

Micro Costing

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Outline

- Motivation
- Pros and Cons of Micro-Costing Quantities
 - Potential for exact data
 - Burden of gathering a large quantity of data
 - Electronic data collection opportunities
- Pros and Cons of Micro-Costing Prices
 - Measured locally & interpreted for other locales
 - Difficulty of making cross-national comparisons
- New technologies
- Comparisons of productive efficiency
- Non-market goods
- Data management
- Comments from experience



Motivation

- Micro-costing provides the *potential* for very precise measurement of the value of resources being used for an intervention
 - Apply the technique anywhere
 - Analyze new technology
 - Obtain a local estimate of resources
 - Analyze whether variation in cost in existing technology in a local health care system or across systems comes from quantity variation or price variation



Micro-costing does not require...

- An extensive claims system
- A sophisticated reimbursement system
- Sophisticated data gathering technology



Micro-costing does require...

- That keeping careful records of resources be seen as an integral part of study
- Excellent data base management
- Method of valuing all goods, services, and non-market resources that are used in the analysis



Pros of Micro-Costing Quantities

- Potential to obtain very precise measurements of the resources that are used for each case or study subject

Cons of Micro-Costing Quantities

- Burden of collecting precise data
 - Data collection effort is a function of the number of different resources and the expected variation in the amount of each resource that is being used
 - Measurement is sometimes done by the same staff who implement an intervention
 - If measurement is done by study staff who are not involved in implementation the cost of the research can be large
- Data collection questions
 - Do people fill out forms as they go along?
 - Do people fill out exact times or do they estimate?

Does electronic data collection make micro-costing easier?

- Use of time stamps on a PDA or computer can make collection of time data more accurate
 - Avoid the need for estimation
 - Consider what level of precision is needed
- Having electronic data collection facilities, an investigator may try to capture more data more precisely more often
 - While each data collection point is likely to be easier if the increase in quantity, frequency, and precision is sufficient the study will end up requiring greater effort



Cross-Site Issues

- Comparisons of interest
 - Cross provider
 - Cross system
 - Cross national
- Ascertain whether cost differences are a function of different quantities or different prices
- Standardize prices applied to different quantities
- Be mindful of whether differences in relative prices and marginal productivity reflect true differences in different settings



Pros of Micro-Costing Prices

- Apply local prices to present case study results for local decision makers
- If results are presented in a way that shows quantities and prices, a decision maker can use the quantity data and apply her own prices
- Assuming that quantity data are generalizable, local data can easily be generalized to national costs using standardized costs



Cons of Micro-Costing Prices

- What is the right price to apply for generalization?
- How difficult is it to obtain local prices for each decision maker?
- Cross national studies involve a combination of exchange rates, purchasing power parity, and other reasons for differences in relative prices



Costing New Technologies

- Micro-costing can be useful for assessing the resources required for something that has not been costed before
- If the costing exercise is done alongside a research exercise to establish efficacy, the method of implementation is unlikely to be identical to the eventual “scaled up” implementation
 - May be more implemented more efficiently by people in the field rather than researchers
 - May be more layers of bureaucracy to implement scaled up version
- Mixture of data collection and implementation may make quantity estimates (and prices) less precise



Data Management Issues

- Most data in studies are collected with the individual being the unit of observation
- Sometimes resource data are collected with the resource being the unit of observation
- Must make sure to have a cross-walk system so that resources can be matched with study subjects

Micro-costing of non-market goods

- Potential precision of quantity data is similar to the potential for quantity data for market goods
- Do not need to have a market price
 - Can use shadow prices
- Examples
 - Time for individuals who are not employed for pay
 - Land that is held by the government

Guided Care¹

- System in which a nurse provides help with navigating the care system for individuals with multiple comorbidities who are predicted to have high expenditures
- Personnel asked to track their own time
- Track nurse time within a practice
 - Asked to fill in a grid of 15 minute blocks
 - Attribute nurse time to specific patients
 - Attribute nurse time to specific activities
 - Use micro-costing to enhance the understanding of the process of care
- Use average wage rates from BLS with local wages as a sensitivity analysis
- Combine with claims based system of measuring cost-offsets
 - For both prices and quantities

Infant Feeding Support²

- Community health worker and peer-counselor paying home visits to mothers of newborns and being available by phone on a warm line
- Personnel tracking their own time and study subjects asked about resources in surveys
- Track time of different types of personnel
 - Asked to estimate to nearest 15 minutes
- Track mileage
- Track resources used for or loaned to study participants
 - Scales
 - Breast pumps
- Track time required of mothers
- Track medical resources uses by mothers



Infant Feeding Support Prices

- Use average wages from BLS and local wages
- Use lowest cost infant formula (powdered, large package, not name brand) and use other costs of formula as sensitivity analysis
- Medical care
 - Reimbursable amounts
- Other supplies
 - Program cost

Intergenerational Family Care³

- Social work, legal, and health system for grandparents raising grandchildren
- Significant use of computer technology
- Social work interns paid home visits and worked over the phone
- Elaborate computer time measurement system was used to track all time in the office
 - Use of time stamps automated to go along with entry of the client name and type of activity in the system
- Data on health care providers and legal interns that are part of the system
 - Computer technology system does not extend to these professional service providers
- Use average wages from BLS for employees with appropriate levels of training

³DePanfilis D, Dubowitz H. Family connections: a program for preventing child neglect. *Child Maltreat.* 2005; 10(2): 108-23.

Vision Screening in Preschoolers⁴

- Comparison of two different types of personnel using four different screening devices to identify potential vision disorders in children
- Personnel had to use a time stamp to stamp sheets that “traveled” with the child as the child went from one personnel-device combination to the next
- High compliance
- All other resources were “common” so the time per child could receive a lot of attention
- Use wholesale costs of devices with retail costs as sensitivity analysis
- Use average wages from BLS and standard travel costs

⁴Ying GS, et al. Sensitivity of screening tests for detecting vision in preschoolers-targeted vision disorders when specificity is 94%. *Optom Vis Sci.* 2005; 82(5): 432-8.

Salisbury Eye Evaluation in Nursing Home Groups⁵

- Vision technicians screened older adults living in nursing homes for vision disorders
- This would then be followed by an ophthalmologist exam and services provided by an optometrist or a low vision rehabilitation specialist
- Research assistant tracked start and stop times
- Moderate compliance and some estimation
- Use average wages from BLS with local wages as sensitivity analysis
- Use standard reimbursement rate of cataract surgery
- Use cost of least expensive glasses and actual program cost of low vision training efforts

⁵West SK et al. A randomized trial of visual impairment interventions for nursing home residents: study design, baseline characteristics and visual loss. *Ophthalmic Epidemiol.* 2003; 10(3): 193-209.



CONCLUSION

- Micro-costing provides the *potential* for very precise measurement of the value of resources being used for an intervention
- Particularly useful for assessing the cost of new technologies or making comparisons of efficiency among different providers
- Consider what is gained by using resources to obtain such precise measurements
 - A cost-benefit analysis of the cost-effectiveness exercise!