

incorporating
cost analysis
into program evaluation

cost-inclusive evaluation

- what it is ... and can be
- Q&A
- examples:
 - ... of Parent-Child Interaction Training
 - ... of Hillside Work-Scholarship Connection
- recognizing, overcoming obstacles



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Department of Psychology

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what cost-inclusive
evaluation is
... and can be

why cost-*inclusive*?

“All human endeavors have three things in common:

- they consume resources
- they involve certain means or processes
- and they produce outcomes...

At the very least, what we do, say or think consumes time and yields an outcome of no change at all.”

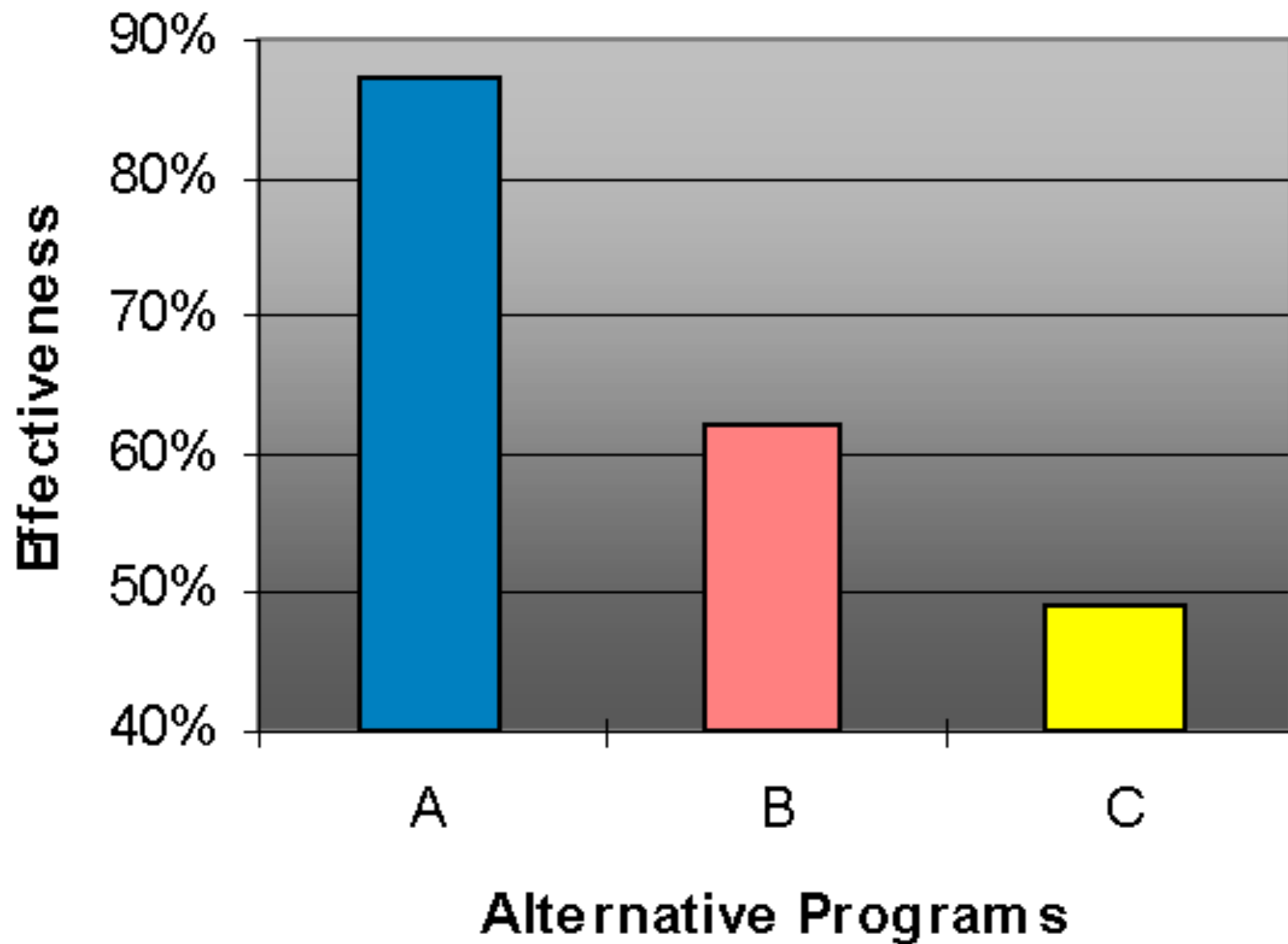
Evaluating the costs of programs is the missing link between

- performing an evaluation
- perform an evaluation that gets changes made and funding delivered

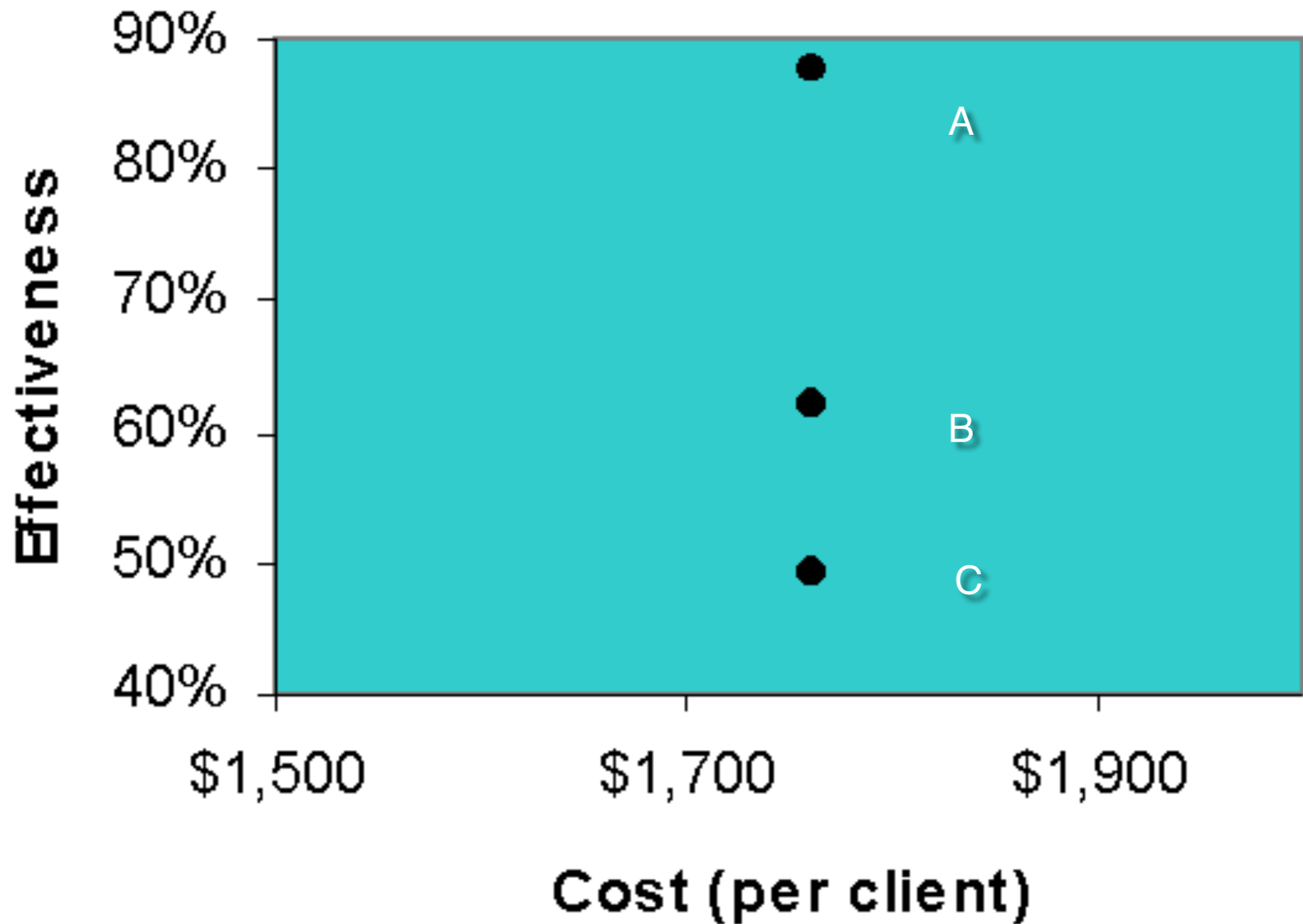
Evaluating the monetary outcomes of programs can help, too

3 evaluators walk
into a room ...

