

PIDS public seminar

# Poverty is Multidimensional: But Do We Really Need a Multidimensional Poverty Index?

Jose Ramon G. Albert, Ph.D.

Jana Flor V. Vizmanos

DECEMBER 2018

DISCUSSION PAPER SERIES NO. 2018-26

**Poverty is Multidimensional: But Do We Really Need  
a Multidimensional Poverty Index?**

*Jose Ramon G. Albert and Jana Flor V. Vizmanos*

# Outline

---

## 1. Introduction

- ❑ Current Official Poverty Measurement System in PH
- ❑ Multidimensional Poverty Measurement Approaches
- ❑ Research Objectives

## 2. Findings

- ❑ Review of Pros and Cons of Multidimensional Poverty Measurements (and Issues in Estimation)
- ❑ Generation of Multidimensional Poverty Index (MPI) with FIES, APIS, and NDHS

## 3. Summary and Ways Forward

# 1.1 Who are considered Poor?

---

- **RA 8425 of 1997 (Social Reform and Poverty Alleviation Act):**
    - ❑ individuals and families whose **income** fall below the poverty threshold as defined by the NEDA; and/or
    - ❑ cannot afford in a sustained manner to provide their minimum basic needs of **food, health, education, housing** and other essential **amenities**
  - **How PSA measures income poverty:**
    1. (Per capita) Income data sourced from triennial FIES \*
    2. Cost-of-basic needs (food menu plus indirect approach for non-food) → official poverty thresholds
    3. Summarize poverty data: poverty incidence (among families, population, among “basic sectors”), poverty gap
- \* Starting 2012, 1st sem FIES data analyzed, so with (half-sem) income from APIS

# 1.1 Who are considered Poor?

Last April 10, the PSA released official poverty statistics for first sem of 2018 (and revised figures for first sem of 2015)

Poverty Statistics	First Sem 2018	First Sem 2015
Poverty threshold (indicative for a family of five)	PHP 10,481	PHP 9,453
Poverty incidence among population (in %)	21.0	27.6
Poverty incidence among households (in %)	16.1	22.2
Subsistence poverty threshold (indicative for a family of five)	PHP 7,337	PHP 6,617
Poverty incidence among population (in %)	8.5	13.0
Poverty incidence among households (in %)	6.2	9.9

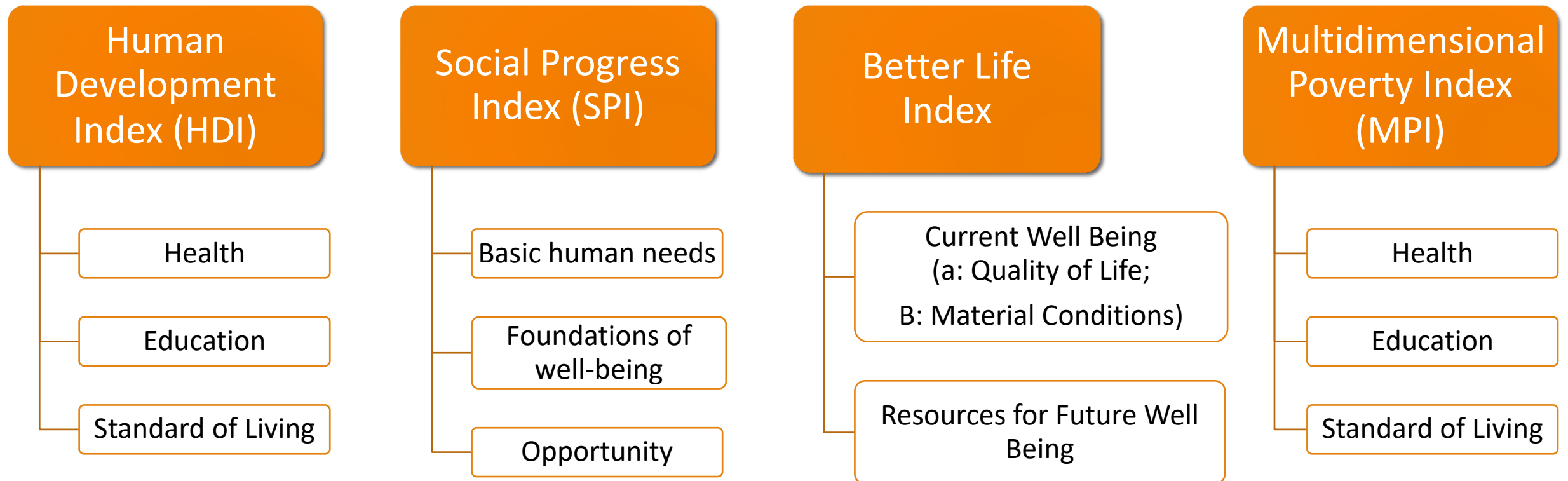
## 1.2 Poverty is multidimensional

---

- **Dimensions of poverty go far beyond inadequate income**—to poor health and nutrition, low education and skills, inadequate livelihoods, bad housing conditions, social exclusion and lack of participation. (UNDP HDR, 2010)
- The case for measuring multidimensional poverty over and above income poverty is rooted in the sense of poverty as “capability failure” (Sen, 1980, 1985, 1999)
- In December 2014, the UN Secretary General Ban Ki Moon wrote: “Poverty measures should reflect the multidimensional nature of poverty”
  - **SDGs** (and predecessor **MDGs**) cover multiple dimensions: 232 SDG indicators for 17 goals, no single composite index

