Potential Approaches for Implementing a Cost Analysis

Presented by:

Amena Abbas, MPH | *Evaluation and Program Effectiveness Team*

Teg Uppal, MPH | *Health Economics Research Group*

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Centers for Disease Control and Prevention

National Center for Chronic Disease Prevention and Health Promotion

Division for Heart Disease and Stroke Prevention

Hello and welcome to today's Coffee Break presented by the Applied Research and Evaluation Branch in the Division for Heart Disease and Stroke Prevention at the Centers for Disease Control and Prevention. My name is Ally Chase, and I am an ORISE Fellow. I will be acting as today's moderator.

Our presenters today are Amena Abbas, a contracted health scientist with the evaluation and program effectiveness team, and Teg Uppal a contracted health economist from the Health Economics Research Group in the Applied Research and Evaluation Branch here at the Division for Heart Disease and Stroke Prevention. They are presenting this webinar to introduce program cost analyses and walk through an example cost data collection tool that is accessible online.

Before We Begin…

- Any issues or questions?
  - Use Q & A box on your screen
  - Email AREBHeartInfo@cdc.gov

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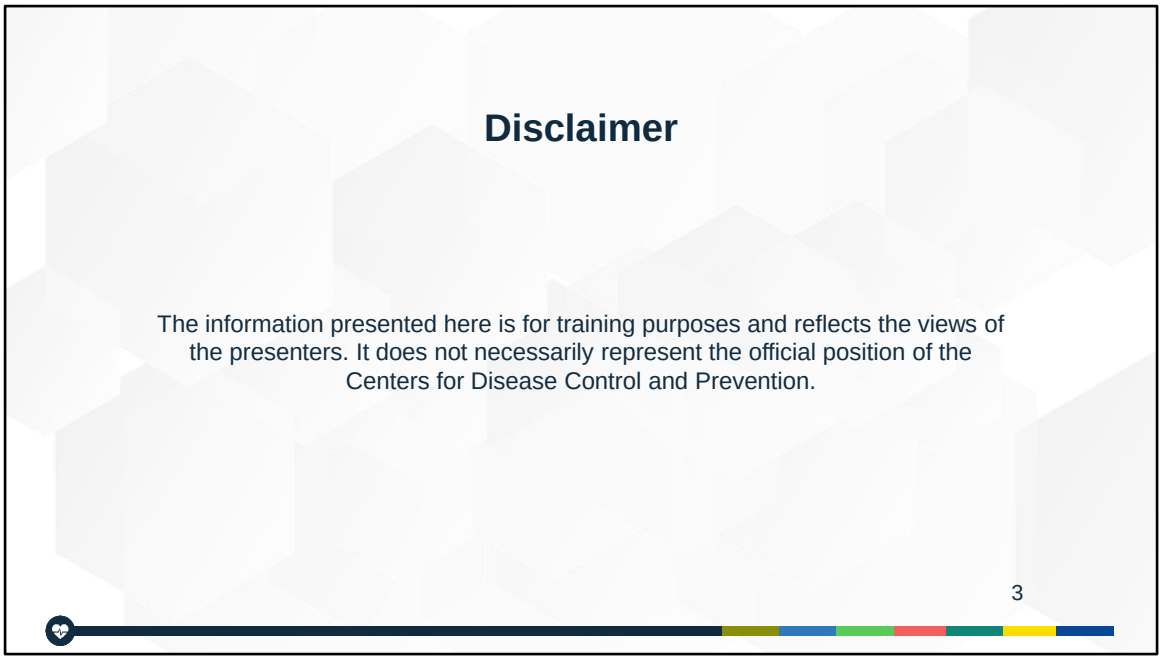
Before we begin, there are some housekeeping items. If you are having issues with audio or seeing the presentation, please message us using the Q&A or send us an email at AREBheartinfo@cdc.gov. Please submit any questions for the presenters using the Q&A as well. Since this is a training series on applied research and evaluation, we hope you will complete the poll at the end of the presentation and provide us with your feedback.



As a disclaimer, the information presented here is for training purposes and reflects the views of the presenters. It does not necessarily represent the official position of the Centers for Disease Control and Prevention.

So, without further delay. Let's get started. Amena and Teg, the floor is yours.

PRESENTATION OUTLINE

- **Introduce Economic Evaluation**
- **Program Cost Analyses and Data Collection**
- **Walk Through an Example Cost Tool**
- **Other Cost Tools Available Online**
- **Wrap Up**
- **Question and Answer**

Thank you, Ally.

This presentation will first include a brief overview of economic evaluations and then we will go into some details on programmatic cost analyses. Followed by a demonstration of the data collection tool to for this analysis.

Economic Evaluation

- Can be used to identify, measure, value, and compare the costs and consequences of different public health interventions.
- Enhances decision-making and helps set health policy.
- Allocating resources and implementing interventions requires understanding of the relationships between resources used and health outcomes achieved.

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- Financial resources for public health are scarce and we need make the most of resources, decide between promising program options, and find the best ways to demonstrate the benefits of public health programs. This requires an understanding of the relationships between resources used and health outcomes achieved by the program or intervention.
- Public health professionals can use economic evaluation to identify, measure, value, and compare the costs and consequences of different public health interventions.
- Integrating cost analyses into evaluation planning offers opportunities to build on information collected through other evaluation components, such as process, outcome, or impact studies.
- It is beneficial to examine the costs and benefits of activities to ensure that 1) effective interventions are being implemented and then 2) resources are being allocated efficiently. This allows us to demonstrate the full value that is gained from the resources we use.

