Published in final edited form as:

Child Indic Res. 2018 June ; 11(3): 755–781. doi:10.1007/s12187-017-9487-2.

Multidimensional Child Poverty in three Countries in Sub-Saharan Africa

Lucia Ferrone¹, Marlous de Milliano²

¹UNICEF Office of Research – Innocenti, Florence, Italy.

²Department of Public Policy, University of North Carolina, Chapel Hill, NC, United States.

Abstract

This paper describes and reviews the process of constructing a Multidimensional Child Poverty Measure in three sub-Saharan Africa countries: Mali, Malawi, and Tanzania. These countries recently (in 2015 and 2014) constructed such indicator using UNICEF's Multiple Overlapping Deprivation Analysis (MODA) methodology and conducted a comprehensive Child Poverty study including both deprivation and monetary poverty. This work describes how the indicator was adapted in the different contexts, discussing critical issues arisen during the process of the study, and it discusses the results of these studies in comparison. The goal is to offer an overview of the different national processes and how similar or different factors influence the results.

Keywords

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

1 Introduction

Children are one of the most vulnerable groups in society, as they depend on others and do not command economic resources of their own. Everywhere across the world, children are at the highest risk of poverty. Growing up in poverty can have long-term consequences, negatively affecting the life chances of future adults, with associated consequences for all members of society. Addressing child poverty is a powerful way to achieve equality of opportunities for all.

Child poverty is for the first time explicitly mentioned in the SDGs (UNDESA, 2016), as goal 1.2 states:

“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.”

The goal specifically addresses three key points: (i) children as a separate group to monitor, and therefore possibly as unit of analysis; (ii) recognition of poverty as a multi-faced experience, which implies an approach that goes beyond monetary poverty based on income

or expenditures; (iii) finally, the goal calls for national definitions, tailored to context and countries' specificities. While standardized measures, such as the \$1.90 PPP a day poverty line, are fundamental for global comparisons and are a powerful tool to evaluate progress, they can still hide national disparities. Using a country-specific definition of poverty allows to tailor the poverty measure to the specific context. In particular, for the growing category of middle income countries, a national definition assists in identifying the disparities within the country. Using multidimensional poverty helps to highlight the progress being made with respect to specific dimensions, unmasking potential trade-offs between various dimensions which are hidden by the use of monetary poverty measures. Moreover, multidimensional poverty analysis enables to select dimensions which constitute deprivation in a given country regardless of their location or level of development.

Distinguishing children as a separate group in the population allows to zoom in on the particularities of children's specific needs. In combination with the second feature, which describes poverty as multidimensional it leads to the suggestion that child poverty should be measured in a more comprehensive way than the currently predominant way of measuring the share of children living in households below the poverty line (White, Leavy, & Masters, 2003). Besides the explicit mention in the SDGs of 'poverty in all its dimensions', there are several reasons why measuring child poverty only with a monetary approach can be misleading. First, children generally are dependent on household income, but do not have decision-making power over its spending. Household resources are not automatically shared equally, or according to fixed proportions as is assumed in monetary poverty measurement. Secondly, income is a means to an end, not an end in itself. This latter aspect of well-being is especially true for children. Many goods and services that children need for their development are not available through common competitive market mechanisms; they either depend heavily on public investment (water, health, education), or simply cannot be purchased on the market (e.g. protection from violence and exploitation; participation in society). Therefore, due to the specific developmental needs and the possible shortcomings of monetary poverty measurement for children, the use of a multidimensional indicator is crucial in understanding and tackling poverty effectively.

Regardless of the methodology used, an ideal multidimensional child poverty measure should meet the following broad principles: (i) the choice of the components should be rooted in the Convention on the Rights of the Child. The human rights framework should ground and guide the components of any child poverty indicator, since it provides both background and justification. (ii) It should have the child as the unit of analysis. Since the measure concentrates on all aspects affecting child well-being, context factors cannot be ignored (e.g. shelter, access to water). Nevertheless, an ideal indicator should aim at focusing on the individual child as the unit of analysis. (iii) When possible, the indicator should address the different needs at different stages of a child's life. Children's developmental needs with regards to e.g. nutrition, health care, socialisation and education change throughout their life span, an ideal poverty measure should be able to reflect this. The indicator should also allow for enough flexibility, to be able to adapt to national contexts and therefore be a suitable SDG indicator.

