

GLOBAL PRACTICES PROFILE

Knowledge Brief

Spatial heterogeneity and household life cycle in the Multidimensional Poverty Index: The case of Colombia

The multidimensional poverty index (MPI) is a useful measure to assess deprivations in a society beyond traditional money-metric approaches. During the last decade, the MPI has been used to complement traditional monetary poverty measures in several Latin American countries such as Chile, Costa Rica, Colombia, Dominican Republic, Ecuador, El Salvador, Honduras, Mexico and Panama (World Bank, 2017).

Moreover, nowadays several countries are implementing the MPI not only for monitoring multidimensional poverty over time but also for public policy design, as well as for program monitoring and evaluation; targeting the poorest groups and other beneficiary groups or geographic zones. For instance, Colombia uses the MPI to define regions for the allocation of the conditional cash transfer program *Mas Familias en Acción*, and the program *Unidos* (a household is graduated from the program if and only if it is not extreme poor by income nor multidimensional poor).

This note discusses the evolution of the MPI in Colombia since 2010 and describes some of the challenges associated with the spatial heterogeneity of multidimensional poverty across urban and rural areas, and the relationship between life cycle and the evolution of the MPI over time. Also, this note opens a discussion that has not been yet addressed by the

literature on how to update the indicators in the MPI once these are no longer capturing significant deprivations.

The Multidimensional Poverty Index in Colombia

In Colombia, the MPI was adopted as an instrument for monitoring public policy following the *Plan Nacional de Desarrollo 2010-2013 "Prosperidad para todos."* The selection of indicators included in the official MPI relied on data gathered by the Life Quality Survey (*Encuesta de Calidad de Vida*, ECV), while the implementation of the MPI follows the methodology proposed by Alkire and Foster (2007).

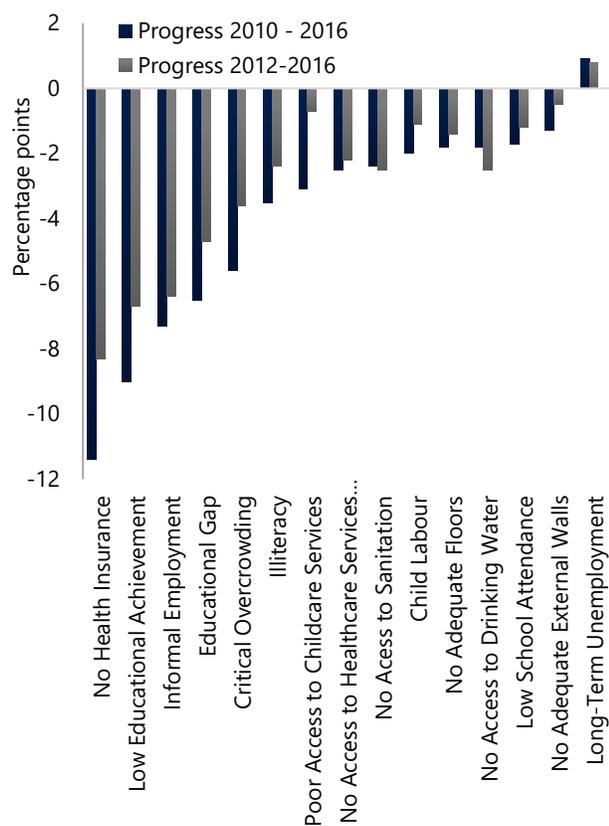
Figure 1: Dimensions of the MPI in Colombia

Dimension No 1: Education (0.2)	Dimension No 2: Youth and children (0.2)	Dimension No 3: Labor (0.2)	Dimension No 4: Health (0.2)	Dimension No 5: Housing (0.2)
Illiteracy (1/2)	School attendance (1/4)	Informal employment (1/2)	Lack of health insurance (1/2)	No water services (1/5)
Low educational attainment (1/2)	Educational lag (1/4)	Long term unemployment (1/2)	Barriers to health services given a need (1/2)	No sanitation (1/5)
	Barriers to early childhood services (1/4)			Lack of adequate floors (1/5)
	Child labor (1/4)			Lack of adequate walls (1/5)
				Overcrowding (1/5)

Colombia's index is comprised of five dimensions, each with multiple indicators (Figure 1). Under the current approach, the index is a weighted sum of dichotomized attainments (or indicators). Then, each dimension is given the same weight and, following a nested weighting scheme, within a dimension each indicator is given the same weight.

From 2010 to 2016, Colombia achieved a significant reduction in its official MPI (see Figure 2). The official MPI not only fell from 30.4 percent in 2011 to 17.8 percent in 2016, but Colombia experienced an improvement in 14 of the 15 indicators that composed the MPI.

