

Changes in multi-dimensional poverty between 2008 and 2010^{*}

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Introduction

In this paper we make use of panel data from the first two waves of the National Income Dynamics Study (NIDS) to investigate changes in multi-dimensional poverty between 2008 and 2010. We utilise a new multi-dimensional poverty index (Alkire and Santos, 2011) in an attempt to move beyond one-dimensional money-metric poverty measures. The Multidimensional Poverty Index (MPI) for South Africa is composed of nine indicators corresponding to three dimensions included in the UNDP's Human Development Index – these are education, health and standard of living. The MPI captures a set of direct deprivations that affect all people living in a household at the same time. In the second part of the paper, we compare the results obtained using the MPI to those obtained using the conventional single-dimension income poverty measures.

Why consider multiple dimensions of poverty?

The first reason to consider multiple dimensions of poverty is that income is an imperfect indicator of well-being. As argued in Amartya Sen's seminal work "[h]uman lives are battered and diminished in all kinds of different ways, and the first task... is to acknowledge that deprivations of very different kinds have to be accommodated within a general overarching framework" (Sen 2000). While income and consumption are reasonably good proxies for well-being, they cannot capture all aspects of poverty. Indeed, when the poor are asked to characterise what it means to be poor, their answers reflect a wide range of answers. For example, in the South African Participatory Poverty Assessment (May, 1998), the poor characterized poverty as an isolation from the community, a lack of security, low wages, a lack of jobs, poor nutrition, poor access to water, having too many children, poor educational opportunities and the misuse of resources.

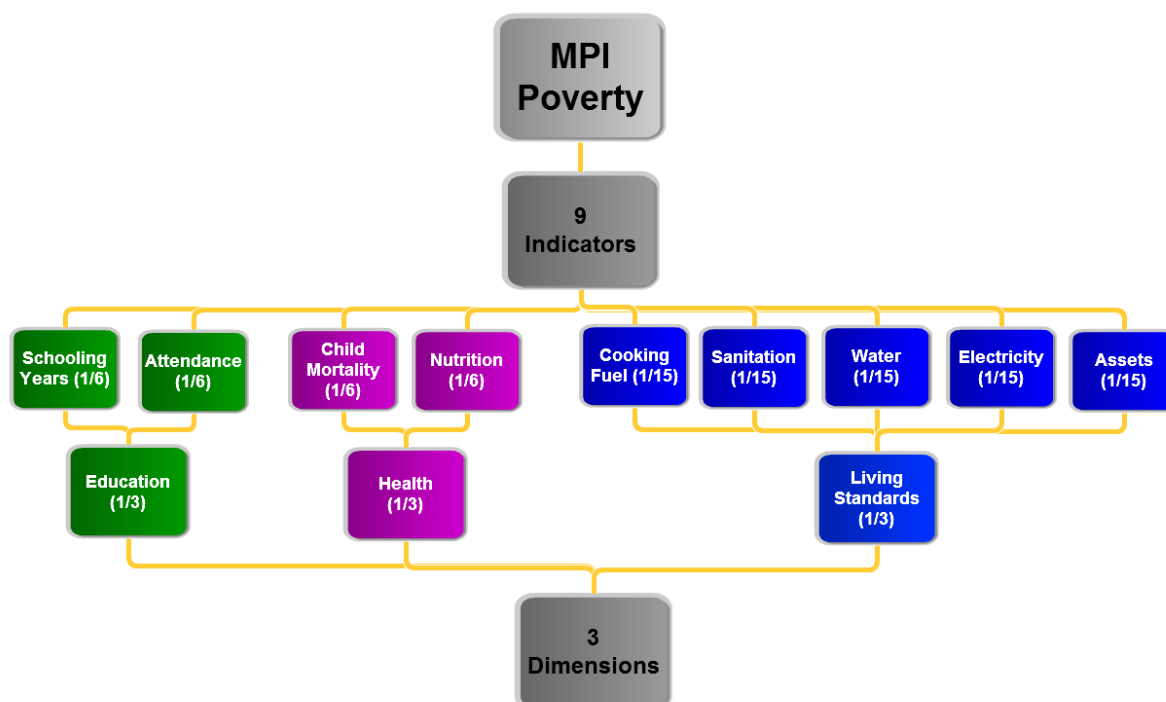
Secondly, multi-dimensional poverty indices can lead to better policy-making. The more policy-relevant information available on poverty, the better-equipped policy makers will be to reduce it. For example, a province in which most people are deprived in education is going to require a different poverty reduction strategy to a province where most people are deprived in housing conditions.

