

Cost Analysis in Implementation Research: Principles and Examples

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QUERI Implementation Research Seminar

April 12, 2012

What is the question ?

- Does the intervention work?
- How much does the intervention cost?
- How much will it cost to implement?
 - Will the intervention change over time
 - Will the costs change over time
 - Can the implementation be more efficient?
 - Can the intervention be more efficient?

More questions

- What outcomes can we achieve with this program?
 - How much will this program cost compared to others?
 - What is the value (outcome/cost) of this program compared to other programs?
 - Which program should we choose?
-

Who is the audience?

- Cost identification
 - Patients , providers, payers, policy makers
- Cost effectiveness analysis
 - Patients , providers, payers, policy makers
- Budget impact analysis
 - Payers, policy makers

What Costs ?

- Cost of the intervention?
 - Cost of VA healthcare utilization?
 - Travel time for healthcare?
 - Cost of Non-VA utilization?
 - Cost of implementation?
 - Cost of the research?
 - Unpaid caregiver time?
 - Other costs?
-

What costs where?

Audience	Type of Analysis	What costs?
Patients , providers, payers, policy makers	Cost identification	Intervention costs
Payers, policy makers	Budget Impact	<i>Above plus:</i> Implementation costs VA Utilization
Payers, policy makers	CEA/CUA	<i>All Above plus:</i> Non-VA utilization Travel Costs Caregiver costs Indirects /overhead

Cost of the intervention



Cost of the intervention

- Personnel costs
 - Clinician time
 - Support staff
- Supplies/DME
- IT
 - Equipt
 - Software
 - Maintenance
- Other?



Estimating these costs

- Direct measurement
 - Observe/track activities and assign a cost
- Pseudo bill
 - Use billing codes/services and assign costs
- Cost regression
 - When costs of care are known
 - Estimating the marginal costs

Estimation decisions

- What data is available?
- Which method is feasible?
- What method will give you the greatest analytic flexibility?
- Which method will give you the greatest precision?

Direct Measurement

- Identify all elements of the intervention
- Observe or track activities
- Summarize time/materials and supplies
- Use VA labor costs to estimate the value of the time (time x \$)



Examples

- First draft
- Pilot tested with relevant staff
- Revised and reformatted prior to initiation of the study
- Designed for “datafax”

**Staff Activity Log
Form 1 (Page 1 of 2)**

Visit

 Hospital Id Study ID (Examiner) Study ID (Veteran)

Exam Date
 Month Day Year

1. Did another staff member perform any portion of this examination including the extraction of information from the veteran's records?

Yes No If "No", skip to question 2.

1.1 What are the credentials of the staff member? (please select one)

Licensed provider
 Staff assistant (without a professional license)
 Other (specify):

1.2 What is the total amount of time that the staff member spent on this examination?

Minutes

For questions 1.2 and 2-7, please record your time in 5-minute increments. Please round up your time increments to the nearest 5-minute increment. For example, if you spent 41 minutes doing an activity, please record it as 0045 minutes.

2. How much time did you spend in this C&P examination? Minutes

3. During this time, did you perform the following activities?

- Chart review and reviewing self-report information or other preparatory activities, before you met face-to-face with the veteran? Yes No
- Meeting face-to-face with the veteran? Yes No
- In chart review or other research activities following the face-to-face meeting with the veteran but prior to the report writing? Yes No
- Writing a report or summarizing your findings Yes No

**Staff Activity Log
Form 1 (Page 2 of 2)**

Visit

Hospital
Id

Study ID
(Examiner)

Study ID
(Veteran)

Exam Date
Month Day Year

4. If you will spend additional time beyond the examination time writing or completing the report, please estimate the time you will need to complete the report for this veteran..... Minutes

5. If you spent additional time on this C&P examination for PTSD that has not been captured in the questions above (questions 2-4), please describe below the activity and the time you spent on this activity.

Activity 1 _____ Minutes

Activity 2 _____ Minutes

Activity 3 _____ Minutes

6. Did you have adequate time scheduled to complete this examination including report writing?

Yes *If "Yes" skip to question 7.*

No

6.1 If "No", how much time would have been adequate to complete this examination?

Minutes

7. Did you have adequate trauma exposure information for this veteran?

Yes No

Another example

- It is time consuming to track staff activities
- Form was created with input from outreach workers
- Manager reviewed them for accuracy each week