And now we will home in on the collection of data to estimate programmatic costs.

Programmatic Cost Analysis

- An approach to estimate the costs of implementing a program or intervention
- Programmatic cost analysis may be called cost outcome analysis, cost minimization analysis, or cost consequence analysis
- Usually the first step in economic evaluation
- Understanding costs of implementing components of a program is essential for future program planning
  - Allows decision-makers to ensure programs are funded appropriately and resources are allocated wisely
  - Quantifying cost details such as in-kind contributions (e.g., donated time, materials, space, etc.) from partner organizations helps to understand true value of involvement and contribution

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- A program cost analysis is one component of an economic evaluation
- It is usually one of the first steps for any method of an economic evaluation.
- Analyses of program costs can produce measures that provide important insight into the operation of public health programs, including the overall cost of implementing and sustaining a program, costs for specific program activities, and costs per program participant.
  - Understanding costs of implementing components of a program is essential for future program planning
  - Allows decision-makers to ensure programs are funded appropriately and resources are allocated wisely
  - A simple budgetary analysis is usually insufficient to address costs of program implementation, because it omits the value of voluntary donations and other sources of funding
  - Quantifying cost details such as in-kind contributions from partner organizations is important for program planning so these organizations understand true value of their involvement and contributions. For example, volunteer time and donated space required to implement an intervention may not show up on the program's budget sheet, because no money was required for their use.

- Cost analyses also establish a foundation for other types of economic analyses, such as cost-effectiveness, cost of illness, and cost-benefit analysis
    - The precision of these analyses depends, in part, on accurate analysis of program costs.

Value of Program Cost Analysis

- On their own, completed program cost analyses can answer questions such as:
  - What is the pre-implementation, implementation, and post-implementation costs of an intervention?
  - How much annual funding is expected for a program?
  - How do program expenditures vary from site to site?
  - How do program expenditures vary based on strategies implemented?
  - What is the average cost per person served by the program?
  - What is the total cost of the intervention/program?

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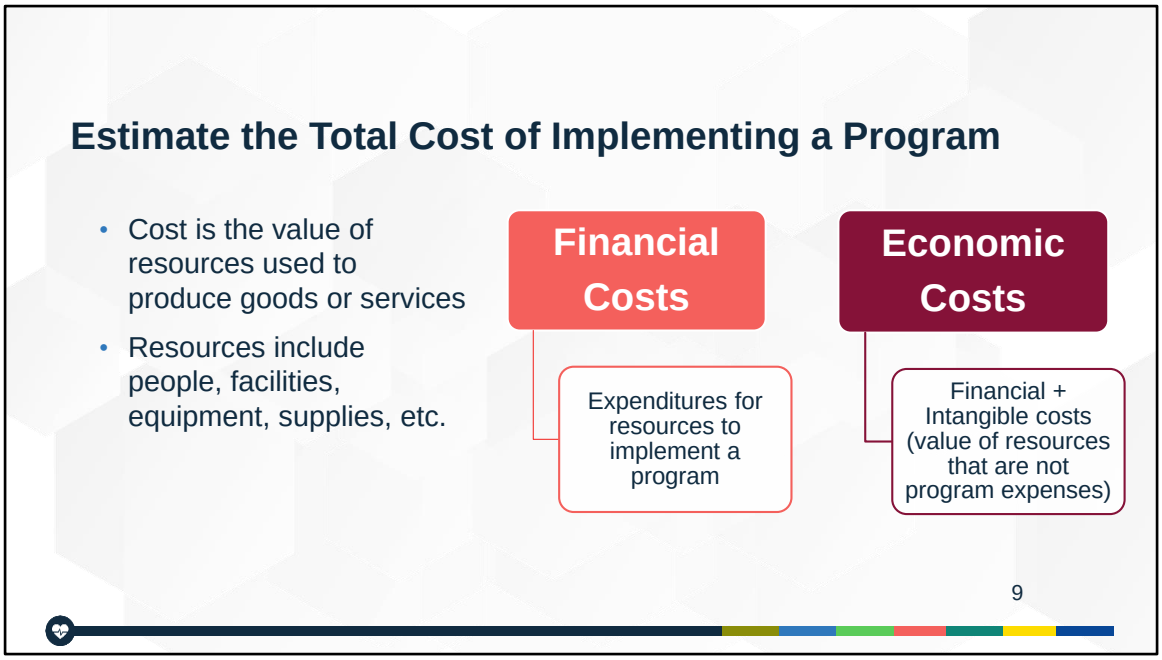
- On their own, completed program cost analyses can help you…
  - Understand costs throughout different phases of the program
  - Estimate the annual funding that is required for implementation and expenditures for each program site; or by specific strategies that are implemented
  - And estimate the average cost per person served by the program



The cost analysis can be used to assess the resources required to implement an intervention by estimating the total economic costs of a program. Data collection includes gathering program financial and economic costs.

Usually when thinking about costs we are thinking of finances or how much we paid for something. But estimating the value of a resource is more complex. So financial costs are those that are associated with running a program or intervention and can be referenced from a standard budget sheet. While this information is still needed for the cost analysis, it does not provide you with the whole picture; there's a lot more which may be relevant depending on the perspective taken in the study.

And so that leads us to Economic costs, which include both the financial costs plus the value of resources that are not paid for but must be monetized, and those are the intangible or in-kind resources such as volunteer time, caregiver time, and donated space and equipment.

And as mentioned, the type of costs that are relevant really depend on the perspective of the analysis.

