



EVALUATION 2013:

# Evaluation Practice in the Early 21st Century

October 14-19, 2013 | Washington, DC

**Skill-Building  
Workshop**

## Cost-Inclusive Evaluation (CIE)

*Planning It, Doing It, Using It*



## overview of cost-inclusive evaluation

Evaluating the costs of programs is the missing link between

- doing a superficial evaluation
- doing an evaluation that gets changes made and funding delivered

Evaluating the monetary outcomes of programs can help, too.

# your workshop leader

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# schedule

|      |                                       |
|------|---------------------------------------|
| 8:00 | overview of cost-inclusive evaluation |
| 8:15 | evaluating costs                      |
| 8:45 | evaluating benefits & other outcomes  |
| 9:00 | combining cost and outcome info       |
| 9:15 | beyond costs and outcomes             |



# you will learn:

- what a “cost study” is ... and can be
- how evaluations can include resources used, and resources produced, by a program
- basic tools for conducting and using several forms of cost-inclusive evaluation

overview of cost-inclusive evaluation

What a cost study is ...



## overview of cost-inclusive evaluation

# modeling program theory:



## overview of cost-inclusive evaluation

# types of cost studies

- cost only
  - program cost ... cost per client per visit
- outcomes (monetary) only
- cost → outcome
  - cost → benefit
  - cost → effectiveness, cost → utility
- resource → activity → process → outcome



tools for cost-inclusive evaluation

tools  
for cost-inclusive  
evaluation

tools for cost-inclusive evaluation

... tools to measure

- resources used (aka “costs”)
- resources produced (aka “benefits”)

by a program

by programs



tools for cost-inclusive evaluation

## Qualitative tools...

- shift rapidly between multiple perspectives
- view costs as not money
- view outcomes possibly as money
- consider that neither outcomes nor costs may be what's most important

tools for cost-inclusive evaluation

## Quantitative tools...

- spreadsheet functions:  
inflation, present-value
- statistics
  - nonparametric analyses
  - parametric analyses



tools for cost-inclusive evaluation

*for quant & qual evaluation...*

database access to the region's:

- health service system
- criminal justice system
- income supplement / welfare system
- other entitlement providers

tools for cost-inclusive evaluation

*To do CIE (cost-inclusive evaluation):*

awareness of resistance

- ... to evaluation in general
- ... to cost-inclusive evaluation in particular
- deal-with-able, if not solvable

perhaps: resistance  $\propto$  importance

evaluate costs

evaluating costs

evaluate costs

costs can be reported as:

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



evaluate costs

# problems with “cost”

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

evaluate costs

# re-conceptualizing costs

- “costs” as what is paid
  - ...to assemble the resources for a program
- “costs” as the value of program “ingredients”  
types and amounts of resources, e.g.,
  - personnel time
  - physical plant
  - supplies

evaluate costs

## stakeholder perspectives on costs

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

evaluate costs

# alternative definitions

- What was paid for them (price cost)
- What it took to get them (price, shipping...)
- What would need to be paid for them (replacement cost)
- What they are worth to the community, society (opportunity cost)
- What they are, and how much of them was used (complete description & quantification)

evaluate costs

## costs as types & amounts of resources used

- ... to show contribution of volunteered services and donated facilities
  - fairer comparisons between programs
- translate costs to different countries and times
- replicate program
- understand of what the program is
- improve effectiveness or reduce costs or both

evaluate costs

# common cost data options

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



evaluate costs

## my advice to measure 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 the resulting resource → activity matrix, estimate, the amount of each resource used for each activity
- verify estimates with actual measurements



evaluate costs

# activities (examples)

- Individual Counseling
- Group Counseling
- Acupuncture
- Pharmacotherapy
- Education about HIV and STDs
- Vocational Counseling
- Case Management

evaluate costs

# resources (examples)

- time and skills of treatment personnel
- administrators and office personnel
- space, furniture, equipment
- transportation
- communication services
- liability insurance
- financing

evaluate costs

## construct Resource → Activity Matrices

- provider perspective
- consumer perspective
- consumer family perspective
- taxpayer perspective
- community perspective
- funder perspective
- evaluator perspective

evaluate costs

# Resource → Activity Matrix

| Program Resources<br>↓ | ← Program Activities → |                  |     |            |
|------------------------|------------------------|------------------|-----|------------|
|                        | Individual Counseling  | Group Counseling | ... | Evaluation |
| Personnel              |                        |                  |     |            |
| Space                  |                        |                  |     |            |
| ...                    |                        |                  |     |            |
| Administration         |                        |                  |     |            |

evaluate costs

## Resource Use: Resource → Activity Matrix I

| Program Resources<br>↓ | ← Program Activities → |                  |     |                |
|------------------------|------------------------|------------------|-----|----------------|
|                        | Individual Counseling  | Group Counseling | ... | Evaluation     |
| Personnel              | 200 hours              | 300 hours        | ... | 40 hours       |
| Space                  | 300 square feet        | 600 square feet  | ... | 60 square feet |
| ...                    |                        |                  | ... |                |
| Administration         |                        |                  | ... |                |



evaluate costs

## Unit Cost: Resource → Activity Matrix 2

| Resources<br>↓ | ← Activities →           |                     |     |                     |
|----------------|--------------------------|---------------------|-----|---------------------|
|                | Individual<br>Counseling | Group<br>Counseling | ... | Evaluation          |
| Personnel      | \$60/hour                | \$40/hour           | ... | \$30/hour           |
| Space          | \$40/square<br>foot      | \$20/square<br>foot | ... | \$20/square<br>foot |
| ...            |                          |                     | ... |                     |
| Administration |                          |                     | ... |                     |

evaluate costs

Use  $\times$  Cost: Resource  $\rightarrow$  Activity Matrix 3:

| Resources<br>↓ | ← Activities →                                  |   |     |   |
|----------------|---|---|-----|---|
|                | Individual<br>Counseling                        | Group<br>Counseling                             | ... | Evaluation                                      |
| Personnel      | 200 hours $\times$<br>\$60/hour                 | 300 hours $\times$<br>\$40/hour                 | ... | 40 hours $\times$<br>\$30/hour                  |
| Space          | 300 square feet<br>$\times$ \$40/square<br>foot | 600 square feet<br>$\times$ \$20/square<br>foot | ... | 60 square<br>feet $\times$ \$20/<br>square foot |
| ...            |   |   | ... |   |
| Administration |   |   | ... |   |

evaluate costs

# Resource → Activity Matrix 3 after calc's

| Resources<br>↓ | ← Activities →           |                     |     |            |
|----------------|--------------------------|---------------------|-----|------------|
|                | Individual<br>Counseling | Group<br>Counseling | ... | Evaluation |
| Personnel      | \$12,000                 | \$12,000            | ... | \$1,200    |
| Space          | \$12,000                 | \$12,000            | ... | \$1,200    |
| ...            |                          |                     | ... |            |
| Administration |                          |                     | ... |            |

evaluate costs

total, add overhead: Resource → Activity Matrix 4

| Resources<br>↓ | ← Activities →           |                     |     |            | Total of<br>Resources |
|----------------|--------------------------|---------------------|-----|------------|-----------------------|
|                | Individual<br>Counseling | Group<br>Counseling | ... | Evaluation |                       |
| Personnel      | \$12,000                 | \$12,000            | ... | \$1,200    | \$50,000              |
| Space          | \$12,000                 | \$12,000            | ... | \$1,200    | \$30,000              |
| ...            | ...                      | ...                 | ... | ...        | ...                   |
| Administration |                          |                     | ... |            | \$100,000             |

evaluate costs

apportion overhead 1 of 2: Resource → Activity Matrix 5

| Resources<br>↓                      | ← Activities →           |                     |     |            | Total of<br>Resources |
|-------------------------------------|--------------------------|---------------------|-----|------------|-----------------------|
|                                     | Individual<br>Counseling | Group<br>Counseling | ... | Evaluation |                       |
| Personnel                           | \$12,000                 | \$12,000            | ... | \$1,200    | \$50,000              |
| Space                               | \$12,000                 | \$12,000            | ... | \$1,200    | \$30,000              |
| ...                                 |                          |                     | ... |            |                       |
| Total Cost of<br>Direct<br>Services | \$35,000                 | \$30,000            | ... | \$7,000    | \$100,000             |
| Administration                      |                          |                     | ... |            | \$100,000             |

evaluate costs

apportion overhead 2 of 2: Resource → Activity Matrix 6

| Resources<br>↓                   | ← Activities →           |                     |     |            | Total of<br>Resources |
|----------------------------------|--------------------------|---------------------|-----|------------|-----------------------|
|                                  | Individual<br>Counseling | Group<br>Counseling | ... | Evaluation |                       |
| Personnel                        | \$12,000                 | \$12,000            | ... | \$1,200    | \$50,000              |
| Space                            | \$12,000                 | \$12,000            | ... | \$1,200    | \$30,000              |
| ...                              |                          |                     | ... |            |                       |
| Total Cost of<br>Direct Services | \$35,000                 | \$30,000            | ... | \$7,000    | \$100,000             |
| Administration                   | \$35,000                 | \$30,000            | ... | \$7,000    | \$100,000             |

evaluate costs

# Resource Cost TOTALS

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



evaluate benefits & other outcomes

evaluating benefits &  
other outcomes

evaluate benefits & other outcomes

assessing benefits

evaluate benefits & other outcomes

# Benefits

- types of benefits
- measurement and monetization strategies

evaluate benefits & other outcomes

# types of benefits

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

evaluate benefits & other outcomes

can 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

evaluate benefits & other outcomes

converting effectiveness to

benefits, continued

- *monetization* strategies for income(necessary!)
- actual income, from self-report or records
- estimated income, given profession or hours worked
- include value of time volunteered, donated
- include any enterprise profit!