Client Contact Form							
Your Name: _____		Today's Date: _____		Time: _____			
Client's Name: _____						ID#: _____	
Type of Contact:		Contact to (CHA, client, other): _____					
<input type="checkbox"/> Phone		Contact from (CHA, client, other): _____					
<input type="checkbox"/> In person		Where: _____					
Total Time with Client:		Travel Time:		Expenses:			
Hours	Minutes	Hours	Minutes	Mileage	Parking	<input type="checkbox"/> County vehicle	
						<input type="checkbox"/> Own vehicle	
Reason for call/visit				Outcome			
<input type="checkbox"/> Administer pre-survey				<input type="checkbox"/> Next appt date: _____			
<input type="checkbox"/> Administer survey				Date to give reminder call: _____			
<input type="checkbox"/> Provide information				Date to check if appointment kept: _____			
<input type="checkbox"/> Check to see if she scheduled appointment				Appointment kept?			
<input type="checkbox"/> Schedule an appointment for her				<input type="checkbox"/> Yes <input type="checkbox"/> Cancelled			
<input type="checkbox"/> Remind her of appointment				<input type="checkbox"/> No, why? _____			
<input type="checkbox"/> Check if she kept appointment				Reached - New appt date/time: _____			
<input type="checkbox"/> Other _____							
Consultation/Intervention				Referrals			
<input type="checkbox"/> A. Consumer skills (blue/green/pink/yellow)				<input type="checkbox"/> B. Transportation			
<input type="checkbox"/> D. Calendar				<input type="checkbox"/> AC Transit Voucher			
Coping:				<input type="checkbox"/> C. Child care			
<input type="checkbox"/> E. Distancing				<input type="checkbox"/> I. Mental Health			
<input type="checkbox"/> F. Seeking Social Support				<input type="checkbox"/> J. Alcohol abuse			
<input type="checkbox"/> G. Escape Avoidance				<input type="checkbox"/> K. Substance abuse			
<input type="checkbox"/> H. Planful Problem Solving				<input type="checkbox"/> L. Domestic violence			
<input type="checkbox"/> Education about abnormal Paps				<input type="checkbox"/> M. Sexual abuse			
<input type="checkbox"/> Other (specify): _____				<input type="checkbox"/> V. HIV/AIDS			
Attempts to contact:							
1 <input type="checkbox"/> Date and time of day: _____		10 <input type="checkbox"/> Date and time of day: _____					
2 <input type="checkbox"/> Date and time of day: _____		11 <input type="checkbox"/> Date and time of day: _____					
3 <input type="checkbox"/> Date and time of day: _____		12 <input type="checkbox"/> Date and time of day: _____					
4 <input type="checkbox"/> Date and time of day: _____		13 <input type="checkbox"/> Date and time of day: _____					
5 <input type="checkbox"/> Date and time of day: _____		14 <input type="checkbox"/> Date and time of day: _____					
6 <input type="checkbox"/> Date and time of day: _____		15 <input type="checkbox"/> Date and time of day: _____					
7 <input type="checkbox"/> Date and time of day: _____		16 <input type="checkbox"/> Date and time of day: _____					
8 <input type="checkbox"/> Date and time of day: _____		17 <input type="checkbox"/> Date and time of day: _____					
9 <input type="checkbox"/> Date and time of day: _____		18 <input type="checkbox"/> Date and time of day: _____					

And another...

- CPRS template
- Designed for this study
- Implemented at all study sites

template: SCL VOCATIONAL INTEGRATION PROGRAM

ZZZZZZZU,TEST (000-00-5897) is participating in a research study titled, "A Spinal Cord Injury Vocational Integration Program (SCI-VIP): Implementation and Outcomes" (IRS# 04-094).

As part of the clinical services provided through study participation, the Vocational Rehabilitation Counselor (VRC) had contact with

Veteran
 Employer
 State Vocational Rehabilitation
 Vocational Rehabilitation and Employment
 Other:

The contact was by phone by email face-to-face, occurred on [] [] [], and lasted [] minutes.

The following Procedures were conducted:
Click all that apply

THE TOTAL OF ALL MINUTES ENTERED FOR THE ACTIVITIES BELOW MUST EQUAL THE TOTAL SESSION MINUTES ENTERED ABOVE.

<input type="checkbox"/> Orientation/CWI Intake	+ [] Minutes
<input type="checkbox"/> Focused Interview Assessment	+ [] Minutes
<input type="checkbox"/> Treatment Plan Development	+ [] Minutes
<input type="checkbox"/> Materials for Collateral Services	+ [] Minutes
<input type="checkbox"/> Job Readiness Training	+ [] Minutes
<input type="checkbox"/> Job Development	+ [] Minutes
<input type="checkbox"/> Vocational Counseling	+ [] Minutes
<input type="checkbox"/> Worksite Accommodation	+ [] Minutes
<input type="checkbox"/> Job Placement	+ [] Minutes
<input type="checkbox"/> Vocational Case Management	+ [] Minutes
<input type="checkbox"/> Employment Supports and Job Coaching	+ [] Minutes
<input type="checkbox"/> Treatment Plan Review & Revision	+ [] Minutes
<input type="checkbox"/> Employment Follow-up	+ [] Minutes
<input type="checkbox"/> Other: (specify) []	+ [] Minutes

Clinical activity(ies) were provided in an individual treatment setting.