Perspectives for Program Cost Analysis

- Two Common Perspectives
  - Healthcare Sector Perspective and Societal Perspective
  - The healthcare sector perspective has been more commonly used in practice than the societal perspective because it is more aligned with budget analysis and budget allocation although the societal perspective is more theoretically sound
- Recommendations from the Second Panel on Cost-Effectiveness in Health in Medicine (2016)
  - Report one reference case analysis based on a healthcare sector perspective and another one based on a societal perspective

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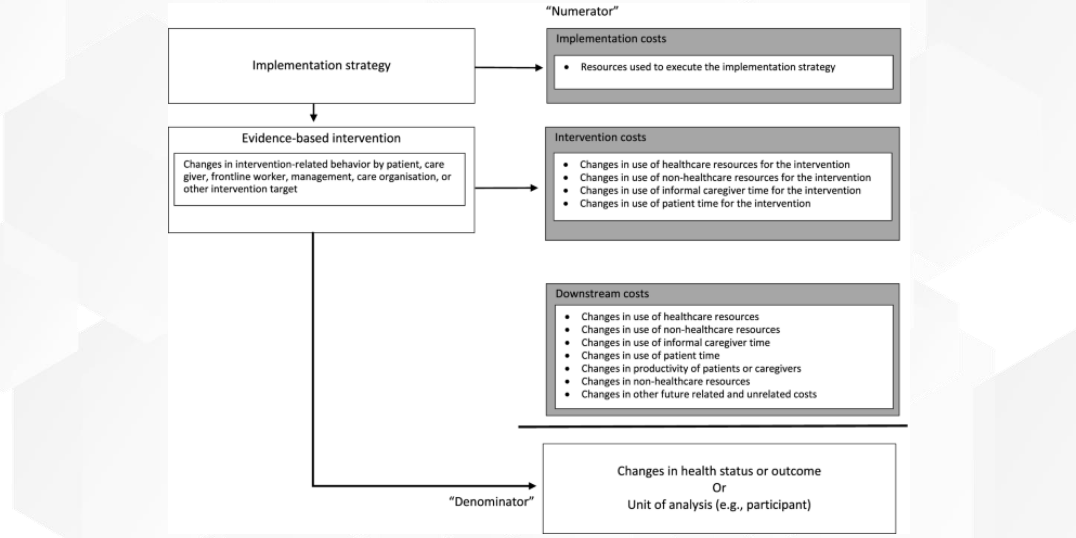
The perspective of a cost study answers the question, “The . Cost . To . whom?,” and determines what costs should be considered and measured. For example, travel to a screening program site is a cost from the perspective of the patient and society, but not from the screening program provider’s perspective. The perspective gives relevance on whether or not to include certain costs; so patient-related costs will need to be collected for a study from a social perspective – or for the perspective from the healthcare system or clinic you would attempt to only collect clinic related costs.



From Cost data in implementation science: categories and approaches to costing. Gold, et al. (2022), *Implementation Science*

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This figure demonstrates the distinctions in different costs through the lifecycle of a program—such as the initial implementation phase, cost related to the actual intervention, and costs downstream or any changes later in time. For example, a strategy may lead to intended and unintended downstream effects and costs. The cost categories shown here are meant to serve as a guide to determine which costs may be important to capture, depending on your research question under consideration.

And depending on the perspective of the cost analysis, the denominator can be participant for cost per participant or a patient, or changes in health status or outcomes in a cost effectiveness or cost-benefit analysis. For example, a cost analysis from the programs perspective will not need to capture changes in use of patient time and will not need data on change in health as a denominator, whereas a cost-effectiveness analysis from the societal perspective will need to capture patient costs and require a measure of changes in health status.

POTENTIAL SOURCES FOR RESOURCE USE

- **Primary data collection**
  - Accounting and payroll systems
  - Records
  - Questionnaires
  - Observation
- **Published literature**
- **Professional guidelines**

A cost analysis may be competed prospectively (before the program implementation period begins or in the planning phase), retrospectively, or in the widespread dissemination and implementation phase.

To collect costs retrospectively, you look back at how the intervention was implemented and using programmatic documentation to come up with approximations of the resources and their costs required to implement the intervention.

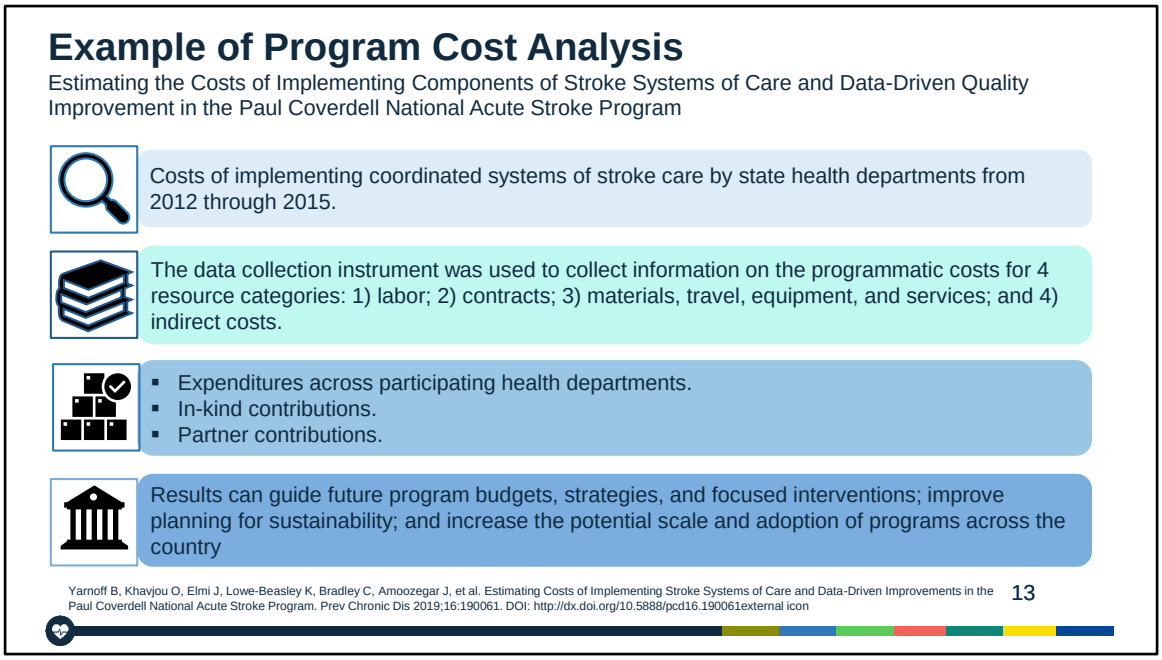
Resource use can be measured in physical units or in the percentage of use for shared costs, for example sometimes there is the use of a vehicle by more than one program.

