

Multidimensional poverty and the Alkire-Foster method for its measurement

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Sochi, 2016

Tabita, Kenya

Rabiya, India

Stéphanie, Madagascar

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Dalma, Kenya

Ann-Sophie, Kenya

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Motivation



“Human lives are battered and diminished in all kinds of different ways”

Motivation

Don't ask me what poverty is because you have met it outside my house. Look at the house and count the number of holes. Look at my utensils and the clothes that I am wearing. Look at everything and write what you see. What you see is poverty. —A poor man, Kenya 1997

Water is life, and because we have no water, life is miserable. —Kenya 1997

In the evenings, eat sweet potatoes, sleep
In the mornings, eat sweet potatoes, work
At lunch, go without (Guatemala 1997)

The rich have one permanent job; the poor are rich in many jobs. —Poor man, Pakistan 2000

I am illiterate. I am like a blind person. —
Illiterate mother, Pakistan 1995

Why such interest?

In recent years multidimensional measures of poverty have been on the upswing.

In addition to the moral or ethical motivations already covered, they can be divided into three types:

1. *Technical* – we can
2. *Policy* – we realize the value-added
3. *Political* – there is a demand

1. Technical - we can

- Since 1985, the multi-topic household survey data has increased in frequency and coverage
- Even greater breath-taking increases have occurred with income and expenditure data
- Technology exists to process these data

1. Technical – we can

Increases of data availability together with increased computational power have led to the generation of new indices

- HDI, IHDI, Canada Index of Well-being, etc.
- Doing Business Index
- Good Governance
- Global Peace Index & related
- SIGI & other gender-related

2. Policy – we realize the value-added

Table 5. Lack of overlaps between monetary and CA poverty

Capability poverty measured as		Education		Nutrition/health	
		Children	Adults	Children	Adults
% of CA poor not in monetary poverty:	India	43	60	53	63
	Peru	32	37	21	55
% of monetary poor not CA poor:	India	65	38	53	91
	Peru	93	73	66	94

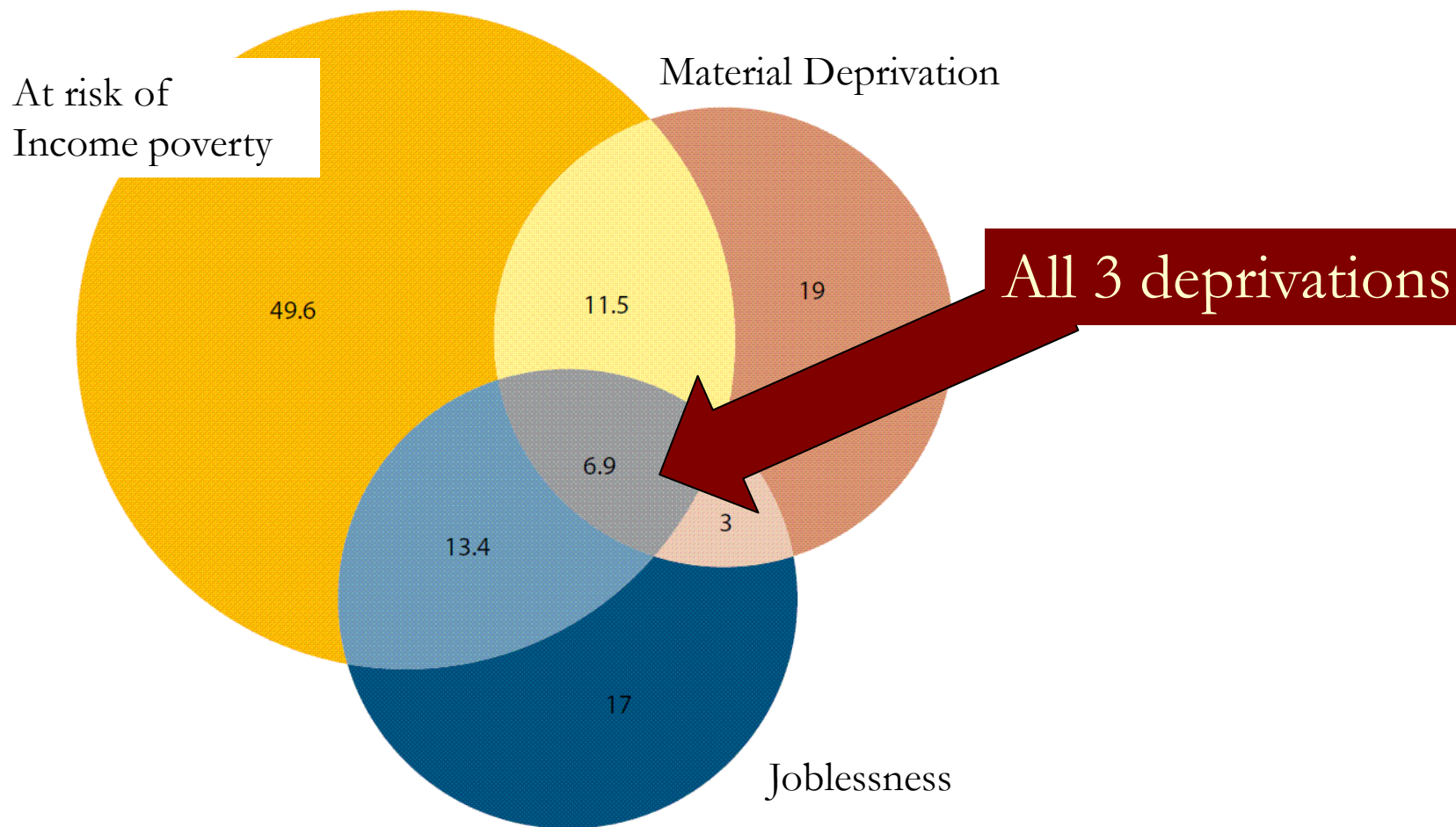
I (omission)

