

# Micro costing: studies, systematic review and checklist development

On the State of the Art in Costing Methods: Workshop

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January 22, 2015

# Outline

- **Studies:** Results of two Randomized Controlled Trials
  - Costs of HIV prevention and substance abuse treatment among women
  - Costs of a motivational enhancement therapy coupled with cognitive behavioral therapy for pregnant substance users
- **Systematic Review:**
  - Pilot study results
- **Checklist development:**
  - Protocol for a micro costing checklist

# Micro-Costing

- Micro-costing is a method with “direct enumeration and costing out of every input consumed in the treatment of a particular patient” (*Gold, Siegel, Russell, and Weinstein 1996; Panel on Cost Effectiveness in Health and Medicine*)
- Advantages of micro-costing:
  - Accuracy/precision
  - Reflection of actual resource use and economic costs (rather than charges, reimbursement, payments, or prices)
  - Separate different activities and cost categories, gathers detailed information directly enumerates and values specific resources used in an intervention
  - Reliability and validity from cost collection alongside actual program delivery
  - Ability to account for the most significant inputs
- Disadvantages of micro-costing:
  - Generalizability
  - If self-observation by providers and study personnel may be prone to error
  - Significant burden of detailed cost collection is placed on intervention personnel. Systems makes estimating costs easier.

# Costs of HIV Prevention and Substance Use Treatment Among Women: Results of a Randomized Controlled Trial

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# Three Step Micro-Costing Approach: Identify-Measure-Value

- Methodology developed and employed in previous studies<sup>a</sup>:
  - Identifying resources used
  - Measuring resource use
  - Valuing resources
- Total cost =  $\sum_i$  (quantity of each type of resource<sub>i</sub> x unit cost<sub>i</sub>)
- Average cost per participant = total cost/number of participants

<sup>a</sup>. Ruger JP, Ben Abdallah A, Cottler L (2010) Public Health Rep 125 Suppl 1: 83-94.

Ruger JP, Chawarski M, Mazlan M, et al. (2012) Health Serv Res 47: 865-887.

Ruger JP, Emmons KM, Kearney MH, Weinstein MC (2009) BMC Pregnancy Childbirth 9: 46.

# Methods

- Estimated total, variable and fixed costs for the SI and additional costs for the two enhanced interventions (WWE and 4ES)
- Compared breakdown of cost categories across intervention components
- Estimated costs from both service provider and societal perspectives
- Concluded with sensitivity analysis of the robustness of these estimates to changes in key cost components
- Only costs related to implementation of intervention included; study recruitment, development of survey instrument, and other activities associated with research objectives excluded

