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ANALYSING MULTIDIMENSIONAL CHILD POVERTY IN SUB-SAHARAN AFRICA: FINDINGS USING AN INTERNATIONAL COMPARATIVE APPROACH

Marlous de Milliano¹, Ilze Plavgo²

¹Department of Public Policy, University of North Carolina, Chapel Hill, NC, United States.

²Department of Political and Social Sciences, European University Institute, Fiesole (Florence), Italy

Abstract

This study provides with a first indication on the number of multidimensionally poor children in sub-Saharan Africa. It presents a methodology measuring multidimensional child deprivation within and across countries, and it is in line with the Sustainable Development Goal 1 focusing on multidimensional poverty by age and gender. Using the Multiple Overlapping Deprivation Analysis (MODA) methodology, the study finds that 67% or 247 million children are multidimensionally poor in the thirty sub-Saharan African countries included in the analysis. Multidimensional poverty is defined as missing two to five aspects of basic child well-being captured by dimensions anchored in the Convention on the Rights of the Child, namely nutrition, health, education, information, water, sanitation, and housing. The analysis also predicts the multidimensional child poverty rates for the whole sub-Saharan African region estimating 64% or 291 million children to be multidimensionally poor. In comparison, monetary poverty rates measured as less than USD 1.25 PPP per capita spending a day and weighted by the child population size finds 48% poor children. The results of this study highlight the extent of multidimensional poverty among children in sub-Saharan Africa and the need for children to have a specific poverty measure in their own right.

Keywords

child poverty; multidimensional deprivation; child rights; sub-Saharan Africa

1 Introduction

Children's physical and psychological needs are multifaceted and their non-fulfilment can have lasting effects with regards to children's development (Minujin and Nandy, 2012; Roelen and Gassmann, 2008). The specific nature of children's needs regarding for instance education, nutrition, and care signifies that poverty experienced by children differs from poverty experienced by other household members. In addition, the position of children within the household and their living environment makes children dependent on their

caretakers and on the way adults decide to distribute resources (Waddington, 2004). To capture the specifics of child poverty, UNICEF has developed a child-centred methodology called MODA - Multidimensional Overlapping Deprivation Analysis (de Neubourg et al, 2012). For the purpose of this paper, a special application of this methodology is used to measure multidimensional child poverty across and within thirty countries in sub-Saharan Africa, and to study its relation with monetary poverty.

The recent adoption of the Sustainable Development Goals with target 1.2 calling for the reduction of child poverty in all its dimensions by half³ supports the focus of this study on multidimensional poverty among children. Acknowledging that the SDG on multidimensional poverty refers to the development of national measures, the methodology at hand is sufficiently flexible to allow for national adaptations as is shown in a number of other studies (e.g. De Milliano and Handa, 2014; Chzhen and Ferrone, 2016). The methodology and the estimations presented here can be used to further guide country-specific poverty measurement activities, and the results can act as an SDG baseline to facilitate monitoring of regional trends towards the progress of the SDG target 1.2.

In line with the international monetary poverty measure of USD1.25 PPP a day, the internationally comparable multidimensional poverty measure presented here concentrates on the analysis of absolute deprivation. The difference between the two absolute measures of poverty is that monetary poverty measures households' means, while multidimensional poverty includes a direct measurement of child outcomes such as nutrition and education indicators. Moreover, deprivation can be defined using dimensions that are difficult to monetise such as freedom from violence and appropriate care.

While the addition of multidimensional poverty as an SDG is new at the international policy-making level, non-monetary poverty and deprivation measures have been used in the literature already since the late 1990s. Sahn and Stifel (2000) use the DHS wealth index, an internationally comparable asset index, to compare poverty over time and across seven Southern African countries. They find a decline in poverty in five out of seven countries between two points in time in the late 1980s and 1990s. Von Maltzahn and Durrheim (2008) analyse Lesotho, Namibia, South Africa, Swaziland and Zambia using income and living standards data. The authors find a high correlation between income poverty and the assets used as a non-monetary measure suggesting that there is one underlying element of poverty. These findings contrast with findings of Booysen et al. (2008) who build on the work of Sahn and Stifel (2000) and argue that assets are less volatile than income resulting in a slower occurrence of changes. More recent work has concentrated on multidimensional deprivation rather than assets pointing at its contribution as being more representative of the multidimensional nature of poverty. Multidimensional poverty analyses have been included in national and/or comparative poverty analyses of South Africa (Klasen, 2000), South Sudan and Sudan (Ballon and Duclos, 2016), Tanzania (Atkinson and Lugo, 2010) and Zimbabwe (Stoeffler et al., 2016), among others. Methodologies and objectives differ, with Atkinson and Lugo (2010), for instance, accounting for deprivation with only three

³SDG 1 – Target 1.2: By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions (UNDESA, 2016).

dimensions placing multidimensional deprivation in a larger context of poverty alleviation, distribution and economic development. Ballon and Duclos (2016) compare dimensions of consumption, education, and public and private assets for multiple age groups in Sudan and South Sudan. Stoeffler et al. (2016) analyse the effect of a social, political and economic crisis in Zimbabwe on wellbeing combining multiple dimensions such as health, education, assets, and employment. These studies exemplify how multidimensional poverty analyses can complement the knowledge obtained from income or consumption poverty analyses. The articles also show that methodologies vary depending on the population and the context studied.

The methodology used for this article holds that multidimensional child poverty and monetary poverty are complementary measures of child poverty, a notion that is echoed by the literature and the adoption of both poverty measures in the SDG targets 1.1⁴ and 1.2. More importantly, this article shows how the methodology at hand can be used to inform poverty assessments for children, and how monetary poverty and multidimensional child poverty relate across the thirty countries analysed.

The article starts by setting out the multidimensional child poverty methodology used in this study, followed by key findings of child poverty across thirty countries in sub-Saharan Africa. The multidimensional poverty rates are then compared with the monetary poverty rates to give an indication on the relationship between the two concepts. The study concludes with a prediction of the number of multidimensionally poor children in all 44 sub-Saharan countries in Africa, giving a first estimation of the number and proportion of multidimensionally poor children in this region.

2 Background

The Convention on the Rights of the Child, ratified by most countries in the world, determines that children have the right to survival, development, protection and participation (United Nations, 1989). Based on the rights listed in this convention, UNICEF has developed a multidimensional child poverty methodology (MODA) defining child poverty as the non-fulfilment of child rights and moving from household-level to child-level poverty measurement.⁵ The approach concentrates on the access to various goods and services for children, as well as freedom from violence and exploitation. Measuring child-level outcomes allows for measuring intra-household differences in the distribution of resources, which may reflect decisions (either explicit or implicitly made) on issues such as schooling, labour and marriage (see also de Neubourg et al., 2014, Gordon et al., 2003; Minujín et al., 2006; Minujín and Nandy, 2012). The methodology facilitates the analysis of the interrelation of various child deprivations, and provides background information on the socio-economic characteristics of the deprived children (See de Neubourg et al., 2012a; 2014 for more background).

