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Workshop on MPI

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MPPN Roundtable

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Alkire-Foster Method

Alkire-Foster Method

- The Alkire-Foster (AF) method of multidimensional measurement is used for **Multidimensional Poverty Indices (MPIs)**
- It is also used for other measures, including:
 - Bhutan's Gross National Happiness Index
 - Women's Empowerment in Agriculture Index
- It is a counting-based approach developed by Sabina Alkire and James Foster
- Can measure both **breadth** and **depth** of poverty in a society, as well as an **overall index**, normalized 0 to 1
- It can be disaggregated for different population sub-groups (rural/urban, regions, gender, age, ethnicity, etc.)
- It can be decomposed by indicator to show **composition** of poverty

Steps to Construct an MPI

First you need to make some decisions (normative choices):

- **Dimensions:** conceptual categories (e.g. education, health, living standards, etc.)
- **Indicators:** what are you actually measuring? (e.g. school attendance, electricity, etc.)
- **Deprivation cut-offs** (for indicators): how much is enough to be non-deprived?
- **Weights** (for indicators): relative importance of each indicator compared to others
- **Poverty cut-off:** how much is enough to be non-poor?

Steps to Compute an MPI

Steps to the Alkire-Foster (AF) method used to compute an MPI:

1. Identify whether or not each person is deprived in each indicator by comparing their achievements in the indicator to the deprivation cut-off
2. Apply the weights to the deprivations in each indicator
3. Sum each person's weighted deprivations to get their deprivation score
4. Identify who is poor by comparing each person's deprivation score to the poverty cut-off
5. Compute incidence, intensity, MPI, and other results

Steps to Compute an MPI

Indicators

Schooling	Food	Assets	Electricity	
13.1	14	4	1	Usha
15	7	5	0	Ana
12.5	10	1	0	Rizwan
20	11	3	1	Jakob
10	12	2	0	Monica

Persons

Start with data on **achievements** for selected indicators

Steps to Compute an MPI

	<i>Indicators</i>				
	Schooling	Food	Assets	Electricity	
	13.1	14	4	1	Usha
	15	7	5	0	Ana
	12.5	10	1	0	Rizwan
	20	11	3	1	Jakob
	10	12	2	0	Monica
Deprivation cut-offs	(13	12	3	1)	

Persons

1. Compare values to deprivation cut-offs to **identify deprivations** (deprived if value is less than cut-off)

Steps to Compute an MPI

<i>Indicators</i>				
Schooling	Food	Assets	Electricity	
0	0	0	0	Usha
0	1	0	1	Ana
1	1	1	1	Rizwan
0	1	0	0	Jakob
1	0	1	1	Monica

Persons

Create **deprivation matrix** (1 = deprived; 0 = non-deprived)

Steps to Compute an MPI

		<i>Indicators</i>					
		Schooling	Food	Assets	Electricity		
		0	0	0	0	Usha	<i>Persons</i>
		0	1	0	1	Ana	
		1	1	1	1	Rizwan	
		0	1	0	0	Jakob	
		1	0	1	1	Monica	
Weights		(0.3	0.25	0.2	0.25)		

Identify **weights** for each indicator

Steps to Compute an MPI

2. Apply weights to deprivations in each indicator

		<i>Indicators</i>					
		Schooling	Food	Assets	Electricity		
		0	0	0	0	Usha	<i>Persons</i>
		0	0.25	0	0.25	Ana	
		0.3	0.25	0.2	0.25	Rizwan	
		0	0.25	0	0	Jakob	
		0.3	0	0.2	0.25	Monica	
Weights		(0.3	0.25	0.2	0.25)		

Steps to Compute an MPI

<i>Indicators</i>				<i>Deprivation Score</i>	<i>Persons</i>
<i>Schooling</i>	<i>Food</i>	<i>Assets</i>	<i>Electricity</i>		
0	0	0	0	0	Usha
0	0.25	0	0.25	0.5	Ana
0.3	0.25	0.2	0.25	1	Rizwan
0	0.25	0	0	0.25	Jakob
0.3	0	0.2	0.25	0.75	Monica

3. Sum each person's weighted deprivations to calculate their **deprivation score**

Steps to Compute an MPI

Set a poverty cut-off (k)

<i>Indicators</i>				Deprivation Score	<i>Persons</i>
Schooling	Food	Assets	Electricity		
0	0	0	0	0	Usha
0	0.25	0	0.25	0.5	Ana
0.3	0.25	0.2	0.25	1	Rizwan
0	0.25	0	0	0.25	Jakob
0.3	0	0.2	0.25	0.75	Monica

