

## TIMELINE OF ACTIVITIES FOR COST ANALYSIS

This document provides guidelines to analysts for the sequencing of activities required to execute a cost analysis or cost-effectiveness analysis (CEA). The timeline is designed for a 5-year study such as an IES efficacy or effectiveness project in which a cost analysis or CEA is conducted concurrently with the impact study of the intervention(s) being investigated. It assumes that three cohorts of participants are treated each for one year during Years 2-4 of the project. Year 1 is spent planning and recruiting. Year 5 is spent on analysis, reporting and dissemination. The timeline also assumes that separate research teams will conduct implementation activities, evaluation of implementation and impact, and cost analysis/CEA. Accordingly, coordination between the teams is built in. Cost analysts should adapt these guidelines as needed if the same personnel are conducting multiple aspects of the work, if the project is shorter, if fewer or more cohorts are treated and/or if the cost analysis is prospective or retrospective rather than concurrent with the impact analysis<sup>1</sup>.

For free, IES-funded technical assistance about cost analysis and CEA, submit a request to CAP Project [here](#).

### Year 1: Planning and design of data collection instruments

- i. Logistics: Participate in IRB application, data sharing agreement, kick-off and monthly leadership meetings; set up secure joint data systems (e.g., SharePoint).
- ii. Establish a quarterly cost analysis meeting with the implementation team and other evaluation teams.
- iii. Review any existing cost analyses and cost metrics for the same or similar interventions to inform cost analysis strategy.
- iv. Design time logs for the implementation team and any other project personnel who participate in any start-up or ongoing implementation activities. Collect these at least quarterly.
- v. Review descriptions of the intervention(s) being studied from past implementation studies, prior project reports, websites, etc. to gather details of implementation requirements.
- vi. Create a cost analysis worksheet and begin populating spreadsheets with an initial list of ingredients required to implement the program (personnel time, materials, equipment, facilities etc.). Organize by site and/or key component or activity (e.g., training, coaching, one-to-one instruction) as relevant for the study design and research questions.
- vii. Establish a “key parameters” table in your worksheet for important assumptions and data values that you may need to change and to which formulas can be keyed, e.g., interest rate used, discount rate, number of years over which facilities or training are amortized, number of participants or sites over which overhead costs should be split.

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<sup>1</sup> Prospective cost analyses would rely on expected rather than actual resource use while retrospective analyses would require implementers to recollect resource use from prior years. In both cases, the timeline would likely be contracted to 1 or 2 years total but the accuracy of estimates and level of detail available would also likely be reduced.

- viii. Interview members of the implementation team (e.g., 2-3 project staff) who can further explain how the program will be implemented in practice, how this may vary across implementation sites, and what quantity and quality of resources will be required to facilitate fidelity of implementation. (See CAP Project's [Interview Protocol Template](#) for cost analysts). Add relevant information to the cost worksheet.
- ix. Agree with implementation team on whether cost data need to be collected from all study sites or a representative sample, and which participants will be the best source(s) of data on resource use (e.g., trainers, coordinators, teachers, principals, students).
- x. Discuss with implementation team whether collection of cost data will be integrated into instruments being used to collect implementation and impact data or whether separate instruments will be administered by cost analysts. Consider the burden on participants and on the researchers administering the instruments.
- xi. Design cost-related questions/items for data collection instruments, e.g.,
  - a. surveys and interviews of district office staff coaches, school administrators, teachers or other school staff;
  - b. observations of training sessions and program delivery;
  - c. time and activity logs;
  - d. attendance logs for training and other group activity sessions. Ideally, these would be in digital format, e.g., using Eventbrite or a Google form, and collected for every session.

Note that data should be collected about resource use in the business-as-usual and/or counterfactual conditions for any interventions similar to the intervention(s) under study.

- xii. Agree with implementation team how often time logs will be completed by participants and covering what time period, e.g., daily, weekly to cover the past week, once per month but only to cover the prior week etc. Also agree who will nudge participants to complete the logs and how this will be done (e.g., automatic email reminders, announcements during training workshops).
- xiii. Pilot data collection instruments and revise as needed.
- xiv. Request deposit in shared folders of attendance sheets from all implementation activities including buy-in and orientation meetings, training sessions, and workshops. Ideally, the research teams would have access to a constantly-updated master spreadsheet of implementation events and participants.
- xv. Request that the implementation team establish a master spreadsheet of study participants and establish a schedule to update it regularly to reflect attrition of sites or individual participants, new joiners, and any other changes.
- xvi. For each group activity related to implementation of the intervention(s), ask implementation team for an Event Log (CAP Project provides an [Event Log template](#)). Update ingredients worksheets regularly with these data.
- xvii. Contribute to annual report.

