The Incidence of Recent Child Health Improvements

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Introduction

• Growth has finally picked up, especially in Africa
• Still, there is concern that the fruits of this growth are not equitably distributed
• Thus, the literature on "pro-poor" or "inclusive" growth
• All of that literature focuses on one “fruit”: income or expenditure
• We want to look at a different one: child health
Thus, this paper sits at the intersection of two important literatures about improving living standards and poverty reduction: 1. the distribution of income growth; and 2. poverty or welfare as a multidimensional phenomenon.
Motivation

Our purpose here is to consider the extent to which improvements in children’s health are distributionally progressive, or pro-poor.

• Thus, our topic(s):
  • Are intertemporal changes in the distribution of expenditures and health similar to each other?
  • How are health improvements distributed across the income distribution?
  • How are health improvements distributed across the health distribution?
Data

• Health indicators are children’s standardized heights and infant mortality, drawn from DHS
• This gives us about a 20-year span in many countries
• There have been substantial improvements that allow us to look at the distribution of benefits
• Household expenditures per capita are predicted, based on their projection on a set of household characteristics using a suitable income/expenditure survey
• Note: the samples are for kids, then, not households or all individuals
# Improvements in Child Health

<table>
<thead>
<tr>
<th>Year</th>
<th>Sub-Saharan Africa</th>
<th>Latin America and Caribbean</th>
<th>East Asia and Pacific</th>
<th>South Asia</th>
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<tbody>
<tr>
<td></td>
<td>Infant Mortality Rate</td>
<td>Infant Mortality Rate</td>
<td>Infant Mortality Rate</td>
<td>Infant Mortality Rate</td>
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<tr>
<td></td>
<td>Stunting Prevalence</td>
<td>Stunting Prevalence</td>
<td>Stunting Prevalence</td>
<td>Stunting Prevalence</td>
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<tr>
<td>1990</td>
<td>177</td>
<td>48</td>
<td>54</td>
<td>23</td>
</tr>
<tr>
<td>2012</td>
<td>98</td>
<td>38</td>
<td>19</td>
<td>11</td>
</tr>
</tbody>
</table>

*Data Source: [http://www.data.unicef.org/resources/2013/webapps/nutrition#](http://www.data.unicef.org/resources/2013/webapps/nutrition#)*
Methods: Growth Incidence Curve
Ravallion and Chen

• Simple tool for examining whether economic growth is pro-poor.
• For a cumulative distribution of incomes $F(y)$, let $p$ be the quantile associated with a given income so that $p = F(y)$. $p$ ranges from 0 (the poorest quantile) to 1 (the richest).
• The growth incidence curve (GIC) is:

$$g_t(p) = \frac{y_t(p)}{y_{t-1}(p)} - 1$$

This curve shows how much income at the $p^{th}$ quantile has grown at time $t$, graphing it for all values of $p$. 
Methods: Growth Incidence Curve

Figure 4 – Growth Incidence Curves (GIC) cont.

Madagascar

Malawi
Figure 4 – Growth Incidence Curves (GIC)


Figure 4 – Growth Incidence Curves (GIC) cont.

Colombia

Growth Incidence of Household Expenditures p.c., 2010 - 1986

Bangladesh

Figure 4 – Growth Incidence Curves (GIC) cont.

Peru

Methods: Gradient Health Improvement Incidence Curve (HIIC)

• For “gradient” approaches, we use

\[ dgh_t(p) = h_t(y_t(p)) - h_{t-1}(y_{t-1}(p)) \]

• This requires a regression to get the health status conditional on income at the \( p^{th} \) percentile

• One advantage: handles discrete health indicators
Figure 5 – Gradient Health Improvement Incidence Curves (GHIIC) cont.

Ghana
Figure 5 – Gradient Health Improvement Incidence Curves (GHIIC) cont.

Uganda


Figure 5 – Gradient Health Improvement Incidence Curves (GHIIC) cont.

Peru


Percentiles of predicted HH expenditure p.c. distribution

Difference in Survival Probability

Difference in Standardized Heights, cm
Figure 5 – Gradient Health Improvement Incidence Curves (GHIIC) cont.

Colombia

Growth Incidence of Infant Survival, 2010 - 1986

Growth Incidence of Standardized Heights, 2010 - 1986
Figure 5 – Gradient Health Improvement Incidence Curves (GHIIC) cont.

Bangladesh
Figure 5 – Gradient Health Improvement Incidence Curves (GHIIC)

Cameroon


Figure 5 – Gradient Health Improvement Incidence Curves (GHIIC) cont.

Madagascar


Growth Incidence of Standardized Heights, 2008 - 1992
Figure 5 – Gradient Health Improvement Incidence Curves (GHIIC) cont.

Malawi

Growth Incidence of Infant Survival, 2010 - 1992

Growth Incidence of Standardized Heights, 2010 - 1992
Methods: Health Improvement Incidence Curve (GHIIC)

• Strict analogy would be:  
  \[ dh_t(p) = \frac{ht_t(p)}{ht_{t-1}(p)} - 1 \]

• Or absolute changes:  
  \[ dh_t(p) = ht_t(p) - ht_{t-1}(p) \]

• These are consistent with the “univariate” approach to evaluating the distribution of health

  \[ dgh_t(p) = h_t(y_t(p)) - h_{t-1}(y_{t-1}(p)) \]
Figure 6 – Figure Health Improvement Incidence Curves cont.

Peru


Bangladesh

Growth Incidence of Standardized Heights, 2011 - 1996
Figure 6 – Figure Health Improvement Incidence Curves cont.

Colombia

Uganda

Growth Incidence of Standardized Heights, 2010 - 1986


Cornell University
Figure 6 – Figure Health Improvement Incidence Curves

Cameroon


Ghana

Growth Incidence of Standardized Heights, 2008 - 1993
Figure 6 – Figure Health Improvement Incidence Curves cont.

Madagascar

Malawi

Growth Incidence of Standardized Heights, 2008 - 1992

Growth Incidence of Standardized Heights, 2010 - 1992

Cornell University
Results

There are several patterns across countries:

- Traditional expenditure-based GIC tend to be regressive (especially in faster growing economies) or at best distributionally neutral – exception is Peru
- The distributional benefits of health improvements differ from income, and tend to be pro-poor
- Gradient Health Improvement Incidence Curves (GHIIC) indicate:
  - Most countries witnessed substantial health improvements over time, even in countries with relatively small income improvements.
  - Tend to be progressive with greater improvement in absolute and relative terms among the poor.
  - The greater the absolute improvement on average, the more progressive it is distributed.
RESULTS continued

• Health Improvement Incidence Curves (HIIC) indicate:
  • More mixed story, but often those at the top end of the univariate distribution benefit more. That is:
    • In non-African countries less healthy kids grow more, e.g., Colombia and Peru
    • In some cases the taller kids have increased in stature more, e.g., Madagascar
  • Cannot predict what the Gradient Health Improvement Incidence Curve or HIIC will look like based on the growth incidence curves (GIC)
    • Incidence of income growth and health improvements is certainly not the same within a country
    • So it’s worth doing this in more countries to look for more regional patterns
    • Justifies going beyond growth incidence curve (GIC)