

Economics of Implementation: Developing a Cost Analysis Plan

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HERC's Plan to Support QUERI

- We conducted a needs assessment in 2016
- HERC developed two parallel work streams to support the economics needs of the QUERI programs:
 - Tailored support for three QUERI programs
 - General support for twelve QUERI programs

Tailored Support

- We connected with three QUERI programs:
 - Chronic Pain QUERI: Improving Pain-Related Outcomes for Veterans (IMPROVE)
 - Measurement Science QUERI
 - Personalized Care QUERI: PrOVE – PeRsonalizing Options through Veteran Engagement
 - In collaboration with each program, we developed a data measurement and analysis plan for:
 - Intervention costs
 - Implementation costs
 - Consequence costs
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General Support

- We will utilize the lessons learned from the tailored support to develop tools and resources for the other QUERI programs.
- These tools include:
 - A toolbox to inform economic data measurement and analysis
 - Educational materials
 - A help desk

Objectives

- Is economics important?
 - Developing an economic plan
 1. Estimating the costs of implementation
 2. Estimating the costs of the intervention
 3. Estimating consequence costs
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Is a Cost Analysis Needed?

■ Good opportunities

- Interventions that have a large impact on health care costs
- Widely adopted interventions
- Intervention designed to meet an economic objective or to replace existing care

■ Limited or uncertain opportunity use

- Close substitutes
 - If economic findings depend on proof of effectiveness
 - Basic science hypotheses
 - Low-cost interventions
 - Conditions with no current treatment
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Steps in Conducting a Cost Analysis

Step 1:
Gather Project Details



Step 2:
Identify Cost Categories
(including cost inclusions & exclusions)



Step 3:
Conduct Cost Analysis

Step 1: Gather Project Details

- Gather the following background information for the project.
 1. Perspective
 2. Time Horizon
 3. Treatment Alternatives
 4. Patient Population
 5. Outcome Measure Considerations
 6. Sub-Group Analyses
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Step 2: Identify Cost Categories

- Micro-costing, statistical and econometric models are commonly used to identify costs for the three categories in QUERI projects:
 1. Implementation
 2. Intervention
 3. Healthcare utilization following an intervention

Step 2a: Cost Inclusions and Exclusions

- Consider the following factors to determine cost inclusions and exclusions for the analysis:
 - **Implementation**: cost is included, if requiring recurrent and significant resource;
 - **Intervention**: cost is always collected;
 - **Downstream**: analysis is always included
 - Cost may decrease if patients' health status is improved and healthcare utilization is reduced following an intervention.
 - Cost may increase if an intervention encourages patients' healthcare utilization and improves their health status.

Step 2: Implementation Costs

- Implementation costs are generally measured by a micro-costing method and commonly include the following cost items:
 - **Staff**
 - **Project Implementation**
 - Average time (in FTE) and title of people involved in the project implementation.
 - Indirect labor cost (training, vacation, etc.) should be considered.
 - **Meeting Time of Participants**
 - Average time and title of meeting participants (physicians, nurses, etc.)
 - **Supplies**
 - **Equipment**
 - Equipment and shared time (if share with other services) needed to implement an intervention.
 - **Material**
 - Manual, handbook, instruction, newsletter etc.
 - **Telephone/email**
 - Service fee and time of regular telephone and email communication
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Step 2: Intervention Costs

- Intervention costs are also typically measured by the micro-costing method, including costs associated with the intervention.
 - The major cost components of an intervention are similar as implementation.

Step 2: Micro-costing Tool

Below is a tool that could be used to track provider time for micro-costing efforts.

NOTE: Complete every time you talk to a woman or talk to someone on her behalf.

