

Note: All estimates are approximate.

All three methods produced valuable data that were useful to the programs, but the precision of the data and the certainty of the conclusions varied. Your program's actual time and resources may differ considerably, but the ballpark estimates shown may help you weigh your options. Use *Customizing Data Collection Method Staff Burden Estimates* (Tool B-1-4) to estimate time and resources for your program.

In step 2, you will explore these methods in depth and choose the right option for your organization.

Step 2: Data Collection Planning

Step 1 helped you consider data collection approaches with a high, medium, or low level of precision and staff burden. Any of these approaches will produce valuable insights to help program managers and policy decision makers understand the labor and costs involved in serving families with various characteristics. Each approach has advantages and disadvantages. More precise cost analysis generally requires greater burden on program staff (i.e., more time) and higher evaluation costs. Less precise cost analysis is generally less burdensome and costly (FAQ B-7).

Step 2 will help you choose a specific method for collecting data on two categories of labor: case-specific **client service delivery** and non-case-specific **general program activities**. Costs for **management and administration** labor are typically not broken down by activity type; methods for allocating these costs are described below, along with allocation of nonlabor costs (FAQ B-8).

Step 2 will help you choose a specific method for collecting data on two categories of labor: case-specific client service delivery and non-case-specific general program activities.

Two tools can guide your selection of data collection methods. For client service delivery activities, use the *Precision/Burden Decision Tree* (Tool B-2-1). For general program activities and management and administration activities, use the *Program-Level Decision Tree* (Tool B-2-2). There may be reasons to mix and match methods across labor categories. For example, you may want to select a high precision method for client service delivery labor and a low precision method for management and administration. The *Labor Use Data Collection Matrix* (Tool B-2-3) provides further details to support your decision (FAQ B-9).

Client Service Delivery

Case-level cost analysis focuses on client service delivery activities, because they can be directly assigned to cases. Module A led you through the process of defining, at minimum, some general client service delivery activity types (level A). For case-level cost analysis, you will need to define level B types (activities conducted with the client and activities conducted on behalf of the client) and level C types (specific activities such as counseling and support). Include program leadership and management in developing an initial list of key program and definitions. Use the *Case-level Focus Group Protocol: Wilson County* (Tool B-1-3) to help plan your focus group to further define activity types and estimate the staff time required to deliver each activity (FAQ B-10). Then use the results to inform data collection (i.e., developing a survey or modifying or designing a case management information system).

General Program Activities

Frontline workers typically conduct activities that are *not* associated with a specific case. This general work may include activities that support the operation of the project such as attending trainings, receiving supervision, and participating in project meetings. General program activities can also be tracked in your survey or case management information system. However, since they are not case specific, less precise data collection methods are acceptable (see Tool B-2-3). Two options include (1) adding general program activities to the client service delivery focus groups described above, and then collecting data on general program activity labor using surveys or a case management information system; or (2) using a one-time survey, staff interviews, or focus groups to obtain labor estimates for general program activities (FAQ B-11).

Management and Administration

Management and administration labor includes activities that are conducted by project leadership and administrative staff. Similar to general program activities, management and administration activities require less precise data collection methods, since these services cannot be directly associated with a specific case (see Tool B-2-3). Two options include (1) adding management and administration activities to the client service delivery focus groups described above, and collecting data using surveys or a case management information system; or (2) reusing the management and administration data gathered for the program-level cost analysis (Module A) if it is still current. If the data have changed (e.g., compensation, staff rosters, activities), you will need to update it, unless you are conducting the program-level and case-level cost analyses concurrently (FAQ B-12). Programs that want detailed information about management and administration labor may supplement program-level cost data with a one-time survey, staff interviews, or focus groups.

Step 3: Data Collection and Quality Assurance

Steps 1 and 2 helped you choose data collection methods. Step 3 will explain how to collect the data and assure its quality.

Master Staff/Case Roster: Client Service Delivery

First, you'll need to prepare a master roster that identifies your frontline staff (anyone who delivers client services) and their assigned cases. No matter what method you choose to collect the data, you will begin by asking these staff about the activities they conduct with and on behalf of each family. The *Master Staff/Case Roster* (Tool B-3-1) is an example of a program's frontline staff roster.

Data Collection

If you are using a survey, you will need to prepare an instrument to collect data from frontline staff on client service delivery activities by case and estimated total labor on the case during the look-back period. The survey look-back period should reflect the frequency with which the client service delivery

staff interact with their clients. A weekly survey, for example, should only be used for a program with frequent interactions—at least once a week. Limit the length of the look-back period to avoid deterioration of data quality. Recall error increases as the length increases, typically leading to over-inflation of time estimates.

The *Smith County Weekly Survey* (Tool B-3-2) is an example of a weekly online survey. The first section asks staff to provide a general estimate of the total time spent on the case during the past week as an internal validity check for quality assurance (QA) (FAQ B-13). Then it collects data on the type, frequency, and time spent per client service delivery activity for a specific case, identified through a drop-down menu of the staff member's assigned cases. The survey also inquires about staff member participation in general program activities during the past week.

Provide staff training on how to properly complete the data collection instrument to maximize data quality. For instance, training should cover how to report time to ensure consistency across survey participants (e.g., rounding to the nearest half hour or reporting exact times). Training should also include activity type definitions; the amount of time staff should set aside to complete the survey; the types of information they may want to review, such as case notes or calendars; and the procedure and deadlines for submitting the survey. Consider conducting a small pilot test of the survey with 5–10 frontline staff. Pilot tests allow for practice in administering the survey and correcting problems with the questionnaire or data entry procedures. It is important that all staff complete the survey, because missing data cause complications and delays. Make it clear that survey completion is part of their job responsibilities.

If you are using a case management information system, no data collection instruments are needed. However, you will need to build a case management information system or modify your existing system to be able to track case labor. Evaluators should consider gathering a team of program managers, select frontline staff, and a programmer to inform system design. The combination of programmatic and technical expertise will ensure that the system will capture cost data in a user-friendly way. The *Wilson County Activity Codes* tool (Tool B-3-3) provides a sample list of frontline worker activities that were programmed into the county's case management information system. Staff tracked their case-specific, non-case-specific, and management and administration work each time they completed an activity.

Database Format

Case-level cost analyses typically require data to be formatted and analyzed from one location. When using a Web-based survey platform, each response is usually exported into a single row in an Excel spreadsheet. Review preliminary data in the spreadsheets to ensure the platform captures the information you need. The *Smith County Survey Data* tool (Tool B-3-4) is an example of raw data for one survey response exported from a Web-based survey platform.

To efficiently manage the data, transfer each individual response into a new Excel sheet, which then becomes your consolidated database for all of your cost study survey data (FAQ B-14). Format the database (e.g., merge data, remove duplicates, recode and reorganize variables) as required for the analytical software you will use (FAQ B-15). The *Smith County Database* (Tool B-3-5) is an example of a cleaned and formatted database. The headers clearly display the questions, important dates, case IDs, and staff information. The evaluator will manage the database, transfer the data into the database, and conduct QA.

Quality Assurance

Module A prepared you to monitor data collection and provide QA, which is sometimes referred to as data cleaning. In case-level cost analysis, cleaning data in a database requires the use of reports. If you select a case management information system or regularly administered survey method for data collection rather than, for example, a one-time survey, your evaluator should clean the data regularly — weekly or monthly—throughout the data collection period.

Since surveys are often submitted with missing or incomplete data, a QA regimen or checklist will help ensure that data quality issues are addressed immediately. When errors are detected, the staff member should be contacted to resolve them. See Tool B-3-6 for an example of a QA checklist used in an actual case-level cost analysis. Document the data that have been cleaned and the surveys that need follow-up.

One of the last steps before analysis is reporting on the data quality, including factors such as survey response rates, number of missing responses, and cases that contain data discrepancies (FAQ B-16). The amount of data that is missing can have major implications for your analysis. See Tool B-3-7 for an example of a data quality report from Smith County.

Once data collection and QA are complete, you are ready to fine-tune the data for analysis and reporting.

Step 4: Analysis and Reporting

Analysis begins at the end of the data gathering and quality assurance period. Step 4 covers the main types of analyses used in case-level cost analysis. Modules C and D cover more advanced analyses that include case-level outcome measures (FAQ B-17).

During the analysis phase, consider the data collection methods you used. High precision methods yield more reliable results than medium or low precision methods. The tools and exhibits in this step are taken from actual cost analyses and represent a range of methods. Wilson County's cost analysis used a very high precision method that recorded direct labor data daily over a 34-month observation period using a case management information system. It also included an experimental design, with families randomly assigned to either a control group that received standard care or an experimental group that received standard care plus additional intervention services. Smith County's cost analysis used a medium precision method, conducting a weekly activity survey for a 7-month observation period.

The tools and exhibits in this step are taken from actual cost analyses and represent a range of methods.

A third cost analysis in Washington County used a low precision method, conducting a one-time survey for a 1-month look-back period. All of these methods produced valuable data that were useful to the programs, but the precision of the data and the certainty of the conclusions varied.

Before beginning the analysis, enter the cleaned data on client service delivery activities, time per activity, and staff compensation into the database of your analytical software (e.g., SPSS, SAS, Stata). The evaluator will usually provide the software that will be used later to analyze the data. Next, you will need to address missing data (FAQ B-18).

Address Missing Data

Despite rigorous quality assurance efforts, most datasets will have at least some level of missing data. Information regarding *which* activities were conducted for a case and *how much time* staff expended on each activity is crucial for the cost analysis. Following up with individuals to resolve missing data may not always be possible (for example, if the staff person no longer works for the program). Missing data may also occur when technical issues delay or interrupt data collection. When necessary, use one of the following methods to estimate missing data within a reasonable range of error.

- Multiple imputation is an approach for addressing random missing data (Widaman, 2006). It uses multiple regression analysis to estimate significant amounts of missing data. Applying statistical methods to address missing survey data can help reduce bias and increase the precision of your cost estimates (Wood, White, & Thompson, 2004). For optimal precision, include all available demographic data (e.g., child, caregiver, family, and therapist demographics) associated with cases in the cost study. These data will help provide contextual information to predict missing survey data in a more statistically rigorous way than simply imputing the mean value for missing variables. Wait until the end of data collection to use the most complete data set for missing data estimates. If your evaluator does not have the statistical knowledge and experience required for multiple imputation, you will need to engage a statistical analyst. See *Wilson County Multiple Imputation Plan* (Tool B-4-1) for an example of key steps involved in multiple imputation.
- Data extrapolation is an approach for addressing systematic missing data—when no data were collected from individual staff or all staff during the observation period. If your cost study aims to identify the full costs from case opening to closure for all cases served during a particular timeframe (e.g., the final year of the project), it must account for missing data for cases that were opened before the observation period or closed after it. Extrapolation is a method for estimating a data point when actual data are missing or were not collected. It can be used for long-range estimates and short-range forecasting, but more errors can present as the range becomes larger. Extrapolation assumes that data will continue to follow established trends. While extrapolation is less accurate than multiple imputation (it may underestimate or overestimate labor for some cases), it can provide a consistent approach to addressing missing data across all cases. Wait until the end of data collection to extrapolate from the most complete data set possible. See Linear Interpolation and Extrapolation for examples.

Assign Direct Labor to Cases

The next activity is to assign direct labor to cases for case-specific activities (activities provided with and on behalf of families). Your database now has the information required to perform this function: the activity performed, the case number it was performed for, and the amount of time assigned to each activity. The *Smith County Monthly Labor Assignment Report* (Tool B-4-2) shows a monthly activity report for a hypothetical case that demonstrates the labor assignment process for a high precision, medium burden cost study approach using weekly logs to collect both activity frequency and time data from staff. As another example, the *Jackson County Labor Assignment Report* (Tool B-4-3) shows a report for a hypothetical case that demonstrates the labor assignment process for a low precision, low burden cost study approach using a one-time online survey with activity frequency only. Once the labor data are organized by case, they can be analyzed as described below.

Labor Use Analysis

Labor use data can be an important tool for managing and planning programs. It can help you use resources efficiently to serve clients with different needs. It may be useful to know, for example, the mean time spent for each activity, and which activities consumed the most and least time for all families combined (FAQ B-19).

Labor use analysis can be relatively simple, as demonstrated by two tools. Both tools illustrate descriptive methods of analyzing how staff labor was used. *Sample Distribution of Labor Across Activities* (Tool B-4-4) describes the percentage of time frontline staff spent on activities with and on behalf of families. *Longitudinal Labor Data Use Analysis* (Tool B-4-5) shows how labor with and on behalf of a family varied over time for two programs providing the same services. Comparing variation among median, high, and low labor use cases for the programs may reveal further insights.

Exhibit 4 shows the amount of staff labor used per family by labor category in Smith County, demonstrating the variance among cases. The chart also displays trends in service delivery. Most cases received more indirect labor than direct labor, and 19 families did not use enough hours to register on the graph's scale.