When it comes to sources of the data, In the case of an existing program, a lot of information can be gathered from payroll and accounting systems.

And I the case of collecting costs prospectively as the intervention is being

implemented, one technique here involves using surveys to collect data. You can survey participants, medical staff, administrators, and others that are involved. For example, let's say you need an estimate of the time spent traveling to and from the intervention site. You could survey the intervention patients and average out their answers. In this case, of course, you are relying on the accuracy of participants' reports. And also to mention that sometimes surveys can be more resource intensive to get an appropriate response rate.

The published literature can also be a source of information. For example, if you need to know the average length of time people remain hospitalized for congestive heart failure, you can search for articles on that topic. In this case, clinical trial reports can be very useful. Usually a range of estimates may be available, so its good to mention here that in this case you would then consider doing a sensitivity analysis to account for the range in these estimations.



We also wanted to provide a brief example of a cost analysis. This study estimated the costs of implementing coordinated systems of stroke care by state health departments to help policy makers and planners gain a sense of the potential return on investments in establishing a statewide stroke care quality improvement program

- The study quantified activity-based expenditures by the state health department
- And also collected in-kind contributions by either the department and in-kind contributions by program partners

A data collection tool was developed to collect information on the programmatic costs across 4 resource categories including labor (like staff time); 2) any contracts; 3) and information for materials, travel, equipment, and services; and 4) the indirect costs.

Through this study Coverdell recipients were able to identify the costs for public health and the health care sector to establish and implement components of systems of care to reduce the burden of stroke with the potential to also understand the cost effectiveness to implement and sustain these efforts statewide.

For more information on this study please see the link to the article in chat and we also have additional examples towards the end of this presentation. Now I will turn it over to Teg.

Estimating Costs of Implementing Stroke Systems of Care and Data-Driven Improvements in the Paul Coverdell National Acute Stroke Program: https://www.cdc.gov/pcd/issues/2019/19_0061.htm#

Thank you Amena, I will now introduce cost inventory tools which provide a framework for capturing all important cost data for an intervention.

In a programmatic cost analysis, we must first define a set of cost categories which are crucial for program implementation and operation. The specific line items between different program sites vary widely but there are usually a few key cost categories to consider when collecting programmatic cost information. Major cost drivers include personnel time, travel costs, facility spaces and utilities, and supplies/equipment. Costing tools are most often excel worksheets which provide a set of instructions and facilitate data entry for all relevant cost categories.

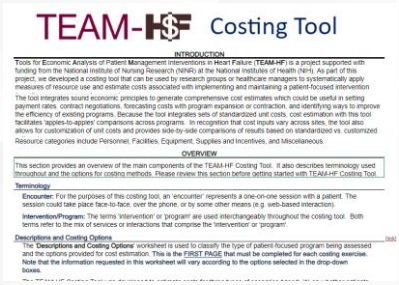
Information to fill out costing tools about quantities and costs are often available from primary data sources such as payroll and accounting systems and we provide example data sources on the slides that follow.

I'll be walking through the TEAM-heart failure costing tool produced by the Duke Clinical Research Institute. This example costing tool is a user-friendly computerized spreadsheet program for use by health care managers to systematically generate cost estimates for economic evaluation. There are many costing tools available online and

we are not promoting or requiring anyone to use this tool, rather we are providing this tool as an example for the purposes of familiarizing people with what a costing tool looks like and captures.

Example Costing Tool: Team-HF Costing Tool

Screenshot 1: Instructions Sheet



TEAM-HF Costing Tool

INTRODUCTION

Tools for Economic Analysis of Patient Management Interventions in Heart Failure (TEAM-HF) is a project supported with funding from the National Institute of Nursing Research (NINR) at the National Institutes of Health (NIH). As part of this project, we developed a costing tool that can be used by research groups or healthcare managers to systematically apply measures of resource use and estimate costs associated with implementing and maintaining a patient-focused intervention

The tool integrates sound economic principles to generate comprehensive cost estimates which could be useful in setting payment rates, contract negotiations, forecasting costs with program expansion or contraction, and identifying ways to improve the efficiency of existing programs. Because the tool integrates sets of standardized unit costs, cost estimation with this tool facilitates 'apples-to-apples' comparisons across programs. In recognition that cost inputs vary across sites, the tool also allows for customization of unit costs and provides side-by-side comparisons of results based on standardized vs. customized

Resource categories include Personnel, Facilities, Equipment, Supplies and Incentives, and Miscellaneous.

