

Cost Effectiveness Analysis

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Markets and Active Living Policy

- Has the operation of markets contributed to childhood obesity and to more sedentary life style?
- What are the economic rationales for market intervention?
- What are policy options? How do we conduct an economic evaluation of these options?

Economic Rationale for Intervention

- Imperfect information
- Externalities
- Non rational economic agents
- Monopoloy power

Cost Effectiveness Analysis

- Definition; Comparison with other forms of economic evaluation
- Steps in conducting a cost effectiveness analysis
- Examples of cost-effectiveness studies of interventions related to active living
- Criticisms and limitations of CEA

Cost Effectiveness Analysis (CEA)

- “Compares the cost of an intervention to its effectiveness as measured in natural health outcomes” (CDC Econ Eval Tutorial)
- Useful to compare alternative programs with a common health outcome or to assess consequences of expanding an existing program

Critical Questions

- Whose Perspective?
 - Societal perspective
 - Decision maker's perspective
- What is the Time Frame and Analytic Horizon?
 - Discounting
- What Outcomes?
 - Intermediate, Final
 - QALY/DALY

Critical Questions – Cont.

- What are the available alternatives?
 - No intervention
 - Other interventions
- What are the costs to be included in the CEA?
 - Direct tangible expenditures
 - Opportunity costs
 - Valuing time

CEA RATIO

$$\text{CE ratio} = \frac{\textit{Cost}_{new} - \textit{Cost}_{existing}}{\textit{Outcome}_{new} - \textit{Outcome}_{existing}}$$

DESIGN A COST
EFFECTIVENESS ANALYSIS
of
FOLLOWING
INTERVENTION

Example: Wang et al, Planet Health, 2003

- Societal Perspective
- Time frame - 2 year intervention;
Analytic horizon - 25 years
- Outcomes
 - Cases of adulthood overweight prevented (N)
 - QALY saved
- CER
 - $(C-NA)/NQ$
- C=Intervention Costs (See Table)
- Estimated N (based on observations of BMI)
- Literature based estimate of A (medical costs per case of overweight adult)

Intervention Costs

- Salaries for trainers and asst. trainer
- Stipends for teachers who participate in training
- Food during training
- Fitness funds
- Salary of trainer for schools
- Planet Health book

“A distinctive aspect of Planet Health is the interdisciplinary curriculum approach, which infuses intervention material into major subject areas and physical education, using grade- and subject-appropriate skills and competencies. Because such an approach does not require additional time relative to the existing practice, we did not include the cost of classroom lessons, but we did include the cost of the curriculum book.”

Example: Brown et al, CATCH in El Paso

- Societal perspective
- Time frame - 3 years; Analytic Horizon - Age 40 to 64
- Outcome
 - Number of Adult Cases Averted;
 - QALY
- Costs -
 - Trainer salary
 - Teacher time evaluated at wage
 - Excluded classroom time
- Similar strategy to Wang.

Findings

| Study | Cost Effectiveness Ratio (Overall) | Cost Effectiveness Ratio (Hispanics) |
|-----------------------------|------------------------------------|--------------------------------------|
| Wang et al, Plant Health | \$5166 | NA |
| Brown et al. CATCH | US\$900 0 | US\$903 0 |

Net Benefit Calculation

- Benefits
 - Medical costs averted
 - Productivity losses averted
- Costs
 - Intervention costs
- Wang et al
 - \$7313
- Brown et al
 - Overall - \$68125
 - Hispanic - \$58481

Sensitivity Analysis

- Uncertainty about parameter estimates
- Variations in implementation, e.g. differences in wages and salaries across locales
- Brown et al, CER ranges from \$900 to \$1143.

Example: Roux et al, Weight Loss Interventions

- Societal perspective
- Time frame - 12 months; Analytic Horizon - Age 35 to end of life
- Outcome - QALY (based on BMI reduction)
- Costs
 - Direct medical costs
 - Direct nonmedical costs
 - Time loss from work or leisure for participants

| Intervention | Target Pop. | CER | Source |
|---------------------------------------|----------------------------------|-----------------|----------------|
| Planet Health | Middle School Children | 4305 (in girls) | Wang et al. |
| Orlistat (Drug) | OW patients with Type 2 diabetes | 8327 | Maetzel et al. |
| Diet, Exercise, Behavior Modification | Adult Women | 12640 | Roux et al |

Criticisms and Limitations

- Too limited definition of relevant health outcomes
- Omission of Opportunity cost - Unpaid direct costs of time of participants frequently excluded in CEA studies. What was alternative use of time devoted to this curriculum? How do we evaluate this? Cost of time may vary by demographic group.
- Neglect of variations across demographic subgroups
- Lack of standardization
- Inappropriate choice of horizon

Final Points

- Cost effectiveness analysis provides useful information to guide policy decisions
- Analysis should identify all costs of the intervention

Resources

- Centers for Disease Control - http://www.cdc.gov/dhdsp/library/economic_evaluation.htm
- Johns Hopkins lecture materials <http://ocw.jhsph.edu/courses/UnderstandingCostEffectiveness/lectureNotes.cfm>
- Tufts CEA Registry - <https://research.tufts-nemc.org/cear/default.aspx>