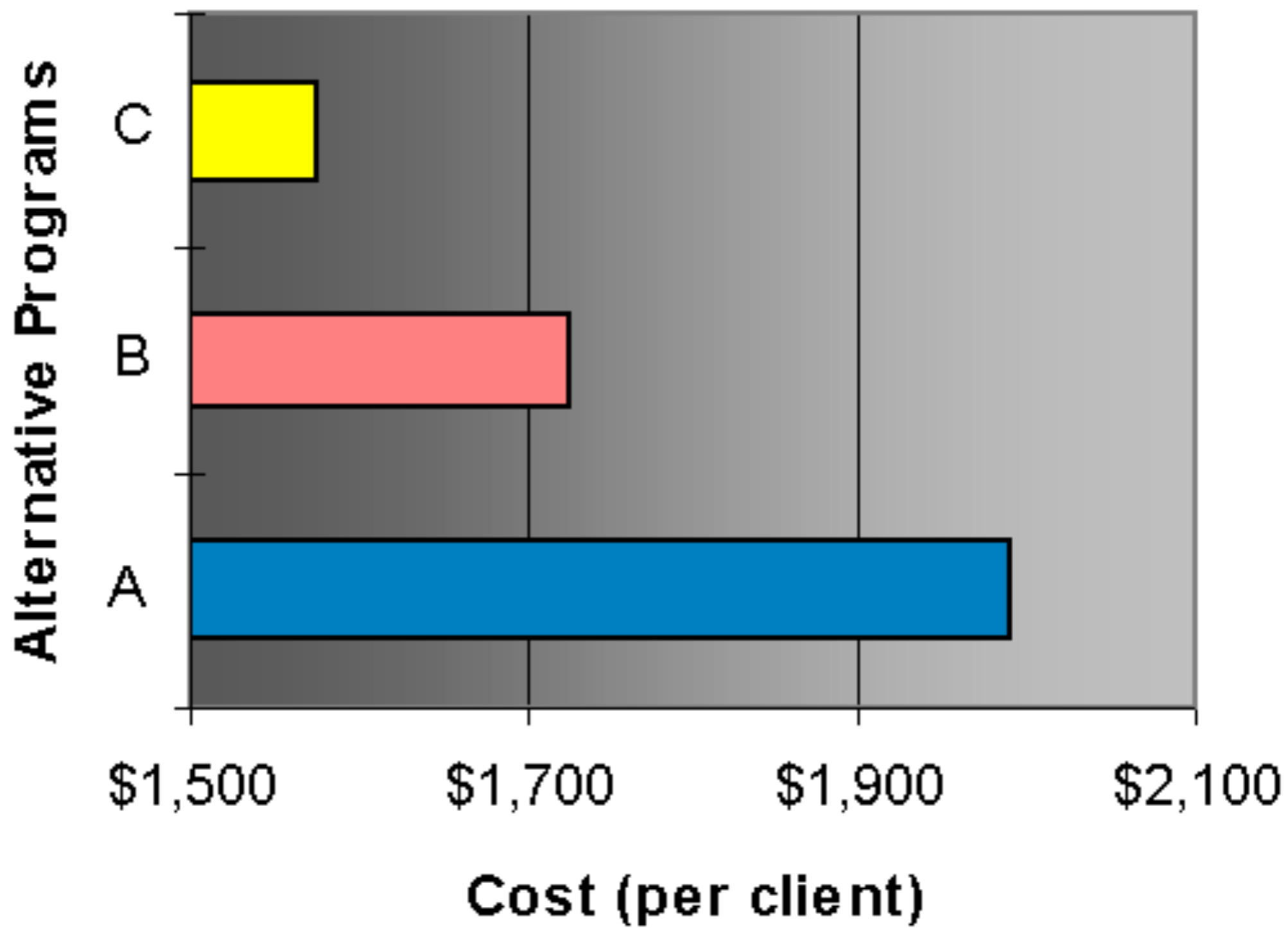
Program Effectiveness



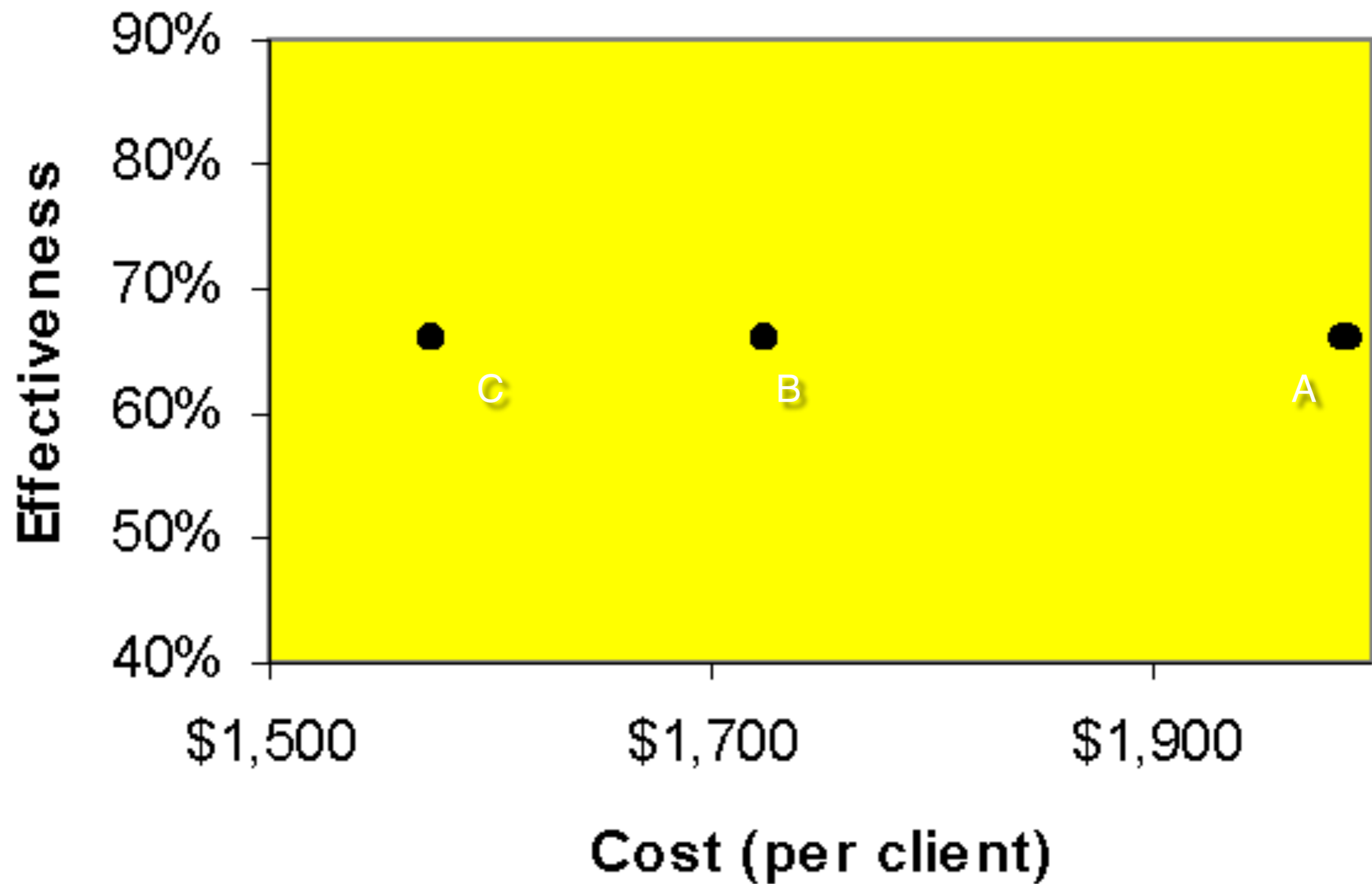
Effectiveness, Ignoring Cost



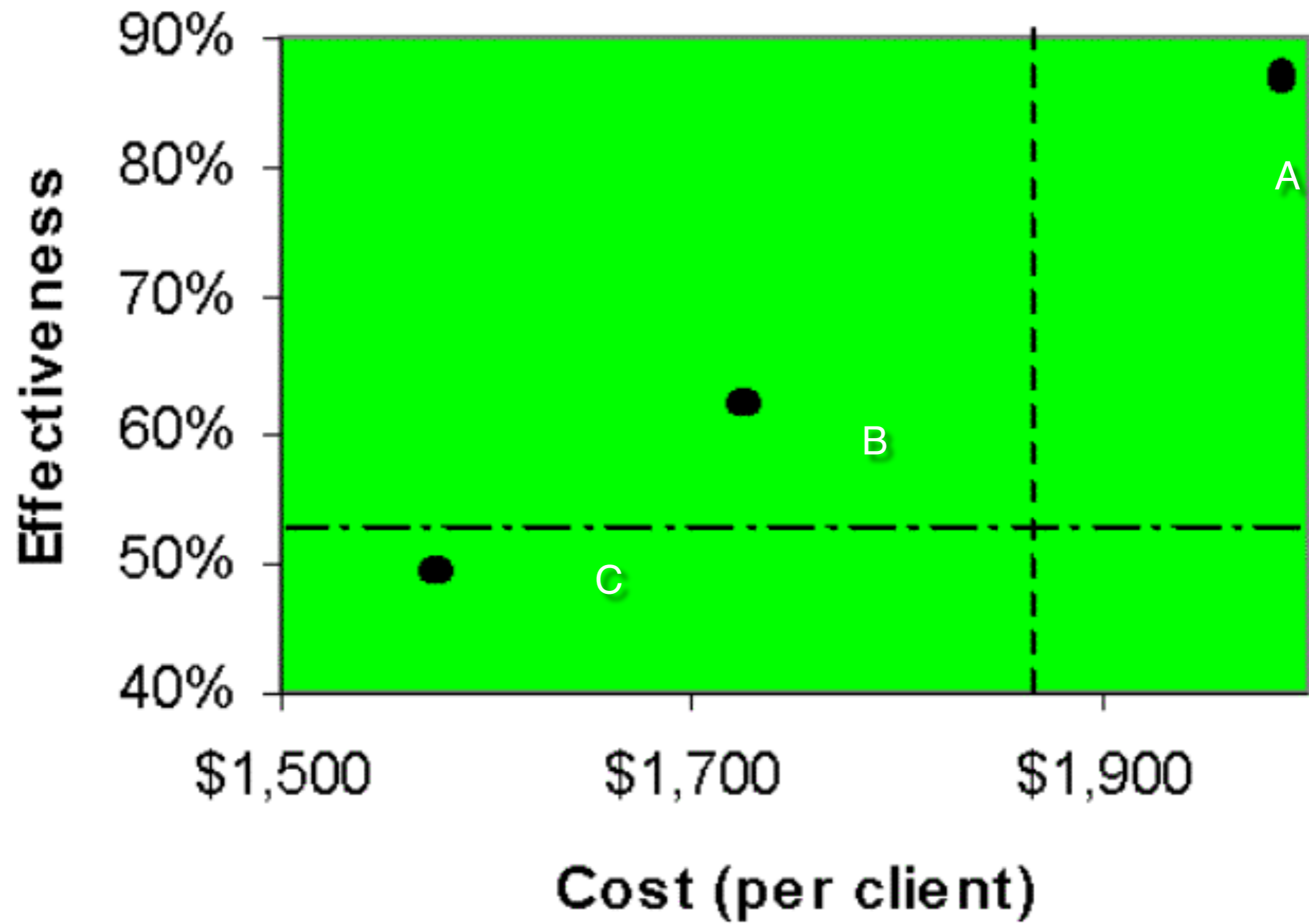
Program Cost



Cost, Ignoring Effectiveness

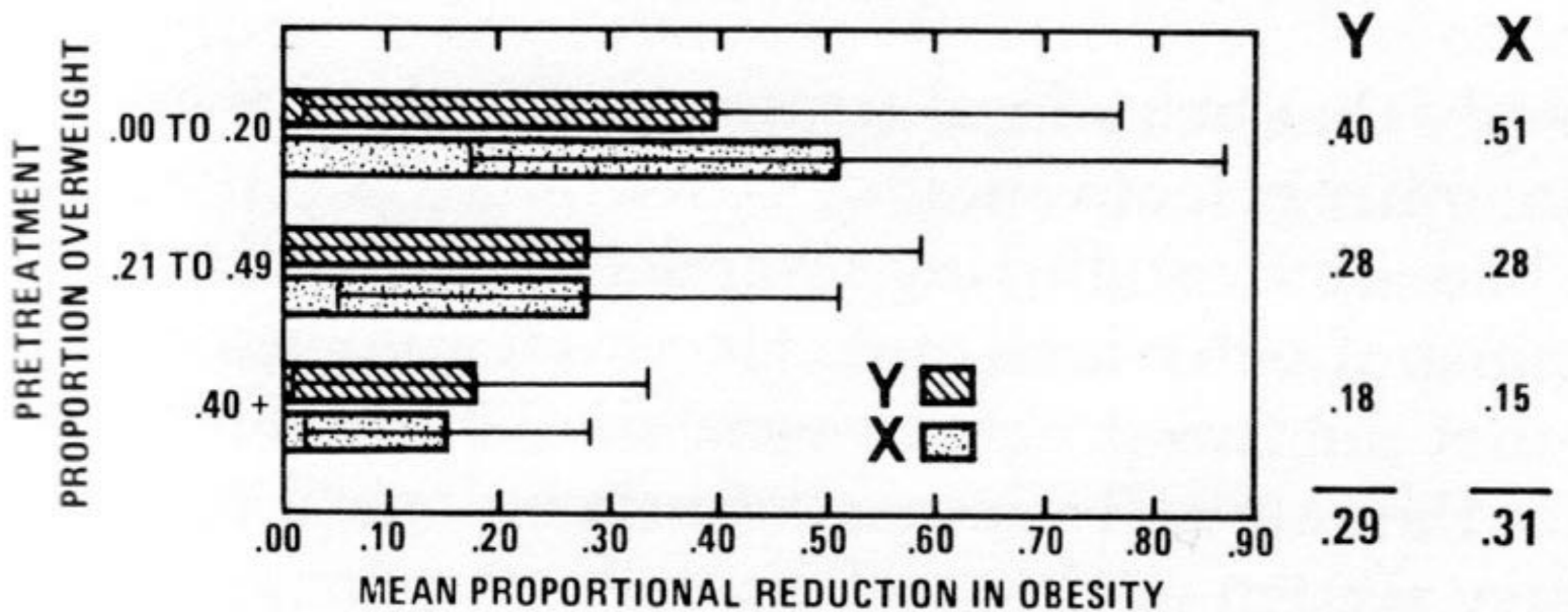


Cost-Effectiveness for Alternative Programs



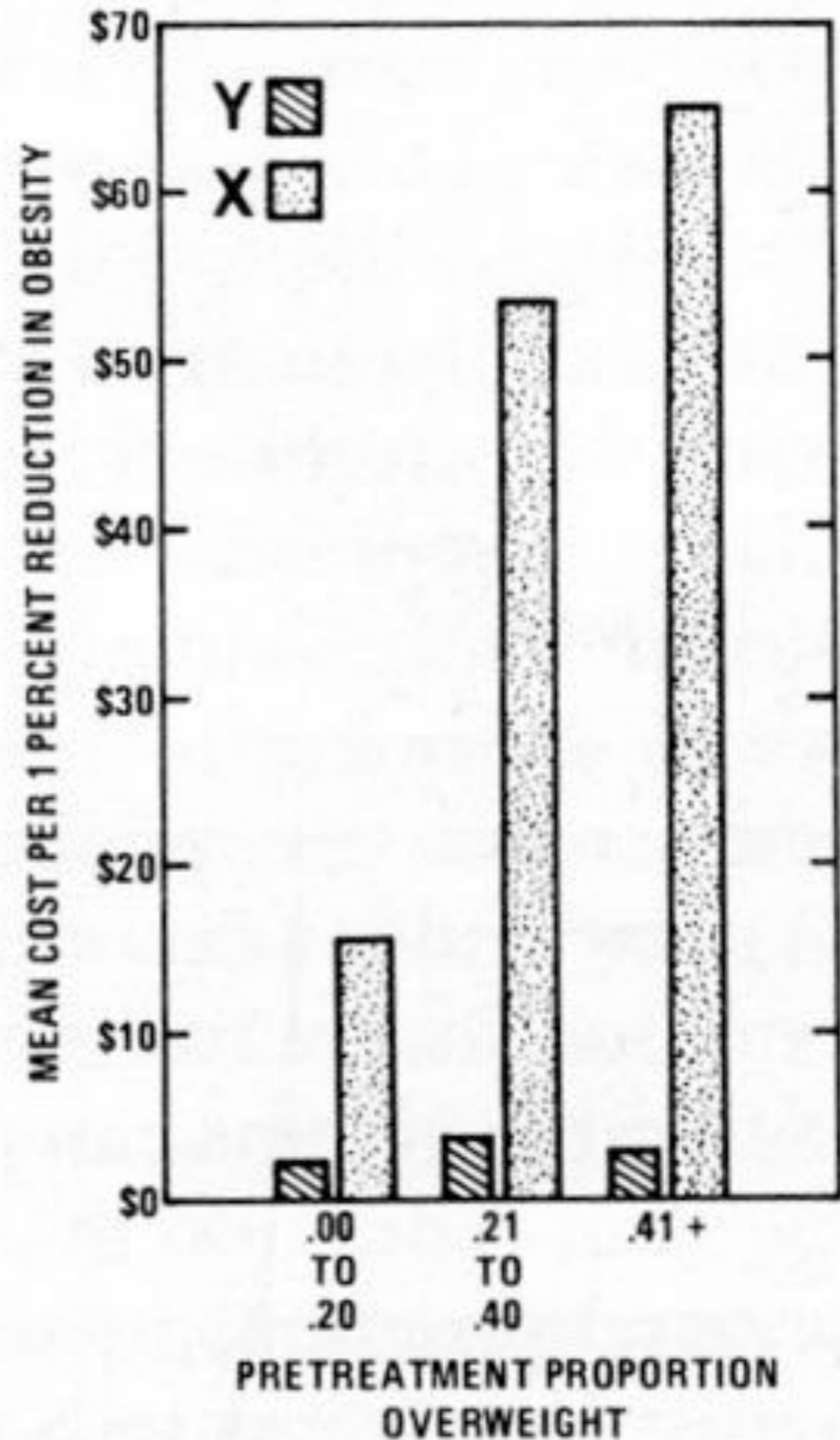
sometimes costs are all that
matters...

treatments Y and X ...
 effectiveness: $Y = X$



costs:

$X \gg Y$



evaluating *costs*

re-conceptualizing costs

- cost as cumulative value of program ingredients, i.e., types and amounts of resources, e.g.,
 - personnel time
 - physical plant
 - supplies

perspectives on costs

- provider
- consumer
- family members
- taxpayer
- community
- policy makers
- funders
- evaluator!

alternative ways to quantify "cost"

- what was paid (price)
- what we are *willing to pay*
- what it took to get it (price, shipping...)
- what would need to be paid for it next time (replacement cost) in the same locale
- its next best possible use (opportunity cost)
- what it is, and how much of it is used

compare reported income
to...

