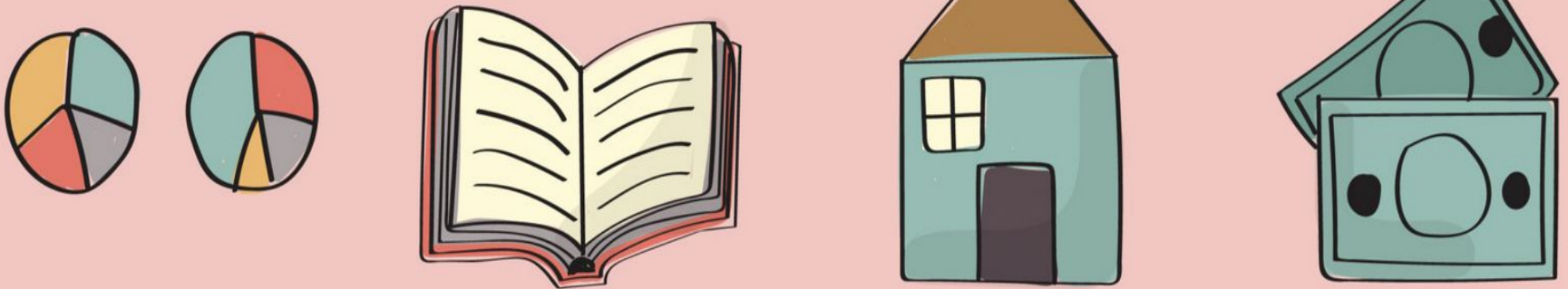


PERCEPTIONS OF POVERTY

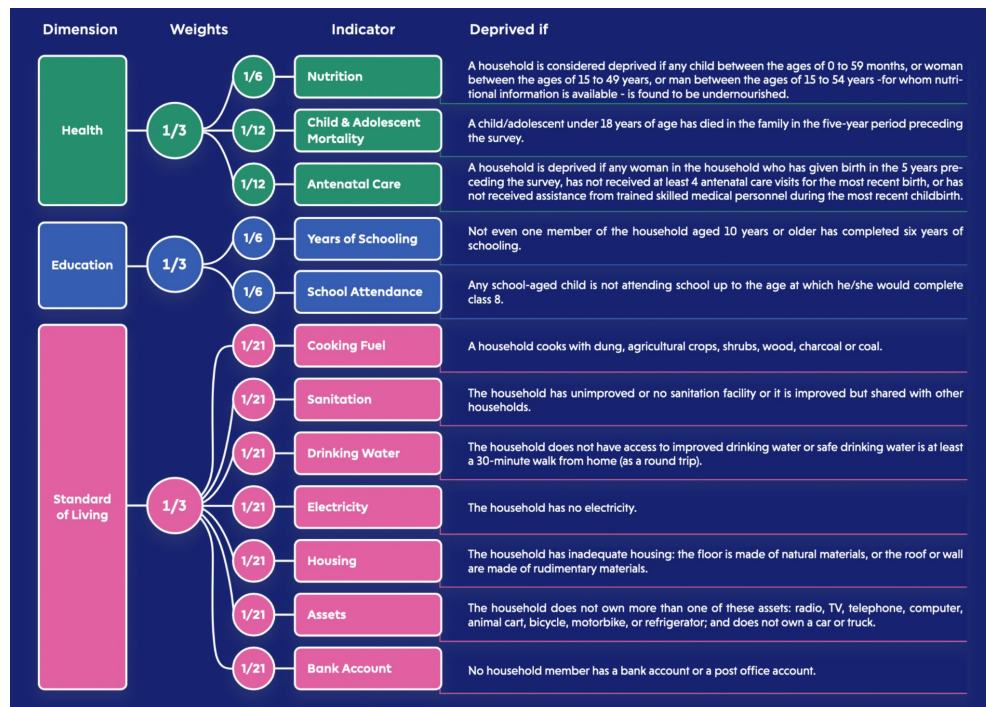
Rishi Dey Chowdhury, Anushka De, Shibendra Kumar Singh, etc.



Multi-Dimensional Poverty Index

An weighted sum score calculated based on this chart is the Deprivation Score (DS) which translates to Poverty level of a person.

Here, we do not question the validity of MPI. But we want to improve on it to be apt for all class of people and across all regions across India.