$k=0.5$

Steps to Compute an MPI

<i>Indicators</i>				<i>Deprivation Score</i>	<i>Persons</i>
<i>Schooling</i>	<i>Food</i>	<i>Assets</i>	<i>Electricity</i>		
0	0	0	0	0	Usha
0	0.25	0	0.25	0.5	Ana
0.3	0.25	0.2	0.25	1	Rizwan
0	0.25	0	0	0.25	Jakob
0.3	0	0.2	0.25	0.75	Monica

$k=0.5$

4. Identify who is **poor** based on poverty cut-off (deprivation score greater than or equal to k)

Steps to Compute an MPI

<i>Indicators</i>				<i>Deprivation Score</i>	
<i>Schooling</i>	<i>Food</i>	<i>Assets</i>	<i>Electricity</i>		
0	0	0	0	0	Usha
0	0.25	0	0.25	0.5	Ana
0.3	0.25	0.2	0.25	1	Rizwan
0	0.25	0	0	0.25	Jakob
0.3	0	0.2	0.25	0.75	Monica

Persons

$k=0.5$

$$H = 3/5 \text{ persons} = 0.6 = 60\%$$

5. Compute results!

H = percentage of people in society who are poor (headcount ratio or incidence of poverty)

Steps to Compute an MPI

<i>Indicators</i>				Deprivation Score	
Schooling	Food	Assets	Electricity		
0	0	0	0	0	Usha
0	0.25	0	0.25	0.5	Ana
0.3	0.25	0.2	0.25	1	Rizwan
0	0.25	0	0	0.25	Jakob
0.3	0	0.2	0.25	0.75	Monica

Persons

$k=0.5$

5. Compute results!

A = average share of weighted deprivations among the poor (intensity of poverty among the poor)

$$A = (0.5 + 1 + 0.75)/3 = 2.25/3 = 0.75 = 75\%$$

Steps to Compute an MPI

5. Compute results!

$$\text{MPI} = H \times A$$

<i>Indicators</i>				Deprivation Score	
Schooling	Food	Assets	Electricity		
0	0	0	0	0	Usha
0	0.25	0	0.25	0.5	Ana
0.3	0.25	0.2	0.25	1	Rizwan
0	0.25	0	0	0.25	Jakob
0.3	0	0.2	0.25	0.75	Monica

Persons

$k=0.5$

$$\text{MPI} = 0.6 \times 0.75 = 0.450$$

Steps to Compute an MPI

<i>Indicators</i>				Deprivation Score	
Schooling	Food	Assets	Electricity		
0	0	0	0	0	Usha
0	0.25	0	0.25	0.5	Ana
0.3	0.25	0.2	0.25	1	Rizwan
0	0.25	0	0	0.25	Jakob
0.3	0	0	0.25	0.55	Monica

$k=0.5$

Persons

Note: if Monica becomes non-deprived in assets, she'll still be poor. H won't change, but A and MPI will

Interpreting MPI Results for Policy

Key Terms

- **Dimensions:** conceptual categories (e.g. education, health, living standards, etc.)
- **Indicators:** what are you actually measuring? (e.g. school attendance, electricity, etc.)
- **Deprivation cut-offs** (for indicators): how much is enough to be non-deprived?
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Key Terms

Incidence/Headcount ratio(H)

Percentage of people in the population who are multidimensionally poor

Intensity (A)

Average percentage of weighted deprivations experienced by poor people

MPI

Share of possible weighted deprivations experienced by the poor out of all the deprivations they could be experienced if everyone were deprived in every indicator (index from 0 to 1; 0 is good and 1 is bad)

Key Terms

Uncensored headcount ratios

Percentage of population that is deprived in each indicator

Censored headcount ratios

Percentage of population that is both poor and deprived in each indicator

Absolute contribution

Amount of MPI that each indicator/dimension contributes (sums to MPI value)

Percentage contribution

Percentage of the MPI that each indicator/dimension contributes (sums to 100%)