what people in similar occupations
earn

- <http://www.bls.gov/bls/blswage.htm>
- <http://www.homefair.com/real-estate/salary-calculator.asp?cc=1>

costs are not easy to measure

- not just budgets, not just accounting records
- may need to monetize essential resources:
 - volunteers' time
 - interns', externs' time
 - under-paid staff member's time
 - space rented below-market
 - donated food, transportation, equipment

cost data collection

- methods
 - survey
 - self-report
 - observation
- instruments
 - computer (e.g., Drug Abuse Treatment Cost Analysis Program, DATCAP)
 - paper-and-pencil spreadsheets

costs can be reported as:

- cost per client
- cost per "slot" ... per "bed"
- cost per client day
- cost per group

Assessing the value of
volunteered and donated
resources

for Providers, Consumers, & Family
Members

Measuring Volunteered & Donated Resources can:

- facilitate understanding of why programs do (or don't) work
- guide replication of successful programs in new communities
- suggest where programs utilizing high amounts of volunteered and donated resources might not be replicable

Time x Cost per unit time
= Total Value of Resource

Example

- 10 hours x \$50/hour = \$500 of services

Alternatives for estimate cost per unit time:

- Opportunity cost using current pay rate
- Replacement cost

Collecting Data on Volunteered Resources in a Human Service (Yates, Haven, & Thoresen, 1979)

Time-Study For All Learning House Participants, Cost-Effectiveness Analysis

Participant Name: _____

Monitoring Week: ____/____/____ through ____/____/____

		Monday		Sunday		Total	
		am	pm	am	pm	am	pm
Program-Related Activities (Record as mutually exclusive and in minutes, please.)	w/LH children						
	w/LH parents						
	w/LH staff						
	community relations						
	household & shopping						
	phone contacts						
	reading						
	writing						
	preparing for counseling						
	preparing for other						
	other:						
	Totals						

Findings for a Residential Program for Youth

OPERATIONS AND COMMUNITY COSTS FOR LEARNING HOUSE PERSONNEL

<i>Personnel Category (Degree)</i>	<i>Operations Cost</i>	<i>Hourly Payrate</i>	<i>Time (Hours)</i>	<i>Community Cost</i>
MD, JD, CPA	\$1,462	\$45.00	32.5	\$ 1,462
PhD	849	15.67	50.9	798
MA	2,706	7.78	829.3	6,452
BA	2,972	7.66	1785.2	13,675
Paraprofessional	0	5.53	532.3	2,943
Undergraduate	0	1.70	699.4	1,189
Other (Includes Clients' Parents)	0	2.00	297.0	594
Total Personnel Cost	\$7,988			\$27,112

NOTE. These data were compiled for a single two-month period. From Yates, Haven and Thoresen (1979).

cost adjustments...

- "load" in program: at, under-, or over-capacity?
- program in *start-up* or *wrap-up* stage?
- currency differences...
- cost of living in country, province, urban area
- inflation (or deflation)
- *present value* of costs in later years of program
- hidden expense of investing taxes in public programs ("deadweight loss")

online cost calculators

- Excel, Numbers, most calculators, but ...
- data.bls.gov
- inflation: http://www.bls.gov/data/inflation_calculator.htm
- wages: <http://www.bls.gov/bls/blswage.htm>
- net present value, different amounts each year: <http://dailycalculators.com/npv-calculator>

a “cost study” can be ...

- cost analysis (CA)
 - budgets versus expenditures
 - which is better?
 - why budgets are more popular
- cost *feasibility* analysis (CFA)
 - develop an itemized budget
 - compare to funds, other resources available
 - why it's not enough

1st step beyond costs:

Activity-Based Costing

(ABC)

		activities		
		activity 1	...	activity j
resources	resource 1			
	...			
	resource i			

my advice for measuring costs:

- ask representative of each interest group to:
- list the activities of the program--what it does
- for each activity, list the resources invested in the Activity by each interest group
- In cells of the resulting resource → activity matrix, estimate the amount of each resource used for each activity
- verify estimates with actual measurements

from each perspective: sum costs for each activity

Resources ↓	← Activities →				Total of Resources
	Individual Counseling	Group Counseling	...	Ongoing Evaluation	
Personnel	\$12,000	\$12,000	...	\$1,200	\$50,000
Space	\$12,000	\$12,000	...	\$1,200	\$30,000
...			...		
Total Cost of Direct Services	\$35,000	\$30,000	...	\$7,000	\$100,000
Administration	\$35,000	\$30,000	...	\$7,000	\$100,000
Total Cost of All Services	\$70,000	\$60,000	...	\$14,000	\$200,000

cost-*outcome* studies

cost-effectiveness analysis

CEA

“What does this program accomplish relative to its cost?”

examples:

- cost per drug-free day
- cost per year of life saved
- cost per quality-adjusted life year gained (\$/QALYG)

effectiveness

effectiveness:

... outcomes that aren't money

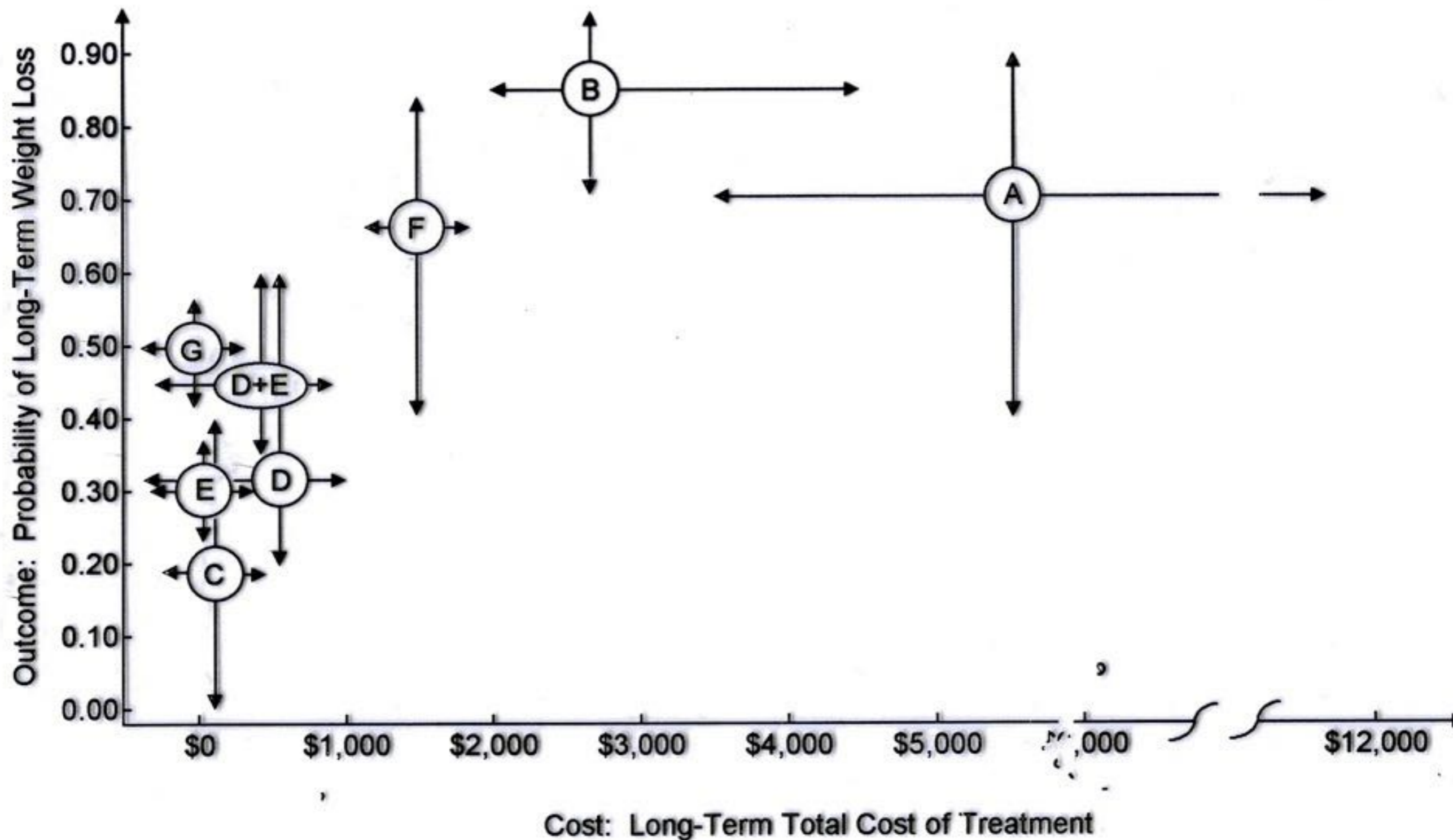
examples:

- reduced bullying
- reduced Emergency Department visits
- increased hours working

effectiveness is ...

- what most researchers excel at measuring!
- best if from the same perspectives as costs
- best if same level of specificity as costs (e.g., individual, family)

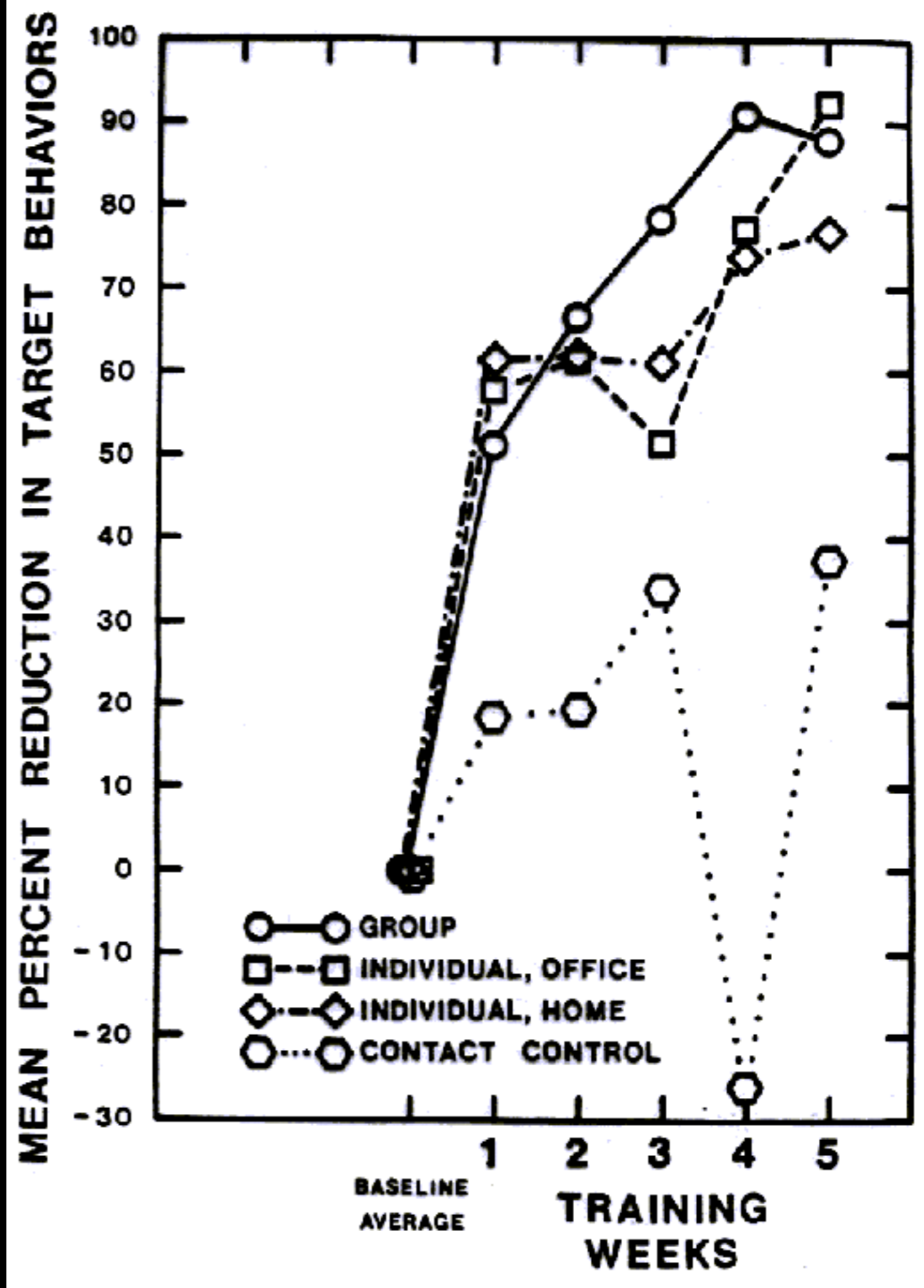
cost → effectiveness areas (a 2-hour CEA!)