OVERVIEW

This section provides an overview of the main components of the TEAM-HF Costing Tool. It also describes terminology used throughout and the options for costing methods. Please review this section before getting started with TEAM-HF Costing Tool.

Terminology

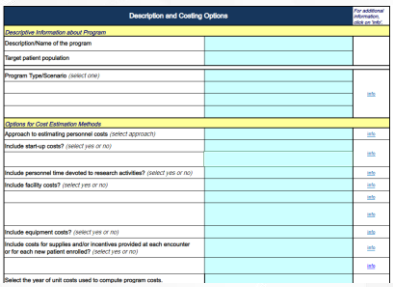
Encounter: For the purposes of this costing tool, an 'encounter' represents a one-on-one session with a patient. The session could take place face-to-face, over the phone, or by some other means (e.g. web-based interaction).

Intervention/Program: The terms 'intervention' or 'program' are used interchangeably throughout the costing tool. Both terms refer to the mix of services or interactions that comprise the 'intervention' or 'program'.

Descriptions and Costing Options

The 'Descriptions and Costing Options' worksheet is used to classify the type of patient-focused program being assessed and the options provided for cost estimation. This is the FIRST PAGE that must be completed for each costing exercise. Note that the information requested in this worksheet will vary according to the options selected in the drop-down boxes.

Screenshot 2: Overview & Costing Options



Description and Costing Options		For additional information, see text box
Descriptive Information about Program		
Description/Name of the program		
Target patient population		
Program Type/Scenario *(select one)*		
		info
Options for Cost Estimation Methods		
Approach to estimating personnel costs *(select approach)*		info
Include start-up costs? *(select yes or no)*		info
Include personnel time devoted to research activities? *(select yes or no)*		info
Include facility costs? *(select yes or no)*		info
		info
Include equipment costs? *(select yes or no)*		info
Include costs for supplies and/or incentives provided at each encounter or for each new patient enrolled? *(select yes or no)*		info
		info
Select the year of unit costs used to compute program costs.		

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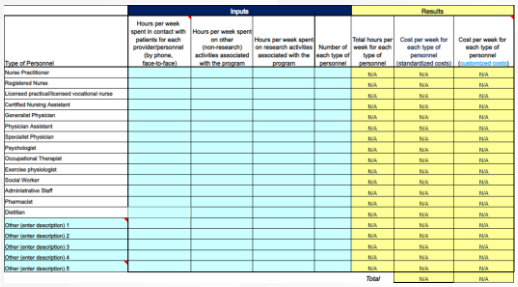
- On this slide and following slides, I will share some screenshots from each sheet of the TEAM-HF costing tool and provide a brief description of key cost categories often captured in costing tools.
- The image on the left shows the instructions sheet of the tool, which provides an overview of the purpose of costing tool, data collected, time allocated to complete data collection, and definitions related to capturing key costs for each cost category.
- The image on the right shows the overview & costing options sheet, which typically captures information about the site where the data is being collected from, the year of data collection, and any key choices made during data entry of costing information. The overview sheet often summarizes the overall costs for each cost category.
- Of note, for all of the costs for the following slides, information should be captured at the most feasible per-time basis (e.g. per hour for wages, or per month for utilities) and scaled up to a standardized per-time basis across all categories such as per year.
    - Scaling up would simply involve some conversions, for example multiplying the hourly wages by the hours worked per year to estimate the annual salary.

Team-HF Costing Tool: Personnel Costs

Screenshot 3: Personnel Costs



	Inputs				Results		
Type of Personnel	Hours per week spent in contact with patients for each provider/personnel (by phone, face-to-face)	Hours per week spent on other (non-research) activities associated with the program	Hours per week spent on research activities associated with the program	Number of each type of personnel	Total hours per week for each type of personnel	Cost per week for each type of personnel (standardized costs)	Cost per week for each type of personnel (customized costs)
Nurse Practitioner					N/A	N/A	N/A
Registered Nurse					N/A	N/A	N/A
Licensed practical/licensed vocational nurse					N/A	N/A	N/A
Certified Nursing Assistant					N/A	N/A	N/A
Generalist Physician					N/A	N/A	N/A
Physician Assistant					N/A	N/A	N/A
Specialist Physician					N/A	N/A	N/A
Psychologist					N/A	N/A	N/A
Occupational Therapist					N/A	N/A	N/A
Exercise physiologist					N/A	N/A	N/A
Social Worker					N/A	N/A	N/A
Administrative Staff					N/A	N/A	N/A
Pharmacist					N/A	N/A	N/A
Dietitian					N/A	N/A	N/A
Other (enter description) 1					N/A	N/A	N/A
Other (enter description) 2					N/A	N/A	N/A
Other (enter description) 3					N/A	N/A	N/A
Other (enter description) 4					N/A	N/A	N/A
Other (enter description) 5					N/A	N/A	N/A
					Total		

- Personnel costs are typically are one of the largest cost categories
- Key data points:
  1. Hours spent overall and on key activities
  2. Cost / hour or monthly/annual salaries
  3. Fringe benefit rate and indirect expenses
  4. Volunteer hours and role (if applicable)

Data sources: payroll, questionnaires, program/clinic databases

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On the topic of salaries and personnel, personnel costs are typically are one of the largest cost categories and requires careful data collection.