All None * Indicates a Required Field Preview OK Cancel

Start | Inbox - Microsoft Outlook | RE: VRC Template Chan... | CPRS Patient Chart | 8:23 AM

Direct Measurement Cost Estimation – labor costs

- Summarize the time
 - Value the time
 - VA labor estimates
 - http://www.herc.research.va.gov/resources/faq_c02.asp
 - Local salary data
 - BLS
 - Other?
-

Cost data for supplies, equipt, DME

- National Prosthetics Patient Database (NPPD)
 - records purchase price of all items ordered through the VISTA Prosthetics and Sensory Aids package
 - stored and handled by NPPD data manager at Hines VAMC
- Your local A&MMS purchasing officer

Pseudo bill

- Use CPT/other utilization codes to estimate the intervention costs
 - When CPT coding is specified and has face validity (and consistently employed)
 - Use Medicare or other payment schedules

Pseudo bill example

- Patients receive physical therapy services for back pain complaints
 - Physical medicine CPT code section used to document services provided
 - 97140 45 minutes (standard use)
 - 97110 Who is the provider?
 - 97110 Where was this provided?

Direct Measurement - Pseudo bill caveats

- Watch for double counting
 - Clinicians may be entering CPT codes as well as completing survey instruments
- Watch for inconsistent utilization of codes across VAMCs
 - Time value of codes may be altered at the site (30 min code used as 15 min, etc)

TODAY'S DATE	____ / ____ / ____	STAFF INITIALS	____
	m m / d d / y y y y		
SUBJECT ID#	_____	MONTH/DAY BDAY	____ / ____
			m m / d d

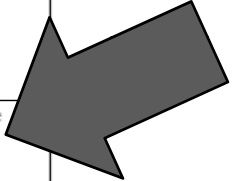
FORM 14 WEEKLY VRC TEMPLATE REVIEW

1. Progress Note # _____
 2. Appointment Date: ____ / ____ / ____
 3. Appointment Time: ____ : ____ AM / PM
 4. Appointment Total Length: _____ Minutes
 5. The appointment was: _____ Attended _____ No-Showed* _____ Cancelled*
- *If appointment was no-showed or cancelled, enter data for items 1 through 7 only.

Clinical Activity	Check if provided	If provided, record minutes
8. Orientation / CWT Intake		
9. Focused Interview Assessment		
10. Treatment Plan Development		
11. Referrals for Collateral Services		
12. Job Readiness Training		
13. Job Development		
14. Vocational Counseling		
15. Worksite Accommodation		
16. Job Placement		
17. Vocational Case Management		
18. Employment Supports & Job Coaching		
19. Treatment Plan Review & Revision		
20. Employment Follow-Up		
21. Other:		

22. Treatment Setting: ____ individual ____ group (#pts ____)

6. Contact Type: (Check ONE)
 - ____ a. Face-to-Face
 - ____ b. Phone
 - ____ c. Email
7. VRC Met with: (Check all that apply)
 - ____ a. Veteran
 - ____ b. Employer
 - ____ c. State VR
 - ____ d. VR&E
 - ____ e. Other:
23. List Procedure Codes
 - 23a. _____
 - 23b. _____
 - 23c. _____
 - 23d. _____
 - 23e. _____
 - 23f. _____
 - 23g. _____



Micro-costing methods

- Cost regression
 - Estimate marginal costs using statistical techniques

Cost regression

- Use to estimate marginal effect of an intervention
- Use when data exists for current practice
- Not for new technology or when accounting cost is not known

Cost of the implementation

What is the question ?

- Does the intervention work?
 - How much does the intervention cost?
 - How much will it cost to implement?
 - Will the implementation change over time
 - Will these costs change over time
 - Can the implementation be more efficient?
 - How generalizeable are study costs?
-

Estimation decisions

- What data is available?
- Which method is feasible?
- What method will give you the greatest analytic flexibility?
- Which method will give you the greatest precision?

