Principles of Costing for Global Health

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Overview of today's lecture

- Review economic principles
- Review cost concepts
- Overview of costing process and methods
- Application: HPV vaccination –multi-country study

What is a cost?

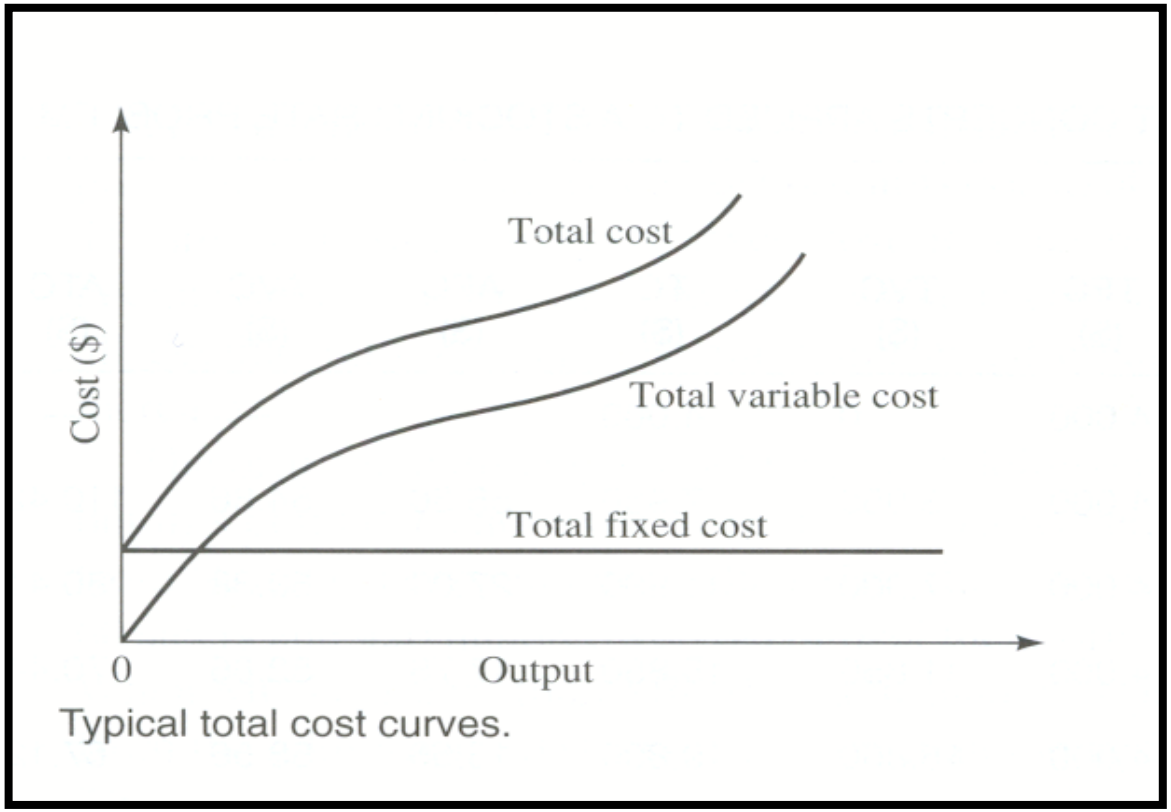
- **Cost** is a general term that can refer to the value of resources/inputs used to produce a good or service.
  - This can refer to financial, economic, unit or average, or other types of costs depending on the ingredients included.

