Quantifying and Analyzing Health Equity



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Brian Briscombe

Improving Financial Access to Health Services for the Poor
Calabar, Nigeria, November 2011

USAID
FROM THE AMERICAN PEOPLE

Presentation Goals

We will cover the following:

1. How to measure poverty and inequality
2. How to display findings to illustrate inequities in health
3. How to understand and address common data challenges

Who Is Poor?

Relative poverty

- Ranks people within the same country or region
- Group A is poorer/less poor than Group B (but we do not know by how much)
- Purchasing power/socioeconomic status (used by marketers)

Absolute poverty

- Compares people across countries against a standardized poverty line (national poverty line, $1/day, $2/day, etc.)
- Quantifies absolute income or expenditures

What Kind of Data Do We Need?

Relative poverty

- Actual income or expenditures
- Household assets or durable goods
- Individual characteristics shown to correlate with income (e.g., education of head of household, occupation, and place of residence)

☞ **Analytic method for combining multiple variables into a single measure or scale**

Demographic and Health Survey (DHS) Data

Relative poverty: wealth quintiles or groups

- Start with data on
  - Ownership of assets, such as televisions and cars
  - Dwelling characteristics, such as flooring material and drinking water sources
- Each household is given a standardized score for each asset it owns
- Scores are summed by household
- Individuals are ranked according to the total score of their household
- Individuals are divided into population groups or quintiles

Demographic and Health Surveys

Funded by USAID

- Wealth quintiles included in all DHS final reports since 2004
- Retroactively added to data files going back to 2000
- DHS data available for more than 40 countries; many countries have DHS series over time

Reference link:
www.measuredhs.com/accesssurveys/Data_quality_use.cfm

Demographic and Health Surveys

Table 2.10 Wealth quintiles

Percent distribution of the jure population by wealth quintiles, according to residence and province, Zimbabwe 2005-2006

Residence/ province	Wealth quintile					Total	Number
	Lowest	Second	Middle	Fourth	Highest		
Residence							
Urban	na	na	1.5	37.9	60.5	100.0	13,087
Rural	29.3	29.3	28.5	11.7	1.2	100.0	28,236
Province							
Manicaland	16.4	21.6	31.2	22.0	8.7	100.0	5,166
Mashonaland Central	23.4	32.7	25.8	13.2	4.9	100.0	4,329
Mashonaland East	9.8	22.4	34.6	23.2	9.9	100.0	3,772
Mashonaland West	21.7	23.4	18.5	21.8	14.7	100.0	4,140
Matabeleland North	55.6	24.0	8.1	7.7	4.6	100.0	3,043
Matabeleland South	20.2	24.9	32.2	12.7	10.0	100.0	2,205

Source: 2005/06 DHS Zimbabwe.

Table 4.2 Fertility by background characteristics

Total fertility rate for the three years preceding the survey, percentage of women 15-49 currently pregnant, and mean number of children ever born to women age 40-49 years, by background characteristics, Zimbabwe 2005-2006

Background characteristic	Total fertility rate	Percentage currently pregnant[1]	Mean number of children ever born to women age 40-49
Residence			
Urban	2.6	4.4	4.0
Rural	4.6	8.0	5.8
Province			
Manicaland	4.2	7.4	5.5
Mashonaland Central	4.6	8.6	5.1
Mashonaland East	3.7	7.7	5.1
Mashonaland West	3.7	6.7	5.3
Matabeleland North	4.2	6.1	5.9
Matabeleland South	4.0	5.3	5.0
Midlands	4.2	7.3	5.7
Masvingo	4.9	8.0	6.5
Harare	2.5	5.3	4.1
Bulawayo	2.3	2.4	3.6
Education			
No education	5.8	2.0	6.1
Primary	4.5	7.9	5.5
Secondary	3.3	6.3	4.0
More than secondary	2.7	5.0	2.9
Wealth quintile			
Lowest	5.5	8.0	6.4
Second	4.8	10.0	6.1
Middle	4.0	7.1	5.5
Fourth	3.2	6.3	4.5
Highest	2.3	3.5	3.8

Source: 2005/06 DHS Zimbabwe.

Multiple Indicator Cluster Surveys (MICS)

Coordinated by UNICEF

- MICS are designed to track the status of children
- MICS use DHS methodology to create wealth quintiles
- Standard tables include wealth quintiles as a background indicator

Resource link: www.childinfo.org/mics2_background.html

Multiple Indicator Cluster Surveys

Table 11: Percentage of children of primary school age attending primary school, Cote d'Ivoire, 2000

		Sex				Total	
		Male		Female			
		Attending primary school		Attending primary school			
		Attending	Number	Attending	Number	Attending	Number
Wealth Index Quintiles	Poorest	44.3	1192	33.7	985	39.5	2177
	Second	55.9	1190	44.7	910	51.0	2100
	Middle	59.2	1076	46.4	1005	53.0	2081
	Fourth	72.0	988	64.3	932	68.2	1920
	Richest	85.2	814	77.9	802	81.6	1617
Regio	Centre	55.2	403	47.2	342	51.5	745
	Centre Nord	60.4	501	52.4	452	56.6	953
	Nord Est	52.9	277	41.2	210	47.9	486
	Centre Est	58.9	129	58.7	126	58.8	255
	Sud (sans Abidjan)	61.0	944	53.5	865	57.4	1808
	Sud Ouest	53.6	442	36.7	401	45.6	843
	Centre Ouest	63.8	718	51.6	603	58.3	1321
	Ouest	66.3	333	51.9	286	59.6	620
	Nord Ouest	43.3	259	34.7	185	39.7	444
	Nord	45.3	337	36.9	293	41.4	630
	Abidjan	79.6	917	72.3	871	76.0	1788
Area	Urban	70.8	2385	63.2	2205	67.1	4590
	Rural	53.8	2876	42.7	2429	48.7	5304
Age	6	35.3	902	31.0	813	33.3	1716
	7	58.4	961	48.7	782	54.0	1743
	8	69.7	927	56.8	830	63.6	1756

Source: Côte D'Ivoire MICS 2000 (http://measuredhs.com)

Reproductive Health Surveys

Conducted by CDC under the MEASURE Project

- Funded by USAID
- Designed to focus on reproductive health issues
- Use DHS methodology to create wealth quintiles
- Includes standard tables using wealth quintiles as a background indicator

Resource link:
www.cdc.gov/reproductivehealth/surveys/SurveyCountries.htm

What Kind of Data Do We Need?

Absolute poverty

- Actual information on income or expenditures
- Previous surveys collecting both income and/or expenditures and household assets

☞ **Analytic method for comparing household assets with a determined poverty cut-off line**

Living Standards Measurement Studies

Conducted by the World Bank

- Detailed information on household income and expenditures and economic and social areas
- Now includes progress toward achieving the Millennium Development Goals (MDGs)
- Data can measure poverty based on income and expenditures