The Problem

Regional Problems

Many of the indicators does not portray the true picture of poverty or deprivations faced by people living in a region.

Current weighting scheme doesn't take into account this factor.

Indian Context

The MPI Indicators are taken directly from global MPI model. This makes it less accurate in Indian context.

Need to revisit the indicators and improve their quality.

Problem statement

Design a weighting scheme which is more robust and flexible:

- Adaptable Weights
- $\text{Weights} \propto \text{Deprivation}$
- The Indicators truly capture what is intended

Challenges deep-dive

Challenge 1

Design Questionnaire

The questionnaire should ideally touch upon all the important aspects required to validate the weights and make them adjustable.
Also the validity of the indicators.

Challenge 2

Collect Data

We can help ease out this step of survey by following the sampling scheme of NSSO.
We must collect as much bg info about a place in advance as possible and frame the qsns accord.

Challenge 3

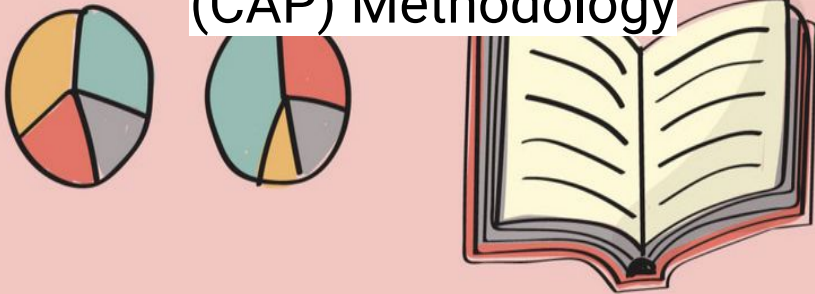
Inference and Benchmark

We will have to infer from whatever response we get from the survey. Translate it into meaningful decisions for policy makers and also validate our empirical results with past data.



CAP Framework

Contrastive Allocative Perturbative
(CAP) Methodology



An effective framework which can be leveraged to design questionnaire and estimate weights for MPI



Design

The Questionnaire Structure

Emphasis should be put on the fact that the **respondents should be encouraged to answer this question keeping in mind their locality** and not the entirety of the city or India

Collect as much **background information about the place** from secondary data, if possible, where survey will be conducted to calibrate the two extremes of the poverty scale and available facilities to frame targeted questions and reduce redundancy.

Questionnaire ●

Collect information regarding **socio-economic background of the respondent**.

Past MPI Data collected can give us prior idea in selecting which questions to ask.

● **Contrast**

To identify the relative importance between two or more indicators, we design situations where the respondent have to decide who can be deemed poorer than the other

● **Allocation**

To identify the poor indicators, we design situations where the respondent have to decide the indicator status for an average man of that region/community

● **Perturb**

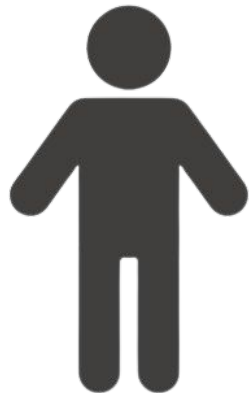
To identify the optimum threshold of one indicator by finding the bare minimum requirement of this indicator such that a person is not deemed poor, we design such situations with different levels of this indicator

Sample Questions

Contrastive Comparison

Rank the following according to their level of poorness. The other indicators not mentioned remain the same across each person.

A





B





C



Framing the Comparisons

I: We should keep the number of  same in each person, o.w. one with more  will be selected as more poor.

I: To reduce the no. of questions we can compare **good** indicators among themselves and same for **bad** ones.

I: If some region is not having **good** medical facilities then at least one of our ranking question must have one  and one  for one of the medical indicators.

Why? To understand if they really feel deprived of that

What is good? The indicators which received higher score

What is bad? The indicators which received lower score

Past MPI data can come into play.
More on it Later

Between the Broad indicators

Q:  Schooling,  Nutritious Daily Meal,  Electricity

Q:  Water,  Children Care,  Education

Q:  Bank Account,  Antenatal Care,  Education

Allocation Analysis

In your opinion what should be the allocation of indicators for an average man in this region?



We may provide the background of the average man depending on the average income, family size and education level of that region.



Health



Education



Standard of Living



Between the Broad indicators

Q: Would you choose paying medical bills over your child's school fees?