Contact Information	Client's Name: _____ Phone# _____ ID#: _____		
	Attempts to Contact by Phone (Date, Time, Call Result) Example #1: 1/2/00, 8:00pm, Message left		
	Example #2: 1/2/00, 8:00pm, No Answer		NOTE: Home visit if "no contact" after a minimum of 5 call attempts.
	1)	6)	
	2)	7)	
	3)	8)	
4)	9)		
5)	10)		
Reason for Contact			
<input type="checkbox"/> Administer pre-survey	<input type="checkbox"/> Remind her of appointment		
<input type="checkbox"/> Administer survey	<input type="checkbox"/> Check if she kept appointment		
<input type="checkbox"/> Provide consultation/referral information	<input type="checkbox"/> Other(specify): _____		
Contact Details			
Contact Date: _____		Contact Time: _____	
Contact To / From (circle one): _____			
Contact Type: <input type="checkbox"/> Phone or <input type="checkbox"/> In Person (specify location): _____			
Total Time with Client*:		Travel Time*:	
Hours	Minutes	<input type="checkbox"/> Travel Only	
		No Contact	
		Hours	
		Minutes	
Expenses:			
Mileage	Parking		

Step 2: Micro-costing Tools

- Need to be tailored to the study
- Track services provided (e.g., patient meeting)
- Track time, if there is variation within service and precision is needed
- Useful to get input from those who will complete the form

Step 2: Consequence Costs

- Consider the following information regarding the study design and objectives to determine the most appropriate measurement model for the healthcare utilization costs:
 - **Control group**
 - Ensure similarity between patients in the control and intervention groups.
 - Assess sample size to ensure we have the power to statistically detect differences.
 - **Length of the study period**
 - Determine an appropriate period pre-and post the intervention.
 - **Relevant category of healthcare utilization**
 - Identify healthcare utilization that is relevant to the study intervention, which may not always be possible.

Step 2: Consequence Costs cont'd

- Consider the following information regarding the study design and objectives to determine the most appropriate measurement model for the healthcare utilization costs:
 - **Variation in medical treatment**
 - Healthcare practice varies across regions and facilities, which should be considered when we conduct a budget impact analysis for each facility and for the entire VA system.
 - Two commonly used methods to identify net impact of an intervention:
 - Difference-in-differences (before and after, control and intervention)
 - An interrupted time series
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Step 3: Conduct Cost Analysis

- Determine activities that should be included in cost analysis (Tables 1 to 2).
 - Choose a cost measurement method for each activity.
 - Determine the necessary factors for consequent cost analysis.
 - Develop a consequent cost analysis method.
 - Complete a cost analysis plan.
 - Data collection
 - Data analysis
 - Report
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Table 1: Activity of Implementation Cost

Activity	Description	STAFF			SUPPLIES			OTHER
		Total Staff (FTE)	Length of Staff on Project	Meeting Time of Participants by Employment Category	Equipment	Material	Telephone / Email time (project specific to all patients)	Other

Table 2: Activity of Intervention Cost

Activity	Description	STAFF			SUPPLIES			OTHER
		Total Staff (FTE)	Length of Staff on Project	Meeting Time of Participants by Employment Category	Equipment	Material	Telephone / Email time (project specific to all patients)	Other

Table 3. Downstream Cost Considerations (VA perspective)

Cost category	Time periods	
	_ months pre intervention	_ months post intervention
Total Inpatient Costs*		
Medicine		
Mental health & SUD treatment		
Other		
Total Outpatient Costs**		
Outpatient Medicine		

*Use table 3a to assign inpatient care to a category.

**Use table 3b to assign outpatient care to a category.

All care should be listed as a category.

Table 3a: Examples of Inpatient Categories of Care

Category of Care	Bedsection / Treating Specialty
Medicine	1-19, 24, 30, 31, 34, 83, 1E, 1F, 1H, 1J
Mental health SUD Treatment	25, 26, 28, 29, 33, 38, 39, 70, 71, 75, 76, 77, 79, 89, 91-94, 1K, 1L 27, 72, 73, 74, 84, 90, IM
Rehabilitation	20, 35, 41, 82, 1D, IN
Blind Rehabilitation	21, 36
Spinal Cord	22, 23
Surgery	48-63, 65, 78, 97, 1G
Intermediate	32,40
Domiciliary	37, 85, 86, 87, 88
Long Term Care	42-47, 64, 66-69, 80, 81, 95, 96, 1A, 1B, 1C
PRRTP	25-29, 38, 39

NOTE: Decide which of these categories can be combined into an “Other” category.