⁴SDG 1 – Target 1.1: by 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day (UNDESA, 2016).

⁵While many of the indicators are collected at a household level, the analysis is child-centred using children as unit of analysis.

The Multiple Overlapping Deprivation Analysis (MODA) methodology has built upon existing approaches of multidimensional poverty measurement, such as UNICEF's Global Study on Child Poverty and Disparities (see Gordon et al. 2003; UNICEF, 2007), OPHI's Multidimensional Poverty Index (see Alkire and Santos, 2014; Alkire and Foster, 2011), and other research carried out in the field of multidimensional poverty. The methodology adds to the existing studies by providing a child-focused poverty methodology, sensitive to the changing needs between early childhood, primary childhood, and adolescence. It separates the analysis in age-groups so that age-specific indicators can be included. For each of the age-groups it measures the average depth of multidimensional poverty by measuring the number of deprivations children experience simultaneously, and assesses which deprivations correlate by carrying out a deprivation overlap analysis. When the data allows the methodology encourages to analyse monetary child poverty and multidimensional deprivation simultaneously arguing that both should be considered as complements rather than proxies to explain the situation of children.

The findings in this paper are based on the cross-country application of the MODA methodology. The cross-country (CC-MODA) analysis has been developed to measure child poverty across low- and middle-income countries by applying international standards as guiding principles for the construction of a core set of dimensions and indicators. The details of the general MODA methodology are set out in de Neubourg et al., 2012a, while the specificities regarding this multi-country study are given in the CC-MODA Technical Note (de Neubourg et al., 2012b). This article presents findings on multidimensional child poverty in sub-Saharan Africa by country as well as for the whole region. The core of the multidimensional poverty analysis has been performed for thirty countries (see Annex 1 for the list of countries). These results are complemented by a prediction of multidimensional poverty rates among children in the remaining fourteen countries in the region in the latter half of this study, giving an indication on the number of multidimensionally poor children in the whole region.

3 Methodology

Following a rights-based framework, the dimensions included in the study have been selected in line with the Convention on the Rights of the Child (CRC) as presented in Table 1. The selection of indicators and thresholds for CC-MODA has been guided by internationally accepted standards assuring relevance to children's development irrespective of their country of residence, socio-economic status, or culture (for more details see Annex 2 or the CC-MODA Technical Note, De Neubourg et al., 2012b).

The analysis uses Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS) as data sources because of their relatively rich information on child deprivations in low- and middle-income countries as well as their ability to ensure international comparability.

The lack of data in the DHS and MICS datasets on some of the key aspects of child well-being has presented challenges when selecting dimensions and indicators. The choice of variables has been partially shaped by data availability. Seven dimensions⁶ have been

included in the CC-MODA analysis for sub-Saharan Africa, three dimensions referring to all children below the age of 18 and the other four being age-specific (see Figure 1). The dimensions of water, sanitation, and housing refer to all children irrespective of their age, while nutrition and health are measured for children below age five,⁷ and education and information are measured for school-age children and adolescents.

The two age-groups used for the analysis represent children at infancy and early childhood (children under five years), and children of school-age and adolescents (5 to 17 years). Most findings are presented by age-group, while key outcomes are also presented for all children below age 18.

The analysis firstly shows results by dimension using a unidimensional approach (i.e., looking at one dimension at a time). The dimensional deprivations are then counted for each child applying an equal weight to each of the dimensions analysed. This is a multidimensional approach that allows to analyse deprivation overlap, deprivation distribution, and multidimensional poverty rates and indices. To separate the multidimensionally poor from the non-poor, a threshold of two dimensional deprivations has been chosen, defining multidimensional child poverty as missing two to five aspects of basic child well-being captured by the selected dimensions. This cut-off has been chosen based on the deprivation distribution among children in the region (see in the results section on deprivation distribution), and is in line with other research carried out on multidimensional poverty in sub-Saharan Africa (e.g. SSA 2013; Ballon and Duclos, 2016)⁸.

The number of multidimensionally poor children is expressed as a share of the total child population of the region and by country, as well as in absolute numbers. The absolute numbers are obtained by weighting the respective child population of each country⁹. In addition to the multidimensional poverty headcount rates, the study presents the average deprivation intensity among the multidimensionally poor children to account for the depth of children's deprivation. The two measures are then used to calculate a summary measure of multidimensional child poverty called the adjusted multidimensional poverty headcount rate (M_0).¹⁰ It is an index ranging between 0 and 1, incorporating the number and proportion of multidimensionally poor children and the number of deprivations these children experience, calculated using the following formula:

$$M_0 = \frac{\sum q_k \times c_k}{n \times d}, \text{ with } c_k = D_i \times y_k$$

Where

⁶The eighth dimension – Protection from violence – is included in the standard CC-MODA method whenever the violence module is available in the dataset. Since it was unavailable for several of the 30 countries in sub-Saharan Africa, the Violence dimension has been excluded from this specific study to ensure comparability of results in the region.

⁷Although nutrition and health are crucial for child well-being regardless of children's age, these dimensions are not included in the analysis for children aged 5–17 due to lack of adequate indicators for this age-group in the DHS and MICS surveys.

⁸The analysis has also been carried out using all thresholds; the results can be found in de Milliano and Plavgo (2014).

⁹To calculate child population, the percentage of children in a country (authors' calculations based on MICS/DHS data; See Annex 1) is multiplied with the total population of each country in 2012 (World Bank Databank, 2014).

¹⁰Alkire and Foster (2011) methodology has been applied to calculate the average deprivation intensity (A) and the adjusted multidimensional poverty headcount rate (M_0).

q_K - number of children multidimensionally poor according to cut-off point K ;

n - total number of children

d - total number of dimensions considered per child

D_i - number of deprivations each child i experiences

y_K - poverty status of a child i depending on the cut-off point k , with $y_K=1$ if $D_i \geq k$; $y_K=0$ if $D_i < k$.

Alongside multidimensional poverty, the methodology also encourages the use of monetary poverty. Both concepts of poverty complement each other, with monetary poverty concentrating on the average financial means available to the household, and multidimensional poverty focusing on whether children's basic needs are satisfied. Following the MODA methodology it would be most informative if the simultaneous experience of both concepts was assessed at the individual level¹¹. Since the datasets used for this analysis do not include data needed for measuring monetary poverty, this article studies the correlation between the two measures by using the aforementioned methodology for multidimensional child poverty, and comparing it with aggregate monetary poverty rates retrieved from a secondary data source¹².

4 Findings

The findings section presents five sets of results; first, it presents the deprivation rates by dimension; second, it shows the deprivation distribution, deprivation overlap, the multidimensional poverty rates, and the number of multidimensionally poor children in the selected sub-Saharan African countries; third, it compares multidimensional child poverty rates across the thirty countries; fourth, the study shows the correlation between multidimensional child poverty and monetary poverty; and fifth, it predicts multidimensional child poverty rates for the sub-Saharan region as a whole based on the findings of the thirty countries analysed.

4.1 Single deprivation analysis

The single deprivation analysis is the basis for understanding the situation of children in each of the dimensions analysed. Knowledge of the deprivation rates by dimension gives a starting point for the multidimensional poverty analysis to follow.