# Variable Costs Incurred

## (Service Provider Perspective)

Description of items	Group	Cost/ unit	Total units	Total costs	SI (N=501)		WWE (N=342)		4ES (N=170)	
					No. of units	Total costs	No. of units	Total costs	No. of units	Total costs
<b>MATERIALS &amp; TESTING COSTS</b>										
Male condoms	A	\$80.25/1000	5000	\$401.25	5000	\$401.25		-		-
Female condoms	A	\$1,000/1000	1000	\$1,000.00	1000	\$1,000.00		-		-
Demonstrator condoms	A	\$80.25/1000	500	\$40.13	500	\$40.13		-		-
Speculums for WWE	B	\$23.00/25	342	\$314.64		-	342	\$314.64		-
Latex gloves	A, B	\$4.59/100	2350	\$107.87	2000	\$91.80	350	\$16.07		-
Nitrile gloves	A, B	\$9.71/100	350	\$33.99	300	\$29.13	50	\$4.86		-
Protection lubricant	A	\$165/100	1000	\$165.00	1000	\$165.00		-		-
23 Gauge Butterfly Needles	A	\$35.50/50	25	\$17.75	25	\$17.75		-		-
Alcohol Preps	A	\$1.28/200	826	\$5.29	826	\$5.29		-		-
Ammonia inhalants	A	\$18.29/100	50	\$9.15	50	\$9.15		-		-
Bandages	A	\$1.97/100	550	\$6.90	550	\$6.90		-		-
Gauze pads	A	\$2.01/100	413	\$8.30	413	\$8.30		-		-
IV ¼ Vacutainer set	A	\$37.23/50	59	\$43.93	59	\$43.93		-		-
Penis model	B	\$12/model	3	\$36.00	3	\$36.00		-		-
10% KOH solution	B	\$12/bottle	2	\$24.00		-	2	\$24.00		-
9% NaCl solution	B	\$3.50/bottle	2	\$7.00		-	2	\$7.00		-
Bottle and dropper set	B	\$161.71/144	144	\$161.71		-	144	\$161.71		-
Disposable exam sheets	B	\$19/100	342	\$64.98		-	342	\$64.98		-
Disposable pipettes	B	\$128.17/case	1	\$128.17		-	1	\$128.17		-
Exam capes	B	\$12.68/50	350	\$4,438.00		-	350	\$4,438.00		-
Exam table paper	B	\$3.00/roll	6	\$18.00		-	6	\$18.00		-
Lens paper	B	\$7.55/ 12	12	\$7.55		-	12	\$7.55		-
Pap smearing fixative	B	#13.00/12	24	\$26.00		-	24	\$26.00		-
Safetex-Cytology spray fixative	B	\$25.60/12	12	\$25.60		-	12	\$25.60		-
Test-tube holding tray	B	\$30.55/ tray	1	\$30.55		-	1	\$30.55		-
HIV-Negative	A	\$139/test	501	\$69,639	501	\$69,639		-		-
HIV-Western blot	A	\$206/test	13	\$2,678	13	\$2,678		-		-
Pap smear test kit	B	\$62/ kit	342	\$21,204		-	342	\$21,204		-
<b>MISCELLANEOUS SUPPLIES</b>										
Air freshener	A,B,C	\$3.21/each	4	\$12.84	2	\$6.42	1	\$3.21	1	\$3.21
Bleach	A,B,C	\$1.84/bottle	3	\$5.52	1	\$1.84	1	\$1.84	1	\$1.84
Empty spray bottles	A,B,C	\$6.79/3bottles	3	\$6.79	1	\$0.63	1	\$0.63	1	\$0.63
Paper towels	A,B,C	\$18.60/12rolls	12	\$18.60	6	\$6.35	4	\$4.33	2	\$2.15
Soap	A,B,C	\$4.09/bottle	4	\$16.36	2	\$8.18	1	\$4.09	1	\$4.09
Tissues	A,B,C	\$1.89/box	9	\$16.99		-		-	9	\$16.99
Disolv Germicidal cleaner	B	\$13.25/12	12	\$13.25		-	12	\$13.25		-
Sanitary pads	B	\$3.24/48pads	48	\$3.24		-	48	\$3.24		-
Sterile cotton tops	B	\$1.88/500	500	\$1.88		-	500	\$1.88		-
Tampons	B	\$3.88/40	40	\$3.88		-	40	\$3.88		-

# Variable Costs Incurred (Service Provider Perspective) (cont.)

Description of items	Group	Cost/unit	Total units	Total costs	SI (N=501)		WWE (N=342)		4ES (N=170)	
					No. of units	Total costs	No. of units	Total costs	No. of units	Total costs
<b>OFFICE SUPPLIES</b>										
Felt-tipped markers	A,B,C	\$5.99/8	16	\$11.98	8	\$7.97	5	\$5.44	3	\$2.71
Folders	A,B,C	\$1.09 each	12	\$13.08	6	\$6.54	4	\$4.36	2	\$2.18
Light bulbs	A,B,C	\$13.63/24	24	\$13.63	12	\$3.23	8	\$2.21	4	\$1.10
Pens	A,B,C	\$5.99/50	50	\$5.99	25	\$106.09	17	\$72.42	8	\$36.00
Cassette tapes	C	\$100/pack	1	\$100.00		-		-	1	\$100.00
Paper	A,C	\$11.62/ream	9	\$104.58	7	\$10.17		-	2	\$3.45
Pencils	A,C	\$1.20/12	24	\$2.40	18	\$2.24		-	6	\$0.76
Tape	A,C	\$21.22/6rolls	6	\$21.22	4	\$74.66		-	2	\$25.34
Binders	C	\$1.09 each	4	\$4.36		-		-	4	\$4.36
Dry-Erase markers	C	\$4.29/4	4	\$4.29		-		-	4	\$14.07
Easel cling-pad	C	\$16.12 each	1	\$16.12		-		-	1	\$16.12
Plastic cups, plates, utensils	C	-	-	\$14.07		-		-		\$14.07
<b>INCENTIVES</b>										
Monetary remuneration	A,B,C	\$20/ person	501	\$10,020.00	159	\$3,180.00	172	\$3,440.00	170	\$3,400.00
Certificates	C	\$3.49/25	170	\$23.73		-		-	170	\$23.73
Frames	C	\$2.00/frame	170	\$340.00		-		-	170	\$340.00
Ivory embossed cards	C	\$18.78/100	2	\$37.56		-		-	2	\$39.56
Votives	C	\$42.50/170	170	\$42.50		-		-	170	\$42.50
Respondent meals	C	-		\$1,961.02		-		-		\$1,961.02
<b>Subtotal (Materials and Testing costs)</b>						<u>\$77,589.88</u>		<u>\$30,031.90</u>		<u>\$6,055.87</u>
<b>PERSONNEL COSTS</b>										
<b>SI Peer facilitator</b>										
SI I: 30 min/ person; 501 people	A	\$15/hour	250.5	\$3,757.50	250.5	\$3,757.50		-		-
SI I Lab delivery: 15 min each, 400 trips	A	\$15/hour	100	\$1,500.00	100	\$1,500.00		-		-
SI II: 30 min/ person; 501 people	A	\$15/hour	250.5	\$3,757.50	250.5	\$3,757.50		-		-
<b>Rater</b>										
Reminder calls: 10min each, 501 people	C	\$15/hour	83.5	\$1,252.50		-		-	83.5	\$1,252.50
<b>WWE Nurse practitioner</b>										
WWE: 30 min each, 342 people	B	\$25/hour	171	\$4,275.00		-	171	\$4,275.00		-
<b>4 ES Peer facilitator</b>										
ES: 130 min each, 213 sessions	C	\$15/hour	461.5	\$6,922.50		-		-	461.5	\$6,922.50
<b>4 ES Health professional</b>										
ES: 120 min each, 213 sessions	C	\$25/hour	426	\$10,650.00		-		-	426	\$10,650.00
<b>4 ES Child care provider</b>										
ES: 120 min each, 213 sessions	C	\$10/hour	426	\$4,260.00		-		-	426	\$4,260.00
<b>Subtotal (Personnel costs)</b>						<u>\$9,015.00</u>		<u>\$4,275.00</u>		<u>\$23,085.00</u>
<b>Total Variable Costs</b>						<u>\$86,604.88</u>		<u>\$34,306.90</u>		<u>\$29,140.87</u>
<b>Variable Costs per Client</b>						<b>\$172.86</b>		<b>\$100.31</b>		<b>\$171.42</b>