1. Hours spent both a) overall and b) on key program activities within a certain time basis (weekly, monthly etc.)
2. Cost per hour or monthly/annual salaries for each personnel.
3. Information on fringe benefit rate and indirect expense (such as payroll taxes) per personnel
4. Information on Volunteer hours and their roles (if applicable)
    - It is important to capture volunteer time and in-kind contributions since ignoring time spent providing services can underestimate the total resources required for an intervention.

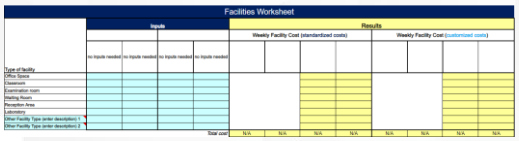
Data sources may include human resources records, payroll records, time tracking systems, contracts and agreements, organizational budget reports, and more.

A good rule of thumb for collecting costs is that if a given resource is required for the program the cost for that resource should be captured.

This sheet of the TEAM-HF Costing tool separates out hours worked based on research- and non-research based activities. This stratification was for the specific purpose of this particular intervention, but hours can be separated out based on any categorization, such as medical and non-medical activities, which may be more relevant for your particular analysis.

Team-HF Costing Tool: Facility Costs

Screenshot 4: Facility Costs



- Facility costs tend to be a large cost category
- Key data points for cost/square foot method:
  1. Overall expenses (rent/lease/utilities/insurance)
  2. Square footage of a) space of facility used for program activities and b) overall facility
  3. Name of City/Town if facility cost is not available

Facility cost = expense per time basis × quantity per time basis × % of overall square footage used for program activities

Data sources: facility records, market prices, program/clinic databases

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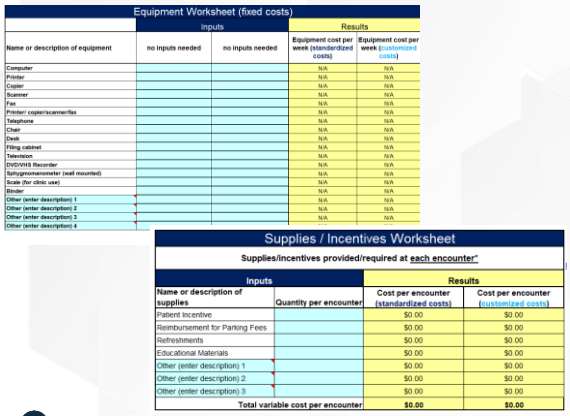
- Facility costs are also a key cost category for data collection as they tend to be large expenses
- There are multiple methods for estimating facility costs, and here we describe a commonly used approach to estimate facility costs: the cost per square foot method
- With the cost per square foot method, facility costs are based on estimates of the square footage used by the program. This method also provides an option for the user to apply an 'add-on percentage' to assign costs for utilities and other overhead costs.
- Key data elements:
- Overall expense per time basis (e.g., weekly, monthly, annually),
    - This could be the monthly or annual cost for rent/lease/utilites/insurance
    - Square footage of a) space of facility used for program activities and b) overall facility
        - These two measures can be used to estimate the % of the facility used for an intervention which can be multiplied with overall facility costs to estimate the intervention-specific costs.

- If the facility cost is not available, the name of City/Town where the facility is located can be used by evaluation team members to estimate the facility costs based on market rates

- The equation for the cost/sq. Foot method is:
  - Expense per time basis * quantity per time basis * % of overall square footage used for program activities = Intervention-Specific Facility cost
  - e.g.: with a monthly rent of 1000 multiplied by 12 months per year, the overall facility rent costs are $12,000
  - If for a given intervention 50% of overall sq. Footage was used for program activities, we would approximate $6000 annual facility rental costs per year for the intervention.
  - This method can be expanded by also capturing the % of time that a space is used for program activities, although it is more resource intensive to estimate the % of time spent on an intervention within a given area.

Team-HF Costing Tool: Equipment/Supply Costs

Screenshots 5 & 6: Equipment/Supply Costs



Equipment Worksheet (fixed costs)

	Inputs		Results	
Name or description of equipment	no inputs needed	no inputs needed	Equipment cost per week (standardized costs)	Equipment cost per week (customized costs)
Computer			N/A	N/A
Printer			N/A	N/A
Copier			N/A	N/A
Scanner			N/A	N/A
Fax			N/A	N/A
Printer/ copier/scanner/fax			N/A	N/A
Telephone			N/A	N/A
Chair			N/A	N/A
Desk			N/A	N/A
Filing cabinet			N/A	N/A
Television			N/A	N/A
DVD/VHS Recorder			N/A	N/A
Sphygmomanometer (wall mounted)			N/A	N/A
Scale (for clinic use)			N/A	N/A
Binder			N/A	N/A
Other (enter description) 1			N/A	N/A
Other (enter description) 2			N/A	N/A
Other (enter description) 3			N/A	N/A
Other (enter description) 4			N/A	N/A

Supplies / Incentives Worksheet

Supplies/incentives provided/required at each encounter"

Inputs		Results	
Name or description of supplies	Quantity per encounter	Cost per encounter (standardized costs)	Cost per encounter (customized costs)
Patient Incentive		$0.00	$0.00
Reimbursement for Parking Fees		$0.00	$0.00
Refreshments		$0.00	$0.00
Educational Materials		$0.00	$0.00
Other (enter description) 1		$0.00	$0.00
Other (enter description) 2		$0.00	$0.00
Other (enter description) 3		$0.00	$0.00
Total variable cost per encounter		$0.00	$0.00

- Requires different calculations based on type of equipment/supply
  - Long term equipment
    (e.g. computers, medical equipment)
    1. Total years of useful life
    2. Purchase price,
    3. Maintenance costs, and
    4. Quantity
  - Supplies/Short term equipment
    (*e.g. printer paper, disposable office equipment)*
    1. Cost per unit and
    2. Quantity purchased per time basis.

