CAP Project

MODULE 5 VIDEO 4 LEVERAGING CAPCAT 1.2 FOR REPORTING AND PRESENTATION OF RESULTS

Hello and welcome to Module 5 Video 4 in which I will show you where you can find various cost metrics and cost breakdowns to use in reporting out the results of a cost analysis or CEA if you have been using the CAP Project's cost analysis template, CAPCAT 1.2 Plus. I will be using the results of the Reading Recovery vs Fast ForWord Reading study that we have been following throughout the modules.

When we were designing the study back in Module 2, we specified the metrics and breakdowns that we planned to report:

First, for each of the 2 programs, we want the following summary metrics: the total cost to the district of implementing the program, the average cost per school, and the average cost per student.

And we also want the following cost breakdowns for each program: cost per resource category, cost per component, and cost per site.

You may remember that there were 15 elementary schools implementing Reading Recovery and another 15 implementing Fast ForWord Reading. So, 15 sites in the Treatment condition and 15 in the Control condition.

Then, for the comparative costs of Reading Recovery vs. FastForWord Reading, we want to report incremental cost per school of Reading Recovery relative to FastForWord Reading, incremental cost per student, and the cost-effectiveness ratio of Reading Recovery vs. FastForWord Reading.

So, let's see whether we can find all these metrics in CAPCAT 1.2 Plus and consider how to present the results.

Note that you will need to use your judgment about which metrics are useful to report for the particular program or activity you are studying and CAPCAT may not show every breakdown you need, so you may have to calculate some yourself.

One of the advantages of using an Excel-based template for data documentation and analysis is that you can introduce new columns to add your own breakdown labels and then either use the data sorting function or write lookup formulas to summarize the results. For example, you may want to add a column to label direct and indirect costs.

As you enter your cost data in each of the 4 ingredients tabs, CAPCAT automatically begins populating the results tables in the Summary tab. It's a good idea to take a quick look at the summary tables from time to time as you enter data because, if it is still all blank, or if you see a bunch of error signs, it may mean you have not completed the Setup tab correctly or you're missing some information in one or more of the mandatory columns in the ingredients tabs. I have also seen problems when analysts try to forecast costs of the program in future years and forget to enter an expected inflation index or interest rate in the Rates tab.

The first metric we are interested in is the total costs of each program. That can be found in the second table in the summary tab, which is titled Summary by condition.

So, let's take a look a closer look at the Summary by condition table.

It lists the condition in the first column and I can replace the Treatment label here with Reading Recovery for this analysis and the Control label with Fast ForWord Reading like this, so it's easier for us to read the results.

Now we can see that, for Reading Recovery, the total cost of implementing the program at the district's 15 elementary schools is almost $1.47 million if we use local prices, and just over $1.5 million if we use national average prices.

For Fast ForWord Reading, the total cost of implementing the program at 15 other elementary schools in the same district is just over $177,000 using local prices, and a little over $186,000 using national average prices. So that is a lot less than Reading Recovery.

To present these results visually, you can use Excel's Insert Charts function to create a bar chart like this that you can paste into your slide deck or report. This one shows the total costs of each of the 2 programs using local prices, and this one shows total costs of each program using national average prices.

The next summary metric we want is the average cost per site for each program. This metric is reported in the very first table in the Summary tab, appropriately titled Summary metrics.

Again, I've edited the labels to replace "T" with "RR" for Reading Recovery and "C" with "FFW" for Fast ForWord Reading. You can see in the second column that the cost per school to implement Reading Recovery is almost $98,000 using local prices and just over $100,000 using national average prices. The cost per school to implement Fast ForWord Reading is almost $12,000 using local prices and $12,400 using national average prices. The last column in this table shows the local costs adjusted by the geographical index which I discussed back in Module 4 Video 6.4 about geographical adjustments.

The next 2 rows in the same table show you the average cost per student for each program. So, you can see the cost per student to implement Reading Recovery is about 7 1/2 thousand dollars using local prices and just over $7,700 using national average prices. Implementing Fast ForWord Reading costs almost $910 per student using local prices and just over $950 per student using national average prices.

In the Graphics tab of CAPCAT 1.2 Plus, CAPCAT automatically creates a few visual representations for you using local prices. These include a bar chart comparing the average costs per site for each program – so that's the average cost per school in our analysis, and one comparing the average cost per participant. In this study, participants are students.

You are welcome to use these but because they have generic labeling, you may prefer to make your own charts so that you can adjust the labeling, and also so you can show these metrics using national average prices.

Now let's move on to the cost breakdowns we want to report for our Reading Recovery vs. Fast ForWord Reading analysis. The first of these was costs by resource category. The categories we've been using all along are personnel, materials, facilities, and other inputs.

You'll find these results in the 3rd table in the Summary tab.

Again, in the first column I've relabeled "Treatment" as "Reading Recovery" and "Control" as "Fast ForWord Reading". In the second column, "Costs using local

prices," we can see that Reading Recovery personnel costs amounted to $1.38 million for the whole district, which constitutes 94% of the total $1.47mm. Materials costs for Reading Recovery were around $17,400 and only represented 1% of overall costs. Facilities costs for Reading Recovery were approximately $32,600, representing 2% of the total costs and, finally, costs of other inputs were about $38,200, representing 3% of the total costs.

You can see that the resource category breakdown is quite different for Fast ForWord Reading: personnel only account for 29% of the costs while other inputs account for 69%.