Resource link: http://go.worldbank.org/WKOXNZV3X0

Other Measures of Absolute Poverty

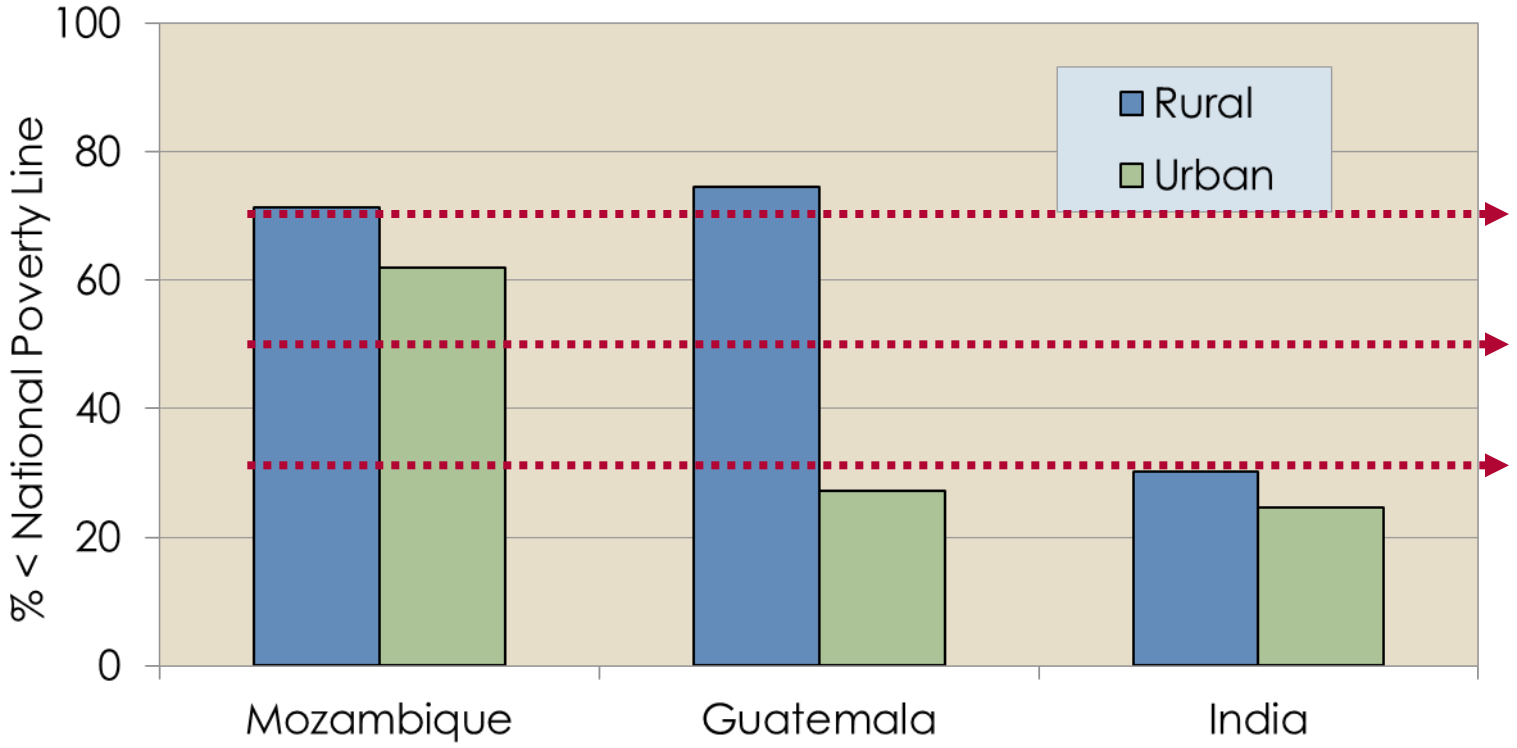
Developed for microfinance projects

- Derived from comparisons of household assets and characteristics against national living standards surveys
- Limited number of countries available
- Can be incorporated into new surveys

Resource links:

- www.povertytools.org/
- www.microfinance.com/

Relative vs. Absolute Poverty



People below the national poverty line could include only the poorest quintile or the bottom two quintiles—or even the bottom three quintiles!

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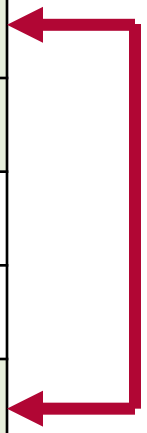
Tables Draw Attention to Values

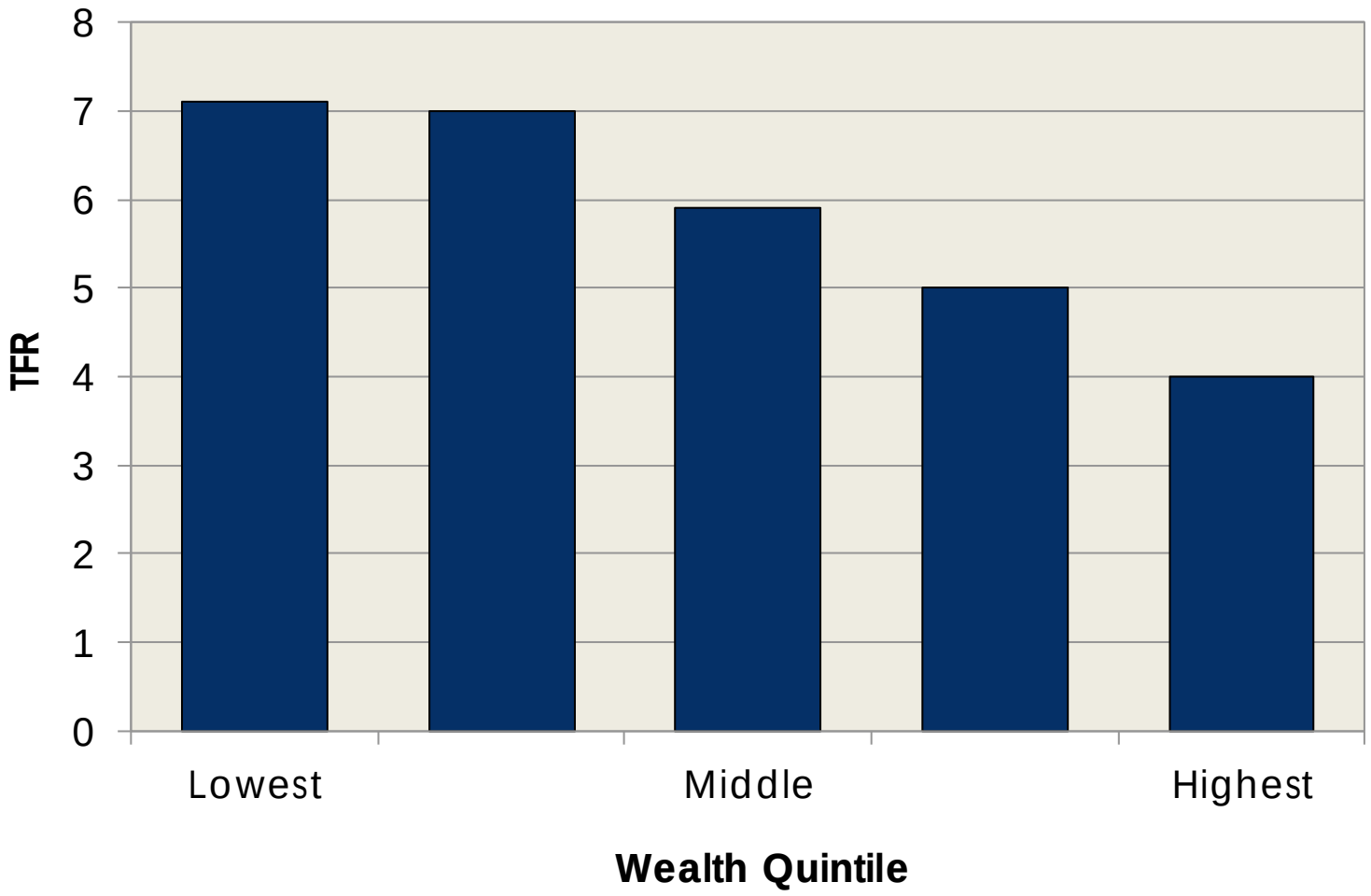
Wealth Quintile	TFR
Poorest	**7.1**
Lower middle	**7.0**
Middle	5.9
Upper middle	5.0
Wealthiest	**4.0**



Tables highlight numbers, especially if the data points are few.