Construction of the MPI

For a detailed explanation of the MPI see Alkire and Foster (2011). The MPI for South Africa has three dimensions and nine indicators, which are shown in the box below¹. Each dimension is equally weighted, each indicator within a dimension is also equally weighted, and these weights are shown in brackets in Figure 1, below.

¹ The MPI that Alkire and Foster (2011) use for various countries contains 10 indicators. We omit the “floor type” category from our analysis due to the lack of data on this.

Figure 1 Composition of Multidimensional Poverty Index



Each indicator has its own cut-off point which determines whether a household is deprived in that particular area. These are as follows :

Health – Each indicator weighted equally at 1/6

- Child mortality: Any woman in the household has had a child (aged 0 to 15 years old) who has died in the last 20 years
- Nutrition: At least one adult (> 18 years old) has a BMI less than 18.5, or at least one child has a WHO weight-for-age score z-score less than -2

Education – Each indicator weighted equally at 1/6

- Schooling years: No household member has at least 5 years of education
- Enrolment: At least one child of school-going age (7-15 years old) does not attend school

Standard of living – Each indicator weighted equally at 1/15

- Water: Source of water is not from a pipe on site
- Toilet: No flush toilet or pit latrine, or household shares toilet with another household
- Cooking fuel: Household does not use electricity, gas or paraffin for cooking
- Electricity: Household does not have electricity
- Assets: A household is considered deprived if it owns zero or one of the following “small” assets – television, radio, telephone, cellphone, fridge, bicycle AND the household does not own a vehicle

The MPI reflects both the proportion of the population that is multi-dimensionally poor, denoted H (as this is simply the headcount ratio) and the average intensity (A) of their poverty. That is, A is the average proportion of indicators in which poor people are deprived. The MPI is calculated by multiplying the incidence of poverty by the average intensity across the poor ($H \cdot A$). A person is identified as poor if he or she is deprived in at least one third of the weighted indicators.

Table 1 shows the multi-dimensional poverty rate (MPI) and its two components: incidence of poverty (H) and average intensity of deprivation faced by the poor (A). Those identified as MPI poor are deprived in at least one-third of weighted indicators. Those identified as "Vulnerable to Poverty" are deprived in 20% - 33% of weighted indicators and those identified as in "Severe Poverty" are deprived in over 50%.

Table 1 MPI using the full Wave 1 and Wave 2 samples

Year	Incidence of poverty (H)	Average intensity across the poor (A)	MPI = H x A	% vulnerable to poverty	% in severe poverty
2008	0.103	0.408	0.042	22.3%	0.9%
2010	0.086	0.407	0.035	21.2%	0.6%

Table 1, above, uses the full Wave 1 and Wave 2 samples. However, in order to reduce sampling variability and to investigate changes over time, for the remainder of this paper we choose rather to use the “balanced panel sample”. This means that we only include individuals who were found and successfully interviewed in both waves.² We include Table 1 in order to compare it to the analysis obtained when using only the balanced panel (in Table 4).

Before restricting the analysis to the balanced panel, we must confirm that attrition between Wave 1 and Wave 2 is not a significant concern. In Table 2 we show the average deprivation scores for attritors (individuals who were interviewed in Wave 1 but were not interviewed at Wave 2 because they refused, were not found, moved overseas or died) versus non-attritors. We find that the mean deprivation score for attritors is slightly lower than that for non-attritors, but not so low that we are concerned about the nature of the attrition biasing our results.

² For completeness, we include all analysis using the full (unbalanced sample) in an appendix to this paper.

Table 2 Deprivation Scores and Attrition

	Mean	Obs.
Deprivation		
Score		
Non-attritor	0.06	22551
Attritor	0.05	5696

In Table 3 we find that 21% of the MPI-poor attrited between Wave 1 and Wave 2. In comparison, only 18% of the MPI non-poor attrited. This is a rather surprising result, given the finding of Brown *et al.* (2012) that individuals living in households with higher incomes are more likely to have left the sample. Nevertheless, the two percentages are very close and suggest that we need not be unduly concerned about selective attrition.

