



MODULE 4 VIDEO 1: INTRODUCTION TO MODULE 4

Hello and welcome to Module 4.

In Module 1, we provided an introduction to cost analysis. In Module 2, we showed you how to design a cost analysis which covers the first stage of conducting a cost analysis.

In Module 3, we looked closely at Stage 2, collecting cost data. We reviewed several resources from the CAP Project that can help with the process.

This module, Module 4, is about the next and third stage: analyzing cost data, and how tools like the CAP Project cost analysis templates can support your analysis.

During the analysis stage, you will:

1. Assign values to each resource
2. Adjust prices
3. Calculate costs
4. Categorize costs, and
5. Conduct sensitivity analysis.

Before starting on these analytical steps, it is very important to check your data for accuracy, completeness, and consistency. It also helps to have a second analyst review your data entries and assumptions, if possible. To help ensure data are accurate and complete:

Compare the details in written or verbal descriptions of the program or in your overview tables to the ingredients you have listed and to the data you have collected on units, quality, percentage of use, and price, for each resource. The details should align.

For example, if you noted that one full-time staff person spends half of their time on the program: the unit is a person, the quantity should be 1, and the percentage

of time spent on the program should be 50 percent. The price would be this person's annual salary and fringe.

We also recommend that you check for any missing data. If you are missing data on the units, quantity, percentage of use, or price of any resource, you will either need to go back to your data sources to gather the missing details, or you'll need to make justifiable assumptions to fill in the missing data.

For example, if you cannot find the salary for an assistant principal, you might make an assumption that it is 10%-20% lower than a new principal's salary.

The next two recommended checks focus on alignment between the data.

Check for alignment between units, quantity, and price of each ingredient.

For example, if the program requires 30 laptops and the price you obtained is for a 10-pack of laptops, then the unit is a 10-pack and the quantity you need of this unit is only 3.

The price would be the price for the ten-pack, let's say \$8,000. Alternatively, you can make the unit a single laptop and the quantity would be 30 but the price would need to be shown as one-tenth of the price of the 10-pack, which would be \$800.

Next, you need to check for completeness and alignment in resource use across categories of ingredient, for example, if you entered 20 hours for a counselor's time to implement a program, did you also include facilities, and materials and equipment used by the counselor for those 20 hours (but not more than 20 hours)?

Once you have checked your data and filled in any details that are missing, you can proceed to assign an initial value to each resource. This simply requires you to multiply the three pieces of data you should have at this point for each ingredient: quantity, percentage of use, and price.

You'll also need to check that you have spread ingredients appropriately across participants and sites. For example, resources provided by a district office may be used at multiple schools in your study so the costs should be spread among them.

When you think you are ready to share data summaries and assumptions, do some “member checking” - that means checking your data and assumptions with the people who served as sources for the data. This may have been staff implementing the program or people receiving services.

You can share the overview tables and your assumptions with implementers and participants to check that the ingredients, quantities, percentages of use, and assumptions make sense to them given their practical knowledge of the program.

Finally, make sure that you have kept clear notes in your worksheet about assumptions you are making, data sources, and calculations you made.

For example, you might have 2 math teachers who each spend 25% of their work time implementing a math intervention you are studying. Each teacher is paid \$60,000 per year plus 50% in fringe benefits so the total price for each teacher is one and half times the salary. The initial value to assign to this ingredient is \$45,000.

Adjusting prices comes next. In videos 2 through 5, Rob will introduce 4 types of price adjustments and explain when you would need to make each one. For example, if the year from which you obtain a price is not the same as the year in which you plan to present the costs, you would make an inflation adjustment to the price.

If a resource that is used in the program you are studying lasts more than a year, you could spread its value over its expected useful lifetime. This is called amortization.

If you are studying a multiyear program, you would need to discount or compound costs incurred in different years to a single base year to account for the time value of money.

If a price you are using is not from the location for which you are estimating costs, you could apply a geographical adjustment to convert it to a price that is in line with general price levels in the location you need.

