



LABOR AND POPULATION

***Cost-Benefit and Related Analyses  
As Frameworks for Assessing the Value  
Of Prevention and Wellness Strategies***

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# *Outline*

- **Types of cost and outcome analysis**
- **Strengths and weaknesses for valuing prevention and wellness strategies**
- **Priorities for methods development**
- **Bottom line**

# ***Cost and Outcome Analysis Is Used To Compare Intervention or Policy Alternatives***

- **Class of analyses sharing these two features**
  - Consider both inputs (costs) and outcomes
  - Compare alternative choices
- **Expresses results in common units to facilitate comparisons**
- **Used regularly to compare alternatives in health and social services**

# *Four Types of Cost and Outcome Analysis Dominate Social Sciences*

Type of Analysis	Question Addressed
<b>Cost analysis</b>	Full resources required to implement intervention/ policy
<b>Cost-effectiveness analysis (CEA)</b>	Highest amount of one particular outcome generated per dollar to implement intervention/policy
<b>Cost-savings analysis</b>	Compares costs and benefits of one or more interventions to government (taxpayers)
<b>Benefit-cost analysis (BCA)</b>	Compares costs and benefits of one or more interventions for all of society

# *Types of Cost and Outcome Analysis Vary in Information Required*

Type of Analysis	Costs Measured	Outcomes Measured
<b>Cost analysis</b>	<b>Complete intervention costs</b>	<b>None</b>
<b>Cost-effectiveness analysis (CEA)</b>	<b>Complete intervention costs</b>	<b>One outcome</b>
<b>Cost-savings analysis</b>	<b>Complete intervention costs paid by government</b>	<b>All benefits to government</b>
<b>Benefit-cost analysis (BCA)</b>	<b>Complete intervention costs</b>	<b>All benefits to society</b>

## ***All Methods Require Comparison Group***

- **Compare costs, outcomes or benefits to either**
  - **World without this intervention/policy**
  - **Alternative interventions/policies**
- **Requires rigorous evaluation comparing intervention group to comparison group**
  - **Ideal is random assignment to baseline or intervention being evaluated**
  - **Rigorous non-experimental methods are also available**

# ***Intervention Costs Should Account for All Consumed Resources of Value to Society***

- **On budget**
  - **Additional materials needed**
  - **Salaries of added staff**
  - **Rental of extra space**
- **Off budget**
  - **Costs paid by participants (including time)**
  - **Donated time, other resources**
  - **Value of other lost opportunities**

## ***Outcomes Measured in Evaluations Used to Estimate Monetary Value of Benefits***

- **Ideally, evaluation would measure comprehensive set of outcomes changed by intervention**
- **Gain in outcomes relative to no intervention or alternative interventions converted into dollar value**
- **Sum benefits over comprehensive set of outcomes to estimate total monetary benefit**

# ***Example: Monetary Benefits Estimated from Evaluations of Early Childhood Interventions***

<b>Outcome Measured by Evaluation</b>	<b>Monetary Benefit Estimated from Evaluation Measure</b>
<b>Reduced child maltreatment</b>	<b>Lower costs to child welfare system and lower abuse victim costs</b>
<b>Reduced child accidents and injuries</b>	<b>Lower costs for emergency room visits and other health care costs</b>
<b>Reduced use of special education</b>	<b>Lower costs for special education</b>
<b>Increased labor force participation and earnings in adulthood</b>	<b>Increased lifetime earnings for participants and increased tax revenue to government</b>
<b>Reduced crime and contact with criminal justice system</b>	<b>Lower costs for criminal justice systems and lower crime victim costs</b>

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## ***Strengths of This Class of Methods for Valuing Prevention and Wellness Strategies***

- **Expresses value of alternatives in a summary measure in common units to facilitate comparisons**

## ***This Feature Important for Valuing Community-Based, Non-Clinical Strategies***

- **Would facilitate relevant comparisons between**
  - **Treatment and prevention approaches**
  - **Non-clinical strategies and clinical strategies**
  - **Community-based services and services in more traditional health care provider settings**
- **Could compare many strategies at a time where one or more characteristics of the strategy varied**