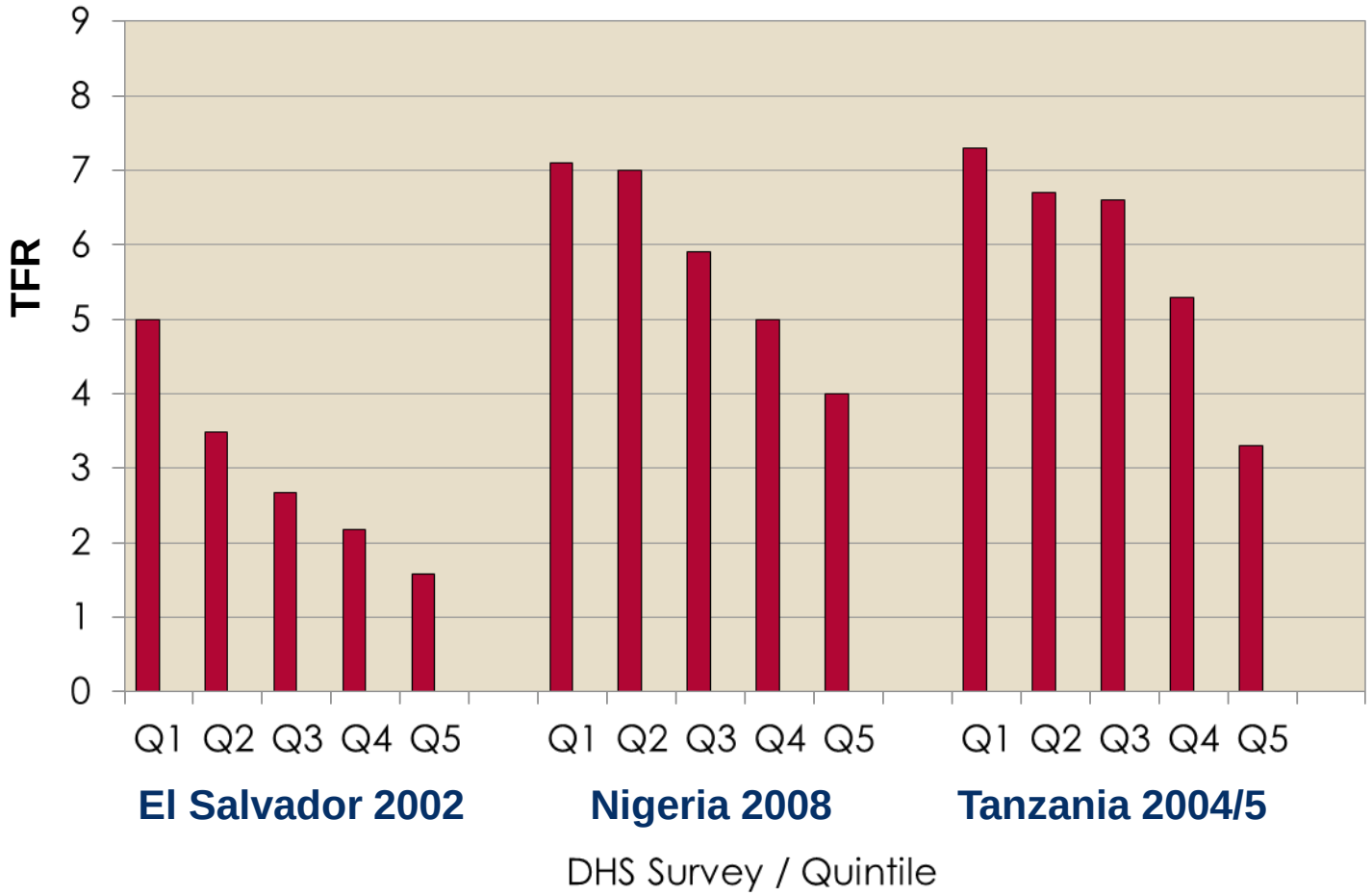
Source: Nigeria DHS 2008

Bar Charts Draw Attention to Relative Values

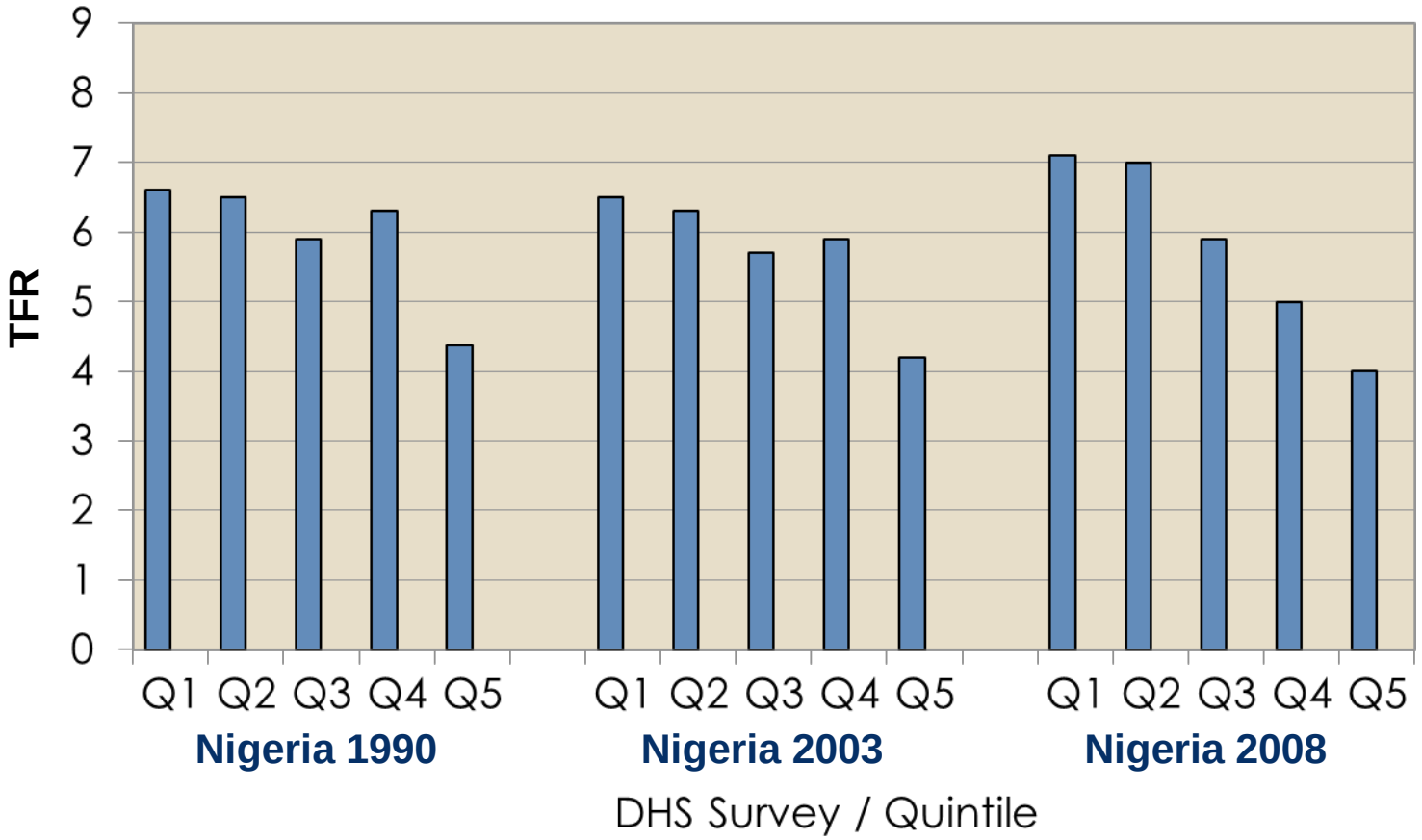


Source: Nigeria DHS 2008

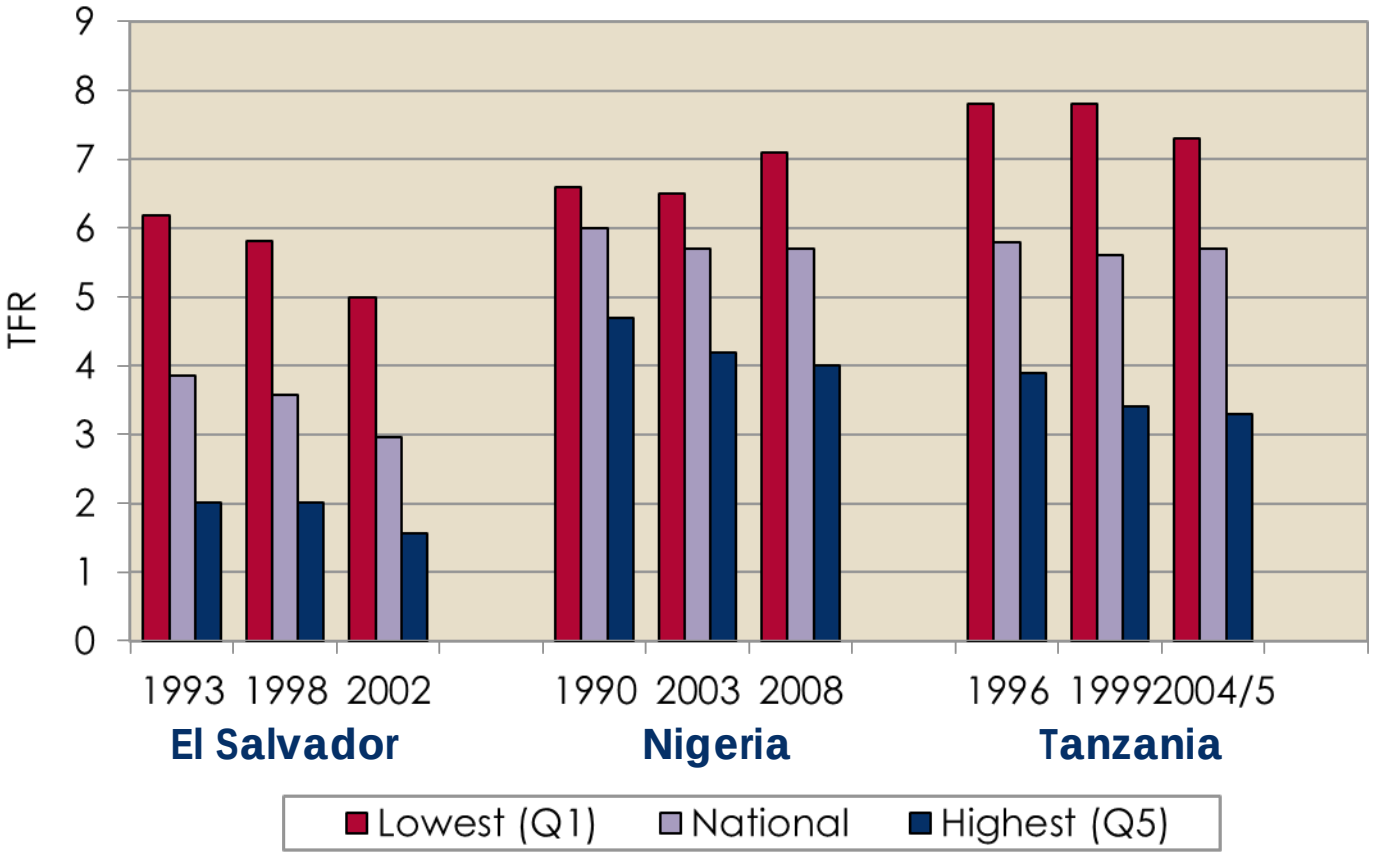
Displaying Data: Multiple Bar Charts



Bar Charts Show Trends for Specific Quintiles Over Time in a Country