# 1.2 Poverty is multidimensional

- Multidimensional measurements aggregating welfare:



## 1.3 Research Objectives

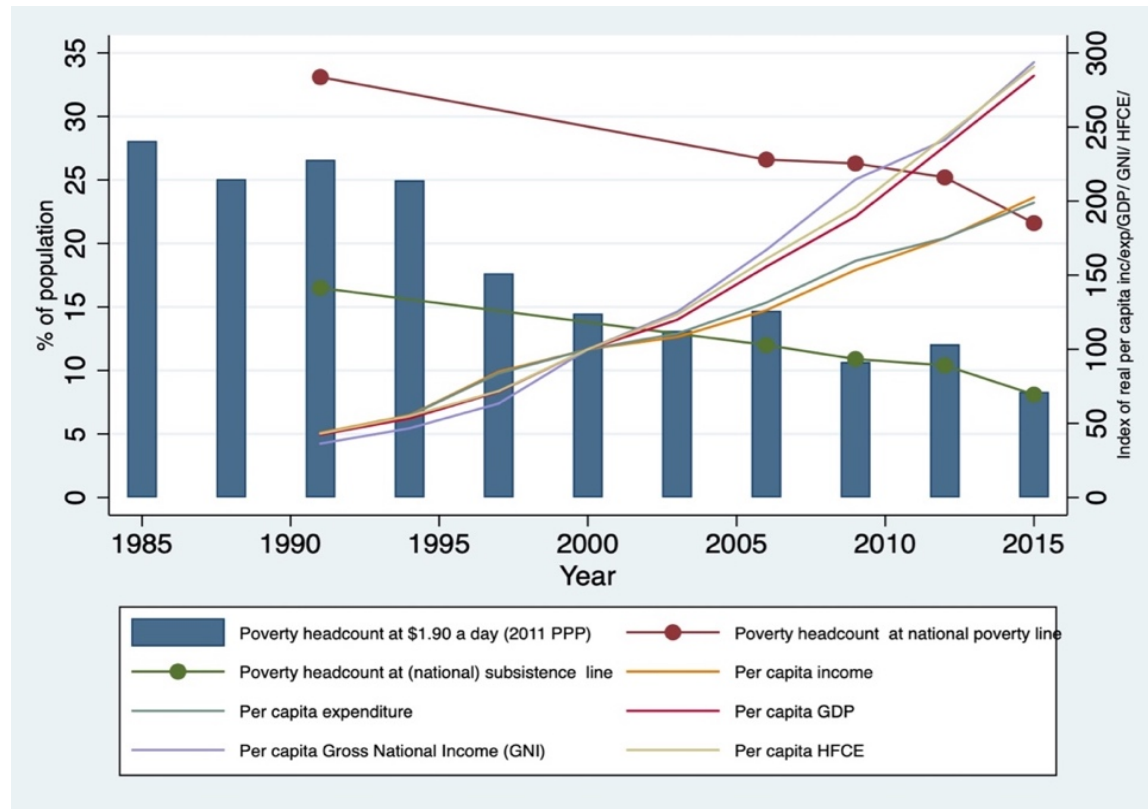
---

- **Describe composite measures** that aggregate various components of welfare
- **Explain methodological issues** behind a multi-dimensional poverty measurement system; and
- **Develop MPI estimates for at least three years** based on household surveys in PH

## 2.1 Measures Beyond GDP

➤ Economic growth, while important, is not sufficient.