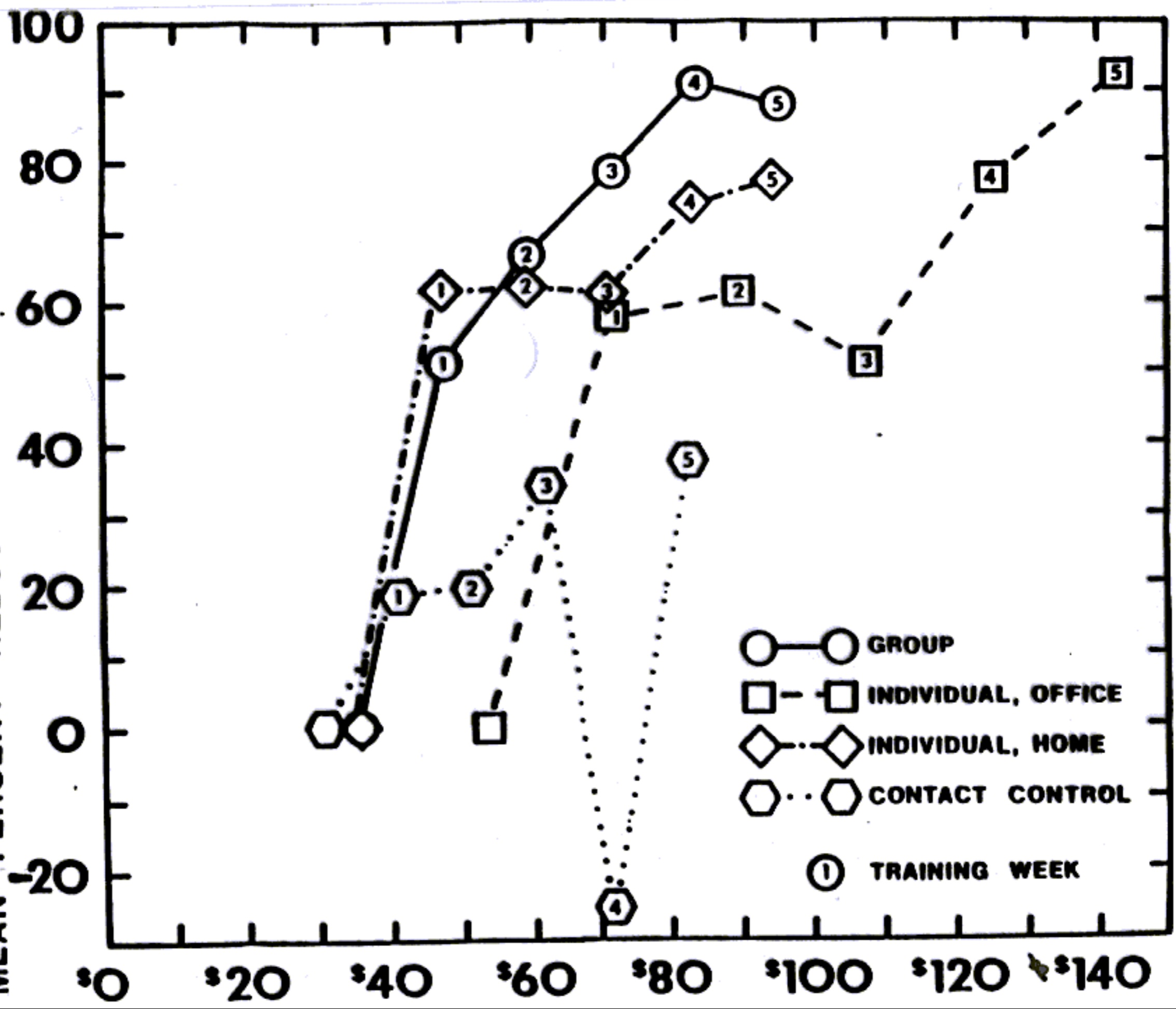
when outcomes are
multiple ...

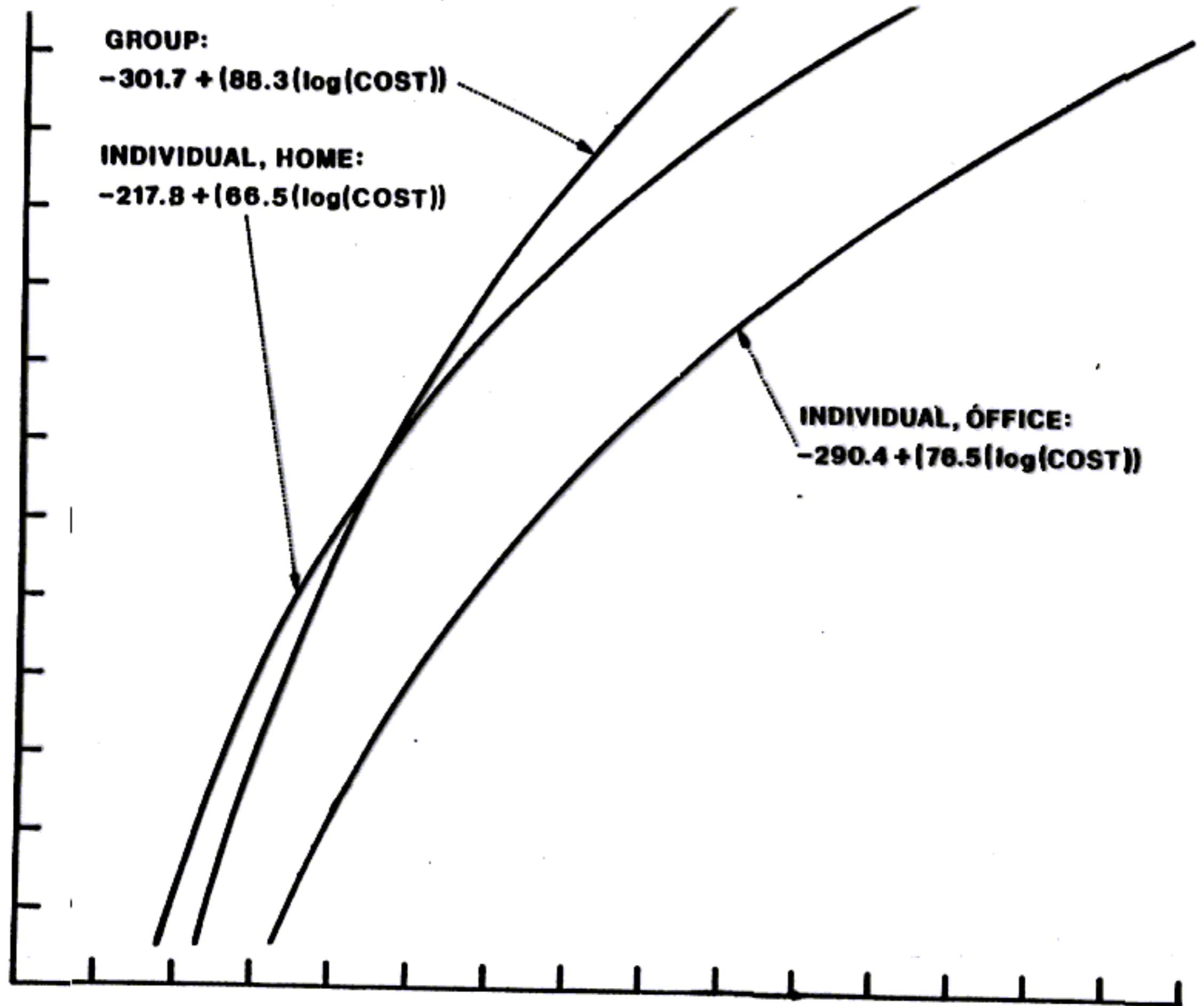
- common in human services, and in most organizations:
- examine their mission statements

Outcomes =
 f (program
Activities)



MEAN PERCENT REDUCTION IN TARGET BEHAVIORS





comparing
different programs'
outcomes

- How do you compare apples and oranges?
 - ... *as fruit!*

effect sizes

- ... as a common metric
- may still need to weight for importance, depending on the measure(s) for which effect sizes are obtained
- “cost per effect size” is a bit abstract
- ... and where's the value-ation?

Quality Adjusted Life Years (QALY)

“QALY” defined...

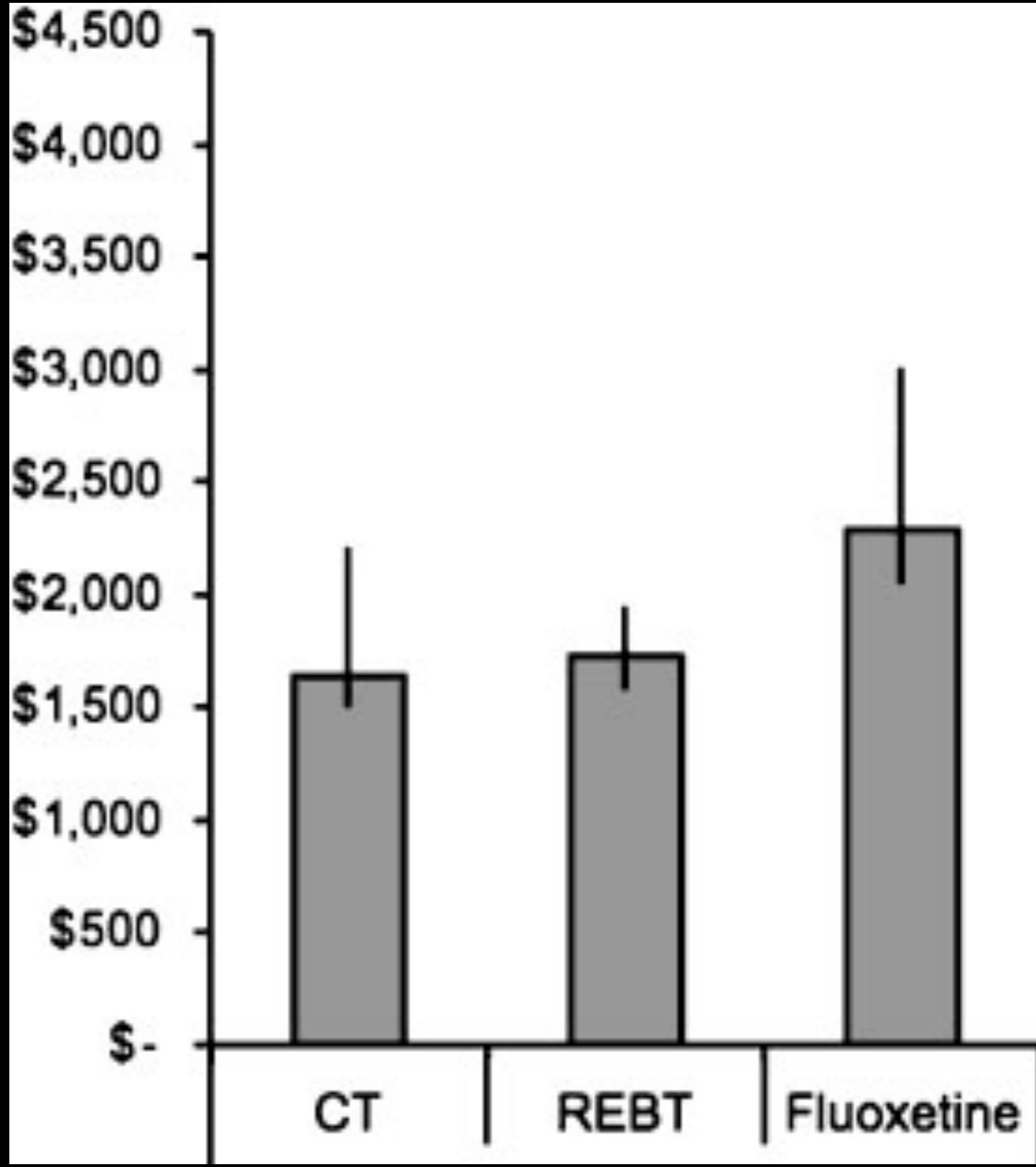
- 1.00 QALY = 1 year in perfect health
- 0.60 QALY = 1 year chronically depressed
- 0.00 QALY = death

compare:

Quality Adjusted Life Year Gained (QALYG)

- QALY Gained compared
 - no program: 0.3 QALY
 - program: 0.7 QALY
 - QALY_G for program = $0.7 - 0.3 = 0.4$

costs per
QALY
gained



cost-benefit analysis

CBA

“Is the cost of this program justified relative to its outcome?” ... “Is this a good investment?”

examples:

- ratio of dollars spent *for* therapy to
 - dollars saved in reduced health services used
- net benefit (after subtracting costs) of diversion program for homeless adults

benefits

- types of benefits
- measurement and monetization strategies

types of benefits

- cost-savings
 - reduced use of health services
 - reduce "transfer payments" (e.g., income assistance) ... *perspectives*
- income enhancement
 - employment income
 - other, better measures of productivity?

convert effectiveness to benefits

- to *monetize* cost-savings benefits
 - measure number of times each service used
 - find cost per service use (from program policies, records, other)
 - multiple service use x cost per service use

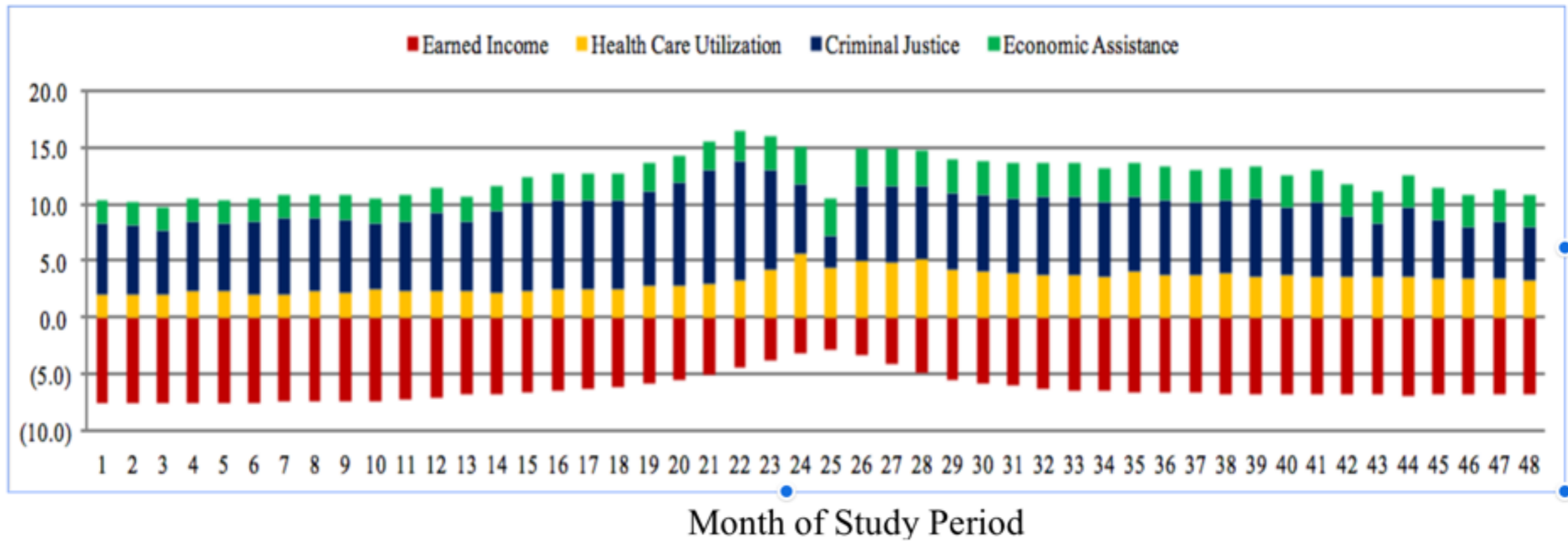
monetization strategies for income:

- actual income, from self-report or records
- estimated income, given profession or hours worked
- include value of time volunteered, donated
- include any enterprise profit!
- include health, other benefits

Cost-savings Benefit:	Effectiveness (program- induced change in ...)	Transformation examples:
savings to patient, society	drug abuse treatment	\$___ per day of treatment
savings in disability	disability payments	\$___ per day of disability support
savings in use of health services	health services	\$___ per ED visit, \$___ per inpatient day

<p>Cost-savings Benefit:</p>	<p>Effectiveness (program- induced change in ...)</p>	<p>Transformation example:</p>
<p>savings to victims, society</p>	<p>criminal acts</p>	<p>\$___ per theft, \$___ per assault</p>
<p>money not spent on drugs</p>	<p>drugs not purchased</p>	<p>\$___ per day of opiate use</p>
<p>reduced criminal justice expenses</p>	<p>criminal justice services</p>	<p>\$___ per arrest, \$___ per court day, \$___ per jail</p>

2011 US Dollars (millions)



return on investment

ROI

- "how much will we make back on our (societal) investment?"
- whether? or when?