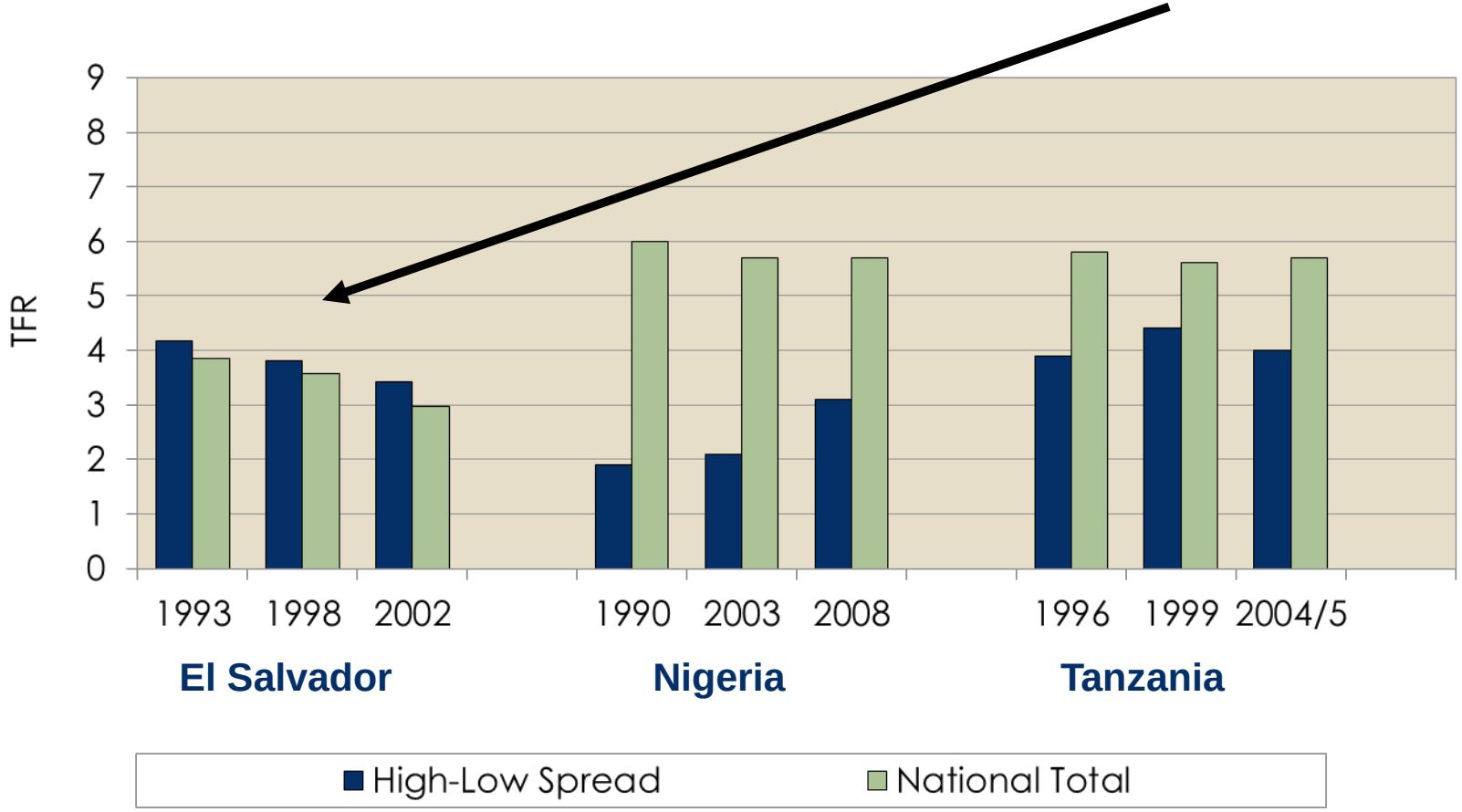
Comparing Differences between the Poorest and Highest Quintiles



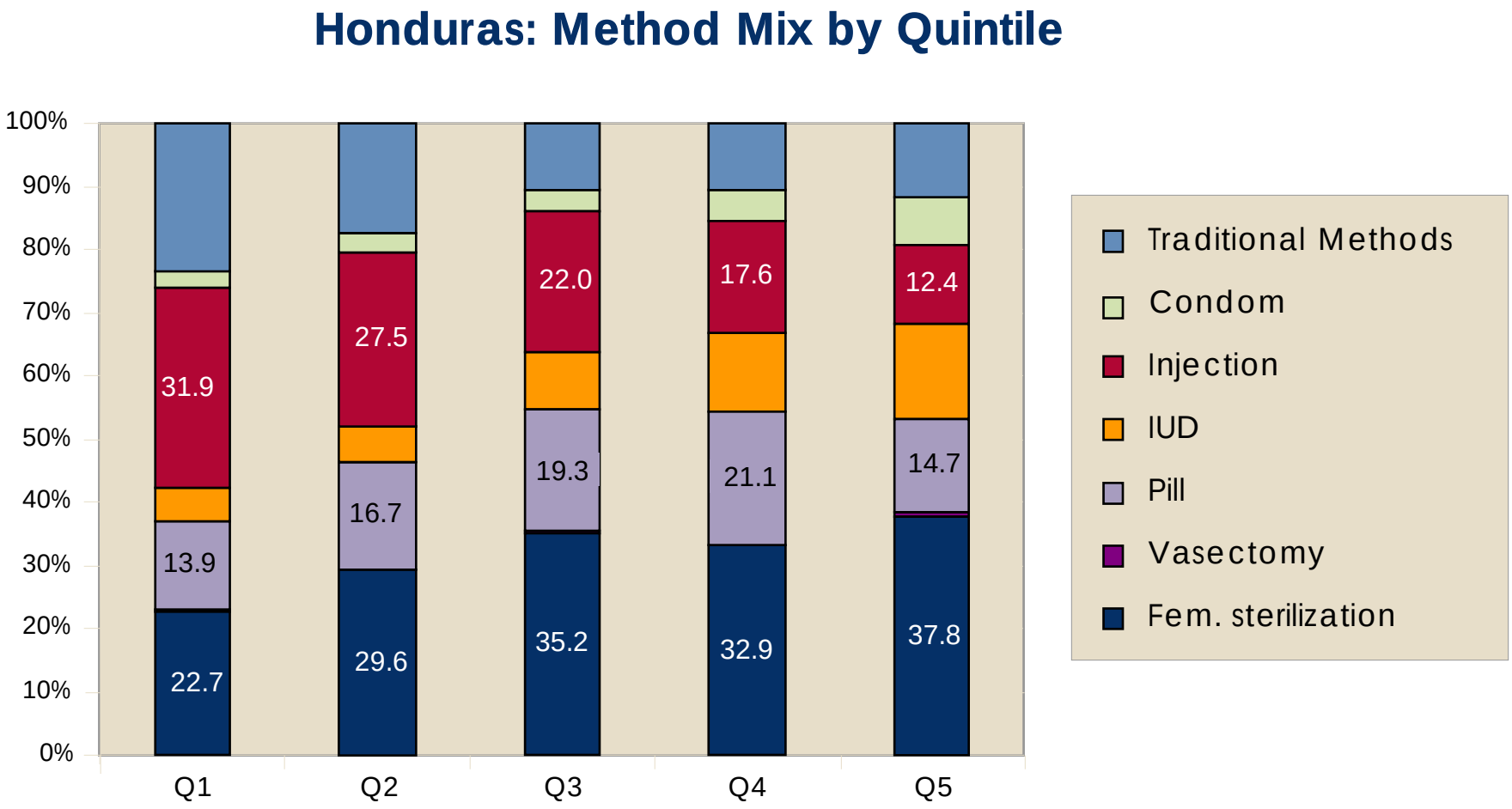
Dropping some quintiles creates space to compare TFRs in multiple years for different countries. Which countries **improved equity** over time?

