

ESA/STAT/AC.320/1

EXPERT GROUP MEETING ON DATA DISAGGREGATION
27-29 JUNE 2016
NEW YORK

Data needs for analyses of inequalities:
WHAT WE LEARNED FROM THE COUNTDOWN TO 2015
By Cesar G Victora



International Center for
EQUITY
in Health | Pelotas



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

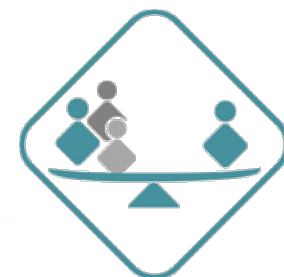


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Outline

- **Where we came from**
- What we do
- What lies ahead

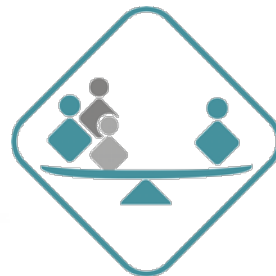


Millennium Development Goals 1990-2015



- 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!



Lancet Child Survival Series 2003

CHILD SURVIVAL IV

Child survival IV

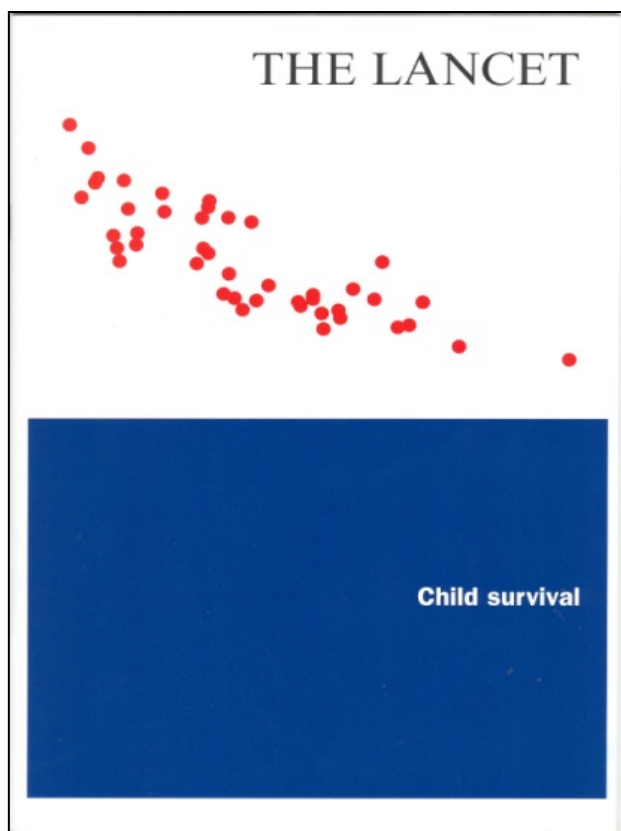
Applying an equity lens to child health and mortality: more of the same is not enough

Cesar G Victora, Adam Wagstaff, Joanna Armstrong Schellenberg, Davidson Gwatkin, Mariam Claeson, Jean-Pierre Habicht

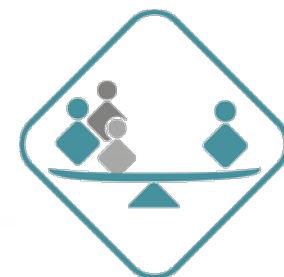
- *Regular monitoring of inequities and use of the resulting information for education, advocacy, and increased accountability... is urgently needed... (Lancet 2003)*



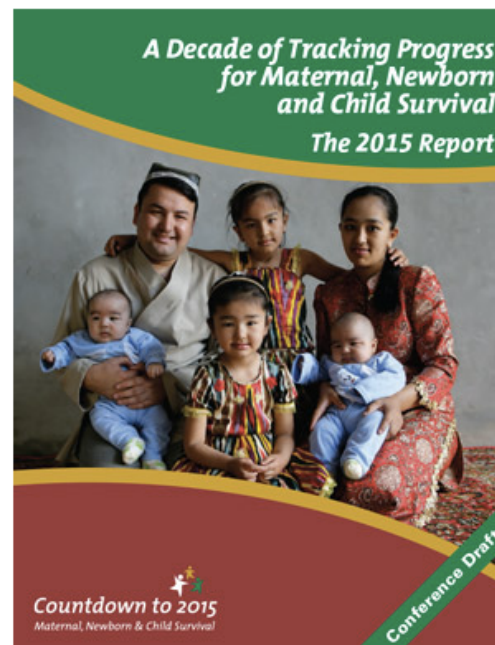
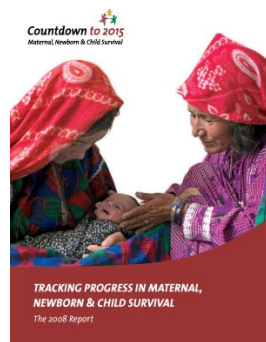
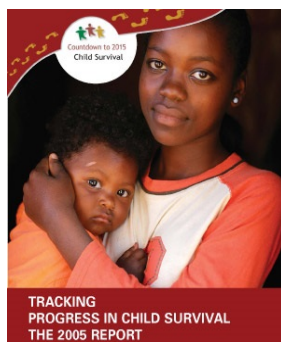
Lancet Child Survival Series 2003



- *“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.**”*



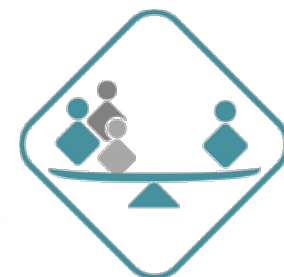
Countdown to 2015



Multi-stake holder initiative to monitor coverage in RMNCH

www.countdown2015mnch.or

g

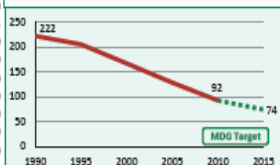


DEMOGRAPHICS

Total population (000)	14,901	(2010)
Total under-five population (000)	2,715	(2010)
Births (000)	663	(2010)
Birth registration (%)	-	(2010)
Total under-five deaths (000)	56	(2010)
Neonatal deaths: % of all under-5 deaths	32	(2010)
Neonatal mortality rate (per 1000 live births)	27	(2010)
Infant mortality rate (per 1000 live births)	58	(2010)
Stillbirth rate (per 1000 total births)	24	(2010)
Total maternal deaths	3,000	(2010)
Lifetime risk of maternal death (1 in N)	36	(2010)
Total fertility rate (per woman)	6.0	(2010)
Adolescent birth rate (per 1000 women)	177	(2010)

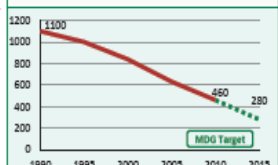
Under-five mortality rate

Deaths per 1,000 live births



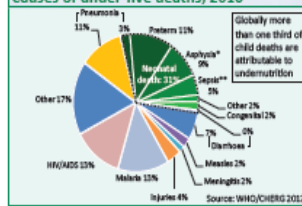
Maternal mortality ratio

Deaths per 100,000 live births

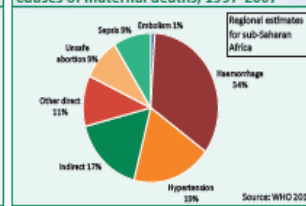


DEMOGRAPHICS

Causes of under-five deaths, 2010

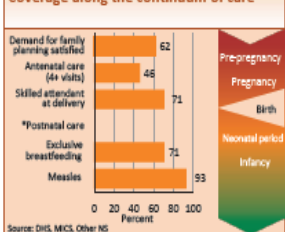


Causes of maternal deaths, 1997-2007

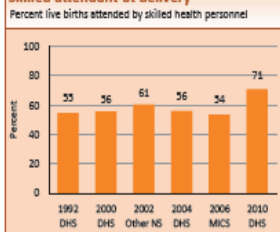


MATERNAL AND NEWBORN HEALTH

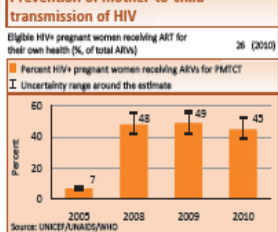
Coverage along the continuum of care



Skilled attendant at delivery

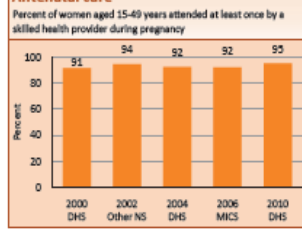


Prevention of mother-to-child transmission of HIV



MATERNAL AND NEWBORN HEALTH

Antenatal care

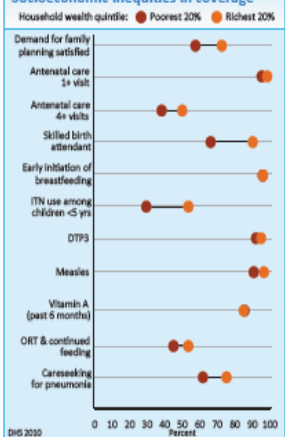


Demand for family planning satisfied (%)

Antenatal care (4 or more visits, %)	46	(2010)
Malaria during pregnancy - Intermittent preventive treatment (%)	60	(2010)
C-section rate (total, urban, rural; %)	5, 8, 4	(2010)
Neonatal tetanus vaccine (%)	87	(2010)
Postnatal visit for baby (within 2 days for all births, %)	-	(2010)
Postnatal visit for mother (within 2 days for all births, %)	-	(2010)
Women with low body mass index (<18.5 kg/m ² , %)	7	(2010)