Table 3 MPI Poverty and Attrition

	Non-attritor	Attritor	
MPI Poor	79.5	20.5	100
MPI Non-poor	81.8	18.2	100

It is thus not surprising that when we compare the results of Table 4 (which uses only the balanced sample) to Table 1 (which uses the full sample), we find that the balanced panel does not give results that are markedly different from the full sample.

Table 4 MPI using the balanced panel, Wave 1 and Wave 2

Year	Incidence of poverty (H)	Average intensity across the poor (A)	MPI = H x A	% vulnerable to poverty	% in severe poverty
2008	0.107	0.407	0.044	24.8%	1.3%
2010	0.090	0.406	0.037	21.3%	0.7%

According to Table 4, 10.7% of South Africans were MPI-poor in 2008. This fell to 9.0% in 2010. In addition, the “intensity” of MPI poverty fell very slightly between the two time periods, from 0.407 to 0.406. Consequently, the MPI index fell from 0.044 to 0.037. In addition, the percentage of the population that are "Vulnerable to Poverty" (that is deprived in 20% - 33% of weighted indicators) also fell, as did those in in "Severe Poverty" (deprived in over 50% of weighted indicators). All the MPI indicators therefore point in the direction of significant improvements over this short time period of only two years.

Intensity of deprivation

Figures 2a and 2b show the intensity of deprivation among the MPI-poor. Among those that are MPI-poor, more than half are poor in less than 40% of the dimensions and almost none are poor in more than 80% of dimensions.

Figure 2a: Wave 1 Intensity of Deprivation Among MPI Poor

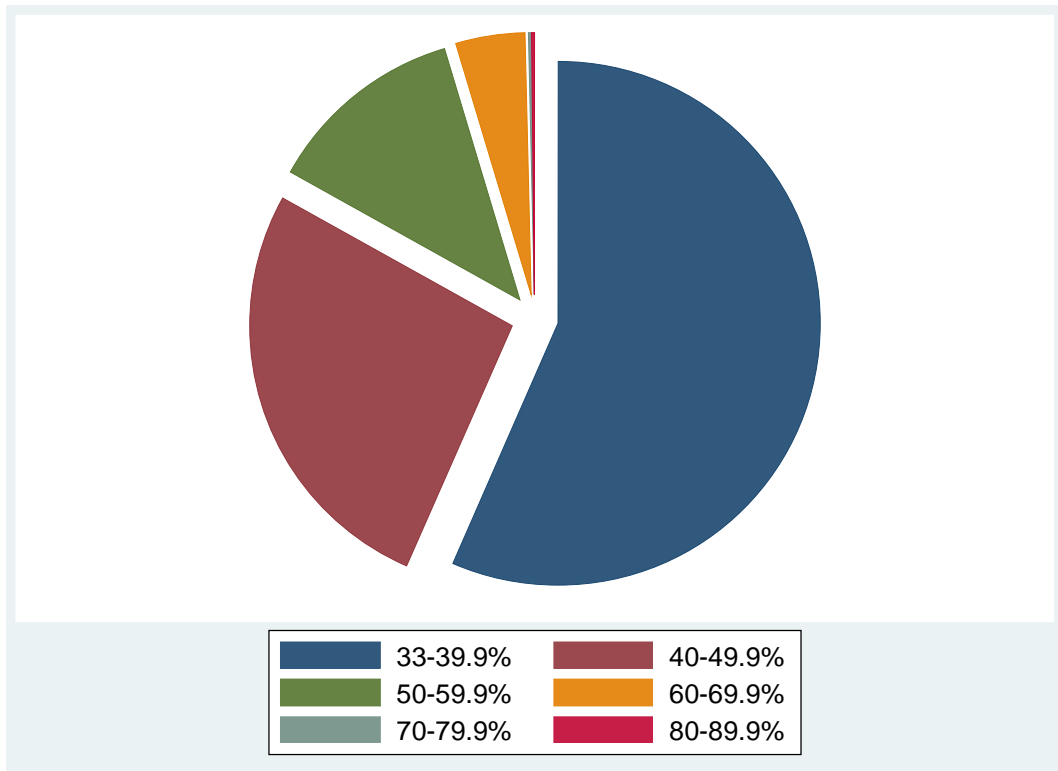
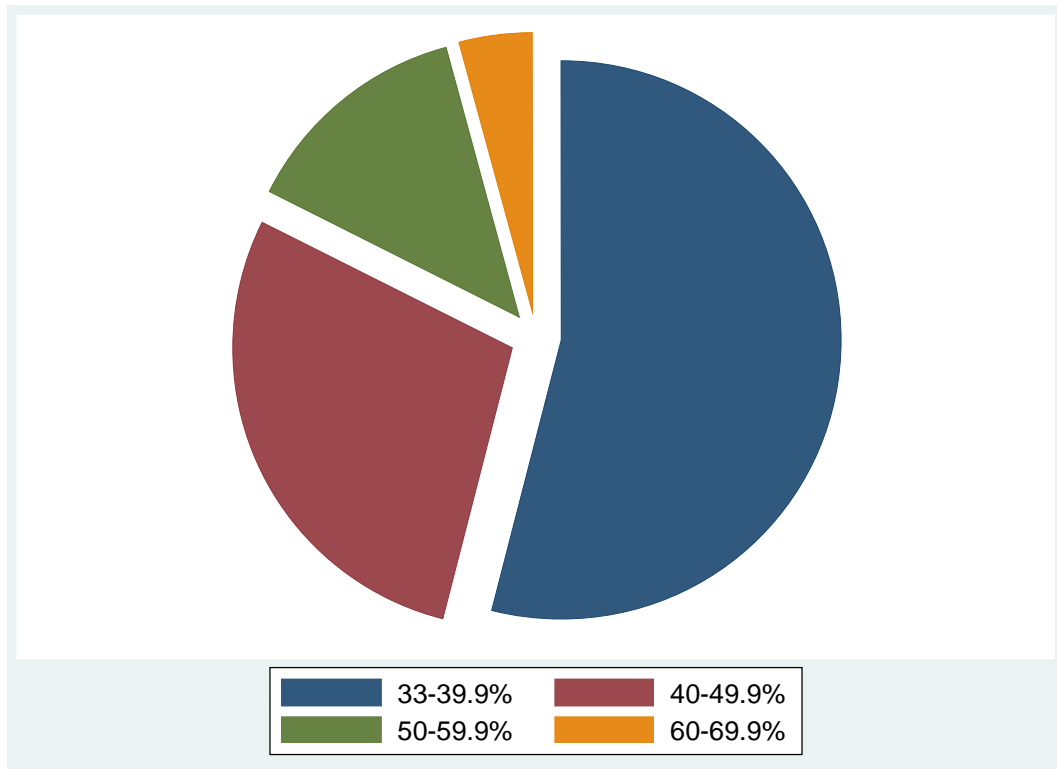