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**Example—estimate net monetary benefit of each strategy:**

$$\text{Net benefit} = \text{Total benefits} - \text{Total Costs}$$

## *Net Cost-Savings Estimates for Higher-Risk Nurse Family Partnership Participants*

Component of Net Savings	Dollars per Child		
	Due to Mother	Due to Child	Total
<b>Program cost</b>			<b>6,083</b>
<b>Savings to government</b>	<b>20,384</b>	<b>4,310</b>	<b>24,694</b>
Drop in health service cost	0*	115	115
Taxes on increased income	5,683	0*	5,683
Drop in welfare cost	14,067	0*	14,067
Drop in criminal justice cost	634	4,195	4,828
<b>Net savings to government</b>			<b>18,611</b>

\*not measured

## ***Strengths of This Class of Methods for Valuing Prevention and Wellness Strategies***

- Expresses value of alternatives in a summary measure in common units to facilitate comparisons
- Incorporates measures of more “subjective” quality of life improvements as well as quantity measures

# *Valuing Preferences and Subjective Aspects Key for Community-Based Strategies*

- **Can assign values to quality-of-life improvements and other changes that people and communities care about**
- **Methods can be adapted from other health care analyses**
  - **Example: arthritis treatment valued not because it extends your life, but rather because it improves the quality of your life**
- **Could be modified to incorporate diversity in community preferences**

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- Distinguishes between different stakeholders/actors in the system
  - Participants, government, insurance companies, etc.

## ***Cost and Outcome Analysis Can Distinguish Between Different Stakeholders***

- **Example: Can measure costs of intervention relative to some baseline for different groups**

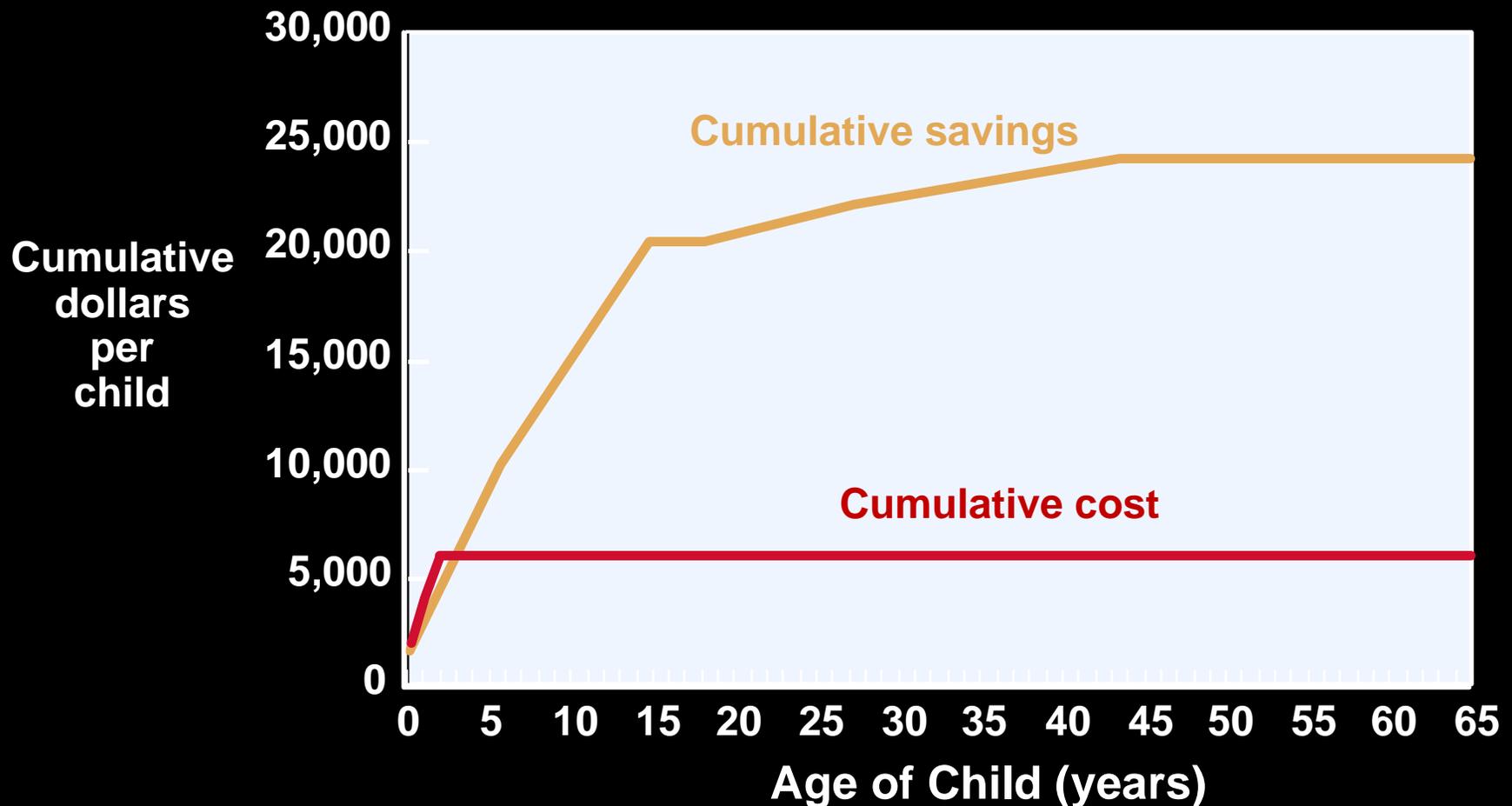
<b>Stakeholder</b>	<b>Examples of Costs for Intervention Relative to Baseline</b>
<b>Implementing organization</b>	<b>Costs of the intervention</b>
<b>Community partners</b>	<b>Costs of more referrals for partner services</b>
<b>Participating families</b>	<b>Costs of transportation to the appointments</b>