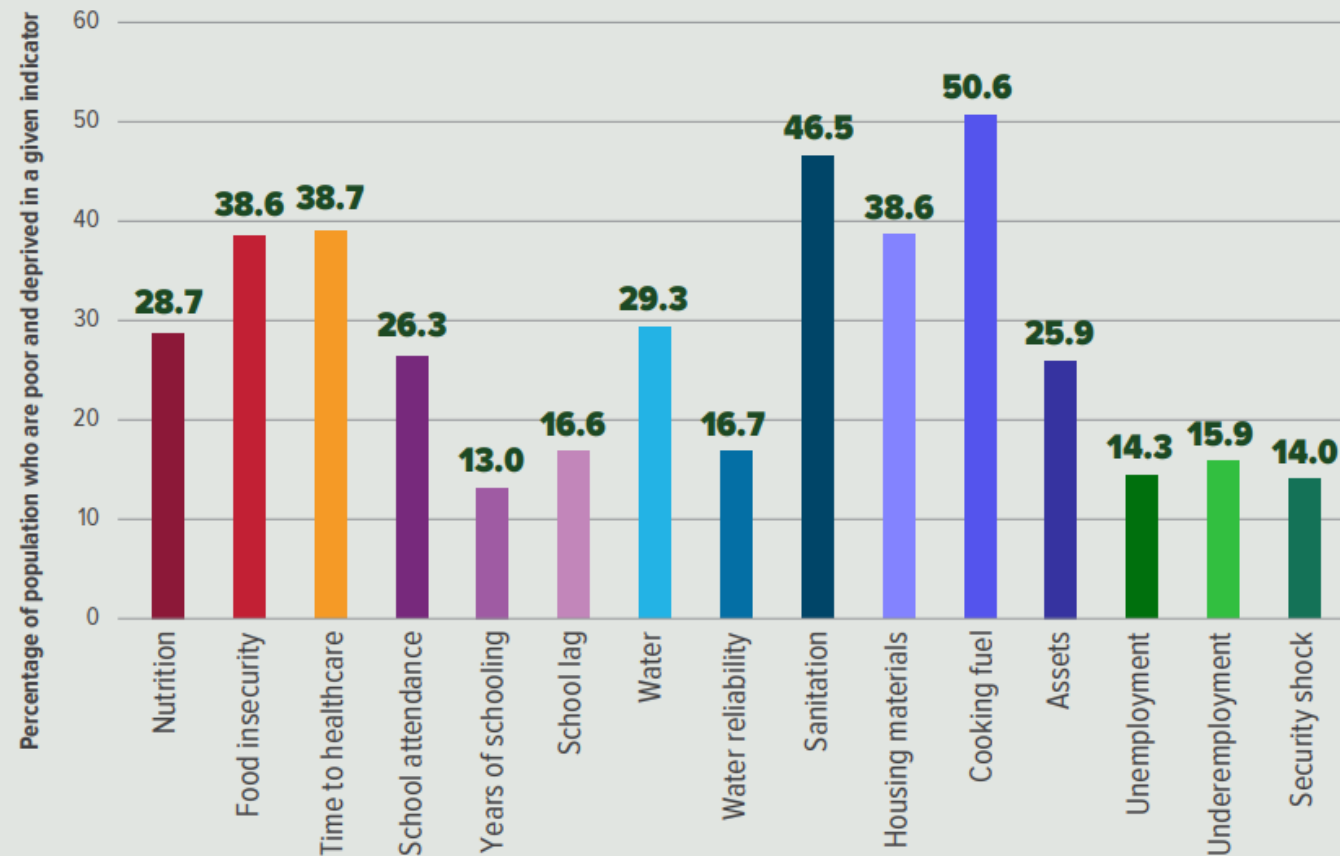
Examples: Nigeria National MPI 2022

Poverty cutoff (k)	Index	Value
k value=26%	MPI	0.257
	Incidence (H, %)	62.9
	Intensity (A, %)	40.9
	Number of poor people (million)	132.92

How would you interpret these numbers?