Exhibit 4. Distribution of Labor Time by Category Across Cases

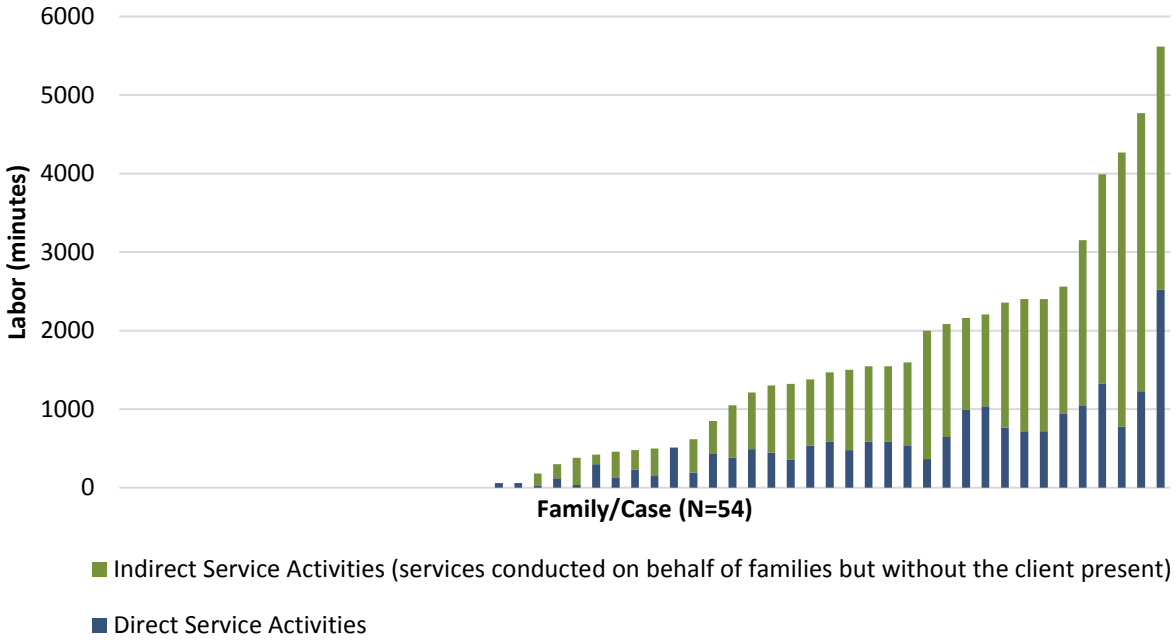
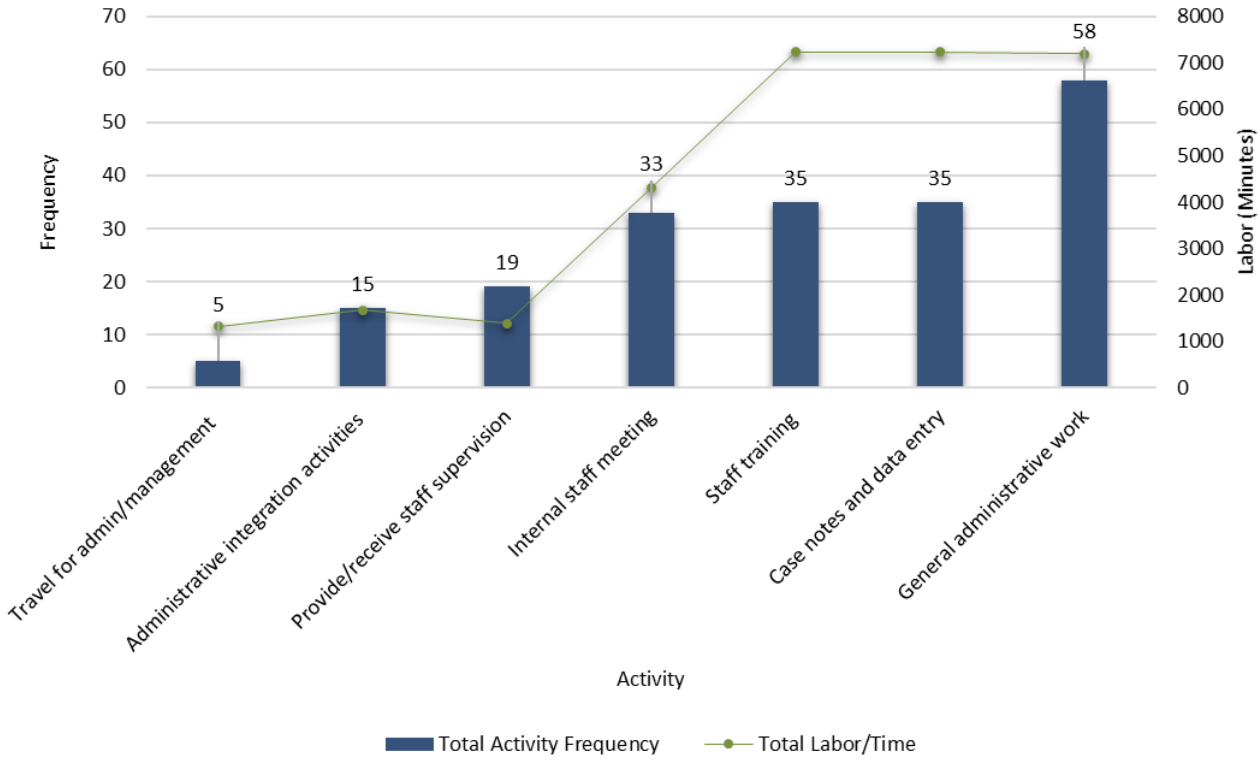


Exhibit 5 shows the frequency and labor minutes for non-case-specific, administrative-type activities. In this example, data were collected from 50 staff members in Washington County. The most frequently performed administrative and management activities conducted during the 1-month observation period were (1) general administrative work, (2) case notes and data entry, and (3) staff training and professional development. These activities also required the most labor, with staff reporting more than 7,000 minutes per activity. These labor patterns may not be generalizable beyond the 1-month observation period, which is a drawback of the one-time survey approach.

Labor use data can also be analyzed using more sophisticated analytical techniques, such as regression analysis, to understand factors associated with greater or lesser amounts of labor use. Regression analysis examines the strength of association of one or more **independent variables** on the **dependent variable**—in this case, labor use (FAQ B-20). For example, does the number of adults in a household influence the amount of labor used to serve the family? Is labor use for families with older children above or below average? The *Labor Use Regression Analysis Example* (Tool B-4-6) shows a regression analysis output taken from an actual cost analysis study.

Approaches to minimizing staff burden, such as requiring staff to track activity frequency only, require using average activity times identified during the initial cost study focus group to estimate the total time per case. Using average times reduces the certainty of the conclusions from the analysis compared to higher burden data collection approaches using actual activity times. While average times represent how services for a "typical" case may transpire, families come into child welfare agencies with varying needs and require varying levels of service dosage. Averages allow for simplistic estimates of case-level costs, but they may obscure important distinctions such as the actual time needed to conduct specific activities for clients with different characteristics.

Exhibit 5: General Program Activity Frequency Compared to Expended Labor



Monetize Direct Labor

Start with your frontline staff—those who conduct activities with and on behalf of families. First, determine the compensation rate for each staff member by adding the annual salary (including all benefits) and dividing by the number of hours (including all sick and vacation days) the salary is based upon—usually 2,080 hours per year. If a different time measure is used, adjust the rate to the same scale (e.g., divide by 60 for labor use data in minutes). The result is the staff person's compensation rate—a constructed variable in the database. Next, multiply the direct labor per case by the activity provider's compensation rate to compute total direct labor cost per case.

The formula used to monetize each activity is as follows:

$$Total\ Staff\ Labor\ per\ Activity\ (hours, minutes)\ \times\ Staff\ Hourly\ Compensation\ Rate = Cost\ of\ Activity$$

See *Monthly Direct Labor Cost Report* (Tool B-4-7) for an example of a hypothetical case that demonstrates the direct labor monetization process. The total direct labor cost for the case will become another constructed variable in the database for later analysis.

Determine Full Case Costs

While case-specific labor costs are the most important costs to identify in a case-level analysis, you learned in Module A that it is also important to identify other costs related to general program activities conducted by frontline staff, program management and administration, contractors, and overhead costs such as travel, materials, equipment, and facilities. These cost components cannot be directly associated with a single case, but because they help support client service delivery, they should be included in calculating the full cost per case.

Depending on the level of specificity desired, assigning these added costs (or non-case-specific costs) to cases can be done using two different approaches. One approach would be to calculate a more general added cost multiplier to determine full case costs. If you are interested in obtaining a more detailed summary of case costs, apportioning these costs across cases provides more in-depth information. Both methods build on case-specific labor costs and are described below.

General Approach to Assigning Added Costs to Cases

To assign added costs in a general way across cases, the next activity in the monetization process is computing another constructed variable—the added cost multiplier (ACM). This variable is similar to the indirect cost rate (ICR) you created in Module A. However, it is modified to gather all program costs except for the total case-specific costs (referred to in Module A as direct labor costs) allocated to cases for the entire observation period of the case-level cost analysis. The purpose of the ACM is to account for all the other non-case-specific costs and allocate them to cases. These costs include frontline staff time not spent with or on behalf of a case, program management labor, general administration labor assigned to the program, and nonlabor expenses (e.g., overhead) incurred by the program.

After summing the case-specific labor costs from all cases, you will need to revisit your program-level cost analysis. First, adjust the program-level costs in two steps: (1) update them to reflect current costs if the program-level cost analysis was not concurrent with the case-level cost analysis and (2) adjust the program-level data to coincide with the observation period of the case-level cost analysis (FAQ B-21). This activity is a strong incentive for a program to perform both types of cost analyses concurrently.

Once you have the total case-specific labor costs for all cases from the case-level analysis database and the total program costs for the observation period from the updated program-level analysis, you are ready to compute the ACM:

$$\frac{Total\ \boldsymbol{Program}\ Costs\ -\ Total\ \boldsymbol{Case-Specific\ Labor}\ Costs}{Total\ \boldsymbol{Case-Specific\ Labor}\ Costs} = ACM$$

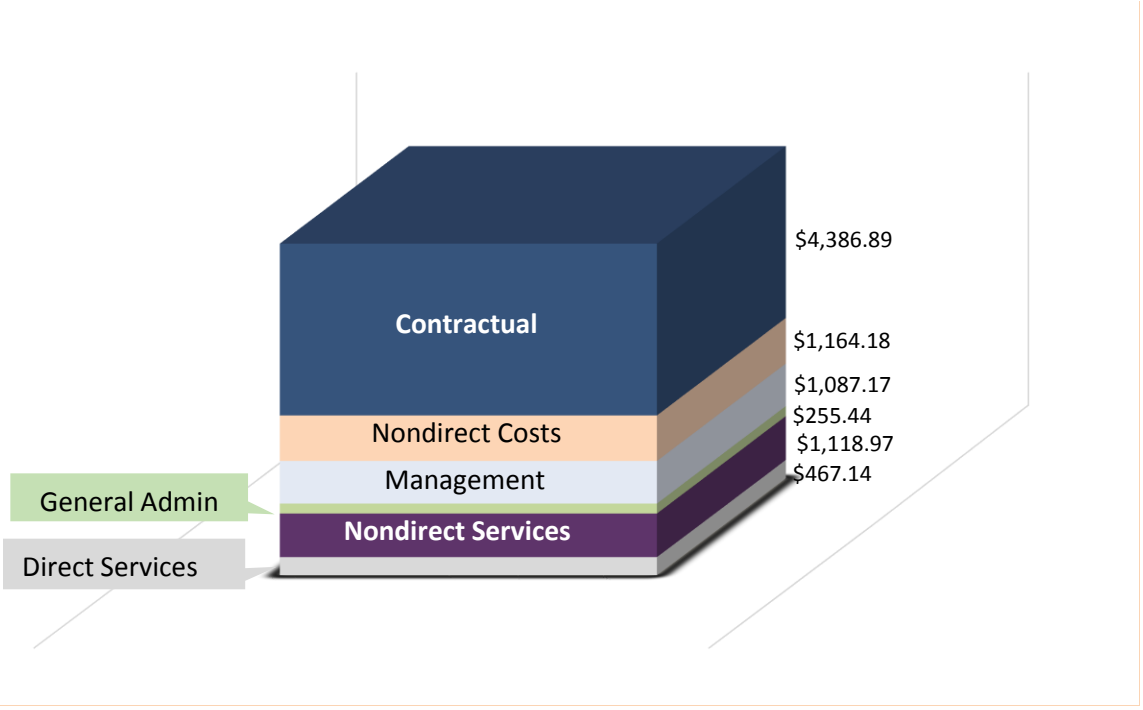
With the ACM, you are now ready to compute the full program cost per case. The *Added Cost Multiplier* (Tool B-4-8) demonstrates the logic of computing the total case-level costs for a hypothetical set of cases by multiplying each case-specific cost by the ACM.

Comprehensive Approach to Apportioning Added Costs to Cases

Apportioning (or distributing) costs across cases allows you to compare the unique contributions of each cost component (see exhibit 6). Since case-specific service delivery is the primary focus of most casework, the total costs for each component should be apportioned across cases in relation to their total case-specific labor costs. Cases that require more staff time are presumed to require higher general administrative, management, overhead, and contractual costs.

To apportion added costs across cost study cases, first calculate the total costs for each non-case-specific labor component (e.g., general program activities, program management and administration, contractual services). Module A provides detailed instructions for calculating these total costs.

Exhibit 6. Average Cost per Case



Note*:* Total average cost per case = $8,479 .79

Next, apply the formula provided to each case in the study in order to apportion costs for each component. The formula below provides an example of how total **program management and administration costs** would be apportioned to each case:

$$\left(\frac{Total\ case-specific\ labor\ costs\ of\ the\ case}{\sum case-specific\ labor\ cots\ across\ all\ cases}\right) \times \sum total\ \boldsymbol{program\ managment\ and\ administation}\ cost$$

To create layered case costs, as seen in exhibit 6, repeat this formula for each cost component (e.g., general program activities, contractual).

In addition to the labor costs associated with frontline staff, managers, and contractors providing services, your program will incur other nonlabor expenses (including general administration, materials, equipment, facilities, and other costs associated with operating the program). Once you have apportioned all other non-case-specific labor costs across cases, you can use your program's ICR to account for overhead expenses and allocate them to cases. As discussed in Module A, an ICR is the ratio between the total indirect expenses and some direct cost base.

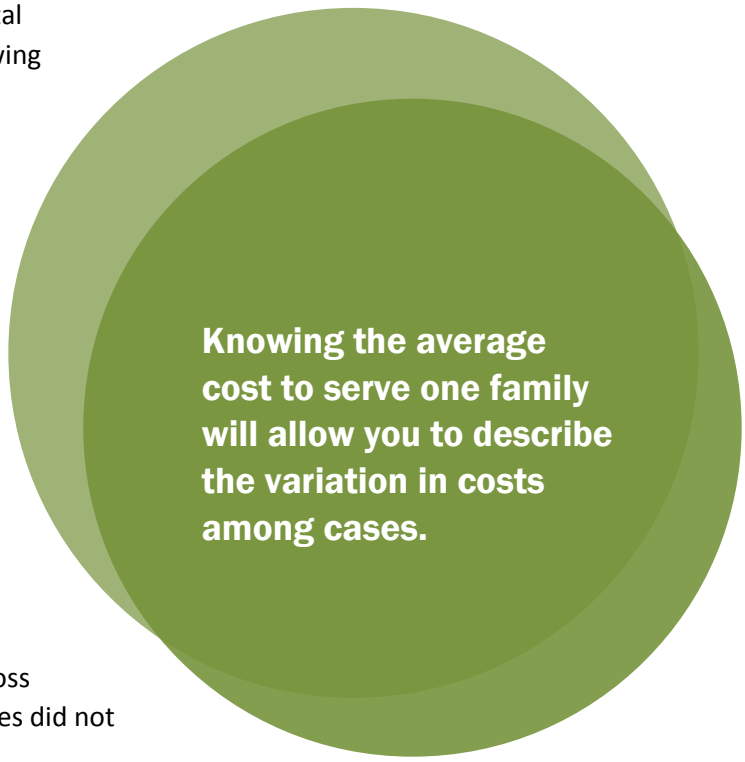
There are several ways to arrive at an acceptable ICR:

- Use an existing ICR. Many organizations already have an ICR approved by the state or federal government.
- Use the ICR you calculated in Module A if all cost data are still current. If cost data have changed, recalculate the ICR using updated data.
- Conduct the program-level and case-level analyses concurrently.

Using an ICR calculated concurrently with the case-level analysis is the most straightforward method, because it coincides with the observation period of service delivery (FAQ B-21). With the ICR, you are now ready to multiply the rate by the case's cumulative case labor cost (which includes case-specific and all other added labor costs) to yield the full case cost.