Table 3b: Examples of Outpatient Categories Based on Clinic Stop

HERC Category of Care Name	Clinic Stop Number
Outpatient Medicine	101-103, 110, 116, 130, 131, 142-144, 149, 153, 158, 159, 182, 185-188, 231, 301-326, 329-333, 335-342, 345, 348-353, 369-373, 394, 434, 436, 437, 439, 450-485, 511, 674, 683-686, 690-692, 694, 695, 706, 709, 710, 712
Mental health	156, 157, 501, 502, 504-506, 509, 510, 512, 515, 516, 520-522, 524-540, 542, 546, 550-554, 557-559, 561-584, 589-592, 731
SUD Treatment	507, 508, 513, 514, 517-519, 523, 543-545, 547, 548, 555, 556, 560, 588, 593-599, 707
Pharmacy	180, 181
Dialysis	602-604, 606-608, 611
Ancillary Services	111, 117, 120, 122-125, 147, 160, 161, 163-169, 708, 711, 714, 999
Rehabilitation	195-199, 201-211, 213, 214, 216-225, 228-230, 240, 250, 438, 715
Diagnostics Services	104-109, 115, 126-128, 145, 146, 148, 150-152, 154, 212, 334, 701-705, 717, 718
Prosthetics	417, 418, 423, 425, 449
Surgery	327, 328, 401-416, 419-422, 424, 426-433, 435, 716
Adult Daycare	190, 191
Home Care	118, 119, 121, 170-179, 215, 503, 670, 680-682, 725-730
Extended Care	650-652, 654, 656
Other Contract Care	610, 640-643, 653, 655, 658
Unassigned	801, 802, 900, 998

NOTE: Decide which of these categories can be combined into an “Other” category.

Example: Estimating Labor Costs by Direct Measurement

Wagner, T. H., Engelstad, L. P., Mcphee, S. J. & Pasick, R. J. (2007) The costs of an outreach intervention for low-income women with abnormal Pap smears, *Prev Chronic Dis*, 4, A11.

Wagner TH, Goldstein MK. Behavioral interventions and cost-effectiveness analysis. *Prev Med* 2004;39:1208-14.

Outreach Workers

- A local county hospital routinely performed Pap smears in the ED.
- Problem: Low rates of follow-up among abnormal Pap smears (~30% follow-up)
- Question: what is the cost of using an outreach worker to improve follow-up?

Objective

- We evaluated the cost and cost per follow-up of usual care (a mailed postal reminder) with a tailored outreach intervention compared to usual care alone.
- Do costs vary by disease risk?

Study Overview

- Randomized, controlled trial
- Usual care: notified by telephone or mail, depending on the degree of abnormality. Provided intervention after 6 months.
- Intervention: Usual care plus outreach and tailored individual counseling
- Estimated costs using direct measurement

Methods

- Method 1: Sum all the intervention costs and divide by number of participants (easy)
- Method 2: Estimate the cost of the intervention for each patient (hard)
- If you want to ask, “was the intervention more cost-effective for subgroups?”, then you need to use method 2?