Q: If you have money so that you can either spend over your child's school fees or eating a month's two times a day nutritious meal , what would you choose?

Q: Would you consider expenditure for antenatal care more important than paying for electricity?

Q: Which is more important for you: use of cooking fuel or payment of your child's school fees?

Within the Indicators

Q: What would you prioritize: payment for electricity or payment for clean drinking water?

Q: Is living in a *pucca* house more important for you or having access to electricity?

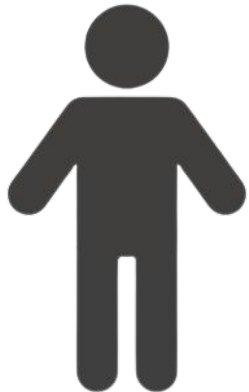
Q: Which is more important for you: living in a *pucca* house or having a bank account?

Q: Which is more important for you: owning a T.V. or having a bank account?

Perturbation Performance

Whom out of the following will you consider to be NOT poor? More than one person can be chosen.

A



Attended School Upto Class 8

B



Attended School Upto Class 10

C



Attended School Upto Class 12

D



Graduated

Benefits of CAP Framework

Better, Flexible and Accurate Methodology

How CAP Framework Outstands?

Mitigate Bias

- We never ask the respondent about his situation.
- We always present the respondent with schematics of a person which helps reduce false response or bias.



Measures Deprivation

- Help Figure out the threshold of deprivation for many indicators.
- People have to prioritize between the indicators which help identify the levels of deprivation.



Capture Regional View

- Helps bring out the implicit and explicit views on various indicators in that region.
- Allows us to inculcate regional aspects and poverty extremes in our questionnaire to make them more relatable



Past MPI Data

Adding Insights for framing regional questions

West Bengal

A snapshot of multidimensional poverty in West Bengal



Overview

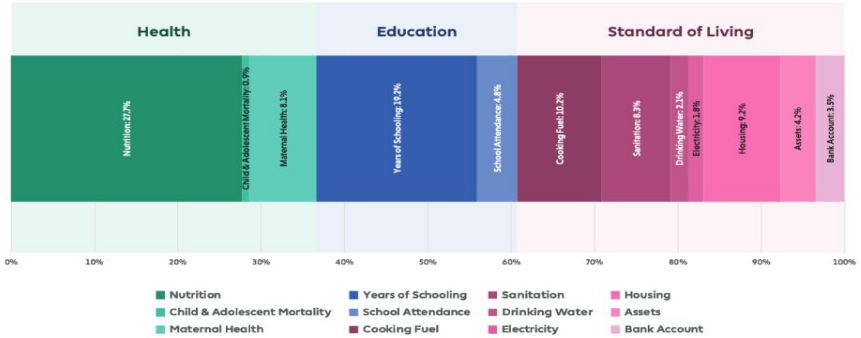
West Bengal Headcount Ratio, Intensity and MPI



Rural			Urban		
Headcount Ratio	Intensity	MPI	Headcount Ratio	Intensity	MPI
25.8%	45.39%	0.117	11.67%	46%	0.054

West Bengal: Indicator-wise Contribution to the MPI

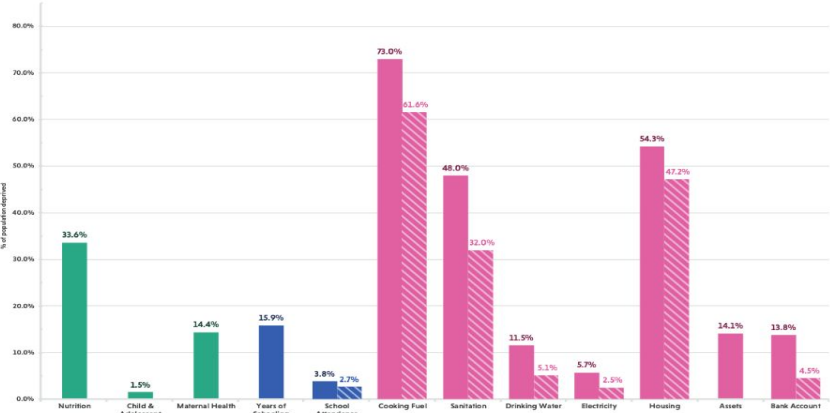
Percentage contribution of each indicator to the MPI score



Note on the data period: The NFHS 4 (2015-16) precedes the full roll out of flagship schemes of Pradhan Mantri Awas Yojana (PMAY), Jal Jeevan Mission (JJM), Swachh Bharat Mission (SBM), Pradhan Mantri Sahaj Bijli Har Ghar Yojana (Saubhagya), Pradhan Mantri Ujjwala Yojana (PMUY), and the Pradhan Mantri Jan Dhan Yojana (PMJDY).