**Real Per Capita Income and Poverty Rates : 1985-2015**

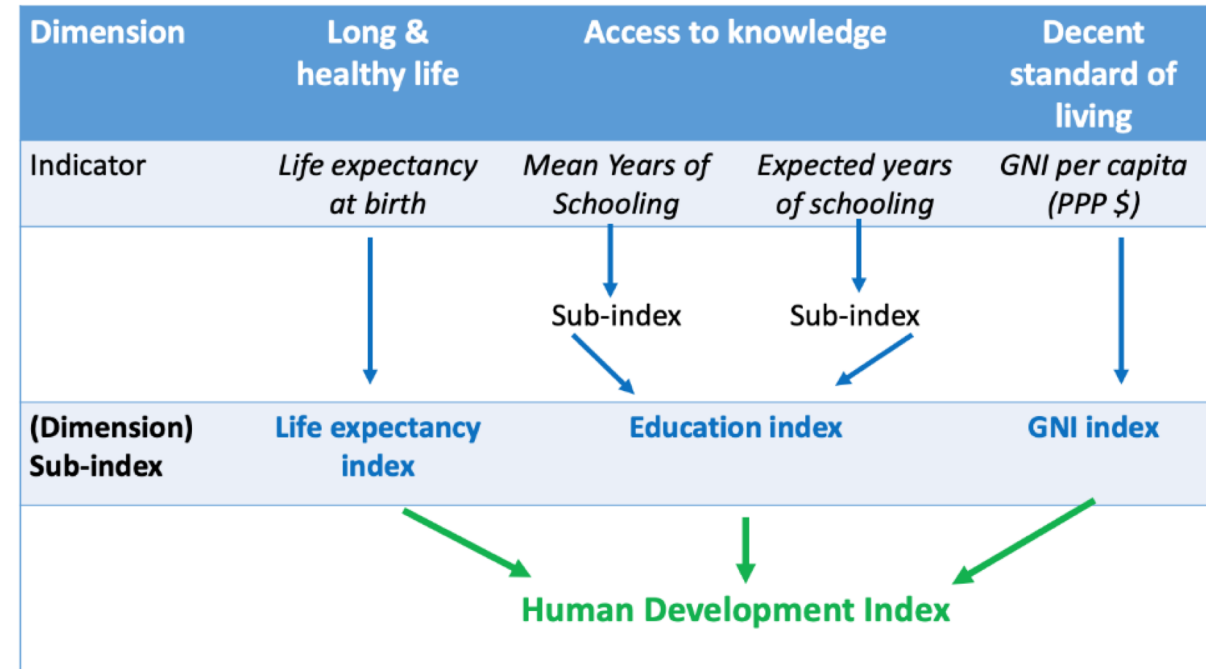


- Lackluster decline in income poverty from 2000-2012 despite growth in GDP per capita
- Progress in non-income indicators of poverty over this period
- Income poverty may not be sufficiently capturing other dimensions of poverty



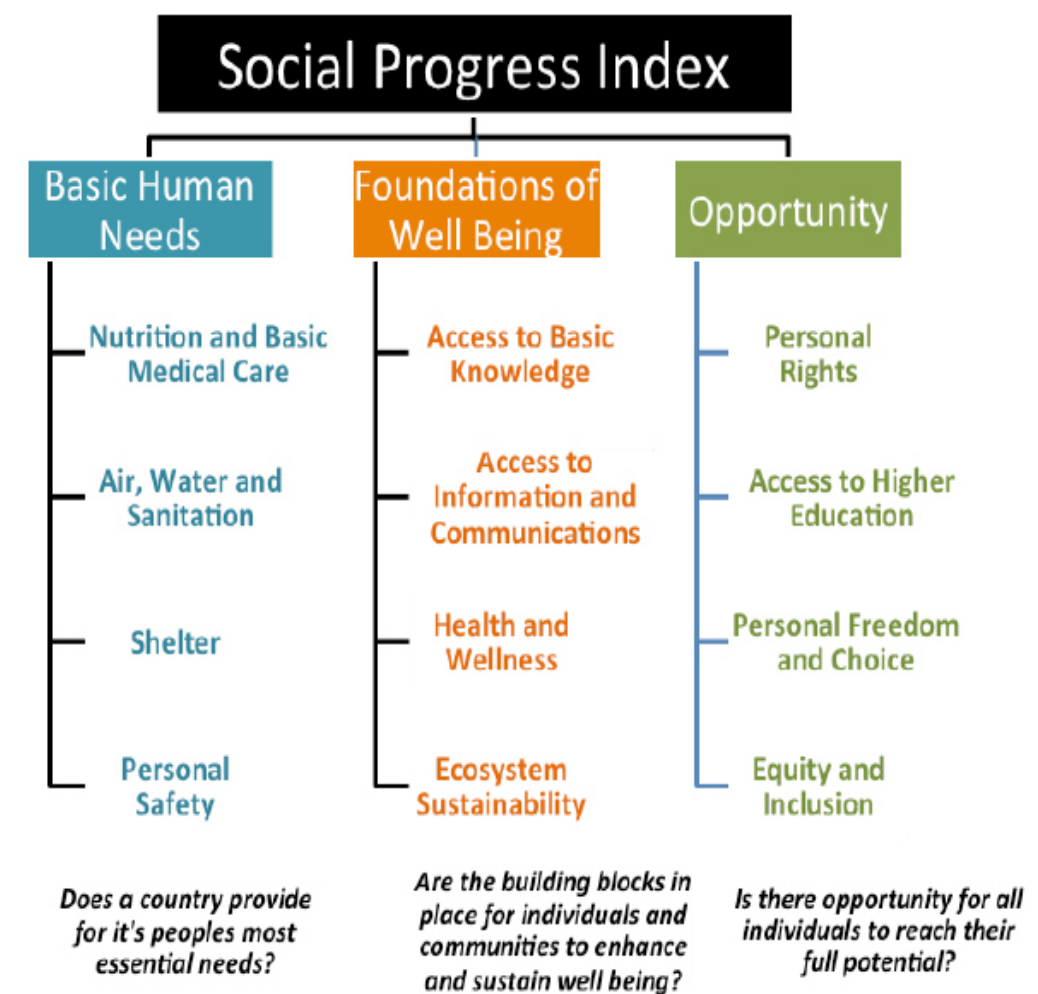
## 2.1.1 Human Development Index (of UNDP)