Figure 2: Changes in Multidimensional Poverty Rate in Colombia by indicator, 2010-2012-2016



The main drivers of the reduction in the MPI were: increased access to the health system, reduction of the educational gap and increase on educational attainment. Regarding the health dimension, an additional 11.4% of the population got access to the health system in the last 7 years mainly due to the

expansion of the subsidized regime, particularly after 2004. Although we observe progress on informal employment, the rate of people working informally is still high (as high as 73.6% in 2016).

The only indicator that regressed was the long-term unemployment, linked to the weak performance in economic activity faced by the country in recent years. There was an increase on the percentage of people experiencing long-term unemployment.

BOX: The MPI in Latin America

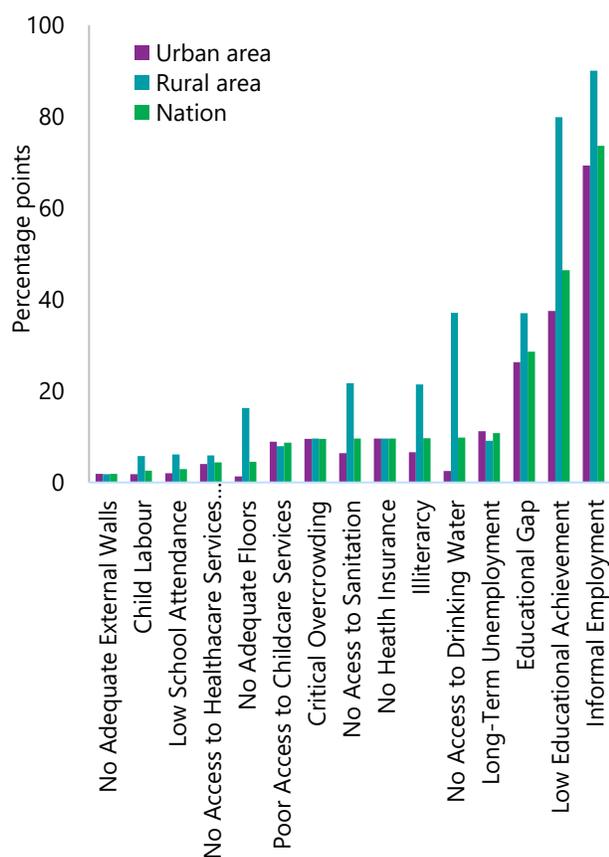
1. In Mexico, the MPI considers two dimensions: social rights and economic welfare. A person is considered multidimensionally poor if her income is below the poverty line and she is deprived in any of the 6 indicators used to construct the social right dimension.
2. In Panama, the MPI is composed of 5 dimensions with equal weight. A person will be considered as multidimensional poor if she lives in a household deprived in more than 30% of the 17 weighted indicators.
3. The MPI in Honduras uses 15 indicators, grouped in 4 dimensions. The dimensions on health, education, and labor have 3 indicators, while the dimension on housing has 6 indicators. A person is multidimensionally poor if she lives in a household deprived in more than 25% of the 15 weighted indicators.
4. The MPI in Ecuador uses 12 indicators grouped in 4 dimensions (education; labor and social security; health, water and nutrition; and, housing and environment). A person is considered as multidimensional poor if she is deprived in at least 33.33% of the 12 weighted indicators.
5. The MPI in Chile is composed of 5 dimensions each one with 3 indicators. A person is considered as multidimensional poor if she is deprived in at least 25% of the 12 weighted indicators.
6. Costa Rica defined 5 dimensions for its MPI. A person will be considered as multidimensional poor if she is deprived in more than 20% of the weighted indicators.
7. The MPI in El Salvador uses 20 indicators grouped in 5 dimensions (each dimension has a total of 4 indicators). A household will be considered as multidimensional poor if she is deprived in more than 7 of the 20 indicators (35% of the weighted indicators).

Source: Own elaboration.

Spatial Heterogeneity and the Multidimensional Poverty Index

Five out of 15 indicators in the Colombia's MPI no longer measure significant levels of deprivations at the national level. These indicators are: no adequate floors (4.5%), no access to health services when needed (4%), school non-attendance (2.9%), child labor (2.6%) and lack of adequate walls (1.9%). Thus, the Colombian government is revisiting and updating the list of indicators, cut-off points and weights of its official MPI.

Figure 3: Urban, Rural and National MPI in Colombia (2016)



However, an indicator might not seem informative at the national level, but spatial disparities could be hidden (Figure 3). For instance, while the indicator for lack of adequate floors at the national level is 4.5 percent (and just 1.3 percent in urban areas), it is

more than thrice higher (16.3 percent) in rural areas. This reveals a significant spatial disparity between areas. Similarly, even though child labor and school attendance are below 3 percent at the national level, these indicators are around 6 percent in rural areas.

The spatial heterogeneity also occurs among other indicators. An important indicator such as lack of access to drinking water is below 10% at the national level, but it is four times higher (37%) among the rural population. Likewise, in the case of lack of access to sanitation, the indicator at the national level is 9.6 percent, while among rural areas is more than 21 percent. These cases suggest the importance for policymakers to consider spatial heterogeneity when using the MPI to evaluate the evolution of welfare, as well as to update the MPI.

