Economic Evaluation

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What is economic evaluation?

If the government is going to take on a project or intervene, we need ways to compare the costs and benefits of the project/intervention for decision-making:

- whether to take on a project or not
- which of several possible projects is best

Prevention is often not cheaper than cure

- Prevention targets more people than will ever get the disease, so even if per person prevention is cheaper, there are more people involved.
- Some interventions aren't very effective at changing behavior.
- Prevention makes people live longer, thus increasing health care expenses, social security and Medicare, but not economic productivity (Not a reason to avoid prevention though.)

Implications:

- Need economic evaluation before decisions are made.
- Careful economic evaluation should take into account the appropriate costs and benefits. (e.g. increased Medicare costs from people living longer maybe should not be included)

Costs of interventions

Intervention	Costs per Life -year ($1993)
Childhood immunizations	less than 0
Prenatal care for pregnant women	less than 0
Influenza vaccine for all citizens	140
Mammography for women age 50	810
Random motor vehicle inspections	1,500
Water chlorination	4,200
Pneumonia vaccination	12,000
Strengthening of buildings in earthquake-prone areas	18 million

From Box 4-1 in text.

Cost Benefit Analysis

- Compare costs (C) and benefits (B) of public investment
- If $B - C > 0$, then invest
- Or choose approach with highest B/C ratio

CBA – details

- Opportunity costs:
  - what you pay (flu shot costs)
  - what you give up (pty time of workers getting shot)
- Benefits:
  - to recipient (person who got flu shot)
  - to external party (not immunized who has less exposure to flu)

Discounting

If project has future costs and benefits, need to discount

$$NPV = \sum_{t=1}^{T} \frac{B_t - C_t}{(1+r)^t} \tag{1}$$

Valuation of Outcomes

It is difficult to know the value of improved health, longer life, better quality of life.
There are 3 common methods of valuing these outcomes:

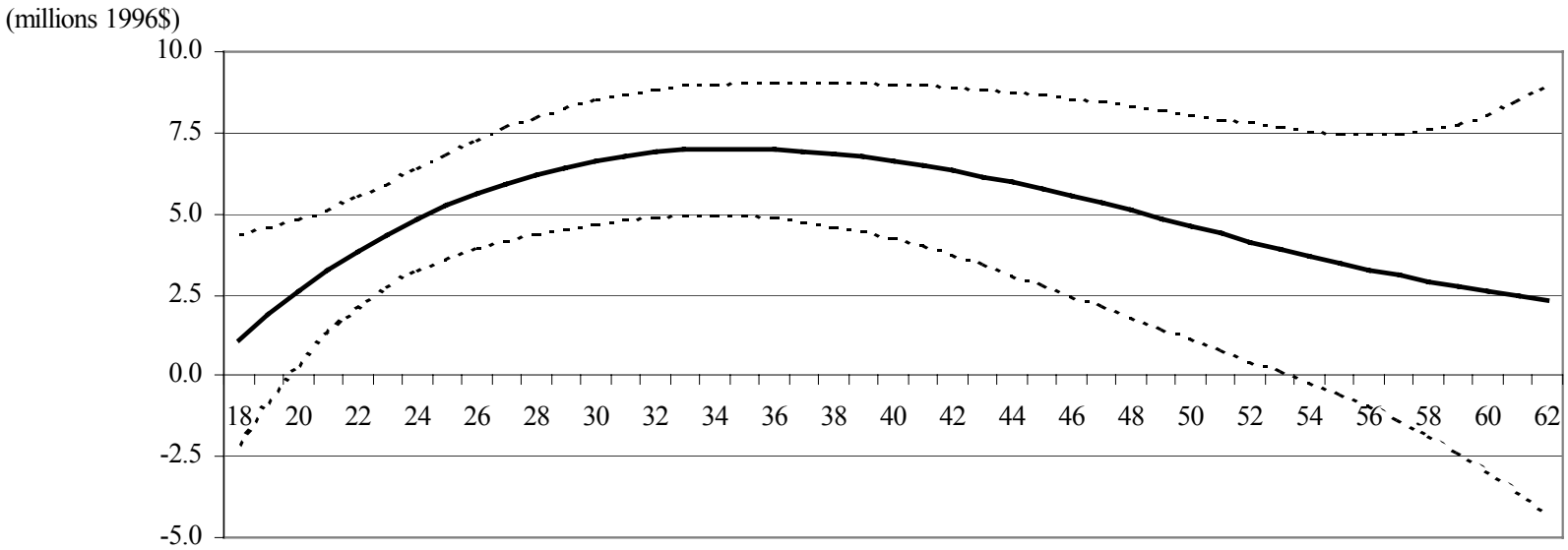
1. Human Capital approach
2. Risk Preference
3. Contingent Valuation