- Uses country-level data
- **Enables comparison of countries with similar level of development but different human development outcomes**
- Scores of three dimension indices aggregated by way of geometric mean
- **Issue:** Not easy to justify how to put weights
- **Issue:** more useful for advocacy than policy since policy priorities needs to be determined at the sectoral-level



## 2.1.2 Social Progress Index

- Like HDI, based upon social outcomes, determining **level of social progress**
- Includes other indicators such as institutional, environmental, equity, and inclusion factors. All in all, 54 indicators are used to form the SPI.
- Main issue: indicators and weights
  - Access to Information and Communications component of SPI has 4 indicators(fixed broadband subscriptions, internet users, mobile telephone subscriptions, press freedom index); Health and Wellness component has 6 indicators (life expectancy, obesity, cancer death rate, deaths from HIV, deaths from cardiovascular disease and diabetes, and availability of health care).



- Why fixed broadband would be effectively given  $\frac{1}{4}$  weight, but yet, life expectancy, would be giving a  $\frac{1}{6}$  weight?
- Why would cancer deaths have same weight as life expectancy, and deaths from HIV?

## 2.1.3 Multidimensional Poverty Index (MPI)

Dimension	Indicators
Health (1/3)	<ul style="list-style-type: none"><li>• Child Mortality (1/6)</li><li>• Nutrition (1/6)</li></ul>
Education (1/3)	<ul style="list-style-type: none"><li>• Years of schooling (1/6)</li><li>• School attendance (1/6)</li></ul>
Living Standards (1/3)	<ul style="list-style-type: none"><li>• Electricity (1/18)</li><li>• Sanitation (1/18)</li><li>• Safe Drinking Water (1/18)</li><li>• Floor (1/18)</li><li>• Cooking fuel (1/18)</li><li>• Asset ownership (1/18)</li></ul>

- Same steps as traditional poverty measurement, i.e. (1) choosing indicators; (2) setting thresholds; (3) summarizing poverty data
  - Difference is poverty defined from a number of deprivations a person experiences
  - Global MPI defines poor hh = deprived in at least a third of the weighted indicators
- Uses microdata from HH surveys
- Methodology
  - Same Dimensions as HDI
  - Measures prevalence and intensity
  - Dimensional decomposability

## 2.1.3 MPI (cont'd)

### Acc. to Alkire and Foster (2011):

- Overall measures and sub-indices are intuitive and easy to interpret
- Can show change over time based on internally consistent framework
- An overview indicator that give rise to a range of more specific analyses through decompositions and partial indices
- Applicability of methodology in 104 countries (based on HDR 2010) which reflected acute poverty across developing countries
- Participative processes about what poverty is and what current priorities might be: dimensions, cutoffs and weights can be chosen to reflect purpose of measure and context (flexibility)

### Criticisms on MPI ( Ravallion 2011):

- Multidimensionality of poverty does not imply need to collapse multiple dimensions into one index
- No consensus exists on what dimensions to include and how they should be weighted (ex. child mortality vs. type of flooring)
- Aiming for a credible set of “multiple indices rather” than a single “multidimensional index”
- Needs a single survey to capture all the indicators for each household
- If MPI can be decomposed, why the need to aggregate in the first place?
- Ignores all implications for welfare measurement of consumer choice in a market economy
- Hardly helpful in advancing open debate due to lack of understanding in assigning weights

## 2.2 Main Issues on Generating MPI

---

- As summarized by Datt (2017) :
  - **Dimensions and indicators:** (a) Which indicators to include in a multidimensional poverty measure? (b) What sort of dimensional cut-offs should be used to define deprivation?
  - **Weights :** How should the different dimensions be weighted?
  - **Identification and Aggregation:** How should multidimensionally-poor be identified? How should multiple deprivations of those identified as poor be aggregated over the population (or a sub-population)?

