Data needs for analyses of inequalities: WHAT WE LEARNED FROM THE COUNTDOWN TO 2015

By Cesar G Victora
DATA NEEDS FOR ANALYSES OF INEQUALITIES:
WHAT WE LEARNED FROM THE COUNTDOWN TO 2015

United Nations and UNICEF
Expert Group Meeting on Data Disaggregation
27 June 2016

Cesar G Victora
Outline

• Where we came from
• What we do
• What lies ahead
Millennium Development Goals 1990-2015

- MDG1: reduce the prevalence of underweight in children by 1/2
- MDG4: reduce under-five mortality by 2/3
- MDG5: reduce maternal mortality by 3/4
- MDG6: control HIV/AIDS, TB, malaria, other infections

Equity completely overlooked!
Regular monitoring of inequities and use of the resulting information for education, advocacy, and increased accountability… is urgently needed… (Lancet 2003)
Lancet Child Survival Series 2003

• “We commit ourselves to convening a series of meetings, every 2 years,
  • … to take stock of progress in preventing child deaths, and to hold countries and their partners accountable.”
Countdown to 2015

Multi-stake holder initiative to monitor coverage in RMNCH

www.countdown2015mnch.org
Outline

• Where we came from
• What we do
• What lies ahead
Countdown Equity WG
Univ. of Pelotas team
Disaggregated analyses

Stratifiers

• Sex of child
• Wealth quintiles
• Woman’s age
• Woman’s education
• Urban/rural residence
• Region of the country

Outcomes

• Intervention coverage
  • RMNC(A)H continuum
• Child mortality
• Child nutrition
Data management

- National RMNCH surveys
  - 100+ countries
  - 300+ surveys
  - >3.5 million women
  - >7 million children

- Semi-processed databases
  - Standard definitions
  - Equity stratification
  - Summary equity indices
  - Standard errors
  - Double-checked against original survey reports

- Analyses of multiple surveys in batch mode
Data structure

- Country/ Year
- Province/ State
- Household
- Mother
- Child
Current status of the database

- 198 DHS, 94 MICS, 2 other surveys incorporated
- 107 countries
- Other surveys (under way)
  - 27 Reproductive Health Surveys (up to 2008)
  - 10 PMA 2020 surveys (data collection under way)
- Non-standard surveys
  - Brazil, Mexico, etc.
- Recently released DHS/MICS
The equiplot: country level analyses
Composite coverage index by wealth in selected countries
The equiplot: global level analyses
Mean coverage by quintile for selected interventions

- Family planning needs satisfied
- Antenatal care (4+ visits)
- Skilled birth attendant
- Post-natal care
- Exclusive breastfeeding
- DPT3 vaccine
- Pneumonia careseeking
The equiplot: national trends
Institutional deliveries in Brazil 1986-2013
Global trends for rich and poor

![Graph showing prevalence trends](image)
Inequality in births attended by skilled health personnel:
The proportion of births attended by skilled health personnel in 77 low- and middle-income countries demonstrated a gradient across wealth quintiles. Median coverage in the poorest quintiles, middle quintiles and richest quintiles were 47%, 76%, and 95%, respectively.

Read more
View interactive graph
Outline

• Where we came from
• What we do
• What lies ahead
SDGs and Countdown to 2030
17.18 Data, monitoring and accountability

“to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts.”
Challenges

- Which data sources
  - Primary reliance on surveys
- Which stratifiers?
- Which outcomes?
- Which analyses?
  - Sample sizes
  - Summary measures of inequality
  - Absolute vs relative inequalities
  - Standalone versus aggregate coverage indicators
SDG 17.18: 

stratifiers

Easier to measure:

income, gender, age, geographic location

Harder to measure:

race, ethnicity, migratory status, disability

Nigeria ethnic groups 2008

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Freq.</th>
<th>Percent</th>
<th>Cum.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hausa</td>
<td>9,386</td>
<td>24.10</td>
<td>24.10</td>
</tr>
<tr>
<td>Yoruba</td>
<td>5,606</td>
<td>14.39</td>
<td>38.49</td>
</tr>
<tr>
<td>Igbo/Ibo</td>
<td>5,448</td>
<td>13.99</td>
<td>52.48</td>
</tr>
<tr>
<td><strong>Fulani</strong></td>
<td>2,425</td>
<td>6.23</td>
<td>58.71</td>
</tr>
<tr>
<td>Ijaw/Izon</td>
<td>1,590</td>
<td>4.08</td>
<td>62.79</td>
</tr>
<tr>
<td>Ibibio</td>
<td>849</td>
<td>2.18</td>
<td>64.97</td>
</tr>
<tr>
<td><strong>Tiv</strong></td>
<td>621</td>
<td>1.59</td>
<td>66.56</td>
</tr>
<tr>
<td>Urhobo</td>
<td>582</td>
<td>1.49</td>
<td>68.06</td>
</tr>
<tr>
<td>Nupe</td>
<td>533</td>
<td>1.37</td>
<td>69.43</td>
</tr>
<tr>
<td>Kanuri/Beriberi</td>
<td>523</td>
<td>1.34</td>
<td>70.77</td>
</tr>
<tr>
<td>Igala</td>
<td>416</td>
<td>1.07</td>
<td>71.84</td>
</tr>
<tr>
<td>Ebira/Igbara</td>
<td>399</td>
<td>1.02</td>
<td>72.86</td>
</tr>
<tr>
<td>Fulfulde</td>
<td>391</td>
<td>1.00</td>
<td>73.87</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>358</td>
<td>0.92</td>
<td>74.78</td>
</tr>
<tr>
<td>Esan</td>
<td>356</td>
<td>0.91</td>
<td>75.70</td>
</tr>
<tr>
<td>Idoma</td>
<td>353</td>
<td>0.91</td>
<td>76.60</td>
</tr>
<tr>
<td>Bini/Edo</td>
<td>283</td>
<td>0.73</td>
<td>77.33</td>
</tr>
<tr>
<td>Kambari</td>
<td>278</td>
<td>0.71</td>
<td>78.05</td>
</tr>
<tr>
<td>Annang</td>
<td>263</td>
<td>0.68</td>
<td>78.72</td>
</tr>
<tr>
<td>Mumuye</td>
<td>259</td>
<td>0.66</td>
<td>79.39</td>
</tr>
<tr>
<td>Gbaju/Gbagi</td>
<td>258</td>
<td>0.66</td>
<td>80.05</td>
</tr>
<tr>
<td>Tarok</td>
<td>230</td>
<td>0.59</td>
<td>80.64</td>
</tr>
<tr>
<td>Wurkum</td>
<td>192</td>
<td>0.49</td>
<td>81.13</td>
</tr>
<tr>
<td>Ogoni</td>
<td>183</td>
<td>0.47</td>
<td>81.60</td>
</tr>
<tr>
<td>Mambila</td>
<td>166</td>
<td>0.43</td>
<td>82.03</td>
</tr>
<tr>
<td>Eggon</td>
<td>164</td>
<td>0.42</td>
<td>82.45</td>
</tr>
<tr>
<td><strong>Mada</strong></td>
<td>161</td>
<td>0.41</td>
<td>82.86</td>
</tr>
</tbody>
</table>

Total: 310 groups!
Wealth quintiles or deciles?
Double stratification: wealth and residence

SBA coverage is higher in urban than rural areas in all wealth quintiles (average of CD countries)
Challenges: outcomes

- Mortality
  - Difficult (impossible?) for maternal mortality
  - Straightforward for child mortality levels
    - But not for causes of death

- Nutrition (under and over)
  - Easy

- Coverage
  - Separate indicators (over 70 in the Countdown)
  - Summary indicators (averages or sums)
Demand for family planning satisfied
Antenatal care (1+ visit with skilled provider)
Skilled birth attendance
BCG vaccine
DPT vaccine (3 doses)
Measles vaccine
Oral rehydration therapy
Caresseking for suspected pneumonia
Composite Coverage Index (CCI)
Co-coverage 6+ interventions

Countries with wide inequalities on CCI

Nigeria
Cameroon
Madagascar

Countries with intermediate inequalities on CCI

Haiti
Benin
Congo (Brazzaville)

Countries with narrow inequalities on CCI

Honduras
Jordan
Dominican Republic
Composite coverage index

• Need a proxy for UHC in the RMNCH context

• CCI = weighted average of 8 interventions
  • equal weights to 4 stages in the continuum of care
    • family planning
    • maternal and newborn care
    • immunization
    • case management of sick children

\[
CCI = \frac{1}{4} \left( FPS + \frac{SBA + ANCS}{2} + \frac{2DPT3 + MSL + BCG}{4} + \frac{ORT + CPNM}{2} \right).
\]
CCI with a priori weights correlates well with PCA-derived indices

\[ r = 0.94 \]
CCI by wealth in different countries

Kyrgyzstan
Timor-Leste
Ethiopia
Guatemala
Morocco
Nepal
Chad

CCI coverage
Q1
Q2
Q3
Q4
Q5

0 10 20 30 40 50 60 70 80 90 100
Global CCI trends by wealth quintile

CCI coverage

- Richest
- Poorest

CCI inequality

- Absolute
- Relative

Graph showing trends in CCI coverage and inequality from 1993 to 2013.
Co-coverage: sum of eight preventive interventions needed by every child.
Challenges: analyses

- Sample sizes
  - Stratified analyses

- How to express inequalities
  - Extreme group comparisons
  - Whole distribution measures
## Sample sizes in 300+ surveys