Time to Return On Investment TROI

- like ROI but emphasizing time
- need to adjust benefits & costs for...
 - present value
 - inflation

Social Return On Investment SROI

CBA with costs and benefits defined
comprehensively and with care

Pay For Success (PFS)

- <http://www.whitehouse.gov/omb/factsheet/paying-for-success>
- *"Pay for success bonds engage philanthropic and private sector investors to deliver better outcomes"*
- *"Pay for success bonds can help achieve better outcomes in many program areas"*
- *"Pay for success bonds support better outcomes for federal, state, and local governments"*

actual \$?

\$100 million in budget for 2012 fiscal year
in

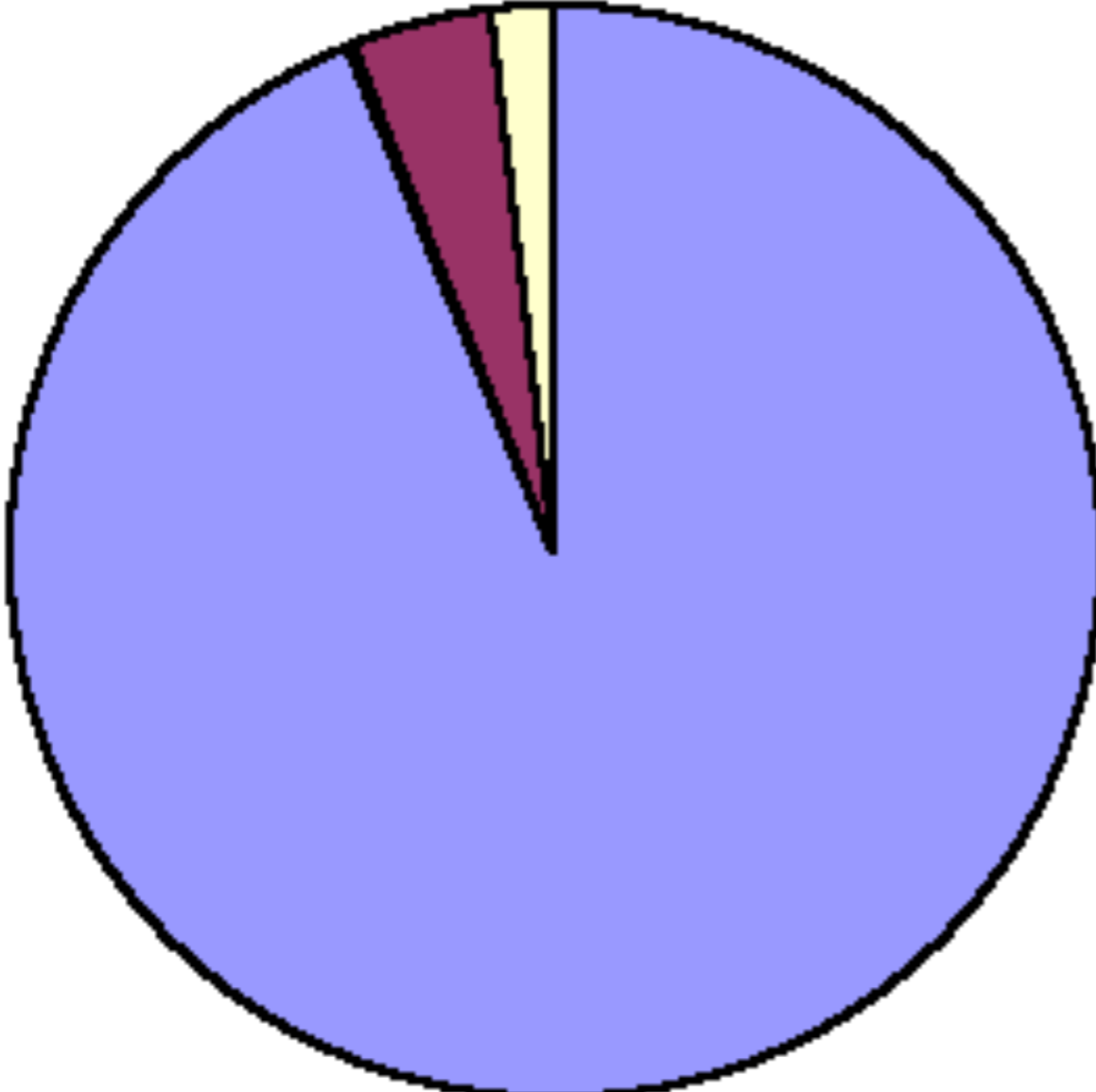
- Dept of Education
- Social Security Administration
- Dept's of Justice, of Labor
- Corporation for National and Community Services

problems?

in CBA, *strong* incentives to:

- under-estimate costs
 - classic: exclude costs to less powerful interest groups
- even over-estimate benefits
- ignore negative benefits
 - ... especially to less powerful interest groups

Cost-Savings from Substance Abuse Treatment (NTIES)



- Reduced crime-related costs
- Increased Earnings
- Reduced Health Care Costs

self-report of services, acts, support, earnings

- subject to demand characteristics
- exacerbated by recall period
 - nonlinearity makes extrapolating or interpolating both dangerous

If Benefits $<$ Costs?

Cost Of Living Now Outweighs Benefits

APRIL 13, 2005 | ISSUE 41-15

WASHINGTON, DC—A report released Monday by the Federal Consumer Quality-Of-Life Control Board indicates that the cost of living now outstrips life's benefits for many Americans.

 ENLARGE IMAGE



"This is sobering news," said study director Jack Farness. "For the first time, we have statistical evidence of what we've suspected for the past 40 years: Life really isn't worth living."

To arrive at their conclusions, study directors first identified the average yearly costs and benefits of life. Tangible benefits such as median income

(\$43,000) were weighed against such tangible costs as home-ownership (\$18,000). Next, scientists assigned a financial value to intangibles such as finding inner peace (\$15,000), establishing emotional closeness with family members (\$3,000), and brief moments of joy (\$5 each). Taken together, the study results indicate that "it is unwise to go on living."

"Since 1965, the cost-benefit ratio of American life has been approaching parity," Farness said. "While figures prior to that date show that life was worth living, there is some suspicion that the benefits cited were superficial and misreported."

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RAPOA model of a program

RESOURCES

(examples)

- staff time, expertise
- consumer time, expertise
- space
- assessment instruments
- client time
- transportation
- medication
- iDevices
- & much more!

ACTIVITIES

(examples)

- intake
- assessment
- diagnosis
- assignment to team
- social skills
- ongoing assessment
- relapse prevention
- transition to self-management

PROCESSES

(examples)

- heightened client expectation of success
- acquisition of social skills
- acquire relapse prevention skills
- acquire self-management skills

OUTCOMES

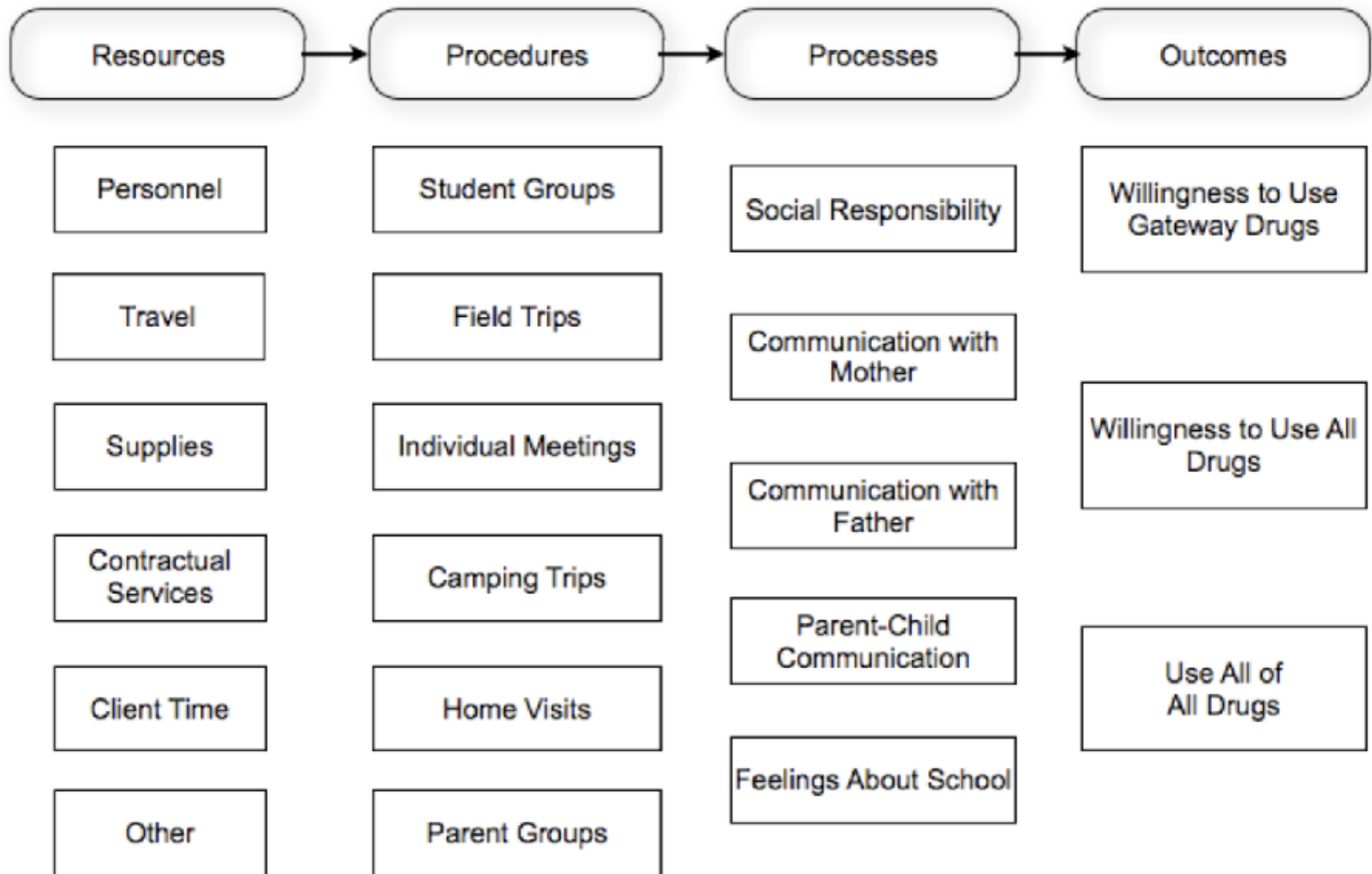
(examples)