## evaluate benefits & other outcomes

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



## evaluate benefits & other outcomes

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

evaluate benefits & other outcomes

assessing effectiveness

evaluate benefits & other outcomes

# Effectiveness

- this is what evaluators excel at!
- from the same perspective as costs
- at the same level of specificity as costs
- But what to do with multiple outcomes?
- But how to compare the effectiveness of different programs?

evaluate benefits & other outcomes

# When outcomes are multiple ...

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

evaluate  
benefits &  
other  
outcomes

# OBSERVATION SHEET

Client:

Date: / /

Observer:

Companion:

Site

From \_\_\_\_:\_\_\_\_:\_\_\_\_

P/AM to \_\_\_\_:\_\_\_\_:\_\_\_\_ P/AM

## Effectiveness Variables

## Time Intervals

1 2 3 4 5 6 7 8 9

### Negative Behaviors

1. Lying/Cheating/Stealing
2. Noncooperative Verbal Response to Request
3. Noncooperative Nonverbal Response to Request
4. Late/Off-Task
5. Pestering Following Denial
6. Complain/Bitch/Cry to Adults
7. Negative Verbal Interaction
8. Negative Nonverbal Interaction
9. Playing Alone
10. Improper Manners

### Positive Behaviors

1. Honest
2. Cooperative Verbal Response to Request
3. Cooperative Nonverbal Response to Request
4. On Time/On-Task
5. Taking "No" for an Answer
6. Compliment/Thank/Smile to Adult
7. Positive Verbal Interaction
8. Positive Nonverbal Interaction
9. Playing with Others
10. Proper Manners



evaluate benefits & other outcomes

# operational definitions for effectiveness

meetings and instrument testing. For example: “Complaining/Bitching/Crying to Adults” was defined as

... occurring in the absence of (i.e., at least 5 minutes after) any denial of child-initiated requests. *6N* [the behavior] is the critical, verbal expression of dissatisfaction with the present state of affairs. Crying, denoted by tears, and whimpering, are also members of the *6N* category. *6N* behaviors are usually preceded by “Why . . .?” as in “Why are we having spinach again?” “I hate Learning House” and “I feel like a dead horse” are also examples of *6N* behaviors. *6N* is never recorded during family meetings, when complaints and constructive criticism of Learning House and its clients and staff are openly solicited. Minor “tattling,” e.g., “I saw Johnny spill the cat’s milk,” also is a *6N* response.



evaluate benefits & other outcomes

## composite indicators

### Importance Weightings

Staff discussion made it clear that some of the twenty behaviors were more important to normalize than others. Staff and researchers decided that the relative importance of each behavior could be surveyed, transformed into a number, and incorporated into an overall outcome index that would be made by combining data from all effectiveness variables. The six staff members were asked to independently rate the relative importance of each variable using ten-point scales:

(one of the behaviors) is

.....  
much *more*  
important

.....  
much *less*  
important

than other behaviors.

evaluate benefits & other outcomes

# Importance weightings from ratings:

<sup>2</sup> Mathematically expressed, the importance weightings were computed

$$W_b = \frac{\sum_{i=1}^m [r_{i,b} / (\sum_{b=1}^n r_{i,b} / n)]}{m}$$

where  $m$  is the total number of staff members who supplied ratings,  $n$  is the total number of effectiveness variables, and  $r_{i,b}$  is the rating of importance given by staff member  $i$  for effectiveness variable  $b$ .



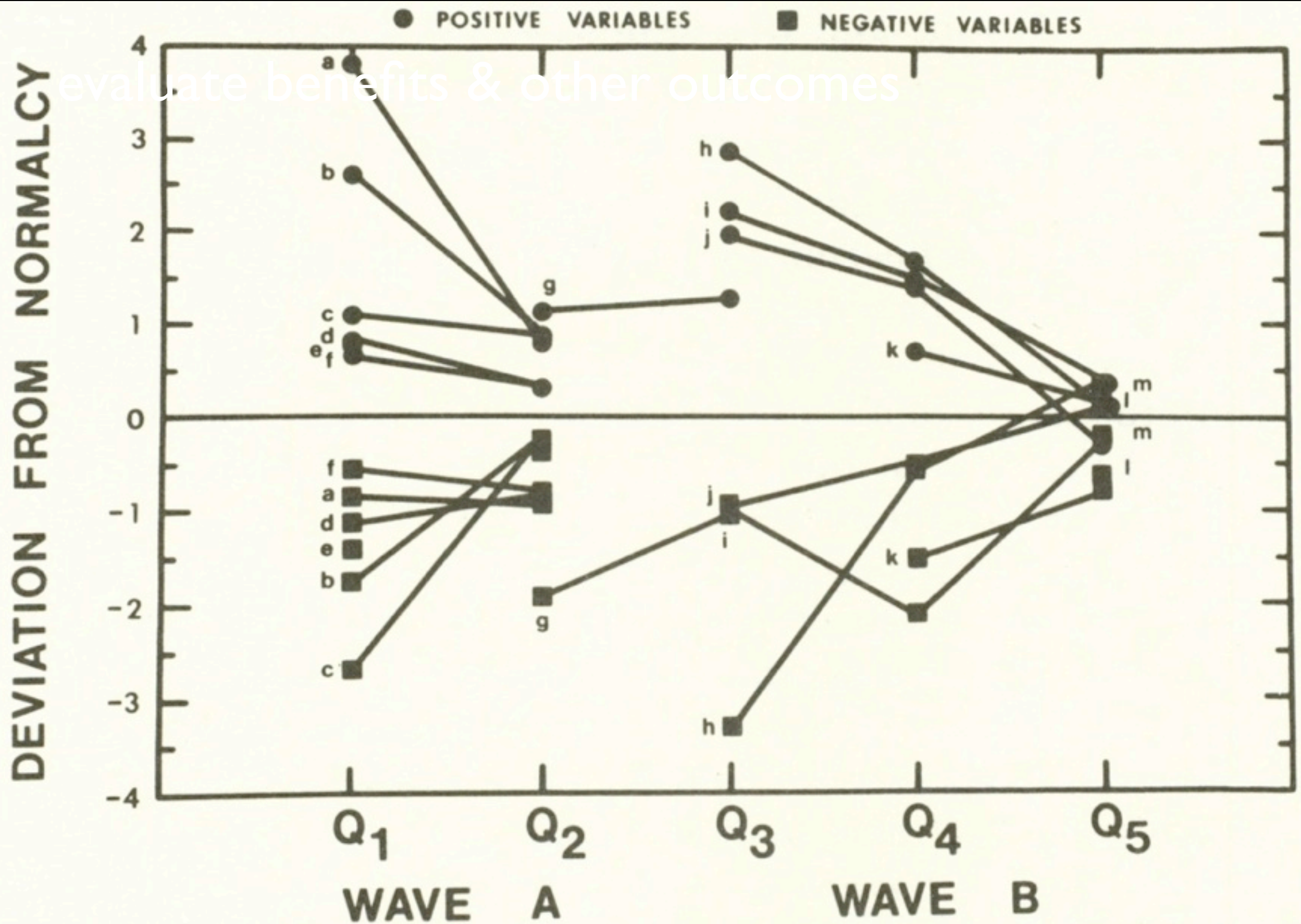


Figure 3. Mean effectiveness for positive and negative effectiveness variables for each child in two successive groups. Lower case letters indicate specific children. From Yates, Haven, and Thoresen (1979).



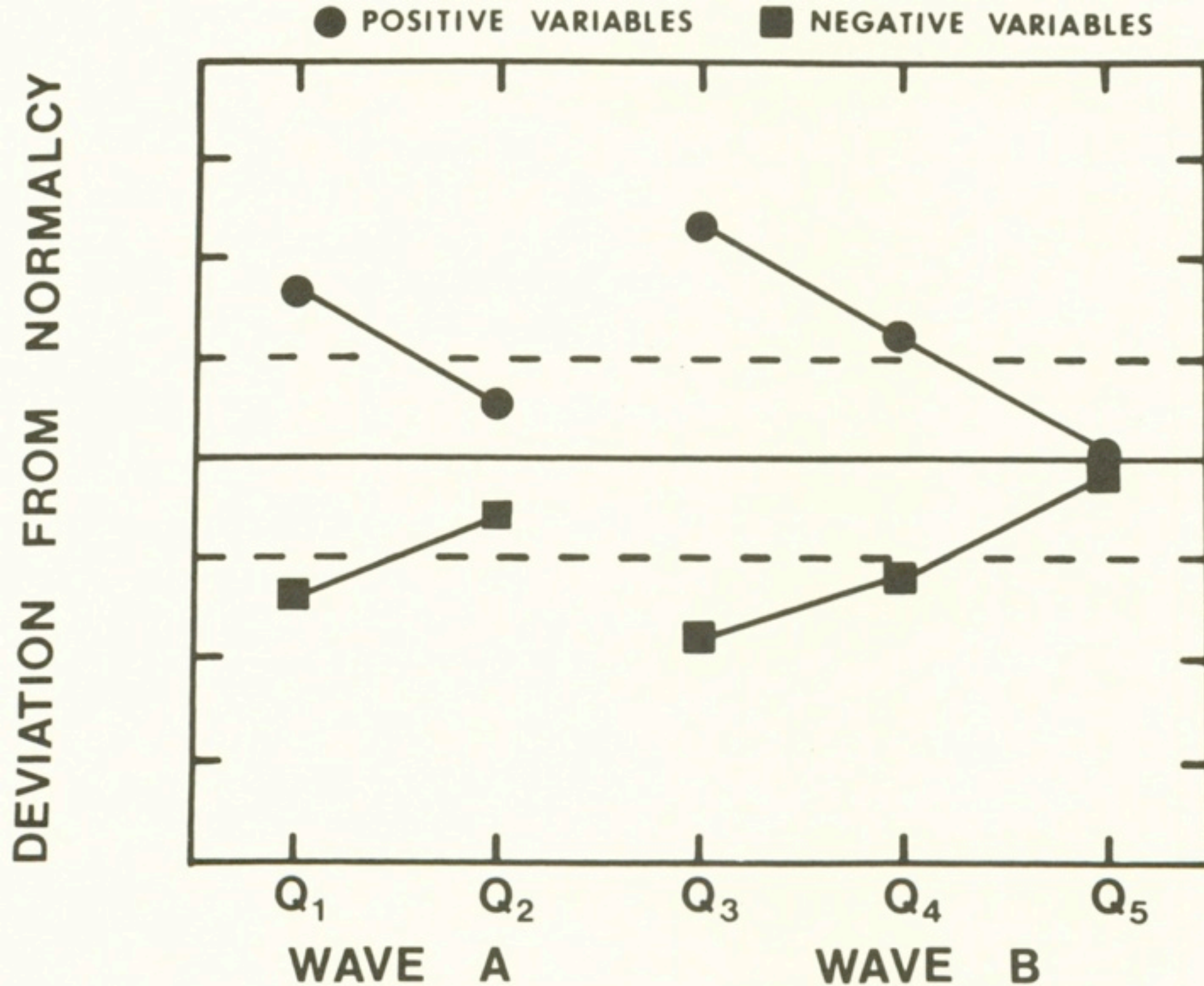


Figure 4. Average effectiveness score for positive and negative effectiveness variables of children who spent two or more quarters in a group (dash lines indicate one standard deviation from normative behavior frequencies). From Yates, Haven, and Thoresen (1979).

evaluate benefits & other outcomes

to compare the  
benefits, effectiveness  
of different programs

- How do you compare apples  
and oranges?