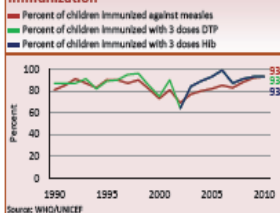
EQUITY

Socioeconomic inequities in coverage

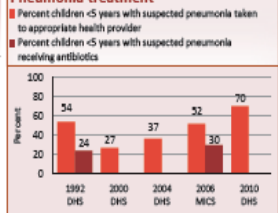


CHILD HEALTH

Immunization

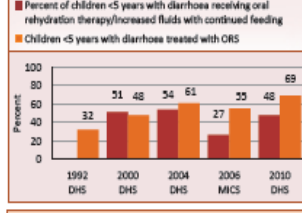


Pneumonia treatment

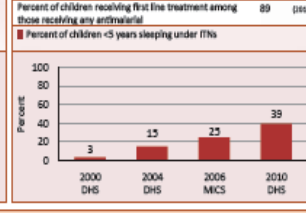


CHILD HEALTH

Diarrhoeal disease treatment



Malaria prevention and treatment



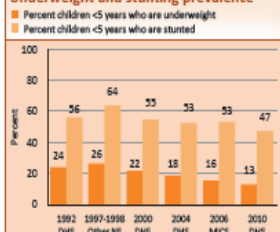
Coverage levels are shown for the poorest 20% (red circles) and the richest 20% (orange circles). The longer the line between the two groups, the greater the inequality. These estimates may differ from other charts due to differences in data sources.

NUTRITION

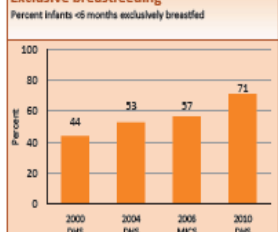
Wasting prevalence (moderate and severe, %)	4	(2010)
Low birthweight incidence (moderate and severe, %)	13	(2010)

Early initiation of breastfeeding (within 1 hr of birth, %)	58	(2010)
Introduction of solid, semi-solid/soft foods (%)	86	(2010)
Vitamin A supplementation (two dose coverage, %)	96	(2010)

Underweight and stunting prevalence

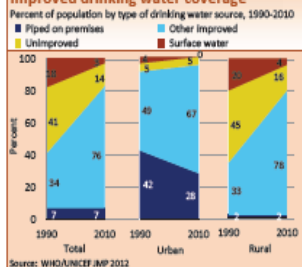


Exclusive breastfeeding

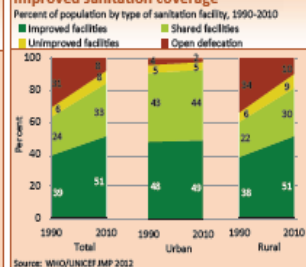


WATER AND SANITATION

Improved drinking water coverage

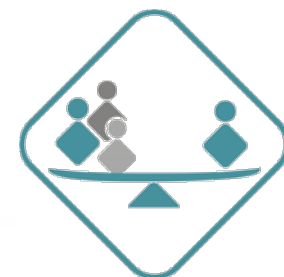


Improved sanitation coverage



Outline

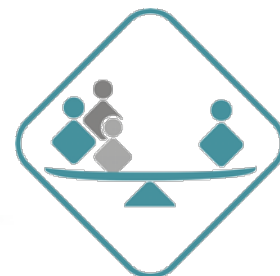
- Where we came from
- **What we do**
- What lies ahead



Countdown Equity WG Univ. of Pelotas team



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Disaggregated analyses

Stratifiers

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

Outcomes

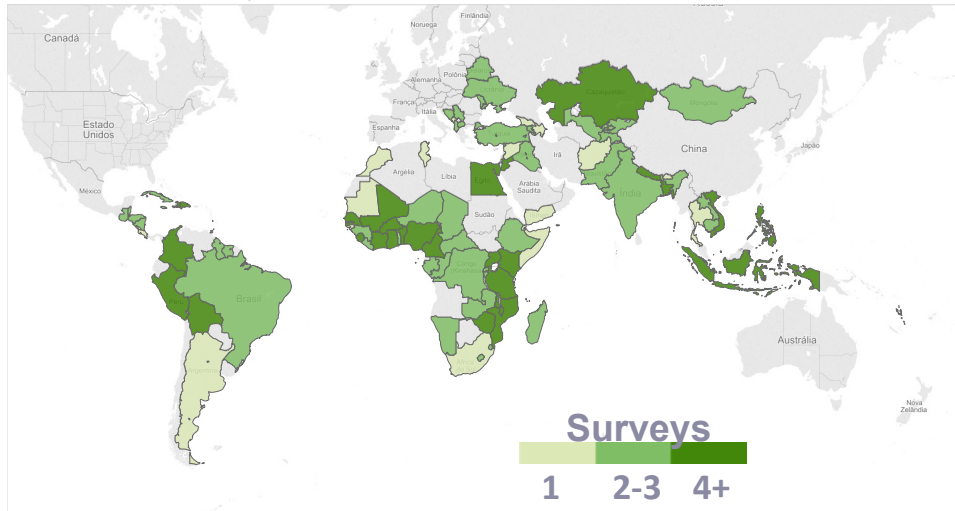
- Intervention coverage
 - RMNC(A)H continuum
- Child mortality
- Child nutrition



Data management

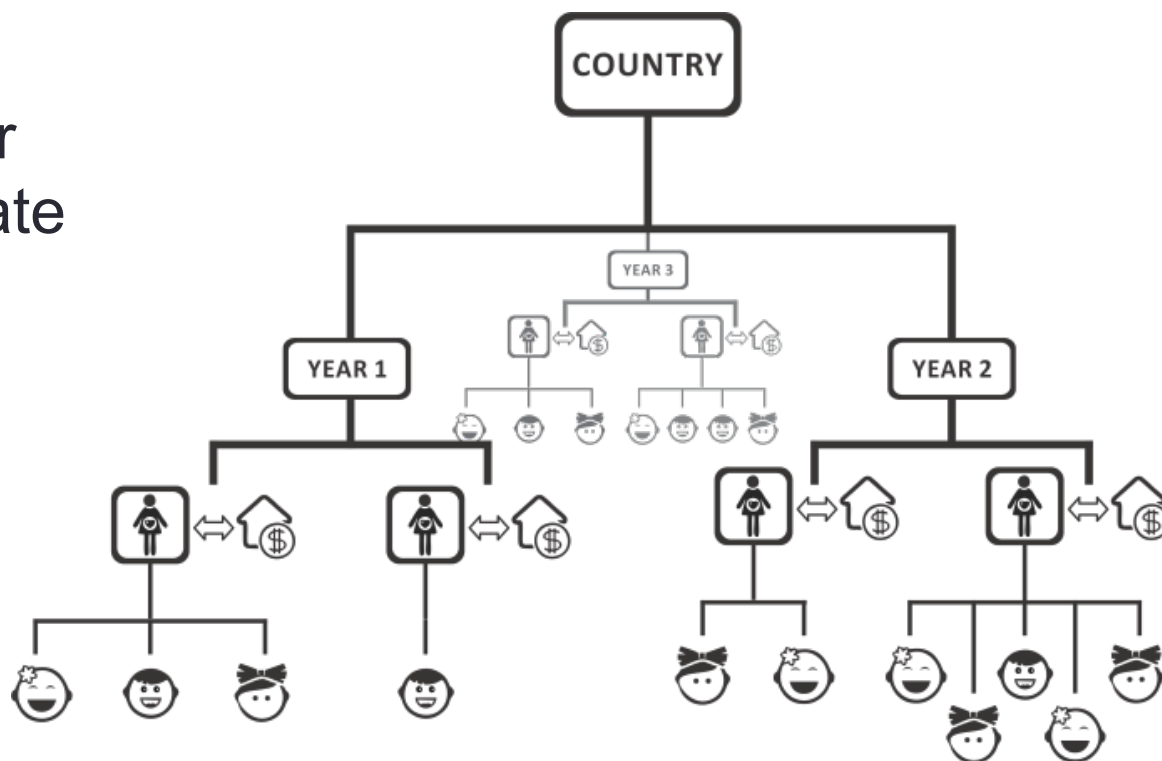
- National RMNCH surveys
 - 100+ countries
 - 300+ surveys
 - >3.5 million women
 - >7 million children
- Semi-processed databases
 - Standard definitions
 - Equity stratification
 - Summary equity indices
 - Standard errors
 - Double-checked against original survey reports
- Analyses of multiple surveys in batch mode