In Video 6, which is split into 4 sections, Fiona demonstrates how to use the CAP Project cost analysis templates, specifically CAPCAT 1.2 Plus and 1.3 Advanced, to make each of the 4 adjustments that Rob describes.

After making any adjustments that are needed, you can calculate the final costs of each ingredient. It's the same calculation as before but using the adjusted price instead of the original one.

For example, let's say you had to inflation-adjust the salary of the math teachers we used in the example calculation earlier, and the inflation-adjusted salary is \$62,500. The new calculation is 2 math teachers x 25% of their time x the adjusted salary of \$62,500 and 1.5 for fringe, totaling \$46,875. This is the final cost estimate for this ingredient.

Categorizing costs comes next in the analysis stage. There are multiple ways that you can categorize costs to provide useful information to decision makers and other stakeholders. The CAP Project Guidelines include a detailed description of potential categories. Some categories that may be useful include:

Categorizing costs by stakeholder group or "payer": Stakeholders or payers are the entities that bear the burden of the costs. These may include a school, a school district, a state education agency, a local foundation, the federal government, parents, families, volunteers, or participants.

You could also categorize costs by Stage of implementation, that is, whether they are start-up or ongoing costs. If you include costs of development, or of research and evaluation in your analysis, label these categories clearly to indicate that these costs are not incurred during the implementation of the program.

For multi-year programs you should categorize costs by Year.

You can also categorize costs by funding status, that is, whether they are resources that already exist at the education agency implementing the program, or whether they require new expenditures, or were acquired by in-kind donations.

A categorization that is often expected in cost analyses is labeling ingredient quantities as fixed, variable, or lumpy. These labels are particularly helpful for decision-makers who are considering scaling up a program or scaling it down.

Fixed quantities are those that do not change regardless of the number of participants served by a program, for example, there is only ever a single director of the program.

Variable quantities vary in proportion to the number of participants. For example, in a one-to-one digital learning environment, every new student needs a digital device.

Lumpy quantities increase in steps. For example, an additional teacher is needed when class size exceeds the allowable maximum number of students.

Depending on the complexity of the program you are studying and the study design itself, you may also want to report costs by program component, by cohort, and by funding source, for example, whether an ingredient cost is covered by Title I funds or General Funds. Categorizing costs in several different ways may enhance the usefulness of your findings.

If your program is implemented across multiple sites, you'll also want to be able to report costs for each site. If some resources are provided by a central entity like a district office but used at multiple sites, like schools, then these centralized costs must be spread or distributed across the relevant sites. In Video 7 of this Module, Fiona shows you how to do this in CAPCAT 1.2 Plus.

Throughout the Module 4 web page, we include Methods Notes to support your analysis. One of these Methods Notes lists a few suggestions for sensitivity analysis, which is the last step of the analysis stage. This is where you can vary assumptions used in your main analysis (the “base case”) about quantities, types of resources, prices, interest rates, and inflation rates to explore uncertainty about the assumptions and demonstrate the implications of such changes. Fiona demonstrates how to do some sensitivity analyses using the CAPCATs in Video 6.

You want to be sure that the main or “base case” analysis is complete before you try any sensitivity analysis.

Sometimes, at this point, analysts simulate alternative ways of implementing a program to see how costs are affected. For example, if an intervention is normally implemented with groups of 4 students, the analyst might look at how much more costly it would be to serve the students in pairs. Such changes are, of course, likely to have implications for how effective the intervention is.

Whew, that was a thorough overview of analyzing costs. By the end of this stage, you will have entered all your cost data in a cost analysis tool; checked your data entries for accuracy, completeness, and consistency; made all your adjustments;

calculated costs of each ingredient; spread any centralized costs across sites; conducted sensitivity analysis by varying key assumptions; and be ready for the reporting stage.

Ready to begin? Hop over to video 2 where Rob is ready to get started with adjustments.