The results show that the highest deprivation rates of the seven dimensions analysed are in sanitation (67% for the younger and 66% for the older age-group), health (56% for the younger age-group) and water (52% for younger and 51% for older children). Table 2 shows that the deprivation rates are higher in rural areas in almost all dimensions apart from nutrition for which the deprivation rates are not statistically different by area¹³. For children

¹¹Monetary poverty has been included in other MODA studies such as the studies on Mali (De Milliano and Handa, 2014) and the European Union (Chzhen et al, 2016).

¹²International monetary poverty rates of USD 1.25 PPP a day are applied, retrieved from the World Bank Databank.

below the age of five, the main issues are sanitation (78%) and health (64%) in rural areas, and nutrition (41%) in urban areas. Children between age 5 and 17 mainly experience deprivations in sanitation (77%) and water (62%) in rural areas, and sanitation (34%) in urban locations. Also, more than one third (35%) of school age and adolescent children across the analysed countries in sub-Saharan Africa are deprived in schooling (41% in rural areas and 20% in urban areas). For the deprivation rates by indicator, see Annex 3 which provides further details on the drivers of deprivation per dimension.

Unlike monetary poverty which is a household-level measure, deprivation analysis provides more space to measure individual level differences. In the case of CC-MODA, four indicators are measured at an individual level allowing for analysis by gender.¹⁴ When looking at the children of all thirty countries jointly, some gender differences are observed (although with variations across countries). Table 3 shows the deprivation rates for boys and girls regarding wasting, immunisation, school attendance, and primary school attainment. The general trend in sub-Saharan Africa is that for children below the age of five the deprivation rate in wasting is higher among boys (9.4% for boys and 7.8% for girls), while no statistically significant gender differences can be observed in terms of DPT immunisation. With regards to schooling indicators for older children, the percentage of children not attending school at compulsory school age is significantly higher among girls, while the percentage of adolescents without primary education does not show any statistically significant difference.

4.2 Deprivation distribution among children in sub-Saharan Africa

The multidimensional deprivation analysis looks beyond single sectors, and captures the number of deprivations experienced by each child. The results provide with an understanding about the intensity of deprivation and the overlap of certain dimensions.

Figure 2 shows that among children below the age of five in the thirty countries analysed (119.7 million in total), 8.5% (10.2 million) are not deprived in any of the five dimensions, while a similar share of children (8% or 9.4 million) are experiencing all five deprivations simultaneously. More than half of the children of this age-group (54% or 64.3 million) are deprived in three to five dimensions. Among children of the older age-group the breadth of deprivation is relatively lower, with 36% of children between the age 5 and 17 deprived in only one or none of the five dimensions. 41% are having three to five deprivations, representing 102.2 million out of 248.2 million children.

This difference is to a large extent driven by the two individual level dimensions for the older age-group, namely education and information, as the deprivation rates in these two dimensions are lower than the deprivation rates in the dimensions of health and nutrition for children under age five. Table 2 on deprivation headcount rates by dimension and age-group has shown this in more detail.

¹³Although it would be informative to analyse the differences in deprivation rates within urban areas focusing on slum areas, the data used for this analysis do not permit this.

¹⁴Analysis by gender using CC-MODA is only possible at indicator level; it is not done for the multidimensional poverty analysis because five out of seven dimensions are constructed using indicators that are applied to all children of the same household.

Large disparities in the deprivation distributions can be found when breaking the total child population into sub-groups based on children's geographic location and socio-economic characteristics of the children and their parents¹⁵. In particular, children in rural areas, children who live in households that have experienced under 5 child mortality, children whose mothers have a low educational attainment, and children living in households with a higher number of children are more likely to experience multidimensional deprivation and a higher multidimensional deprivation intensity (i.e., a larger share of children with the aforementioned characteristics have three, four, or five dimensional deprivations).

4.3 Deprivation overlap analysis

Deprivation overlap analysis shows whether dimensional deprivations are unique issues or whether the deprivation in a given dimension is experienced simultaneously with other deprivations. This knowledge may serve as input to design and consolidate policy interventions.

Figure 3 presents the deprivation incidence for three dimensions by area, subdivided by the extent of overlap with other deprivations. The results show that deprivation in nutrition for children under the age of five across the selected sub-Saharan countries is similar in rural and urban areas (39%), but the nutrition deprivation in rural areas is more often associated with deprivations in other dimensions. Among the children living in urban areas and being deprived in nutrition, more than one-third (37%) experience malnutrition as a unique problem, while this is so only for 6% of the malnourished children in rural areas. More than a half (58%) of the malnourished children in rural areas experience three to five other deprivations, while this is so only for 10% of the malnourished children living in urban areas.

Similarly, health and education cannot be regarded in isolation from other deprivations as they are not stand-alone problems in the region. In rural areas, for example, roughly half of all the children deprived of access to health-care are deprived in 3 or 4 other dimensions, while in urban areas only 16% of those deprived in health experience 3 to 4 other deprivations.

The results from the overlap analysis reconfirm the need for integrated approaches to address children's poverty. Figure 4 shows the interaction between the deprivations in nutrition, health, and sanitation among all children below the age of five in the selected countries divided by area. The findings for children in rural areas show high levels of deprivation and a high degree of deprivation overlap. While 39% of all the children living in rural areas are deprived in nutrition, 90% of these malnourished children also suffer from lack of access to health services and/or are using an unimproved toilet or latrine. Thus, addressing the nutritional problems would only solve one of the many problems these children are faced with. The overlap of nutrition, health, and sanitation deprivations is much smaller for children living in urban areas, which may require different intervention strategies

¹⁵While gender is an important expected correlate to deprivation, results are not presented by gender given that the inclusion of indicators measured at the household level would mask any gender differences.

than for children in rural areas where more than one fifth of all children experience all three specified deprivations.

4.4 Multidimensional poverty ratios

In the thirty countries included in the analysis, 86.4% of all the children below the age of 18 experience at least one out of five deprivations analysed (317.7 million children). These children suffer from 2.6 deprivations on average (see Figure 5). The average number of deprivations among children with at least one deprivation ranges from 1.7 in Gabon and Swaziland to 3.4 in Chad and Ethiopia¹⁶. Based on the deprivation distribution (Figure 2) and on the average number of deprivations among children in the thirty countries analysed (Figure 5), in this study children are identified as multidimensionally poor when experiencing two or more deprivations. The chosen threshold for identifying the multidimensionally poor and non-poor children is in line with other research carried out on multidimensional child poverty in sub-Saharan Africa, such as research in South Africa (SSA 2013), and South Sudan and Sudan (Ballon and Duclos). Following this threshold, 67% children are identified as multidimensionally poor across all thirty countries. Deprivation incidences show large variation with a difference between the lowest and the highest multidimensional child poverty rate of 60 percentage points (30% in Gabon and 90% in Ethiopia).