### Stratifiers

<table>
<thead>
<tr>
<th>Stratifier</th>
<th>Level</th>
<th>Median</th>
<th>10th centile</th>
<th>90th centile</th>
<th>% total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wealth quintile</td>
<td>Q1</td>
<td>1146</td>
<td>420</td>
<td>3035</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>1043</td>
<td>385</td>
<td>2625</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>965</td>
<td>367</td>
<td>2434</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>873</td>
<td>318</td>
<td>2104</td>
<td>18%</td>
</tr>
<tr>
<td></td>
<td>Q5</td>
<td>709</td>
<td>250</td>
<td>1813</td>
<td>15%</td>
</tr>
<tr>
<td>Place of residence</td>
<td>Rural</td>
<td>3255</td>
<td>996</td>
<td>7360</td>
<td>68%</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>1510</td>
<td>581</td>
<td>4975</td>
<td>32%</td>
</tr>
<tr>
<td>Maternal education</td>
<td>None</td>
<td>1078</td>
<td>35</td>
<td>4774</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Primary</td>
<td>1383</td>
<td>294</td>
<td>4804</td>
<td>38%</td>
</tr>
<tr>
<td></td>
<td>Secondary+</td>
<td>1143</td>
<td>321</td>
<td>4843</td>
<td>32%</td>
</tr>
<tr>
<td>Maternal age</td>
<td>15-17 yrs</td>
<td>69</td>
<td>14</td>
<td>246</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td>18-19 yrs</td>
<td>216</td>
<td>68</td>
<td>535</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>20-49 yrs</td>
<td>4162</td>
<td>1939</td>
<td>9725</td>
<td>94%</td>
</tr>
<tr>
<td>Sex of child</td>
<td>Male</td>
<td>2440</td>
<td>1019</td>
<td>5810</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>2429</td>
<td>924</td>
<td>5750</td>
<td>50%</td>
</tr>
<tr>
<td>All</td>
<td>All</td>
<td>4878</td>
<td>1932</td>
<td>11563</td>
<td>100%</td>
</tr>
</tbody>
</table>
## Sample sizes in 300+ surveys

### Selected outcomes

<table>
<thead>
<tr>
<th>Stratifier</th>
<th>Level</th>
<th>FPS</th>
<th>SBA</th>
<th>DPT3</th>
<th>ORT</th>
<th>CPNM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wealth quintile</td>
<td>Q1</td>
<td>639</td>
<td>1183</td>
<td>288</td>
<td>244</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>679</td>
<td>1146</td>
<td>263</td>
<td>205</td>
<td>117</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>708</td>
<td>1079</td>
<td>245</td>
<td>192</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>780</td>
<td>1009</td>
<td>236</td>
<td>165</td>
<td>86</td>
</tr>
<tr>
<td></td>
<td>Q5</td>
<td>834</td>
<td>810</td>
<td>194</td>
<td>113</td>
<td>63</td>
</tr>
<tr>
<td>Place of residence</td>
<td>Rural</td>
<td>1394</td>
<td>1370</td>
<td>382</td>
<td>242</td>
<td>126</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>2002</td>
<td>3037</td>
<td>760</td>
<td>520</td>
<td>308</td>
</tr>
<tr>
<td>Maternal education</td>
<td>None</td>
<td>674</td>
<td>1158</td>
<td>284</td>
<td>237</td>
<td>147</td>
</tr>
<tr>
<td></td>
<td>Primary</td>
<td>1152</td>
<td>1453</td>
<td>339</td>
<td>255</td>
<td>164</td>
</tr>
<tr>
<td></td>
<td>Secondary+</td>
<td>1404</td>
<td>1215</td>
<td>312</td>
<td>180</td>
<td>108</td>
</tr>
<tr>
<td>Maternal age</td>
<td>15-17 yrs</td>
<td>51</td>
<td>97</td>
<td>23</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>18-19 yrs</td>
<td>125</td>
<td>296</td>
<td>81</td>
<td>61</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>20-49 yrs</td>
<td>3723</td>
<td>6105</td>
<td>1177</td>
<td>922</td>
<td>543</td>
</tr>
<tr>
<td>Sex of child</td>
<td>Male</td>
<td>3341</td>
<td>619</td>
<td>489</td>
<td>265</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>3307</td>
<td>622</td>
<td>431</td>
<td>234</td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>All</td>
<td>3750</td>
<td>5232</td>
<td>1259</td>
<td>910</td>
<td>495</td>
</tr>
</tbody>
</table>
Extreme group comparisons
Summary measures of inequality: absolute or relative?

- Summary measures take the full distribution into account
- Less affected by sample size than comparisons between extreme groups
Absolute vs relative inequality: does it really matter?
The last SDG

17.18 Data, monitoring and accountability

“to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts.”
Cesar Victora
cvictora@equidade.org
www.equidade.org