II (inclusion)

Source: Franco et al. (2002).

Ruggieri Laderchi Saith and Stewart 2003. 'Does It Matter That We Don't Agree on the Definition of Poverty? A Comparison of Four Approaches', *Oxford Development Studies* 31(3): 243-74

Europe 2020: Multidimensional Poverty



Atkinson, A. B., E. Marlier, F. Monatigne, and A. Reinstadler (2010) 'Income poverty and income inequality', in *Income and Living Conditions in Europe*, Atkinson and Marlier (eds), Eurostat.

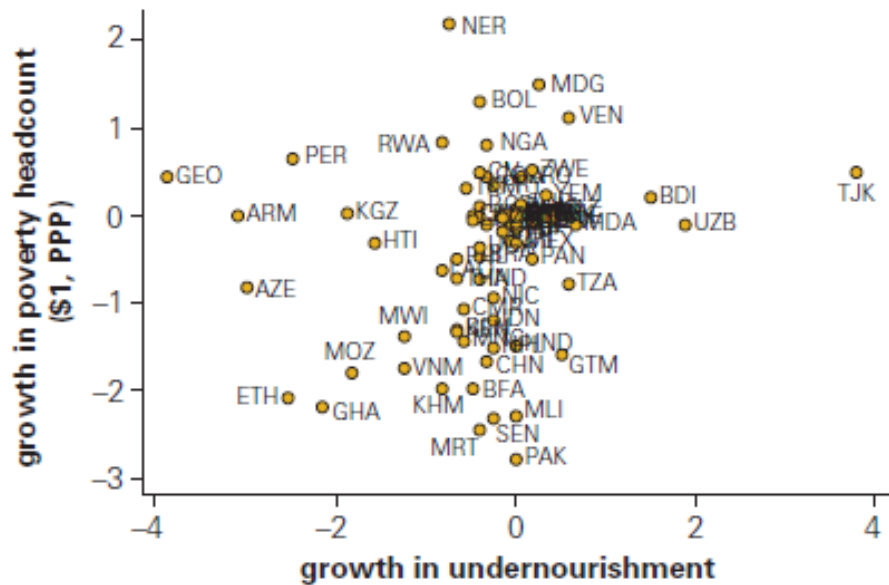
2. Policy – we realize the value-added

Monetary poverty:

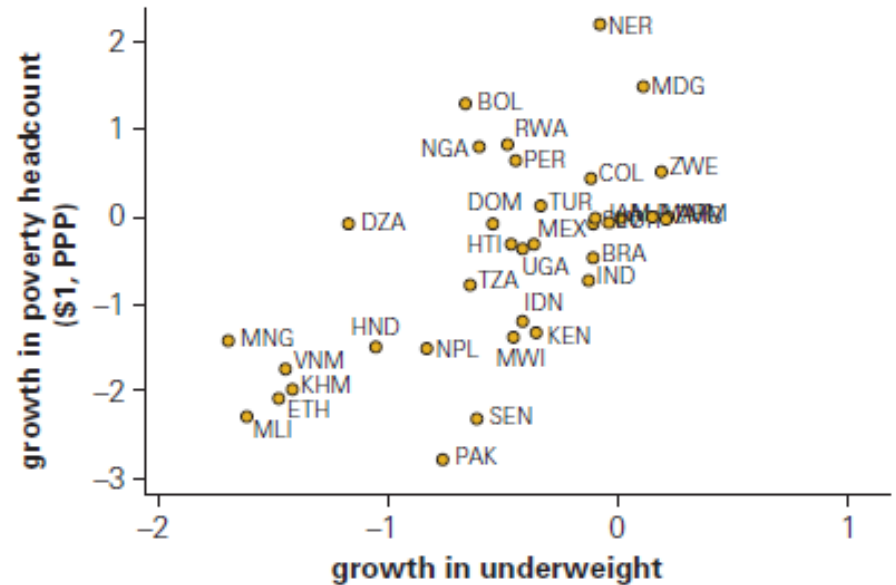
- does not show *how* people are poor
- non-sampling measurement error (accuracy)
- time and cost of survey (data collection)
- comparability (rural-urban, international)
- the trends of \$1/day poverty did not match trends in other MDGs in 1990-2006 (World Bank, 2010)

Figure 2.3 Heterogeneity across MDGs

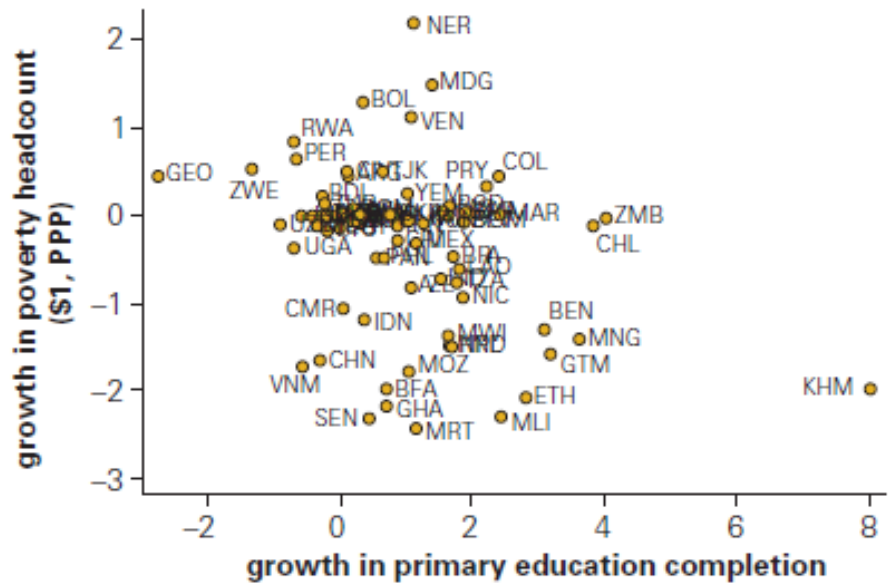
correlation of annual growth rates, 1990–2006



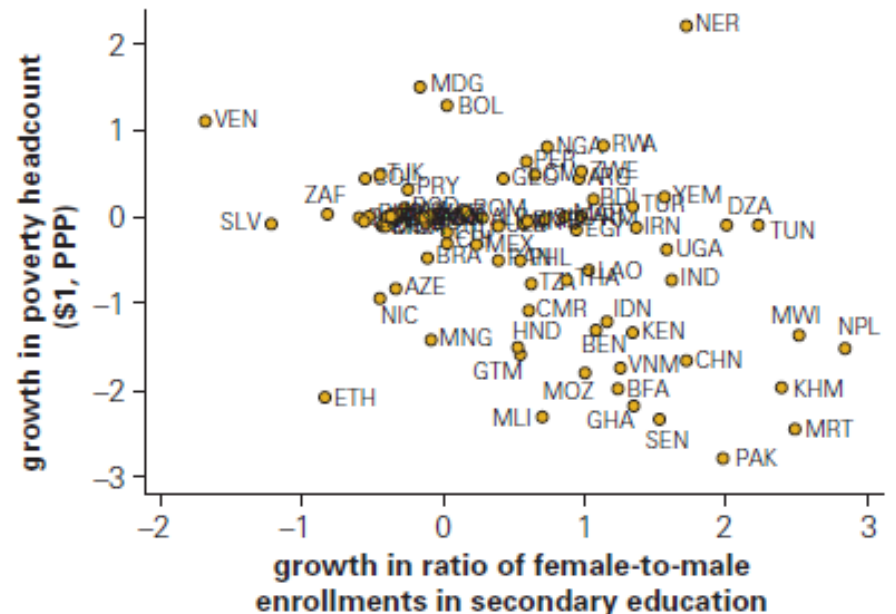
correlation of annual growth rates, 1990–2006