... as fruit!

evaluate benefits & other outcomes

# Estimating health utilities and quality adjusted life years in seasonal affective disorder research

Freed, M. C., Rohan, K. J., & Yates, B. T. (2007).  
*Journal of Affective Disorders*, 100, 83-89

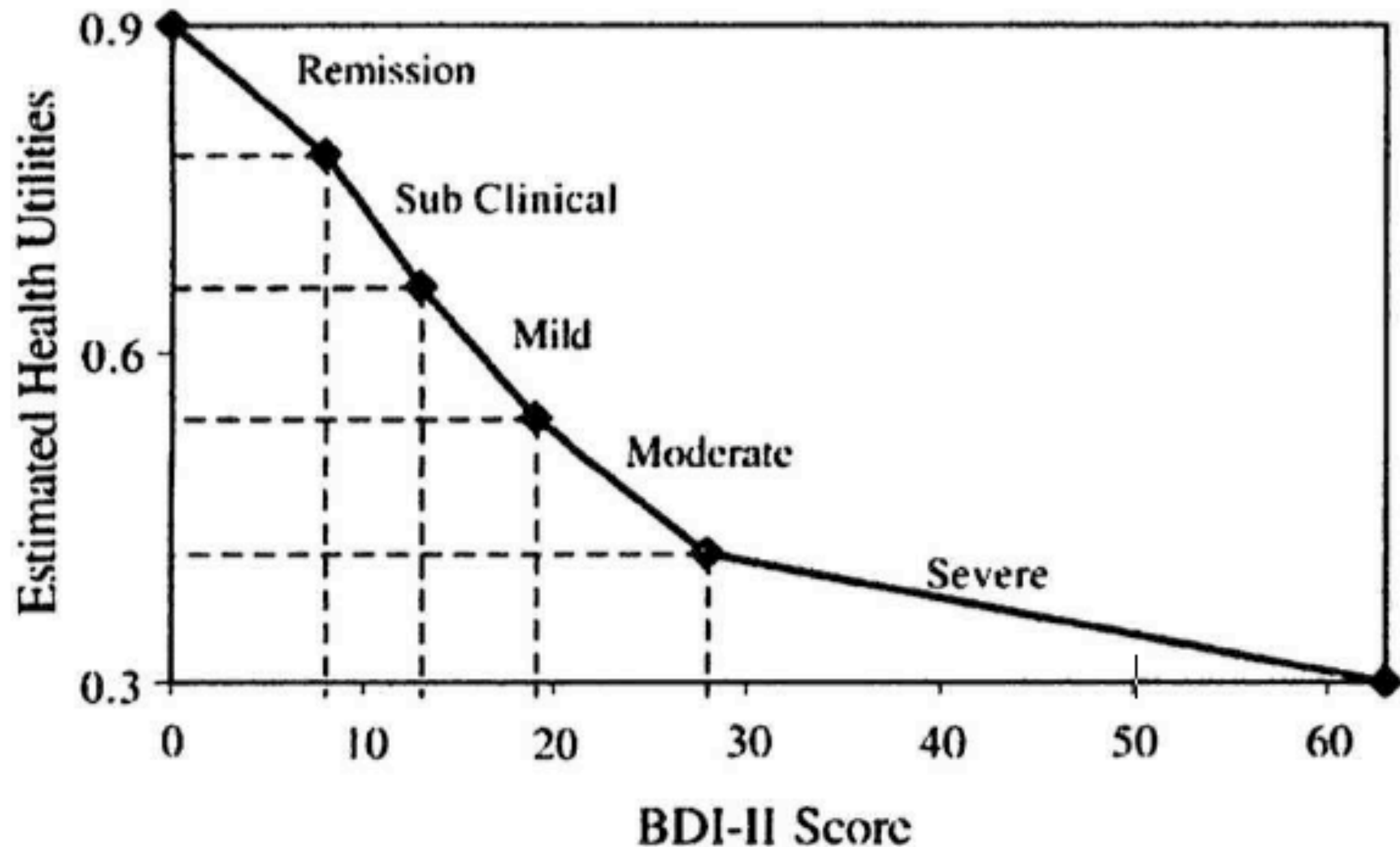
evaluate benefits & other outcomes

# Quality Adjusted Life Year (QALY)

- define QALY
  - 1.00 QALY = 1 year in perfect health
  - 0.00 QALY = death
- indifference gamble: no preference between
  - 6 out of 10 chance of depression cured
- versus
  - 4 out of 10 chance of death

evaluate benefits & other outcomes

translate effectiveness into QALY



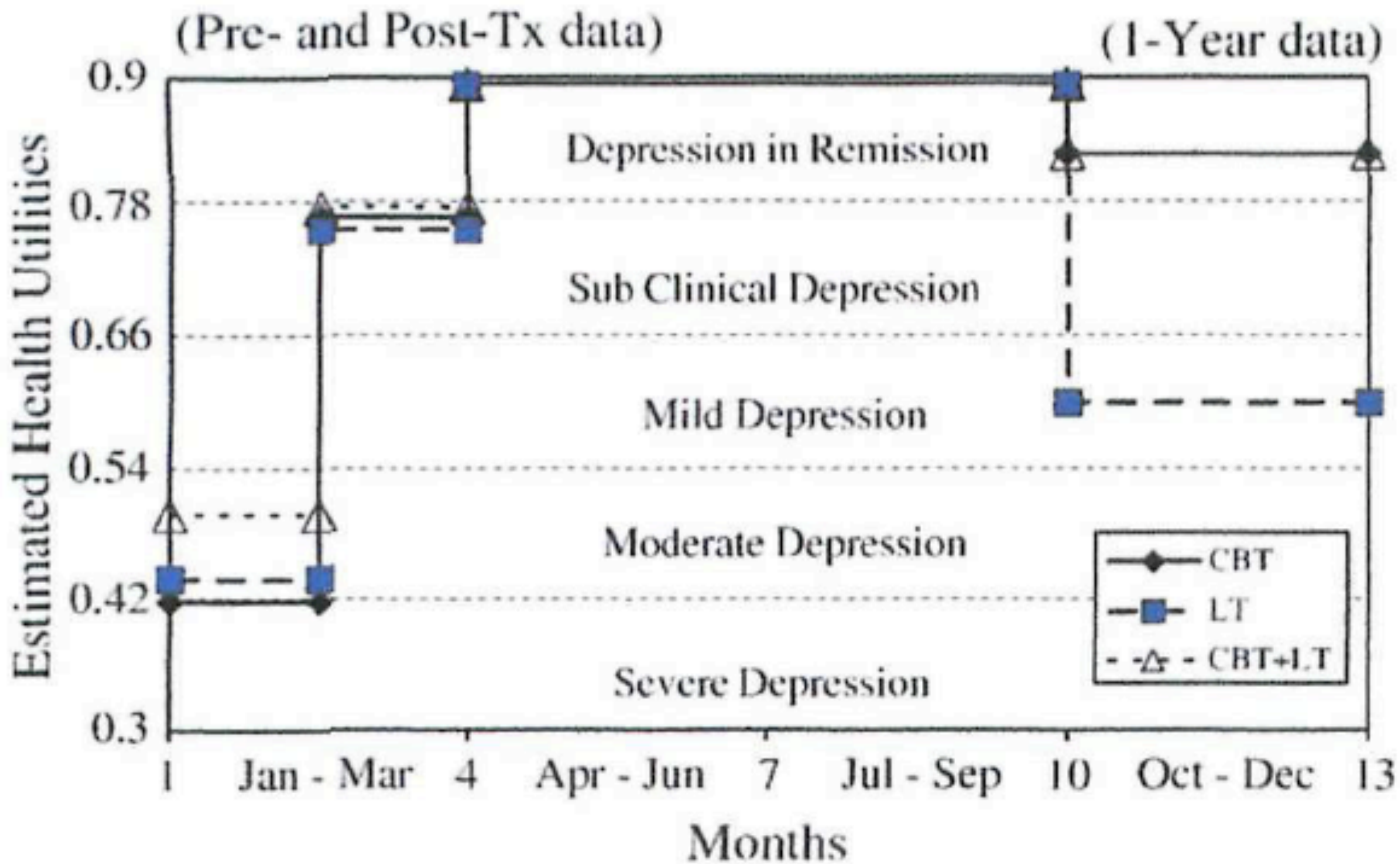
evaluate benefits & other outcomes

compare: Quality Adjusted  
Life Year Gained (QALYG)

- QALY Gained compared
  - Program A: 0.3 QALY
  - Program B: 0.7 QALY
  - QALYG for Program B =  $0.7 - 0.3 = 0.4$



# evaluate benefits & other outcomes





combine cost and outcome info

combining cost and  
outcome info



*"McGuire, what's with you? Everybody else here seems to have a perfectly clear idea of what 'cost effectiveness' means."*

combine cost and outcome info

# Cost-Effectiveness Analysis

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

Examples:

- cost per drug-free day
- cost per child prevented from smoking
- cost per year of life saved
- cost per quality-adjusted life year (\$/QALY)

combine cost and outcome info

# Cost-Benefit Analysis

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

## Examples:

- ratio of dollars spent for therapy versus dollars saved in reduced unnecessary use of health services
- net benefit (after subtracting costs) of diversion program for homeless adults (in terms of reduced use of Emergency Room and jail)

combine cost and outcome info

# Ratio, e.g., Benefit/Cost

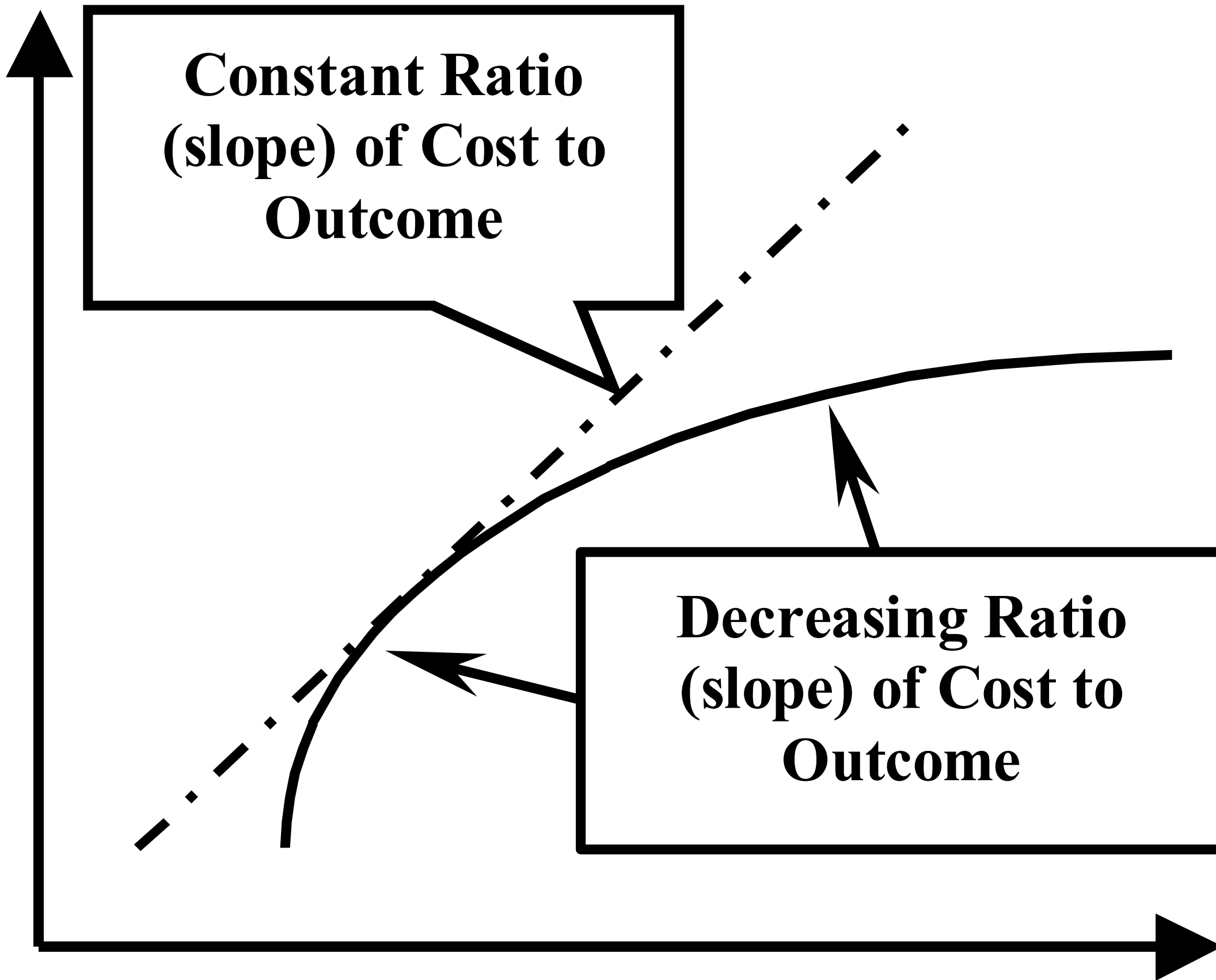
- advantages: simple, memorable, “understandable”
- problems:
  - ratios are, essentially, slopes
    - assumes a linear cost  $\rightarrow$  outcome relationship
  - discards info on:
    - diminishing returns
    - economies of scale
    - step functions

**Outcome**

**Constant Ratio  
(slope) of Cost to  
Outcome**

**Decreasing Ratio  
(slope) of Cost to  
Outcome**

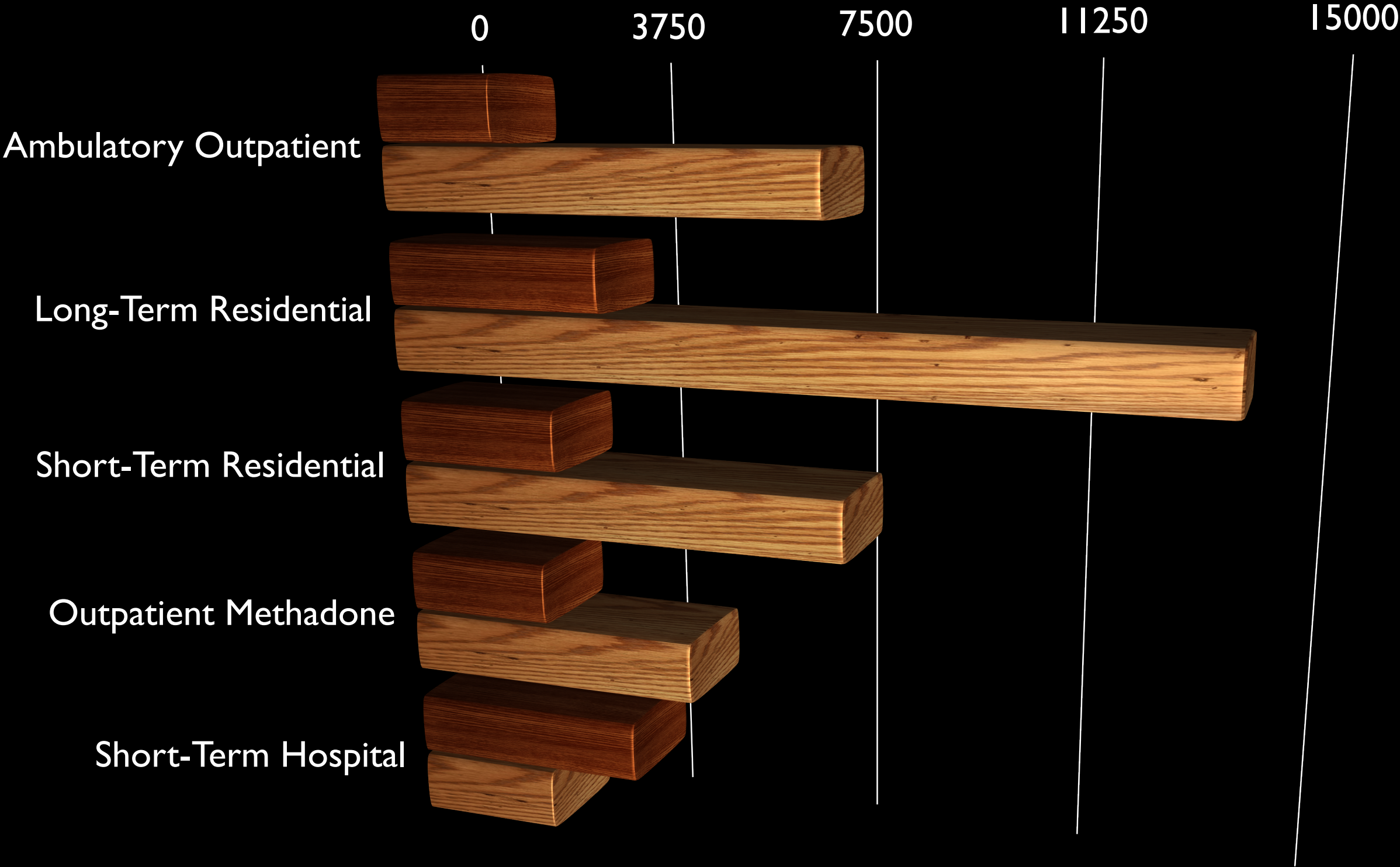
**Cost**





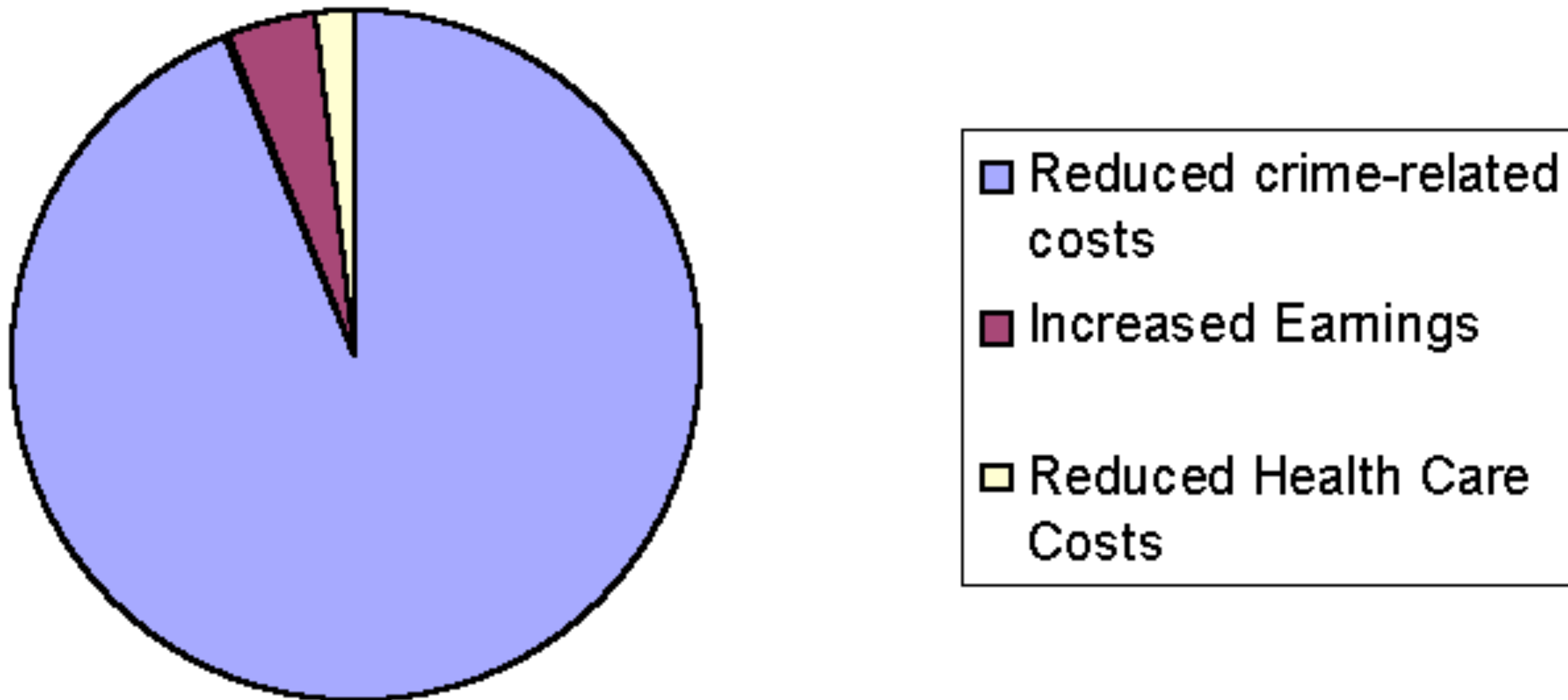
combine cost and outcome info

Costs  
Benefits



combine cost and outcome info

## Cost-Savings from Substance Abuse Treatment (NTIES)





If Benefits  $>$  Costs?