Estimation methods

- Direct Measurement
- Pseudo bill
- Cost regression

Elements of the Implementation



Costing the implementation

- PLAN
- DO
- STUDY
- ACT

Implementation design

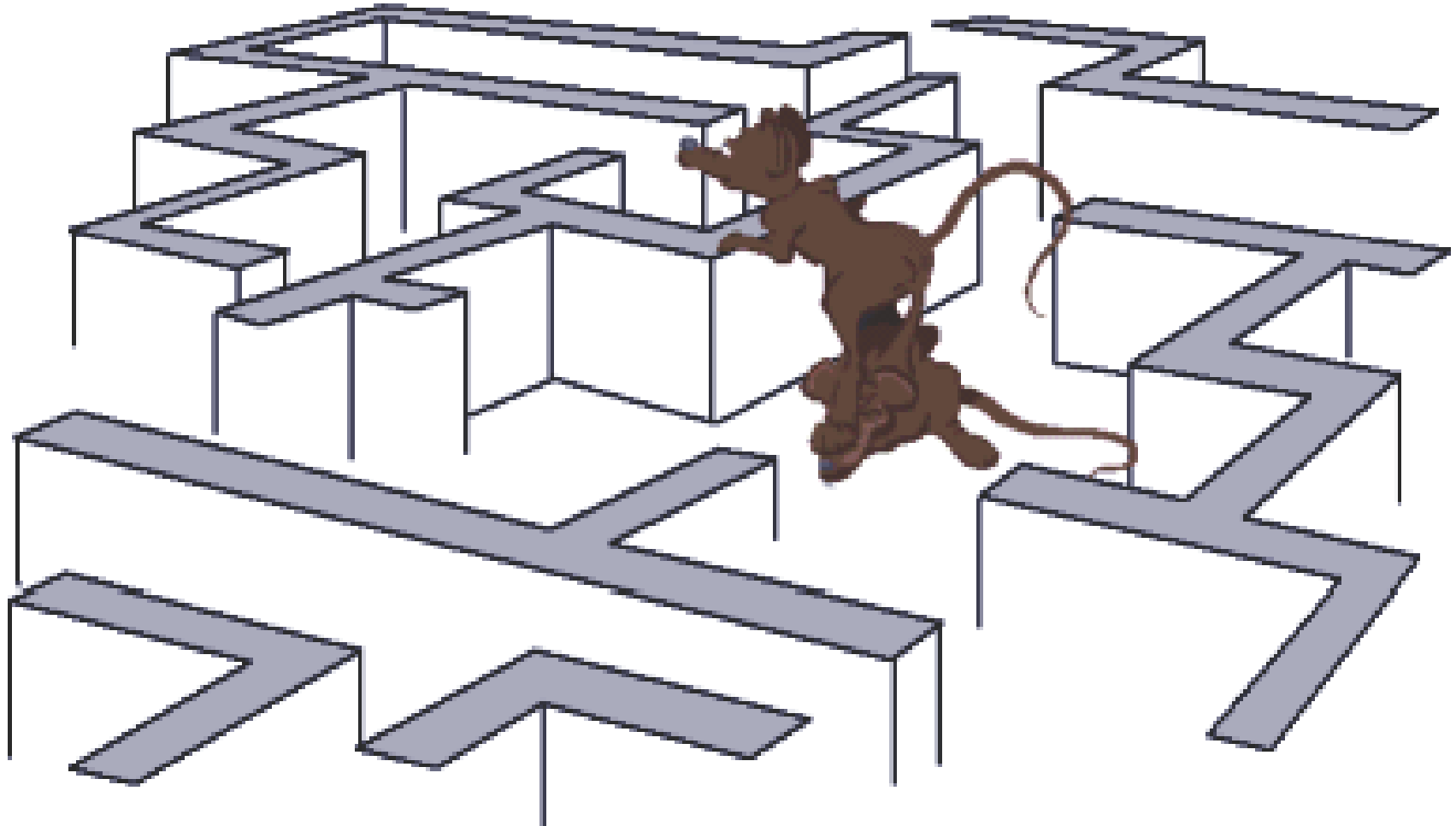
- Creating the plan
 - Leadership engagement
 - Clinician participation
 - Support personnel
 - Technical experts
 - Clinician training
 - Support training/admin staff training
-

Data collection tools

- Diaries?
- CPRS?
- Recall surveys?
- Observations
- Web trends?
- Other?

Frequency?

Intervention or Implementation?



Intervention or Implementation?

- Clinician training
 - Coaching
 - Access the web
 - Documentation
 - Time of the coach
 - Ongoing leadership involvement
 - Technical experts
-

Intervention or Implementation

- Or RESEARCH ?

Will these costs change over time?

- Intervention
- Implementation
- Ongoing support
- Maintenance
- Spread?

Summary

- Intervention costs
- Implementation costs
- Maintenance

Reading

- Liu CF, Rubenstein LV, Kirchner JE, et al. Organizational cost of quality improvement for depression care. *Health Serv Res.* Feb 2009;44(1):225-244.
- Wagner TH, Engelstad LP, McPhee SJ, Pasick RJ. The costs of an outreach intervention for low-income women with abnormal Pap smears. *Prev Chronic Dis.* Jan 2007;4(1):A11.
- Wagner TH, Goldstein MK. Behavioral interventions and cost-effectiveness analysis. *Prev Med.* Dec 2004;39(6):1208-1214.