Equity & medical impoverishment into cost-effectiveness: Extended Cost-Effectiveness Analysis (ECEA)

Presenter:
Stéphane Verguet
Department of Global Health
University of Washington
Email: verguet@uw.edu
Overview

• Background
  A new perspective on economic evaluation

• ECEA example
  Public finance of rotavirus vaccination
• **Traditional economic evaluation focus**
  Cost-effectiveness of technical interventions
  (e.g. antiretroviral therapy for HIV/AIDS)

• **Decision-making & priority setting focus**
  Resources allocated across different options
  1) Health service delivery platforms
  2) Health policy levers
     (e.g. public finance, taxation, CCTs)

Take consideration of several criteria:
  → burden, costs, equity, medical impoverishment
Health system objectives

• Improving health and the distribution of health in the population

• Prevention of medical impoverishment

• Fairness in the financial contribution toward health

Murray & Frenk (2000); World Health Report 2000
Distribution of health & equity

Rotavirus deaths for a birth cohort of 1M

Per capita numbers adapted from:
Tate et al. (2012)
Rheingans et al. (2012)
Medical impoverishment: e.g. borrowing

<table>
<thead>
<tr>
<th>Country</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethiopia</td>
<td>20</td>
</tr>
<tr>
<td>Senegal</td>
<td>40</td>
</tr>
<tr>
<td>South Africa</td>
<td>10</td>
</tr>
<tr>
<td>India</td>
<td>50</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>40</td>
</tr>
</tbody>
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Adapted from: Kruk et al. (2009)
Consequences of publicly financed interventions

- **Health gains**
  Burden of disease averted (e.g. deaths averted)

- **Financial consequences for households**
  Public finance “crowds out” treatment which is privately financed (= cost savings for households)

- **Financial protection benefits for households**
  Public finance provides “insurance” from catastrophic expenditures
Economic evaluation of policy levers

Cost-Effectiveness Analysis (CEA)

Extended Cost-Effectiveness Analysis (ECEA)

1. Distributional consequences across wealth strata of populations
2. Financial risk protection benefits for households
ECEA Methods

- Applied to the *Disease Control Priorities* assessments

- ECEA Methods Paper – DCP3 Working Paper No.1
  “Universal Public Finance of Tuberculosis Treatment in India: An Extended Cost-Effectiveness Analysis” by Verguet S, Laxminarayan R & Jamison DT
Public finance of rotavirus vaccination in India and Ethiopia: An extended cost-effectiveness analysis

Stéphane Verguet\textsuperscript{a,*}, Shane Murphy\textsuperscript{a}, Benjamin Anderson\textsuperscript{b}, Kjell Arne Johansson\textsuperscript{c}, Roger Glass\textsuperscript{d}, Richard Rheingans\textsuperscript{b,e,f}

\textsuperscript{a} Department of Global Health, University of Washington, Seattle, WA, United States
\textsuperscript{b} Department of Environmental & Global Health, University of Florida, Gainesville, FL, United States
\textsuperscript{c} Research Group in Global Health: Ethics, Economics and Culture, Department of Public Health & Centre for International Health, University of Bergen, Bergen, Norway
\textsuperscript{d} Fogarty International Center, National Institutes of Health, Bethesda, MD, United States
\textsuperscript{e} Center for African Studies, University of Florida, Gainesville, FL, United States
\textsuperscript{f} Emerging Pathogens Institute, University of Florida, Gainesville, FL, United States
Rotavirus burden of disease

- 5 countries account for > 50% of all rotavirus deaths (300,000 deaths): (Tate et al. 2012; Liu et al. 2012)
  - D.R. of the Congo
  - Ethiopia (5% of global rotavirus deaths)
  - India (30% of global rotavirus deaths)
  - Nigeria
  - Pakistan
Public finance program for rotavirus vaccination

Vaccinate birth cohort with a 2-dose course vaccine

Partially effective vaccination (~ 50%)

Coverage achievable by health system (e.g. DTP2 coverage)

Rotavirus deaths averted

Rotavirus treatment costs averted by households

Financial risk protection afforded

Poorest

Poorer

Middle

Richer

Richest
Financial risk protection benefits

• Different measures of medical impoverishment:
  
  ➢ Threshold-based approach (Xu et al. 2003; Wagstaff, 2010)
  ➢ Forced asset sales & forced borrowing (Kruk et al. 2009)
  ➢ Number of cases of poverty averted: estimate number of individuals crossing poverty line because of medical expenses
  ➢ Money-metric value of insurance provided
    (McClellan and Skinner 2006; Finkelstein and McKnight 2008; Verguet, Laxminarayan and Jamison, 2012)
Rotavirus deaths averted for a 1 million birth cohort

Income Quintile (Poorest to Richest)

Deaths averted

India
Ethiopia
Financial risk protection afforded for a 1 million birth cohort

Money-metric value ($)

India
Ethiopia

Income Quintile (Poorest to Richest)
Health gains & financial protection afforded, per $1M spent

- India ($5.0)
- Ethiopia ($0.4)

Rotavirus deaths averted

I: Poorest
II: Poorer
III: Middle
IV: Richer
V: Richest
Conclusions
How does each HIV intervention map itself?

Poverty cases averted & deaths averted, per $100,000 spent

Deaths averted

Poverty cases averted

I: Poorest
II: Poorer
III: Middle
IV: Richer
V: Richest
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Email: verguet@uw.edu