If Benefits < Costs?

combine cost  
and outcome  
info

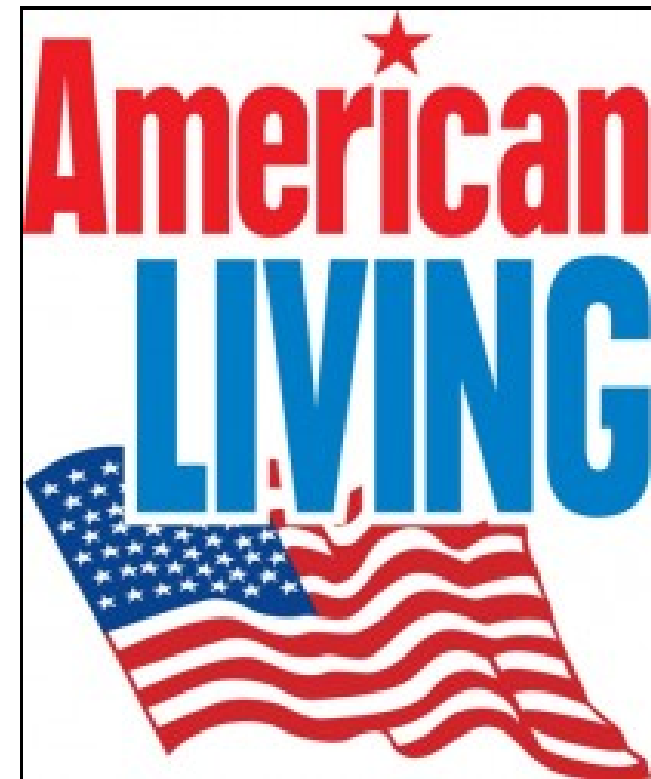


# Cost Of Living Now Outweighs Benefits

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 homeownership (\$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."

 E-MAIL

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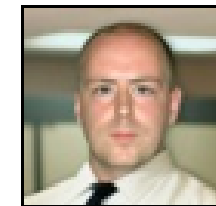
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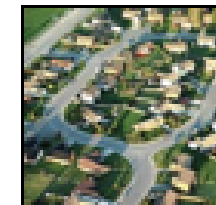
Women Now Empowered  
By Everything A Woman Does

FEBRUARY 19, 2003



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Shatter Office

DECEMBER 18, 2002



What Can Be Done To  
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JUNE 3, 1998

## EMAIL THIS ARTICLE

To:

From:

SUBMIT

beyond just costs and outcomes

beyond costs and  
outcomes

beyond just costs and outcomes

why go beyond just  
costs and outcomes

beyond just costs and outcomes

Resource → Activity →

Process → Outcome

model

of a Drug Abuse Prevention

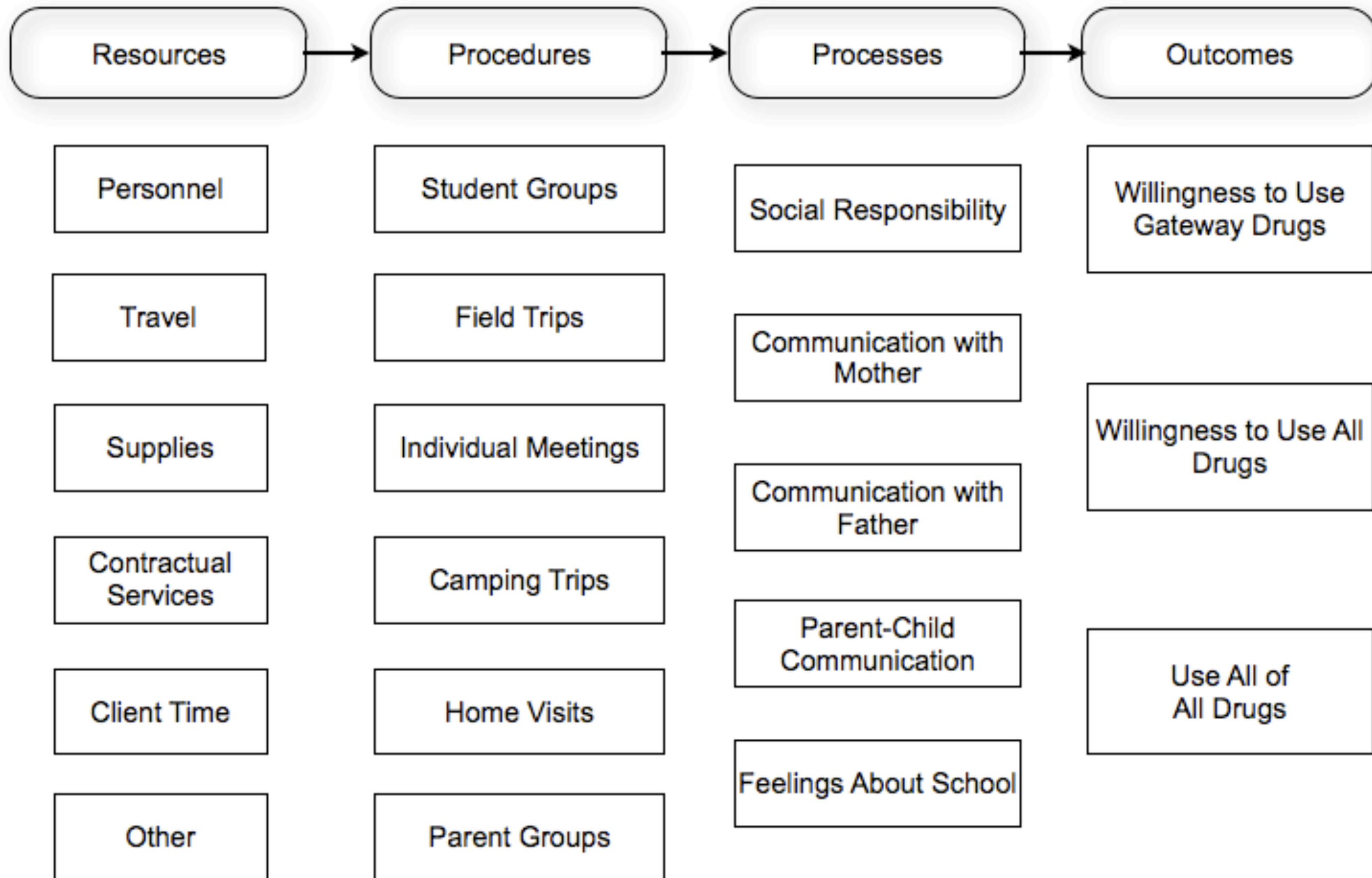
program

Audrey Kissel's thesis at AU

beyond just costs and outcomes

# RAPO model of substance abuse prevention

# beyond just costs and outcomes





## RESOURCES (COSTS)

## PROCEDURES

## PROCESSES

## OUTCOMES

Personnel

Travel

Supplies

Contractual  
Services

Client Time

Other

Student  
Groups  
\$368

Field  
Trips  
\$458

Individual  
Meetings  
\$459

Camping  
Trips  
\$1332

Home  
Visits  
\$1630

Parent  
Group  
Meetings  
\$655

Female

Social  
Responsibility

Communication  
with Mother

Communication  
with Father

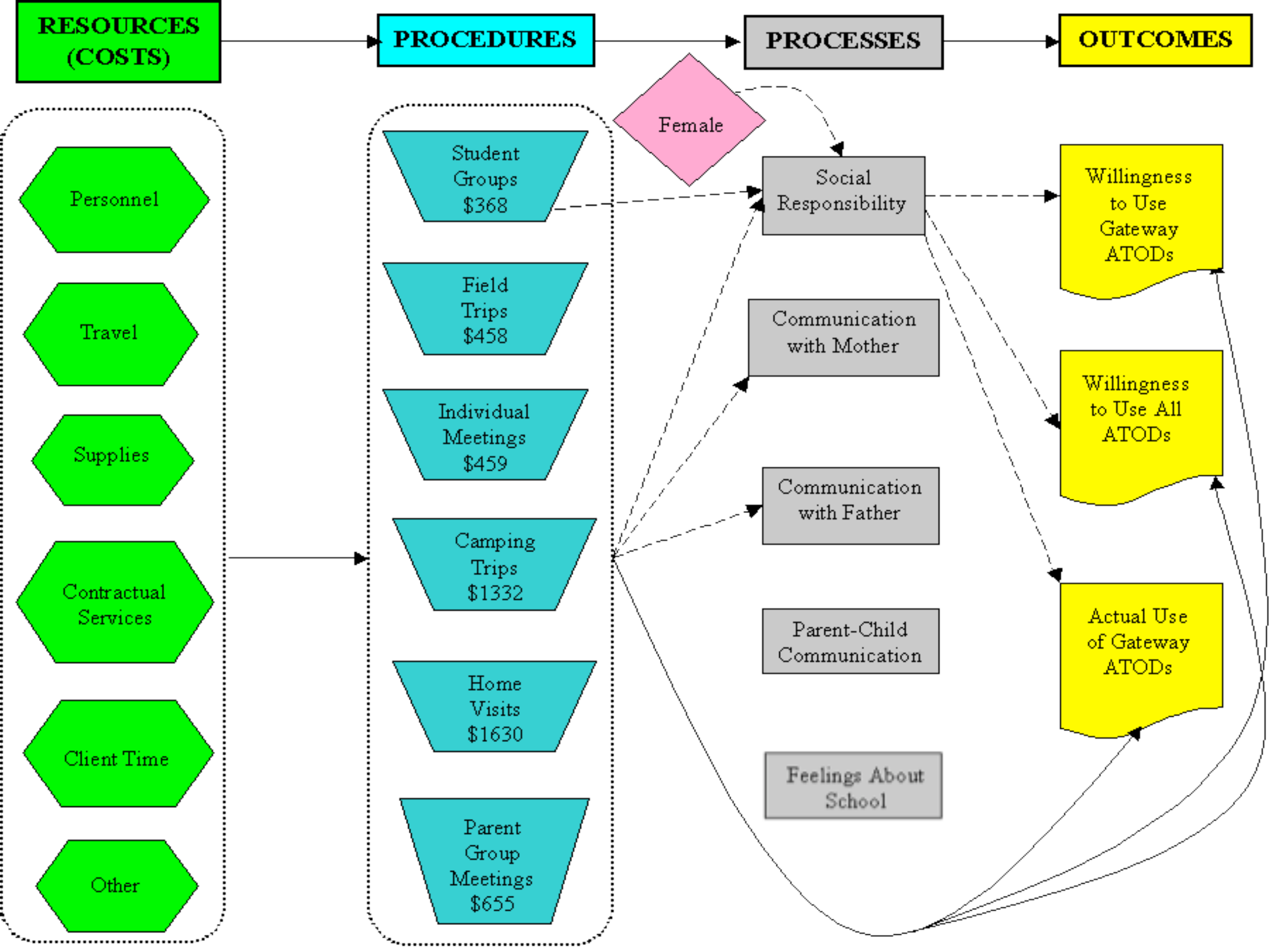
Parent-Child  
Communication

Feelings About  
School

Willingness  
to Use  
Gateway  
ATODs

Willingness  
to Use All  
ATODs

Actual Use  
of Gateway  
ATODs



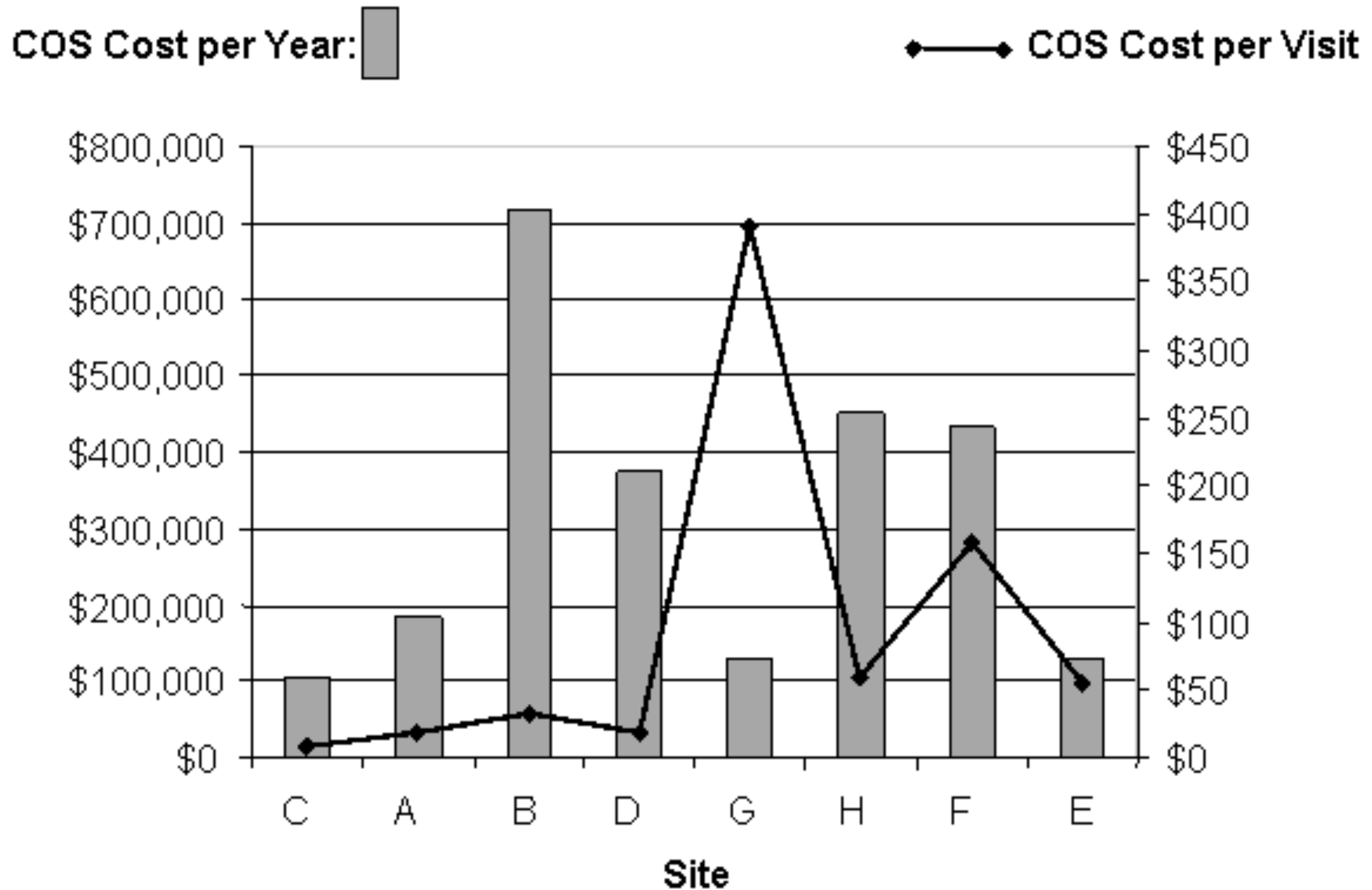
beyond just costs and outcomes

ways to go  
beyond just costs and  
outcomes

beyond just costs and outcomes

# Consumer-Operated Services (COS) Costs

# beyond just costs and outcomes



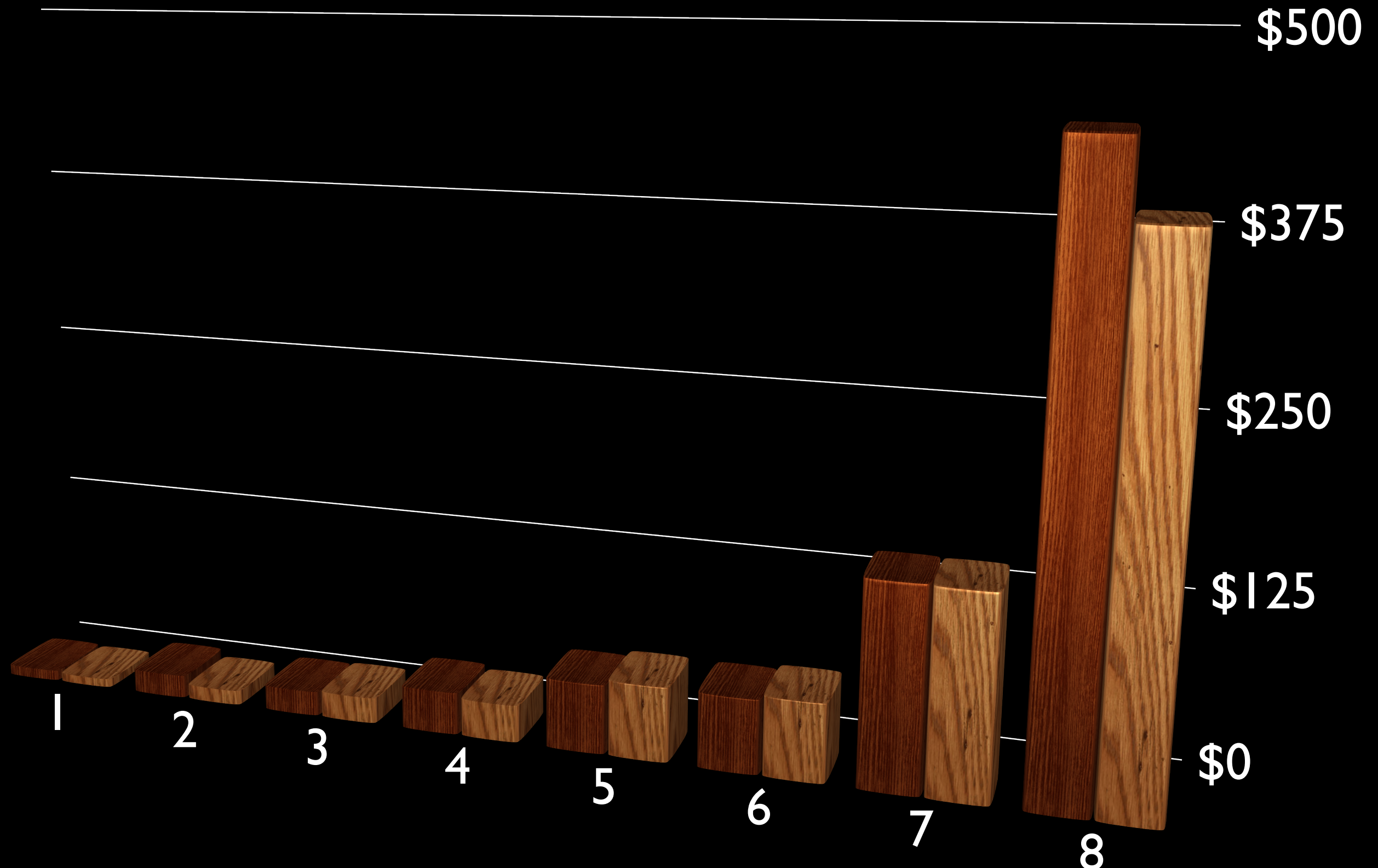
beyond just costs and outcomes

# Why so much variability?

- local cost of living?
- different models?
- program size?
- volunteers, donations?
- staff pay?
- delivery system?