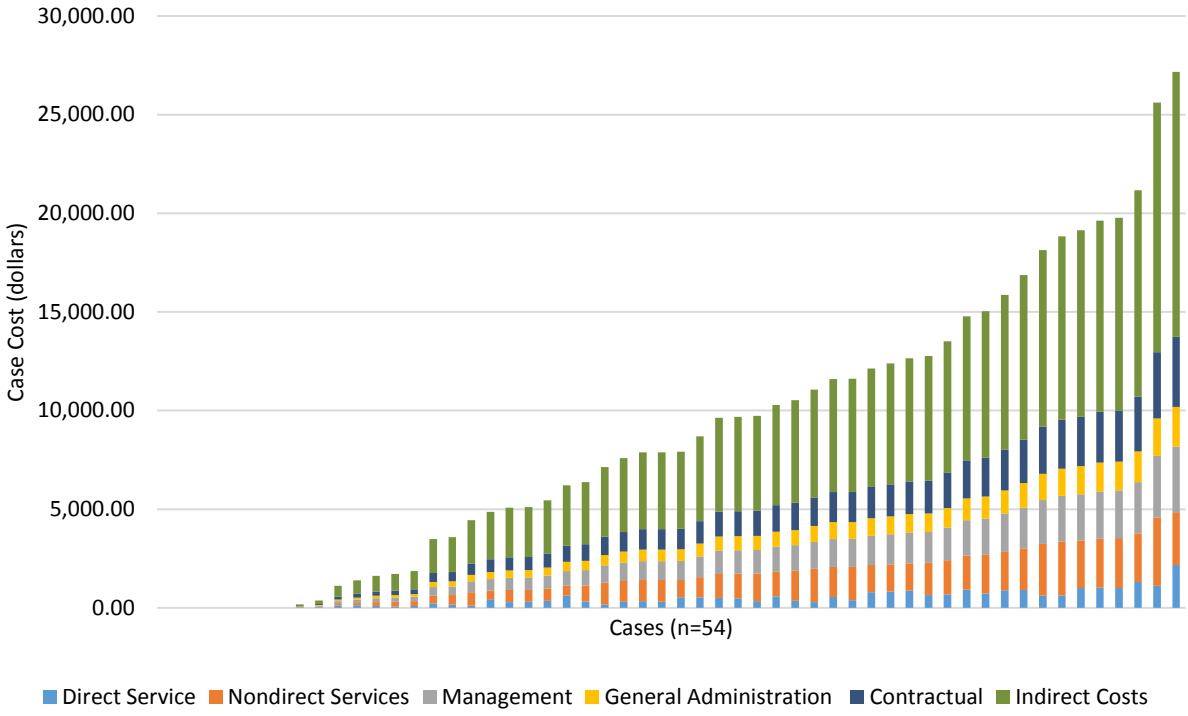
Cost Analysis

Begin the cost analysis with a description of the total program costs and the average cost per case. Knowing the average cost to serve one family will allow you to describe the variation in costs among cases. Exhibit 6 presents a real-life example of an average cost per case, including major cost components and proportions. Cost components may include a variety of direct and nondirect case costs, from service delivery costs to the costs associated with using a private vendor to conduct fidelity reviews and provide guidance on adapting a proprietary service model. In the example below, contractor costs represent the largest proportion of the average case cost.



The primary function of a case-level cost analysis is to examine how costs vary across cases and why. Exhibit 7 provides an example of cost variation across cases and cost categories. In exhibit 7, seven families did not use enough hours to register on the graph's scale.

Exhibit 7. Distribution of Full Costs Across Cases



In addition to describing cost variation across cases, you may consider analyzing the underlying factors. For instance, what family characteristics predict higher or lower costs? The answers can have a profound impact on a program's ability to be both effective and efficient. If your research questions aim to go beyond simply providing descriptive labor and cost information, your database should contain a variety of data, such as family and staff characteristics that might explain cost—whether you are explaining total cost per case or just cost components (e.g., direct labor costs). You can use the data as they appear in the database for independent variables, or you can construct your own variables by combining them, often as ratios. See *Wilson County Regression Analysis for Constructed Variables* (Tool B-4-9) for a real-life example of the effect of two constructed variables (case duration and service intensity) on the cost of direct labor using stepwise regression techniques.

Exhibits 8 and 9 provide examples of two types of analytical graphs for cost analyses using an experimental design. Each graph demonstrates the extent to which the experimental (intervention) group and the control group differ on costs per case. Costs vary within each group, but the costs for the experimental group families are much higher and their growth rate is much steeper, as evidenced by the slope of the upward curve in the first graph. Program directors considering adding the new intervention would need to be aware of the additional costs and when those costs would be incurred.

Exhibit 8. Distribution of Full Costs per Case for Experimental and Control Cases

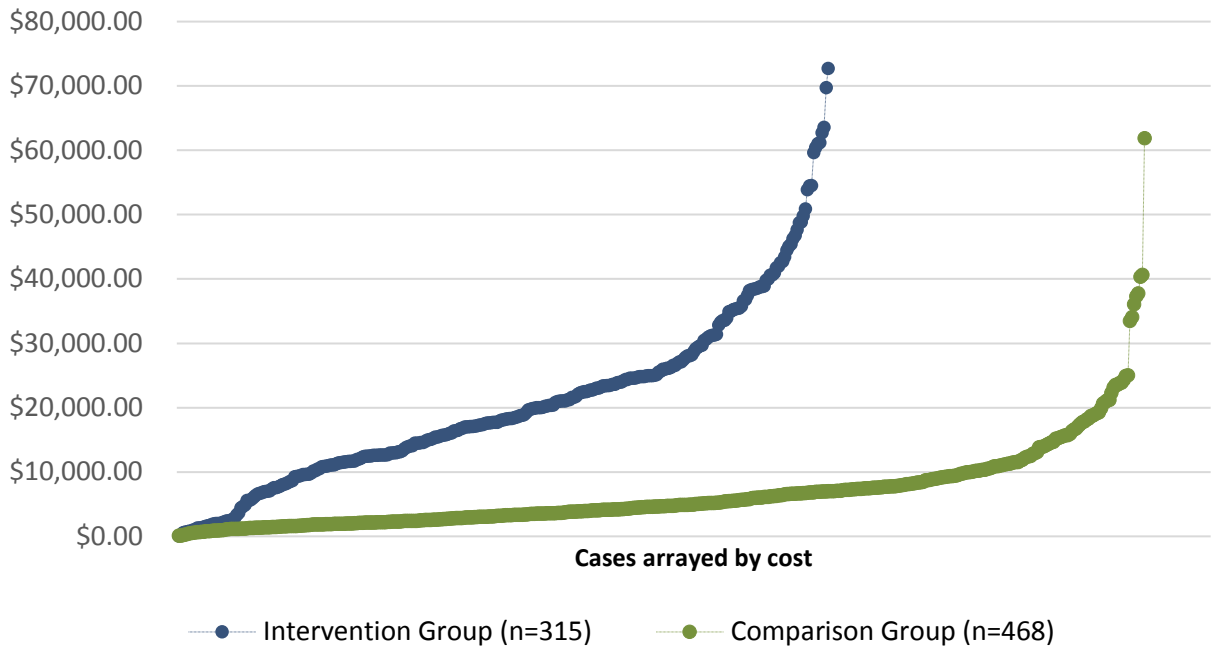


Exhibit 9 shows differences in case costs between the experimental and control groups for a specific subpopulation of interest (e.g., families with children under age 3).

Exhibit 9. Cost Variance per Case for a Subpopulation of Experimental and Control Case

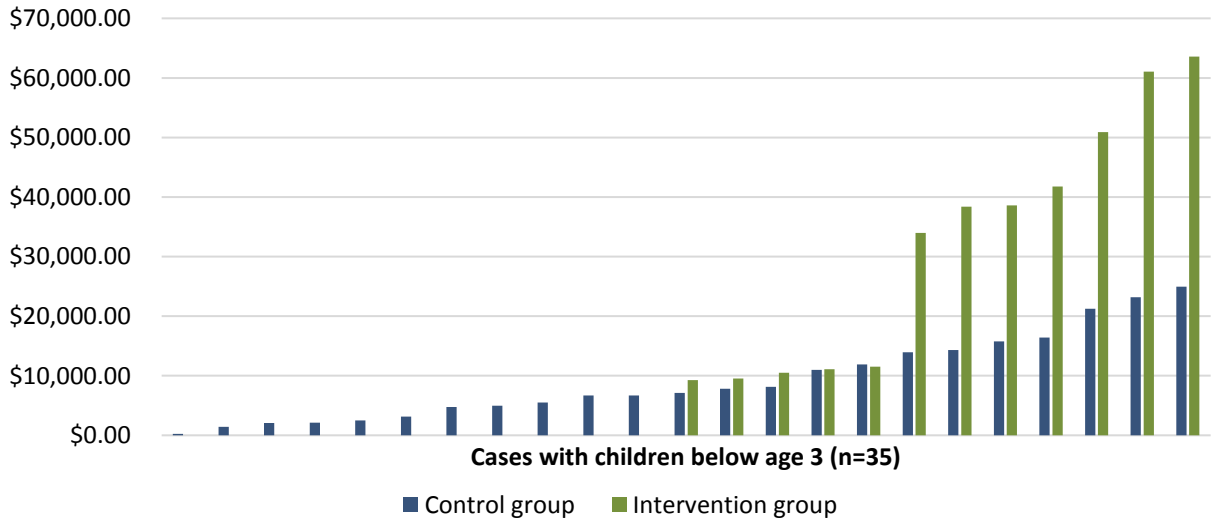
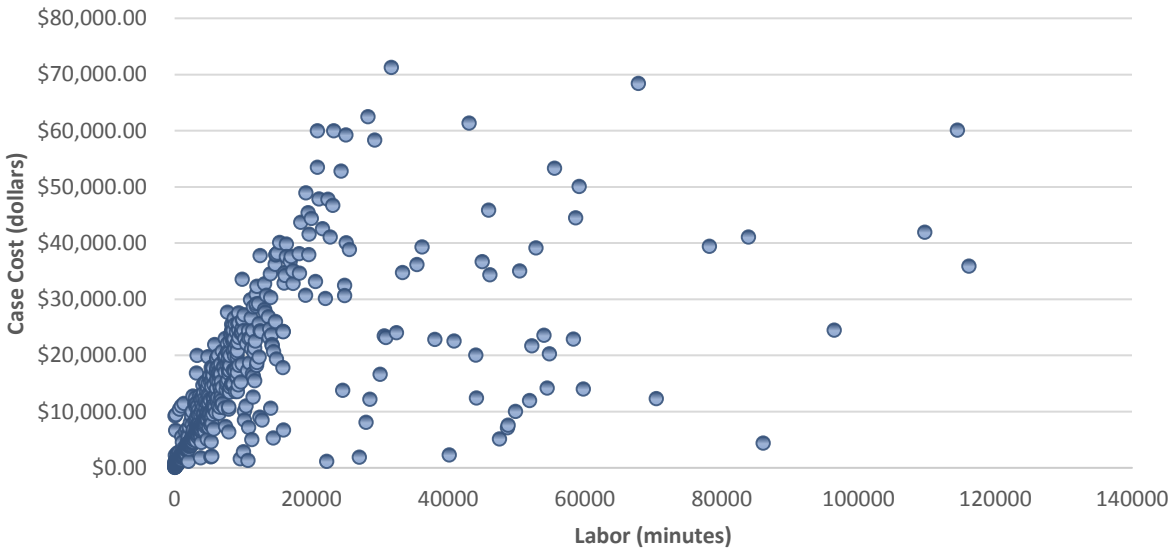


Exhibit 10 shows the relationship between labor usage and cost using case-level data. Most of the families represented in the lower left corner of the graph show the expected linear relationship: costs climb in close relationship to labor usage. There are, however, a significant number of outlier cases that do not line up as expected. The analyst might use this graph to pursue further investigation of the outlier cases. Why are they outliers? Do they have similar characteristics? Are there different categories of outliers?

Exhibit 10. Distribution of Labor Minutes and Total Case Costs



Review Analysis Results with Program Staff

Case-level cost data are based on estimates. To assess the extent to which cost estimates are accurate, review them with the program staff who participated in data collection. Staff should consider whether the results provide the answers needed to help guide and manage the program in the future (FAQ B-22).

It is best to review the results with staff in a manner that allows discussion, such an in-person meeting or focus group, conference call, or Webinar.

Reporting

Once you have completed your analysis, you are ready to move on to reporting. Refer to step 5 in Module A for guidance.

Appendix A: Tools

Tool B-1-1. Cost Analysis Preplanning Worksheet: Wilson County

Complete this tool as you move through preplanning as described in step 1.

1. **Target Program:** Wilson County Waiver Demonstration Program

2. **Cost Evaluation Team**

Team Member	Estimated Time Commitment	Planning Notes
Evaluator	30 hours per month for 15 months	Consultant, affiliated with local university
Lead Program Administrator	8 hours per month for 15 months	Director of Department for Children and Families, Wilson County Program Director
Lead Finance Administrator	8 hours per month for 15 months	Director of Administration and/or Finance, Wilson County Program Director
Finance Data Manager	12 hours per month for 15 months	Financial or IT staff
Timekeeping Data Manager	12 hours per month for 15 months	Program frontline staff supervisor

3. **Audience:** Who needs the information and how will it be used? The Children's Bureau (waiver funder) is one audience; evaluation is a funding requirement. The report should also be relevant to decision makers considering sustaining the program and possibly to program management staff.

4. **Research Questions:** What is the cost per case? Do certain cases cost more than others? Which cost components drive the costs of the program? Which program activities are the most resource intensive? How cost effective are the program activities in comparison to standard practices?

5. **Evaluation Parameters**

Evaluation Parameter	Questions To Ask	Possible Responses	Planning Notes
Perspective	Who incurs the costs?	Funder, government, service provider, implementing agency, client, society	Agency perspective
Scope	What is the "program" being evaluated?	Program component, single program, multiple programs	Single program
Observation Period	When is the period of analysis? Is the observation period in the past, present, or future?	Funding period, intervention duration, fiscal year, specific implementation stage	12 month, prospective study
Implementation Stage	In what implementation stage is the target program?	Exploration, installation, initial implementation, full implementation	Full implementation

Implementation Stages[1]

- Exploration: Examine the degree to which a particular model, program, or plan meets the needs of identified children, youth, and families and examine feasibility of and support for implementing the intervention successfully.
- Installation: Create a hospitable environment for the new way of work by hiring and preparing staff and preparing the organization for the change.
- Initial implementation: Begin providing the new program or service.
- Full implementation: Workers demonstrate skillful practices; practice at all levels reflects changes in policies.

[1] Adapted from the National Implementation Research Network, http://implementation.fpg.unc.edu

6. **Available Resources**

Resource Parameter	Questions to Ask	Planning Notes
Evaluator	How much time will the evaluator need to spend on the evaluation?	The evaluator will need to spend 30 hours per month for 15 months on the evaluation.
Acceptable Burden on Program and Administrative Staff	How much time will the staff on the evaluation team need to spend on the evaluation? What other program and administrative staff will be required to participate? What is the acceptable amount of labor they may contribute?	Excluding the evaluator, the four staff members serving on the evaluation team will need to spend a combined 40 hours per month for 15 months. For other staff, the Director of the Department for Children and Families has approved an additional 6 combined financial staff hours per month for 12 months and 16 combined direct staff hours per month for 12 months.
Existing Systems	Prospective or retrospective study? How will data be collected? Is the system already in place to collect this data, or does one need to be created or modified?	Data collection is needed to move forward (prospective). The system is already in place to collect some accounting data, and other information will need to be collected from direct staff. Need to think more about the protocol for collecting this information from direct staff in a standardized way.

Tool B-1-2. Cost Data Collection: Sampling

When the number of cases served by your program is too large, sampling techniques can provide reliable case-level cost estimates and are more economical than census approaches. Sampling is often necessary when resources are limited, and provides a way to answer the research questions without overburdening staff. While precise prescriptions for sampling cannot be given since sample design options are highly dependent on local contextual factors, resources, available sampling frames, and the specific objectives of the cost study, this section of the toolkit raises common questions that should be addressed when designing data collection procedures for a time-use survey. The sampling approach that you select for your cost study will largely depend on your analytical objectives, program design, and evaluation capacity.

Questions to consider:

Question 1: Is sampling appropriate for my cost study data collection?

A census approach is a technique in which the entire population of interest (i.e., cases) is included in the data collection. Sampling the entire population is highly recommended when the number of units being investigated is relatively small. When working with a small population, excluding even a minimal number of cases may leave significant gaps in your cost study. While sampling all cases for the cost study is generally the best way to ensure that cost data are reliable and accurate, this is not always possible because the census approach is resource-intensive and requires a great deal of labor and effort on the part of the evaluator to manage incoming data (i.e., checking for data quality, conducting survey follow-up with staff to optimize response rates). It can also be burdensome on program staff to complete surveys for all of their assigned cases. If your program has a heavy volume of cases and lacks the resources to conduct regular quality assurance checks on responses, sampling may be a more appropriate approach to cost data collection. Attempting to use a census approach without the proper organizational capacity can lead to less accurate data than sampling. A carefully designed and well-conducted sampling approach can be more efficient than a census and can yield sufficient accuracy to inform your program about case costs.