# Fixed Costs Incurred (Service Provider Perspective)

Description of Items	Group	Cost per unit	Total Units	Total Costs	SI (N=501)	WWE (N=342)	4ES (N=170)
<b><u>BUILDINGS AND FACILITIES COSTS</u></b>		<b>Monthly rent</b>					
HS North Location (excl. utilities)	A, B, C	\$1900	34 months	\$38,760.00	\$19,169.56	\$13,085.80	\$6,504.64
Suite 4 Kingshwy Location (+ utilities)	C	\$6620	34 months	\$112, 540.00			\$112,540.00
<b>Utilities (HS North Location)</b>							
Phone service	A, B, C	\$157	34 months	\$3,202.80	\$1,584.01	\$1,081.30	\$537.49
Gas	A, B, C	\$166	34 months	\$3,386.40	\$1,674.81	\$1,143.29	\$568.30
Water service	A, B, C		34 months	\$335.81	\$166.08	\$113.37	\$56.35
Electricity	A, B, C	\$73.75	34 months	\$1,504.47	\$744.07	\$507.93	\$252.48
Janatorial/ Cleaning service	A, B, C	\$83.47	34 months	\$1,702.84	\$842.17	\$574.90	\$285.77
Security System	A, B, C		34 months	\$324.00	\$160.24	\$109.39	\$54.37
<b>Subtotal</b>						<u>\$16,615.97</u>	<u>\$120,799.40</u>
<b><u>TRANSPORTATION COSTS</u></b>							
<b>Client transportation</b>							
Van rental and gas	C		16 days	\$988.90	-	-	\$988.90
Cab fares	C			\$498.15	-	-	\$498.15
Transporting participants by car	C		3080 miles	\$924.00	-	-	\$924.00
<b>Subtotal</b>					<u>\$0.00</u>	<u>\$0.00</u>	<u>\$2,411.05</u>
<b><u>EQUIPMENT</u></b>							
Exam chair/ Table/ Stool	B		1	\$1,200.00	-	\$1,200.00	-
Microscope	B		1	\$250.00	-	\$250.00	-
Lamp	B		1	\$75.00	-	\$75.00	-
Small refrigerator	B		1	\$40.00	-	\$40.00	-
Small cooler	B		1	\$10.00	-	\$10.00	-
<b>Subtotal</b>					<u>\$0.00</u>	<u>\$1,450.00</u>	<u>\$0.00</u>
<b>Total Fixed Costs</b>					\$24,340.94	\$18,065.97	\$123,210.45
<b>Fixed Costs per Client</b>					<b>\$48.58</b>	<b>\$52.82</b>	<b>\$724.77</b>

