Methods for data collection and analysis: costing methods in global health

Presenter: Carol Levin, Ph.D.
Overview

- Review general concepts for costing methods
- Apply to an example for increasing access to PMTCT in Zimbabwe
- Insights for costs of scaled up programs
Millions of lives depend on whether spending is guided by evidence

- Priority setting for new interventions or introducing new technologies, drugs, vaccines
- Resource requirements and advocacy
- Financial planning and budgeting
- Improving technical efficiency
Prelude

• Bountiful costing terms and methods.
• Purpose determines the choice of methods.
• Time horizon and timing of costing matters.
• Perspective is about whose costs?
• Scale and scope will affect the total and unit costs.
Some basic concepts in costing

Fixed versus variable costs
Total, average, marginal, incremental...
Example: Deworming, Uganda*

- Brooker et al. Cost and cost-effectiveness of nationwide school-based helminth control in Uganda
- Vertical deworming program through MOH
- Began with 5 national workshops
- District level workshop for teachers and community drug distributors
- Tablets administered in schools by teachers with supervision

*Example courtesy of Sue Horton, University of Waterloo
Example: Cost of deworming

• Average cost per child was $0.52, but ranged from $0.41 to $0.91 by district
• Drug cost was 40% overall, balance labor

Example courtesy of Sue Horton, University of Waterloo
Fixed vs. Variable costs

• Using school-based deworming example
  ▫ Some costs vary even in short-run with number of children treated
  ▫ Some costs do not vary in short-run with number treated
  ▫ In long run, some costs which are fixed in the long run become variable

Example courtesy of Sue Horton, University of Waterloo
Fixed vs. Variable

• Suppose variable cost is $0.20/child (drugs)
• Fixed cost is $1000/district (training session)
  ▫ District 1 has 5000 kids
  ▫ District 2 has 2000 kids
• Average cost per child is:
  ▫ $0.40 in District 1 ($0.20 plus $1000/5000)
  ▫ $0.70 in District 2 ($0.20 plus $1000/2000)
Total and marginal cost

• Total cost
  ▫ District 1: $1000+(5000*$0.20)=$2000 (fixed plus variable costs)
  ▫ District 2: $1000+(2000*$0.20) or $1400 (fixed plus variable costs)

• Marginal costs
  ▫ District 1 and 2 are $0.20 ($0.20 more per child)
    • Unless run out of space at training session
    • Other fixed costs increase—reaching last mile.

Example courtesy of Sue Horton, University of Waterloo
Incremental costs

- Incremental costs are different than marginal costs.
  - We use incremental costs a lot in estimating costs of global health programs.
  - What is the cost of adding a new service or technology or intervention to current health services?
  - Not what is the cost of reaching one more person or producing one more output (marginal cost).
Basic principles

- Define the problem
- Identify
- Measure
- Value
- Aggregate
Identifying Costs - types of costs

- **Direct Health Care costs**
  - Treatment or preventative care
  - Hospital, facilities, communities, home
  - Medication, procedures, tests, equipment

- **Direct Non-Health Care costs**
  - Out-of-pocket expenses - transportation, child care

- **Productivity costs (Indirect costs)**
  - Lost economic productivity due to disability or death
Identifying costs: Basic elements to consider

For example

- Staff costs, drugs, supplies
- Out of pocket expenses
- Lost production form work absenteeism

Costs for the health sector

Costs for patients and their families

Costs for other sectors
Measure: Broad cost methods

- Micro-costing methods
  - Bottom up costing
    - Quantify and cost out every input consumed in preventing or treating disease in an individual

- Gross costing or using average costs
  - Allocate the total budget (expenditures) to a particular department or service.
    - Top down costing

- Not mutually exclusive
Measure- Specific approaches

Step-down accounting

- Health facility level
- Identify major functions or cost centers of the facility

Activity based costing

- Program level (i.e. HIV, TB, immunization)
- Identify the major activities of each organizational level of the program and define these as the cost centers

An activity-based cost analysis of the Honduras Community-Based, Integrated Child Care (AIN-C) programme