West Bengal: Uncensored Headcount Ratio

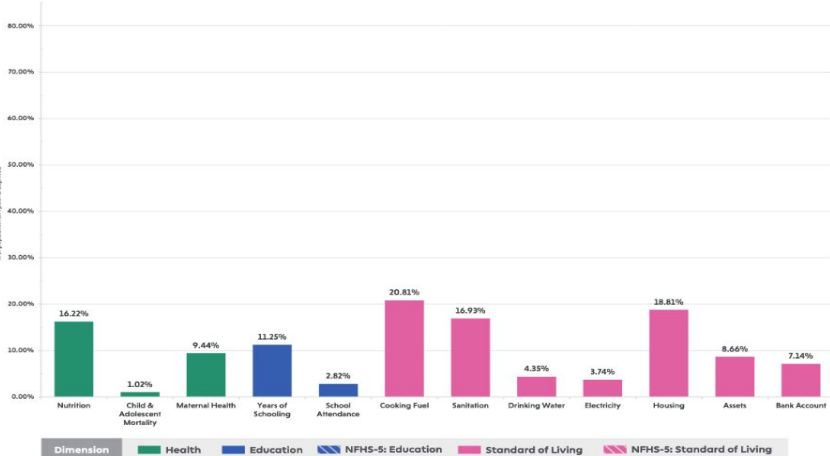
Percentage of total population who are deprived in each indicator



Note on comparison: The striped bars denote the provisional estimates of the uncensored headcount ratio based on the data available in the NFHS-5 West Bengal State Report (2019-20).

West Bengal: Censored Headcount Ratio

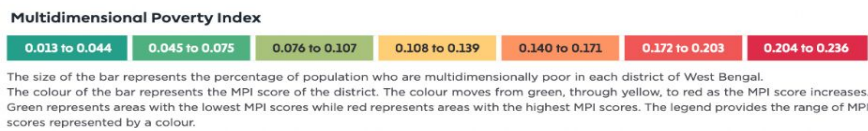
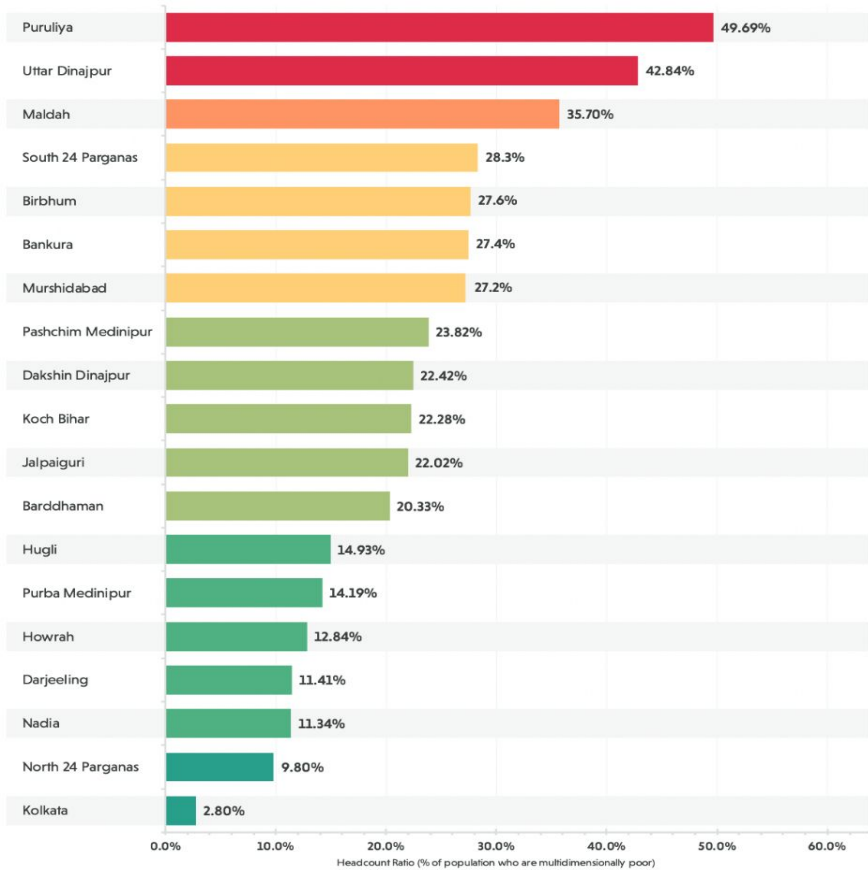
Percentage of total population who are multidimensionally poor and deprived in each indicator