National RMNCH surveys



Data structure

- Country/ Year
- Province/ State
- Household
- Mother
- Child



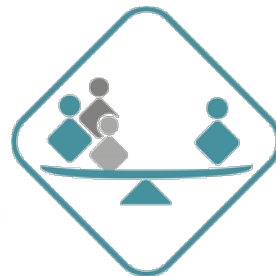
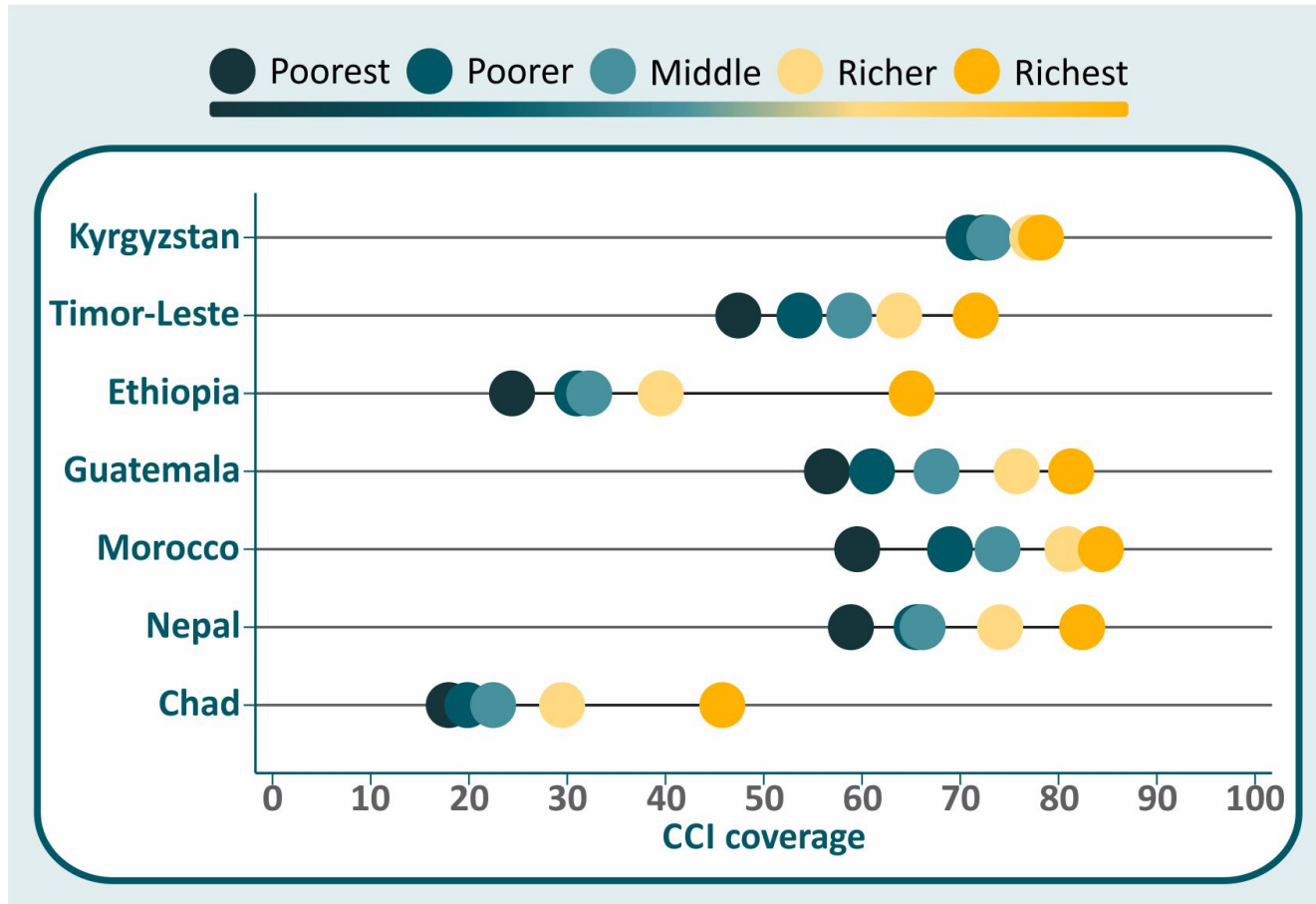
Current status of the database