Potentially, many methodologies can be adapted to this use following these guiding principles, for the purpose of this study we use the Multiple Overlapping Deprivation Analysis (MODA) methodology, which has specifically been designed to measure child deprivation.

The MODA methodology, was developed in UNICEF in 2012/2013 (De Neubourg, Chai, de Milliano, Plavgo, & Wei, 2012), building on existing methodologies concerned with multidimensional poverty measurement, such as the Bristol methodology (Gordon & Nandy, 2012; Gordon, Nandy, Pantazis, Pemberton, & Townsend, 2003) and the Alkire and Foster method (Alkire & Foster, 2011; Alkire & Santos, 2010). Similar to Bristol, MODA uses the Convention on the rights of the child (CRC) as a guide to define dimensions of deprivation and focuses on counting the number of deprivation experiences by each child. As a step forward, dimensions are defined differently for different age groups, and each dimension is defined by one or more indicator which are then aggregated using the union approach. The implication of the union approach is that no depth of deprivation can be measured within a dimension, since a deprivation of at least one indicator would make one deprived in the entire dimension. The choice for the union approach is supported by the overall rights-based approach, suggesting that a deprivation in one indicator constitutes a violation of children's basic needs. The importance of the indicators is stressed by placing the selection of the deprivation indicators at the core of the analysis process. The Bristol methodology is different in that it acknowledges the depth of deprivation by allowing for two different cut-offs points for each dimension: one that defines the deprivation as moderate, and one as severe³. However, this results in two headcounts: one for moderately deprived children and one for severely deprived. It still does not include information on the intensity of deprivation experienced by those who are deprived.

To this aim, MODA incorporates elements of the Alkire and Foster method, as it calculates the intensity of deprivation for each cut-off, and then produces the adjusted headcount ratio (the product of the headcount and the respective intensity), which can be decomposed in its components.

Differently from the Bristol and the Alkire and Foster methods, MODA also analyses the overlap of two or three dimensions at a time, in order to identify the most deprived children and to produce an assessment of child poverty that is as holistic as possible. The overlap analysis includes the overlap of child deprivation and monetary poverty, whenever possible. One of the key features of MODA is the easy adaptability to different contexts: empirical applications include cross national studies of SSA (de Milliano & Plavgo, 2014) and the EU (Chzhen, de Neubourg, Plavgo, & de Milliano, 2016), as well as various different national contexts (see, for example, Chzhen & Ferrone, 2016 on Bosnia-Herzegovina; de Milliano & Handa, 2014 on Mali).

The present work examines the different processes and outcomes of three national studies in Sub-Saharan Africa that used MODA methodology to define their own multidimensional

³E.g. for Nutrition, the indicator for moderate deprivation is a distance below 2 standard deviations from the WHO reference, while severe deprivation is defined as minus 3 s.d

child poverty measure: Mali, Malawi, and Tanzania. While more in-depth country-specific reports are available (see (de Milliano & Handa, 2014; National Bureau of Statistics & UNICEF, 2016; UNICEF, Forthcoming), this article concentrates on the similarities in the national processes and the commonalities in the findings across the three countries.

2 Background

All three countries are sub-Saharan low-income, low human development countries. Income has seen a recent increase in all three countries, but only in Tanzania growth appears to have continued –if to a lower pace- even through the recent economic downturn; while both Mali and Malawi experienced a severe hit in their economies, and are now recovering. All three countries have improved living standards, with an increase in life expectancy and schooling and other development indicators (World Bank, n.d.). Tanzania ranks higher in the HDI, while both Mali and Malawi remains among the lowest ranking countries. Poverty remains high, both at national and international standards, in all three countries: in Tanzania, about one quarter of the population is poor according to national poverty lines, while in Mali and Malawi between 40 percent and a half of the population are poor. In all countries, the share of population living under the international poverty line (\$1.90 PPP a day, 2011– (World Bank, n.d.)) is higher than the one calculated with the national poverty line. Furthermore, Malawi is facing severe consequences from climate change, with heavy floods in 2013 followed by hard droughts during the past year⁴. Mali face terror threats and a civil conflict in the North of the country⁵ (Chauzal & Van Damme, 2015).