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- Handles multiple time periods, which is key challenge of valuing prevention

# Costs of Prevention Likely to Accrue Early, While Benefit Accrue Over Long Period

Time Path of Cost and Savings for Nurse Family Partnership



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- Distinguishes between different stakeholders/actors in the system
  - Participants, government, insurance companies, etc.
- Handles multiple time periods, which is key challenge of valuing prevention
- Communicates to policymakers and the public as well as researchers

## *Limitations of This Class of Methods for Valuing Prevention and Wellness Strategies*

- Long-term outcome data not always available
- Cost data often unavailable for interventions that have been evaluated
- Difficult (or unusual) to measure the comprehensive set of outcomes required for complete accounting of benefits

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## ***Widespread Use of This Framework Requires Methods Development***

- **Standardization of methods to promote comparability across interventions and studies**
  - E.g.—Discount rate, reference age, characterizing uncertainty
- **Approaches for converting some outcomes into values**
  - Example: Improved quality of life for child and parents when child reduces externalizing behaviors
  - Can adapt approaches already used in valuing health care
- **Ways to predict likely long-term outcomes based on measured short-term outcomes**

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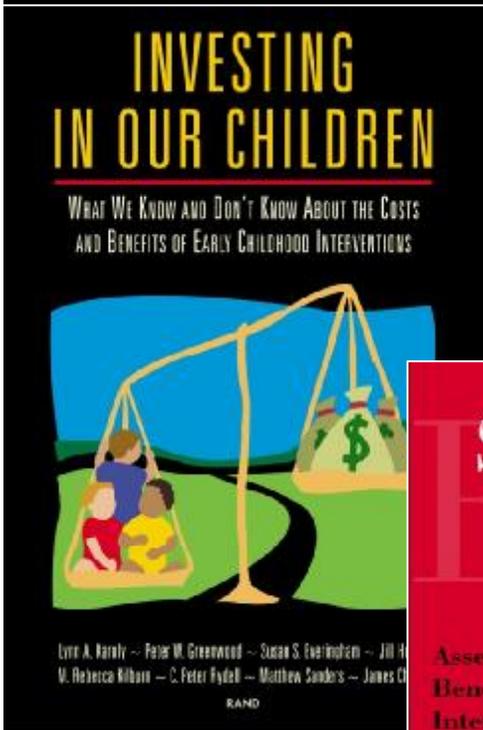
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## ***Cost and Outcome Analysis is a Promising Framework for Valuing These Strategies***