# Societal Costs Incurred

Description of Items	Group †	Time spent per activity	No. of people	Total units in hours	Cost per unit	Total costs	SI (N=501)		WWE (N=342)		4ES (N=170)	
							No. of units	Total costs	No. of units	Total costs	No. of units	Total costs
PARTICIPANT' S TIME*												
Session Time												
Standard Intervention I	A	20 min	501	167	\$5.15	\$860.05	167	\$860.05	114	\$587.10	1360	\$7,004.00
Standard Intervention II	A	20 min	501	167	\$5.15	\$860.05	167	\$860.05				
Well Women Exam	B	30 min	342	114	\$5.15	\$587.10						
4 Education Sessions	C	2 hrs, 4 sessions	170	1360	\$5.15	\$7,004.00						
Travel Time												
Standard Intervention	A	15 min/ session (x2)	501	250.5	\$5.15	\$1,290.08	250.5	\$1290.08	85.5	\$440.33	170	\$875.00
Well Women Exam	B	15 min/ session	342	85.5	\$5.15	\$440.33						
4 Education Sessions	C	15 min/ session (x4)	170	170	\$5.15	\$875.50						
Total societal costs								\$3,010.00		\$1,027.43		\$7,879.50
Societal cost per client								\$6.01		\$2.05		\$15.73

† Cost per unit is the minimum wage for Missouri from the Labor Bureau of Statistics, August 2005

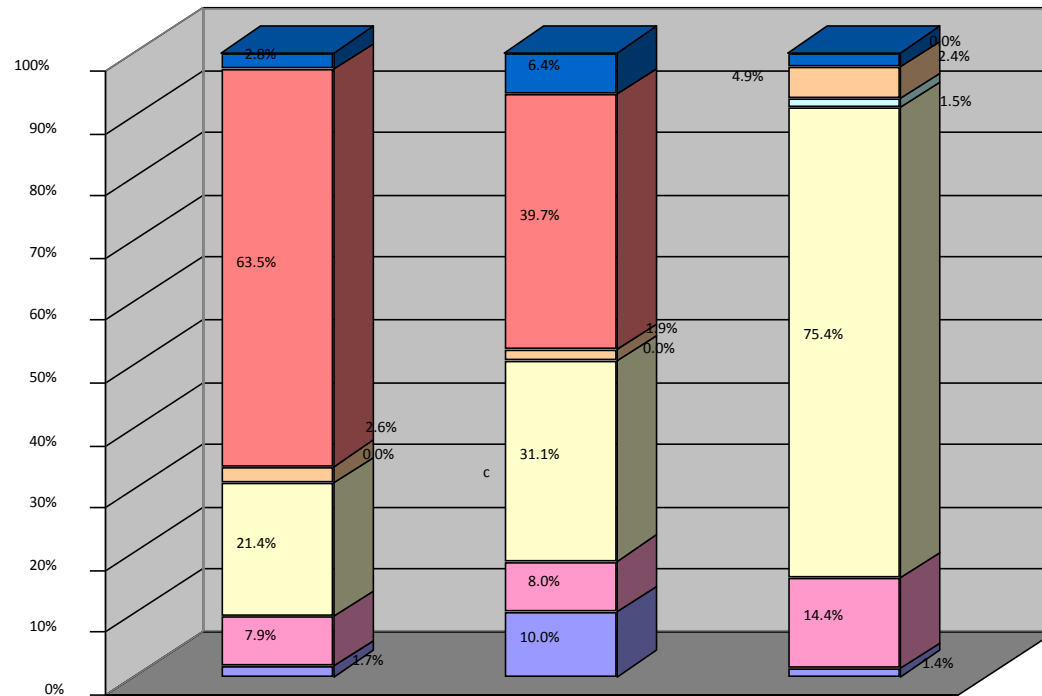
Note: Total costs x Time spent per Session x Number of Age x Wage

\* A==SI; B==WWE; C==4ES

# Total Costs Incurred

Description of Items	SI (N=501) Total Costs	WWE (N=342) Total Costs	4ES (N=170) Total costs
Total Variable Costs	\$86,604.88	\$34,306.90	\$29,140.87
Variable Cost per client	\$172.86	\$100.31	\$171.42
Total Fixed Costs	\$24,340.94	\$18,065.97	\$123,210.45
Fixed Cost per client	\$48.58	\$52.82	\$724.77
Total Societal Costs	\$3,010.18	\$1,027.43	\$7,879.50
Societal Cost per client	\$6.01	\$2.05	\$15.73
<b>Total Cost</b>	<b>\$113,955.99</b>	<b>\$53,400.30</b>	<b>\$160,230.82</b>
<b>Total Cost per client</b>	<b>\$227.46</b>	<b>\$156.14</b>	<b>\$942.53</b>

# Cost breakdown by Cost category



	SI	WWE	4 ES
Incentives	2.8%	6.4%	2.4%
Testing	63.5%	39.7%	0.0%
Societal Costs	2.6%	1.9%	4.9%
Transportation	0.0%	0.0%	1.5%
Buildings & Facilities	21.4%	31.1%	75.4%
Personnel	7.9%	8.0%	14.4%
Materials	1.7%	10.0%	1.4%