## 2.2.1. Indicators for forming MPI

### Balisacan (2011) used FIES, APIS, NDHS

Dimension	NDHS	FIES	APIS
<b>HEALTH</b>			
Child mortality	✓		
Water		✓	✓
Sanitation		✓	✓
Nutrition			
Food poverty	✓ <sup>a</sup>	✓	✓
<b>EDUCATION</b>			
Years of schooling	✓	✓	✓
Child school attendance	✓		✓
Potential schooling		✓	
<b>STANDARD OF LIVING</b>			
Electricity	✓	✓	✓
Shelter			
Flooring	✓		
Roof		✓	✓
Wall		✓	✓
Mobility			
Access to motor vehicles	✓	✓	
Access to national roads		✓	
Urban agglomeration		✓	
Asset ownership			
Household assets	✓	✓	✓
Transport			✓
House tenure			✓
Other sources of income		✓	✓

### Datt (2017) used APIS

Main dimension	Variable name	Indicator	Description
<b>Education</b>	<i>educ1</i>	Primary schooling	No household member has completed at least six years of schooling
	<i>educ2</i>	School attendance	A school-age child (up to grade 10, i.e. between age 6-16) is not attending school
<b>Health</b>	<i>health1</i>	Food consumption	If per capita food consumption < 4/5 of food poverty line
	<i>health2</i>	Illness	If more than 50% of household members report illness or injury over the past month (past 6 months for 2013)
<b>Standard of living and livelihood</b>	<i>sliv1</i>	Sanitation	If household does not use own flush or closed pit toilet
	<i>sliv2</i>	Water	If household's main source of water is not piped water or protected well
	<i>sliv3</i>	Electricity	If there is no electricity in the house
	<i>sliv4</i>	Roof-wall	If roof and outer wall is not made of predominantly strong materials
	<i>sliv5</i>	Assets	If household does not have at least one communication asset (amongst phone, tv, radio, or PC) AND at least one mobility asset (amongst car, motorcycle or motorboat) OR at least one livelihood asset (amongst agricultural land, livestock, refrigerator/freezer)
	<i>sliv6</i>	Employment	If less than 50% of working age members who are not students worked over the past 6 months

## 2.2.2 Weights for MPI

---

**Datt (2017)** suggested different weighting schemes for MPI:

- Nested Uniform Weights: Example, Global MPI and HDI: give dimensions equal weights, then split weights equally among indicators in a dimension
- Nested inverse incidence (NII) weights: Similar to idea in constructing an asset index : a more commonly-owned asset is deemed less valuable The weights assigned to deprivation indicators vary inversely with the prevalence of those deprivations in the population
- Subjective welfare (SW) weights: Weights generated from an estimated relationship between a measure of subjective welfare (survey-based) and the indicators to be included in a multidimensional poverty measure

Other methods may also be employed for generating weights:

- Principal components analysis (Filmer, 1998; Filmer and Pritchett, 2001; Filmer and Scott, 2008; Albert, 2009)

## 2.2.3 Identification and Aggregation

---

- In global MPI framework (Alkire and Foster, 2011), the poor are identified by a **cross-dimensional cut-off**
- **Cross-dimensional cut-off (k)**: specified in terms of the minimum percentage of (weighted) dimensions a person must be deprived in for him/her to be considered poor
  - Can range from a single dimension (minimum weight of any dimension) to all dimensions (100%)
  - Global MPI uses  $k = 1/3$
- However, there are possibilities to include:
  - a) Using multiple values of cross-dimensional cut-off (explored by Balisacan, 2015)
  - b) Not using a cross-dimensional cut-off at all . This is equivalent to the “**union**” **approach** to identification – which asserts that **all deprivations are essential** – a person is considered poor if deprived in any dimension



## 2.3.1. MPI Trends in PH (in previous studies)

### ➤ Global MPI methodology on the NDHS

#### Share of Population by Poverty and Vulnerability Status

Proportion of population (in %)	2017	2013	2008
in multidimensional poverty (who have higher than 33.32% intensity of deprivations)	4.3	6.3	6.8
in severe poverty (with intensity higher than 50%)	2.3	4.2	4.5
who experience 20-33.32% intensity of deprivations	4.9	8.4	10.4
who experience more than 0 but less than 20% intensity of deprivations	58.7	68.2	67.6
with no deprivations (intensity=0)	32.1	17.1	15.2

**Note:** While the global MPI makes use of 10 indicators, only 8 are available in the NDHS

- Proportion in multidimensional poverty (as estimated from NDHS) reduced by 4.7 percent per year in the period from 2008 to 2017. Adjusted headcount (i.e. MPI) reduced by 5.1 percent. Both these rates of change are faster than the corresponding annual drops (3.7 percent, and 1.4 percent, respectively) in the World Bank estimate of consumption poverty incidence in the Philippines and in the official income poverty headcount in the period from 2009 to 2015.