Children have an increased vulnerability, being dependent on adult household members for the fulfilment of needs crucial to their further development. Moreover, in all three countries children below the age of 18 represent more than half of the population⁶. A previous analysis of child multidimensional poverty, conducted using the cross-country application of MODA, finds 79 percent of children deprived in at least 2 dimensions in Malawi and 76 percent in Tanzania⁷. This analysis is the result of a cross-country comparative study (de Milliano & Plavgo, 2014) that uses standardized indicators and dimensions, in which the indicator of child multidimensional poverty is not nationally defined. The proportion of children deprived here reported cannot be compared with the results of the national studies. However, it can be used as a reference point to set the context of the three countries used in this analysis.

3 Process and methodology

The process for the construction of the multidimensional child poverty measure took place in a similar way in each of the countries. The first step consisted in convening a meeting with UNICEF and governments counterparts: line ministries representatives, and representatives of the national statistical offices. In addition, representatives from civil

⁴ For 2013 floods: http://www.unicef.org/media/media_67684.html; for 2015/16 droughts: <http://www.aljazeera.com/news/2016/04/malawi-declares-state-emergency-drought-160413144707560.html>

⁵ However this is likely not reflected in the data, which were collected before the start of the conflict.

⁶ Source: authors' elaboration from survey data.

⁷ The same analysis is not available for Mali

society organisations, development partners and other UN agencies where usually invited to attend and contribute to the discussion. This meeting stands at the core of the analysis process assisting in defining the main components of the multidimensional poverty measure through discussion with key partners at the national level. Starting from the choice of the data to use, this technical working group defined appropriate age groups, dimensions and indicators for each group. During this process the scope and the perspective of the analysis are determined by discussing key decision points which are crucial to the results of the analysis. This stage is mainly concerned with creating appropriate definitions for deprivations fitting the local context, while remaining rooted in what is defined as deprivation by the CRC (see table 1). Further background on deprivation as a concept and on how to define dimensions of deprivation as input to poverty measure can be found in the 'Lost (in) Dimensions'-paper (De Neubourg, de Milliano, & Plavgo, 2014).

Data

The analyses rely on two very different types of datasets, i.e. surveys structured according to Living Standard Measurement Studies (LSMS) and Multiple Indicator Cluster Surveys (MICS). In Malawi and Tanzania LSMS-ISA⁸ type of surveys were used. For both countries the last wave of a panel survey was used; IHS 2013 for Malawi, and the National Panel Survey 2012/13 for Tanzania. These surveys are very rich in household information and individual information on labour and education, and they have consumption modules that allow for the analysis of the overlap between monetary poverty and deprivation. Besides, the panel nature enables analysis of the trends in poverty and deprivation. However, these data present several challenges in constructing a multidimensional child poverty measure. The main challenges with this type of data are twofold: LSMS type of surveys are usually not very rich in information on children such as young children's health and nutritional status and they do not collect data on issues like domestic violence or reproductive health which are relevant for children and adolescents; secondly, being panel surveys, the samples are reduced in numbers, which does not allow for a fine geographical disaggregation of results.

In Mali, the analysis was conducted using a unique example of integration between a national living standard survey including a consumption module (ELIM, L'Enquête Intégrée auprès des Ménages 2009/10), and the MICS survey. These data have rich information on both consumption and therefore monetary poverty, and the living condition of children, including young children's nutrition status and access to health care services. The case of Mali, where a large survey, such as the MICS, was combined with existing data collection efforts, serves as an example on how information essential for child poverty monitoring can be obtained with little additional resources or effort.

We would like to highlight the essential role of the national statistical offices (NSO) in all three cases. Firstly, their involvement helped to build sound ownership and therefore credibility of the analysis. Second, with regards to the data they are the most knowledgeable about the datasets used for the analysis and any other national data sources. Third, involving the NSOs in the analysis process was found useful giving them an insight of what type of

⁸Integrated Survey on Agriculture.

data and skills are crucial for this type of analysis and provides with a reference for future data collection and analysis for e.g. annual reporting and SDG monitoring.