# Costs of a Motivational Enhancement Therapy Coupled with Cognitive Behavioral Therapy for Pregnant Substance Users: Results of a Randomized Controlled Trial

Xiao Xu, PhD;<sup>1</sup> Kimberly A. Yonkers, MD;<sup>1</sup> Jennifer P. Ruger, PhD<sup>2</sup>

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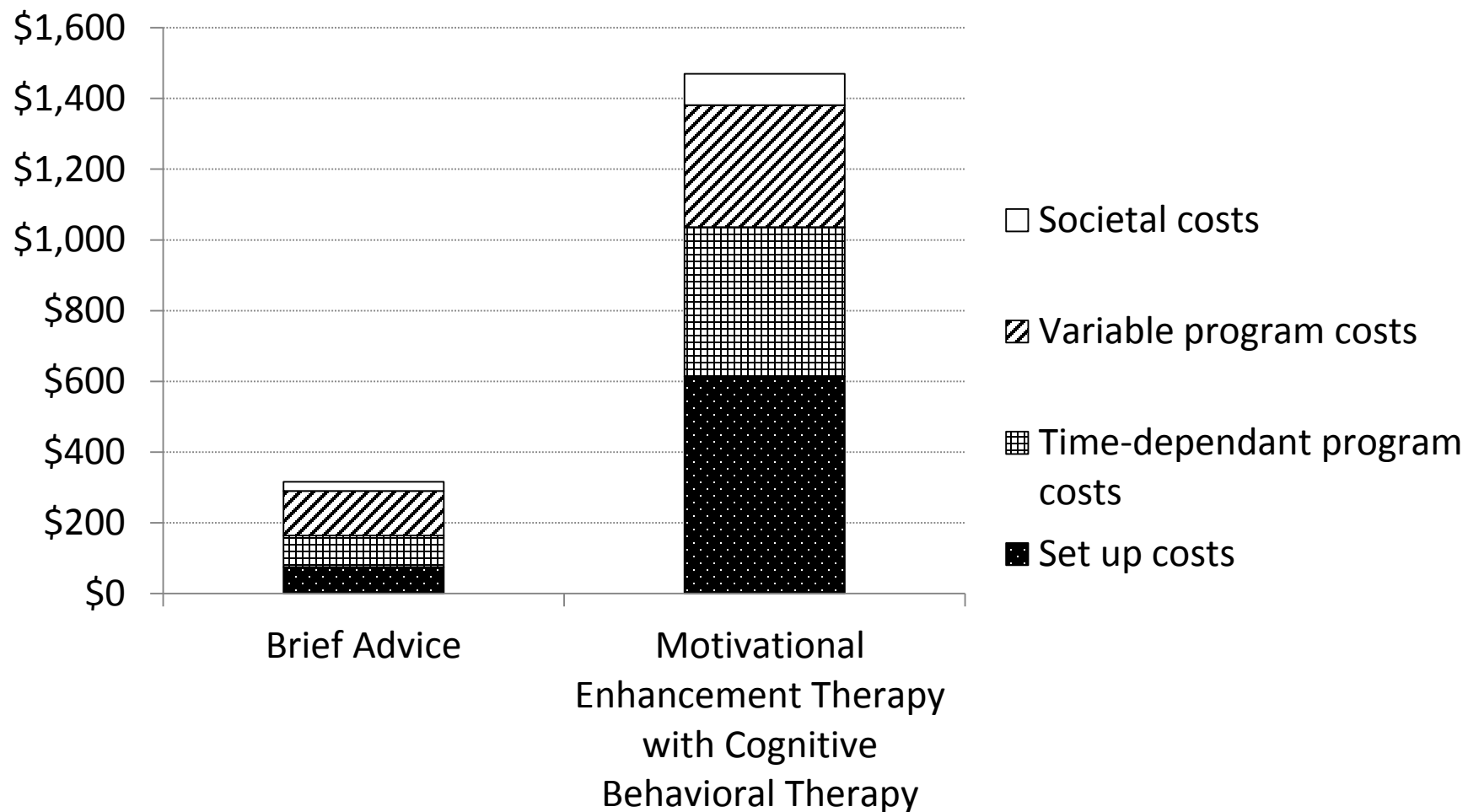
## Estimated total and per participant costs of BA and MET-CBT