## 2.3.1. MPI Trends in PH (in previous studies)

Data source	MPI	Percent contribution of dimension to MPI		
		Health	Education	Standard of Living
NDHS				
1993	0.208	23.5	20.7	55.8
1998	0.164	24.3	19.6	56.1
2003	0.141	23.0	21.0	56.0
2008	0.137	23.0	24.2	52.8
FIES				
1988	0.309	36.5	18.8	44.7
1991	0.299	36.6	18.3	45.1
1994	0.274	35.7	18.9	45.5
1997	0.235	35.4	20.8	43.8
2000	0.188	36.8	18.9	44.3
2003	0.188	35.6	19.6	44.8
2006	0.171	36.3	20.4	43.3
2009	0.149	36.0	21.2	42.8
APIS				
1998	0.181	37.2	10.2	52.6
2002	0.151	33.3	16.6	50.1
2004	0.153	31.3	18.4	50.2
2007	0.140	32.7	18.7	48.6
2008	0.130	32.5	18.5	49.0

➤ **Balisacan (2011): All 3 data sources showed reduced multidimensional poverty in 2000s despite level of income poverty unaffected by GDP growth since 1997**

- Reduction in MPI = reduction in number of the poor simultaneously experiencing various deprivations
- Highest deprivation attributed to living standards (40-50%)
- Same rankings of contributions of dimensions in all 3 data sources

## 2.3.1. MPI Trends in PH (in previous studies)

### □ Datt (2017) estimates from APIS



Datt (2017) suggests that most of the decline in multidimensional poverty seems to be on account of significant improvements in:

- Completed primary schooling and school attendance
- Access to electricity, roof-wall of dwelling, and household assets



In contrast with the absence of a trend decline in income poverty, there appear to be significant gains in reduction of multidimensional poverty during 2004-2013

Year	Nested Uniform Weights		Nested Inverse Incidence Weights		Subjective Welfare Weights		Balisacan (2015) weights
	Multidim. Poverty Estimate	Std. Err.	Multidim. Poverty Estimate	Std. Err.	Multidim. Poverty Estimate	Std. Err.	Multidim. Poverty Estimate
M( $k=1/3$ )							
2004	0.084	0.002	0.067	0.001	0.107	0.002	0.154
2007	0.082	0.002	0.068	0.002	0.099	0.002	0.140
2008	0.064	0.001	0.051	0.001	0.082	0.002	0.130
2010	0.069	0.002	0.056	0.002	0.080	0.003	0.128
2011	0.062	0.001	0.050	0.001	0.075	0.002	0.124
2013	0.072	0.003	0.063	0.003	0.068	0.004	
2011 ÷ 2004	0.74		0.75		0.70		0.81

## 2.3.2 Indicators Used in this Study

\*= merged with data from Labor Force Survey (LFS);

<sup>1</sup> = available in NDHS;

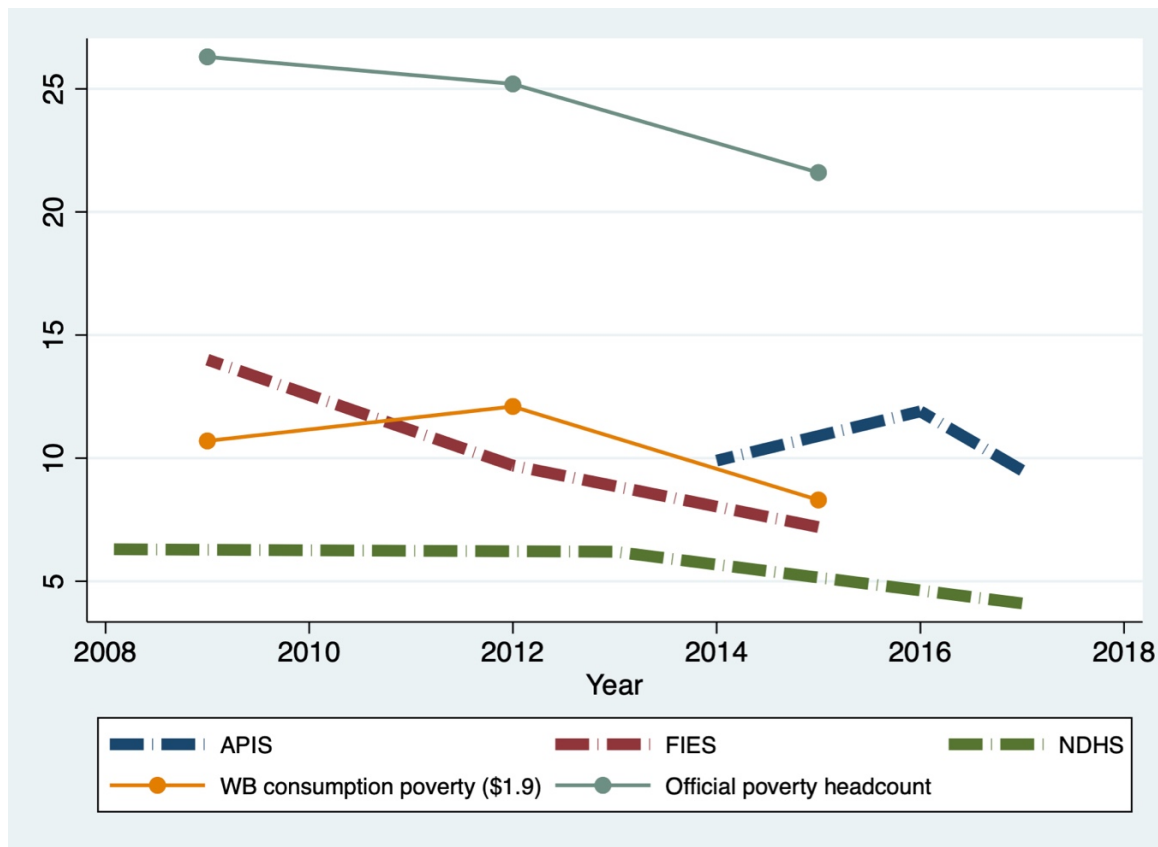
<sup>2</sup> = available in FIES;