- 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



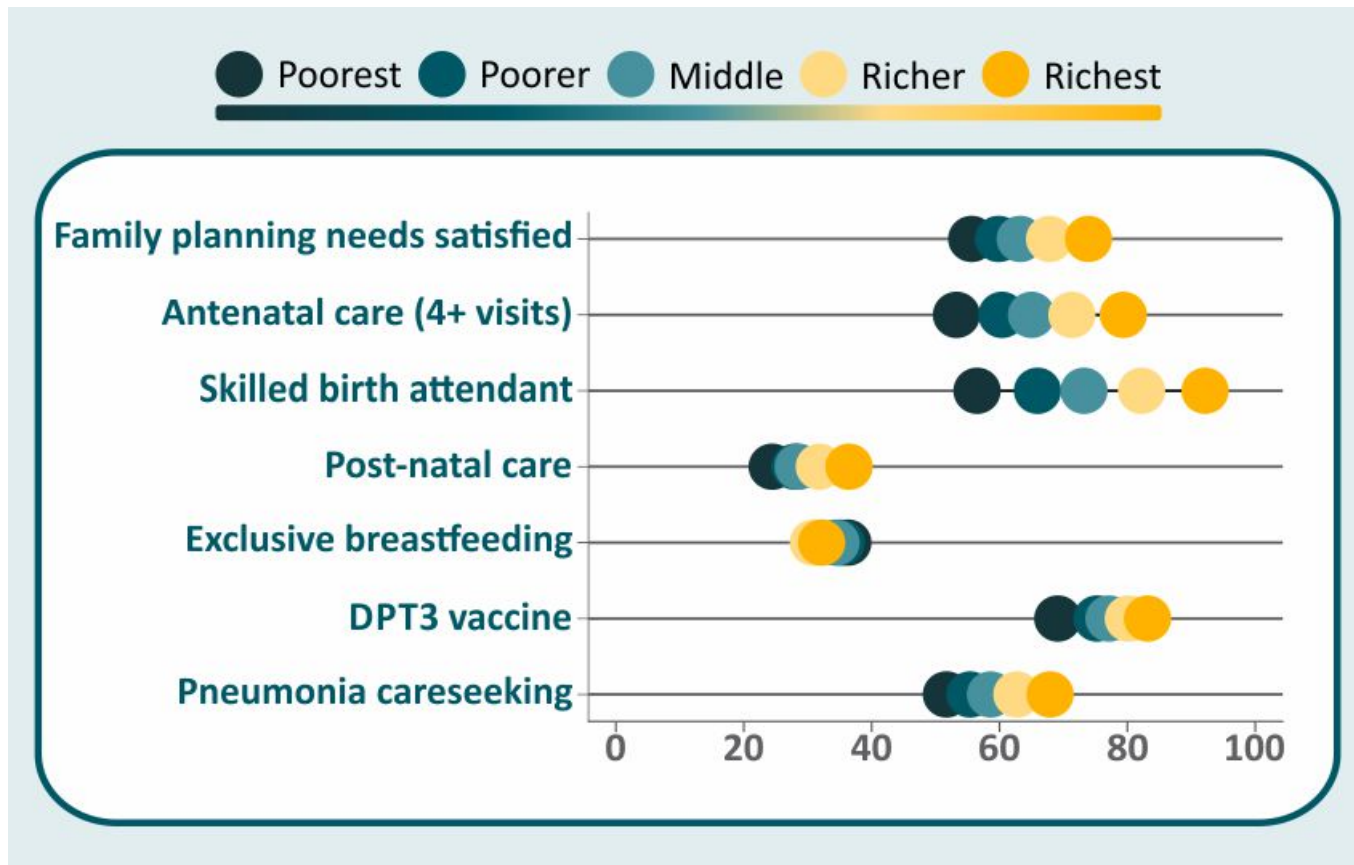
The equiplot: country level analyses

Composite coverage index by wealth in selected countries



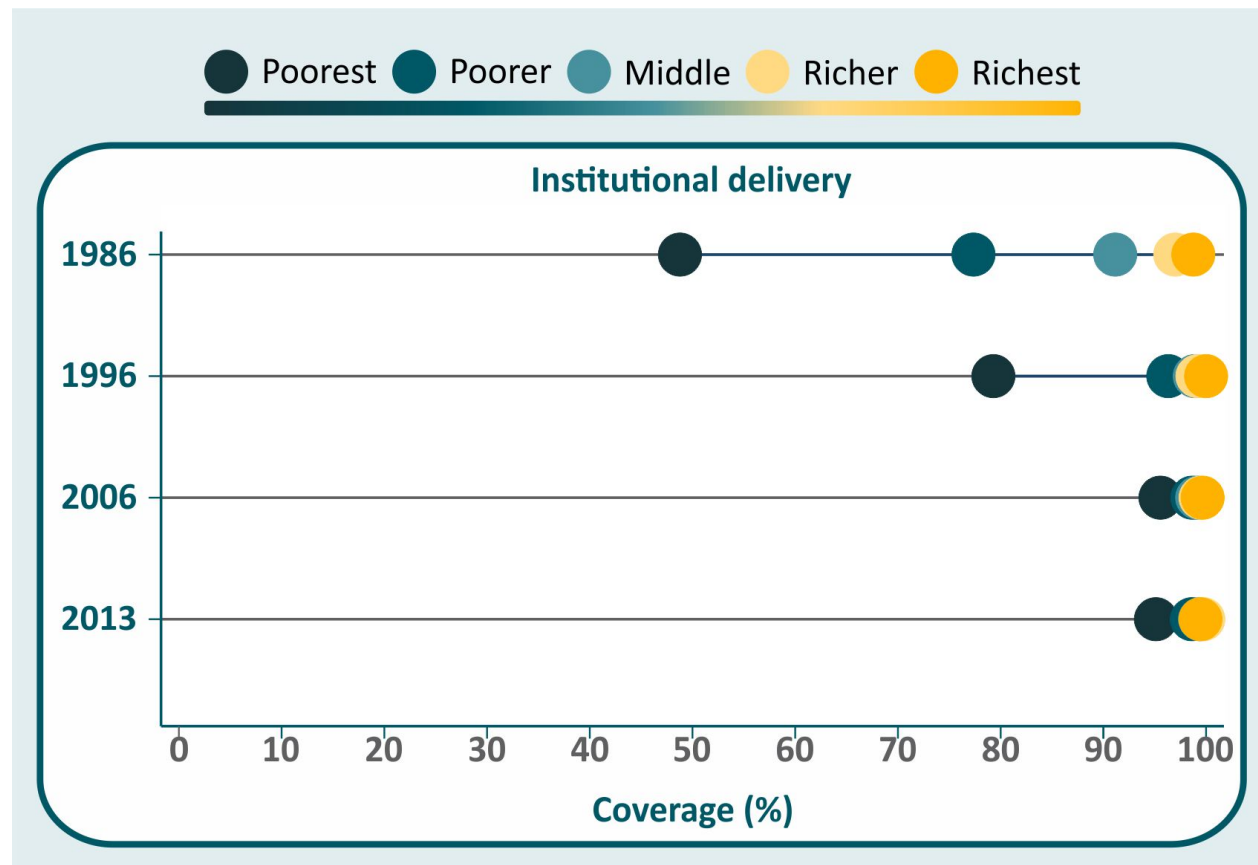
The equiplot: global level analyses

Mean coverage by quintile for selected interventions

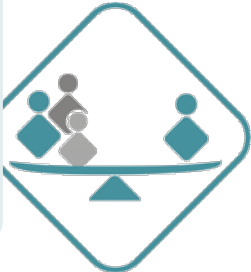
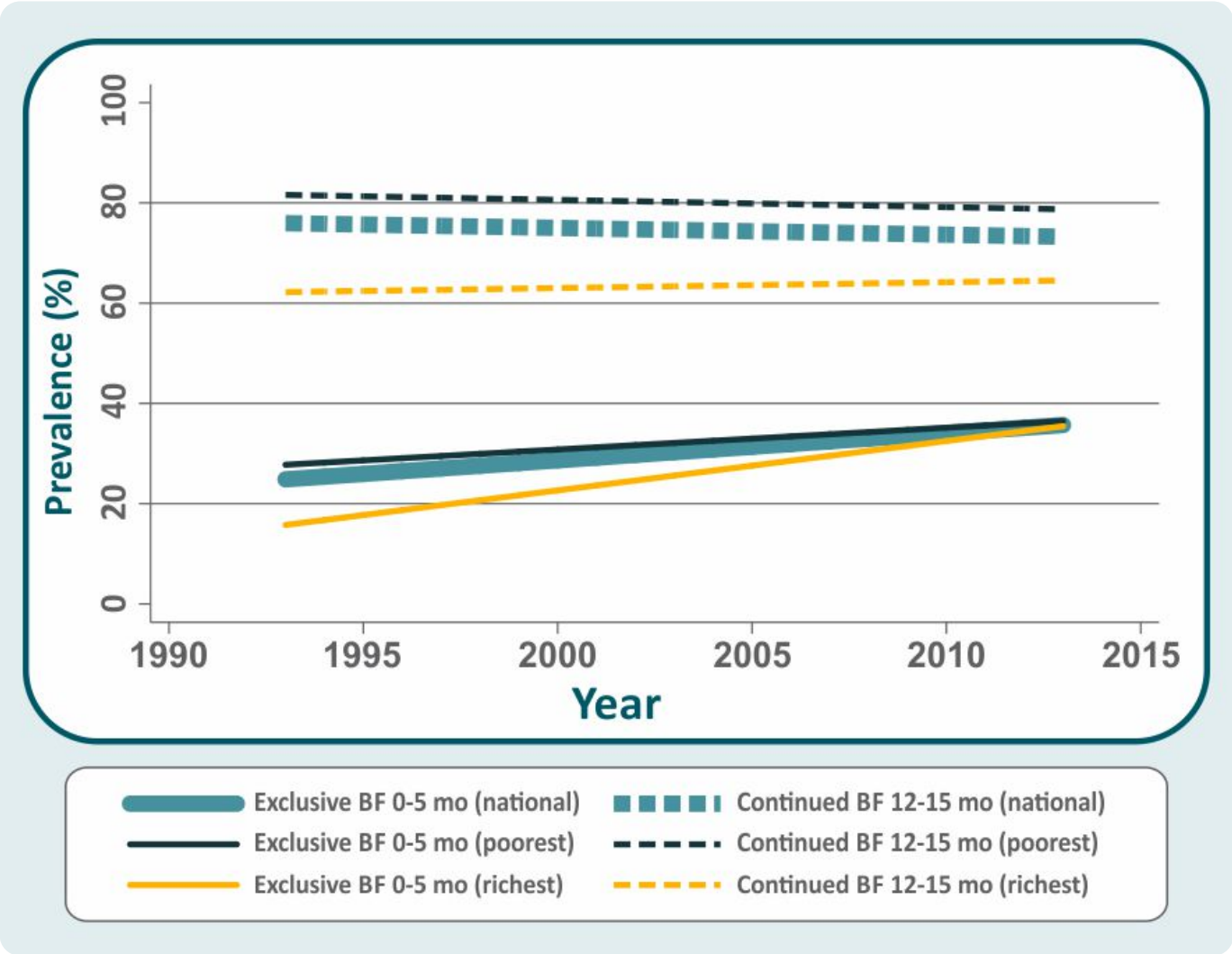


The equiplot: national trends

Institutional deliveries in Brazil 1986-2013



Global trends for rich and poor



Dissemination: WHO/GHO



SMALL BITE:
BIG THREAT

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Data repository

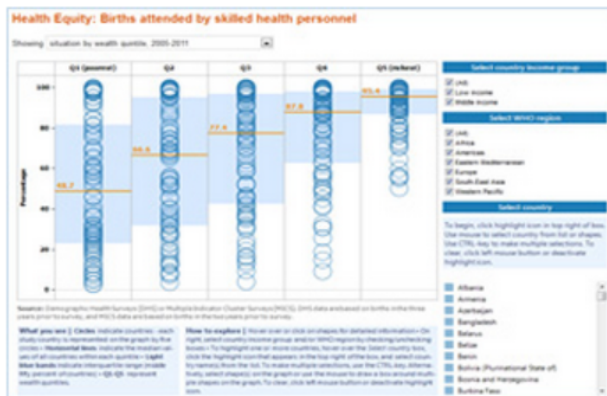
Reports

Country statistics

Map gallery

Standards

Health Equity Monitor

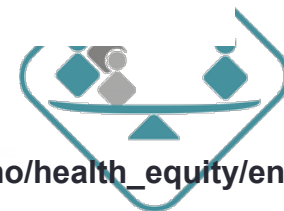


Inequality in births attended by skilled health personnel:

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

1 NO POVERTY



2 NO HUNGER



3 GOOD HEALTH



4 QUALITY EDUCATION



5 GENDER EQUALITY



6 CLEAN WATER AND SANITATION



7 CLEAN ENERGY



8 GOOD JOBS AND ECONOMIC GROWTH



9 INNOVATION AND INFRASTRUCTURE



10 REDUCED INEQUALITIES



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION



13 PROTECT THE PLANET



14 LIFE BELOW WATER



15 LIFE ON LAND



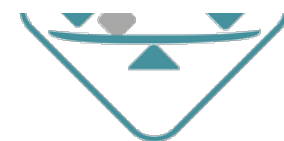
16 PEACE AND JUSTICE



17 PARTNERSHIPS FOR THE GOALS



THE GLOBAL GOALS



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.**”*



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

Nigeria ethnic groups 2008

Easier to measure:

*income, gender, age,
geographic location*

Harder to measure:

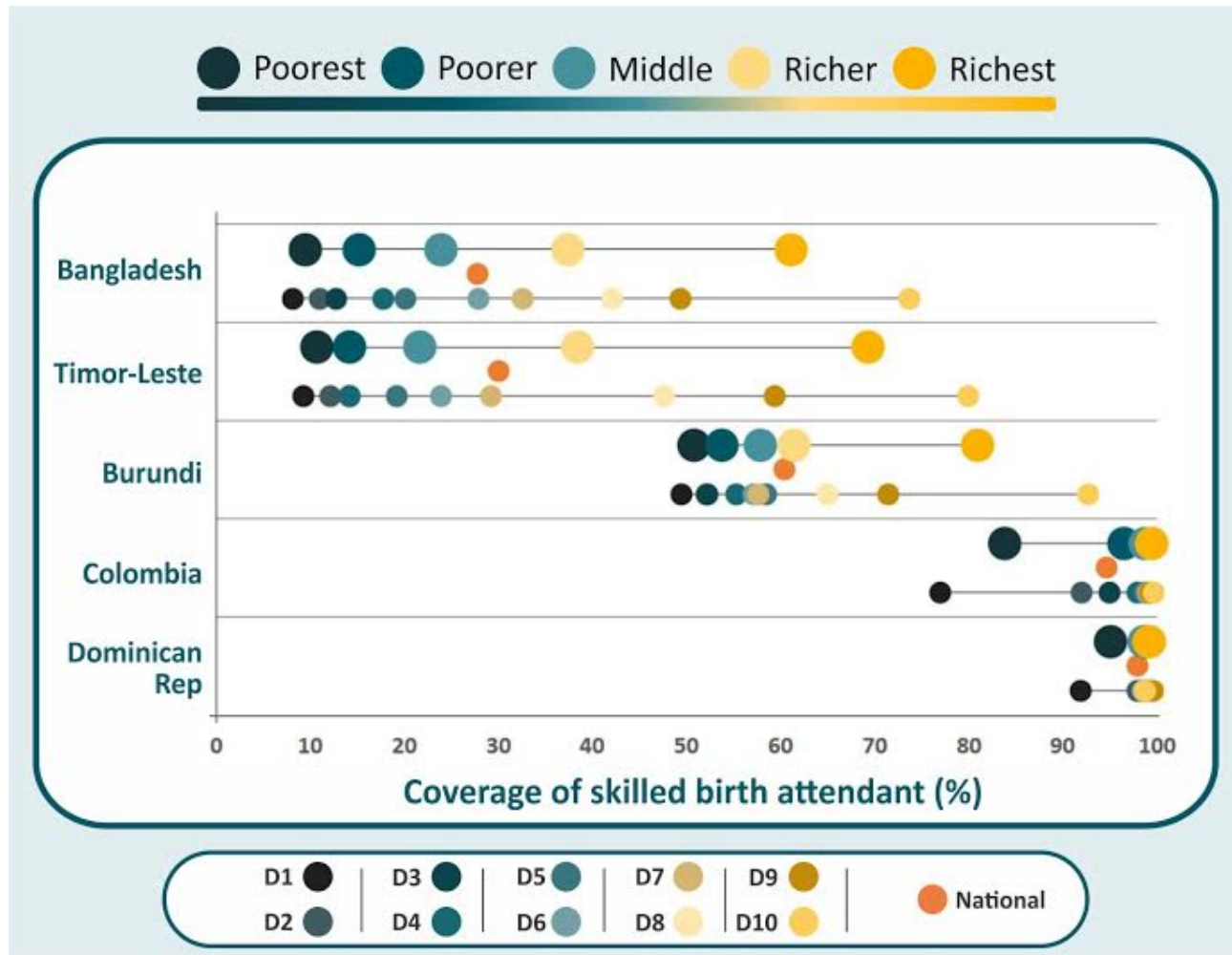
*race, ethnicity, migratory
status, disability*



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

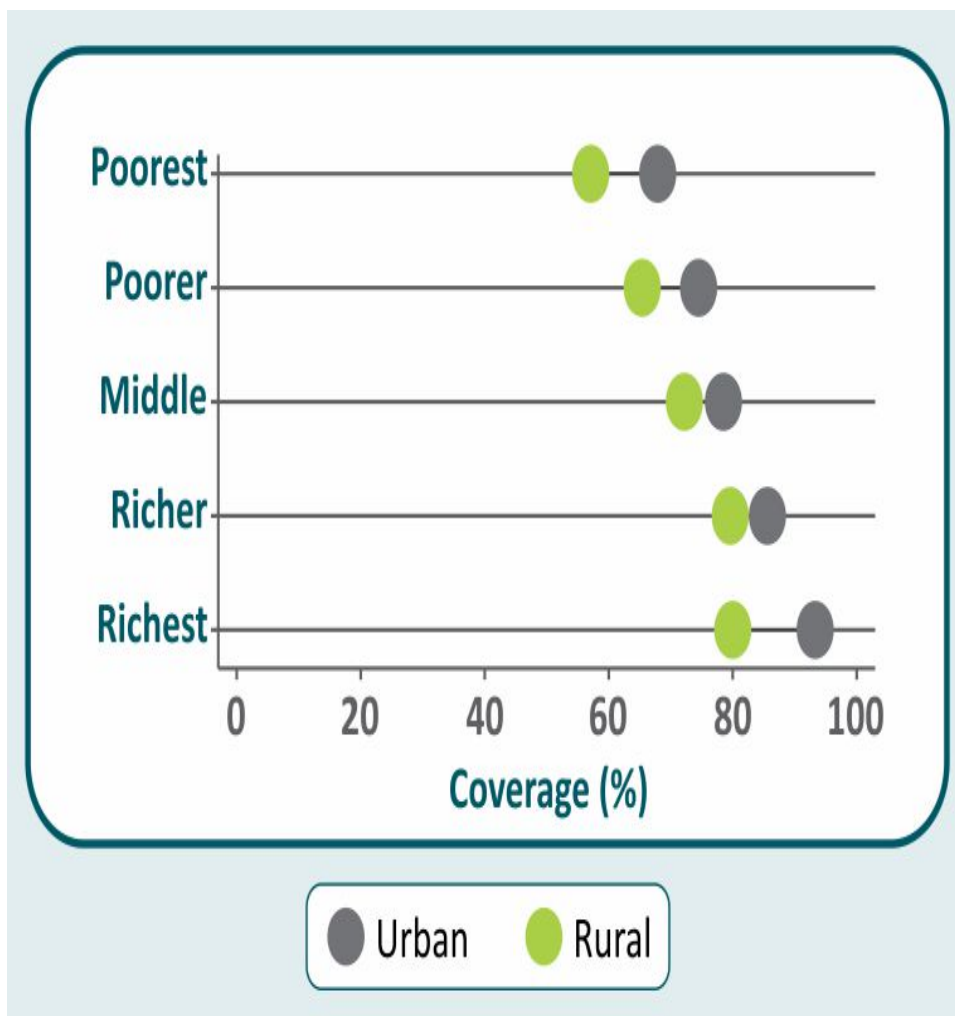
Total: 310 groups!

Wealth quintiles or deciles?



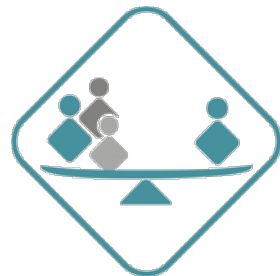
Double stratification: wealth and residence

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



Challenges: outcomes

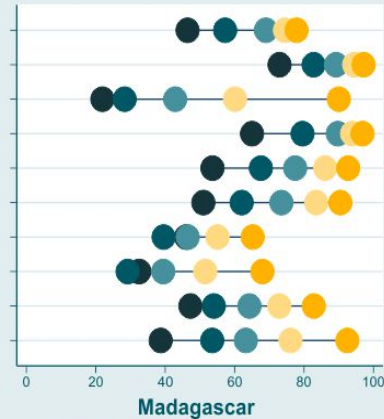
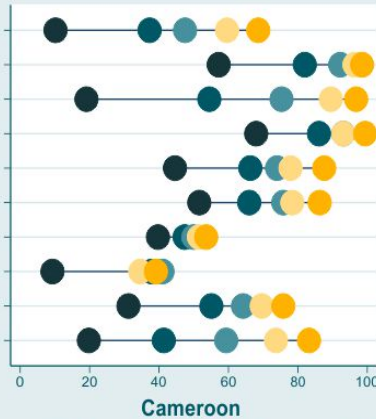
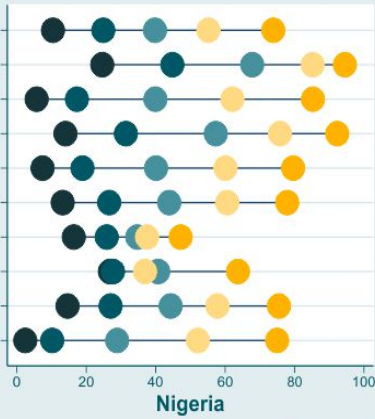
- Mortality
 - Difficult (impossible?) for maternal mortality
 - Straightforward for child mortality levels
 - But not for causes of death
- Nutrition (under and over)
 - Easy
- Coverage
 - Separate indicators (over 70 in the Countdown)
 - Summary indicators (averages or sums)





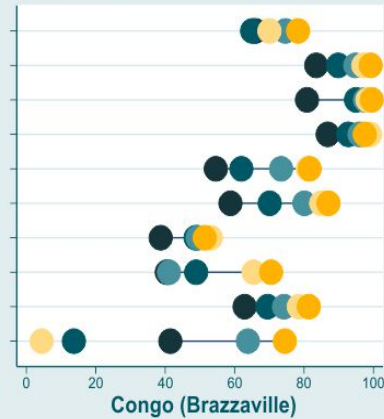
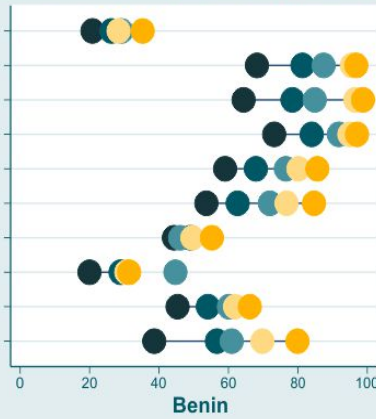
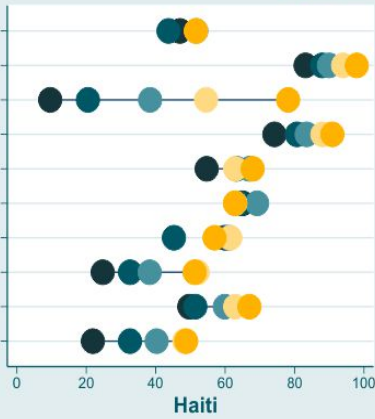
Countries with wide inequalities on CCI

- Demand for family planning satisfied
- Antenatal care (1+ visit with skilled provider)
- Skilled birth attendance
- BCG vaccine
- DPT vaccine (3 dosis)
- Measles vaccine
- Oral rehydration therapy
- Caresseking for suspected penumonia
- Composite Coverage Index (CCI)
- Co-coverage 6+ interventions