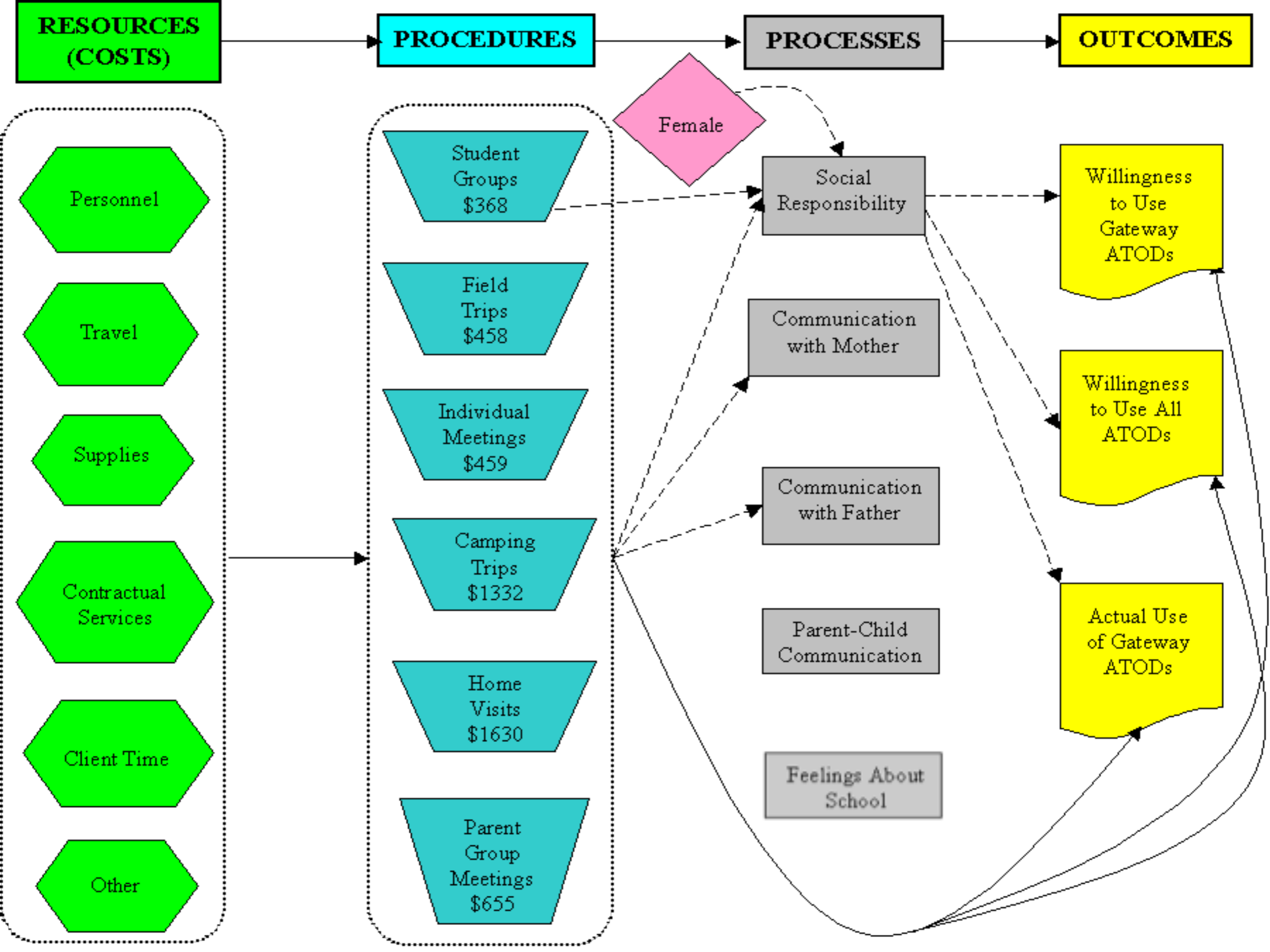
- improved functioning
- less drug use
- more income
- more productivity
- less use of health services
- less use of criminal justice services

Resource → Activity →

Process → Outcome model
of a Drug Abuse Prevention
program

Audrey Kissel's MA thesis at AU





Q&A #1

examples

Alexis French, M.A.

cost-effectiveness of parent-child interaction training (PCIT)

- alternative delivery sites: client homes versus clinics
- cost perspectives: provider, client, administrator, overall
- lessons learned about measuring costs

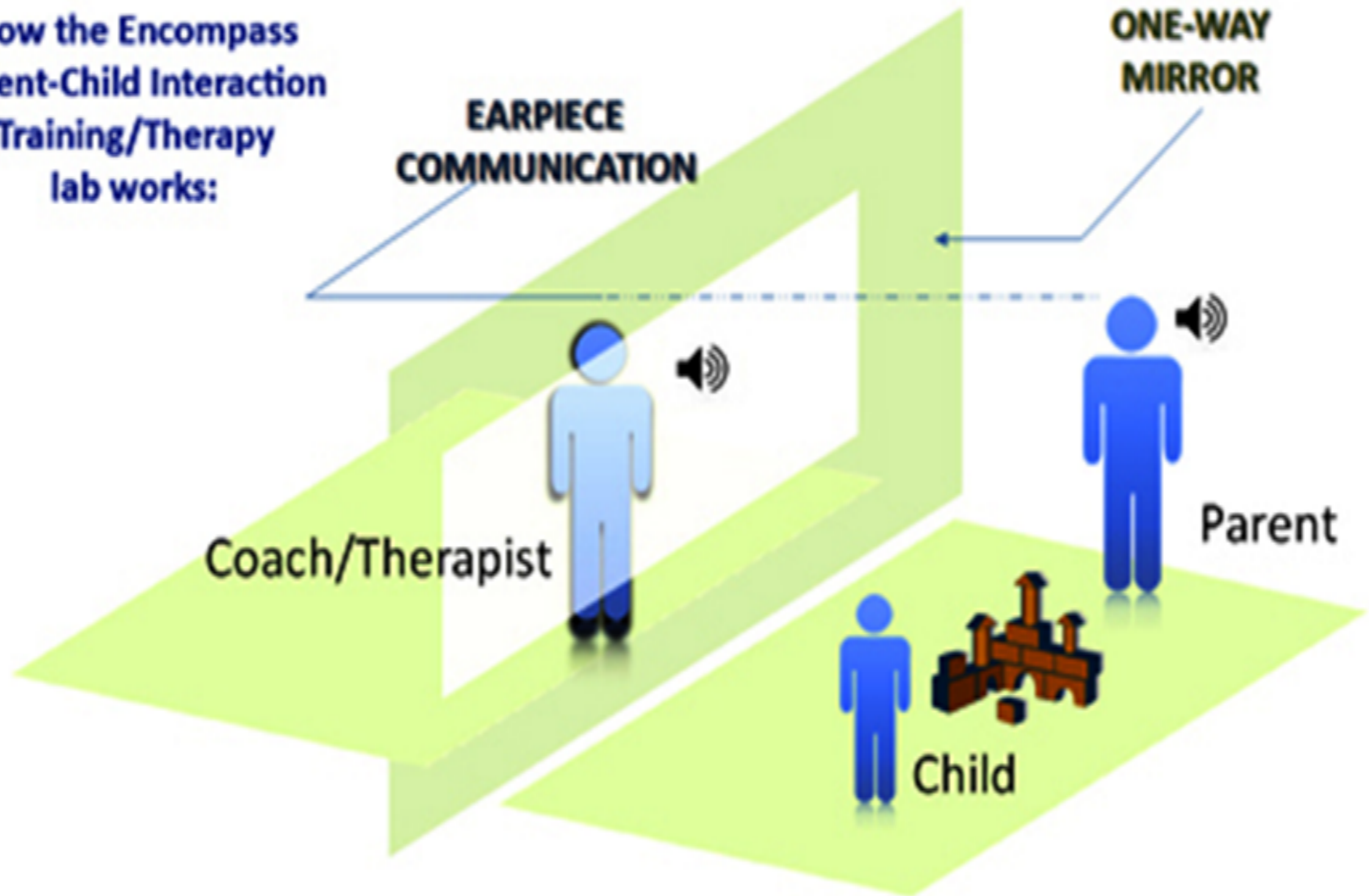
Challenges of Evaluating Costs and Effectiveness of Parent-Child Interaction Therapy (PCIT) From a Quasi-Experimental Design

Alexis French, M.A.

What is PCIT?

- Aims to improve quality of the parent-child relationship and change parent-child interactions
- Target population: children ages 2 to 7 and their parents
- 12 to 16 weekly sessions

**How the Encompass
Parent-Child Interaction
Training/Therapy
lab works:**



Study details

- Quasi-experimental design
- N = 264 (139 clinic-based; 125 home-based)
- Effectiveness data collected previously by University of Delaware (collaborator, Timothy Fowles, Ph.D.)
- Research questions: From the 4 perspectives, which treatment setting (clinic versus home) is less costly and more effective?

Design Issues



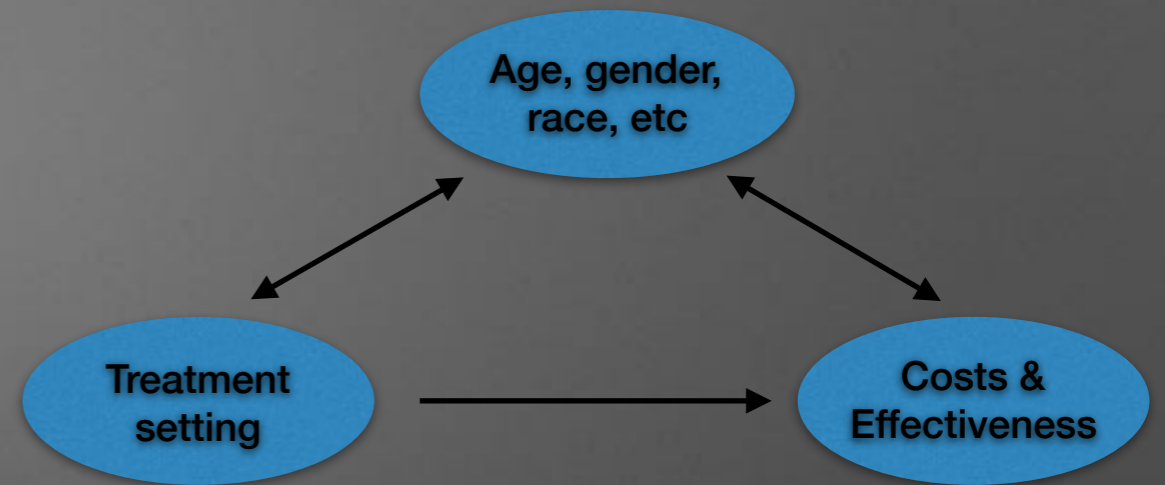
- Perspectives on costs
- Quasi-experimental design and dealing with confounds
- Nonexistent data on costs
- Missing data for demographics and effectiveness

Perspectives on Costs

- “Perspectives” are not only stakeholders
- Perspectives can also be defined as those investing resources into the treatment
- 4 perspectives we examined: Client, Provider, Administrative, & Overall

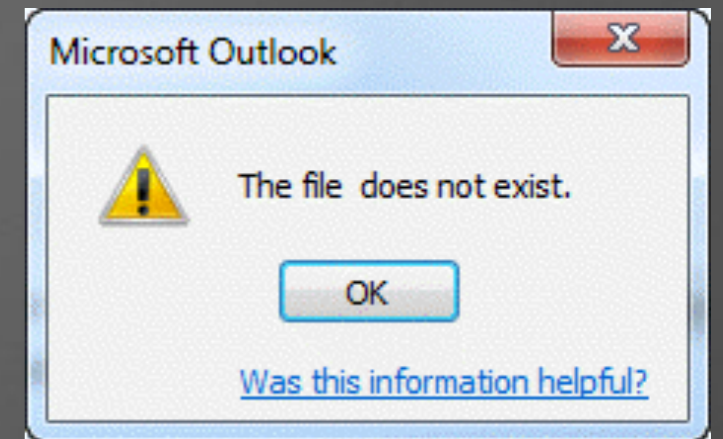
A photograph of a piece of yellow graph paper with the words "PERSPECTIVE IS EVERYTHING" written in large, bold, black, hand-drawn capital letters. The text is arranged in three lines: "PERSPECTIVE" on the top line, "IS" in the middle, and "EVERYTHING" on the bottom line. The paper has a grid pattern and a slightly aged, yellowish tint.

Quasi-Experimental Design



- Nonrandom assignment
- Possible confounds - effects of child's age, gender, race, and number of referring problems
- Dealt with possible confounds by using a Multivariate Analysis of Covariance (MANCOVA)
 - Removes the effects of the covariates

Nonexistent Data on Costs



- Cost data were collected post-hoc
- **Plan A:** Used surveys and interviews to gather specific info on providers. Number of problems though.
- **Plan B:** Tossed most of the information collected from surveys and interviews. Estimated costs using websites and tools such as U.S. Bureau of Labor, GSA, City Feet and LoopNet, Mapquest, etc.

Ingredients for PCIT

- Time
- Transportation
- Space
- Equipment



Valuing Client & Provider Costs



- **Cost of time:**
 - Clients: Hourly rate = median annual salary in Delaware ÷ 2,000 hours
 - Providers: Hourly rate = annual salary X 30% (benefits) ÷ 2,000 hours
 - Travel time = # of miles traveled ÷ 45 mph X hourly rate
- **Mileage reimbursement:**
 - # of miles traveled X GSA rate for 2015

Valuing Administrative Costs



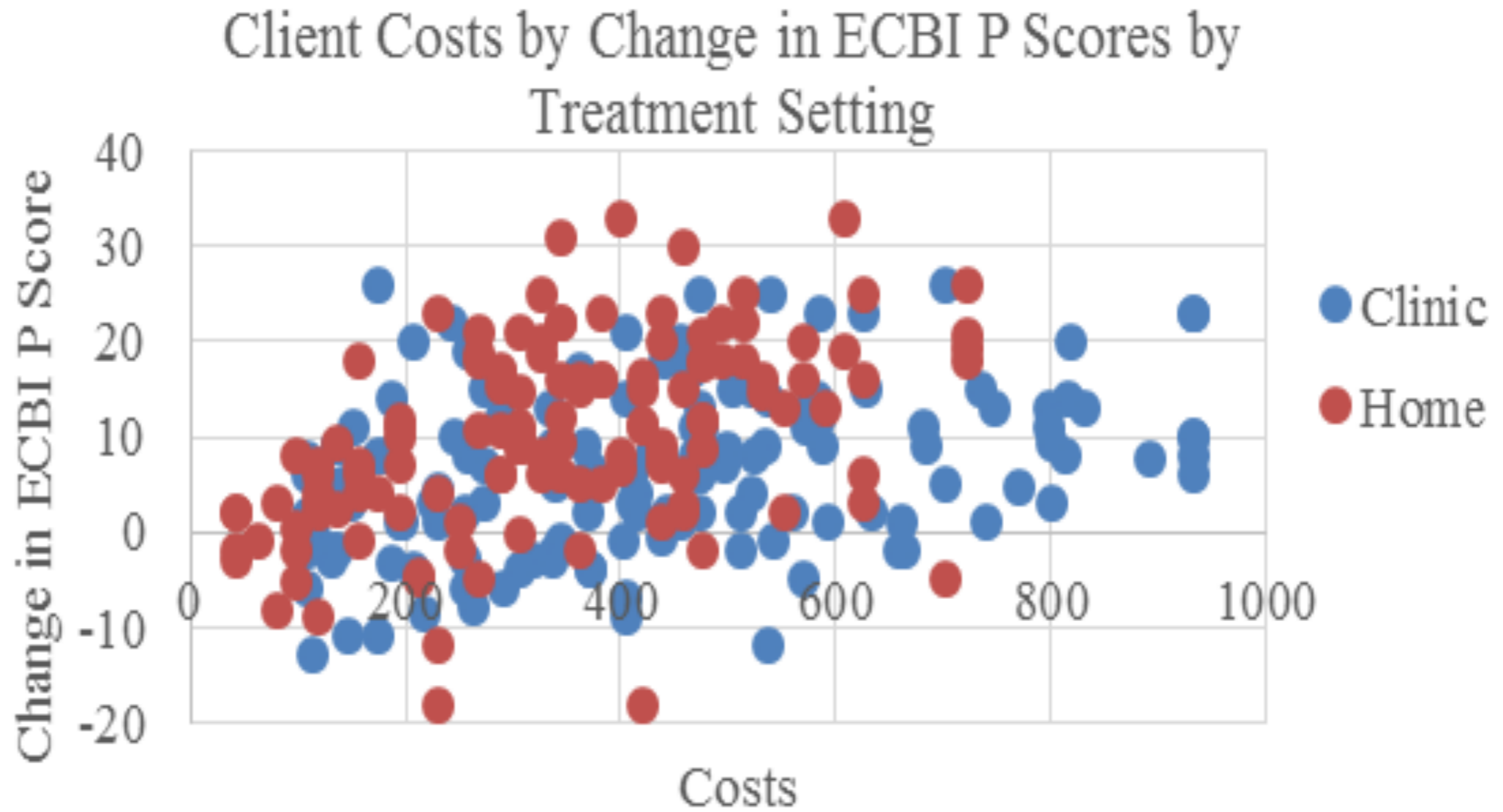
- **Cost of space:** Used City Feet and LoopNet, and identified median monthly rent for an office space in the respective city.
- **Cost of using space** = $1 \text{ hr} \times 272.25 \text{sq}^2 \times \text{cost of square footage (Mdn} = \$16) \div 2,000$
- **Equipment:** Necessary equipment per PCIT International's list: laptop, toys, bug-in-the-ear, mirror and installation, camera, ECBI measure, ECBI and DPICS manual.