correlation of annual growth rates, 1990–2006



correlation of annual growth rates, 1990–2006



2. Policy – we realize the value-added

2008 Growth Commission

“Growth is not an end in itself. But it makes it possible to achieve other important objectives of individuals and societies. It can spare people *en masse* from poverty and drudgery. Nothing else ever has”.

2. Policy – we realize the value-added

The Growth Commission 2008 generated a nuanced set of observations on sustained economic growth based on case studies of countries that had 7% growth for over 25 years.

BUT after 25 years of growth:

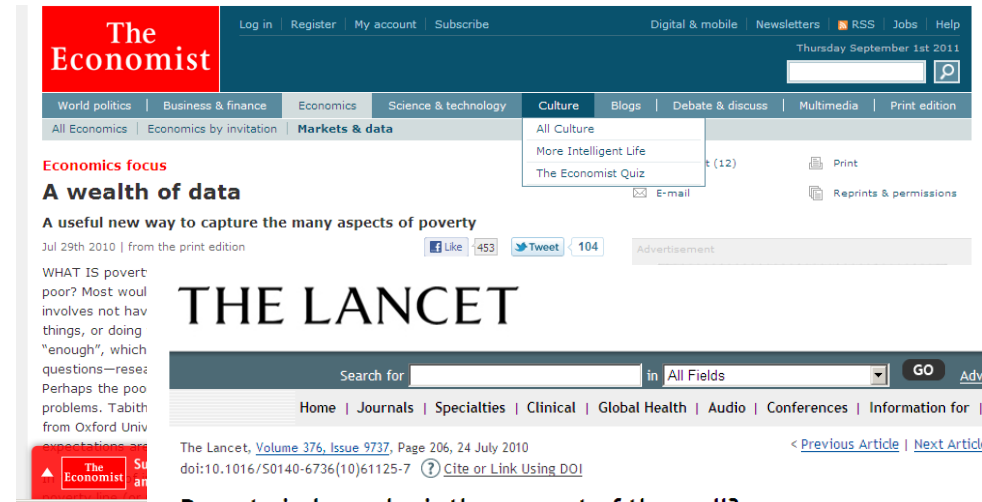
- In **Indonesia**, 28% of children under five were still underweight and 42% were stunted.
- In **Botswana**, 30% of the population were malnourished, and the HDI rank was 70 places below the GDP rank.
- In **Oman**, women earned less than 20% of male earnings.

Yet some other countries with lower growth had made greater progress in social indicators.

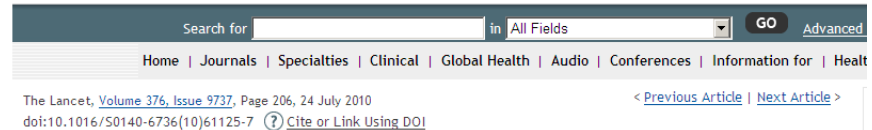
3. Political – there is a demand

60+ countries - including:

- The New York Times (US)
- TIME Magazine (US)
- Xinhua (China)
- Al Jazeera (Qatar)
- The Hindu (India)
- Dawn (Pakistan)
- BBC (UK)
- The Daily Nation (Kenya)
- Agence France Presse (France)
- The Wall Street Journal (US)
- The Economist (UK)
- The Cape Times (South Africa)
- The Australian (Australia)
- The Guardian (UK)



THE LANCET



Poverty index: who is the poorest of them all?

[The Lancet](#)
In a working paper by the [Oxford Poverty and Human Development Initiative](#), Oxford, UK, this month, Sabine Akire and Maria Emma Santos present a new method for measuring and comparing poverty in 104 developing countries: the multidimensional poverty index (MPI). The index measures poverty in terms of nutrition, health, and education.