Question 2: How is cost study sample size determined?

Sample size should be determined prior to data collection. Statisticians caution that "undersized studies can't find real results and oversized studies find even insubstantial ones (Grace-Martin, n.d.). Both undersized and oversized studies waste time, energy, and money; the former by using resources without finding results and the latter by using more resources than necessary." It is difficult to prescribe an exact number of cases to sample without fully understanding the program design, analytical objectives, and evaluation resources. Determining your sample size requires finding a balance between a sample that is small enough to be manageable using available resources, yet large enough to yield statistical power for your analyses. Calculating sample size requires little investment of time and capital. Many sample size

calculators[2] are accessible online to help determine how many cases should be included in your data collection, based on the type of analysis you plan to conduct. When using the online sample size calculator, you will need to specify the size of your population, the desired error level (e.g. 5%), and the desired level of confidence (e.g. 95%).

Question 3: What sampling approaches should be used?

Having the right sample size is not always enough to ensure valid results. The sample needs to be selected in a way to ensure that it is representative of the population of interest. Samples should contain cases with various demographics, and consider differences among multiple sites (if applicable). The following section describes two different approaches to selecting your cost study sample, each with their own benefits and drawbacks. The evaluator should choose the method that most aligns with the program's evaluation capacity and research questions.

Probability Sampling

The approach that provides the most accurate cost estimates is probability sampling, which can be defined as using chance (through random sampling) to select the cases to be included in the sample. Probability sampling ensures that cases selected are representative of the full population and reduces the chance of selection bias, which can give you an inaccurate picture of case costs. The main advantage of probability sampling is that it allows you to generalize the results back to the entire population of families served accurately. This method is not always feasible due to resource constraints, yet it should still be considered the best method for quantitative research.

- **Simple Random Sampling**. Using representative data is important if you intend to generalize your cost study findings to the full population. The most straightforward way to ensure that your cost estimates are representative is to use a simple random sampling approach. This method involves selecting, at random, cases from the full roster. This guarantees that every member of the larger population has an equal chance of being randomly selected for inclusion in the cost study. Because programs serve a variety of cases with varying demographics, it is important to sample from a full roster of all cases served. Since there is variability in case activities, this method ensures that your sample includes a range of high to low intensity cases. Random sampling eliminates bias in the study design, which occurs if cases with certain outcomes are systematically favored; this can invalidate your conclusions. The case cost estimates from a random sample are generalizable to the full population of cases, and inferential statistics can be run with reliability and validity. A drawback to this method is that in some cases, obtaining an exhaustive case roster can be difficult, especially if a tracking system in place is not accurate or up-to-date. Randomization can also unintentionally burden some staff

[2] StudySize 3.0 (http://www.studysize.com) is an example of a sample size calculator that is easy to use and covers many tests, though there is a fee associated with its use. Free online sample size calculators with more limited functions include G*Power (http://www.gpower.hhu.de/en.html) and GLIMMPSE (http://glimmpse.samplesizeshop.org/#).

members more than others. Asking staff members to report on an excessive number of cases (which cannot be controlled for in random sampling) may be disruptive to their daily tasks.

Other probability sampling approaches that organize cases into meaningful subgroups of interest are described below, but keep in mind that whenever there is interference or human intervention in choosing a sample, your study inherently loses degrees of pure probability.

- **Proportionate Stratified Random Sampling** is a method that ensures that subgroups (or strata) of interest are represented proportionately within the sample. If there are key case characteristics that you want to learn more about in your cost study, this method could be used to organize the population of cases by families with certain characteristics (e.g., socioeconomic status) to ensure that cases served by specific types of staff will be included in a representative way. For instance, a percentage of cases are randomly sampled within each income category proportionate to the number cases representing each income category in the full population. For instance, if 75% of cases within a program received less than $25,000 in annual household income, then an equal percentage of cases sampled should be within that income level.
- **Cluster Sampling** is an approach to cost sampling that organizes the population of cases into separate groups (or clusters) and then randomly samples clusters to be included in the data collection. Either all or a random sample of cases within each cluster are tracked for the cost study. Using this method, only a subset of cases is selected to participate in data collection, thus lowering burden and associated evaluation costs. Cluster sampling usually provides less precise cost estimates than either simple random sampling or stratified sampling, but if evaluators are unable to manage surveys for all staff, then it provides a more economical approach to data collection. Although this technique offers a low-cost alternative, it is not always suitable. For instance, it requires that the cases be grouped into mutually exclusive clusters. In other words, a case cannot be in more than one cluster, so the grouping variables must be carefully selected. Additionally, cluster sampling has the potential to reduce representativeness because one group may be over-represented when choosing which clusters to observe. You may risk excluding an important demographic during your sampling due to clusters containing groups of similar cases.

Nonprobability Sampling

Depending on your research questions, you may be interested in other sampling methods to ensure that certain cases are included in your cost study. Nonprobability sampling selects cases in a way that does not give all the individuals in the population equal chances of being selected. This can include using guidelines intended to filter the population, such as selecting cases based on specific demographics of interest (e.g., age, gender, or educational background). Nonprobability sampling leaves the selection of cases at the discretion of the researcher and may or may not accurately represent the target population. While this approach is not optimal for obtaining generalizable results, it can help reduce burden and costs, and can provide a general snapshot of case costs for the specific subset of cases observed.

Purposive sampling involves deliberately selecting specific cases within the population to study. The idea behind this approach is to focus on cases with particular characteristics that will best be able to assist with your research questions, while excluding all other cases. This method is widely used for

programs that have very limited resources or have research questions that are narrowly focused on a subset of cases. For instance, your research questions may be focused on the costs of cases served during a specific point in time (e.g., cases that were opened during a particular timeframe), or cases that receive a specific type of service. Purposive sampling will provide cost data to answer these focused questions, but because this is a nonprobability sampling approach, it is subject to bias and error. Due to the specific focus of this sample, findings may not be generalizable and can only provide a partial picture instead of the full spectrum of case costs for specific staff conducting the work. Therefore; it is important to describe case characteristics included in your sample when reporting costs. Performing inferential statistics is not recommended with this approach, rather you should focus your analyses on descriptive statistics.

Tool B-1-3. Case-Level Focus Group Protocol: Wilson County

This tool presents a sample script you can tailor for your own use in planning a focus group with program staff. The results will allow you to define client service delivery activity types and estimate the staff time required to deliver each activity.

Focus Group Meeting

Introduction (10 minutes)

Lead Facilitator's Scripted Comments: We would like to start off today's discussion by thanking you for agreeing to share your experiences conducting casework and supervision activities under the **Wilson County Waiver program**. My name is **[Focus Group Lead Facilitator]** and with me is my colleague **[Focus Group Facilitator #2]**.

The U.S. Department of Health and Human Services is a federal agency that funded the **Wilson County waiver program**. We are studying the cost of operating the program and four other projects like it across the country so that child welfare agencies in other jurisdictions will be informed about resource requirements as they consider possibly implementing the program in their jurisdictions. The information you give us also will be used to help make improvements to the **Wilson County waiver program** and future programs like this one and to inform the federal government regarding the cost of operating a similar intervention.

Each of you was selected to be here today because you understand through practical experience the common names and definitions of casework and supervision activities involved in serving and supporting children and families under the **Wilson County waiver program**. You also understand from direct experience how much of your time is needed to carry out casework and supervision activities under the program.

Let me briefly mention some of the procedures for our discussion. Throughout most of the meeting you will work in two small groups composed of caseworkers and supervisors. The discussion will last approximately 4 hours including breaks**.** The meeting time will be divided into four exercises: three devoted to the **Wilson County waiver program** casework and supervision activities and one focused on the structure, content, and procedures for completing the activity surveys or case management information system.

[Focus Group Facilitator #2] and I will ask you questions and to share your thoughts and opinions. Remember, we are here to learn and gather information from you, the experts on the **Wilson County waiver program** casework and supervision. There is no right or wrong answer to the questions we will be asking. Please share your point of view even if it is different from what others have said. We expect that you might have different points of view. You are encouraged to add something to what someone has said or you may want to agree, disagree, or add an example. We are here to ask questions, listen to your insights, and make sure everyone has an opportunity to share knowledge gained through actual experiences. Sometimes you may notice we are shifting the conversation so that other people have a chance to talk or closing the discussion on a particular topic so we can be sure to cover all the topics on today's agenda.

While we are talking, please feel free to ask a question at any time, stand up, or get more refreshments. **[Focus Group Facilitator #2]** and I **[Focus Group Lead Facilitator]** will be recording key points on worksheets and easels and taking notes to help us remember what you said. No names will be included in any of the reports. Anything you say during your involvement in the focus group will be kept confidential and will not be shared with other agency personnel involved in the **Wilson County waiver program**. We also ask you not to discuss what anyone else says outside of this room. If you agree, you will be acknowledged as a "key contributor" in reports and publications on the **Wilson County waiver program** cost evaluation.

Let's begin by having each person in the room tell us his/her name, position title, and how long he/she has been involved with the **Wilson County waiver program**.

Exercise A: Names and Definitions of Wilson County Waiver Program Casework and Supervision Activities (60 minutes)

Step 1: Review Exercise Aim—Gain agreement on standard names and definitions of **Wilson County waiver program** casework and supervision activities.

Step 2: Caseworkers and supervisors form separate breakout groups. Lead Facilitator reviews and leads a brief discussion of the caseworker breakout group on the general definitions of "direct client service casework" (casework activities that directly involve children and families, such as conducting a meeting with a parent or observing a visitation between parent and child) and "indirect client service casework" (casework activities conducted on behalf of a client's child and family, such as case management documentation/MIS data entry, locating resources, advocating without the client, and caseworker travel). Concurrently, Facilitator #2 reviews and leads a brief discussion of the supervisor breakout group on the general definitions of "individual supervision activities" (supervisory activities conducted with an individual caseworker, such as case status review meetings, coaching sessions, and individualized training) and "group supervision activities" (supervisory activities conducted with multiple caseworkers, such as conducting team meetings).

Step 3: Working in separate breakout groups of caseworkers and supervisors, review the initial list of key casework and supervision activities and definitions. These names and short definitions will be developed by **Wilson County waiver program** leadership and management team prior to the focus group and will have been reviewed and commented upon by participants prior to the focus group meeting. The facilitator for each breakout group will ask participants to consider the following for each listed casework or supervision activity:

a. Does the activity account for more than 10 percent of casework or supervision time in a typical week? [Yes, Not Sure, No]

- Activities with a "no" response will be eliminated from further consideration during the focus group meeting.

b. Is the activity name accurate and likely to be understood by other caseworkers or supervisors that work on the **Wilson County waiver program**? [Yes, Not Sure, No]

- For activities with a "no" or "not sure" response, the facilitator will lead a discussion on a workable solution: rename the activity, combine the activity with another activity, eliminate the activity, or temporarily "park" the activity without resolution.

c. Is the activity definition accurate and likely to be understood by other caseworkers or supervisors that work on the **Wilson County waiver program**? [Yes, Not Sure, No]

- For activities with a "no" or "not sure" response, the facilitator will lead a discussion on a workable solution: eliminate the activity, redefine the activity, combine the activity with another activity, eliminate the activity, or temporarily "park" the activity without resolution.
- For the remaining activities, the facilitator will ask focus group participants to provide specific examples of work that would fall under each activity.

Step 4: Focus group participants conduct a final all-group review of responses to facilitator questions.

Break (15 minutes)

Exercise B: Names, Definitions, and Person-time Estimates for Wilson County Waiver General Program Activities (40 minutes)

Step 1: Review Exercise Aim—Gain agreement on standard names, definitions, and person-time requirements for **Wilson County waiver program** activities that are not specific to a case.

Step 2: Facilitators review and lead a brief discussion on the general definitions of **Wilson County waiver program** activities that support the delivery of client services, such as attending training, and attending team meetings, attending grantee organization meetings, serving on committees or work groups, screening candidate referral agencies, outreach and marketing, and receiving supervision.

Step 3: Working in separate breakout groups of caseworkers and supervisors, review the initial list of general program activities and definitions. These names and short definitions will be developed by **Wilson County waiver program** leadership and management team prior to the focus group and will have been reviewed and commented upon by participants prior to the focus group meeting. The facilitators will ask participants to consider the following for each listed service delivery management and program administration activity: These names and short definitions will be developed by **Wilson County waiver program** leadership and management team prior to the focus group and will have been reviewed and commented upon by

a. Does the activity account for more than 10 percent of the time spent on general program activities in a typical week? [Yes, Not Sure, No]

- Activities with a "no" response will be eliminated from further consideration during the focus group meeting.

b. Is the activity name accurate and likely to be understood by other caseworkers or supervisors that work on the **Wilson County waiver program**? [Yes, Not Sure, No]

- For activities with a "no" or "not sure" response, the facilitator will lead a discussion on a workable solution: rename the activity, combine the activity with another activity, eliminate the activity, or temporarily "park" the activity without resolution.

c. Is the activity definition accurate and likely to be understood by other caseworkers or supervisors that work on the **Wilson County waiver program**? [Yes, Not Sure, No]

- For activities with a "no" or "not sure" response, the facilitator will lead a discussion on a workable solution: redefine the activity, combine the activity with another activity, eliminate the activity, or temporarily "park" the activity without resolution.
- For the remaining activities, the facilitator will ask focus group participants to provide specific examples of work that would fall under each activity.

d. Is the preliminary estimate of required person-time for each general program activity reasonably accurate and agreed upon by the breakout group (and, in the breakout group's opinion, likely to be generally agreed upon by other caseworkers or supervisors that work on the **Wilson County waiver program)**? [Yes, Not Sure, No]

- The breakout group facilitator will lead a discussion on a workable solution for activities with "no" or "not sure" response.

Step 4: Focus group participants conduct a final all-group review of responses to facilitator questions.

Exercise C: Estimates of Amounts of Person-time Used to Conduct Wilson County Waiver Program Casework and Supervision Activities (60 minutes)

Step 1: Review Exercise Aim - Gain agreement on estimates of typical amounts of person-time expended conducting the **Wilson County Waiver program** casework and supervision activities identified in Exercises A and B.

Step 2: Lead Facilitator will lead all-group discussion on challenges in estimating amounts of time and the intended form of agreed-upon estimates. Challenges include differences in time required across separate instances of the same activity and differences among caseworkers or supervisors in time required for the same activity. The facilitators will emphasize the importance of reaching a working consensus on time estimates and that high, medium, and low time estimates are acceptable for the same activity. A breakout group can decide that they are unable to agree on the estimated time required for a given activity.

Step 3: Caseworkers and supervisors will be asked to review preliminary time estimates (informed by prior examination of administrative data) before the meeting.

The facilitator for each breakout group will ask participants to consider the following questions for each listed casework or supervision activity:

a. Is the preliminary estimate of required person-time for each casework or supervision activity reasonably accurate and agreed upon by the breakout group (and, in the breakout group's opinion, likely to be generally agreed upon by other caseworkers or supervisors that work on the **Wilson County Waiver program)**? [Yes, Not Sure, No]

- The breakout group facilitator will lead a discussion on a workable solution for activities with a "no" or "not sure" response.
- Facilitator will solicit feedback from participants on what contributes to variations in time estimates.