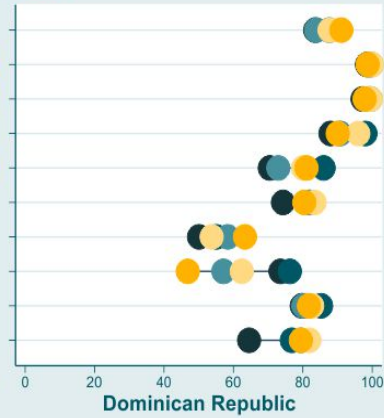
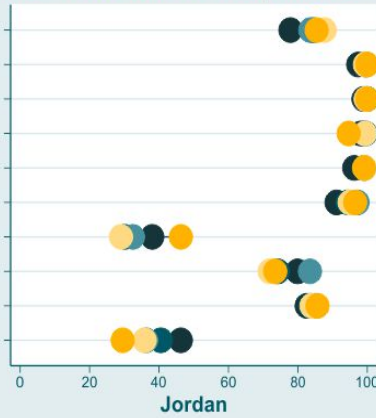
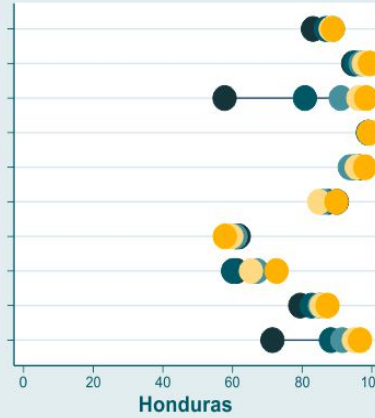
Countries with intermediate inequalities on CCI

- Demand for family planning satisfied
- Antenatal care (1+ visit with skilled provider)
- Skilled birth attendance
- BCG vaccine
- DPT vaccine (3 dosis)
- Measles vaccine
- Oral rehydration therapy
- Caresseking for suspected penumonia
- Composite Coverage Index (CCI)
- Co-coverage 6+ interventions



Countries with narrow inequalities on CCI

- Demand for family planning satisfied
- Antenatal care (1+ visit with skilled provider)
- Skilled birth attendance
- BCG vaccine
- DPT vaccine (3 dosis)
- Measles vaccine
- Oral rehydration therapy
- Caresseking for suspected penumonia
- Composite Coverage Index (CCI)
- Co-coverage 6+ interventions



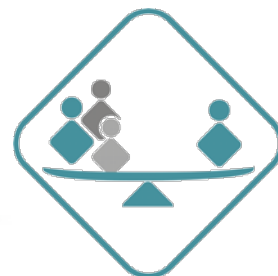
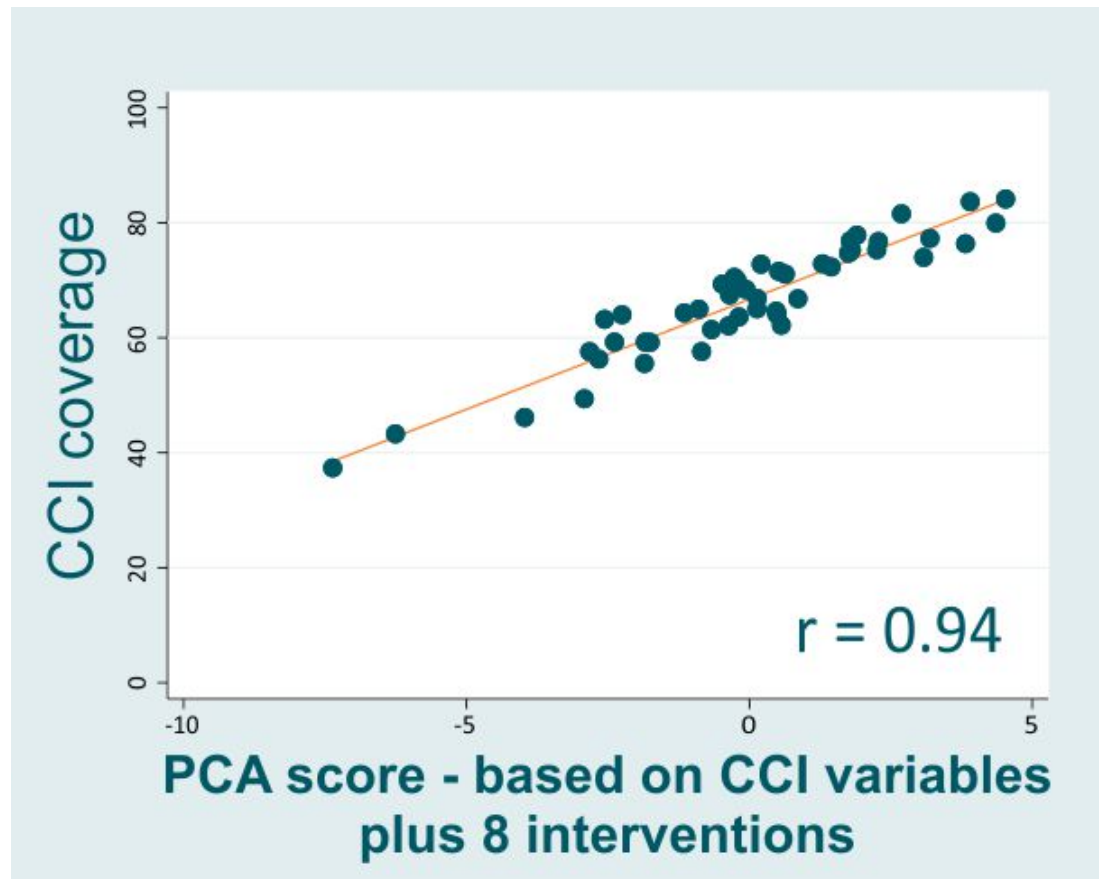
Composite coverage index

- 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

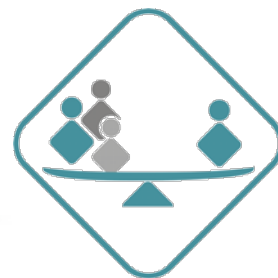
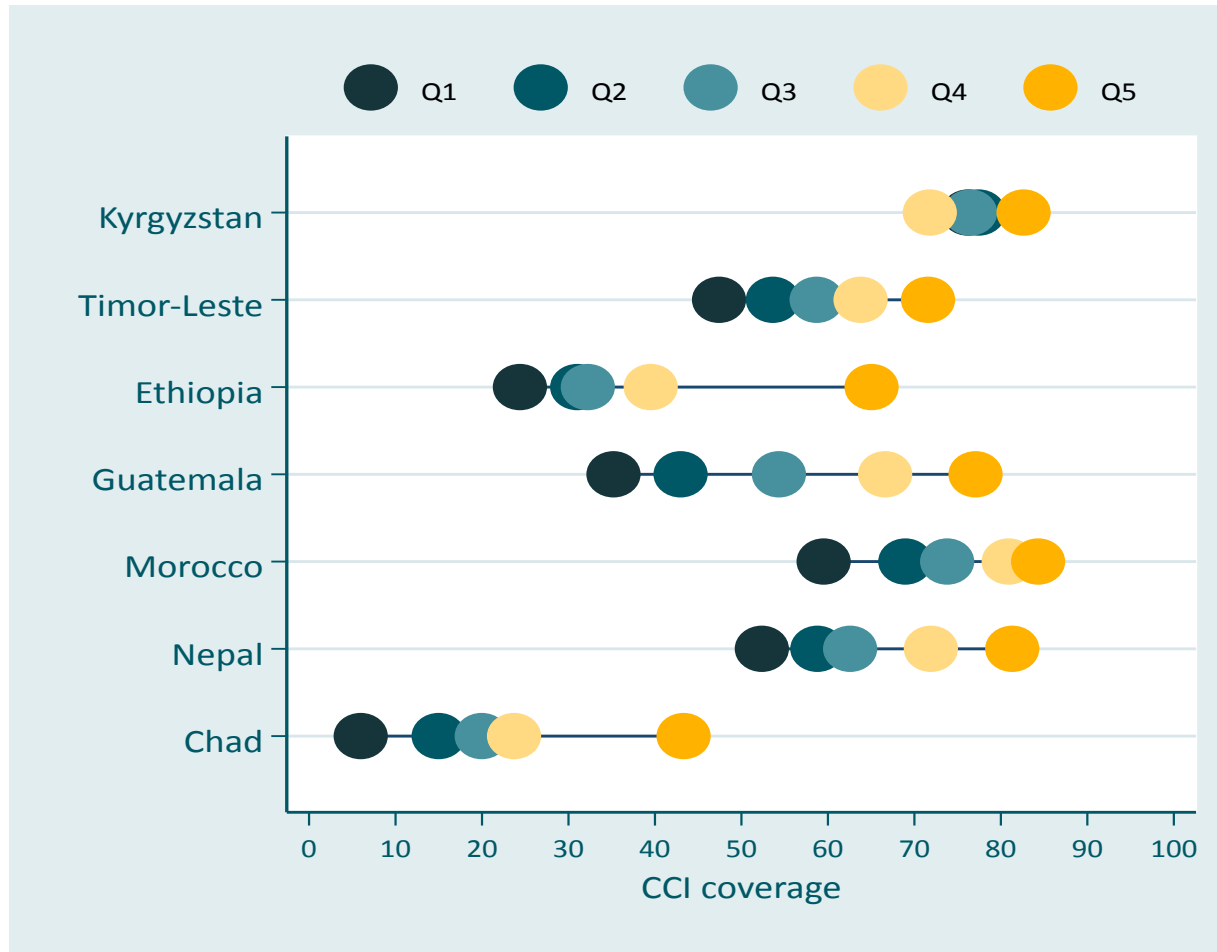
$$CCI = 1/4 \left(FPS + \frac{SBA + ANCS}{2} + \frac{2DPT3 + MSL + BCG}{4} + \frac{ORT + CPNM}{2} \right).$$