<sup>3</sup> = available in APIS

Dimension	Deprivation indicator	Indicator criteria : household is considered deprived if	NDHS	FIES*	APIS*
education	school attendance	any child aged 5-17 is not attending school		✓	✓
education	years of schooling	no member had educational attainment of elementary graduate or better	✓	✓	✓
health	child mortality	any child aged 0-5 died	✓		
health	food consumption	food expenditure is less than food poverty threshold		✓	✓
living standards	electricity	no electricity	✓	✓	✓
living standards	sanitation	toilet facility is not water-sealed, sewer septic tank/other depository, closed pit and/or shared with other households	✓	✓	✓
living standards	source of water	water source is not from community water system (own or shared), tubed/piped deep well (own or shared) or protected spring	✓	✓	✓
living standards	cooking fuel	household cooks with dung, wood or charcoal	✓		
living standards	housing materials	housing materials for roof and walls are not strong	✓	✓	✓
living standards	tenure status	household resides in a housing unit/lot with no consent of the owner	✓	✓	✓
living standards	assets	household does not own a) a durable (e.g. television <sup>123</sup> , radio <sup>123</sup> , washing machine <sup>23</sup> , refrigerator <sup>23</sup> , stove/oven/ microwave oven <sup>23</sup> , aircon <sup>23</sup> , personal computer <sup>23</sup> ) or communications asset (e.g. landline <sup>123</sup> , mobile phone <sup>123</sup> ) and b) a mobility asset (e.g., car/truck <sup>123</sup> , motorcycle/tricycle/bicycle <sup>123</sup> )	✓	✓	✓

## 2.3.3. MPI Estimates from FIES, APIS, NDHS

### Multidimensional Poverty and Monetary Poverty Headcounts



- Using the multidimensional poverty lens, quality of life in PH appears to be consistently improving
- Estimates and reduction in estimates however are not robust, suggesting that measurement crucially depends on the choice of indicators.
  - Even when the indicators are fairly comparable as in FIES and APIS, the results vary considerably on account of the way the indicator is generated in the surveys.
- Regardless of whether we look into monetary poverty or multidimensional poverty aggregates, the reduction in poverty is mostly more evident in later years, consistent also with results from global MPI

## 2.3.3. MPI Estimates from FIES, APIS, NDHS

---

- Multidimensional poverty headcounts based on FIES for the regions correlate very strongly with the APIS-based measures, as well with the income poverty profiles for the regions.
  - Poverty worst in ARMM (at about a third of the population) according to FIES-based multidimensional poverty measurement, and least in Central Luzon and Metro Manila, Calabarzon and Ilocos at under five percent.
  - For the APIS-based multidimensional poverty measures, ARMM still has the highest poverty headcounts while the least headcounts are in Ilocos, Central Luzon, Calabarzon and Metro Manila.
- Poverty profiles are fairly similar for sectors of employment. In both income- and multidimensional poverty measures, the largest concentration of poverty is in agriculture (at least half of the poor population), in rural areas (about three quarters of population), and in Bicol, Western Visayas, Central Visayas, Soccsksargen, and ARMM. Empirical results are expected since among subpopulations where the income-poor are concentrated, income poor are also deprived of services, in part because of interlinkages of governance, geography and the provision of services.

## 2.3.2 Indicators Used in this Study

### Contribution to MPI by Dimension

Data Source	MPI	Percent Contribution of Dimension to MPI		
		Education	Health	Living Standards
2017 APIS	0.028	20.8	46.8	32.4
2016 APIS	0.039	22.0	45.8	32.1
2014 APIS	0.059	19.7	46.8	33.5
2015 FIES	0.045	47.4	1.9	50.7
2012 FIES	0.057	47.4	1.4	51.2
2009 FIES	0.047	52.0	0.7	47.3
2017 NDHS	0.019	40.2	33.3	27.3
2013 NDHS	0.030	38.0	33.1	29.6
2008 NDHS	0.031	38.7	31.6	30.1

Notes: Authors' calculations' using data sourced from APIS, FIES, and NDHS, PSA

➤ For APIS-based measures, health is the dimension that contributed the most to multidimensional poverty estimates, while for NDHS, it is education and for FIES, living standards or education.