Step 4: Focus group participants conduct a final all-group review of responses to facilitator questions

Break (15 minutes)

Exercise D: Review and Discussion of Casework and Supervision Surveys or Case Management Information System (40 minutes)

Step 1: Review Exercise Aim—Obtain initial feedback on the planned structure, content, and procedures for tracking staff activities through either surveys or a case management information system. Discuss the role of focus group participants in a limited trial administration of the casework and supervision activity surveys or trial data entry into the case management information system.

Step 2: Facilitators will lead a presentation and discussion of proposed time and activity tracking procedures. Focus group participants will be asked to comment on the structure of the surveys/information system and issues in the feasibility of completion by caseworkers or supervisors that work on the **Wilson County Waiver program**. Issues raised by focus group participants will be noted and possible resolutions will be discussed.

Step 3: Lead Facilitators lead a presentation and discussion of the role of focus group participants in a limited trial administration of the activity surveys or case management information system. Focus group participants will receive follow-up survey questions about using the surveys or information system (quality of instructions, ease of use, relevance and clarity of questions, etc.). Feedback will be used to improve data collection procedures.

FOCUS GROUP PREPARATION TABLE

Prior to our pre-focus group conference call, please review this preliminary list of casework and supervision activities. Consider the names, definitions, and amounts of person-time estimated for completing each activity. If you want to suggest a revised name, definition, or time estimate, indicate that in the "notes" column. Please spend up to 60 minutes for this review.

	Activity Name	Definition	Person-Time in Minutes	Notes
Casework Activities	**Direct client service casework**			
	Advocacy	Advocacy for and with the client	20	
	Assessment	Assessment of client needs and strengths	30	
	Counseling	Provision of direct counseling/support to client	60	
	Transportation	Transportation of client to and from appointments	40	
	Referral	Referral of client to services	10	
	Indirect client service casework			
	Documentation	Completion of clinical documentation	30	
	Consultation	Consultation and collaboration with colleagues about client progress	10	
	Scheduling	Scheduling of services and meetings on behalf of client	20	
	Travel	Staff member travel	40	
Non-case-specific Activities	**Management and administration activities**			
	Supervision	Supervision of case workers about client needs and progress	20	
	Mentoring	Individual mentoring of caseworkers	30	
	General program activities			
	Training	Provision of training to teams of caseworkers	120	
	Review documentation	Monthly or quarterly review of team progress reports	90	
	Client meeting	Attendance at client/family team meetings	60	
	Committee work	Attendance at inter-agency committee meetings	120	
	Documentation	Review and approval of case documentation	30	

Tool B-1-4. Data Collection Methods: Estimating Staff Burden

Exhibit 3 in step 1 of this module estimates the staff burden associated with three data collection methods. The examples below can help you determine how the estimates would change with different data collection periods and program sizes.

The examples assume data collection for 10 management and administrative staff and 20 frontline staff. The burden unit estimates (in blue) were taken from real programs. Replace the numbers in red with those for your program. You may adjust assumptions such as the data collection period and the number of staff participating in the focus group. The example program was relatively small, so the entire staff was included in the focus group. Larger programs may include a representative staff sample to reduce staff burden and make the focus group more manageable and efficient.

Low Precision/Low Burden

This is the easiest of the three methods to estimate. The method uses a one-time focus group to define activity types and estimate time per activity, along with a one-time survey with a 1-month look-back period to collect data on management and administrative labor and frontline staff labor.

Step 1: Estimate Focus Group and Survey Pretest Burden

		Frontline Staff Hours	Admin. Staff Hours
Initial focus group prep	1 hour each for 1 management and administrative staff and 1 frontline staff	2	2
Focus group pretest	30 minutes each for 5 management and administrative staff and 10 frontline staff	5	2.5
Focus group	4 hours each for 10 management and administrative staff and 20 frontline staff	80	40
Survey pilot test	30 minutes each for 1 management and administrative staff and 1 frontline staff	0.5	0.5

Step 2: Estimate Data Collection Burden

		Frontline Staff Hours	Admin. Staff Hours
Collect survey data	40 minutes each for 10 management and administrative staff and 20 frontline staff	13.3	6.7

Totals: 100.8 51.7

Medium Precision/Medium Burden

This method uses a one-time focus group to define activity types and estimate time per activity, along with multiple weekly surveys over a 10-month data collection period to collect data on management and administrative labor and frontline staff labor.

Step 1: Estimate Focus Group and Survey Pretest Burden

		Frontline Staff Hours	Admin. Staff Hours
Initial focus group prep	1 hour each for 1 management and administrative staff and 1 frontline staff	2	2
Focus group pretest	30 minutes each for 5 management and administrative staff and 10 frontline staff	5	2.5
Focus group	4 hours each for 10 management and administrative staff and 20 frontline staff	80	40
Survey pilot test	30 minutes each for 1 management and administrative staff and 1 frontline staff	0.5	0.5

Step 2: Estimate Data Collection Burden

		Frontline Staff Hours	Admin. Staff Hours
Collect survey data	40 minutes each for 10 management and administrative staff and 20 frontline staff for 40 weeks	533.3	266.7

Totals: 620.8 311.7

High Precision/High Burden

This method uses a one-time focus group to define activity types, a one-time survey for a 1-month look-back period to collect data on management and administrative labor, and a continuous, real-time case management information system to collect data on frontline staff labor. The example assumes each frontline staff averages 10 activities per day over a 174-day data collection period. It also assumes a 10-month development time with 5 administrative staff assigned one-quarter time (2 hours per day). These assumptions drive the burden estimates for data collection using case management information systems and should be adjusted to fit your program.

Step 1: Estimate Focus Group, Survey Pretest, and Case Management Information System Development Burden

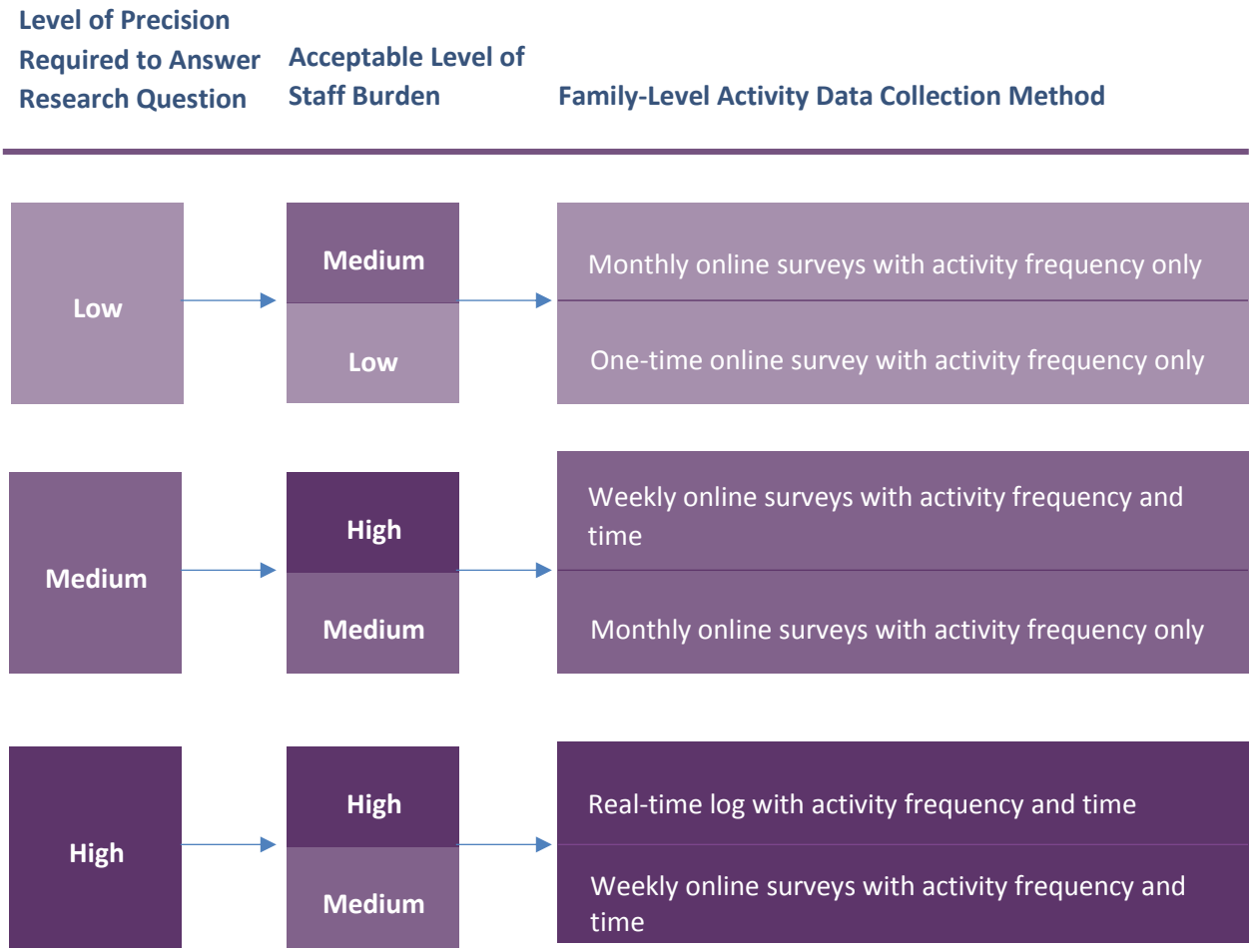
		Frontline Staff Hours	Admin. Staff Hours
Initial focus group prep	1 hour each for 1 administrative and 1 frontline staff	2	2
Focus group pretest	30 minutes each for 5 administrative and 10 frontline staff	5	2.5
Focus group	4 hours each for 10 administrative and 20 frontline staff	80	40
Survey pilot test	30 minutes each for 1 administrative and 1 frontline staff	0.5	0.5
Develop case management information system	2 hours per day for 174 work days for 5 administrative staff		1,740

Step 2: Estimate Data Collection Burden

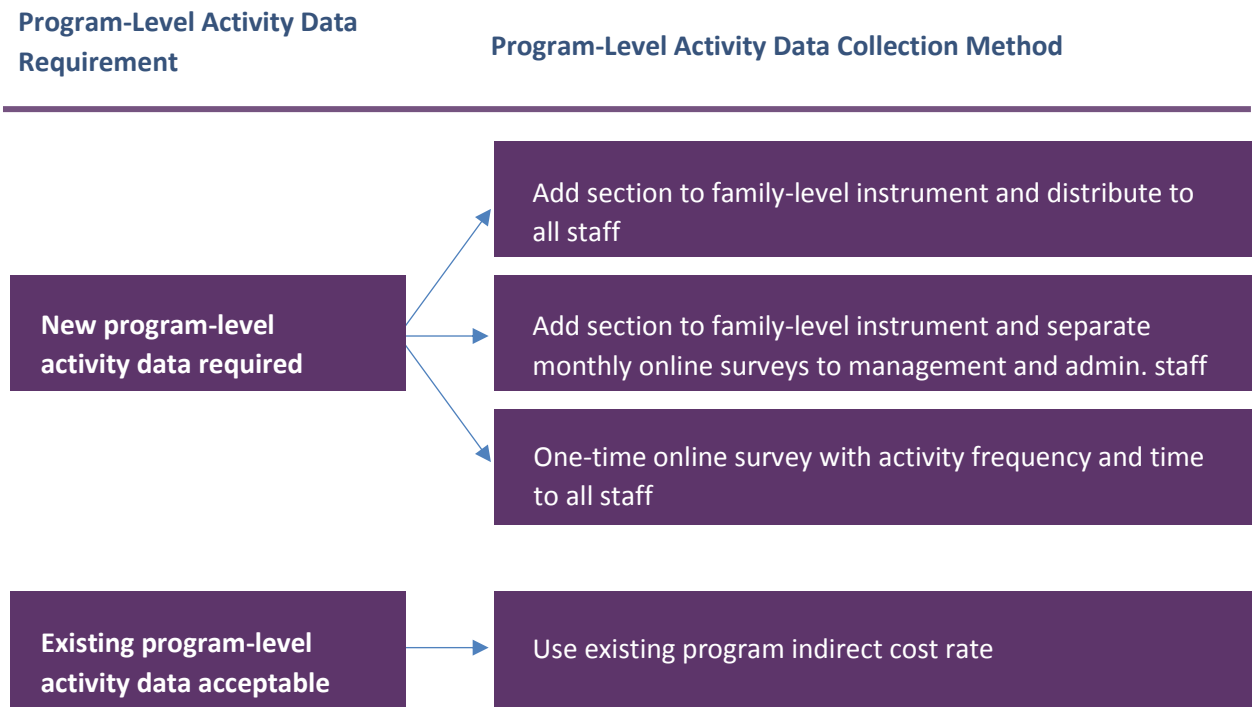
		Frontline Staff Hours	Admin. Staff Hours
Collect administrative survey data	40 minutes each for 10 administrative staff		6.7
Collect frontline staff case management information system data	30 seconds for each of 10 case management entries per day for 174 work days for 20 frontline staff	290	

Totals: 377.5 1,791.7

Tool B-2-1. Precision/Burden Decision Tree



Tool B-2-2. Program-Level Decision Tree



Tool B-2-3. Labor Use Data Collection Matrix

Low Burden/Low Accuracy → **High Burden/High Accuracy**

	Option 1	Option 2	Option 3	Option 4
Overview	Staff complete separate surveys on labor use over a short period (e.g., the previous 2–4 weeks). The data are used to estimate all labor use for the entire evaluation period.	Staff who conduct client service delivery activities complete weekly surveys. Other management and administration staff complete a one-time monthly survey; the data are used to estimate indirect labor use for the entire evaluation period.	Staff who conduct client service delivery activities complete weekly surveys. Labor for management and administration activities is included in an indirect cost rate.	Staff who conduct client service delivery activities record labor in a database in real time. Other management and administration staff complete a one-time monthly survey; the data are used to estimate labor use for the entire evaluation period.
Method Used to Collect Client Service Delivery Labor Use Data (activities with or on behalf of families)	Staff who conduct client service delivery activities estimate, in focus groups, the time it takes to conduct each type of activity. They then complete a retrospective, one-time survey for each family, estimating the number of times they conducted each activity for that family.	Staff who conduct client service delivery activities estimate, in focus groups, the time it takes to conduct each type of activity. They then complete an electronic weekly survey for each family, recording the number of times they conducted each client service delivery activity for that family.	Staff who conduct client service delivery activities complete an electronic weekly survey for each family, recording the actual time spent conducting each activity for that family.	Staff who conduct client service delivery activities record their activities in a database as they occur. They enter the actual time spent conducting each activity for each family.
Method Used to Collect General Program Activities Labor Use Data (activities for the program)	Staff who conduct general program activities estimate, in focus groups, the time it takes to conduct each type of activity. They then complete a retrospective, one-time survey, estimating the number of times they conducted each activity; the data are used to estimate labor use for the entire evaluation period.	Staff who conduct general program activities estimate, in focus groups, the time it takes to conduct each type of activity. They then record their activities using a retrospective, one-time survey based on an average month; the data are used to estimate labor use for the entire evaluation period.	Staff who conduct general program activities estimate, in focus groups, the time it takes to conduct each type of activity. They then complete an electronic weekly survey, recording the actual time spent conducting each activity.	Staff who conduct general program activities record their activities in a database as they occur. They enter the actual time spent conducting each activity.
Method Used to Collect Management and Administration Labor Use Data (activities for the organization as a whole)	Labor for management and administration activities is included in an indirect cost rate, which is based on annual program-level expenditure data.	Staff who conduct management and administration activities estimate, in focus groups, the time it takes to conduct each type of activity. They then record their activities using a retrospective, one-time survey based on an average month; the data are used to estimate labor use for the entire evaluation period.	Staff who conduct management and administration activities estimate, in focus groups, the time it takes to conduct each type of activity. They then complete an electronic weekly survey, recording the actual time spent conducting each activity.	Staff who conduct management and administration activities record their activities in a database as they occur. They enter the actual time spent conducting each activity.