Comparing Spreads between the Highest and Lowest Quintiles

All three countries lowered TFR over time, but which country improved **equity**?



Comparing Contraceptive Use Among Different Wealth Quintiles



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Construction of Wealth Quintiles

- Each household is given a wealth index score
- Individuals are ranked according to the total score of their household
- The sample is then divided into population quintiles—five groups that each have 20% of the individuals in the sample

Who Is in the Quintile?

Wealth Quintile	**Subpopulation** (Tanzania DHS 2004–2005)						
	Women 15-49	Men 15-49	Children <18 years	Married women 15-49	Pregnancies in last 5 years	Births in past 5 years	Children 12-23 months
Poorest	1,840	484	5,273	1,341	1,998	1,974	409
Lower middle	1,944	504	5,014	1,424	1,898	1,857	352
Middle	1,943	516	5,085	1,380	1,889	1,866	328
Upper middle	2,004	517	5,018	1,365	1,719	1,681	327
Wealthiest	2,597	615	4,232	1,440	1,386	1,347	243

When Describing Differences

Pay attention to the denominator. Rates are usually standardized to a common denominator.

- Age-specific fertility rate: 1,000 women in age group
- Infant mortality rate: 1,000 live births

Quintile	Children under 5 (Tanzania DHS 2004–2005)		
	% with fever	# of children	# with fever
Poorest	25.8	1,812	467
Lower middle	25.7	1,664	428
Middle	23.5	1,688	397
Upper middle	24.1	1,561	376
Wealthiest	22.5	1,252	282

Many Ways to Describe Differences

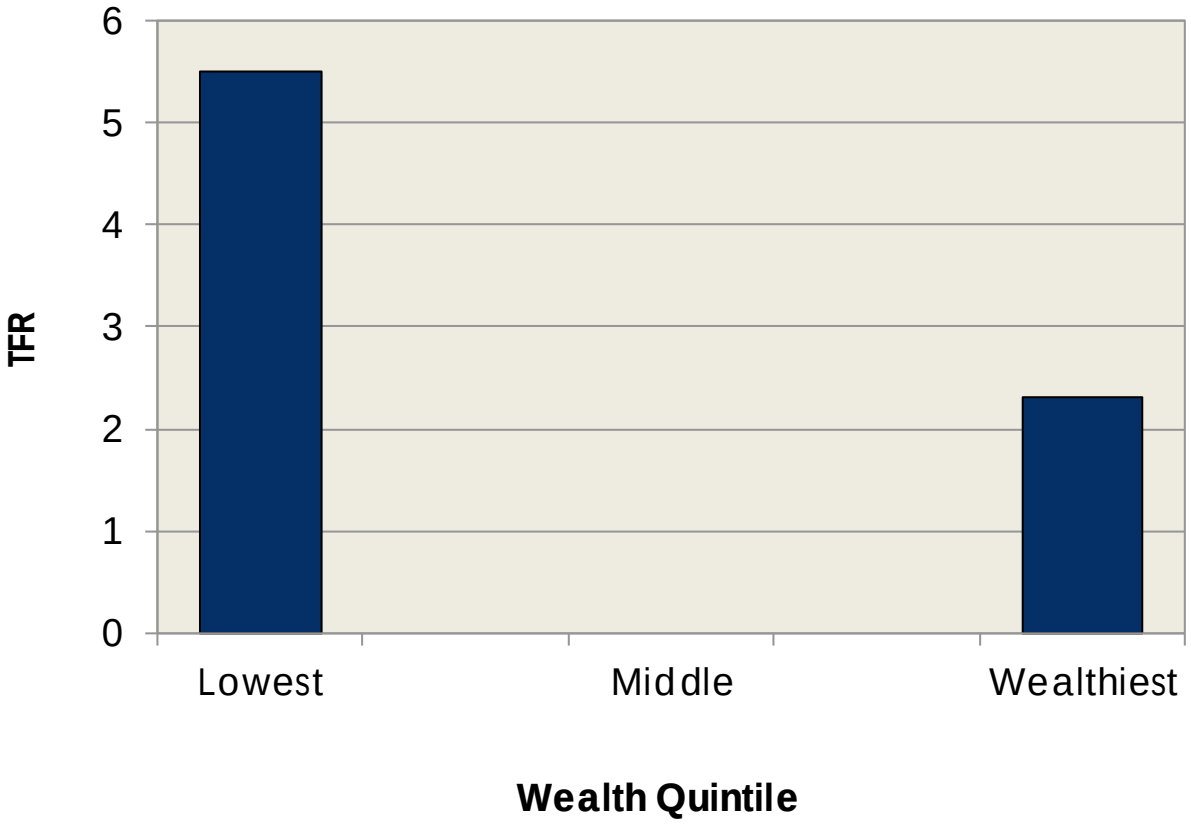
Percentage of Tanzanian households with at least one ITN		
Wealth Quintile	**2004/5 DHS**	**2007/8 MIS**
Poorest	5.9%	22.1%
Lower middle	10.1%	28.2%
Middle	15.0%	33.7%
Upper middle	21.9%	41.3%
Wealthiest	55.8%	66.7%

- Coverage gap between wealthiest and poorest quintiles narrowed from ~50% to ~45%
- Relative gap fell from 10:1 in bed net ownership to 3:1
- Ownership in poorest quintiles nearly quadrupled vs. 10% growth in wealthiest quintile

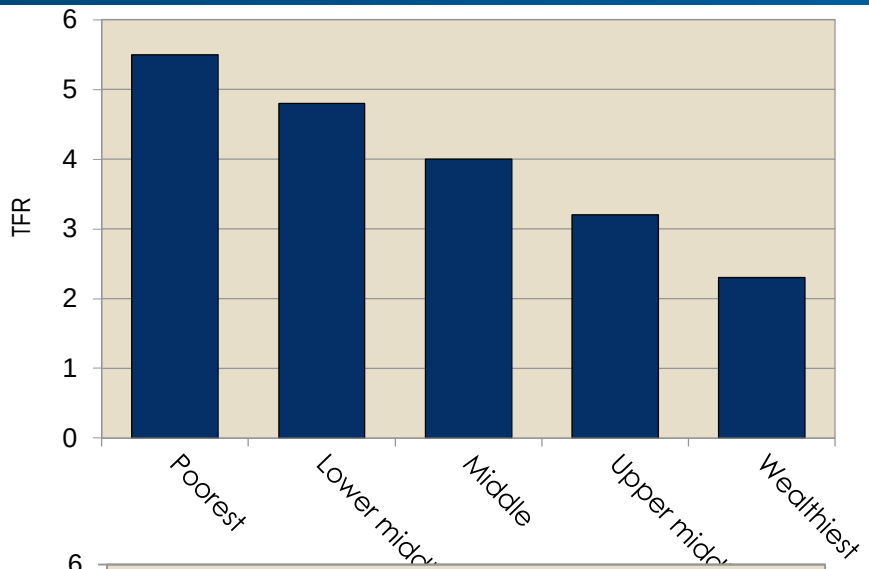
☞ **Note:** This table does not tell us about the number of poorest and wealthiest households that own or do not own a net.

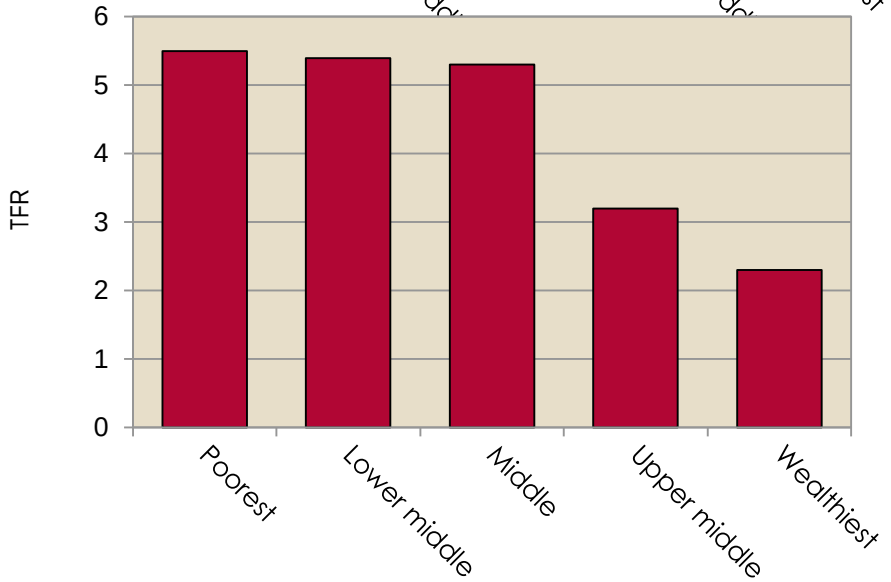
The Middle Matters

- It is tempting to compare only the extremes
- 60% of the population belongs to Quintiles 2–4
- What might happen if we leave out the middle?