CCI with a priori weights correlates well with PCA-derived indices

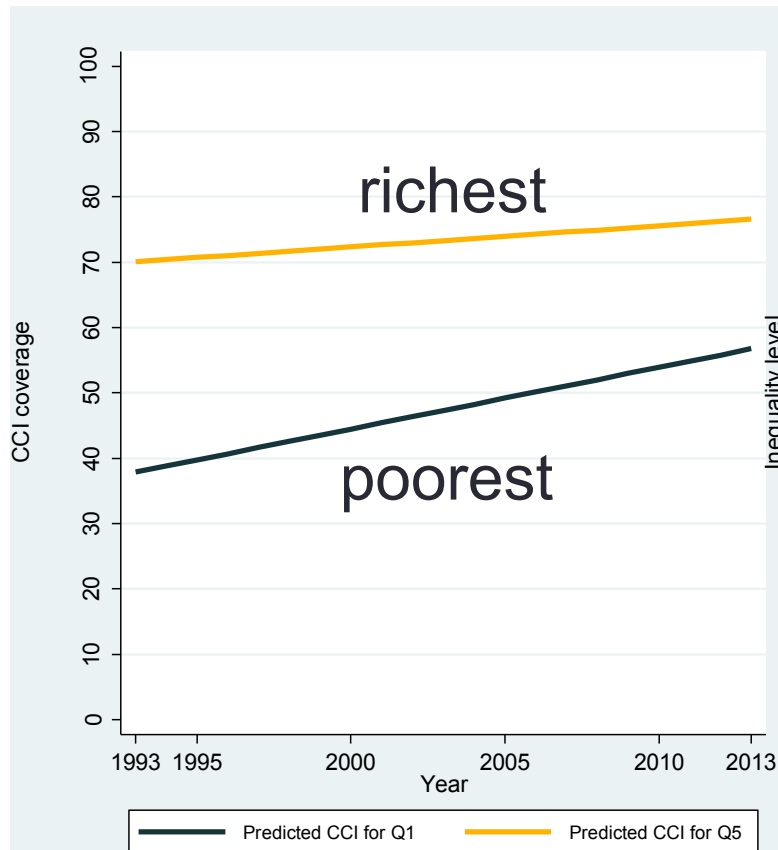


CCI by wealth in different countries

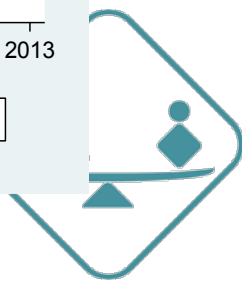
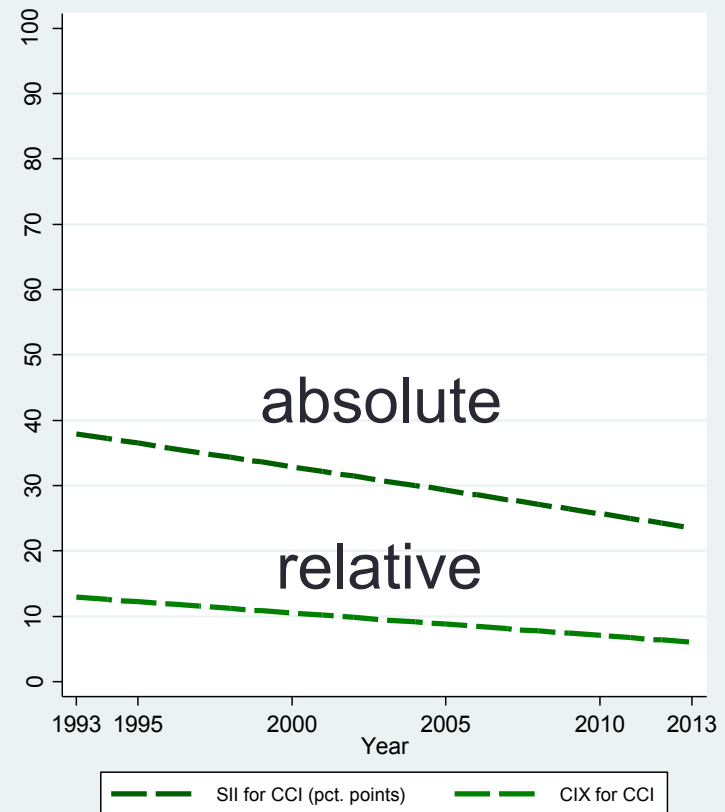


Global CCI trends by wealth quintile

CCI coverage



CCI inequality



"Who is being excluded?"



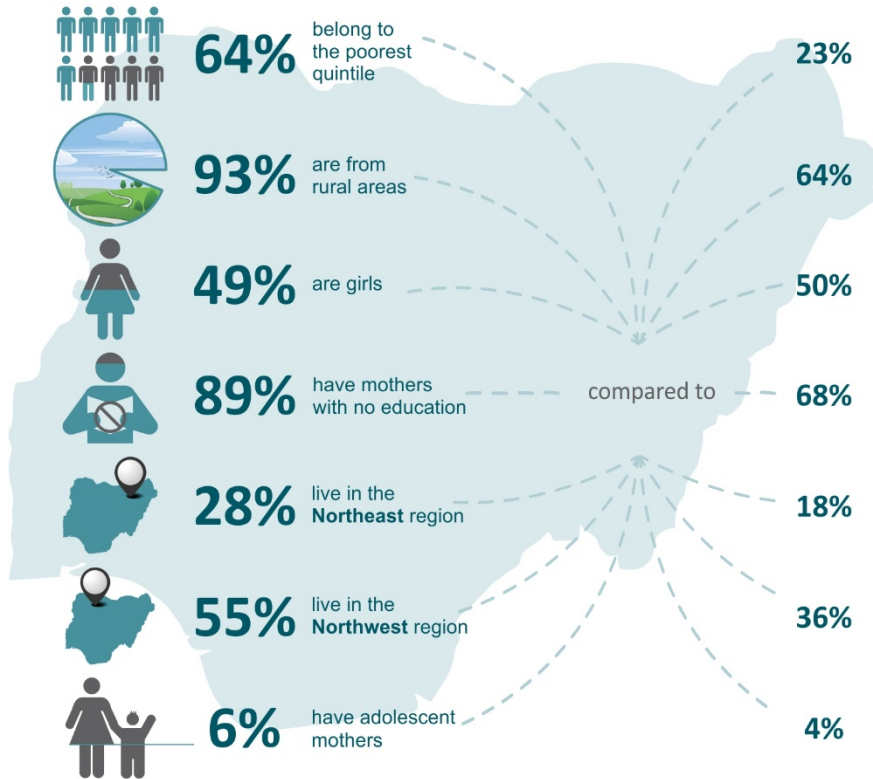
In Nigeria (2013) **13.3%** of all children failed to receive a single intervention