Tool B-3-1. Master Staff/Case Roster

Staff Name	Staff Role/Position Title	E-mail	# of cases assigned to worker	Case Evaluation ID	Case Open Date
Worker 1	Therapist	worker1@smithcountycoststudy.org	3	165059A	12/29/2014
				170211A	1/16/2015
				181739A	3/31/2015
Worker 2	Supervisor	worker2@smithcountycoststudy.org	1	251792A	4/13/2015
Worker 3	Therapist	worker3@smithcountycoststudy.org	5	170548A	12/26/2014
				271745A	3/18/2015
				276070A	11/4/2014
				200455A	7/1/2015
				220027A	7/1/2015
Worker 4	Therapist	worker4@smithcountycoststudy.org	5	104144A	4/27/2015
				24311A	4/17/2015
				261515A	2/16/2015
				185760B	5/4/2015
				30395A	7/14/2015

Tool B-3-2. Smith County Weekly Survey

The U.S. Department of Health and Human Services has contracted with [evaluation contractor] to evaluate the [Evaluation Initiative]. The [Evaluation Initiative] is designed to build knowledge for policymakers and practitioners about the effectiveness of interventions to decrease long-term foster care.

Your answers will be kept confidential. Only the research team will have access to this information. Your answers will not be shared with anyone at your program or any other agency. In our research reports, the information you provide will not be attributed to you.

Agreement to participate. If you agree to participate in the [Evaluation Initiative] cost study, please electronically record your agreement by clicking Accept below.

[*ACCEPT*] [*EXIT*|

The following activity survey asks questions about the case-specific activities that you do with and on behalf of families, as well as more general [Name of Project] activities that are not related to specific case. Please complete a survey for *each* week of your involvement in the [Name of Project] during the period of 6/8/2015 – 11/21/2015.

Please complete a survey for *each* open [Name of Project] intervention case. After you complete a survey for one case, you will be asked to complete the same set of questions for each of your additional [Name of Project] cases. In addition to completing surveys for each open case assigned to you, you will also complete a more general [Name of Project] activity survey of administrative and management tasks that are not directly associated with a specific case.

If you spent time on [Name of Project] cases during the week for which you are reporting, the survey should take approximately **45** minutes[3] to complete for all cases and general [Name of Project] activities.

Web-based Case Work Survey Home Page

Select Survey Week (Drop-down menu)**:**

Please select the calendar week for which you are completing this survey. (Pop-up calendar)

[*Calendar Week Appears Across the Header of Each Page*]

[3] Survey completion times will vary based on the number of activities included in the survey and the number of cases sampled per staff person.

Select a Case

Please select a survey to complete: (Drop-down menu)

- Client ID 1
- Client ID 2
- Client ID 3
- General [Name of Project] Management and Administrative Activities

[*Weekly Activity Survey will load for first client ID selected*]

Weekly Activity Survey

[Name of Project] Personnel in **case management or supervisory** positions might have other, non-[Name of Project] responsibilities in their organizations. The questions ask you to consider each week separately and to exclude non-[Name of Project] activities. You are encouraged to review your schedules and appointment calendars when answering the questions. Note that some weeks will have fewer than five business days. Person-time you expended on [Name of Project] activities outside normal business hours should also be included.

During the calendar week for which you are reporting, how many minutes did you spend on this [Name of Project] case?

☐ N/A- This case has been discharged/closed [*SKIP BACK TO Select a Case*]

☐ Zero Time on this Case [*SKIP BACK TO Select a Case*]

☐ 30 or Fewer Minutes on this Case [*SKIP BACK TO Select a Case*]

☐ 31 or Greater Minutes on this Case[*Continue to 'Direct Service Activities' section*]

A. Direct Service Activities. The following questions pertain to any [Name of Project] services that you may have provided directly to a participant/family (i.e., during face-to-face meetings, over the phone, or via e-mail) in the past calendar week.

1. Excluding any group activities such as group socializations, family events, and community events, did you have any direct contact (i.e., in-person, telephone contact, e-mail, or text message) with client [*client ID*] during the selected calendar week?

   ☐ No [*SKIP TO Indirect Client Services Section*]

   ☐ Yes [*Continue to Question 2*]

2. During the calendar week for which you are reporting, did any of your contacts with client [*client ID*] involve one or more of the following direct service activities? Please indicate the number of times you conducted each of these activities in the past calendar week with Family X. If you *did not* conduct an activity in the last week, enter '0' in the field. Next, specify the total amount of time you spent (all occurrences combined) conducting those activities with Family X. (For more examples, hover your cursor over the activity).

Direct Service Activity	Number of times activity occurred in the past week	Total amount of time spent on the activity in the past week
Assessment Examples: Administering client intake survey or any follow-up surveys, depression screen		
Collaborative case planning Examples: Working directly with family to identify case plan goals and next steps		
Scheduling Examples: Attempts to plan for future meetings		
Skill building Examples: Providing training or modeling behavior		
Maintaining communication with families (via telephone, text, email, etc.)		

B. Nondirect Services. The following questions ask about activities conducted on behalf of a specific client child and family, but *without the participant present*. These are case-specific activities that do not involve direct contact with the client child or family member.

1. During the calendar week for which you are reporting, did you conduct any indirect service activities on behalf of client [*client ID*] and/or the family, directly related to this **[Name of Project]** case?

   ☐ No [*SKIP TO Management and Administration Activities, Question 9*]

   ☐ Yes [*Continue to Question 2*]

2. During the calendar week for which you are reporting, did any of your contacts with client [*client ID*] involve one or more of the following types of indirect service activities? Please indicate the number of times you conducted each of these activities in the past calendar week with Family X. If you *did not* conduct an activity in the last week, enter '0' in the field. Next, specify the total amount of time you spent (all occurrences combined) conducting those activities with Family X. (For more examples, hover your cursor over the activity).

Indirect Service Activity	Number of times activity occurred in the past week	Total amount of time spent on the activity in the past week
Consult and collaborate with non-[Name of Project] external providers about a family Examples: Working with other providers to identify service needs		
Documentation Examples: Documenting referrals, concerns, etc. in case notes		
Locate resources for the family Examples: Researching available resources for referral		
Prepare and research to inform service delivery Examples: Reading materials to strengthen skills and identify ways to better engage family		

[*SKIP BACK TO 'Select a Case' at beginning of survey. After the last case, SKIP TO Management and Administration Activities*]

C. General [Name of Project] Program Activities. The following questions ask about your use of your time on other [Evaluation Initiative] program activities that do not involve doing work for a specific [Evaluation Initiative] case. These activities may support the delivery of client services, such as receiving supervision or coaching, attending training, and attending team meetings. Or they may foster [Evaluation Initiative] intervention development and maintenance, such as attending grantee organization meetings, serving on committees or work groups, screening candidate referral agencies, outreach and marketing, and grants management.

1. During the calendar week for which you are reporting, were you involved in any general [Name of Project] activities?

   ☐ Yes

   ☐ No [*END SURVEY*]

2. During the calendar week for which you are reporting, were you involved in one or more of the following types of activities? Please indicate the number of times you conducted each of these activities in the past calendar week. If you *did not* conduct an activity in the last week, enter '0' in the field. Next, specify the total amount of time you spent (all occurrences combined) conducting those activities. (For more examples, hover your cursor over the activity).

General Program Activity	Number of times activity occurred in the past week	Total amount of time spent on the activity in the past week
Attend [Name of Project] meetings		
Attend [Name of Project] training Examples: Attend training related to the project		
Receive supervision or coaching		
Outreach/marketing Examples: Community engagement to increase awareness of program		

THANK YOU!

[*END SURVEY*]

Tool B-3-3: Smith County Activity Codes

Direct Services Provided to Intervention Group Families				
Activity Code	**Long Description**	**Start Date, Start Time**	**Stop Date, Stop Time**	**Travel Time**
ADVCFRCLNTWCLNT	Advocacy for Client—with Client			
BASCCNCRTASSTNC	Basic Concrete Assistance			
CASEPLANDVLPMNT	Case Plan Development			
CNSLSPRTCSPLNGL	Counsel/Support—Case Plan Goals			
CONCURNTPLANING	Concurrent Planning			
CONFLICTMANGMNT	Conflict Management			
MOTIVATLNINTRVW	Motivational Interviewing			
PROVIDERESOURCS	Provide Resources			
SCHEDULING	Scheduling			
TEACH/MODEL	Teach/Model			

Indirect Services Provided on Behalf of Intervention Group Families				
Activity Code	**Long Description**	**Start Date, Start Time**	**Stop Date, Stop Time**	**Travel Time**
ADVFRCLNTWOCLNT	Advocacy for Client—without Client			
CNSLTCLBTEXTRNL	Consult/Collaborate—External			
COURTPREPARATON	Court Preparation			
CRDNTOTRSVCPRVR	Coordinating Other Service Providers			
OVRSGHTOFCSPLAN	Oversight of Case Plan			
OVRSGHTOFSFTPLN	Oversight of Safety Plan			
REFER	Refer			
RESRCEDEVELPMNT	Resource Development			
UNPLANNDSUPRVSN	Unplanned Supervision			

Management and Administration Services Provided to Families				
Activity Code	**Long Description**	**Start Date, Start Time**	**Stop Date, Stop Time**	**Travel Time**
ATTSTAFFMEET	Attend Staff Meeting			
ATTTRAINING	Attend Training			
RCVSUPCONST	Receive Supervisory Consultation			
PROVSUPCONST	Provide Supervisory Consultation			
RCVCOACH	Receive Coaching			
PROVCOACH	Provide Coaching			
OTHERAA	Other Administrative Activity			

Mode of Contact				
Contact Type	**Long Description**	**Start Date, Start Time**	**Stop Date, Stop Time**	**Travel Time**
ATTEMPTED	Attempted Contact			
E-MAIL	Electronic Mail			
INPERSON	In-Person			
LETTER	Letter			
OTHER	Other			
PHONE	Telephone			
TEXT	Text			

Tool B-3-4. Smith County Survey Data[4]

Note: Data below are an example from a weekly survey from one staff member for two cases. Data were edited to deidentify clients and staff. Data fields were edited for clarity, and many fields were deleted to meet tool size requirements.

V3	V5	V8	V9
Staff Name	EmailAddress	StartDate	EndDate
Brown, Thomas	brown@smithcountycoststudy.org	7/14/2015 16:43	7/16/2015 14:53

Q1002	Q101	Q10	12.2_1
07/06/2015 - 07/10/2015	Client ID: 47650A	During the calendar week for which you are reporting, how many minutes did you spend working directly with the client?	During the calendar week for which you are reporting, did you provide any category 2 activities?
	1	4	1

Q12.2_5	Q12.2_7	Q104
During the calendar week for which you are reporting, did you provide any category 6 activities?	During the calendar week for which you are reporting, did you provide any category 7 activities?	Client ID: 27438A
2	2	1

Q14.3_2_TEXT	Q22.2_9	Q22.2_2	Q22.2_3
During the calendar week for which you are reporting, how many minutes did you spend working directly with the client?	During the calendar week for which you are reporting, did you provide any category 18 activities?	During the calendar week for which you are reporting, did you provide any category 19 activities?	During the calendar week for which you are reporting, did you provide any category 21 activities?
90	1	2	1

[4] As seen in Tool B-3-4, the first row in the raw data spreadsheet includes automatically generated headers for the questions presented in the survey (e.g., "V1" or" Q101"). It is good practice to rename the contents of these cells in the header rows so that they are meaningful and allude back to the original question asked.

Tool B-3-5. Smith County Database

Client ID	Staff Name	Log Report Week	Log Completion Date	Direct Services Provided?	Advocate with participant	Conduct assessments	Provide referrals to participant	Providing treatment to participant	Scheduling appointment with participant	Skillbuilding with parents	Maintain communication with family	Total Direct Service Minutes
016697A	Worker 1	29-Jun-15	6-Jul-15	yes	4	1	0	1	1	2	5	240
016697A	Worker 1	6-Jul-15	20-Jul-15	yes	2	1	1	0	1	3	2	210
016697A	Worker 1	13-Jul-15	20-Jul-15	.	.	.	.	.	.	.	.	.
016697A	Worker 1	20-Jul-15	27-Jul-15	no	.	.	.	.	.	.	.	.
016697A	Worker 1	3-Aug-15	11-Aug-15	yes	3	2	1	1	1	2	3	210
24311A	Worker 2	15-Jun-15	29-Jun-15	.	.	.	.	.	.	.	.	.
24311A	Worker 2	22-Jun-15	1-Jul-15	.	.	.	.	.	.	.	.	.
24311A	Worker 2	29-Jun-15	13-Jul-15	yes	1	2	0	0	4	2	1	120
24311A	Worker 2	6-Jul-15	13-Jul-15	yes	0	1	0	0	3	1	2	90
24311A	Worker 2	20-Jul-15	31-Jul-15	yes	0	2	2	1	1	2	2	145

Client ID	Staff Name	Log Report Week	Log Completion Date	Non-direct Services Provided?	Advocate without participant	Consult with other service providers	Case documentation	Locate resources for participant	Attend court on behalf of participant	Travel for case	Total Nondirect Service Minutes
016697A	Worker 1	29-Jun-15	6-Jul-15	yes	2	3	4	1	0	4	100
016697A	Worker 1	6-Jul-15	20-Jul-15	yes	0	1	1	0	1	3	200
016697A	Worker 1	13-Jul-15	20-Jul-15	yes	0	1	2	0	0	0	60
016697A	Worker 1	20-Jul-15	27-Jul-15	no	.	.	.	.	.	.	.
016697A	Worker 1	3-Aug-15	11-Aug-15	yes	1	2	1	1	1	2	230
24311A	Worker 2	15-Jun-15	29-Jun-15	.	.	.	.	.	.	.	.
24311A	Worker 2	22-Jun-15	1-Jul-15	.	.	.	.	.	.	.	.
24311A	Worker 2	29-Jun-15	13-Jul-15	yes	0	2	3	0	0	2	160
24311A	Worker 2	6-Jul-15	13-Jul-15	yes	0	1	2	1	0	1	60
24311A	Worker 2	20-Jul-15	31-Jul-15	yes	0	1	2	1	0	2	150

Note: Data represent two cases for two service provider staff, each case having five observations (weekly surveys). Dots in cells represent missing data.

Tool B-3-6. Smith County Survey Quality Assurance Checklist

1. Run an initial QA check on the data for each staff person to identify who completed the survey correctly and who skipped questions or sections. Use color coding (green = complete, yellow = partially complete, red = missing data).

2. Highlight areas where staff indicated they had contact with a family or engaged in a type of service (e.g., direct services, nondirect services) but did not identify any activities or mark their time under any activity in that service category. Attempt to follow up with staff on these issues. If there is no response to those attempts, change their response from "yes" to "no" for these questions.

3. Write notes for each survey in the cost database to identify the QA issues *in detail* for surveys that are not complete (e.g., What is missing? What did they skip? Are there reported times that need clarification?).

4. Identify the total number of families for whom there *should* be data. This can be obtained from your roster of cases.