Dimension: Health, Education, NFHS-5: Education, Standard of Living, NFHS-5: Standard of Living

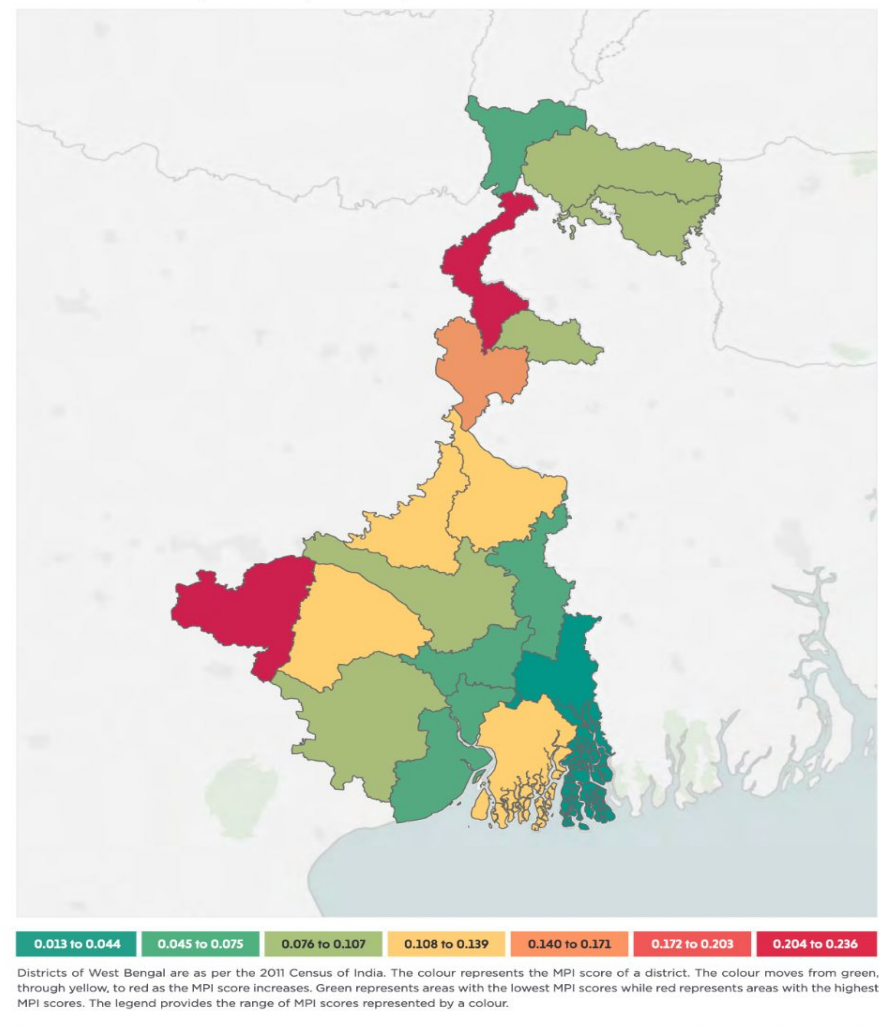
West Bengal: Headcount Ratio

Percentage of population who are multidimensionally poor in each district



West Bengal

Multidimensional Poverty Index Score (District-wise)