Missing data

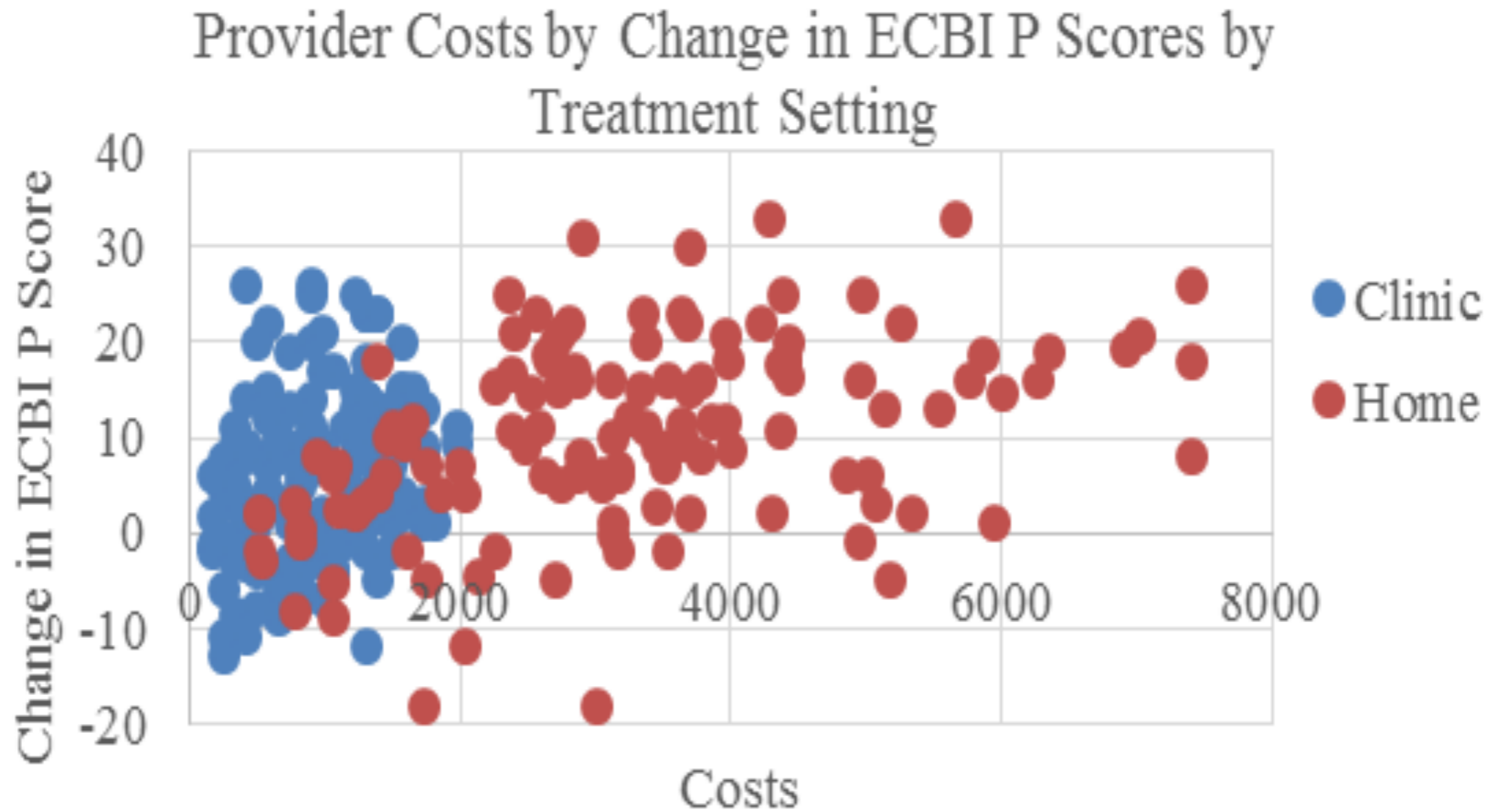
- Missing data on demographic info and effectiveness
 - Multiple imputation = created 5 datasets
 - Problem: Little guidance on how to report findings
 - Listwise deletion = removed cases with “missingness”
 - Problem: Decreases sample size
- Even after manipulating data, there were a number of extreme outliers. “Winsorized” data, but still ended up with non-normality.