Methodology

All countries decided to use four age groups: two for children under five years⁹, to reflect the fast evolving needs of young children, one for primary school-age children, and one for adolescents, who have again their own specificities (See table 2, for an overview of all age groups and dimensions and Appendix Table A1 for all indicators).

In addition, in Mali was decided to add a separate analysis for adolescent girls. This choice reflects that young girls are vulnerable to specific deprivations, which do not do not affect (or to a very low extent) their male counterparts, such as issues concerning pregnancy and reproductive health. If these indicators were included for the whole age group, results would seem misleadingly low given that it would mark a 'non-deprivation' for half of the population. In addition, it is a strategic choice to construct a separate group for girls highlighting the specific vulnerabilities girls experience.

Tanzania and Malawi do not include a specific analysis for girls. This is partially due to data issues, since LSMS surveys do not contain enough specific information to construct and conduct a specific deprivation analysis, and partially to other considerations. Early marriage was included as a deprivation for both girls and boys, because, even if it affects more girls than boys, it is still a violation of children's rights, regardless of their gender. In the same discussion, it was decided to not include early pregnancy as an indicator of deprivation. The rationale for this decision came partially from the data (these data are not readily available in LSMS type surveys), and partially from the recognition that considering pregnancy per se as a rights violation can be problematic. On the one hand we can consider pregnancy as a condition that can lead to other types of deprivation (e.g. dropping out of school), and should therefore be treated similarly to other statuses of being, e.g. being an orphan or suffering from a disability. On the other hand, however, teenage pregnancy exposes girls to increased health risks (World Health Organization, 2011), and in many instances it is the consequence of other deprivations, such as the access to information on reproductive health and to contraception. The decision on these matters should always come from the context.

Both Malawi and Tanzania include indicators on the deprivation in Nutrition for older children. Tanzania collected anthropometric measures for the whole population, which allowed the calculation of BMI for older children. In addition to the BMI, Nutrition for children 5 to 13 in Tanzania includes number of meals per day and having had breakfast the day before the survey. In Malawi, the breakfast indicator was used as a dimension defined as Food Security; the technical working group were of the opinion that this indicator alone did not attain to Nutrition, but to a specific situation. Furthermore by creating a separate dimension it reflects the importance of the issue of food security in the local context; a similar decision has been made to include Child Labour as a separate dimension in Mali. For younger children, in Malawi the decision was to split the anthropometric measures, using

⁹The two age groups for children below the age of five consists of the same dimensions, but are separated in the national reports because they are composed of different indicators.

wasting and underweight as indicators for the youngest children (0–23 months), stunting and meals per day for the second age group (24–59 months). For Mali, no anthropometric information nor data on feeding practices were available for children older than five, which created an inevitable gap in the analysis. For the younger children a combination of exclusive breastfeeding (0–5 months), feeding practices (6–59 months) and anthropometric measures was used to construct the Nutrition dimension.

Across the three countries, one of the main challenges for deprivation analysis was finding appropriate indicators and a dimension on Health for older children. In Mali for young children valuable information was available on routine vaccination schedules, which constitute a good proxy for the respective dimension, however similar standards were not available for older children.

In the countries using LSMS surveys it was also a challenge to identify appropriate indicators for the health dimension of younger children. It was often proposed to use care seeking as an indicator, especially for the second age group (24–59 months). However, in the surveys care seeking behavior refers only to children who were ill in the short reference period, and there is no way of knowing whether health services would have been available in case of need and how parents of non-ill children would have behaved. While acknowledging that the likelihood to be sick is higher for a child deprived in health than for a non-deprived child, the indicator would be inappropriate capturing only a subsample of the intended child population. More suitable indicators would be for example routine check-up, or a question related to hypothetical access (e.g. *‘if your child were sick where would you take her?’*), or, in countries with established healthcare systems, access to health insurance (the latter being an indicator also included in the SDGs). The final choice was to use ante-natal care and assistance at birth of the lastborn child, as a proxy for access to health services. In Malawi, for children of 24 to 59 months, it was decided to use an indicator measuring *‘sleeping under a mosquito net when it is mosquito season’*. The formulation of the question was important in the decision to select it as an indicator; the reference to the entire mosquito season rather than the previous night (as is generally used), made it into a relevant indicator.