The deprivation intensity and incidence are generally positively correlated, apart from a few exceptions. For instance, the percentage of multidimensionally poor children is higher in Tanzania and Malawi (76% and 79%, respectively) compared to the Central African Republic and Mozambique (72% and 75%, respectively). The average number of deprivations that children experience, however, is higher in the Central African Republic and Mozambique (2.9 deprivations in both) than in Tanzania and Malawi (2.7 and 2.6 deprivations respectively). The combination of these findings means that the depth of children's deprivation is greater in the Central African Republic and Mozambique, while Tanzania and Malawi have a higher share of multidimensionally poor children¹⁷.

The adjusted multidimensional poverty ratio (M_0) combines the two aforementioned measures to get to an overall child poverty measure that captures both the incidence and intensity of the deprivation (Figure 6). This ratio ranges between 0 and 1, zero showing no deprivation (according to the cut-off chosen) and one showing that everyone included in the analysis is deprived in all the dimensions analysed. The adjusted multidimensional child poverty ratio is 0.42 across the countries at hand using a threshold of two dimensional deprivations, ranging from 0.14 in Gabon to 0.64 in Ethiopia. This summary measure slightly changes the ranking of countries presented in Figure 5, ranking countries with a higher deprivation intensity as worse off in cases when multidimensional poverty rates are similar, such as in the case of Central African Republic and Mozambique. The map (Figure 6) indicates a few clear groupings of countries with different deprivation levels. The highest adjusted multidimensional poverty levels are found in Ethiopia (0.64) and at the centre of the

¹⁶The average deprivation intensity (A) for Figure 5 is calculated using a cut-off of one dimension to avoid censoring the deprivations that may be experienced in isolation from other deprivations.

¹⁷See De Milliano and Plavgo (2014) for more details on results by threshold and age-group.

continent (Chad, the Democratic Republic of Congo, Niger, and Central African Republic, ranging between 0.49 and 0.64), followed by a stretch of countries in the East (Mozambique, Malawi, Tanzania, Uganda and Kenya, ranging from 0.37 to 0.49) (See Annex 3 for the adjusted multidimensional poverty ratios by country).

Figure 7 shows the contribution of each country to the total adjusted multidimensional poverty ratio of the selected sub-Saharan African countries (total $M_0 = 0.42$). The composition of the pie chart helps to understand where the largest number of multidimensionally poor children are located across the thirty countries. The largest contributions come from Ethiopia (20%), Nigeria (17%) and the Democratic Republic of the Congo (13%). The extent to which each country contributes to the total adjusted poverty ratio depends not only on the percentage of multidimensionally poor children per country and their deprivation intensity, but also on the size of the child population per country (see Annex 6). For this reason, countries such as Chad with a high poverty incidence and intensity contribute relatively little since their child population in absolute numbers is small compared to other countries analysed.

4.5 Composition of the adjusted multidimensional poverty headcount by dimension

Figure 8 shows how the five selected dimensions contribute to the overall adjusted multidimensional child poverty ratio. The adjusted poverty ratio for children under the age of five across the thirty selected countries (0.48) is composed of the following: 14% derives from deprivations in nutrition, 21% from health, 21% from water, 26% from sanitation, and 18% from deprivations in housing. For the older children, the total adjusted poverty headcount (0.39) consists of 13% from education, 13% from information, 24% from water, 29% from sanitation, and 21% from deprivations in housing. These findings suggest that deprivation in sanitation, in combination with health and water deprivations for the younger children, and in water and housing for older children, are the main contributors of multidimensional poverty for children in sub-Saharan Africa.

There are noteworthy differences between countries in terms of the dimensional contributions to the total multidimensional child poverty level. The figure highlights that the relative contribution is most similar for the countries with a higher adjusted poverty ratio, while there is more heterogeneity in the contribution pattern for countries with a lower adjusted poverty ratio. For children below age five, Gabon and Equatorial Guinea, for instance, have a low contribution of housing to their overall multidimensional poverty ratio (between 4% and 6%) and a larger relative contribution from health deprivations (28%), while in Malawi housing is a relatively larger issue than health (contributing 28% and 13%, respectively).

4.6 Monetary poverty and multidimensional child poverty

The MODA methodology applied in this analysis distinguishes two main concepts of poverty: monetary poverty and multidimensional poverty (de Neubourg et al., 2014), and uses both provided that the data has the necessary variables. Especially when regarding children, differences between multidimensional poverty and monetary poverty are expected, as children need goods and services that are more likely to be subject to missing or

incomplete markets, such as health care, school or nutritional needs (Feeny and Boyden, 2004; Roelen and Gassmann, 2008; Roche, 2013). Besides, while monetary poverty measurement concentrates on the average financial means available to the households where children live, multidimensional deprivation measurement attempts to determine whether children's basic needs are satisfied (Minujin et al, 2006). Since DHS and MICS surveys do not have any information on households' consumption or income, monetary child poverty could not be calculated. For this reason, secondary aggregate data from the World Bank have been used to show the monetary poverty rates in sub-Saharan Africa, measured as people living below USD1.25 PPP a day. While acknowledging that the level of the poverty rates cannot be compared given that children are generally overrepresented in the poorer segments of the society, the comparisons based on ranking of poverty are useful to place the results of the multidimensional child poverty analysis into perspective.¹⁸

Figures 9 and 10 show poverty rates per country, comparing the ranking based on monetary poverty rates for the total population retrieved from the World Bank Databank (Figure 9) with the ranking based on multidimensional child poverty rates calculated based on the MODA methodology (Figure 10)¹⁹. The figures reveal that country ranking varies depending on the poverty measure used. Countries with the highest extreme monetary poverty are DR Congo and Burundi (88% and 81%), followed by Malawi, Rwanda and the Central African Republic (ranging from 63% to 72%). The highest multidimensional child poverty rates, however, are in Ethiopia, Chad, and Niger (90%, 88%, and 85%, respectively), followed by DR Congo and Malawi (83% and 79%). Differences can be observed in terms of country ranking, and in the level of monetary poverty and multidimensional child poverty identified per country. In Gabon, for example, while the extreme monetary poverty rate is very low (6%), the multidimensional poverty analysis reveals that 30% of all children are multidimensionally poor.

Figure 11 looks at the correlation between the two measures of poverty presented above. For most of the countries analysed, monetary poverty rates for the total population are considerably lower than multidimensional poverty rates for children, which can be due to differences in unit as well as structural differences in the measure. Regardless of the differences, a sizable group of countries clusters around the trend line suggesting moderate correlation between the two measures. Nevertheless, the relatively high margin of unexplained variance between the two measures ($R^2=0.19$) suggests that there are other important factors beyond monetary poverty that predict child deprivation rates in this region. Further research is necessary to understand the structural differences between monetary poverty and multidimensional child poverty across countries in sub-Saharan Africa.

4.7 Multidimensional poverty among children in sub-Saharan Africa

Based on the results of the thirty selected countries, we have predicted the multidimensional child poverty rates for the remaining 14 sub-Saharan African countries to be able to estimate

¹⁸Additional comparisons between multidimensional child poverty, national poverty, and national child poverty have been carried out (see De Milliano and Plavgo, 2014), but are not included in this paper due to space limitations.