5. Identify the total number of families for whom staff *actually* reported data. If staff said they did not work with a family, that family should not be counted in this total.

6. Provide an update on the QA check to program management. If there are continued issues with survey completion, management will reach out to individual staff.

Tool B-3-7. Data Quality Report

Smith County Data Quality Report	# OR %
Total number of surveys collected during cost study (each weekly case observation counts as one survey)	104
Total number of cases included in sample	26
Number of missing weekly surveys during our cost study data collection	5
Percent of missing weekly surveys during our cost study data collection	5%

Tool B-4-1. Wilson County Multiple Imputation Plan

Multiple imputation (MI) is a reasonable approach for addressing moderate to large amounts of missing data, as long as a large set of variables potentially related to missingness is included in the imputation process (Widaman, 2006). Wilson County planned to identify case characteristics that predict case duration and service intensity. While it had complete labor data from its case management information system, 68 case characteristic variables (e.g., demographics, client outcomes) had missing data. Wilson County developed a plan to impute missing case characteristics data for these variables. MI was used to replace each missing case characteristic value with a set of plausible values. The imputation approach included the following steps:

1. Obtain Wilson County client characteristics data to be used in regression modeling.
2. Describe missingness. Wilson County created a table that described the level of missingness for case characteristics data. This included a total count and percentage of variables with missing values. Remove variables with 50 percent or more missing data, as it is difficult to impute data with such a large amount of missing information. Also remove categorical variables with no variance. If variables are collinear, select one variable for removal.
3. Use multiple imputation to address missing data. Bodner recommends running as many imputations as the percentage of missing data (2008).
4. Multiple approaches were used in the imputation model to ensure that imputed data were plausible and non-negative. The following MI models were used for the different types of case characteristics data:
    a) Ratio data: predictive mean matching model
    b) Ordinal data: ordered logistic model
    c) Nominal data: multinomial logistic model
    d) Binary data: logistic model
    e) Count data: negative binomial model
5. Conduct a diagnostic check to compare distributions of imputed and observed data.

Tool B-4-2. Smith County Monthly Labor Assignment Report

Case ID Number	Activity Date	Activity	Activity Hours	Frequency
1022	10/3/2016	Direct - Basic Concrete Assistance	1.5	1
1022	10/4/2016	Direct - Case Plan Development	2.0	1
1022	10/4/2016	Direct - Scheduling	4.0	8
1022	10/5/2016	Direct - Scheduling	1.0	2
1022	10/5/2016	Indirect - Oversight of Case Plan	3.0	1
1022	10/6/216	Indirect - Court Preparation	2.0	1
1022	10/6/2016	Direct - Teach/Model	2.0	1
		Total	**15.5**	**15.0**
1023	10/2/2016	Direct - Conflict Management	1.0	1
1023	10/2/2016	Direct - Provide Resources	3.0	2
1023	10/3/2016	Indirect - Refer	0.5	2
1023	10/3/2016	Direct - Concurrent Planning	2.0	2
1023	10/3/2016	Indirect - Consult/Collaborate - External	1.5	1
1023	10/6/2016	Indirect - Refer	0.5	1
1023	10/7/2016	Direct - Provide Resources	3.0	2
1023	10/7/2016	Indirect - Resource Development	1.5	1
1023	10/7/2016	Direct - Conflict Management	2.0	2
		Total	**15.0**	**14.0**

The table above depicts how a monthly report would be structured for a high precision, medium burden cost study data collection approach using weekly activity logs that track activity frequency and time. Both direct and nondirect service activities for two cases (1022 and 1023) are listed by the date they occurred. The total monthly activity hours per case are shown.

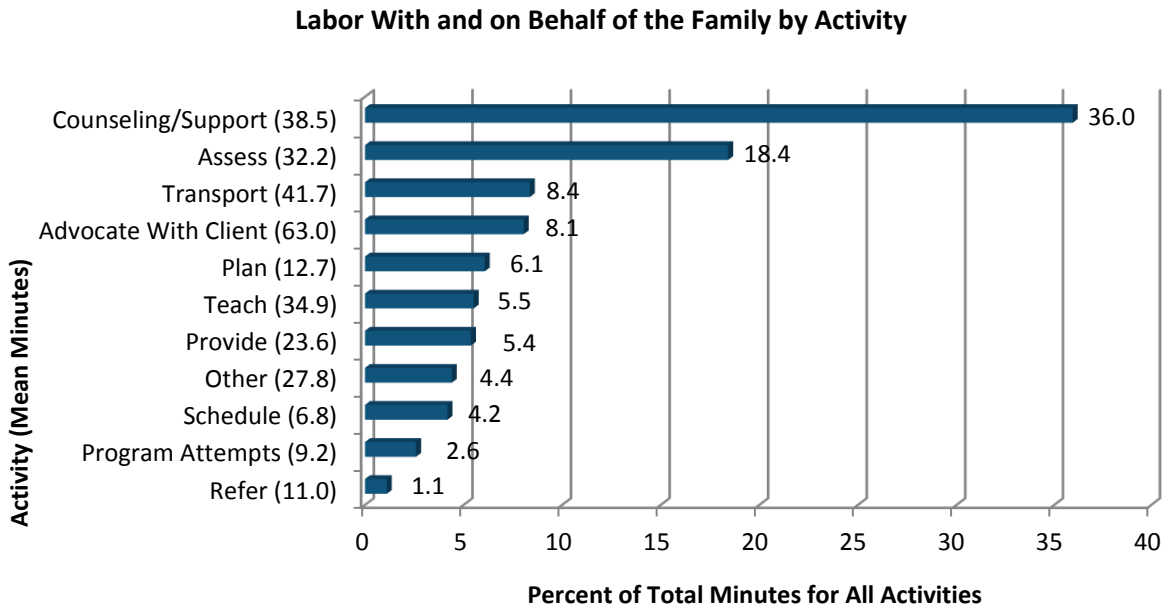
Tool B-4-3. Jackson County Labor Assignment Report

Case ID Number	Activity	Average Activity Time *	Frequency During the Past 30 Days	Total Estimated Time *(Average Activity Time X Frequency)*
8934757X	Direct - Basic Concrete Assistance	1.50	4	6.00
8934757X	Direct - Case Plan Development	1.00	1	1.00
8934757X	Direct - Scheduling	0.25	4	1.00
8934757X	Nondirect - Oversight of Case Plan	1.00	2	2.00
8934757X	Nondirect - Court Preparation	2.00	1	2.00
8934757X	Direct - Teach/Model	2.00	4	8.00
8934757X	Nondirect - Refer	0.50	2	1.00
8934757X	Nondirect - Consult/Collaborate - External	1.50	3	4.50
			Total:	25.50
0287498X	Direct - Basic Concrete Assistance	1.50	3	4.50
0287498X	Direct - Scheduling	0.25	5	1.25
0287498X	Direct - Conflict Management	1.00	1	1.00
0287498X	Direct - Provide Resources	3.00	3	9.00
0287498X	Direct - Concurrent Planning	2.00	1	2.00
0287498X	Nondirect - Consult/Collaborate - External	1.50	2	3.00
0287498X	Nondirect - Refer	0.50	1	0.50
0287498X	Nondirect - Resource Development	1.50	1	1.50
			Total:	22.75

*Average activity times were obtained from an earlier focus group with staff.

The table above depicts how a data report would be structured for a low precision, low burden cost study data collection approach using weekly activity logs that track activity frequency only. Staff were asked to indicate the number of times direct and nondirect service activities were conducted with each client during the past 30 days. The frequencies were then multiplied by the average time per activity, which was obtained from an earlier focus group. The total estimated activity hours per case are shown.

Tool B-4-4. Sample Distribution of Labor Across Activities

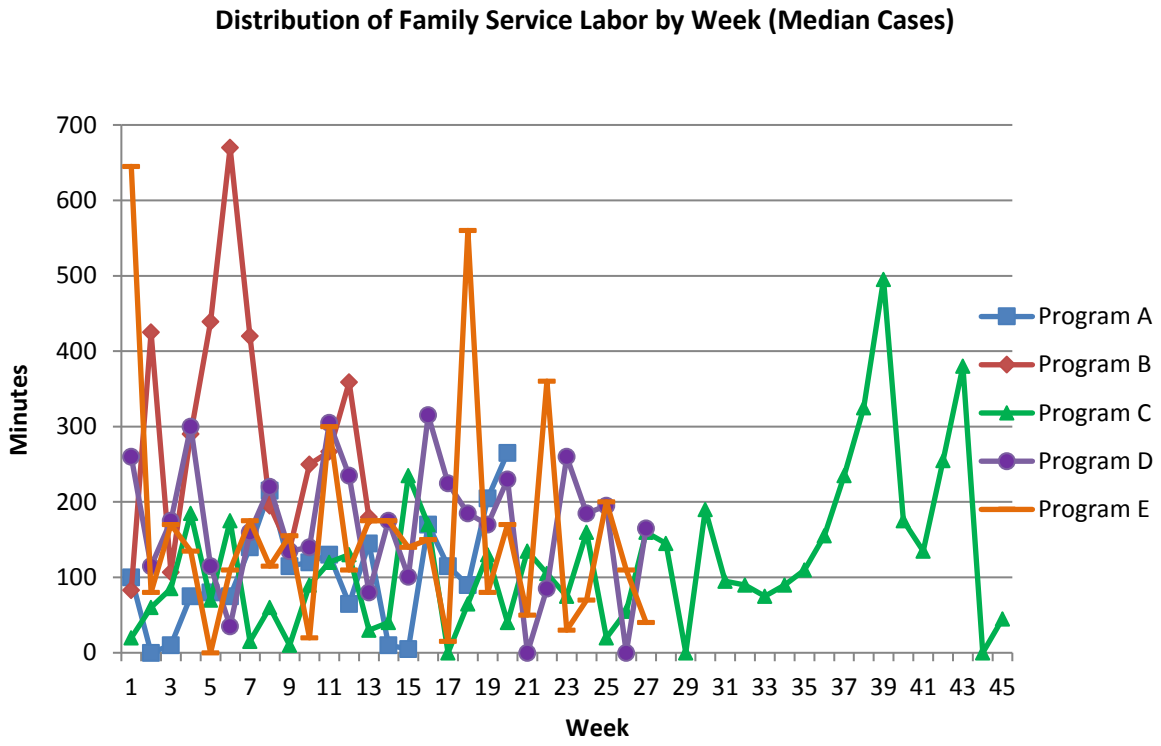


The chart above illustrates all case-specific direct and nondirect service activities, ordered by percentage of total direct service time. It includes activity mean times (in minutes).

Counseling and support for families accounts for 36 percent of labor. This is about double the proportion devoted to family assessment (18.4 percent), the activity with the next greatest percentage. "Other" (4.4 percent) includes a combination of seven activities, such as court representation, that individually consumed relatively small proportions of labor. Providing referrals accounted for the smallest amount of staff labor.

Mean minutes per activity, indicated in parentheses, ranged from a high of 63.0 minutes for advocating with a client to a low of 9.2 minutes for program attempts, or unsuccessful efforts to contact a family.

Tool B-4-5. Longitudinal Labor Data Use Analysis



The charts above compare the distribution of case-specific labor across weeks of project participation for the median case at five different programs implementing the same services. The median case is found by arranging in descending or ascending order the amount of labor expended on each case and then selecting the case in the middle. The chart highlights how service delivery for the same program can look very different across sites.

Tool B-4-6. Labor Use Regression Analysis Example

The table below shows the analytical output from a series of regression analyses utilizing mixed models conducted using average weekly family service minutes as the dependent variable. The data show the extent to which the independent variables in the first (left) column influenced—or predicted—the time spent per case. Time per case and cost per case are highly correlated. The Beta column shows the direction of the relationship (positive or negative), the magnitude of the predicted effect in minutes gained or lost, and whether the correlation was statistically significant. The Standard Error column shows the + and – size of the predicted error range within the significance levels.

This analysis was conducted for a program that administered services in multiple locations, so it was important to see if different sites predicted changes from the combined site data. Site A, for example, reduced the predicted weekly time by 112.35 minutes (+ or - 24.53 minutes) from the combined data, and the prediction was highly significant (p<.001). Site E, on the other hand, did not predict any difference. Site B predicted an increase of 24.81 weekly minutes, which was not statistically significant. A higher number of adults in the household predicted an increase of 24.08 weekly minutes (+ or – 10.95 minutes), which was statistically significant (p<.05).

Predictors of Weekly Minutes Received

Variable (Effect)	Beta	Standard Error
Site A	-112.35***	24.53
Site B	24.81	29.77
Site C	-62.09	43.28
Site D	10.89	23.25
Site E	00.00	0.00
Child age	7.74*	3.89
Number of adults in household	24.08*	10.95
AAPI: Corporal Punishment	14.79**	5.54
AAPI: Power Independence	9.16*	4.19
CBCL Externalizing	-2.41**	0.94
CBCL Internalizing	2.16**	0.86

* p < .05
** p < .01
*** p < .001

Tool B-4-7. Monthly Direct Labor Cost Report

Case ID Number	Staff ID	Activity Date	Activity	Frequency	Activity Hours	Direct Staff Hour Compensation Rate	Direct Labor Cost
1022	111	10/3/2016	Direct - Basic Concrete Assistance	1	1.5	$ 55.00	$ 82.50
1022	111	10/4/2016	Direct - Case Plan Development	1	2.0	$ 55.00	$ 110.00
1022	111	10/4/2016	Direct - Scheduling	8	4.0	$ 55.00	$ 220.00
1022	111	10/5/2016	Direct - Scheduling	2	1.0	$ 55.00	$ 55.00
1022	111	10/6/2016	Direct - Teach/Model	1	2.0	$ 55.00	$ 110.00
			Total		**10.5**		**$ 577.50**
1023	111	10/2/2016	Direct - Conflict Management	1	1.0	$ 55.00	$ 55.00
1023	111	10/2/2016	Direct - Provide Resources	2	3.0	$ 55.00	$ 165.00
1023	111	10/3/2016	Direct - Concurrent Planning	2	2.0	$ 55.00	$ 110.00
1023	111	10/7/2016	Direct - Provide Resources	2	3.0	$ 55.00	$ 165.00
1023	111	10/7/2016	Direct - Conflict Management	2	2.0	$ 55.00	$ 110.00
			Total		**11.0**		**$ 605.00**

Tool B-4-8. Added Cost Multiplier

Case Number	Total Direct Labor Cost	ACM Multiplier	Total Cost
101	$ 6,784.57	1.52	$ 10,312.55
102	$ 12,675.90	1.52	$ 19,267.37
103	$ 3,266.15	1.52	$ 4,964.55
104	$ 13,267.84	1.52	$ 20,167.12
105	$ 26,599.01	1.52	$ 40,430.50
106	$ 8,766.92	1.52	$ 13,325.72
107	$ 11,486.26	1.52	$ 17,459.12
108	$ 19,702.77	1.52	$ 29,948.21
109	$ 12,098.24	1.52	$ 18,389.32
110	$ 21,543.16	1.52	$ 32,745.60
111	$ 12,888.09	1.52	$ 19,589.90
112	$ 16,434.95	1.52	$ 24,981.12
113	$ 4,788.34	1.52	$ 7,278.28
114	$ 9,088.45	1.52	$ 13,814.44
115	$ 13,555.45	1.52	$ 20,604.28
116	$ 17,601.84	1.52	$ 26,754.80
117	$ 8,903.88	1.52	$ 13,533.90
118	$ 2,349.05	1.52	$ 3,570.56
119	$ 9,895.27	1.52	$ 15,040.81
120	$ 12,489.62	1.52	$ 18,984.22
121	$ 9,264.06	1.52	$ 14,081.37
122	$ 16,079.46	1.52	$ 24,440.78
123	$ 10,783.63	1.52	$ 16,391.12
124	$ 5,432.96	1.52	$ 8,258.10
125	$ 9,518.63	1.52	$ 14,468.32
126	$ 13,733.72	1.52	$ 20,875.25
127	$ 15,632.06	1.52	$ 23,760.73
128	$ 12,844.43	1.52	$ 19,523.53
129	$ 21,966.82	1.52	$ 33,389.57
130	$ 4,791.26	1.52	$ 7,282.72
Total			**$ 553,633.84**

Tool B-4-9. Wilson County Regression Analysis for Constructed Variables

Wilson County included a diverse set of direct, indirect, and standard care services provided to families with varying needs over varying time periods. Staff tailored service delivery to meet families' needs. Some families may have required services that were more intensive or long term than others.