John L Fiedler,1* Carlos A Villalobos2 and Annette C De Mattos1

Accepted: 12 May 2008

The Honduran AIN-C programme is a preventive health and nutrition programme of the Honduran Ministry of Health (MOH) that relies on volunteers to help mothers monitor and maintain the adequate growth of young children. A quasi-experimental, design-based evaluation found that the programme advanced universal coverage and was effective in improving mothers' child-feeding knowledge, attitudes and practices, including feeding and appropriate caregiving and care-seeking practices for children with diarrhea and acute respiratory illness. The programme is widely regarded as a model. This study was undertaken to provide the first comprehensive estimates of the cost of the AIN-C programme, with the goal of providing a programme and financial planning tool for Honduras. An additional comparison of study findings was also undertaken to determine the cost of the AIN-C programme’s community-based services relative to a similar factor-based service. Expressed in mid-2005 US$ dollars, the study found that the programme is phased-in: (1) the annual, recurrent cost per child under 2 years participating in the programme is $6.43; (2) the annual, incremental budget requirements per child under 2 years participating in the programme is $3.90; (3) the cost of an AIN-C monthly growth monitoring and counselling session per child is 11% of the cost of a traditional MOH facility-based growth and development consultation per child; and (4) the effect of mothers substituting AIN-C monitor care for MOH facility-based care saves 203,000 outpatient visits a year, with a potential cost saving of $1.66 million, the equivalent of 60% of the recurrent cost of the programme and roughly equal to the annual incremental budget requirements of the programme. Sensitivity analysis of the cost estimates is performed to provide insight for countries considering introducing a similar programme into how modifications of key characteristics of the programme affect its costs.

Keywords: Nutrition, community-based nutrition, cost analysis, health care financing, community participation, volunteer incentives

1 Social Sectors Development Strategies, Boston MA, USA.
2 Public Health Consultant, Health Sector Strategies, Tegucigalpa, Honduras.

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doi:10.1093/heapol/czn018
Measure-empirical data collection methods

**Ingredients approach**

- Collect information on quantities and the prices used to value all resources.

**Expenditure approach**

- Use total expenditure from budget or expense reports from Ministry of Health, implementing organization (i.e. NGO), or donor.

In practice, it is a combination of both methods.
Measure: Sources & methods for collecting quantity and price data

- Administrative data bases
  - From health facility
  - Project expense reports
  - MOH centralized records

- Standardized reporting forms
- Surveys for providers and beneficiaries
- Review of patient charts
- Observation or time-motion studies
- Expert panel
- Published price lists
Value: Estimating capital costs

• Large expenditures that last over one year.
• Could be a hospital, vehicle, laboratory equipment.
• Also often investments that must occur at the beginning of a project or program.
• Depreciation is included in costs.
Multiple year cost calculations

• Inflation
  ▫ Make sure dollars are worth the same amount in terms of what they can purchase

• Discounting
  ▫ Make sure that the dollar value is expressed in terms of the money that is needed at the present time, rather than the total cash flow.
    • Discounting takes into consideration time preference (now is better than later)
    • Related to real interest rate
Value: Estimating volunteer labor

- Community health workers (CHW) provide a lot of support at both the community and health facility level.
- Economic or opportunity cost
How to value volunteer time?

- Is the cost of volunteer labor zero?
  - Even if unemployed, they could be doing something else (leisure or productive) with their time

- How to value?
  - Use the value of similar employed resources
  - Use a single wage regardless of their actual employment (maybe agricultural wage rate?)
Aggregate costs

• Total costs

• Unit costs

• Cost profiles
Aggregate: Cost categories

Different way to consider costs categories

- Inputs
- Cost centers/function/activities
- Source of funding
- Level of service delivery
- Start-up costs verses recurrent
- Intervention specific costs verses joint or shared costs
- Combine categories inputs by activity
Assessing costs and effectiveness of expanding high quality PMTCT services by community and facility strengthening in Mashonaland Central Province, Zimbabwe
Zimbabwe ARISE Project: Intervention objectives

• Increase access to the WHO’s recommended PMTCT prophylaxis regimen, including highly active antiretroviral therapy (HAART) to all pregnant women who need it for their own health.
• Increase community access to and uptake of PMTCT services.
• Evaluate the effectiveness of the intervention by measuring the decrease in HIV infection among HIV exposed infants.
Research Objectives

Economic evaluation objective:

- Determine the *CIDA funded frontline cost* per infant infection averted
- Sub-objectives:
  - Costs: Estimate the *incremental program costs* incurred to provide Option A in Mashonaland Province
  - Impact: Calculate the incremental cost-effectiveness, measured as *cost per infection averted*
Comparison of PMTCT options

**Table 1**: Comparison of Zimbabwe’s WHO 2006 (“MER-28”) and WHO 2010 Option A (“MER-14”) guidelines for HIV-positive women and their HIV-exposed infants

<table>
<thead>
<tr>
<th>WHO 2006, Prophylaxis</th>
<th>WHO 2010, Option A Prophylaxis</th>
<th>WHO 2010, ART</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother (CD4&gt;350):</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• ANC: Single-dose nevirapine (NVP) or dual-drug prophylaxis regimen containing zidovudine (AZT) starting at 28 weeks gestation until BF cessation</td>
<td>• ANC: 2x/daily AZT starting at 14 weeks gestation through pregnancy</td>
<td>• Triple ARV therapy starting at 14 weeks gestation and continued for life.</td>
</tr>
<tr>
<td></td>
<td>• Labor: Single dose NVP at labor, plus initiation 2x/daily AZT+3TC for 1 wk postpartum</td>
<td>• TDF+3TC+EFV is preferred regimen</td>
</tr>
</tbody>
</table>

| **Infant:**            |                               |              |
|                       | • Daily AZT from birth until 6 wks age (irrespective of feeding method) | • Breastfeeding (BF): Daily NVP at birth through 1 wk after BF cessation |

Figure 1. PMTCT cascade\(^1\) and corresponding mother-infant patient volumes during the costing period, February 2012-January 2013.

Perspective and cost definitions

• **Donor perspective (CIDA)**
  ▫ **Frontline (financial) costs** represent actual project expenses paid for by the project to deliver goods and services

• **Ministry of health perspective (MOH Zimbabwe)**
  ▫ **Economic or opportunity costs** value all resources used to provide services even if not paid for in the current project budget:
    • Donated goods and services, volunteer labor, contribution of goods and services by MOH
Start up activities

• Intervention
  • Microplanning
  • Development and prodn of IEC materials
  • Development and prodn of training materials
• Sensitization and awareness raising
• Training
Recurrent activities

- Health system strengthening
- Procure CD4 machines
- Mentoring program
- Training and capacity strengthening
- Procurement
- Health Service Delivery (MOH)
- Community activities to increase demand for services
  - Continuous awareness raising and sensitization
- Supervision
### Cost input/activity categories

<table>
<thead>
<tr>
<th>Variable costs</th>
<th>Fixed or capital goods</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Health commodities</td>
<td>• Vehicles</td>
</tr>
<tr>
<td>• Transport</td>
<td>• Equipment</td>
</tr>
<tr>
<td>▫ Fuel, parking, maintenance, repairs, taxis, tolls, insurance)</td>
<td>▫ CD4 machines</td>
</tr>
<tr>
<td>• Personnel</td>
<td>• Computers</td>
</tr>
<tr>
<td>• Office facilities</td>
<td>• Start-up activities</td>
</tr>
<tr>
<td>• Management meetings</td>
<td>▫ Microplanning</td>
</tr>
<tr>
<td>• Training/supervisory meetings</td>
<td>▫ Developing materials</td>
</tr>
<tr>
<td>• Overhead costs</td>
<td>▫ Training</td>
</tr>
<tr>
<td></td>
<td>▫ Sensitization and awareness raising</td>
</tr>
</tbody>
</table>
Cost outcomes

- Total intervention cost
- Cost profile (share of costs to inputs or activities)
- Cost per pregnant woman screened for HIV
- Cost per HIV positive woman treated
- Cost per infant infection averted
**Arise Zimbabwe project:** Costs of strengthening access to PMTCT (US $2012)