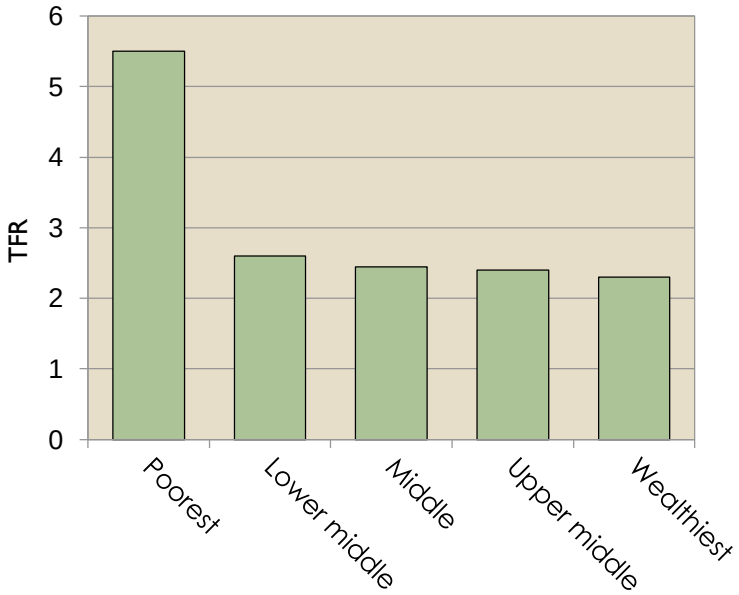


The Middle Matters

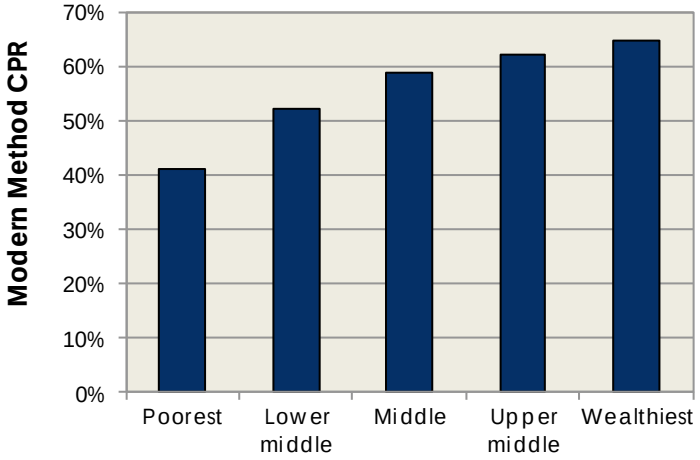


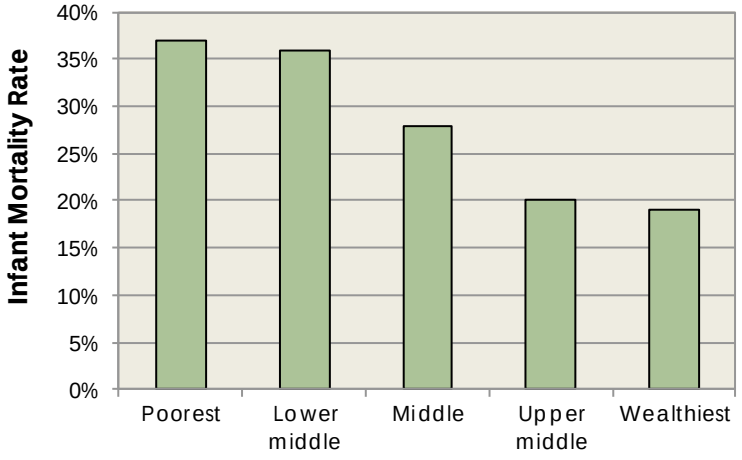


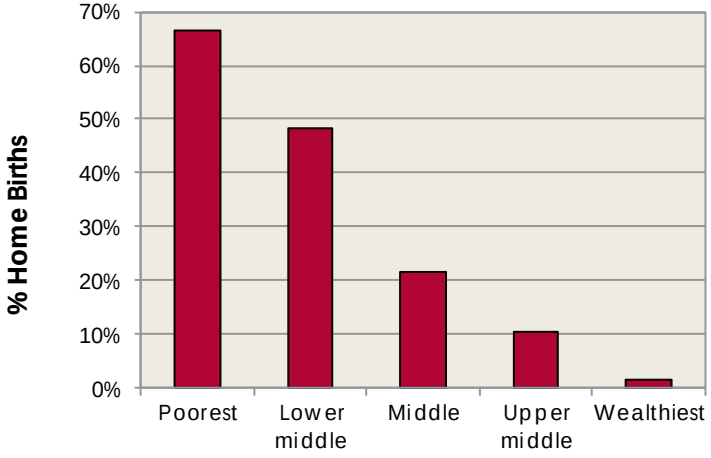
- Which is the priority group?
- Is there only one?