Examples: Nigeria National MPI 2022

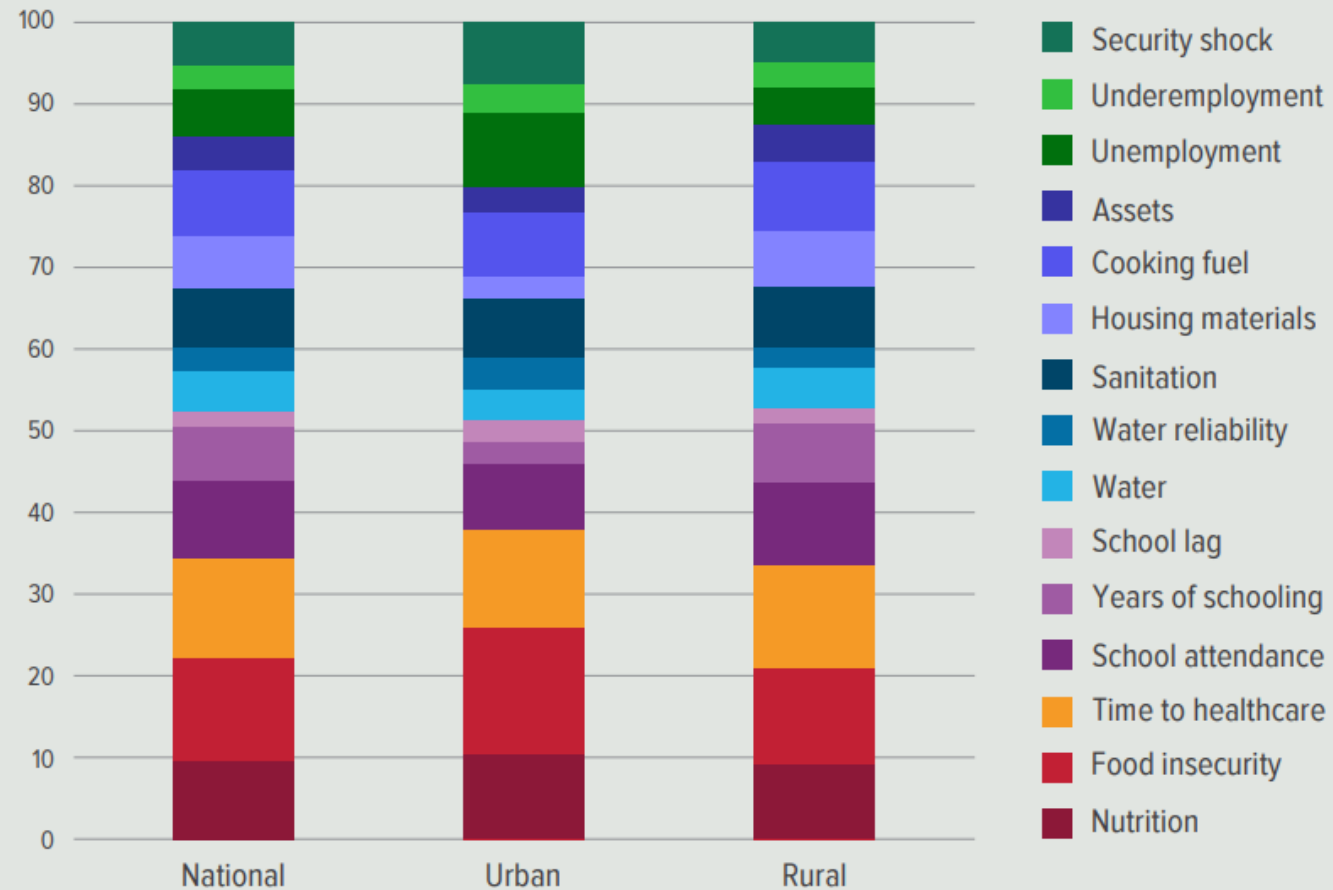
Figure 5: Censored headcount ratios in Nigeria



Source: Calculations using MPIS 2021/22

Examples: Nigeria National MPI 2022

Figure 6: Percentage contribution of each indicator to MPI by area



Source: Calculations using MPIS 2021/22

Examples: Nigeria National MPI 2022

Area	MPI	Incidence (H, %)	Intensity (A, %)	Population share (%)	Number of poor people (million)
National	0.257	62.9	40.9	100.0	132.92
North Central	0.272	66.3	41.0	14.4	20.19
North East	0.324	76.5	42.4	12.7	20.47
North West	0.324	75.8	42.7	28.4	45.49
South East	0.183	49.0	37.3	10.5	10.85
South South	0.250	62.6	39.8	14.8	19.66
South West	0.151	40.0	37.7	19.2	16.27

Hands-On Exercise

Review the global MPI country briefing (<https://ophi.org.uk/global-mpi/2024>) for a country of your choice (not South Africa!) and answer the following questions:

1. What is the level of multidimensional poverty in the country? What percentage of people are poor? How poor are they?
2. What indicators are driving poverty in the country?
3. How does poverty differ in rural vs urban areas?
4. Which subnational regions are poorest and which are least poor?
5. How has multidimensional poverty in the country changed over time? (Note: not every country will have trends over time, but most do – try to choose a country that does)
6. What are three policy recommendations you would make to policymakers in the country?

Thank you!

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