To understand how personnel labor impacts case costs, Wilson staff constructed two variables: service intensity and case duration. Service intensity was defined as the mean number of labor minutes provided to a case per week during the cost study timeframe. Service intensity for each case was calculated by dividing the total number of minutes expended on a case by the duration of weeks the case was open (average labor minutes per week). Case duration was defined as the length of time (in days) that a case remained open and was involved in the evaluation period. Both variables helped describe a unique aspect of service delivery.

To what degree were case duration and service intensity associated with case costs?

Case duration and service intensity were moderately associated with personnel labor costs (service intensity: $r[783] = .28$, $p < .001$; case duration: $r[783] = .47$, $p < .001$).

What is the relationship between case duration and service intensity?

There was a negative association between case duration and service intensity. As service intensity increased, case duration tended to decrease, although these variables did not have a strong interdependence ($r[783] = -.12$, $p < .001$). This suggests that cases receiving higher service intensity were able to close sooner (cases were only closed once case plan goals were achieved).

Findings such as these can be useful for fine-tuning program operations. When coupled with data on monetized benefits, the data allow for more sophisticated analyses that can yield even further information about new service interventions or practices, such as return on investment and benefit-cost analysis.

Using case duration and service intensity as predictors of labor costs, how well did the model fit?

Together, the case duration and service intensity variables explained over half (58 percent) of the variance in labor costs ($F[3,773]=354.8$, $p<.001$, $R^2=.58$, adjusted $R^2=.58$). This suggests other predictors of labor costs should be explored (FAQ B-23).

What was the overall impact of case duration and service intensity on case costs?

As shown by the unstandardized beta values in the summary table below, the average personnel labor cost for each case increased by $0.003 for each day a case remained open, and the average case increased by $0.01 for each additional minute per week that a case received services. These small effects show that case duration and service intensity do not strongly impact case costs.

Summary of Regression Analysis for Constructed Variables

Variable	Mean	Standard Deviation	b	β	Standard Error
Dependent variable: Personnel Labor Cost (dollars)	$3,517.89	$3,293.70			
Service Intensity (average minutes per week)	197.4	415.2	0.01	0.7***	0.0003
Case Duration (days)	344.9	220.3	0.003	1.1***	0.0001

* p < .05 ** p < .01 ***p<.001

Appendix B: Frequently Asked Questions

Step 1: Preplanning

B-1. ***When should you decide whether you will go on to conduct cost-effectiveness and/or benefit-cost/ROI analysis****?*

You should make that determination during preplanning for case-level cost analysis. To conduct advanced analyses, you'll need to track case-level outcomes. For example, for cost-effectiveness analysis, you will define the effect of services on a family and then track the effect over the course of services and potentially beyond, after the family has left the program.

B-2. ***What are the advantages of highly precise information, given the extra burden on staff?***

All costs assigned to cases are estimates. More precise information yields more accurate cost estimates. The method used in this toolkit layers estimates upon estimates; any inaccuracies may be compounded, resulting in greater error. Your research questions should guide you in determining how accurate you need your cost estimates to be. Answering general questions about your program as a whole may require little precision; answering specific questions about cases with particular characteristics requires greater precision. If you plan to go on to more advanced analyses such as ROI, aim for greater precision.

B-3. ***Do you have to include all staff members in the focus group, or can you use a selected group?***

Focus groups work best when the groups are neither very small nor very large. If you have a large program, reduce the burden on staff by using a small group of frontline and management staff who are trained and knowledgeable about the services the program provides. If you have a small staff, include all staff members.

B-4. ***What is a look-back period?***

In the context of this toolkit, a look-back period is the time for which you are entering data. If you are entering data into a survey at the end of each work week, you are reflecting on the labor conducted in the past week and thus have a 1-week look-back period.

B-5. ***Can you use your existing case management information system to collect the data necessary for a case-level cost analysis? If yes, are modifications to the system required?***

Existing systems can be used, usually with modifications that may require significant resources. The most common modification concerns the activities (and time per activity, if desired) that must be tracked by case. Most systems only track activities related to administrative and financial data for management purposes. For case-level cost analysis, all staff activities must be included. For one program, modifying a case management information system for a case-level cost analysis took approximately 10 months and 1,816 programming hours. Programming costs per hour are likely to vary across agencies due to varying hourly rates for programming staff and other factors.

B-6. ***Are these the only three methods?***

No, but they are the most commonly used methods to determine accurate results. The data collection methods outlined in the toolkit (i.e., focus groups, surveys, and/or case management information systems) have been used in numerous cost analyses for federally funded initiatives, including the national replication of Family Connections, the Permanency Innovations Initiative, and the Mother and Infant Home Visiting Program Evaluation (Corso & Filene, 2009). The development of a cost calculator used by Chapin Hall also included staff

focus groups and surveys or logs to track staff time (Chamberlain et al., 2011). You can tailor the methods in the toolkit to suit your needs. Using the case management information system method, for example, you could either enter the time per activity, or enter just the activity and determine the time per activity using estimates from the focus group. The latter option reduces the burden on service providers but greatly reduces the precision of the cost estimates. Using the survey method, multiple surveys could be administered weekly or monthly.

Step 2: Data Collection Planning

B-7. ***What kinds of advantages and disadvantages do the case-level cost analysis approaches present?***

We have discussed advantages and disadvantages in terms of precision and burden on program staff, but there are others. For example, an advantage of case management information systems is that they offer ongoing benefits for program management after the cost analysis has been completed. Systems could also be expanded to include capabilities such as case notes. A disadvantage of case management information systems is their cost to acquire and implement. The systems require program management and a programmer to identify the data to be recorded by staff. A disadvantage of the one-time survey approach is its typical reliance on missing data analysis, which requires advanced analytic skills.

B-8. ***Why do you need to include management and administration and nonlabor costs in a case-level cost analysis?***

Cost analysis should include all costs of the program to provide services—direct and indirect. Even though program management and administration and nonlabor services are normally accrued at the organization level rather than the program level, the fair share of their costs to the program should be included.

B-9. ***Can you mix and match the decision tree choices?***

Some programs may have reason to mix and match. A high precision/burden cost analysis approach for case-level data could be combined with a low precision/burden approach for program-level data. Detailed labor use data for administrators and program managers, for example, may not be useful if the organization already has a deep understanding of how its managers and administrators function and does not want to burden them unnecessarily.

B-10. ***How much extra burden does including general program activities and management and administrative activities in the survey place on frontline staff?***

If frontline staff do not conduct management and administration activities, then no additional burden is incurred. General program activities alone may add approximately 5 minutes to each survey. If staff conduct both program management and administrative activities as well as general program activities, this may add up to 10 minutes.

B-11. ***When would gathering activity data for general program activities and management and administration labor be advantageous?***

It would only be advantageous if the organization wanted a better understanding of how staff use their time in these activity categories. For example, a board of directors might want to know how much labor is used in fundraising to analyze the cost-effectiveness of that function.

B-12. ***What is the advantage of collecting program management data during the case-level cost analysis if you have previously captured that data during the program-level cost analysis?***

If the program costs have not changed, there is no advantage. If the program-level and case-level cost analyses are not concurrent, then capturing program management data during the case-level analysis will be more precise because you can provide the most current data for variables like staff compensation rates. It may also be more efficient, because it eliminates the need to go back and update the program-level data.

Step 3: Data Collection and Quality Assurance

B-13. ***How does checking for total time per case enhance validity?***

If staff report the time spent on each activity, the evaluator should compare the sum of the activities with the estimated total. If the two figures are not reasonably close, the evaluator should ask the program staff to review and correct them.

B-14. ***What kind of expertise is required to build a case-level cost analysis database?***

The evaluator will need the capacity to construct, maintain, and manage a reasonably large, complex database. Database management includes entering data, constructing reports, cleaning data, and exporting data for analysis.

B-15. ***How do you determine what format to choose?***

The evaluator should be experienced with the analytical software that will be used in step 4. Each of the most commonly used analytical software packages has its own format. Structuring the database for easy transfer to the analytical software will save time and effort in step 4.

B-16. ***Who prepares the reports and why?***

Data are entered into the database continuously for each case and are not automatically aggregated. Reports organize the data to facilitate quality assurance and data cleaning. The evaluator will lead these efforts, working with other team members as needed.

Step 4: Analysis and Reporting

B-17. ***What should we do differently in case-level analysis if we plan to go on to more advanced types of cost analysis later?***

If you know you will be going on to cost-effectiveness analysis, you should define the "effect" outcome and collect the relevant data for each case. If you are going on to benefit-cost or ROI analysis, you should define the benefits of the program, monetize the benefits, and collect the relevant data for each case.

B-18. ***Does the order in which you perform the analysis tasks matter?***

Yes, because each task uses the product of the preceding one. You must first address missing data, because the subsequent tasks require the most complete data possible.

B-19. ***Should all cost analyses include analysis of labor use and, if so, why?***

Yes. While labor use and cost are usually strongly correlated, cost alone provides an incomplete picture. Understanding labor use is important for planning and managing your program. It can help inform case assignments and other decisions.

B-20. ***How do you decide which independent variables to include in your analysis?***

For case-level labor use analysis, independent variables are usually family or staff characteristics (obtained from the Adoption and Foster Care Analysis and Reporting System, client intake forms, referral forms, human resources files, etc.) that might explain why some cases use more labor and others use less. Revisit the graph in the introduction to this module and consider what characteristics might cause the differences in your cases. Your choice of independent variables will be limited to the characteristics you included in your database. Discuss the family and/or staff characteristics with your frontline staff to build a set of independent variables you will test to determine their influence on labor use. Once you are set up to run regression analyses through your analytical software, testing additional independent variables does not add very much labor.

B-21. ***How and why should you adjust for the observation period?***

Direct costs for case-level labor use are collected only for the observation period. To get an accurate total cost, you will need to prorate organization-level costs, which are typically accrued monthly or annually.

B-22. ***Is it acceptable to include only program managers in the review process?***

No. In addition to management, include frontline staff, who spend the most time with families and have an important perspective. If your staff is large, select a smaller group. By including frontline staff, you will gain broad input on the thoroughness and accuracy of the cost analysis while fostering buy-in to support action on the results.

B-23. ***What kinds of variables should be examined in analyses to predict case costs?***

Case-level cost analysis tracks data at the individual case or family level, which allows for predictive modeling to identify the strongest variables associated with case costs. Data on individual case costs can be paired with administrative data to identify case demographics (e.g., number of children in the family, household income), service delivery characteristics (e.g., intervention dosage), and staff characteristics (e.g., primary caseworker's years of social work experience) that may help explain variance in costs across cases.

Appendix C: Glossary

Added cost multiplier: Multiplier that can be applied to direct service costs to account for all non-case-specific costs.

$$\frac{Total\ \boldsymbol{Program}\ Costs\ -\ Total\ \boldsymbol{Case-specific\ Labor}\ Costs}{Total\ \boldsymbol{Case-specific\ Labor}\ Costs} = ACM$$

Benefit-cost analysis: Quantifies program benefits in monetary terms and assesses whether they exceed program costs.

Case-level cost analysis: Allocates program-level costs to individual cases.

Compensation rate: The dollar amount of salary plus all benefits divided by a unit of time, usually hours; for example, ($75,200 + $18,568) ÷ 2080 hours = $45.08 per hour. The compensation rate may need to be adjusted in the analysis step if the timekeeping data are kept in another unit of time, such as minutes.

Constructed variable: Any variable created by combining two or more single variables. For example, service intensity is a constructed variable; it is defined as the mean number of labor minutes provided to a case per week during the cost study timeframe. Compensation rate is also a constructed variable.

Cost-effectiveness analysis: Examines the relationship between a program's costs and a relevant unit of program effectiveness.

Data extrapolation: Fills in missing data by using data from another time period when complete data were collected. There are many types of extrapolation. Simply copying data from an earlier time period is perhaps the simplest form. Using linear regression to continue a straight-line trend is an example of a more complex form.

Indirect cost rate: Ratio of indirect costs to direct costs.

Look-back period: Time frame for which staff report data. A weekly survey, for example, requires staff to enter the number and type of activities for each assigned case during the past week. Each staff member relies on memory, case notes, or other methods of recall. A case management information system calls for real-time entries.

Monetize: Change the unit of measurement to dollars; for example, 24 hours of labor at $50 per hour is a $1,200 expenditure.

Multiple imputation: Imputation preserves all cases by replacing missing data with an estimated value based on other available information.

Program-level cost analysis: Captures program-level costs by expenditure category and program activity type, either at a point in time or over a designated period.

Quality assurance (QA): The maintenance of a desired level of accuracy in data, especially by means of attention to every stage of the process of production.

Return on investment (ROI) analysis: Compares program net costs and outcomes in dollars; expressed as percentage gained or lost.

Stepwise regression: Regression analysis is a statistical process for estimating the relationships among variables. Stepwise regression is a semi-automated process of building a model by successively adding or removing independent variables based solely on strength of association with the dependent variable.

Validity: Scientific validity establishes whether results meet the requirements of the scientific research method. It indicates whether the measuring device used measures what it claims to measure.

Appendix D: References

Bodner, T. E. (2008). What improves with increased missing data imputations? *Structural Equation Modeling, 15*(4), 651–75.

Brodowski, M. L., & Filene, J. H. (2009). Engaging program staff in economic evaluation: Lessons learned and recommendations for practice. *Protecting Children, 24*(3), 70–77.

Chamberlain, P., et al. (2011). A strategy for assessing costs of implementing new practices in the child welfare system: Adapting the English cost calculator in the United States. *Administration and Policy in Mental Health, 38*(1), 24–31.

Children's Bureau. Calculating the Costs of Child Welfare Services Workgroup. (2013). *Cost analysis in program evaluation: A guide for child welfare researchers and service providers*. Washington, DC: Administration for Children and Families, U.S. Department of Health and Human Services. Retrieved from http://www.acf.hhs.gov/sites/default/files/cb/cost_analysis_guide.pdf

Corso, P., & Filene, J. H. (2009). Programmatic cost analysis of the family connections program. *Protecting Children, 24*(3), 78–88.

Grace-Martin, K. (n.d.). 5 Steps for Calculating Sample Size. Retrieved from http://www.theanalysisfactor.com/5-steps-for-calculating-sample-size/

Widaman, K. F. (2006). III. Missing data: What to do with or without them. *Monographs of the Society for Research in Child Development, 71,* 42–64. doi:10.1111/j.1540-5834.2006.00404.x

Wood, A. M., White, I. R., & Thompson, S. G. (2004). Are missing outcome data adequately handled? A review of published randomized controlled trials in major medical journals. *Clinical Trials, 1*(4), 368–76.