¹⁹Data on monetary poverty and multidimensional poverty are, where possible, used from the same year. There are, however, time lags for some of the countries, so the comparison should be interpreted with caution due to discrepancies in the year of measurement. Annex 1 specifies the year by country and data source.

the total number of multidimensionally poor children in the whole region.²⁰ In order to make this prediction we use an OLS regression model estimating the relationship between multidimensional child poverty rates and the Human Development Index (HDI) of the countries included in the analysis (see the model in Annex 5)²¹. The regression includes control variables on the share of urban population and the population size in 2012²² and is weighted by the countries' population size. The HDI, the percentage of urban population and the total population size have been selected as parameters describing the socio-economic situation and the level of development of the countries. While beyond the scope of this study, further analysis on the factors associated with multidimensional child poverty is necessary to build a more accurate predictive model. The HDI is selected as main predictor following other multidimensional poverty and deprivation studies using the HDI or dimensions similar to its elements to estimate multidimensional poverty (see Klugman et al., 2011; Alkire and Santos, 2014)²³. Estimates for the whole region show that 291 million out of a total of 452 million children in the 44 countries in sub-Saharan Africa are multidimensionally poor (see Table 4). In other words, 64.4% of children in the 44 countries of sub-Saharan Africa are multidimensionally poor, deprived in two to five dimensions of basic child rights.

The number of monetary poor children is calculated based on monetary poverty rates for the total population retrieved from the World Bank Databank, defined as estimated share of the total population living below USD1.25PPP a day. The available poverty rates were applied to the child population size (number of children under age 18) in each of the countries analysed to make an estimation of the absolute number of poor children. The difference between the monetary and multidimensional poverty rates is more than 16 percentage points, with an estimated 48.2% of all children being monetary poor and 64.6% experiencing multidimensional poverty. Within the 41 countries for which the estimates were made these represent 213 million children living in extreme poverty below USD1.25 PPP a day, and 286 million children experiencing two or more deprivations (see Annex 6 for all estimates).

Even though the two types of poverty show a large discrepancy, it should be noted that the number of children in extreme poverty is likely to be an underestimation; the calculations of monetary poverty are based on monetary poverty rates of the total population (weighted by population size of children in each of the countries analysed), while children are often found to have higher monetary poverty rates compared to the rest of the population (e.g., Olinto et al. 2013; SSA 2013).

Given the data restrictions of this study, we are unable to conclude whether the multidimensionally poor children are at the same time monetary poor. In order to perform an overlap analysis between the two poverty measures, it is necessary to match the information on both types of poverty for the same observations in the data. Some of the country-specific

²⁰Calculations are made for 44 developing countries in Sub-Saharan Africa as classified by the World Bank, excluding Mauritius, Seychelles, Somalia and South Sudan, while adding Equatorial Guinea and Sudan.

²¹Both the HDI and the multidimensional child poverty measure contain dimensions related to living standards, health, and education, suggesting a certain degree of endogeneity. However, the indicators that have been used for constructing the two measures differ, allowing the use of HDI when predicting the multidimensional poverty rates for the purpose of this analysis.

²²The HDI, the share of urban population, and the population size in 2012 are retrieved from the World Bank (2014).

²³As a robustness check the last column in Annex 6 estimates the deprivation rates for the thirty countries in the sample using the HDI predictive model.

child poverty studies have been able to do this showing that monetary poverty and deprivations overlap to some extent, but large proportions of children who are multidimensionally poor are not necessarily monetary poor, and vice versa (see for instance, De Milliano and Handa, 2014; Klasen, 2000). Differences between deprivation and monetary poverty are expected, especially among children due to differences in intra-household distribution of resources, and because children need goods and services that are more likely to be subject to missing or incomplete markets, among other factors. The two measures of poverty complement each other when measuring and analysing child well-being as they reveal different aspects of child poverty, which requires different policy responses.

5 Conclusion

This study presents some of the key results on the multidimensional child poverty analysis in thirty sub-Saharan African countries, using the Multiple Overlapping Deprivation Analysis (MODA) methodology. The methodology anchors the selection of its dimensions in a child-rights framework following the Convention on the Rights of the Child. The same dimensions and thresholds are used across thirty countries included in the analysis, allowing for comparable findings that can be aggregated at a regional level. The findings show that 67% of all children across thirty countries in sub-Saharan Africa experience at least two out of a total of five deprivations critical to children's development. This percentage represents 247 million out of a total of 368 million children in the 30 countries. In an effort to estimate the number of multidimensionally poor children in the entire region of sub-Saharan Africa, a prediction has been made for the remaining 14 countries that were not included in the analysis. The results show that 291 million children in sub-Saharan Africa are multidimensionally poor. This figure can serve as a regional baseline for multidimensional child poverty as suggested by target 1.2 of the Sustainable Development Goals. Further analyses on multidimensional child poverty are necessary to determine the factors associated with multidimensional poverty. Analyses by gender, subnational regions, and more specific age-groups would be helpful to further understand the distribution of multidimensional poverty across the child population, but are beyond the scope of this paper. Additionally, these first estimates create possibilities for including multidimensional child poverty estimates in more specific discussions, such as, for instance, understanding poverty trends in sub-Saharan Africa, analysing poverty and deprivation in specific regions such as ECOWAS or SADAC, or in analyses placing the progress made in MDG1 and various other targets into perspective.

Considering the SDGs, the article also explores the relationship between multidimensional child poverty and monetary poverty measured as living on less than USD1.25 PPP a day. The comparison between the two measures of poverty shows a large discrepancy. While more specific analyses on the level of the child are required to assess the joint experience of monetary poverty and multidimensional deprivation, the results presented here are in line with the existing poverty literature. The conceptual and empirical difference between the two measures of poverty emphasise the need for a child-specific measure analysing direct child outcomes and a monetary poverty measure calculated at a child level to be able to study the relationship and the differences between the two measures of poverty which can in turn inform policy-making when addressing child poverty.

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• Infant and young child feeding • Wasting	Nutrition	Education	• Compulsory school attendance • Primary school attainment
• DPT immunisation • Skilled birth attendance	Health	Information	• Availability of information devices
• Drinking water source • Distance to water	Water	Water	• Drinking water source • Distance to water
• Type of toilet	Sanitation	Sanitation	• Type of toilet
• Material of floor and roof • Overcrowding	Housing	Housing	• Material of floor and roof • Overcrowding
	Age 0-4	Age 5-17	

Figure 1.

Life-stages, dimensions and indicators used for the CC-MODA analysis in sub-Saharan Africa

Note: more detailed information on the definitions and thresholds of indicators can be found in Annex 2.

Figure 2.
Number of deprivations children suffer from, by age-group

Figure 3.
Deprivation overlap by dimension

Figure 4.
Overlap of nutrition (NU), health (HE) and sanitation (SA) by area of residence

Figure 5.
Multidimensional poverty incidence and average deprivation intensity by country for children below 18 years

Figure 6.