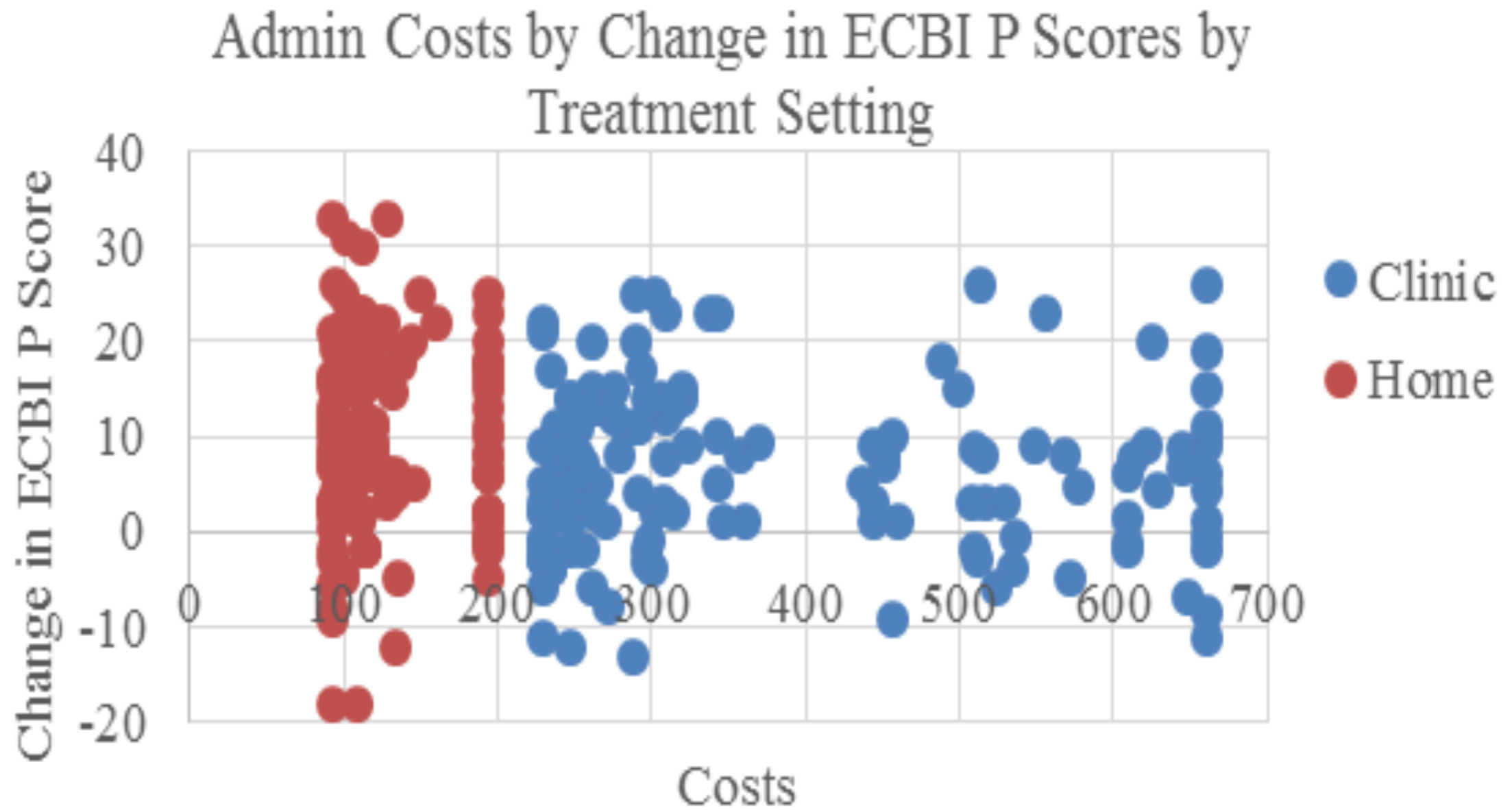
Results



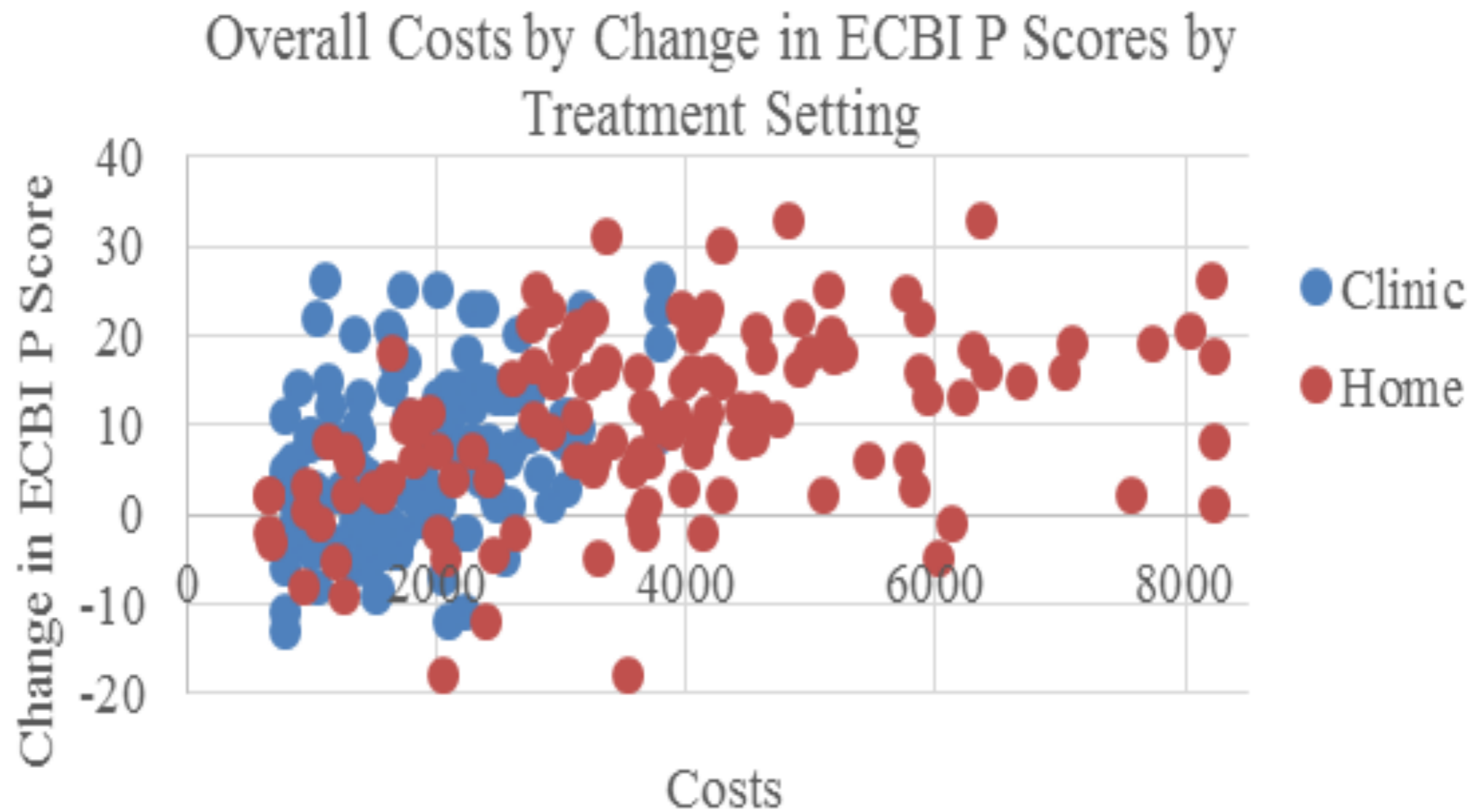
Results



Results



Results



Results

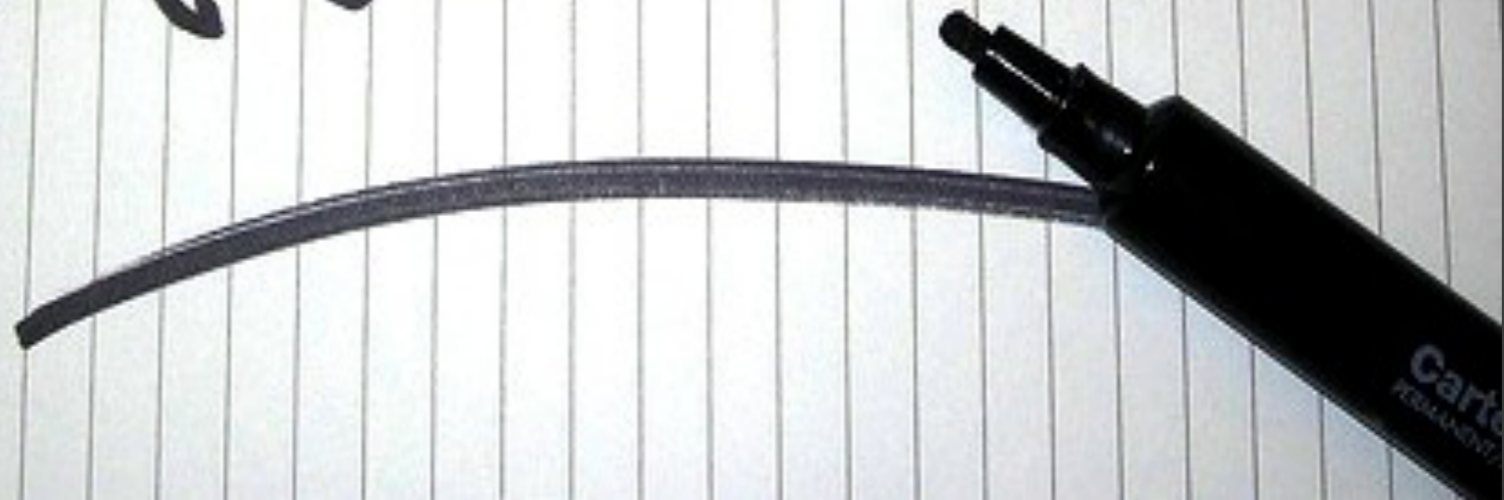
Effectiveness	<ul style="list-style-type: none">• Home-based > Clinic-based
Costs	<ul style="list-style-type: none">• Provider & Overall: Clinic-based < Home-based• Administrative: Home-based < Clinic-based• Client: no difference
Cost-Effectiveness	<ul style="list-style-type: none">• Provider: Clinic-based < Home-based• Overall: Clinic-based < Home-based• Client & Administrative: no differences

Suggestions for future research



- IDEALLY, collect cost data concurrently with effectiveness data after each session
- Weekly logs tracking time and travel
- Keep receipts for monthly rent and equipment
- Collect clients' annual salary and benefits at beginning of study
- Administrative staff also should track providers' pay

Questions?



Hillside Work-
Scholarship Connection

Maria Roncal

Business Process Coordinator

recognizing,
overcoming
obstacles to cost-
inclusive evaluation

“all you care about is
(money) (efficiency)”

cost-*inclusive* evaluation

... may mean balancing outcomes
against resources to enhance quality
of life for the most of us ...

common pitfalls when measuring resources:

- distinguish between price and value
- itemize resources for each activity:
 - types of resources
 - *amounts* of those resources
 - unit value of those resources

(allows better replication of programs too)

“if something works,
we’ll find the money
to pay for it”

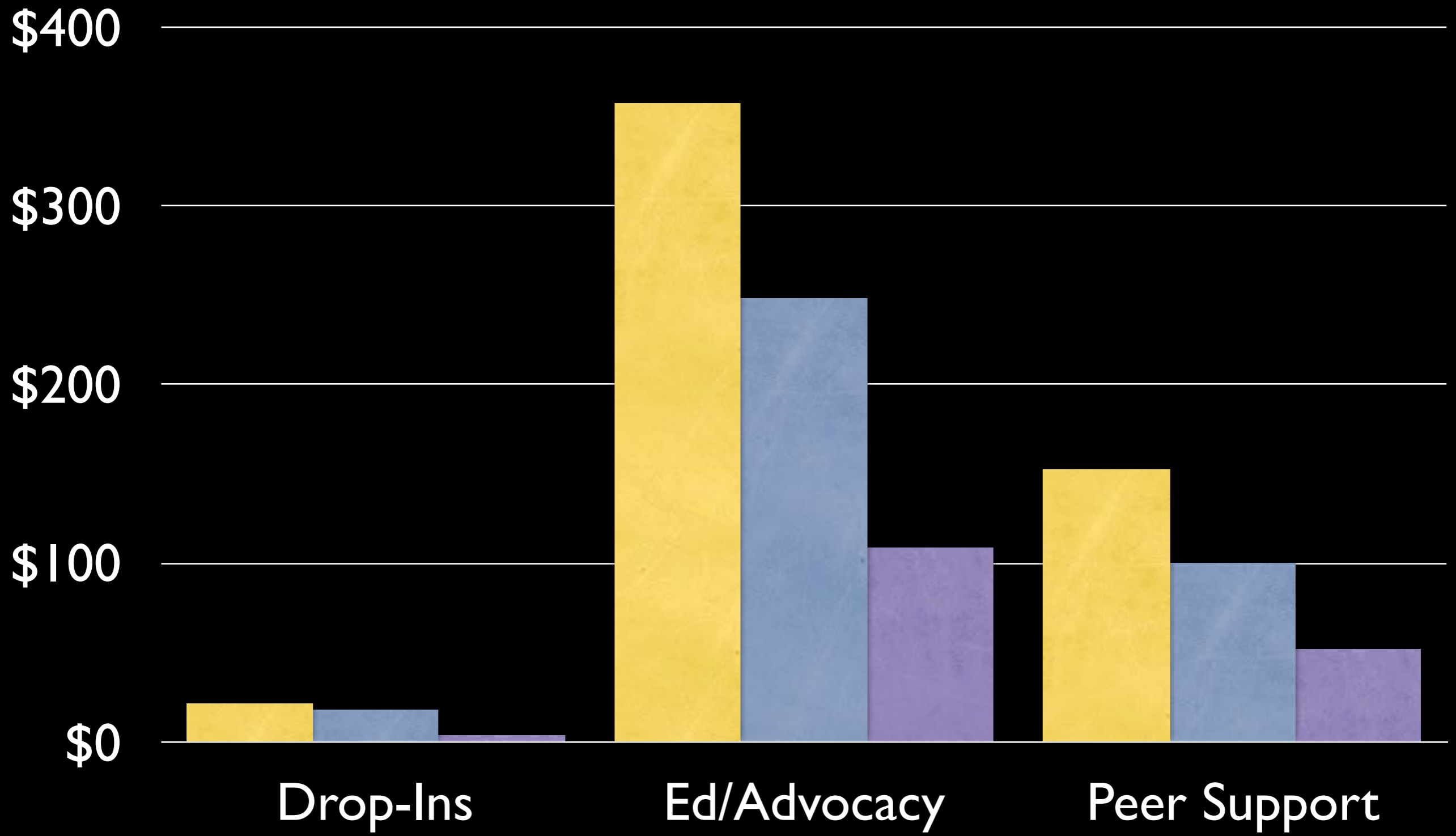
- actually offered by a journal manuscript reviewer as a reason to not prioritize cost assessment in research
- “I wish I lived in that world...”

“It’s simple. You get
what you pay for.”

Consumer-Operated Services (COS) Costs

actually, it might not be the
method ... but the delivery
system!

- Cost per Visit (Volunteered & Donated Added)
- Cost per Visit (Just Expenditures)
- Savings Using Volunteered & Donated Resources



“cost-inclusive
evaluation favors the
wealthy”

avoid pitfalls when valuing resources produced as ...

- income produced
 - but what of inequities in income pay rates?
- social, e.g., health care, resources no longer used
 - ... but still needed?

“OK: let the bean-
counters do it.”

dangers of letting any one
interest group ...

... define, measure,
compare, and interpret
findings of cost-inclusive
evaluation

one interest group is easier to control with ...

- funding
- employment, benefits
- advancement

“Is cost-inclusive
evaluation worth it?”

Good Question!
let's collect the data

resources for
learning more

cost-inclusive evaluation at the
American Evaluation
Association (AEA)

Cost, Effectiveness, Benefits, and
Economics TIG

CEBE TIG

websites for cost-inclusive evaluation



- Tufts University at their Center for the Evaluation of Value & Risk in Health
- <https://research.tufts-nemc.org/cear4/default.aspx>

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Updated Inventory of Evidence- and Research-Based Practices: Washington's Learning Assistance Program

Annie Pennucci, Matt Lemon

September 2014

Washington State provides funding to school districts to help underachieving students through the Learning Assistance Program (LAP). The 2013 Washington State Legislature directed the Washington State Institute for Public Policy to prepare an inventory of evidence-based and research-based effective practices, activities, and programs for use by school districts in LAP and to update the inventory each two years thereafter.

This report describes the updated inventory of evidence-based and research-based practices for use in LAP.

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Preventing Youth Substance Use: A Review of Thirteen Programs

Sean Hanley, Steve Aos

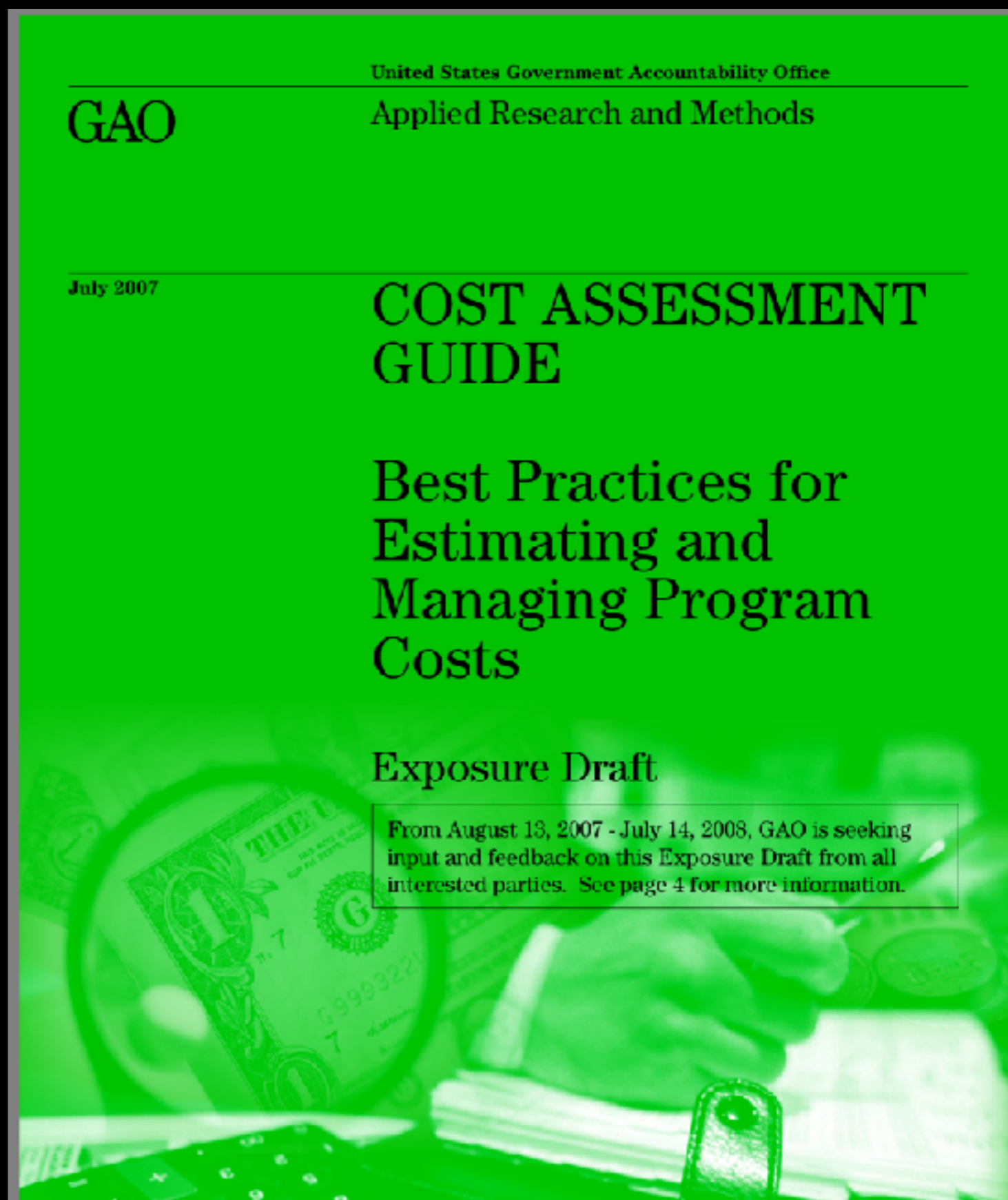
September 2014

Initiative 502, passed by Washington voters in November 2012, legalized recreational marijuana use for adults in the state. The initiative directed WSIPP to evaluate the policy by considering benefits and costs across a number of key areas including public health, public safety, and criminal justice.

As part of this assignment, we reviewed the evaluation literature on 13 youth prevention programs. These programs are on the state

US GAO Cost Assessment Guide

- <http://www.gao.gov/new.items/d071134sp.pdf>
- (2007)



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COST ANALYSIS IN PROGRAM EVALUATION

A GUIDE FOR CHILD WELFARE RESEARCHERS AND SERVICE PROVIDERS

• Create an estimate of total costs

• Estimate program component costs

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This guide is relevant for multiple audiences, including program directors and evaluators, child welfare agency administrators, funders of research studies and evaluation projects, and other important stakeholders who rely on child welfare evaluation.

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