Human Capital approach

- focuses on lost work and lost leisure time; value of lost wages or the amount paid for replacement
  - if working woman loses 5 days of work, then value is per diem wage*days
  - if homemaker loses 5 days of housework, then value is cost of hiring replacement
- equates value of life to the market value of the output produced by an individual during his/her expected lifetime
- drawbacks:
  - overestimates productivity losses because firms use cheaper replacement workers
  - places emphasis on employed so retirees and unemployed are valued less
  - discrimination may hurt some groups
  - doesn't value pain and suffering

Estimates of VSL using HC approach

VSL



Source: Aldy and Viscusi, 2003.

Risk Preference approach

How much are people willing to pay for small reductions in probability of dying?
Examples:

- Jobs that involve a risk of fatal injury by .001 percentage point raise wage by \$6,600/year
  1000 people take job w/ .001 risk $\rightarrow$ 1 person dies
  1000*\$6600 = \$6.6 million paid for 1 to die
- Higher speed limit increases fatality rates by 35 percent but saved 125,000 hours per lost life
  Avg wage = \$12.33
  125,000*\$12.33 = \$1.54 million saved per fatality

Drawbacks of Risk Preference approach

- not easily linked to specific health states (only years of life)
- people with low-risk jobs also have high wages
- people whose views are reflected by political process (e.g. trucking industry) may not be average person

Contingent Valuation approach

- Way to assess the public's willingness to pay for goods like:
  - cleaner environment
  - state park
  - national defense
  - improved medical treatment
- Uses surveys and hypothetical situations
- Uses stated preference, unlike RP approach above which uses revealed preference

CV method

1. Describe good and hypothetical circumstance
   - Must be clear that would have to reduce spending on other things
   - Usually additional spending is in the form of higher taxes or product prices
2. Ask questions which elicit the respondents' willingness to pay for the good
   - In order to trace out demand curve, respondents asked to value several levels of provision
3. Questions about respondents' characteristics (age, income, etc.), preferences relevant to the good, and their use of the good are asked.
   - These are used in regression equations to estimate a valuation function for the good

Drawbacks of CV

- Difficult to apply to specific interventions because requires detailed knowledge about the interventions which is too hard for interviewing process, better suited to answering hypothetical questions about health-related programs
- Difficult to achieve comparability
- Faced with actual situations, people may value things differently

Example of CBA

Should college students be vaccinated again meningococcal disease?

Costs:

- cost of vaccine+admin cost = \$30.53 per dose
- 2.3 million freshmen enter college every year
- 80 percent would receive vaccine
- 1 severe reaction per 100,000 students vaccinated at cost of \$1830 per case

What is the total cost?

Example of CBA, cont.

Benefits:

- direct medical benefits per case = \$8145
- college student rate of disease = 2.6*national average (76 case avoided)
- value of life of 20 year old = \$1 million
- 12 lives saved

What is the total benefit?

Example of CBA, cont.

- Benefit - Cost = ?
- program would save lives, but do the benefits outweigh the costs?