Cost Category	BA (n = 86)		MET-CBT (n = 82)	
	Total	Per Participant	Total	Per Participant
<b><i>Set Up Costs</i></b>	<b><i>\$6,473</i></b>	<b><i>\$75</i></b>	<b><i>\$50,297</i></b>	<b><i>\$613</i></b>
Initial clinic integration	\$2,198	\$26	\$5,732	\$70
Intervention material design	\$372	\$4	\$19,620	\$239
Set-up program administrative office	\$127	\$1	\$127	\$2
Training costs	\$2,185	\$25	\$22,994	\$280
Other initial set up costs	\$1,590	\$18	\$1,823	\$22
<b><i>Time-Dependent Program Costs</i></b>	<b><i>\$7,689</i></b>	<b><i>\$89</i></b>	<b><i>\$34,663</i></b>	<b><i>\$423</i></b>
Continued clinic integration	\$3,893	\$45	\$21,804	\$266
Facility and utilities costs	\$1,243	\$14	\$7,361	\$90
Other utilities	\$1,025	\$12	\$2,439	\$30
Equipment	\$409	\$5	\$1,940	\$24
Furniture	\$216	\$3	\$216	\$3
Office and other supplies	\$904	\$11	\$904	\$11

## Estimated total and per participant costs of BA and MET-CBT

Cost Category	BA (n=86)		MET-CBT (n=82)	
	Total	Per Participant	Total	Per Participant
<b><i>Variable Program Costs</i></b>	<b><i>\$10,790</i></b>	<b><i>\$125</i></b>	<b><i>\$28,314</i></b>	<b><i>\$345</i></b>
Personnel time	\$3,133	\$36	\$23,046	\$281
Testing supplies (urine & breath tests)	\$4,996	\$58	\$3,319	\$40
Exam room and utilities	\$20	\$0	\$354	\$4
Intervention materials	\$2,550	\$30	\$1,520	\$19
Transportation	\$90	\$1	\$74	\$1
<b><i>Societal Costs</i></b>	<b><i>\$2,247</i></b>	<b><i>\$26</i></b>	<b><i>\$7,210</i></b>	<b><i>\$88</i></b>
<b>Total</b>	<b>\$27,199</b>	<b>\$316</b>	<b>\$120,483</b>	<b>\$1,469</b>

Figure 1. Comparison of per participant cost: BA and MET-CBT





# Sensitivity Analysis

Cost Category	Mean Cost per Participant	
	BA	MET-CBT
Base Case Analysis	\$316	\$1,469
One-Way Sensitivity Analysis		
• Increase number of participants by 25%	\$282	\$1,255
• Exclude training costs	\$285	\$1,153
• Replace registered nurses (RN) with social workers as MET-CBT therapists	\$312	\$1,351
• Assume the program was implemented in a non-academic setting	\$335	\$1,471
Two-Way Sensitivity Analysis		
• Increase number of participants by 25% & exclude training costs	\$258	\$1,002
• Increase number of participants by 25% & replace RN with social workers as MET-CBT therapists	\$279	\$1,151

# A Systematic Review of Micro-Costing Studies of Health Care and Health Interventions

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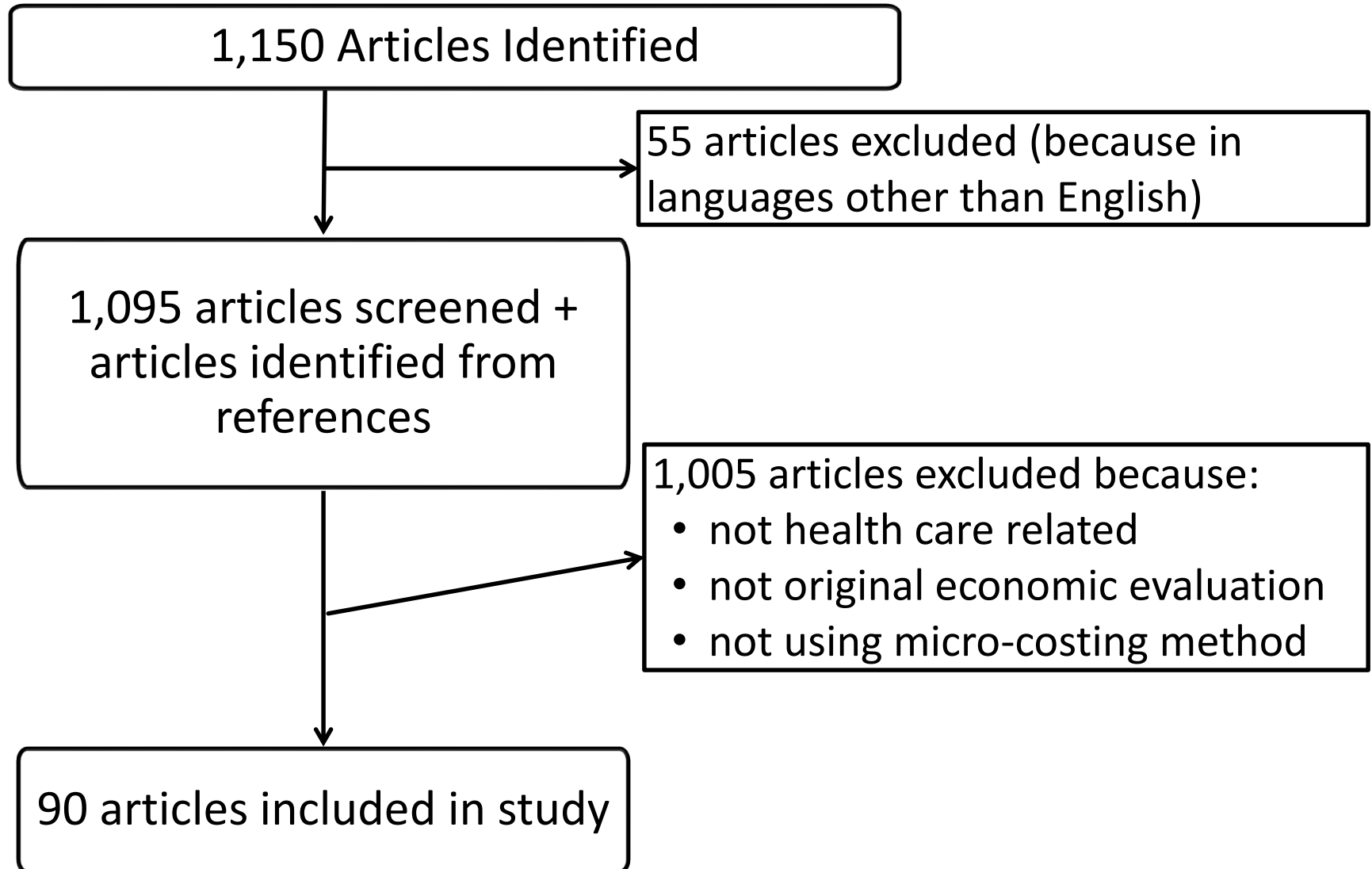
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Acknowledgments: This study has been supported by the National Institutes of Health/National Institute on Drug Abuse (R01DA025555; PI: JP Ruger).