## Year 2: First round of implementation and collection of cost data

- i. Obtain and document in cost worksheets numbers of districts, schools, teachers, classrooms and students served by the intervention(s) and in the control group.
- ii. Collect first round of cost data from Cohort 1 using instruments developed in Year 1.
- iii. For each study condition (each treatment arm and the counterfactual), interview implementing/supervising personnel at study sites to clarify implementation details and determine whether the intervention studied is stand-alone, supplementing, or substituting existing activities (business-as-usual).
- iv. Review data collected across all study schools on the nature of business-as-usual to ascertain the number and variety of alternative approaches being used that are comparable to the intervention(s) being studied.
- v. Develop and implement a feasible strategy for estimating costs of any alternative services provided to control participants that are not also received by the treatment participants.
- vi. Adjust data collection instruments as needed to improve Cohort 2 data collection, especially for the counterfactual.
- vii. Further develop ingredients list for treatment intervention(s) and, where relevant, initiate ingredients list(s) for counterfactual practices.
- viii. For each ingredient, document in your cost worksheet:
  - a. the type of ingredient: personnel, materials & equipment, facilities, other inputs;
  - b. enough description of each ingredient to help in collection of price data, e.g., for personnel, include position title, any qualifications required, years of experience in this position.
  - c. the activity with which the ingredient is associated;
  - d. whether it is fixed (for a given scale), lumpy<sup>2</sup> or variable;
  - e. whether the item represents a new expenditure; is contributed in-kind; or is an existing, reallocated resource;
  - f. who is responsible for providing it (even if there is no actual outlay of funds, e.g., parents may provide volunteer time, a local foundation may provide computers as a donation);
  - g. where possible, source of funding (e.g., Title I grant; family contribution);
  - h. whether it is required only for start-up or would be needed on an ongoing basis if the program is continued at the implementing site(s).

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<sup>2</sup> Lumpy costs increase in steps, for example, an additional classroom may be needed for every 31<sup>st</sup> student.

- ix. Collect prices for ingredients documented to date (salaries and fringe benefits for personnel; rental rates where applicable for facilities<sup>3</sup>; purchase price of materials). This may require collecting local district salary schedules and hours of work per year for each relevant personnel position.
- x. Document assumptions made, for example, about how resources are split across multiple activities, how long resources last, or how to estimate a price in the absence of a market price (e.g., whether you are valuing volunteer time with minimum wage, average salary of paid professionals performing similar services, or some other strategy).
- xi. Identify where additional data are necessary for verifying assumptions either for Cohort 1 costs or looking toward Cohort 2 costs.
- xii. Plan sensitivity analyses when additional data are not available to corroborate assumptions.
- xiii. Contribute to annual report.

### Year 3: Second round of implementation and data collection

- i. For Cohort 2, repeat steps from Year 2. (Same for any additional cohorts).
- ii. Dummy code ingredients list for attrition to facilitate Intent-to-Treat (ITT) and Treatment-on-the-Treated (TOT) cost estimates to match with reporting of effects. The approach to parsing out TOT vs. ITT costs will depend on the study design and cost structure (fixed, variable, lumpy ingredients) of the intervention. A possible scenario is that the ITT cost estimate would include costs for participants who attrited from the study while the TOT cost estimate would exclude variable costs for attrited individuals and spread fixed costs over the number of participants who remain in the study.

### Year 4: Third round of implementation and data collection, commence data analysis

- i. For Cohort 3, repeat steps from Years 2 and 3.
- ii. If relevant, collect national prices for each individual ingredient or apply geographical adjustments to local prices to express them as national average equivalents (See [CAP Project Cost Analysis Standards and Guidelines](#) for details).
- iii. Make any additional necessary adjustments to prices, e.g., for inflation or for amortization of resources that last longer than a year; (See [CAP Project Cost Analysis Standards and Guidelines](#) for details).

### Year 5: Reporting and dissemination

- i. Analyze data collected to establish a range of quantities for each resource required to implement the intervention and counterfactual conditions, and average resource requirements.

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<sup>3</sup> If space is used but no rental fee is paid, use costs of construction spread over the life of the physical building, see [CostOut](#) or CAP Project's Cost of Facilities Calculator at <https://capproject.org/resources>.

- ii. Calculate costs (or savings) for each ingredient (quantity of ingredient x adjusted price) and sum to obtain total costs of implementing the intervention (above or below business-as-usual) and of any alternative services provided to participants in the counterfactual. Provide relevant total and incremental metrics, e.g., cost per school, per teacher and per student metrics.
- iii. Categorize costs (as relevant) by who is responsible for providing the resources (e.g., school, district, parents); by start-up vs. ongoing costs; by fixed, variable or lumpy costs; by core component or major activities; and by site.
- iv. Report relevant summary cost metrics by category in dollar values and as percent of total, e.g.:
  - a. by ingredient type (personnel, materials & equipment, facilities, other inputs);
  - b. by activity;
  - c. by start-up vs. ongoing costs;
  - d. by fixed, variable, lumpy;
  - e. by stakeholder responsible for providing the resources (e.g., school, district office, families);
  - f. by source of funding (e.g., District General Fund, Title II; CARES Act);
  - g. by site, district and/or region.
- v. When relevant, assess whether and how total and marginal costs<sup>4</sup> of the intervention are likely to vary with scale for specific scenarios.
- vi. For CEA, use the cost metrics obtained to calculate cost-effectiveness ratios (average cost per participant above and beyond the counterfactual/average participant-level effectiveness metric).
- vii. Review implementation details to assess why one intervention may be more cost-effective than the other and, where relevant, how costs and cost-effectiveness vary by site or type of participant served.
- viii. Conduct sensitivity analysis by varying key assumptions about resource use and/or prices and compare the results.
- ix. Compare cost and cost-effectiveness findings with any existing studies of the same or similar interventions to assess whether and why the intervention(s) studied appear(s) more or less costly or cost-effective.
- x. Contribute cost analysis and CEA results, conclusions and recommendations to stakeholder presentations, written reports, conference proposals, manuscripts and other dissemination activities.
- xi. Contribute to annual/final reports.

*The development of this timeline was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305U200002 to Teachers College, Columbia University. The opinions expressed are those of the authors and do not represent views of the Institute or the U.S. Department of Education.*

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<sup>4</sup> Marginal costs are the costs to serve one additional unit (e.g., student, teacher, school).