# beyond just costs and outcomes

- Average Cost per Visit
- Adjusted Average Cost per Visit



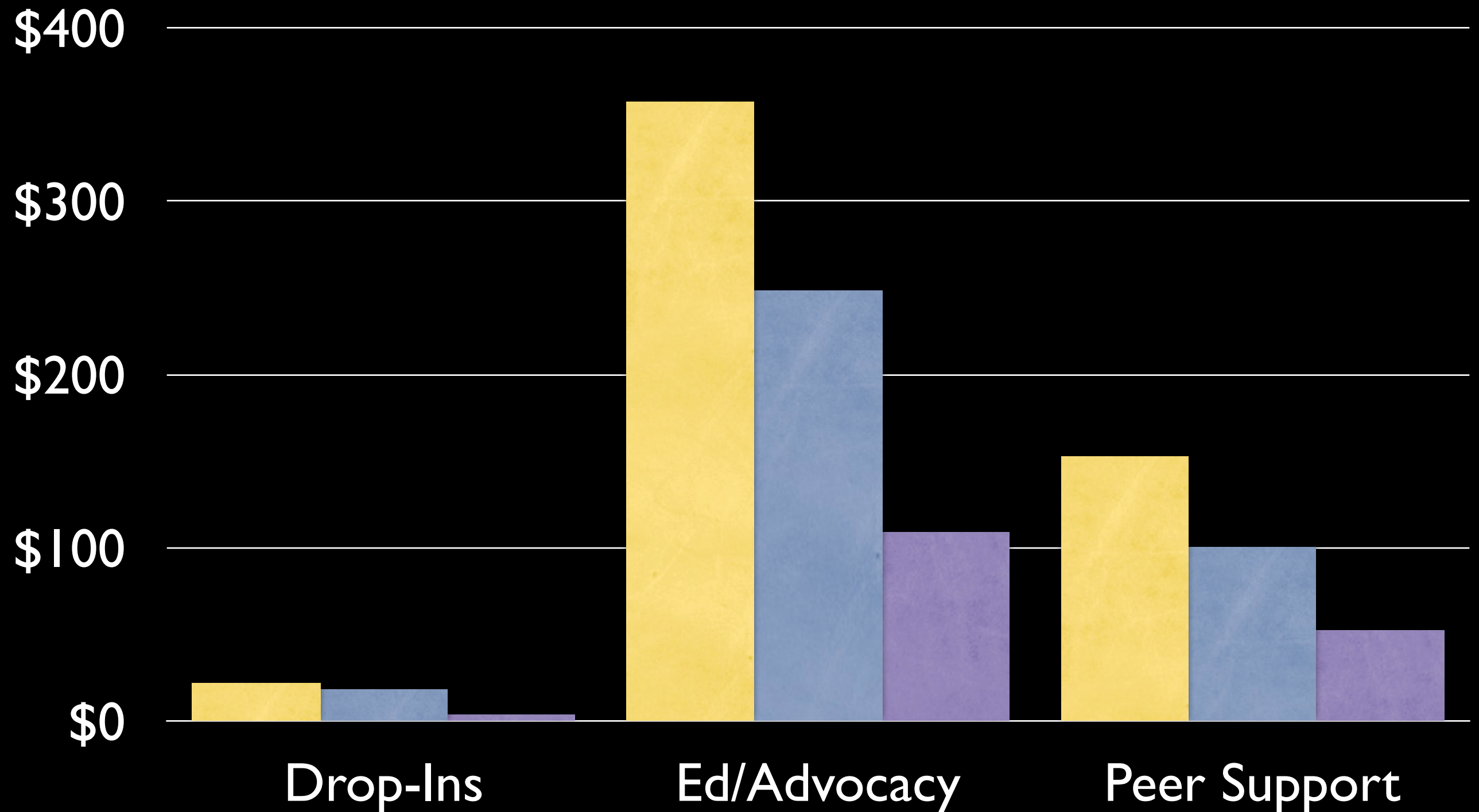
beyond just costs and outcomes

# volunteers and donated resources

- time
  - peers (Consumers)
  - others
- donated space
- donated supplies, equipment, materials, transportation
- concerns about reporting these

# beyond just costs and outcomes

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

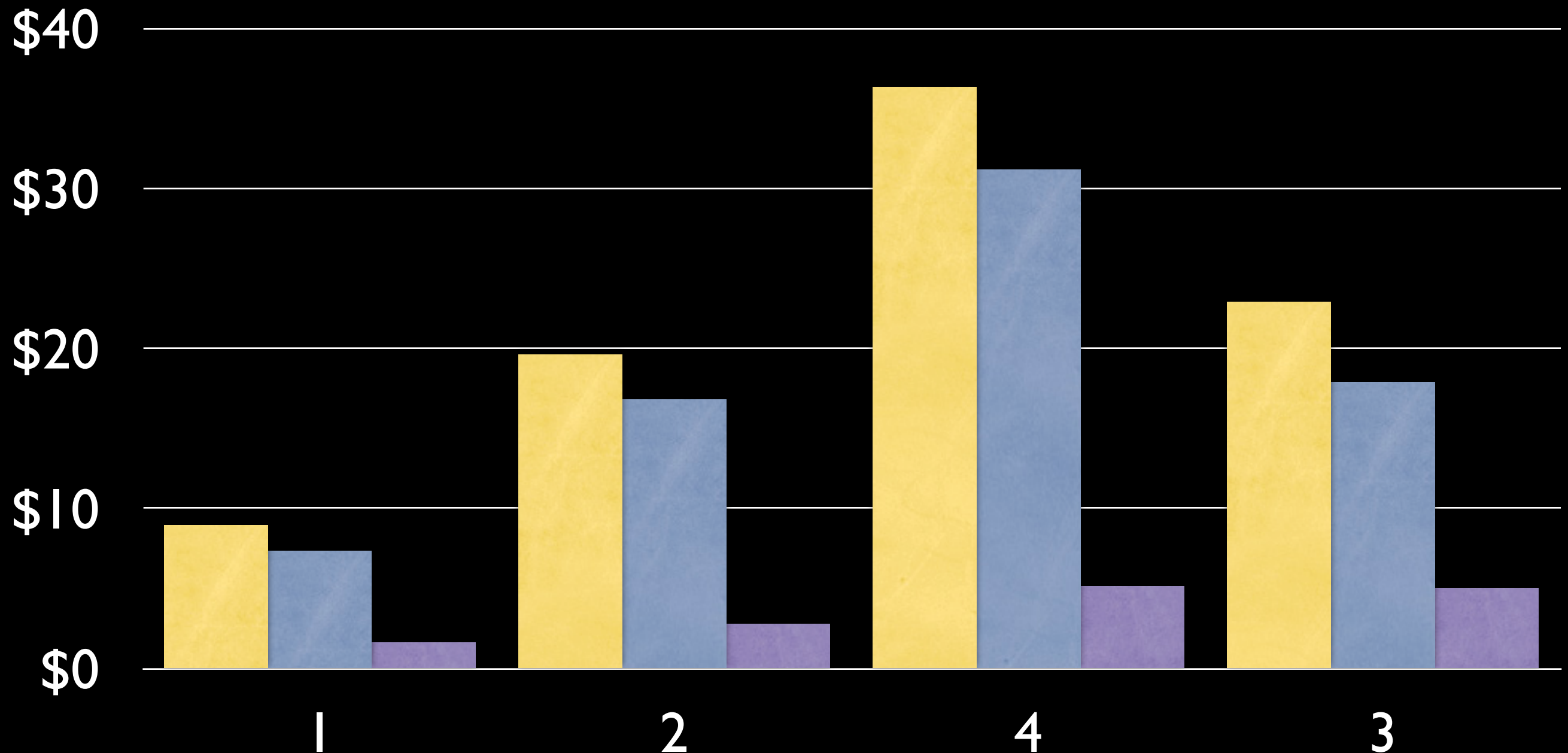




beyond just costs and outcomes

# Drop-In model

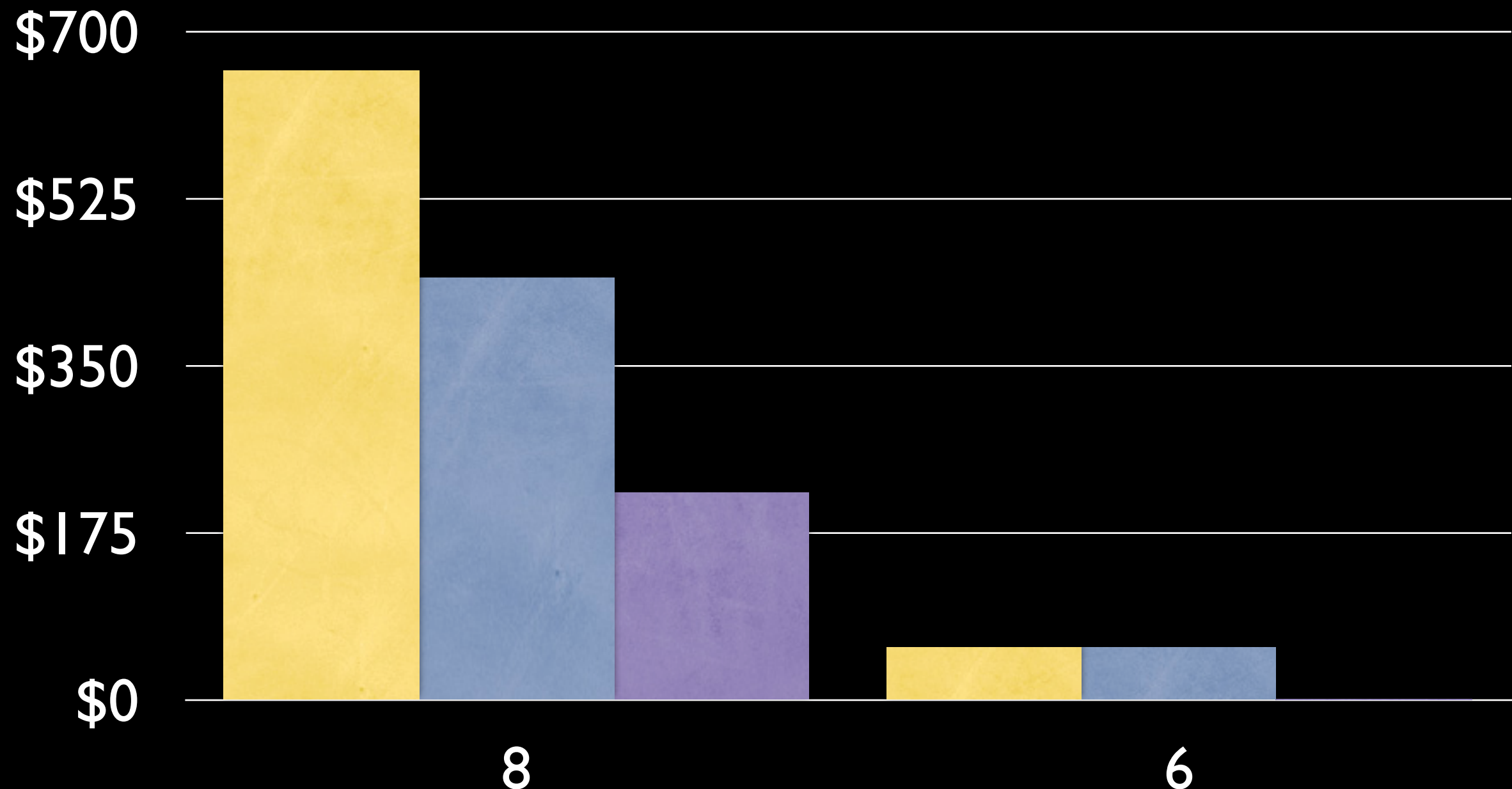
- Cost per visit (volunteered/donated resources added)
- Cost per visit (volunteered/donated resources not added)
- Savings using volunteer/donated resources