# Literature Search

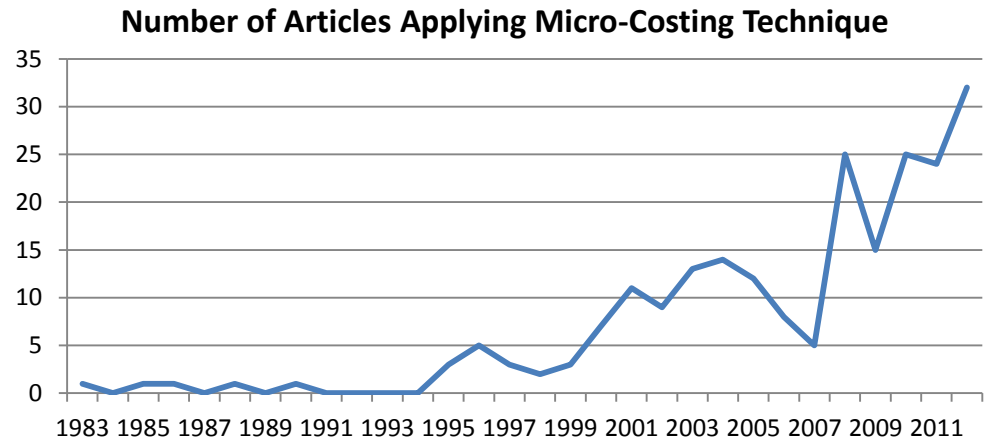
- Search terms:  
(micro cost\*) OR (microcost\*) OR (bottom up) AND (cost OR costs OR costed OR costing))
- Database searched: Ovid MEDLINE, EconLit, BIOSIS Previews, Embase, Scopus, and the National Health Service Economic Evaluation Database (NHS EED)
- Years included: ≤ May 2013, continuously updated
- Language: English articles
- Eligibility criteria:
  - Health care related topics
  - Original economic analysis
  - Application of micro-costing method

# Flow Chart of Study Search and Selection



# Key Findings

- Increasing number of publications over time that used micro-costing



- Diseases/conditions studied:
  - Cancer research (n=19; 21.1%)
  - Mental disorders (n=12; 13.3%)
  - Infectious and parasitic diseases (n=10; 11%)

# Key Findings

- **Analytical time horizon:**
  - Most studies (87.8%) had analytical time horizon < 1 year
- **Analytical quality:**
  - 34 studies (37.8%) failed to report analytic perspective, an essential aspect of study design affecting the scope of cost items
  - 27 studies (30%) did not report the price year of cost data
  - 36 studies (40.0%) either did not perform inflation adjustment for cost data from different years or did not specify whether they made such adjustment
  - 75 studies (83.3%) did not separately report data on unit costs and resource utilization quantity