- The Huffington Post (US)
- Foreign Policy (US)
- The Hindu (India)
- Christian Science Monitor (US)
- The Globe and Mail (Canada)
- The Times of India (India)

The Multidimensional Poverty Peer Network



Launched in June 2013 at University of Oxford

Now has 50 member countries plus 12 international or regional agencies.

The MPPN agenda

- Support **National MPIs** that inform powerful policies
- South-South cooperation: sharing knowledge and experiences
- Suggest an improved **Global MPI 2015+** that reflects the SDGs (acute & moderate poverty versions)
- Strengthen the **data sources** for MPI metrics.

Motivations for new Multidimensional Measures

- Provide an **overview** of multiple indicators at-a-glance
- Show **progress** quickly and directly (Monitoring/Evaluation)
- Inform **planning** and **policy** design
- **Target** poor people and communities
- Reflect people's **own understandings** (Flexible)
- **High Resolution** – zoom in for indicator details

Tabita, Kenya

Rabiya, India

Stephanie, Madagascar

Agatha, Madagascar

Dalima, Kenya

Ann-Sophie, Kenya

Valerie, Madagascar



Alkire-Foster Methodology

Practical Steps

- **Select**
 - Purpose of the index (monitoring, targeting, etc.)
 - Unit of analysis (people, households, countries)
 - Dimensions
 - Specific indicators for each dimension
 - Cutoff for each indicator
 - Weight for each indicator
 - Poverty cutoff
 - **Identification: who is poor?**
 - **Aggregation: how much poverty is there?**

Alkire-Foster methodology

(to simplify we assume equal weights in this example)

Matrix of deprivation scores for 4 persons in 4 dimensions

Who is deprived in what?

	Health	Years of Education	Housing Index	Mal-nourished	
$y =$	ND	ND	ND	ND	Sabina
	D	ND	ND	D	Emma
	D	D	D	D	John
	ND	D	ND	ND	Mauro

Alkire-Foster methodology

(to simplify we assume equal weights in this example)

Matrix of deprivation scores for 4 persons in 4 dimensions

How much?

	Health	Years of Education	Housing Index	Mal-nourished	c
$y =$	ND	ND	ND	ND	0
	D	ND	ND	D	2
	D	D	D	D	4
	ND	D	ND	ND	1

Alkire-Foster methodology

(to simplify we assume equal weights in this example)

Who is poor?

Fix poverty cut-off k , identify as poor if $c_i \geq 2$

	Health	Years of Education	Housing Index	Mal-nourished	c
	ND	ND	ND	ND	0
	D	ND	ND	D	2
$y =$	D	D	D	D	4
	ND	D	ND	ND	1

→ Multidimensional Poverty Headcount (H) = $2/4$

[50% of the population are poor]

Alkire-Foster methodology

(to simplify we assume equal weights in this example)

Who is poor?

Fix poverty cut-off k , identify as poor if $c_i \geq 2$

	Health	Years of Education	Housing Index	Mal-nourished	c	
	ND	ND	ND	ND	0	
$y =$	D	ND	ND	D	2	2/4
	D	D	D	D	4	4/4
	ND	D	ND	ND	1	

→ Intensity of deprivation among the poor $(A) = (2/4 + 4/4) / 2 = 3/4$

[on average, the poor are deprived in 75% of the dimensions]

The MD Poverty Index

Health	Years of Education	Housing Index	Mal-nourished	<i>c</i>	Av. dep
ND	ND	ND	ND	0	
D	ND	ND	D	2	2/4
D	D	D	D	4	4/4
ND	D	ND	ND	1	

→ Multidimensional Poverty Headcount (H) = $2/4 = 50\%$

→ Intensity of deprivation among the poor (A) = $(2/4 + 4/4) / 2 = 3/4 = 75\%$

$$\text{MPI} = H \times A = (2/4) \times (3/4) = 6/16 = 0.375$$

The MD Poverty Index

INTERVENTION

	Health	Years of Education	Housing Index	Mal-nourished	<i>c</i>	Av. dep
	ND	ND	ND	ND	0	
	D	ND	ND	D	2	2/4
→	D	D	D	D	4	4/4
	ND	D	ND	ND	1	

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The MD Poverty Index

INTERVENTION

	Health	Years of Education	Housing Index	Mal-nourished	<i>c</i>	Av. dep
	ND	ND	ND	ND	0	
	D	ND	ND	D	2	2/4
	ND	D	D	D	3	3/4
	ND	D	ND	ND	1	