Multidimensional Poverty in West Bengal

District-wise Headcount Ratio, Intensity and MPI Score

Districts of West Bengal	Headcount Ratio	Intensity	MPI
Bankura	27.42%	44.58%	0.122
Barddhaman	20.33%	47.06%	0.096
Birbhum	27.61%	45.60%	0.126
Dakshin Dinajpur	22.42%	44.18%	0.099
Darjeeling	11.41%	44.97%	0.051
Howrah	12.84%	45.12%	0.058
Hugli	14.93%	44.23%	0.066
Jalpaiguri	22.02%	45.90%	0.101
Koch Bihar	22.28%	45.13%	0.101
Kolkata	2.80%	45.56%	0.013
Maldah	35.70%	45.66%	0.163
Murshidabad	27.23%	45.96%	0.125
Nadia	11.34%	42.60%	0.048
North 24 Parganas	9.80%	41.51%	0.041
Pashchim Medinipur	23.82%	43.50%	0.104
Purba Medinipur	14.19%	42.68%	0.061
Puruliya	49.69%	47.44%	0.236
South 24 Parganas	28.27%	45.67%	0.129
Uttar Dinajpur	42.84%	49.79%	0.213

Districts of West Bengal are as per the 2011 Census of India

Multidimensional Poverty in West Bengal

Urban and Rural Headcount Ratio, Intensity and MPI Score for each District

Districts of West Bengal	Rural			Urban		
	Headcount Ratio	Intensity	MPI	Headcount Ratio	Intensity	MPI
Bankura	29.38%	44.79%	0.132	7.34%	36.00%	0.026
Barddhaman	21.92%	48.56%	0.106	18.38%	44.86%	0.082
Birbhum	30.08%	45.76%	0.138	12.97%	43.41%	0.056
Dakshin Dinajpur	24.89%	44.45%	0.111	5.13%	35.03%	0.018
Darjeeling	15.24%	45.60%	0.069	4.93%	41.69%	0.021
Howrah	14.34%	45.55%	0.065	11.88%	44.79%	0.053
Hugli	17.23%	43.21%	0.074	10.92%	47.00%	0.051
Jalpaiguri	27.88%	46.12%	0.129	3.80%	40.68%	0.015
Koch Bihar	23.98%	45.36%	0.109	7.26%	38.51%	0.028
Kolkata	-	-	-	2.80%	45.56%	0.013
Maldah	37.53%	45.79%	0.172	24.36%	44.42%	0.108
Murshidabad	27.50%	45.03%	0.124	26.33%	49.19%	0.130
Nadia	14.08%	42.39%	0.060	3.92%	44.73%	0.018
North 24 Parganas	13.86%	40.24%	0.056	6.52%	43.70%	0.028
Pashchim Medinipur	24.91%	43.54%	0.108	14.85%	42.91%	0.064
Purba Medinipur	14.74%	43.06%	0.063	9.95%	38.36%	0.038
Puruliya	49.76%	46.04%	0.229	49.30%	55.58%	0.274
South 24 Parganas	31.75%	45.76%	0.145	16.70%	45.12%	0.075
Uttar Dinajpur	46.23%	49.72%	0.230	19.24%	50.92%	0.098

Districts of West Bengal are as per the 2011 Census of India

Data Collection

Questionnaire



A bar chart with four bars of varying heights and colors (teal, red, yellow, orange) is positioned on the left. To the right of the chart are three stylized human silhouettes: a large teal figure, a small teal figure, and a red figure.

Inference

Estimation and Interpretation
of Weights



Two pie charts with different color segments (yellow, teal, red, grey) are on the left. To the right is an illustration of an open book with yellow pages and black lines representing text.