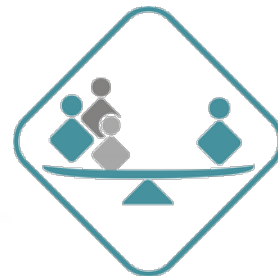
of these



of all children



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

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

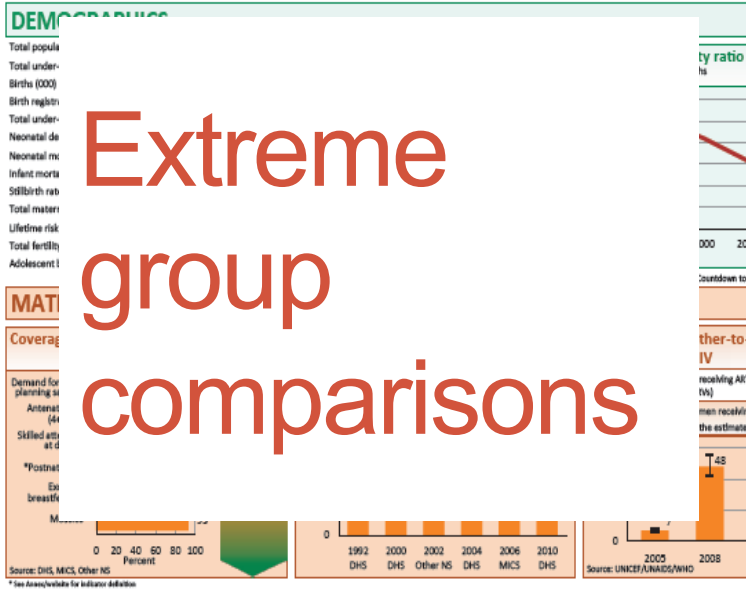


Sample sizes in 300+ surveys

Selected outcomes

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



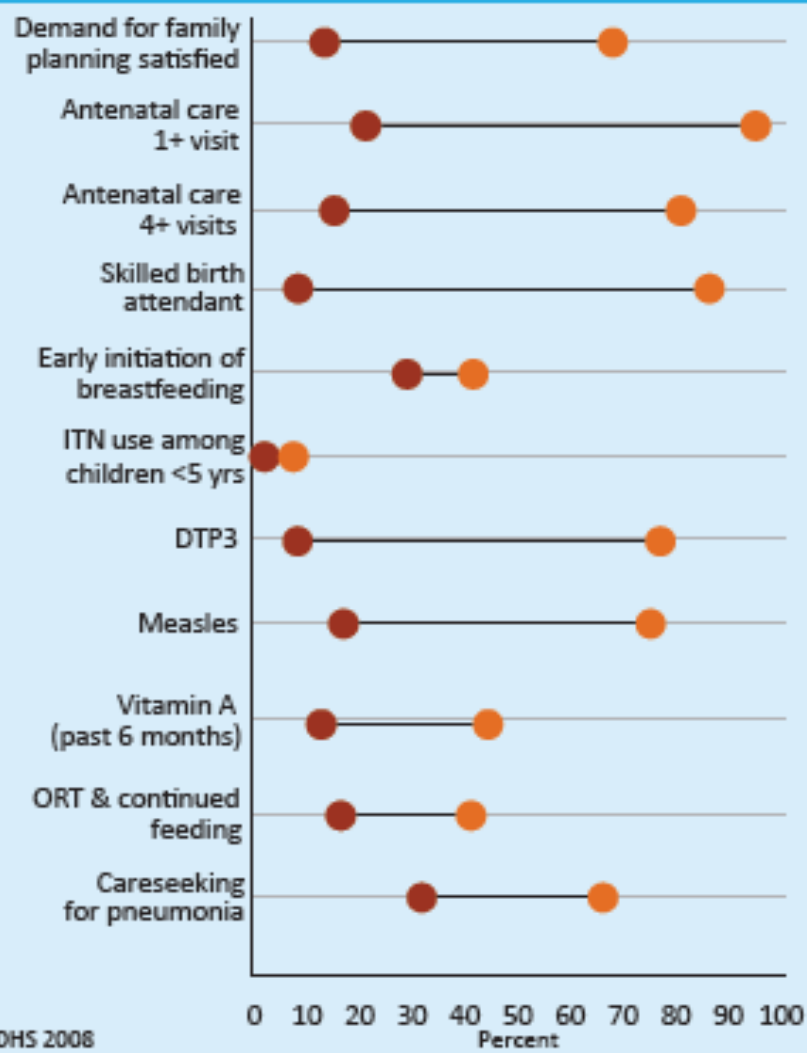


Extreme group comparisons

EQUITY

Socioeconomic inequities in coverage

Household wealth quintile: ● Poorest 20% ● Richest 20%



Coverage levels are shown for the poorest 20% (red circles) and the richest 20% (orange circles). The longer the line between the two groups, the greater the inequality. These estimates may differ from other charts due to differences in data sources.

ES

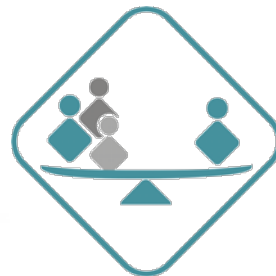
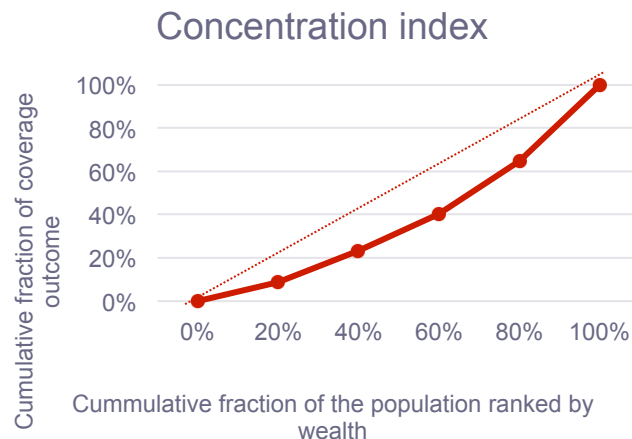
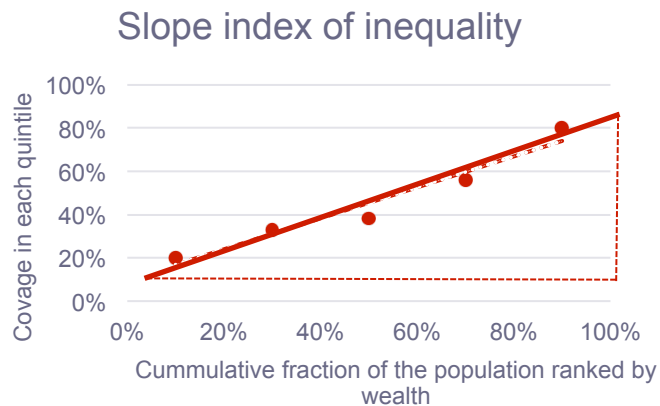
Protection in accordance with IBS	No
Reduction of maternal deaths	Yes
Personnel authorized to prescribe life saving drugs	Yes
Code of Marketing of substitutes	Yes
Home visits in first week of life	Yes
Treatment of pneumonia with antibiotics	Yes
Availability of ORS and zinc for treatment of diarrhoea	Yes
Vaccine	Partial
Maternal vaccine	Yes

RESOURCES AND FINANCING

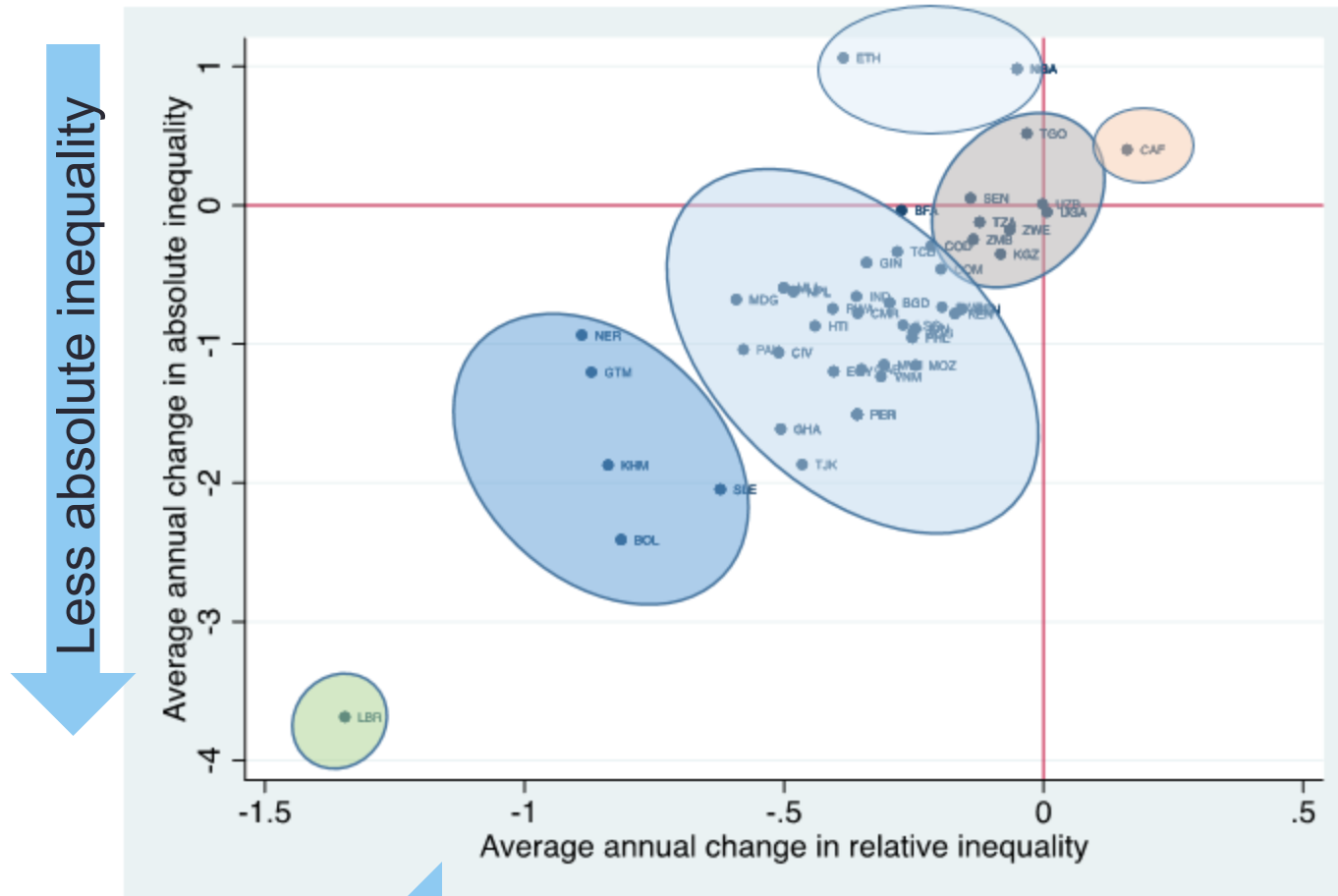
Partial implementation of maternal, newborn and child health available	Partial
Availability of health workers, midwives (skilled)	3.0 (poor)
Availability of emergency services (minimum)	32 (poor)
Total expenditure on health	56 (poor)
Government expenditure % of total government (%)	54 (poor)
Health expenditure as % of GDP	11 (poor)
Development assistance per child (USD)	24 (poor)
Development assistance for neonatal health (USD)	78 (poor)

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.**”*





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