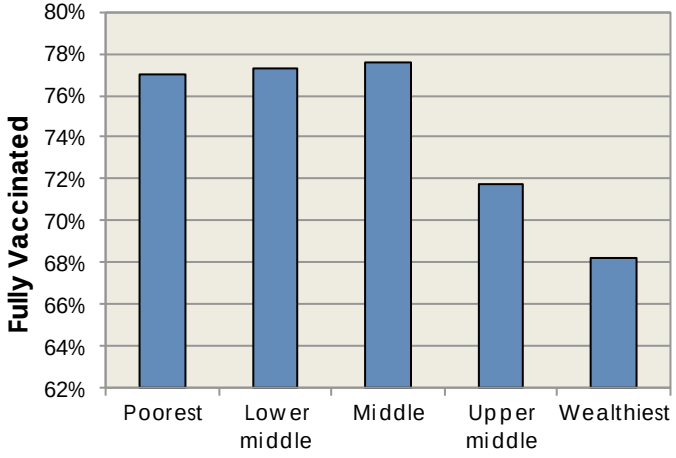


Not All Indicators Show Same Inequalities







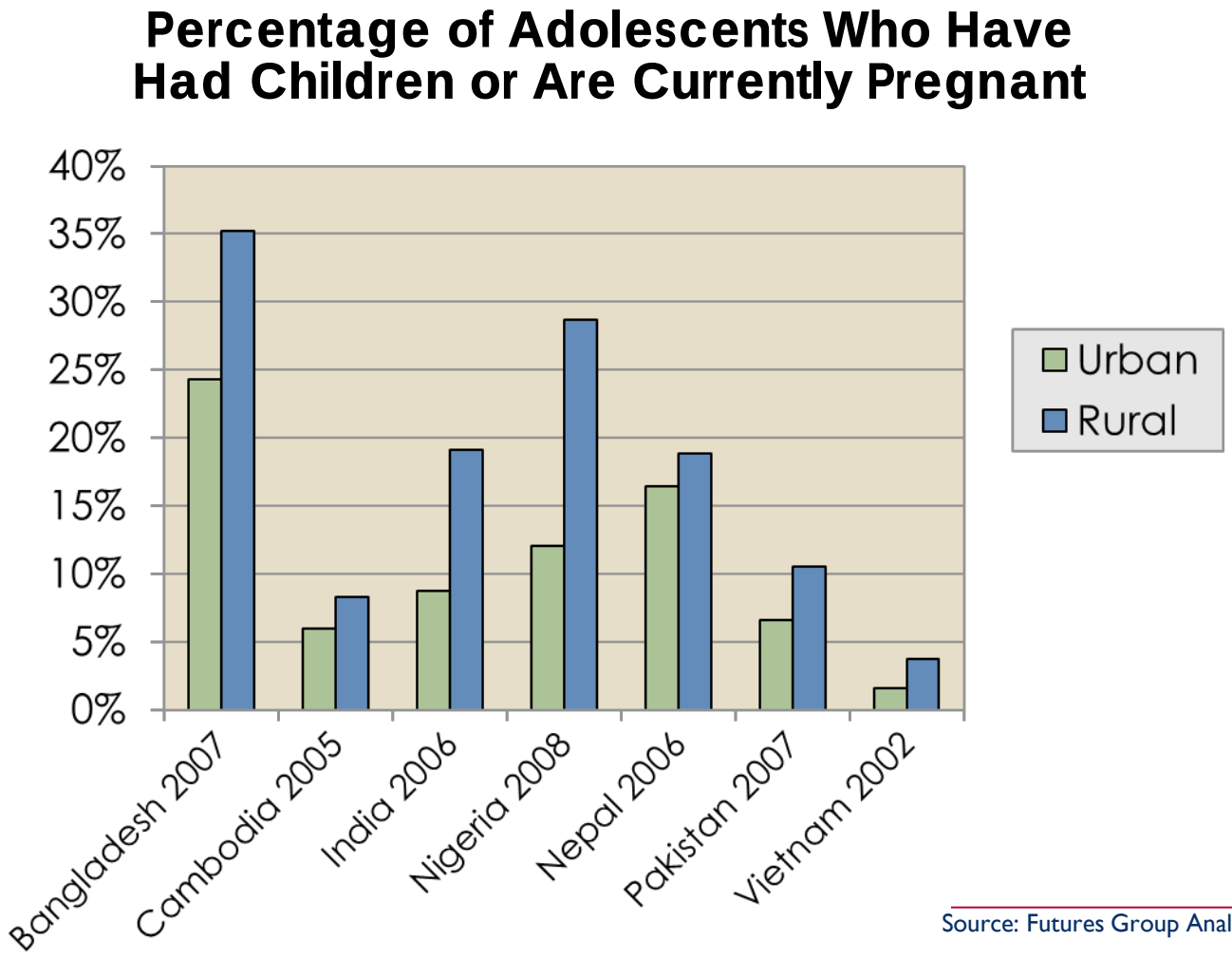


Source:
Honduras DHS
2005–2006

Other Sources of Inequality

- Place of residence (urban-rural)
- Ethnicity
- Gender

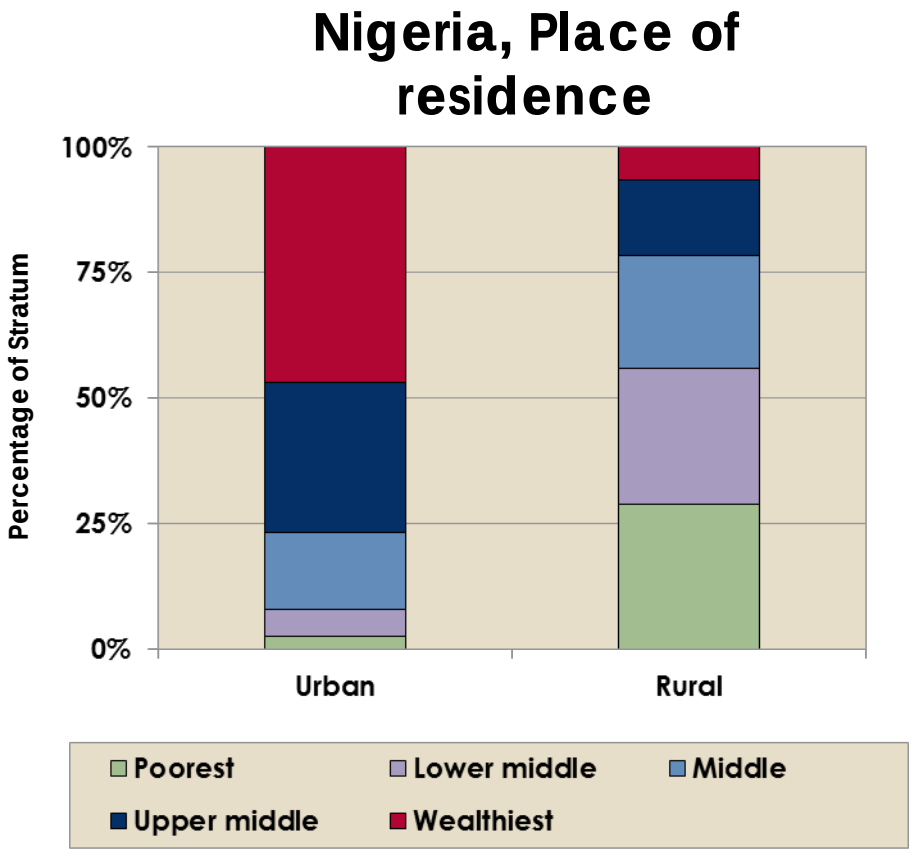
Urban-Rural Inequality



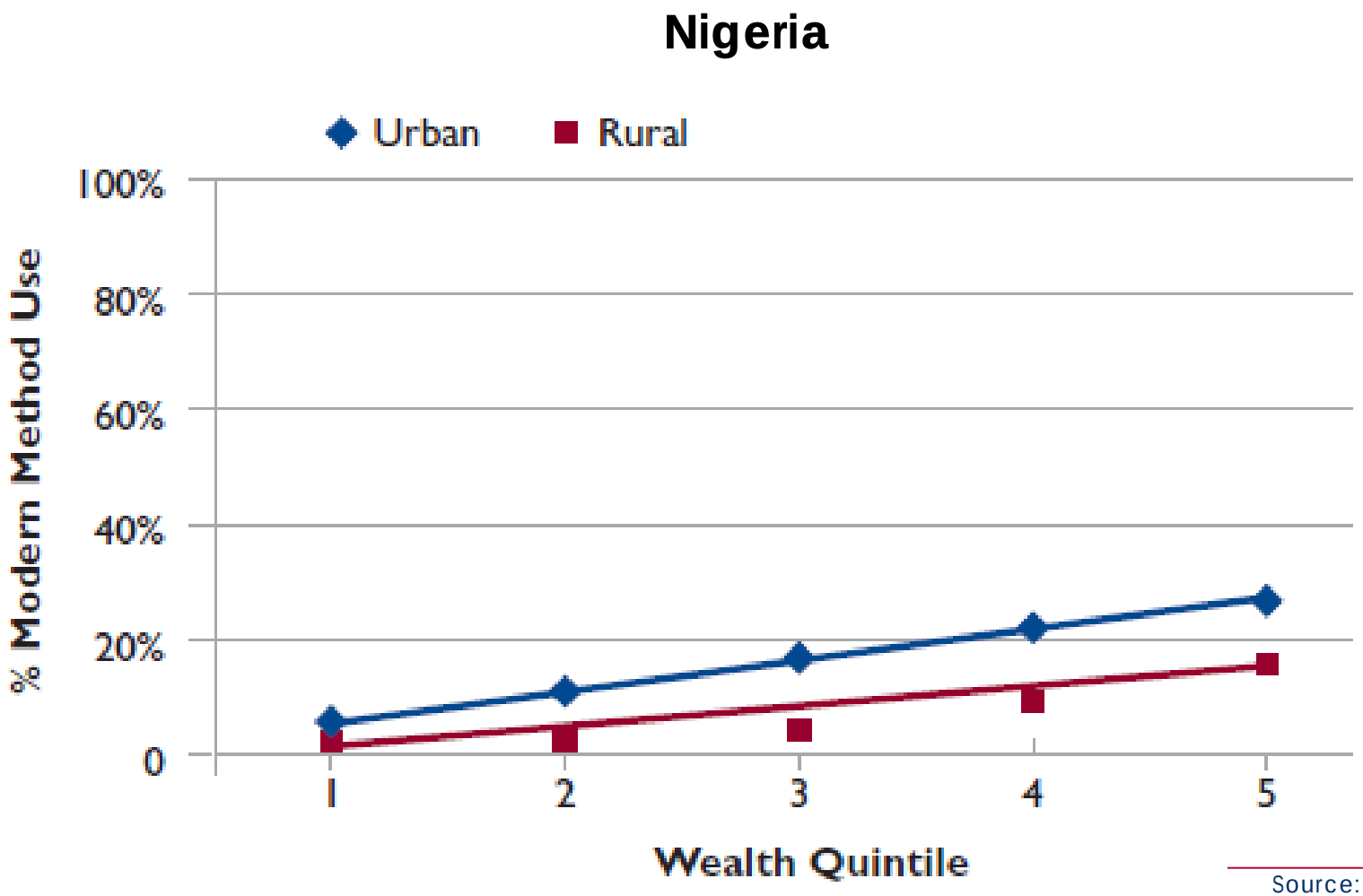
Source: Futures Group Analysis of Various DHS

Urban-Rural Inequality

- Wealth and poverty are often strongly linked with the place of residence (urban or rural).
- Comparing the poorest quintile to the wealthiest quintile may be equivalent to comparing urban residents as a whole with the very poorest rural residents.