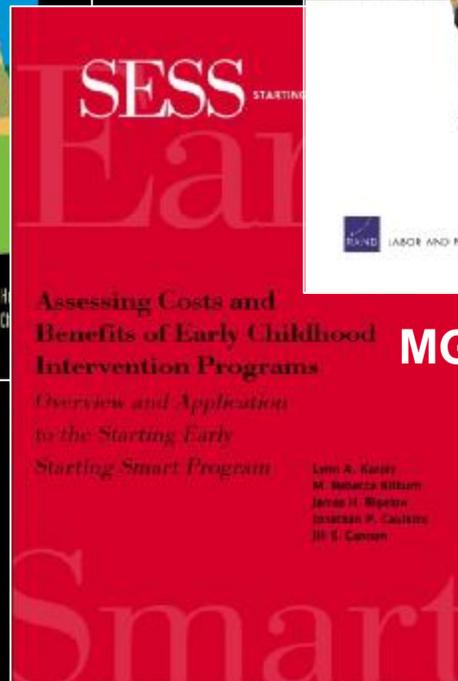
- **Already widely used to value health interventions**
- **Exhibits a number of important strengths relevant to valuing**
  - **Prevention and wellness initiatives**
  - **Community-based approaches**
  - **Non-clinical strategies**
- **Many of the weaknesses are also shared by other frameworks**
- **Methods development could promote the application of this class of analysis to these strategies**

# Several RAND Publications Use These Methods to Value Early Childhood Interventions

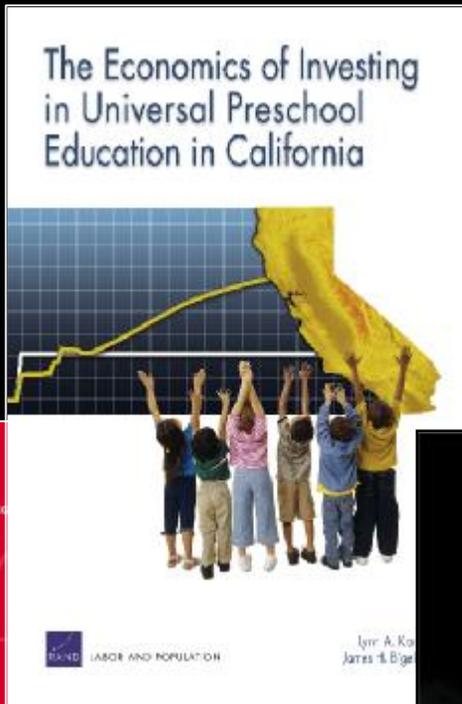


**MR-898, 1998**

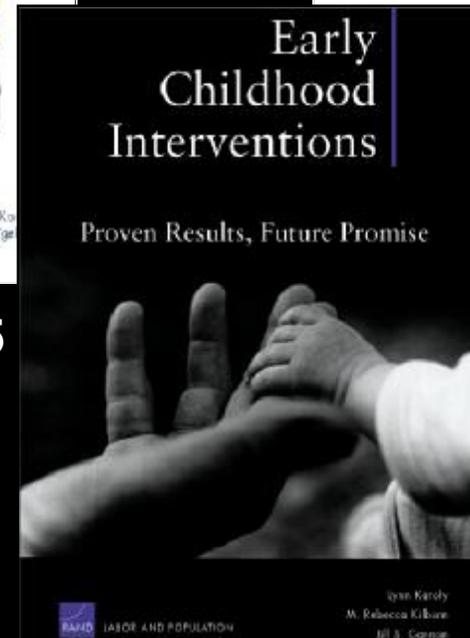
**RAND**



**MR-1336, 2001**



**MG-349, 2005**



**MG-341, 2005**



**OP-227, 2008**