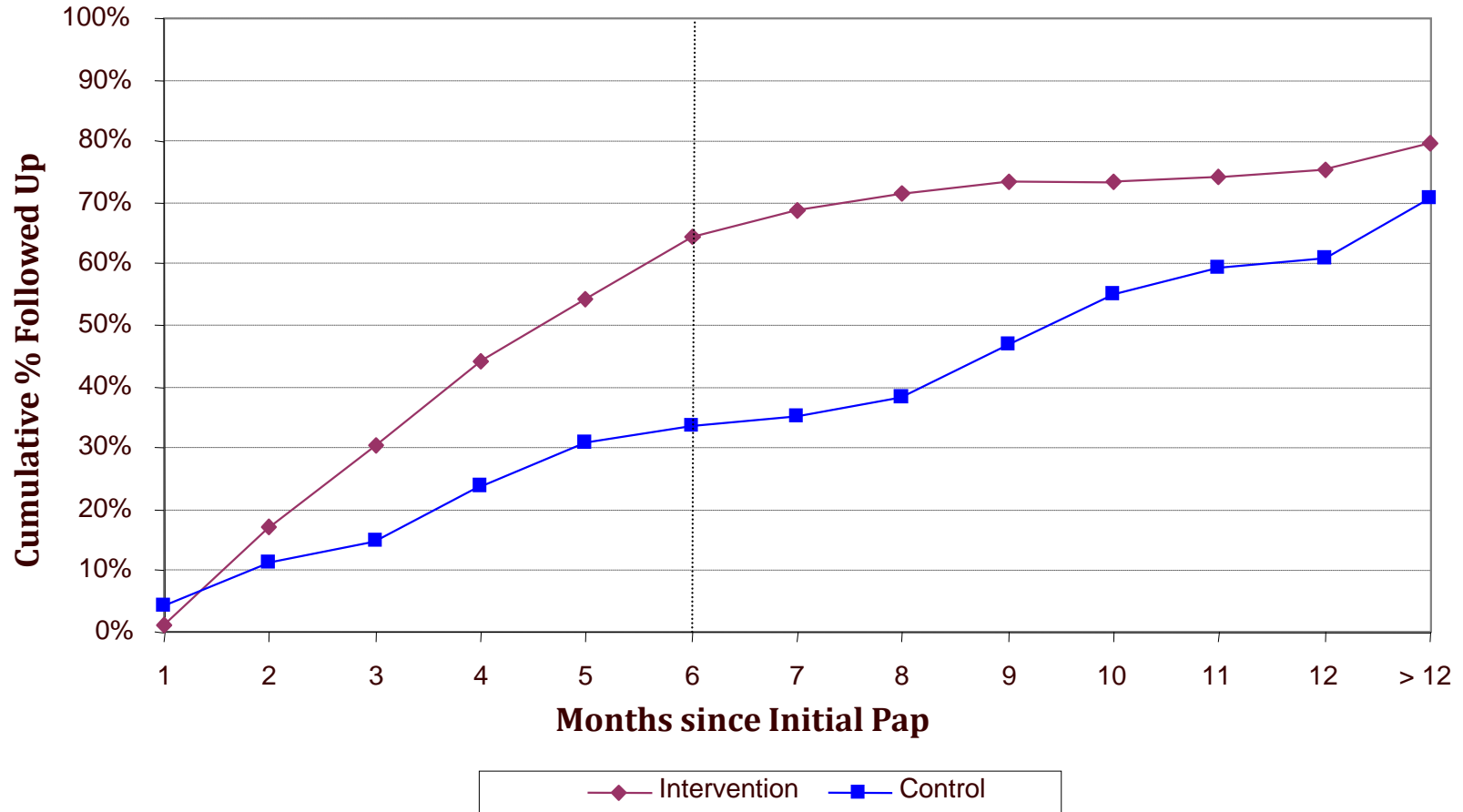
Unit Costs

2002 dollars

	Intervention (n=178)	Usual care (n=170)
Outreach worker costs	\$142	\$0
Travel costs at \$.365 per mile	\$4	\$0
Office space and supplies	\$28	\$0
Outreach worker quality assurance	\$19	\$0
Usual care	\$1	\$1.00
Subtotal	\$47	\$0
Patient Travel Costs for Follow-up	\$19	\$9.9
Total unit cost from societal perspective	\$214	\$10.9
Cost to add intervention from provider perspective	\$194	\$0

Effectiveness

Abnormal Pap Follow-up at Highland Hospital non-OB Patients



Cost per follow-up

	Cost	Incremental cost	Probability of follow-up	Incremental follow-up	Incremental cost per follow-up
Overall					
Control	\$77		0.32		
Intervention	\$355	\$278	0.61	0.29	\$959
Bootstrapped 95% CI					(787-1367)
By severity					
ASCUS/AGUS	\$75		0.32		
	\$347	\$272	0.57	0.25	\$1,090
LGSIL	\$74		0.30		(813-1658)
	\$374	\$300	0.64	0.34	\$882
HGSIL	\$105		0.43		(579-4584)
	\$405	\$300	0.87	0.44	\$681
					(486-1989)