➤ That the results are not robust is not surprising as indicators are not available across all the three surveys. The seemingly most comparable set of indicators are from the FIES and APIS, but since expenditure is of less detail in the APIS, the food expenditure-based indicator (which proxies health and nutrition) may have had much less variability in FIES than in APIS.



## 2.3.2 Indicators Used in this Study

### Distribution of Filipinos by (Per capita) Income Cluster and by MPI-Poverty or Vulnerability Status: 2015

Income Cluster	MPI poor	MPI-vulnerable with 20.0% - 33.3% deprivations	MPI-vulnerable with 0%-20.0% deprivations	Not MPI vulnerable, i.e. with 0% deprivations	Total
Poor	4.4	5.3	11.3	0.7	21.6
Low income but not poor	2.3	5.9	24.6	3.9	36.8
Lower middle income	0.4	1.8	17.2	7.0	26.4
Middle income	0.0	0.2	5.5	4.5	10.2
Upper middle income	0.0	0.1	1.3	2.3	3.7
Upper income but not rich	0.0	0.0	0.3	0.8	1.1
Rich	0.0	0.0	0.1	0.3	0.4
Total	7.2	13.2	60.3	19.3	100.0

Notes: Authors' calculations' using FIES, PSA

- Among the income poor, only a fifth (20.3%) are MPI-poor, but three-quarters (76.7%) are MPI-vulnerable and the remaining 3.0% are without deprivations.
- Among those who are low-income but not poor, nine-tenths (89.4%) are either MPI-poor or MPI-vulnerable, and the remaining proportion (10.6%) are found to be without deprivations.
- Of the non-lower income group, one-twentieth (6.%) have at least 20% deprivations (either MPI-poor or MPI-vulnerable), although the bulk of this is among the lower middle-income cluster.



## 2.3.3. MPI Estimates from FIES, APIS, NDHS

---

- We further explore issue of robustness of empirical results by comparing results from nested equal weights and from weights obtained with principal components analysis.
- Notable differences are observed across the two sets of weights (as in Datt 2017, who also tried out alternative weighting schemes for MPI estimation).
  - Measures using PCA-based weights are much higher (twice to triple) compared to those using nested equal weights for both the FIES and APIS.
  - For the FIES data, estimates and trends multidimensional poverty headcounts using PCA-based weights are fairly similar to official poverty headcounts.
- Lack of robustness show that **MPI is dependent** upon **choice of indicators**, and **weights** used for these indicators, and put serious question on whether we may be observing the precise quantity of signals in multidimensional poverty changes across time.

### 3. Summary and Policy Issues

---

- **Multidimensional measures of poverty indicate a far bigger decline in poverty than** what trends in **official poverty rates** or WB estimates of consumption poverty rates (using international poverty lines).
- The **multidimensional measures are not robust**, both in levels, in the reductions, and in the contributions of the dimensions
  - MPI estimation depends on (a) choice of the data source, (b) component indicators used, as well as (c) selection of weights for the indicators
- Having a single composite index for summarizing multidimensional poverty may seem attractive, but it is **unclear how the MPI can contribute to better thinking about poverty**, or better policies for eradicating poverty
  - The MPI component indicators are a combination of data on stocks and flows, and of inputs to economic well-being and social development outcomes, which makes the MPI appear like a fruit salad that combines apples, oranges, grapes, and other fruits.

### 3. Summary and Policy Issues

---

- **Government should tread carefully in its generation of an official measure of multidimensional poverty.** The PSA recently released an initial set of estimates (after our study) but it should have a communication plan for the methodology, have it undergo scrutiny to see also the usefulness of the estimates.
  - Maybe important for PSA to revert its Poverty Statistics Inter-Agency Committee back to a Technical Committee (of experts)
- The generation of multidimensional measures of poverty may be justified from the perspective that poverty is not static, and neither should its measurement, especially given the various risks to future poverty that people face, and the intersections of the various dimensions of poverty with traditional poverty measurement. But clearly such measures, if generated, may possibly complement current monetary measures of poverty.



Philippine Institute for Development Studies  
*Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas*

Service through  
policy research

## 2018 PIDS Discussion Paper :

<https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidsdps1826.pdf>

# Thank you!



[inquiries@pids.gov.ph](mailto:inquiries@pids.gov.ph) ; [jalbert@mail.pids.gov.ph](mailto:jalbert@mail.pids.gov.ph)



[/PIDS.PH](https://www.facebook.com/PIDS.PH)



[@PIDS\\_PH](https://twitter.com/PIDS_PH)



<http://www.pids.gov.ph>