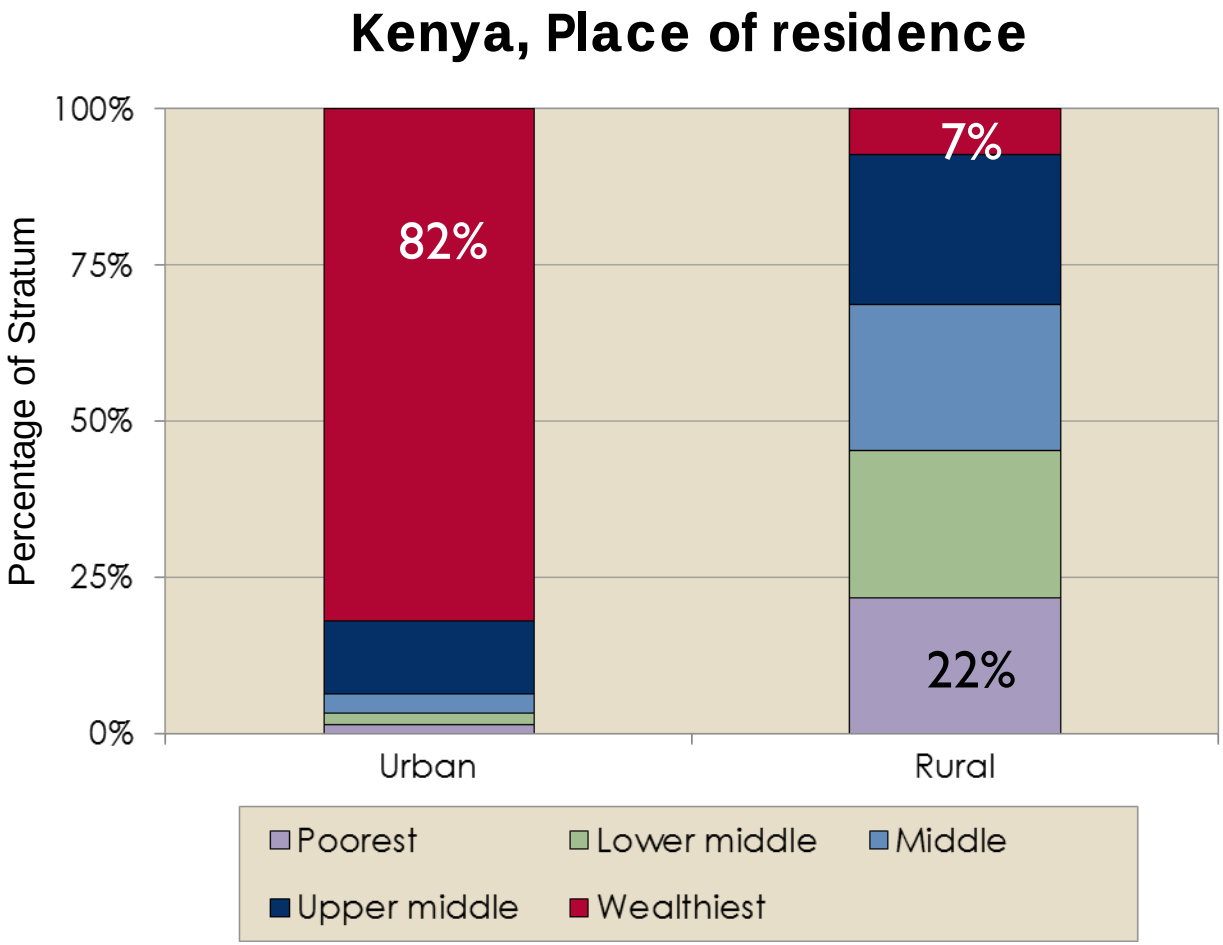


Urban-Rural Inequality



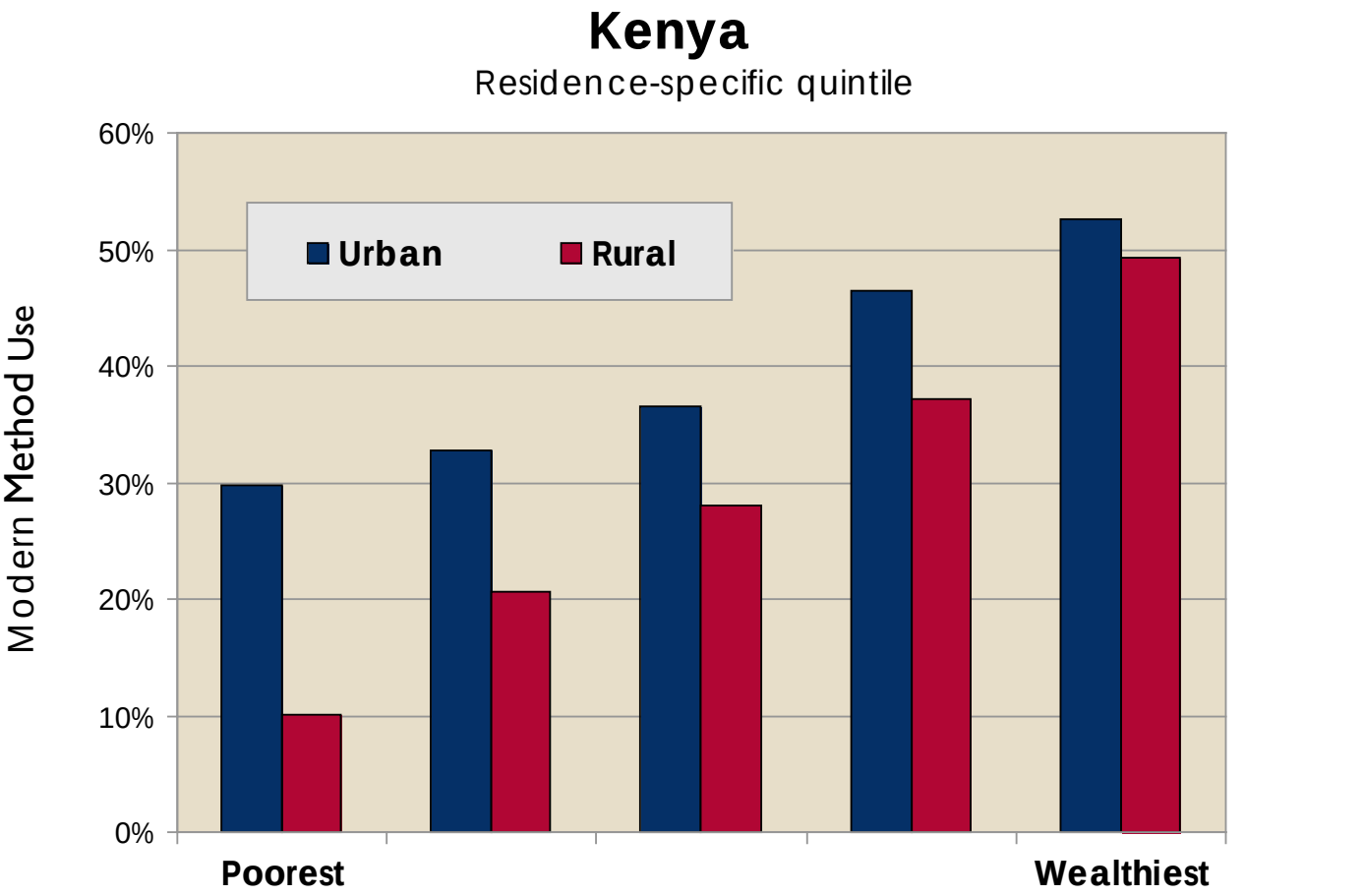
Source: DHS 2008
Nigeria

Urban-Rural Inequality



Source: DHS 2008/09 Kenya

Urban-Rural Inequality



Source: DHS 2008/09 Kenya

In Summary

We covered the following:

1. How to measure poverty

2. How to display findings to illustrate inequities in health

3. How to understand and address common data challenges

Thank You!

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This presentatinon was adapted from: Health Policy Initiative, Task Order 1. 2010. “Session 4.1: Quantifying and Analyzing Health Equity.” Presentation in *Policy Approaches to Equity in Health Seminar* . Washington, DC: Futures Group, Health Policy Initiative, Task Order 1.

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