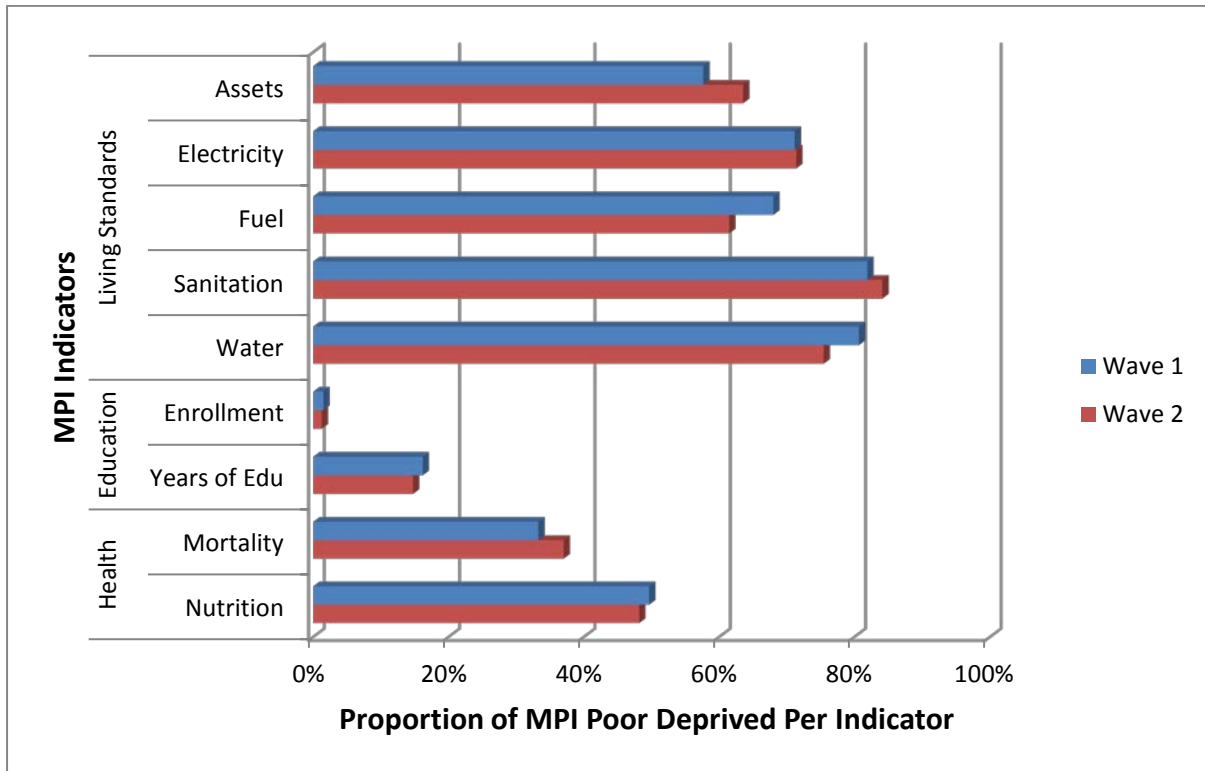
Figure 2b: Wave 2 Intensity of Deprivation Among MPI Poor