Adjusted multidimensional poverty ratio: all children, 2–5 deprivations

Note: See Annex 1 for country names and respective abbreviations

Figure 7:

Contribution of each country to the total adjusted multidimensional poverty ratio: all children, 2–5 deprivations

Figure 8.

Contribution of each dimension to the total adjusted multidimensional child poverty ratio: children experiencing 2–5 deprivations

Figure 9.
Monetary poverty at USD1.25 (PPP) a day (% of total population)
Source: World Bank Databank (2014)

Figure 10.
Multidimensional poverty: children deprived in 2–5 dimensions (% of children below 18)
Source: CC-MODA based on DHS and MICS data

Figure 11.

Relationship between monetary poverty (share of population living under \$1.25 PPP a day) and multidimensional child poverty (share of children under age 18 deprived in 2–5 dimensions)

Note: Monetary poverty rates retrieved from the World Bank (2014); see Annex 1 for estimation year per country.

Table 1

Dimensions of Child Well-being based on the Convention on the Rights of the Child

Categories	Dimensions
Survival and Development	Food, nutrition; Water, sanitation; Health care; Environment/pollution (CRC Art. 24); Shelter, housing (CRC Art. 27); Education (CRC Art. 28); Leisure; Cultural activities (CRC Art. 31); Information (CRC Art.13, 17)
Protection	Exploitation, child labour (CRC Art. 32); other forms of exploitation (CRC Art. 33–36); Cruelty, violence (CRC Art. 19, 37); Violence at school (CRC Art. 28); Social security (CRC Art 16, 26, 27)
Participation	Birth registration, nationality (CRC Art. 7, 8); Information (CRC Art.13, 17); Freedom of expression, views, opinions; Being heard; Freedom of association (CRC Art.12–15).

Source: Authors' selection based on the Convention on the Rights of the Child (United Nations, 1989)

Table 2

Deprivation headcount rates by dimension and area

	0–4 years			5–17 years		
	National	Rural	Urban	National	Rural	Urban
Nutrition	40.3%	40.2%	40.7%			
Health	55.8%	64.1% *	30.1% *			
Education				35.2%	40.7% *	20.1% *
Information				26.3%	32.8% *	8.0% *
Water	51.8%	62.0% *	20.7% *	50.8%	61.5% *	20.5% *
Sanitation	67.1%	77.8% *	34.1% *	66.0%	77.2% *	34.2% *
Housing	44.2%	52.2% *	19.8% *	43.7%	51.1% *	22.5% *

* Indicates statistically significant differences in deprivation rates by area ($p < 0.05$).

Table 3

Deprivation headcount rates by indicator and gender

	Girls	Boys
Wasting: children with height-for-weight below -2SD from ref. population	7.8% *	9.4% *
Immunisation of DPT1, DPT2, and DPT3	37.3%	37.4%
School attendance among children of compulsory school age	24.2% *	20.9% *
Primary school attainment among children beyond primary school age	50.7%	51.3%

* Indicates statistically significant differences in deprivation rates by gender ($p < 0.05$).

Table 4

Results on the actual and predicted number of multidimensionally and monetary poor children in sub-Saharan Africa

	Total number of children	Deprived in 2–5 dimensions	Monetary poverty (USD1.25PPP)
Total 30 countries in sub-Saharan Africa (actual numbers)	367,929,196	246,965,808	
As % of total	100.00%	67.1%	
Total sub-Saharan Africa (44 countries; predicted for 14 countries)	452,184,792	291,059,913	
As % of total	100.00%	64.4%	
Total sub-Saharan Africa (41 countries - excl. ZWE, GNQ, ERI)	442,222,698	285,574,716	213,139,484
As % of total	100.00%	64.6%	48.2%

ANNEX 1 -

List of countries and data sources

Country	ISO code	Survey year	Data	Violence indicator	Poverty ratio at \$1.25 a day (WB): year of estimation
Benin	BEN	2011–12	DHS	No	2012
Burkina Faso	BFA	2010–11	DHS	Yes	2009
Burundi	BDI	2010–11	DHS	No	2006
Cameroon	CMR	2011	DHS	No	2007
Cent. African Rep.	CAF	2010	MICS	Yes	2008
Chad	TCD	2010	MICS	Yes	2011
Comoros	COM	2012	DHS-MICS	Yes	2004
Congo	COG	2011–12	DHS	No	2011
Congo DR	COD	2010	MICS	Yes	2006
Côte d'Ivoire	CIV	2011–12	DHS	Yes	2008
Equatorial Guinea	GNQ	2011	DHS	No	N/A
Ethiopia	ETH	2011	DHS	No	2011
Gabon	GAB	2012	DHS	Yes	2005
Gambia	GMB	2010–11	MICS	Yes	2003
Ghana	GHA	2011	MICS	Yes	2006
Guinea	GIN	2012	DHS-MICS	No	2012
Kenya	KEN	2008–09	DHS	Yes	2005
Lesotho	LSO	2009–10	DHS	No	2010
Malawi	MWI	2010	DHS	No	2010
Mozambique	MOZ	2011	DHS	No	2009
Niger	NEG	2012	DHS	Yes	2011
Nigeria	NGA	2011	MICS	Yes	2011
Rwanda	RWA	2010–11	DHS	No	2011
Senegal	SEN	2010–11	DHS	No	2011
Sierra Leone	SLE	2010	MICS	Yes	2011
Swaziland	SWZ	2010	MICS	Yes	2010
Tanzania	TZA	2010	DHS	Yes	2012
Togo	TGO	2010	MICS	Yes	2011
Uganda	UGA	2011	DHS	No	2009
Zimbabwe	ZWE	2011–12	DHS	Yes	N/A