# Key Findings

- Different approaches of costing:
  - Collection of patient-specific, direct enumeration and unit cost data of ALL inputs consumed;
  - Collection of patient-specific, direct enumeration and unit cost data of SOME inputs consumed + some gross-costing;
  - Collection of patient-specific medical care event data (without direct enumeration of inputs) + estimation of unit cost via micro-costing;
  - Treatment profile defined by staff/expert/literature review/clinical guideline + micro-costing in all or some aspects of the estimation;
  - Other approaches
- Areas for improvement:
  - Specifics about the costing method often not sufficiently described
  - Study perspective not always stated or does not match the cost categories included

# Key Findings

- Different approaches of costing:
  - Collection of patient-specific, direct enumeration and unit cost data of ALL inputs consumed;
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  - Collection of patient-specific medical care event data (without direct enumeration of inputs) + estimation of unit cost via micro-costing;
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- Areas for improvement:
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  - Study perspective not always stated or does not match the cost categories included



# **Development of a checklist for the conduct, reporting and appraisal of micro- costing studies in healthcare**

# Need for guidelines

- There is an increasing need for micro-costing in decision making in health policy
- It is important that studies are conducted according to consistent principles
- Studies should be reported in a way that allows for transparency and comparability across studies

# Limitations of existing guidelines and checklists

- Do not provide sufficient detail for the methods and techniques involved in micro-costing studies
- Do not provide a methodological framework and analytic components specific to the inclusion of items to evaluate micro-costing studies

# Purpose of a micro-costing checklist

- Provide a framework and guidance for the conduct of micro-costing studies
- Lead to more consistency and transparency in conducting micro-costing studies, allowing for comparison of the studies' findings
- Assist in the development of manuscripts reporting micro-costing studies and reviewing the manuscripts for publication

# Methods

The checklist will be developed in four stages:

1. Identification of appropriate potential domains and items
2. Item selection, formulation and reduction
3. External review by expert panel (further item reduction and revision)
4. Testing and assessment

# Identification of Potential Checklist Items

Three methods identify items for inclusion in preliminary list

- A. Systematic review of micro-costing studies
- B. Theoretical analysis of economic concepts relevant for micro-costing
- C. Review of checklists and guidelines for economic evaluations of health interventions; selection of items relevant for micro-costing

# Systematic Review Data Extraction

- a) Cost components included (e.g., personnel costs, consumables/materials/supplies cost, medication cost, facility cost, transportation costs, productivity loss)
- b) Whether the study reports input utilization quantity and unit cost data
- c) Method of quantity data collection used (e.g., time-motion study, patient self-report, cost-accounting database, provider/staff interview)
- d) Method of unit cost data collection (e.g., invoice amount, hospital/clinic/provider catalogue, standard fee schedule)

# Theoretical and Conceptual Analysis

- Search for literature that defines micro-costing and differentiates micro-costing from gross costing and other costing
- Analytical framework and conceptual domains for conducting micro-costing studies will be developed
- Domains that are missing or not adequately represented in the current economic evaluation checklists will be identified
- Newly formulated items will be developed for each conceptual domain



# Review Existing Checklists

- Comprehensive literature search for published checklists and guidelines used to evaluate the quality and reporting of costing in economic analyses of health interventions and programs, including:
  - Articles in the systematic review
  - References from relevant studies
  - Additional literature searches, such as:
    - “Checklist\*”; “guideline\*”; “questionnaire\*”
    - “Costs and cost analysis”
    - “Health care quality, access and evaluation”

# Creation of Initial Item Pool

- Triangulation of methods (i.e., the systematic review, checklist review and theoretical analysis) to compile a comprehensive list
- Duplicate or redundant items will be removed
- The pool of remaining items will be discussed and evaluated by research team members
- Consensus of team members will be reached on a preliminary list of items

# External Review by Expert Panel

- Modified Delphi method
  - An iterative multistage process with the goal of consensus among a group of experts
  - Panel participants selected based on experience in the conduct of economic evaluations, and specific expertise in micro-costing studies
  - The preliminary list of items will be sent to panel participants in the form of a survey

# Pilot Test

- A pilot test will be conducted on a random selection of 10% of the articles from the systematic review
- The articles will be rated by two independent reviewers.
- Reliability estimates will be calculated and discrepancies will be discussed with the research team
- Items may be modified or further explained in order to improve clarity and comprehension
- List of items for checklist will be finalized

# Acknowledgments

- This research was supported by grants from the National Institutes of Health (NIH) (National Institute on Drug Abuse [NIDA] grants R01DA025555, K01DA016358, R01 DA11622 and R01DA019135). Dr. Ruger was also supported by the Patrick and Catherine Weldon Donaghue Medical Research Foundation.