Another dimension that presents several differences across the three countries is Information. Information can be interpreted as access to information media, representing a measure of social participation, but it can also be interpreted as being informed on specific developmental issues (health, reproduction etc.). One of the controversial points about defining what constitutes a deprivation in Information is that access to information media is often measured at the household level, but this, as other household indicators, can hide inter-household differences. Another problem relates to the appropriate age group: how can we define deprivation in Information for younger children? Is the lack of information of their parents a predictor or a mere correlate to child deprivation?

Both Malawi and Tanzania opted to define Information as access to any information device in the household. In Tanzania the dimension of information was defined only for adolescents, as they are the group who is more disadvantaged by the lack of access to information, and that, more importantly, are perceived as able to access information on their own (for example through mobile phones). In Mali, information for younger children was

defined as the knowledge of the mother/female caretaker regarding specific hygiene issues and behaviour. The reasoning for including this as an indicator of child deprivation is to capture the access to knowledge of a primary caretaker in the period that children are dependent on their care.

The examples in this section illustrate the type of discussion undergone by the technical working groups to come to a definition of the national multidimensional child poverty measure. Discussions are centred around identifying what constitutes a deprivation, what is important in the local context, and how drivers of deprivation can be distinguished from correlates of deprivation. The next section illustrates the results of the national child poverty analysis conducted in these three countries using the dimensions as discussed above.

4 Key comparative results for the three countries

Multidimensional deprivation rates and distribution

According to the national definition of the MCPI and the chosen cut-off point¹⁰, deprivation rates are 74 percent in Tanzania, 63 percent in Malawi, and 55 percent in Mali. Table 3 shows the deprivation rates at different cut-off points. The deprivation rates vary substantially across country, with Tanzania as the most deprived, and Malawi as the least one. The deprivation rates represent the weighted average of the four age groups including all children below 18 years.

However, deprivation rates remain quite high in all countries. In all of them the vast majority of children suffers at least one deprivation; this is quite worrisome, especially since monetary poverty rates, even if high, are still lower than deprivation rates.

Concentrating on the distribution of deprivations for all children 0 to 17 years (Figure 1) the distributions have different shapes. In Malawi, it is concentrated to the left, with 14 percent of children not deprived in any dimension, and the highest rate is found at two deprivations (26 percent). The situation in Tanzania is the reverse showing a distribution far more skewed to the left, with only three percent of children who are not deprived, and 51 percent who deprived in four or more dimensions at a time. Mali presents a more balanced distribution with a modal number of three dimensions representing 22 percent of children being deprived in three dimensions at the same time.

All countries present a high degree of disparities between rural and urban children. Figure 3 illustrates the rate of deprived children by area for each country. Deprivations rates are at least double in rural areas compared to urban settings. To understand the extent of the deprivation the share of children living in rural areas, as well as the mean value of other characteristics of the child and the household, is reported in Appendix A2.

While showing a strong pattern between areas for all children, differences can be observed when we assess the distribution by children under five years old, and 5 to 17 years (respectively Figure 3 and 4)¹¹. We can see how the three countries have different

¹⁰The cut-off point is 2 or more deprivations in Malawi, 3 or more in Mali and Tanzania.

¹¹The X-axis is cut to the highest common deprivation number.

distributions for the two macro age groups. Tanzania has a left-skewed distribution for both younger and older children, while the contrary is true for Malawi. In Mali, we observe a shift with younger children clearly more deprived than the oldest: the line for children under five is much more skewed towards the left. It should be noted that Mali has relatively more dimensions for the children below five, while the opposite holds for Malawi and Tanzania.

Deprivation rates by dimension and indicator

To further explore the difference in deprivation, the deprivation rates for each dimension and indicator are presented in Table 4¹².