beyond just costs and outcomes

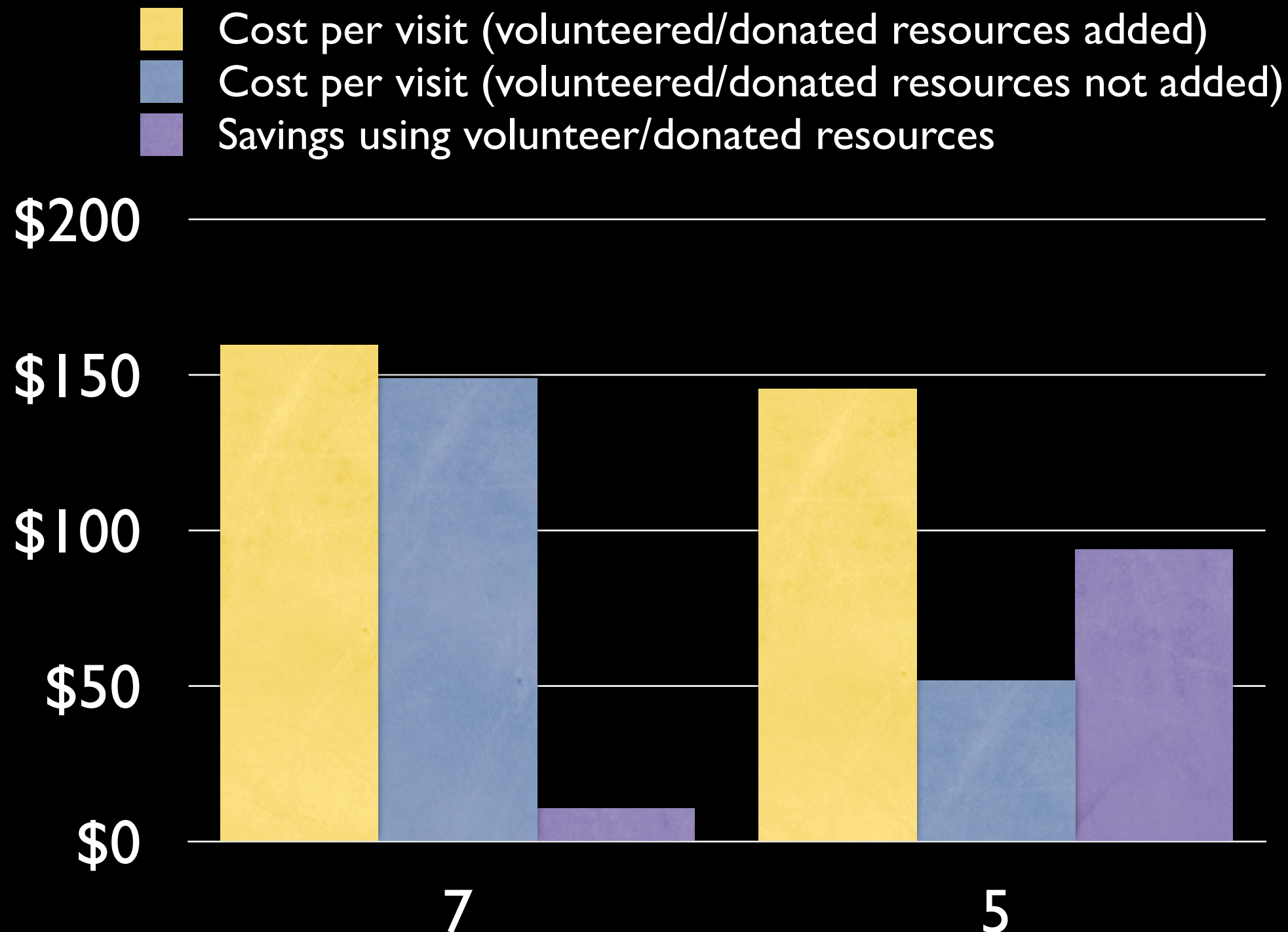
# Education / Advocacy model

- Cost per visit (volunteered/donated resources added)
- Cost per visit (volunteered/donated resources not added)
- Savings using volunteer/donated resources



beyond just costs and outcomes

# Peer Support model



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# References for further learning

- workshop website provides you:
- publications
- web sites
- download handouts, slides

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# websites for cost-inclusive evaluation



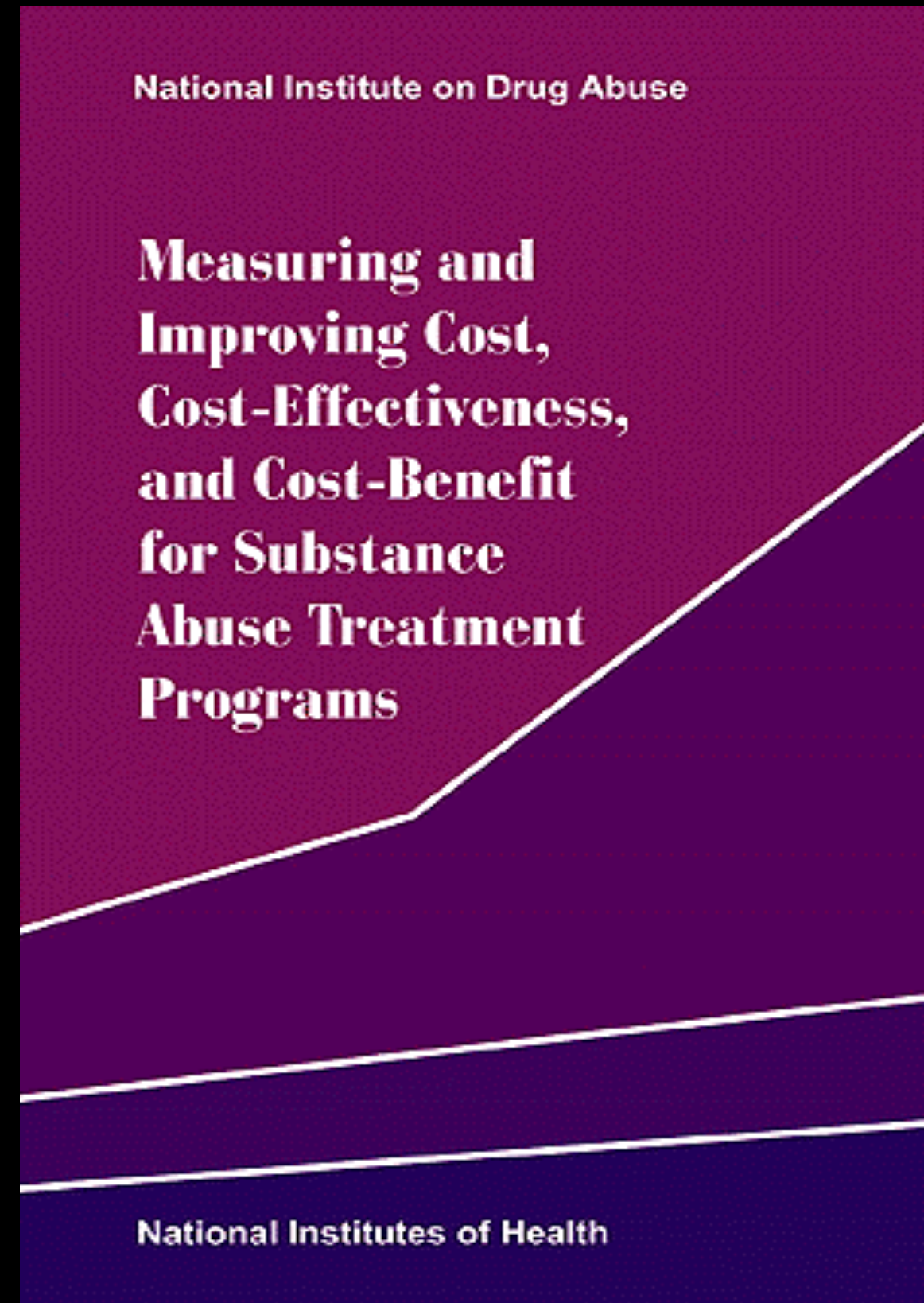
- Tufts University at their Center for the Evaluation of Value & Risk in Health
- <https://research.tufts-nemc.org/cear4/default.aspx>

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[http://archives.drugabuse.gov/IMPCOST/  
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