→ Multidimensional Poverty Headcount (H) = 2/4

→ Intensity of deprivation among the poor (A) = $(2/4 + 3/4) / 2 = 5/8 = 62.5\%$

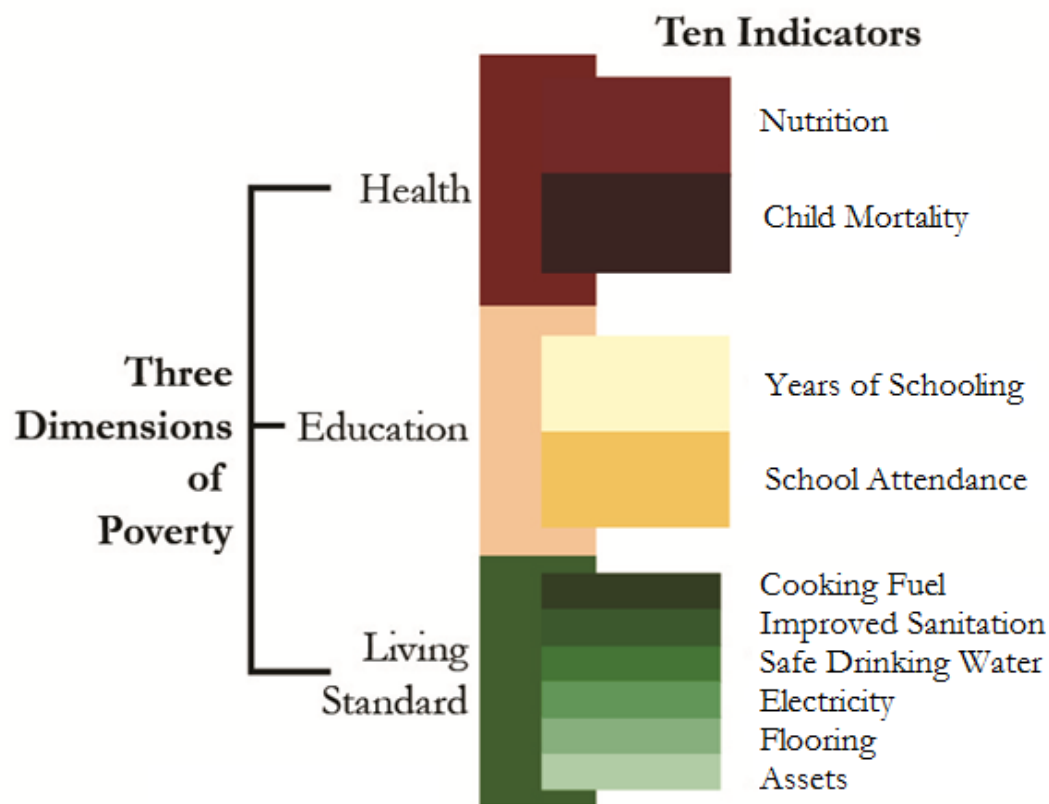
$$\text{MPI} = H \times A = (2/4) \times (5/8) = 10/32 = 0.3125$$

Global Multidimensional Poverty Index

UNDP *Human Development Report 2014* & Alkire, Conconi and Seth 2014

Develop a deprivation profile for each person, using a set of **indicators**, **cutoffs** and **weights**.