Drivers of MPI-poverty

In Figure 3 below we consider the individual components of the MPI measure to investigate which components “drive” MPI poverty and also to unpack which components have contributed the most to the reduction in MPI poverty. It is clear that MPI-poverty is largely being driven by poor performance on the living standards measures, particularly water and sanitation. It is also apparent that most households are achieving the minimum requirements for school enrolment and years of education. Performance on the health measures is poor, but not as poor as the living standards measures. In terms of improvements on individual components between waves, the only living standards indicator that improved was access to adequate sanitation. Nutrition and years of education both improved while mortality rates for the panel sample households worsened.

Figure 3 Deprivations of MPI Poor by Indicator (Balanced Panel)



Another way to look at this is to consider the relative contributions of the components. Figures 4a and 4b contrast the relative contributions in the two samples.

Figure 4a Relative contributions to MPI in Wave 1 (2008)

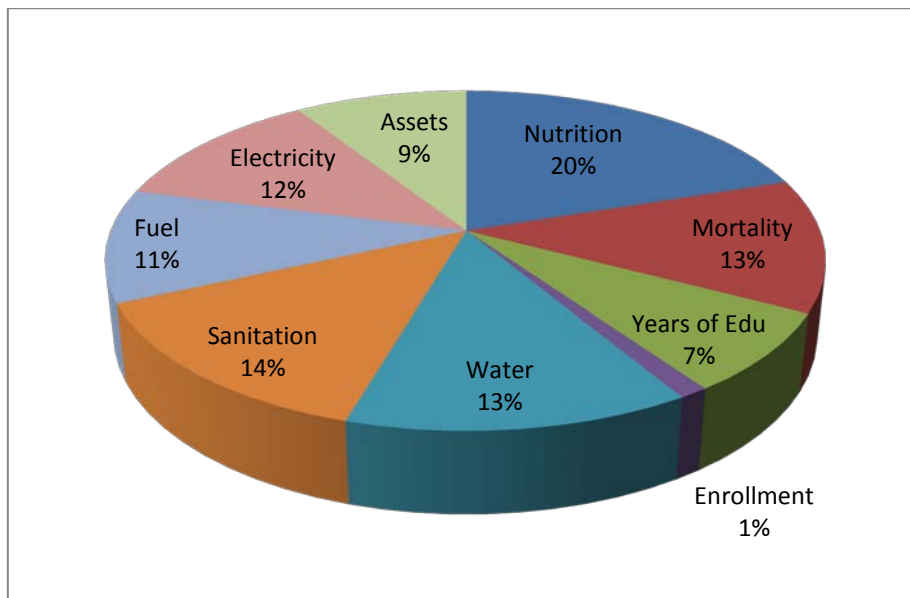
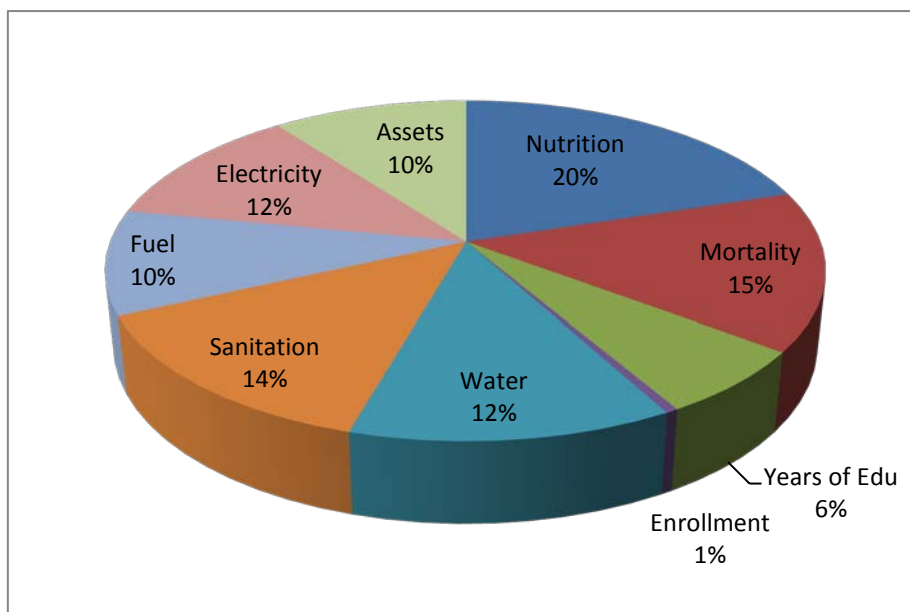