Data sources: facility records, market prices, program/clinic databases, claims records, questionnaires, WHO website price list

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- The next sheets within the tool capture equipment and supply costs. It is important to accurately categorize equipment and supplies as they have varying cost-structures, and calculations for long-term equipment are different than calculations for supplies.
- We define long term equipment as equipment with a useful life greater than 1 year. These equipment represent resources used across multiple years and are not depleted on use such as computers, office furniture, or heavy medical equipment
- To estimate the value of long term equipment, key data points include:
  1. Years of useful life: The total number of years a piece of equipment is expected to remain in use.
  2. Purchase price: initial cost of acquiring equipment,
  3. Maintenance and repairs: keeps equipment in working order
  4. And Quantity
- These data points are used to annuitize the cost of long-term equipment. For example, a $1000 computer may have a useful life of 10 years with an overall 10-year maintenance cost of $100 for repairs.
- The annuitized cost or cost per year would then be $110. This annuitized

measure can also incorporate other costs such as disposal or depreciation costs based on the years of useful life.

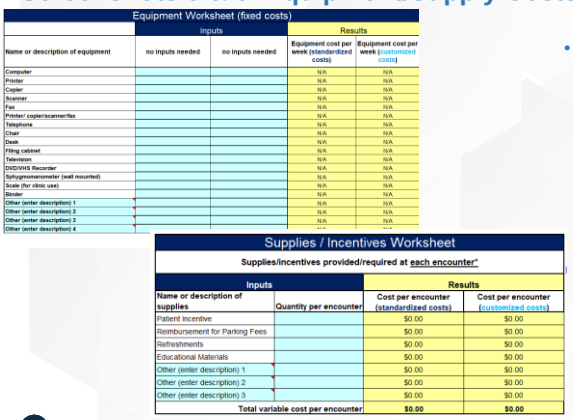
Additionally, we will want to capture the costs for short-term equipment and supplies, which are defined by having a useful life of <1 year or which are disposable such as *printer paper, educational materials, or disposable office equipment*

- Supplies/Short term equipment costs (<1 year):
    - The calculation here is relatively simpler and requires just the cost per unit and quantity purchased per time basis.
    - If equipment was leased or rented on a short term basis, these costs should also be included here
    - For example, a site using 10,000 sheets of paper per month on average at a cost of 0.01 cent per paper would have a monthly cost of $100 for printer paper

Understanding the true cost of equipment and supplies (including long-term costs usually not considered such as depreciation) helps guide efficient resource allocation.

Team-HF Costing Tool: Equipment/Supply Costs

Screenshots 5 & 6: Equipment/Supply Costs



Equipment Worksheet (fixed costs)

	Inputs		Results	
Name or description of equipment	no inputs needed	no inputs needed	Equipment cost per week (standardized costs)	Equipment cost per week (customized costs)
Computer			N/A	N/A
Printer			N/A	N/A
Copier			N/A	N/A
Scanner			N/A	N/A
Fax			N/A	N/A
Printer/ copier/scanner/fax			N/A	N/A
Telephone			N/A	N/A
Chair			N/A	N/A
Desk			N/A	N/A
Filing cabinet			N/A	N/A
Television			N/A	N/A
DVD/VHS Recorder			N/A	N/A
Sphygmomanometer (wall mounted)			N/A	N/A
Scale (for clinic use)			N/A	N/A
Binder			N/A	N/A
Other (enter description) 1			N/A	N/A
Other (enter description) 2			N/A	N/A
Other (enter description) 3			N/A	N/A
Other (enter description) 4			N/A	N/A

Supplies / Incentives Worksheet

Supplies/incentives provided/required at each encounter"

Inputs		Results	
Name or description of supplies	Quantity per encounter	Cost per encounter (standardized costs)	Cost per encounter (customized costs)
Patient Incentive		$0.00	$0.00
Reimbursement for Parking Fees		$0.00	$0.00
Refreshments		$0.00	$0.00
Educational Materials		$0.00	$0.00
Other (enter description) 1		$0.00	$0.00
Other (enter description) 2		$0.00	$0.00
Other (enter description) 3		$0.00	$0.00
Total variable cost per encounter		$0.00	$0.00

- Requires different calculations based on type of equipment/supply
  - In-kind contributions (*e.g. donated supplies*)
    - Resource provided and # of units per time basis provided in-kind
  - Supplies used for/provided to patients: (*e.g. syringes, masks)*
    - Cost per encounter, quantity per encounter, total # of encounters per time basis.

Data sources: facility records, market prices, program/clinic databases, claims records, questionnaires, WHO website price list

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Often, donated or low-expense items are overlooked in calculating equipment/supply costs but are important to capture as even seemingly low-expense items like syringes can add up to a large cost due to annual patient volumes.

- In-kind contributions: *(these include any supplies which are donated to a program site, such as donated medical equipment)*
  - Although the program site incurs no cost, there is a value to these items and it should be captured in the cost of the intervention.
  - By capturing the resource provided and the # of units provided per time basis, the health evaluation team can assess the fair market value of the donated equipment and the cost per time basis.

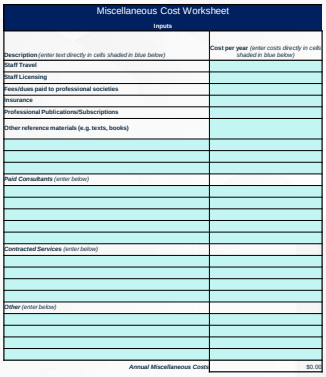
- Supplies provided to patient: *(for example, disposable medical equipment such as syringes or masks)*
  - The value of supplies provided to patients is calculated by tabulating cost per encounter, quantity per encounter, and total # of encounters per time basis.