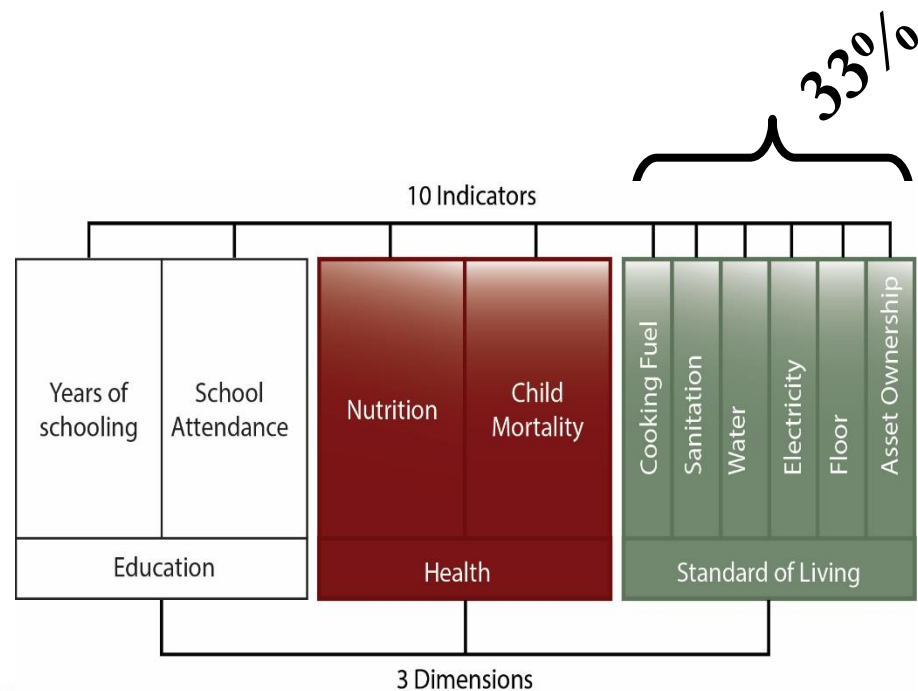
Example:



Identify who is poor

Global MPI: A person is multidimensionally poor if they are deprived in 33% or more of the dimensions.

Nathalie's deprivation score is 67%



Aggregation: Alkire & Foster

- Appropriate for Ordinal data -

The MPI is the product of two components:

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

- 1) *Incidence* ~ the percentage of people who are poor, or the headcount ratio *H*.
- 2) *Intensity* of people's deprivation ~ the average percentage of dimensions in which poor people are deprived *A*.

Tabita, Kenya

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Creating National MPIs in CIS countries

Practical Steps

- **Select**
 - Purpose of the index (monitoring, targeting, etc.)
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Purpose

- The purpose might follow international/regional development goals (for instance, to monitor the new SDGs)
- Or it might look at national priorities – specific goals within a national development plan, a government plan, a Constitutional mandate to guarantee certain things to society, etc.

National MPIs reflect national contexts and priorities. They are useful to guide policies like targeting or allocation, and monitor progress.

Purpose

- Different actors will need to be part of the discussion:
 - Technical capacity is essential to be able to compute the MPI; there has to be clarity on the method and way to compute it
 - BUT political buy-in is essential. If not, a technically solid measure might remain unused, might not be periodically updated or be miscommunicated.
- Many countries have a technical group and a steering committee or advisory/policy group, so that both levels are always communicating and deciding together
 - Legitimizes the measure
 - Feeling of ownership

Dimensions and Indicators

- Let's imagine that the purpose has been chosen and move to the relevant dimensions/indicators.
- Dimensions and indicators might come from:
 - Legislation or national development plans
 - International/regional standards
 - Literature/experts
 - Public consultations
 - Data limitations
- Usually, you don't want to be just data driven
 - Create ideal list of dimensions/indicators
 - Compare against available data

Dimensions and Indicators

- Groups exercise on last meeting – dimensions/indic:
 - Education
 - Health: access to health care
 - Living conditions: access to public services, living in old houses, not able to afford heating, presence of a toilet with water flush in the household
 - Social exclusion
 - Work conditions (including formal and informal market): unemployment, work intensity
 - Financial stability
 - Personal safety
 - Childcare
 - Ecological conditions
 - Hunger

Dimensions and Indicators

- Once the list of ideal dimensions/indicators is ready, we check for data availability
 - Create ‘universe of indicators’ available in the data: consider large set of available indicators (binary 0/1)
 - For each available indicator on the database, create different specifications (e.g. read, write, read&write, read or write)
 - When individual info is aggregated to create indicator at hh level
 - No member, every member, members aged a-b, x% of hh, every woman in the hh, etc.
 - Test different deprivation cut-offs
 - Understand which is the applicable population (e.g. nutritional info & vaccinations only available for children under 5)

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 - Test different deprivation cut-offs
 - Understand which is the applicable population (e.g. nutritional info & vaccinations only available for children under 5)
 - Understand association/redundancy among indicators

Dimensions and Indicators

- What to do with dimensions/indicators not available in the data?
- Decision on which survey instrument to use:
 - Existing surveys
 - New survey
 - Existing survey with some adjustments
- This is an important decision, with practical consequences on the structure of the MPI, but also administrative, logistical and budgetary considerations

Example from HBS: Education

Date birth	of	What is the level of education completed? (from 6 years and over)
month	year	<ol style="list-style-type: none">1. no primary, illiterate2. no primary, literate3. primary4. general (basic)5. secondary6. preliminary vocational (handicraft, industrial)7. middle vocational (technical college, college)8. higher (bachelor degree, master degree)9. post-graduate

- We try different cutoffs:
 - Primary, for 15+ years
 - General (basic), for 15+ years (elderly?)
 - General (basic), for 15-65 ys; primary for 65+
 - Etc.