<table>
<thead>
<tr>
<th>Category</th>
<th>CIDA Upfront Financial</th>
<th>Annual Financial</th>
<th>Annual Economic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect programmatic costs</td>
<td>$200</td>
<td>$200</td>
<td>$400</td>
</tr>
<tr>
<td>Recurrent training meetings</td>
<td>$400</td>
<td>$400</td>
<td>$400</td>
</tr>
<tr>
<td>Recurrent planning meetings</td>
<td>$100</td>
<td>$100</td>
<td>$100</td>
</tr>
<tr>
<td>Supplies</td>
<td>$100</td>
<td>$100</td>
<td>$100</td>
</tr>
<tr>
<td>Personnel</td>
<td>$100</td>
<td>$100</td>
<td>$200</td>
</tr>
<tr>
<td>Equipment depreciation and repairs</td>
<td>$100</td>
<td>$100</td>
<td>$100</td>
</tr>
<tr>
<td>Transportation</td>
<td>$100</td>
<td>$100</td>
<td>$100</td>
</tr>
<tr>
<td>Health Commodities</td>
<td>$100</td>
<td>$100</td>
<td>$200</td>
</tr>
<tr>
<td>Sensitization and awareness raising</td>
<td>$100</td>
<td>$100</td>
<td>$100</td>
</tr>
<tr>
<td>Training and mentoring</td>
<td>$100</td>
<td>$100</td>
<td>$100</td>
</tr>
<tr>
<td>Developing materials</td>
<td>$100</td>
<td>$100</td>
<td>$100</td>
</tr>
<tr>
<td>Microplanning</td>
<td>$100</td>
<td>$100</td>
<td>$100</td>
</tr>
</tbody>
</table>

**Thousands, USD**
Start-up and recurrent costs by implementing partner (US 2012)

<table>
<thead>
<tr>
<th>Partner</th>
<th>Start-up costs</th>
<th>Recurrent</th>
<th>Overhead</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHAI Economic</td>
<td>$150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZAPP Economic</td>
<td>$300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOHCW Economic</td>
<td>$450</td>
<td></td>
<td>$600</td>
</tr>
<tr>
<td>Cost Category</td>
<td>Unit costs</td>
<td>Cost Category</td>
<td>Unit costs</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td># of beneficiaries</td>
<td>20,954</td>
<td># of beneficiaries</td>
<td>20,954</td>
</tr>
<tr>
<td><strong>Start-up</strong></td>
<td></td>
<td><strong>Start-up</strong></td>
<td></td>
</tr>
<tr>
<td>Microplanning</td>
<td>$ 0.93</td>
<td>Developing materials</td>
<td>$ 0.24</td>
</tr>
<tr>
<td>Training and mentoring</td>
<td>$ 3.08</td>
<td>Sensitization and awareness raising</td>
<td>$ 0.31</td>
</tr>
<tr>
<td><strong>Sub-total Start-up</strong></td>
<td>$ 4.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Recurrent</strong></td>
<td></td>
<td><strong>Recurrent</strong></td>
<td></td>
</tr>
<tr>
<td>Health Commodities (consumable supplies)</td>
<td>$ 23.46</td>
<td>Transportation</td>
<td>$ 0.60</td>
</tr>
<tr>
<td>Transportation</td>
<td></td>
<td>- Capital (vehicles annualized depreciation)</td>
<td>$ 0.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Recurrent (Fuel, parking, maintenance, repairs, taxis, tolls, insurance)</td>
<td>$ 7.24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Equipment (CD4 machines, computers annualized depreciation)</td>
<td>$ 1.13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Personnel - implementation staff (excludes management team)</td>
<td>$ 13.09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Office facilities (supplies and communication, such as copying, telephone,</td>
<td>$ 0.61</td>
</tr>
<tr>
<td></td>
<td></td>
<td>postage, stationary, registers, support to PMTCT program</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Project management meetings</td>
<td>$ 0.48</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Training/supervisory meetings</td>
<td>$ 0.16</td>
</tr>
<tr>
<td><strong>Sub-total Recurrent</strong></td>
<td>$ 46.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overhead</td>
<td>$ 1.52</td>
<td><strong>Total Cost per beneficiary</strong></td>
<td>$ 52.85</td>
</tr>
</tbody>
</table>
Summary of ARISE  
Zimbabwe intervention costing methods

- Micro-costing approach
- Bottom up approach
  - Combine activity based costing, ingredients approach and budget expenditure data
- Payer perspectives
  - Donor and Ministry of Health
- Multi-level:
  - National (NGO), health facility, community
- Sub-sample of project intervention health facilities
- Incremental cost to existing PMTCT services
Limitations of micro-costing data

• Using data from demonstration projects may have limited information on cost of actual nationwide introductions
  ▫ Scope
  ▫ Coordination with national program
  ▫ Health system capacity

• Projections of cost of scaling-up are based on assumptions
  ▫ Demographic, health system, utilization
Going to scale: project verses program-what is the difference?