Team-HF Costing Tool: Miscellaneous Costs

Examples of Miscellaneous Costs

Travel	Consultant/Contractor Costs	Start-up/Training costs
Number of staff travelling	Site of cost	# of trainings
By ground: cost/mile & mileage	Total amount spent on service/contract per time basis	Cost per training
By air: airfare costs, taxi/transit costs		Other types of one-time fixed start-up costs: Legal fees, licenses/permits, deposits
Conferences: registration fees		
If multi-day: hotel costs per night, # of nights		
For food/water: per diem, # of days		

Screenshot 7: Miscellaneous Costs



Data sources: travel logs, market prices, program/clinic databases

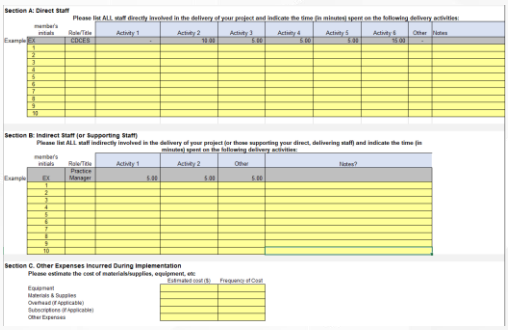
The final sheet of the TEAM-HF Costing tool captures miscellaneous which do not fit in with other categories, such as professional trainings, licensing fees, subscriptions to digital software or for contracted services.

Within the table on the left we've provided a few examples of miscellaneous costs and key data elements to include for each type of cost. The TEAM-HF costing tool does not include a sheet for capturing travel costs, so we've briefly summarized key data points for each type of travel, for contractor costs, and for start-up/training costs. For the sake of time today, we won't be covering each type of miscellaneous cost, but I will briefly describe data points for capturing travel costs.

- If done by ground: the cost/mile and mileage
- By air: airfare costs, taxi/transit costs
- If for a conference: registration fees
- If multi-day: hotel costs per night, # of nights
- For food/water: per diem costs, and # of days

Cost Tools Available Online

1. Tools for Economic Analysis of Patient Management Interventions in Heart Failure
2. Downloadable Cost-collection Questionnaire
3. Public Health Return-on-Investment Template - Demonstration Version



With that we've summarized they key components of the TEAM-HF costing tool.

We've also provided links to access both the TEAM-HF costing tool and two additional publicly available resources which may be of use to reference when collecting programmatic costs. Each tool varies in terms of comprehensiveness in costs captured but each captures most, if not all the cost categories that we reviewed today. We recommend visiting each link and becoming familiar with the variation between the different tools and how the tools are structured, so please look to the chat for those links. If you have trouble accessing any of the links please email DHDSPevaluation@cdc.gov.

1. Team HF tool: https://amp.cdc.gov/HDSP/s/article/Potential-Approaches-for-Implementing-a-Cost-Analysis
2. Downloadable Cost-collection Questionnaire: https://medschool.cuanschutz.edu/docs/librariesprovider94/di-docs/guides-and-tools/implementation-costing-guidebook/implementation-costing-guidebook_b/downloadable-cost-collection-

questionnaire.xlsx?sfvrsn=60a65dbb_2

3. Public Health Return-on-Investment Template – Demonstration version: https://works.bepress.com/glen_mays/64/

Additional Resources

- CDC Introduction to Economic Evaluation: Course providing a broad overview of economic evaluation methods with illustrative examples from public health
- Tufts Medical Center Cost-Effectiveness Analysis Registry: Comprehensive database of cost-effectiveness analyses on a wide variety of diseases and treatment

References

- HaddixA, TeutschSM, Corso PS. Prevention Effectiveness: An Introduction to Decision Analysis and Economic Evaluation. 2nd ed. Oxford University Press; 2003.
- Gold, H. T., McDermott, C., Hoomans, T., & Wagner, T. H. (2022). Cost data in implementation science: categories and approaches to costing. *Implementation Science*, *17*(1), 11.
- Reed, S. D., Li, Y., Kamble, S., Polsky, D., Graham, F. L., Bowers, M. T., ... & Riegel, B. J. (2012). Introduction of the Tools for Economic Analysis of Patient Management Interventions in Heart Failure Costing Tool: a user-friendly spreadsheet program to estimate costs of providing patient-centered interventions. *Circulation: Cardiovascular Quality and Outcomes*, *5*(1), 113-119.

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We've also identified some resources which may be helpful to those of you seeking to learn more about economic evaluations and cost analyses and a list of references for further reading.

If you have access to AMP, you will also be able access a recording of this presentation along with a 2-pager that accompanies this same webinar with definitions, more detailed calculations, and additional cost study examples from the literature. The link will be provided along with a copy of these slides.

CDC Introduction to Economic Evaluation:
https://www.train.org/cdctrain/course/1079247/
Tufts Medical Center Cost-Effectiveness Analysis Registry:
http://healtheconomics.tuftsmedicalcenter.org/cear4/Home.aspx

Contacts for Questions

- **Frank Luo** | AREB Health Economics Lead
  - **hto1@cdc.gov**
- **DHDSPEvaluation@cdc.gov**

Thank you, Amena and Teg! At this time, we'll take questions. First, we'll check to see if any questions have come in through the Q&A box.