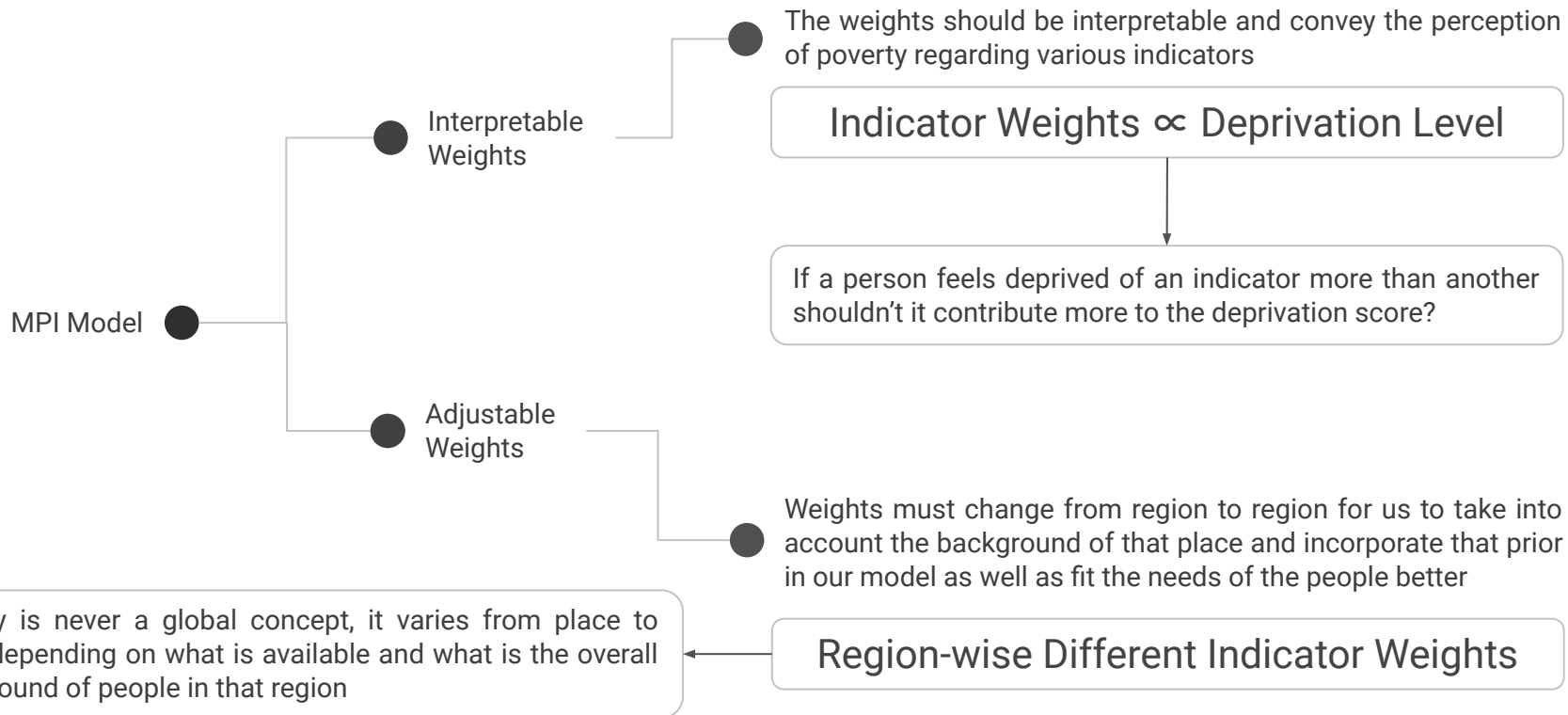
A line graph on a dark blue background with vertical dashed white grid lines. It features two series: a white line with white circular markers and a red line with red circular markers. Both lines show a fluctuating trend. The white line is generally higher than the red line. A red circle highlights the sixth data point of the white series, with a white callout box containing the text 'CAP Estimate' pointing to it.

CAP Estimate

Aim of Our MPI Model

Motivation for the weight estimation scheme

What are we looking for in our MPI Model?



Weight Estimation

Use the **Normalized Proportion of People who feel Deprived of an Indicator** as the **Weight Estimate** for that Indicator in that Region.



Health



Education



Standard of Living

$$W_i = \frac{P_i}{\sum_{j=1}^{12} P_j}$$

W_i = Weight of Indicator
P_i = Proportion of People who feel Deprived

Indicator Weights ∝ Deprivation Level



P1



P2



P3



P4



P5



P6



P7



P8



P9



P10



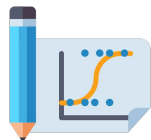
P11



P12

What we need to estimate from our data is the proportion of people who feel deprived for each indicator.

Why not go for Regression-Based Estimate?



Logistic Regression kind of setup requires us to label the respondents as poor/not poor

Our/Policy Maker's judgement should only creep in at the very last in deciding what should be the threshold above which an individual will be deemed Multidimensionally Poor



	Deprivation Score (c_i)	Higher than 0.33? ($c_i \geq k$)	Is MPI Poor?
Individual A	0.48	Yes	Yes
Individual B	0.20	No	No

Brings in personal perception of poverty



Model Estimated Weights are highly influenced by our perception



Better to let the people's deprivation decide how much each indicator should contribute to their poverty