In the Graphics tab, CAPCAT creates pie charts for you of this particular breakdown, again using local prices. The pie on the left is for the Treatment condition, in our case Reading Recovery, and the one on the right is for the Control condition, in our case Fast ForWord Reading.

Before we leave this table, I also want to highlight that, in this fourth column, you can see a summary of expenditures by resource category. So, for example, you can see that neither program shows any expenditures for personnel, meaning that no new expenses were incurred beyond what personnel were already being paid. However, the district needed to spend over $52,000 on materials for Reading Recovery in just this one year of implementation, and had to spend about $123,000 on other inputs for Fast ForWord Reading.

Education agency decision-makers are often more concerned about new burdens on the budget than on total resource use to implement a program so it can be very helpful to show them a chart like this in which you compare costs vs. expenditures. Here I'm showing this comparison for Fast ForWord Reading, the control program in our analysis. The chart essentially shows that costs and expenditures for Other inputs and for Materials are almost the same. But the cost analysis additionally accounts for the use of existing personnel time in blue and facilities time in gray.

CAPCAT also provides more granular analysis of costs in a separate tab called Summary by resource category. This tab contains an additional 11 tables. For example, the first one shows you, for each resource category, what amount constituted a startup cost and what amount constituted an ongoing cost. You don't want to overwhelm your audience with too much data, so these are the

kinds of tables that would be useful for drilling down into the results if specific questions arise about how each category of resources is being used.

The next breakdown we need is costs by component. These can be found in the last table in the Summary tab. In our analysis, you can see costs broken down under supervision, training, program delivery, and evaluation.

CAPCAT doesn't make graphics of these results for you, but you can ask Excel to create pie charts of your own to illustrate these numbers more visually like this.

The last breakdown we want to report is cost per site. CAPCAT produces a detailed cost by site analysis for the treatment program in the Cost by sites T tab, and for the control program in the Costs by sites C tab. Columns with green headings are costs using local prices and columns with orange headings are the costs using national prices.

In the 3rd column, you can see total costs for each site. In the next column, you see the average cost per participant. The next 4 columns show costs by resource category at each site, and then the next 2 columns show costs by startup vs. ongoing phases. The orange columns do exactly the same thing but using national average prices.

The graphics tab in CAPCAT 1.2 Plus does show a cost by site chart which further breaks down the cost at each site by the resource category. You can check how it looks for your particular analysis, but when one category is much larger than the others, it's hard to see the smaller categories and the data legends overlap so you may have to reformat the data labels or create your own chart that simply shows total costs by site.

It may also be useful to show how the costs per student vary across sites like this. This is for the Reading Recovery sites which you can see are quite variable ranging from $5,233 per student to $10,849 per student.

And this chart shows the site-level costs for Fast ForWord Reading. You can see these are much less variable ranging from $782 to $1,069.

If it were the case that each of the 15 schools implemented both Reading Recovery and Fast ForWord Reading, then you could show a direct comparison like

this where the tall columns are the Reading Recovery costs for each site and the shorter ones show the Fast ForWord Reading costs.

Now, let's finish up with the comparative metrics. First, we want the incremental costs per school of Reading Recovery above and beyond the costs of Fast ForWord Reading. These are shown in the last row of the first table in the Summary tab. They are simply the costs of the treatment condition minus the costs of the control condition. Using local prices, it's $97,993 minus $11,823, which gives us the $86,170.

And the incremental costs per student are calculated in the same way in the row above, so we see that Reading Recovery costs $6,628 more per student than Fast ForWord Reading.

These incremental cost metrics are the ones that you will need to calculate your cost-effectiveness ratio. If you estimated effects at the school level, you would use incremental costs per school, and if you estimated effects at the student level, you'll use the incremental costs per student.

So, for example, if we had obtained an average student level effect size of 0.2 standard deviations using a measure of reading comprehension, then the average CE ratio using local prices is $6,628/0.2 or $33,140 per standard deviation increase in reading comprehension.

Remember that this metric is only intended for comparison with other CE ratios of programs that also target reading comprehension for a similar student group. Do not interpret it as meaning that if you spend $33,000 per student on Reading Recovery, above and beyond whatever might be spent on Fast ForWord Reading, that you'd actually produce a one standard deviation increase in reading comprehension!

To avoid any such misunderstanding you can plot the cost and effect metrics on a cost-effectiveness plane. Within CAPCAT 1.2 Plus, I used the Excel scatterplot function to make this. The orange point is the average incremental costs and effects of Reading Recovery vs Fast ForWord Reading across the district.

Just to demonstrate the value of CE planes, let's go back to the scenario where Treatment and Control programs are implemented at the same sites and now let's assume I collected site level effect sizes as well as site level costs for the 15 sites.

This would allow me to calculate a CE ratio for each site. These are the blue points on the chart. This now gives you a quick visualization of the overall results and how sites compare. Schools 1 and 2 are not only showing negative effects, but the costs are over $5,000 per student so this is clearly not a good investment of funds at these schools, or at least implementation needs a review at these sites.

Alternatively, if the study involved a comparison of several reading programs with Fast ForWord Reading as the control condition for all of them, you could plot the average costs and effects for each program on a CE plane like this.

In a Methods Note on CE planes in this module, we point you to a one-pager on CE planes and we also provide some cautions about using and interpreting these kinds of charts. Please be sure to take a look at that Methods Note.

CAPCAT gives you many other options for breakdowns to report and you can probably think of others yourself. You can also check out the section on model reports in this module and the slide deck on ROI approaches for school district decision-making to see other ways of describing results and of presenting them visually.

We look forward to reading what you produce when you have completed your own economic evaluation!