Example from HBS: Education

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month	year	<ol style="list-style-type: none">1. no primary, illiterate2. no primary, literate3. primary4. general (basic)5. secondary6. preliminary vocational (handicraft, industrial)7. middle vocational (technical college, college)8. higher (bachelor degree, master degree)9. post-graduate

- Ex.
 - Primary, for 15+ years
- We take to hh level:
 - At least one adult
 - At least a woman and a man
 - Half, 2/3 of adults
 - All adults (large hh?)

Example from HBS: Housing

C.8. Do you have the following housing utilities, information and communication means:

N	Item	1. yes 2. no 3. yes, but not operating
1	Centralized water supply	
2	Hot running water (tank, Ariston, geyser)	
3	Centralized sanitation compound	
4	Local sanitation compound/hole with waste products/	
5	Outside toilet	

- Yes: non-deprived
- No: deprived
- Yes, but not operating: deprived

Example from HBS: Housing

C.9. What are the sources of water you use?

1. centralized water supply
2. spring water, wells
3. own system of water supply
4. river, lake
5. delivered (imported) water
6. bought water (Noy, Byuregh, etc)
7. rainwater
8. other (specify)

Example from HBS: Housing

C.9. What are the sources of water you use?

1. centralized water supply
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5. delivered (imported) water
6. bought water (Noy, Byuregh, etc)
7. rainwater
8. other _____(specify)

C.11. If you have centralized water delivery system (respondent is point 1 of item C. 9.)

1. how many days a month do you have potable water? days
2. how many hours a day do you have potable water (all day = 24 hours)? hours

Example from HBS: Health

During the last 30 days, for how many days were you ill?

1. Yes
2. No

- Yes: deprived
- No: non-deprived
 - But illness not necessarily deprivation if treated

Example from HBS: Health

During the last 30 days, for how many days were you ill?

1. Yes
2. No

During the last 30 days, did you apply for medical assistance from a family doctor, ambulatory, polyclinic or village health center?

1. Yes
2. No

- Not ill: non-deprived
- Ill + applied for medical assistance: non-deprived
- Ill + didn't applied for medical assistance: deprived
 - But not necessarily deprived

Example from HBS: Health

During the last 30 days, for how many days were you ill?

1. Yes
2. No

During the last 30 days, did you apply for medical assistance from a family doctor, ambulatory, polyclinic or village health center?

1. Yes
2. No

If you did not seek medical advice during the last 30 days, what was the reason why not?

1. self-treatment
2. could not afford treatment
3. too far/ too difficult to reach
4. problem wasn't serious enough
5. there was no need
6. have doctor-relative or friend
7. Other (specify)

Create trial measures

- Objective: assign pre-selected indicators to each dimension, set weights and compute several MPIs, in order to find a final MPI that works and is robust.
- Compute trial measures: several adjustments are possible
 - Test different deprivations cut-offs for each indicator
 - Test different weighting structures
 - Test different poverty cutoffs (k). In general, countries report estimations for at least two values of k
 - Disaggregate by regions, ethnic groups, gender, age groups, etc. Compare *trends* with monetary poverty results
 - Don't let the *level* of H, A and MPI determine the decision of which measure to use

Create trial measures

- This first set of trial measure gives place to debate and discussion by different relevant actors (experts, political committee, etc.)
 - Next step is adjust measures based on their suggestions and feedback and recompute (sequential process)
 - Prepare non-technical document explaining measure (and each step that led to it)
 - This can be done relatively fast – in turn political process can take significant amount of time

Always remember the purpose of the measure!

Each decision should be useful for that purpose

Communication of the MPI

- It is crucial to communicate and be transparent during the whole process of creating a MPI
 - After creating universe of indicators with deprivation rates and missing values, communication is useful to guide team in which ones to keep and which to drop
 - After creating trial measures, communication is essential to check and legitimize
 - Communication within relevant technical team, with stakeholders, within government, sensitization of the media and general public to the terminology

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Thanks!