Figure 4b Relative contributions to MPI in Wave 2 (2010)



It can be seen from Figure 4a and Figure 4b that the drivers of MPI-poverty did not change much between the two years. The contribution of mortality and assets went up very slightly, while the contribution of fuel and water went down very slightly. The changes are negligible, however, which is to be expected given that these indicators change slowly and two years is a very short time period.

MPI-poor versus income-poor

As was shown in Table 4, when we use the MPI measure, 10.7% of individuals are found to be MPI-poor in 2008. In order to compare the profiles of poverty using MPI to that using income as the metric, we need to set a poverty line such that exactly 10.7% of individuals in our 2008 sample are deemed to be income-poor. This line was calculated to be R167 per capita per month in 2008. It should be noted that we are in no way proposing that this is a reasonable poverty line – it is simply the one that we use in order to compare whether the MPI measure gives a different picture of poverty than that using an income-poverty approach. For the 2010 income-poverty line, we deflate R167 by the overall national Consumer Price Index in order to adjust for inflation, using 2008 as our base year.

Table 1 MPI and Money-metric Poverty in Waves 1 and 2 (Balanced Panel)

	Wave 1		Wave 2	
	MPI Poor	Rand Poor	MPI Poor	Rand Poor
Race				
African	0.127	0.129	0.107	0.139
Coloured	0.048	0.025	0.036	0.045
Asian/Indian	0.000	0.013	0.013	0.013
White	0.000	0.003	0.001	0.000
Geo-type				
Rural Formal	0.247	0.048	0.235	0.103
Traditional Authority Area	0.233	0.176	0.189	0.181
Urban Formal	0.031	0.048	0.038	0.071
Urban Informal	0.088	0.118	0.074	0.102
National	0.107	0.107	0.090	0.117

Note: Money-metric poverty line of R167 household per capita income per month in 2008 prices.

The results are interesting. When we fix the Rand-poor poverty line at this very low level of R167 per capita per person in 2008 prices, we find that money-metric poverty increased slightly between 2008 and 2010, whereas MPI poverty fell. The racial picture of poverty is not very different when we use MPI instead of income, but the spatial breakdown is quite different. For example, individuals on farms (rural formal) are much more likely to be MPI-poor than Rand-poor. Individuals in traditional authority areas experienced a significant reduction in MPI poverty (from a headcount of 23.3% to 18.9%) between 2008 and 2010 but a small increase in money-metric poverty (from a headcount of 17.6% to 18.1%). Poverty in urban areas is higher when measured in monetary terms than when measured using MPI. This is perhaps unsurprising given that service delivery has been more rapid in urban areas than rural areas.

Conclusion

In this short note, we computed a new measure of poverty, the Multi-dimensional Poverty Index. The MPI has three broad components, namely education, health and living standards. Using this measure we found that 10.7% of South Africans were MPI-poor in 2008. This fell to 9% in 2010. In terms of MPI, South Africa ranks close to countries such as Paraguay, China and Morocco. South Africa does very well on the education indicators, but far less well on living standards and health indicators. By constructing a monetary poverty line which gives exactly the same poverty rate (of 10.7%) in 2008, we can compare the composition of poverty when using MPI versus income. Relative to the income measure, the MPI classifies more rural dwellers (both on farms and in traditional authority areas) as poor.