ANNEX 2 –

Definitions and thresholds of deprivation indicators

Dimension/Indicator	Deprived if
Nutrition	
Infant and young child feeding	<u>Children of 0–5 months</u> : no exclusive breastfeeding; <u>Children of 6–8 months AND breastfed</u> : Less than 2 feedings in the last 24 hours; <u>Children 9–23 months AND breastfed</u> : Less than 3 feedings in the last 24 hours; <u>Children 6–23 months NOT breastfed</u> : Less than 4 feedings of which one should be milk (WHO, 2008).
Weight for Height	Children under age 5: weight for height (wasting) is below –2 standard deviations from the median of the reference population (see e.g. MDG 1 target 2) (UN MDG, 2003)
Health	
Immunisation	For children aged 1 to 4 years, deprivation is defined as not having received DPT1, DPT2 and DPT3. Children younger than 12 months are not considered deprived, because it is possible to receive DPT vaccines during the first year of their lives. The receipt of DPT3 is only marked as non-deprived if DPT1 and DPT2 are also received (UNICEF, WHO, 2011).
Skilled attendance at birth	Children under age 5: No attendant was present at birth, or birth was assisted by an unskilled attendant such as (trained/untrained) traditional birth attendants, community health workers, voluntary health workers, relatives and friends. Skilled assistance during birth delivery can be provided by doctors, midwives, nurses, health personnel, and trained birth attendants. Skilled birth attendance serves as a proxy for access to qualified health care services. Access to health care services at the time of the interview was unavailable (WHO, 2004)
Education	
Compulsory school attendance	Children of compulsory school age: deprived if not attending school. Compulsory school age is country-specific and UNESCO data ¹ is used for each country. The compulsory school starting age is corrected with one year for differences in the start of the school year.
Primary school attainment	Children of secondary school age or older: child deprived if has not attained primary school. Primary school completion age is derived from UNESCO data.
Information	
Availability of information devices	Children aged 5–17: Children who live in households without access to radio, television, phone, mobile phone and computer. The indicator serves as a proxy to the access to mass media and information as is recognised in Article 17 of the CRC as important for children's social well-being and physical and mental health (CRC- United Nations, 1989).
Water	
Access to improved water source	Children under age 18: Children living in households with unimproved water sources such as unprotected wells, unprotected springs, vendor-provided water, bottled water (unless water for other uses is available from an improved source) and tanker truck-provided water. Improved water sources include household connections, public standpipes, boreholes, protected dug wells, protected springs, and rainwater collections (WHO, 2008).
Distance to water source	Deprived if it takes more than 30 min to search for water (go, get, come back) (WHO, 2008).
Sanitation	
Access to improved sanitation	Children under age 18: Children living in households with sanitation not considered as improved such as bucket latrines, public latrines and open latrines. Improved sanitation includes connection to public sewers, connection to septic systems, pour-flush latrines, pit latrines with slab and ventilated improved pit latrines (WHO, 2008)
Housing	
Overcrowding	Children under age 18: 'More than four' people per sleeping room. An equivalence scale is applied, giving children aged 0–4 years a weight of 0.5, while other members are assigned a weight 1. This is based on the assumption that children have different needs in terms of space and different risks (i.e. diseases, infections, violence) from overcrowding according to their age-group. The threshold is established following UN HABITAT guidelines in combination with African data to make it suitable to the region (UN HABITAT, 2004).
Roof and floor material	Children under age 18: deprived if both, roof and floor are made of natural material. Roof and floor both shape the structure of the house, and can be considered to fulfil their climate protection function if at least one of the two elements is constructed from durable material (WHO, 2010).

ANNEX 3 –

Deprivation headcount rate by indicator and age-group

Dimension	Indicator	Deprivation headcount in %	
		0 to 4 years	5 to 17 years
Nutrition		40.3%	-
	Infant and young child feeding	56.6%	-
	Wasting (weight for height)	8.6%	-
Health		55.8%	-
	DPT immunisation (1–4 years)	37.4%	-
	Skilled birth attendance	49.1%	-
Education			35.2%
	Compulsory school attendance	-	22.6%
	Primary school attainment	-	51.0%
Information			26.3%
	Information devices	-	26.3%
Water		51.8%	50.8%
	Drinking water source	40.4%	38.9%
	Distance to water source	24.6%	25.2%
Sanitation		67.1%	66.0%
	Toilet type	67.1%	66.0%
Housing		44.2%	43.7%
	Floor and roof material	35.3%	32.2%
	Overcrowding	16.3%	20.2%
Protection from Violence		63.2%	62.7%
	Domestic violence	63.2%	62.7%

ANNEX 4 –

Adjusted multidimensional deprivation ratio by country and the contribution of each country to the total adjusted deprivation ratio across thirty countries (children deprived in 2–5 dimensions)

	Adjusted multidimensional deprivation ratio (M_0 , $K=2$)			Contribution to the total adjusted multidimensional deprivation ratio (M_0 , $K=2$)		
	Age 0–4	Age 5–17	All children	Age 0–4	Age 5–17	All children
Benin	0.36	0.29	0.31	1.0%	1.1%	1.1%
Burkina Faso	0.42	0.39	0.40	2.1%	2.4%	2.3%
Burundi	0.39	0.35	0.36	1.2%	1.3%	1.3%
Cameroon	0.39	0.27	0.30	2.4%	2.0%	2.2%
Central African Republic	0.54	0.45	0.49	0.8%	0.7%	0.8%
Chad	0.69	0.61	0.64	3.1%	3.0%	3.0%
Comoros	0.29	0.21	0.23	0.0%	0.1%	0.1%
Congo, Republic of	0.35	0.22	0.27	0.5%	0.3%	0.4%
Congo DR	0.59	0.57	0.58	12.5%	13.8%	13.3%
Cote d'Ivoire	0.37	0.24	0.28	2.0%	1.6%	1.7%
Equatorial Guinea	0.34	0.19	0.24	0.1%	0.0%	0.1%
Ethiopia	0.70	0.62	0.64	17.2%	21.5%	19.9%
Gabon	0.21	0.11	0.14	0.1%	0.1%	0.1%
Gambia	0.26	0.12	0.17	0.1%	0.1%	0.1%
Ghana	0.24	0.21	0.21	1.4%	1.8%	1.7%
Guinea	0.45	0.32	0.36	1.4%	1.4%	1.4%
Kenya	0.43	0.34	0.37	5.0%	5.3%	5.2%
Lesotho	0.40	0.30	0.33	0.2%	0.2%	0.2%
Malawi	0.46	0.48	0.47	2.1%	3.0%	2.7%
Mozambique	0.53	0.46	0.49	4.2%	4.4%	4.3%
Niger	0.63	0.53	0.57	4.0%	3.7%	3.8%
Nigeria	0.41	0.25	0.30	20.5%	14.5%	16.7%
Rwanda	0.20	0.19	0.20	0.6%	0.8%	0.7%
Senegal	0.30	0.22	0.24	1.2%	1.0%	1.1%
Sierra Leone	0.43	0.34	0.36	0.6%	0.7%	0.7%
Swaziland	0.19	0.16	0.17	0.1%	0.1%	0.1%
Tanzania	0.55	0.43	0.47	7.7%	7.5%	7.6%
Togo	0.40	0.33	0.35	0.7%	0.8%	0.8%
Uganda	0.50	0.39	0.43	5.9%	5.7%	5.8%
Zimbabwe	0.33	0.26	0.28	1.1%	1.2%	1.2%
TOTAL	0.48	0.39	0.42	100.0%	100.0%	100.0%

ANNEX 5 –

OLS Model and coefficients for the prediction of multidimensional deprivation

VARIABLES	Deprived in 2–5 dimensions
HDI	-1.159*** 0.17025
Share of urban population	-0.480*** 0.09422
Population	5.49e-09*** 9e-10
Squared population	-0.000*** 0.000
Constant	1.214*** 0.0878255
Observations	28
R-squared	0.905

$$\text{Deprived (2–5 dim)} = \beta_0 + \beta_1 * \text{HDI} + \beta_2 * \text{Share of urban population} + \beta_3 * \text{Population} + \beta_4 * \text{Population}^2$$