- Scale and time horizon (returns to scale)
- Demonstration project informs scaled up program
- Integrated with other programs
- Donor driven or externally funded
  - Abundance of planning meetings, awareness raising and sensitization activities
  - Capital expenses to support project
  - International technical expertise
Concluding remarks

• There is general consensus on the principles of costing
  ▫ Define the problem
  ▫ Describe the intervention
  ▫ Identify resources
  ▫ Measure resources
  ▫ Attach a value to resources

• There are multiple ways to value resources—or measuring ‘costs’ and there is no single “right” way to do it.
  ▫ All have advantages and disadvantages
Best practice depends on...

- Purpose of the study
- Perspective
- Type and complexity of the health intervention or technology
- Precision required
- Generalizability and representativeness required
- Feasibility and costs of measurement method
Thank you!

<table>
<thead>
<tr>
<th>PMTCT Cascade</th>
<th>Average time spent by primary care counselor (minutes)</th>
<th>Average time spent by primary care nurse (minutes)</th>
<th>Average time spent by registered general nurse (minutes)</th>
<th>Average time spent by registered midwife (minutes)</th>
<th>Average time spent by community mobilizer (minutes)</th>
<th>Total labor cost per HIV + PW or HIV - PW</th>
</tr>
</thead>
<tbody>
<tr>
<td>General ANC care (health education only)</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Testing for HIV (pre-test counseling, HIV test, post-test counsel, return results)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV positive PW</td>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV negative PW</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enroll all HIV+ PW in care (Begin on MER 14 prophylaxis)</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Determine ART eligibility (CD4 testing, return CD4 results)</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiate ART for eligible PW (ART prep sessions 1, 2, 3 and initiation)</td>
<td>135</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follow-up during ANC (time for drug dispensing during ANC only)</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor and delivery</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access postnatal Care (3 days, 7 days, 6 weeks)</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Re-test HIV negative PW (with results older than 3 months)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug dispensing (Nevirapine prophylaxis and Co-trimoxazole)</td>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Determine HIV status of infant at 6 weeks (DBS sample, counsel, document)</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return HIV result to caregiver</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rapid HIV Test for HIV-exposed infants at 9 months</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiate HIV+ baby on pediatric ART</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug dispensing pediatric ART</td>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total clinical time HIV + PW (minutes)</td>
<td>0</td>
<td>533</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>37.64</td>
</tr>
<tr>
<td>Total clinical time HIV -PW (minutes)</td>
<td>0</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td>1.48</td>
</tr>
<tr>
<td>Cost per minute</td>
<td>0.03</td>
<td>0.07</td>
<td>0.08</td>
<td>0.08</td>
<td></td>
<td>37.64</td>
</tr>
<tr>
<td>Total clinical cost HIV + PW</td>
<td>-</td>
<td>-</td>
<td>37.64</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total clinical cost HIV -PW</td>
<td>-</td>
<td>-</td>
<td>1.48</td>
<td></td>
<td></td>
<td>1.48</td>
</tr>
<tr>
<td>Total clinical cost of HIV+ partner</td>
<td>0.00</td>
<td>1.48</td>
<td></td>
<td>-</td>
<td></td>
<td>18.86</td>
</tr>
<tr>
<td>Total clinical cost of HIV- partner</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
<td></td>
<td>1.41</td>
</tr>
</tbody>
</table>

Note: The table above shows the average time spent by different healthcare providers for various activities in the PMTCT Cascade, along with the cost per minute and total cost for HIV+ and HIV- clients.
Methods for data collection and analysis

How to choose which health economic analysis to do?
## Types of economic evaluations

<table>
<thead>
<tr>
<th>Method of analysis</th>
<th>Cost Measurement</th>
<th>Outcome measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost-Effectiveness (CEA)</td>
<td>$</td>
<td>Natural units (life-year gained, case averted, blood pressure); single outcome</td>
</tr>
<tr>
<td>Cost-Utility (CUA)</td>
<td>$</td>
<td>Life years adjusted for quality of life, captures mortality and morbidity; multiple outcomes</td>
</tr>
<tr>
<td>Cost-Benefit (CBA)</td>
<td>$</td>
<td>$; multiple outcomes combined into one value</td>
</tr>
</tbody>
</table>
Choosing the appropriate economic evaluation method

• What is the research question?
• Who is your audience?
• How will you use the information?
• When do you need it?
• How much money do you have?
What is the objective of the economic evaluation?