In summary, the MPI measure is relatively easy to compute and provides a useful complement to standard money-metric poverty measures. We propose that it should be routinely computed as part of on-going poverty monitoring.

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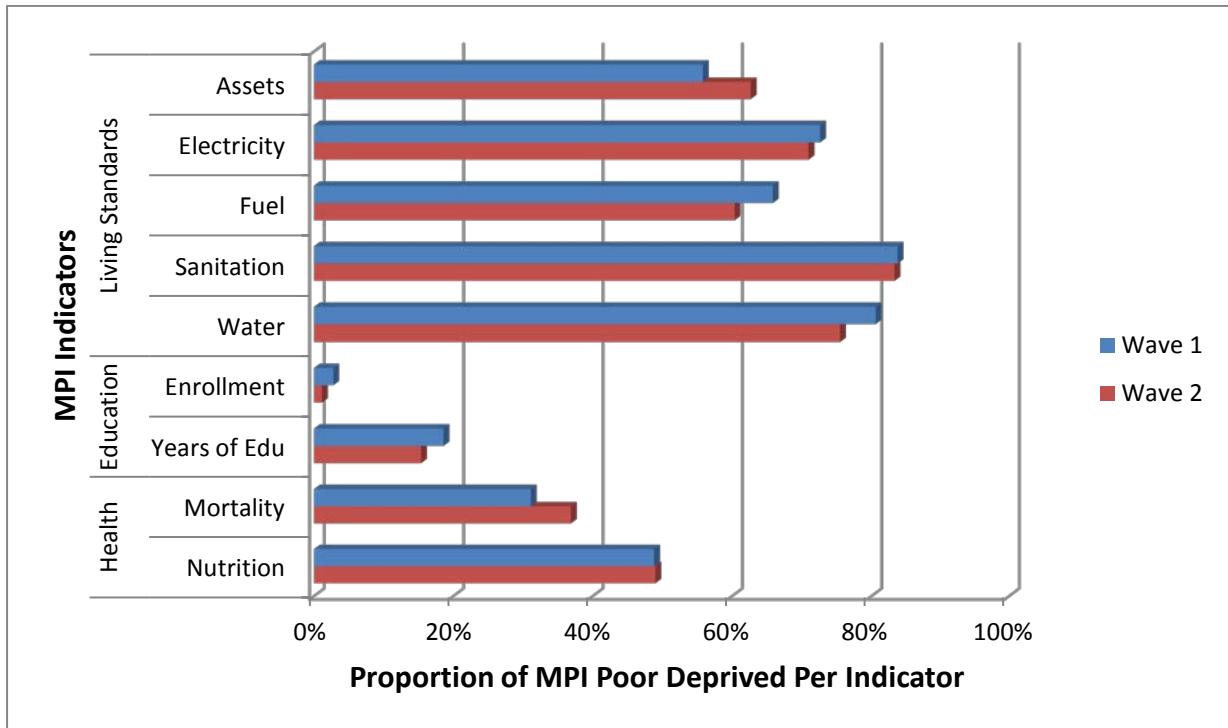
Appendix

Table 2 MPI and Money-metric Poverty in Waves 1 and 2 (full sample)

	Wave 1		Wave 2	
	MPI Poor	Rand Poor	MPI Poor	Rand Poor
Race				
African	0.126	0.127	0.104	0.146
Coloured	0.037	0.020	0.030	0.033
Asian/Indian	0.000	0.006	0.021	0.004
White	0.000	0.007	0.004	0.000
Geo-type				
Rural Formal	0.209	0.046	0.191	0.109
Traditional Authority Area	0.211	0.199	0.154	0.206
Urban Formal	0.019	0.042	0.029	0.054
Urban Informal	0.082	0.110	0.051	0.138
National	0.103	0.103	0.086	0.118

Note: For the unbalanced panel. Money metric poverty line of R168 household per capita income per month.

Figure 5 Deprivations of MPI Poor by Indicator (Cross-sections)



Note: For the full sample (unbalanced panel)

Figure 6 Deprivation Proportions for Entire Population