The Life Cycle and the Multidimensional Poverty Index

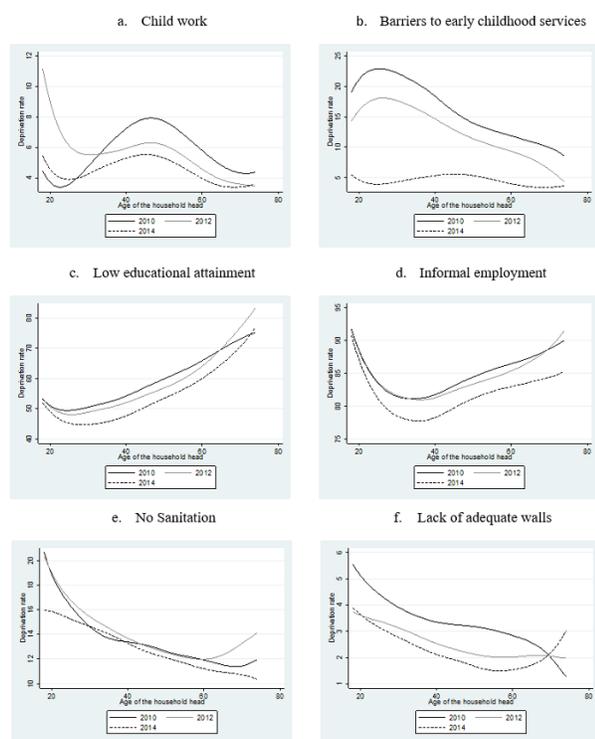
MPI indicators typically apply to different units of analysis in the household such as household members of certain age, under the assumption that in absence of such unit of analysis, the household is non-deprived on that indicator. For instance, the child nutrition indicator in a household with no children will reflect non-deprivation.

Figure 4 suggests that indicators follow a life cycle model. Levels of deprivation in child-work are higher when household heads are older (Panel a), and levels of deprivation in early childhood indicators are higher for those household heads in their most fertile ages (Panel b). In contrast, educational attainment indicators reflect intergenerational changes: younger individuals are more educated than older ones (Panel c). They also reflect that household heads accumulate assets during their life cycle (panels e and f). The MPI does not allow the researcher and policymaker to observe and disentangle these dynamics and address the problems that censoring indicators to population groups entail.

This challenge could be illustrated by comparing

households with and without children and youth. For example, in Colombia, the second dimension of the Colombian MPI is Youth and Children, whose weight is 20 percent. This implies that the maximum percentage of weighted deprivation that could experience a household without children and youth (around 23 percent of the Colombian households) is 80 percent instead of 100 percent.

Figure 4: Smoothed deprivation rates



When a criterium as age is used for defining who is deprived or not in each indicator, this threshold becomes a trigger. For example, in Colombia, the child and youth dimensions are applied to people between 0 and 17 years. Then, a reduction in the MPI could be associated with a demographic change even if the reduction is not related to social progress.

For instance, in case a demographic transition would have occurred in Colombia between 2017 and 2018, we would have observed a fall in the MPI attributable to a change in the age profile. Therefore, we could conclude that demographic changes could partially explain some of the reduction on the MPI.

A potential solution, useful for several indicators

including lack of education, is to adjust the criteria of deprivation by the age of the individual and consider all household members, instead of constraining the population to which the requirements will be applied, that is the case of the lack of education indicator.

Final remarks

This note discusses the evolution of the MPI in Colombia since 2010 and highlights two challenges that arise when analyzing its evolution over time: the spatial heterogeneity of multidimensional poverty (e.g., across urban and rural areas), and the relationship between life cycle and evolution of the MPI over time.

Although, over time an indicator might turn less relevant at the national level, spatial disparities might be hidden in the national aggregate. Thus, public policy design and monitoring need be informed by spatial disaggregation rather than driven only by national averages.

In addition, a change in the MPI over time could be explained by demographic changes. For instance, households deprived today in the indicator “gap of education”, since they have a 17-year child with only 9 years of education, will not be deprived anymore in this dimension next year (i.e., when child will be 18 years old) even when such child hasn’t accumulated more years of education.

These two features need to be considered before creating or modifying the MPI as a monitoring indicator, and before creating or modifying the country’s public policies.

ABOUT THE AUTHORS

Felipe Balcazar is a PhD student in the Wilf Family Department of Politics, New York University.

Eduardo A. Malásquez is an Economist in the Poverty and Equity Global Practice at the World Bank.

Sergio Olivieri is a Senior Economist in the Poverty and Equity Global Practice at the World Bank.

Julieth Pico is a Consultant for the Poverty and Equity Global Practice at the World Bank.