I. Concepts of cost, as used by economists

Basic cost concepts

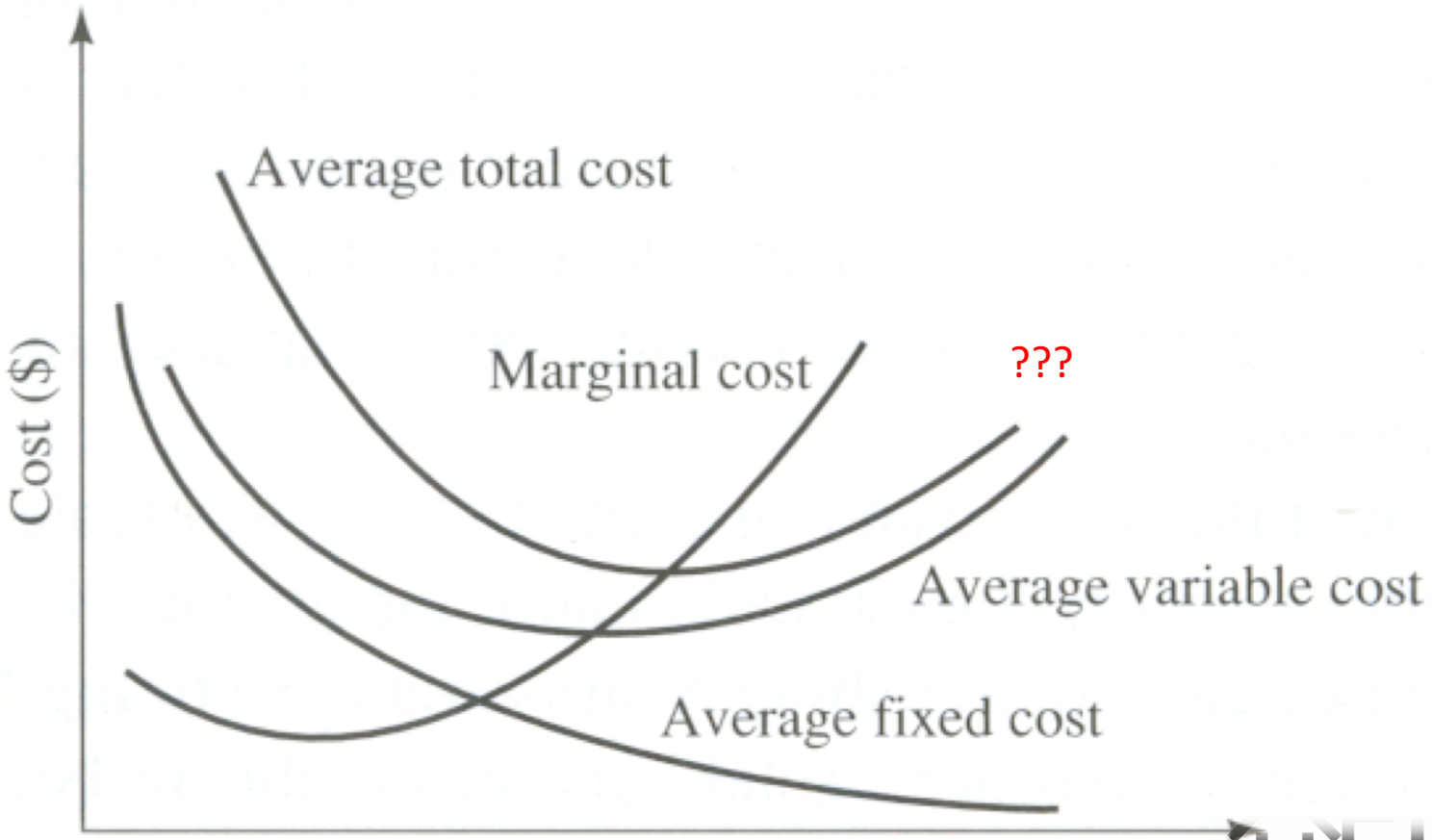
- Total Cost
- Average Cost
- Marginal Cost
- Fixed versus variable costs
- Discounting the future
- Monetary costs versus opportunity costs
- Incremental Cost

Typical total cost curves



Typical total cost curves.

Typical average & marginal cost curves



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 I

- 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 II

- 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.

- Concept of “economies of scale”
  - Spread fixed costs over more children/patients/output then average costs may fall as scale increases
  - At a certain point average costs may increase again => “diseconomies of scale”

Example courtesy of Sue Horton, University of Waterloo

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

Opportunity cost

- Economic concept of “opportunity cost”
- “There is no such thing as a free lunch”- Milton Friedman
- How much would the resource be worth in its next alternative use.
- Use it to value donated goods, volunteer labor or goods and services for which there may not be a market price.

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).

Incremental vs. Marginal Cost