ANNEX 6 -

Estimates and predictions of multidimensional child poverty and monetary poverty

	Country	Total population	Share of urban population	Share of children as % of the total population ²	HDI (2013, based on 2012 data)	Multi-dimensional child deprivation ratio	No. of children deprived in 2–5 dimensions	% of total pop. living on less than \$1.25 a day	No. of poor children (living below \$1.25 PPP a day) ³	Robustness check: using HDI prediction
<i>Countries included in the CC-MODA analysis</i>										
1	Benin	10,050,702	42.7%	54.5%	0.48	57.6%	3,153,106	51.6%	2,825,205	51%
2	Burkina Faso	16,460,141	27.3%	54.3%	0.39	67.0%	5,990,418	44.5%	3,975,134	71%
3	Burundi	9,849,569	11.2%	53.7%	0.39	66.0%	3,488,715	81.3%	4,298,520	76%
4	Cameroon	21,699,631	52.7%	50.8%	0.50	51.5%	5,671,538	27.6%	3,040,605	48%
5	CAR	4,525,209	39.3%	53.0%	0.34	72.2%	1,732,441	62.8%	1,507,608	65%
6	Chad	12,448,175	22.1%	57.7%	0.37	88.3%	6,346,919	36.5%	2,625,022	74%
7	Comoros	717,503	28.0%	47.4%	0.49	47.1%	160,257	46.1%	156,888	52%
8	Congo	4,337,051	64.1%	48.8%	0.56	49.6%	1,049,341	32.8%	694,342	28%
9	Congo DR	65,705,093	41.0%	54.1%	0.34	83.1%	29,537,483	87.7%	31,179,639	86%
10	Côte d'Ivoire	19,839,750	52.0%	48.5%	0.45	52.0%	5,002,416	35.0%	3,370,859	54%
11	Eq. Guinea ¹	736,296	39.5%	43.6%	0.56	47.7%	153,138	N/A	N/A	38%
12	Ethiopia	91,728,849	18.2%	51.9%	0.44	90.1%	42,863,333	36.8%	17,502,131	89%
13	Gabon ¹	1,632,572	86.4%	45.3%	0.67	29.6%	218,696	6.1%	44,995	3%
14	The Gambia	1,791,225	57.7%	51.3%	0.44	32.7%	300,248	33.6%	308,787	44%
15	Ghana	25,366,462	52.1%	47.8%	0.57	41.3%	5,003,002	28.6%	3,463,337	42%
16	Guinea	11,451,273	35.7%	53.0%	0.39	61.2%	3,712,590	40.9%	2,479,306	65%
17	Kenya	43,178,141	24.4%	50.6%	0.54	62.8%	13,707,852	43.4%	9,466,712	66%
18	Lesotho	2,051,545	25.8%	42.2%	0.49	58.3%	505,003	56.2%	486,986	54%
19	Malawi	15,906,483	15.8%	54.9%	0.41	79.2%	6,914,569	72.2%	6,299,941	74%
20	Mozambique	25,203,395	31.4%	54.4%	0.39	74.8%	10,249,935	60.7%	8,319,165	73%
21	Niger	17,157,042	18.0%	60.5%	0.34	85.0%	8,821,217	40.8%	4,235,222	82%
22	Nigeria	168,833,776	45.2%	50.1%	0.50	53.5%	45,259,648	54.4%	45,995,646	54%
23	Rwanda	11,457,801	25.9%	51.1%	0.51	40.2%	2,353,691	63.0%	3,689,791	56%
24	Senegal	13,726,021	42.8%	50.2%	0.49	44.2%	3,044,286	34.1%	2,345,891	52%
25	Sierra Leone	5,978,727	38.9%	47.7%	0.37	62.7%	1,788,849	56.6%	1,615,670	62%
26	Swaziland	1,230,985	21.4%	49.7%	0.53	33.6%	205,544	39.3%	240,413	50%
27	Tanzania	47,783,107	29.5%	52.5%	0.49	75.9%	19,041,643	43.5%	10,908,177	70%
28	Togo	6,642,928	38.5%	49.8%	0.47	62.3%	2,062,128	52.5%	1,736,424	52%
29	Uganda	36,345,860	15.1%	57.6%	0.48	73.6%	15,395,855	37.9%	7,930,121	74%
30	Zimbabwe	13,724,317	32.8%	48.5%	0.49	48.6%	3,231,947	N/A	N/A	56%
<i>Countries for which deprivation rates are predicted*</i>										
31	Angola	20,820,525	41.7%	54.5%	0.53	50.5%	5,731,409	43.4%	4,917,484	

Country	Total population	Share of urban population	Share of children as % of the total population ²	HDI (2013, based on 2012 data)	Multi-dimensional child deprivation ratio	No. of children deprived in 2–5 dimensions	% of total pop. living on less than \$1.25 a day	No. of poor children (living below \$1.25 PPP a day) ³	Robustness check: using HDI prediction
32 Botswana	2,003,910	56.7%	38.8%	0.68	16.0%	124,519	13.4%	104,174	
33 Cape Verde	494,401	63.4%	37.8%	0.64	17.5%	32,696	13.7%	25,636	
34 Eritrea	6,130,922	21.4%	48.8%	0.38	70.2%	2,100,111	N/A	N/A	
35 Guinea-Bissau	1,663,558	46.9%	47.7%	0.40	53.9%	427,345	48.9%	387,836	
36 Liberia	4,190,435	48.5%	49.2%	0.41	52.6%	1,084,484	83.8%	1,727,633	
37 Madagascar	22,293,914	33.2%	49.4%	0.50	58.6%	6,446,482	87.7%	9,652,125	
38 Mali	14,853,572	37.6%	53.7%	0.41	63.7%	5,082,860	50.6%	4,037,535	
39 Mauritania	3,796,141	58.0%	46.9%	0.49	39.1%	696,787	23.4%	417,497	
40 Namibia	2,259,393	43.7%	44.2%	0.62	29.3%	292,717	23.5%	235,284	
41 São Tomé & Prin.	188,098	63.3%	49.3%	0.56	26.4%	24,498	43.5%	40,355	
42 South Africa	52,274,945	63.3%	36.3%	0.66	35.7%	6,785,497	9.4%	1,788,522	
43 Sudan	37,195,349	33.3%	47.9%	0.47	67.1%	11,947,165	19.8%	3,526,212	
44 Zambia	14,075,099	39.6%	52.9%	0.56	44.5%	3,317,535	74.3%	5,536,652	
Total 30 countries						246,965,808			
As % of total						67.1%			
Total 28 countries (excl. ZWE and GNQ)						243,580,722		180,742,538	
As % of total						67.5%		50.1%	
Total Sub-Saharan Africa (SSA - 44 countries)⁴						291,059,913			
As % of total						64.4%			
Total SSA (41 countries - excl. ZWE, GNQ, ERI)						285,574,716		213,139,484	
As % of total						64.6%		48.2%	

¹ The countries that have been excluded from the regression as outliers: Equatorial Guinea and Gabon.

² Source: United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Prospects: The 2015 Revision, DVD Edition.

³ Average share of children as % of population used; generally, child poverty rates are higher than those of the total population.

⁴ Although part of sub-Saharan Africa according to the World Bank classification, the following countries are excluded from this analysis: Somalia, South Sudan, Mauritius and Seychelles.