- Comparing costs and effects of alternative interventions using CEA or CEU?
- Costs of a new health intervention or technology?
- Costs of a demonstration project?
- Costs associated with project impact?
- Costs associated with scaling up?
  - What it would cost a national program to achieve a planned impact? (i.e. 70% coverage of ART therapy for HIV positive individuals).
- One or more of the above?
### Basic types of health care evaluations

#### Are both Costs and Outputs measured?

<table>
<thead>
<tr>
<th></th>
<th>NO</th>
<th>YES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compare two alternatives?</td>
<td>Examines Consequences Only</td>
<td>Describe Costs and Outcomes</td>
</tr>
<tr>
<td>NO</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Examine Costs Only</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Describe Outcomes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

#### Efficacy or Effectiveness Evaluation

<table>
<thead>
<tr>
<th></th>
<th>NO</th>
<th>YES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compare two alternatives?</td>
<td>Efficacy or Effectiveness Evaluation</td>
<td>Cost-Effectiveness Analysis</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>Cost-Benefit Analysis</td>
</tr>
</tbody>
</table>

Source: Drummond et al.
Is there evidence on effectiveness of interventions?

- Is effectiveness of interventions equal?  
  - yes → Cost minimization study  
  - no → Costing study

- Can all outcomes be valued in monetary terms?  
  - yes → Cost-benefit analysis  
  - no → Can outcomes be measured as quality-adjusted life-years?

- Can outcomes be measured as quality-adjusted life-years?  
  - yes → Cost-utility analysis  
  - no → Cost-effectiveness analysis

## Defining the economic evaluation

<table>
<thead>
<tr>
<th>Describe</th>
<th>Questions to consider</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Study objective(s)</strong></td>
<td>What is the specific research objective for the economic evaluation?</td>
</tr>
<tr>
<td><strong>Study design</strong></td>
<td>How will costs and effects be evaluated as part of the overall monitoring and evaluation strategy?</td>
</tr>
</tbody>
</table>
| **What is being evaluated?** | • Health outcomes  
• Health outputs (coverage, utilization)  
• Other performance or operational indicators  
• Costs |
| **Health outcomes** | Which health outcomes will be evaluated?  
1. Cases averted  
2. Deaths averted  
3. Disability averted |
| **Health outputs** | What additional intermediate output indicators will be evaluated?  
• Number of target group reached by intervention  
• Number of target group tested  
• Number of target group diagnosed (number positive, number negative)  
• Number of individuals treated |
## Defining the economic evaluation

<table>
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<tr>
<th>Describe</th>
<th>Questions to consider</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance or operation indicators</strong></td>
<td>What operational indicators will be evaluated? 1. Quality or other performance indicators 2. Number of tests correctly identifying individuals for treatment. 3. Number of target group correctly treated. 4. Loss to follow up</td>
</tr>
<tr>
<td><strong>Costs</strong></td>
<td>Which costs will be included in the analysis? 1. Intervention costs 2. Medical treatment costs averted 3. Client costs incurred or averted</td>
</tr>
<tr>
<td><strong>What will this data reveal?</strong></td>
<td>• Cost per case or death averted • Cost per individual (in target group) reached • Cost per person screened • Cost per person treated • Cost breakdown (cost profiles) for intervention components (inputs/activities) • <em>Information for program planners on the costs and benefits of proposed intervention.</em></td>
</tr>
<tr>
<td><strong>How will the data be used?</strong></td>
<td>• Used in cost-effectiveness analysis to compare new intervention to status quo • To consider introduction or scaling up existing prevention or treatment activities in the country • To evaluate financial sustainability or affordability to the government</td>
</tr>
</tbody>
</table>
Getting started - a few ideas

- Integrate cost analysis into on-going evaluation.
- Depending on resources and when analysis is needed, may consider a rapid approach.
- Focus efforts on obtaining data on the largest input categories.
- Work closely with local counterparts to collect basic data and cost information.
- Look for local health economists who can direct you to resources.
Thank you.