The dimensions with the highest rates of deprivation are Sanitation and Housing. It is interesting to point out how the three countries have a very similar rate of deprivation in Education, being 42 percent in Tanzania and Mali, and 44 percent in Malawi. Deprivation rates in other dimensions vary widely. For example, Protection ranges from 10 percent in Malawi to 66 percent in Tanzania

Given that the union approach is used to identify children as deprived in a dimension, the deprivation rates by dimension are driven by the number and type of indicators each country has selected; this is particularly true for the dimension on Protection. For example, in Tanzania the deprivation in Protection is strongly driven by the lack of birth registration (62% deprived), while at the same time child labour and early marriage register relatively low deprivation rates. However, this indicator was defined over the whole child population in Tanzania, while in Mali, where deprivation is around 24 percent, birth registration is defined only for children under five.

Child labour shows a rate of around 30 percent in Mali, where it is defined as a distinct dimension, and differs strongly from Tanzania (20 percent) and Malawi (10 percent). If we consider Education in Malawi the deprivation rate is driven mostly by children lagging behind in school and not completing primary on time, while in Mali there is a high percentage of younger children not attending school and older children being illiterate.

Characteristics of multidimensionally deprived children

Where the deprivation rates by dimension are merely giving an indication on which deprivations are associated with a severe multidimensional child poverty measure (at the various cut-off points) they do not identify the characteristics of deprived children. The following multivariate regression analysis informs about the probability of children with various characteristics to be multidimensionally deprived.

The strongest correlate is the area of residence showing that children in rural areas are more at risk of being deprived in all three countries (see Table 5). In every country, consumption has a significant relationship with deprivation, the effect of a one percent¹³ increase in monthly consumption are larger in Malawi, and smaller in Mali. Effects of an increase in monthly consumption vary from 0.9 percentage points in Mali to 2.3 percentage points in

¹²Indicators are grouped by dimensions, and are left blank if not used in a country.

¹³To keep results comparable, we use the logarithm of monthly consumption per capita.

Tanzania. The education and working status of the household head are two of the major drivers of deprivation in all countries, but with different effects. Having completed primary education strongly decreases the chances of a child of being deprived in all countries. Working as a waged employee reduces the probability of being deprived in Malawi and Tanzania (with different statistical significance) but not so in Mali. At the same time, if the household head works in agriculture, this has a detrimental effect on children in both Tanzania and Mali (in the latter the probability of being deprived is increased by 15 percentage points). The gender of the household head only affects deprivation probability in Mali, as well as the gender of the child. In Malawi and Tanzania both these variables on gender are insignificant. These results are for all children combined, and can therefore hide age group specificities; for example, both Malawi and Tanzania exhibit gender differences for adolescents.

Overlap between dimensions

One of the key features of the MODA methodology is the possibility to analyse overlaps between dimensions. Overlaps are important because single distributions can hide different realities, since dimensions of deprivation are rarely independent of each other, and the joint distribution of dimensions can be different than the single one (Duclos, Sahn, & Younger, 2006)]. Furthermore, analysing overlaps identifies the children who are most deprived and the simultaneous shortcomings in sector interventions: both are crucial points in effective programming.

Theoretically overlap analysis can be performed on all possible combinations of dimensions, varying the number and combination of dimensions included. Nevertheless, the abundance of information resulting from the possible analyses will rather confuse than assist the audience. To direct the analysis the overlap analysis can be guided either by the a priori choice of combinations or by letting the results guide the combinations on which we focus. Both approaches are valid, of which the first aims at pointing out possible pitfalls for children that we know to be detrimental. For example, in a context with a clear lack of infrastructure, it is likely that household dimensions such as water, sanitation and housing will present a high degree of overlap. However, to inform policy, especially direct intervention policy, it is definitely an added value to be able to identify to what extent children are suffering simultaneously from specific deprivations. The second approach aims at finding out possible unexpected overlaps (or lack thereof), which may in turn reveal hidden problems. Highlighting the correlation between certain combinations of deprivation may lead to new opportunities for more integrated and effective policy-making suggesting cooperation patterns across sectors.

MODA usually reports the overlap between three dimensions. Table 6 shows the degree of overlap between selected dimensions, for all children and for a selected age group. As we can see, the overlap between the three housing-related dimensions is relatively high for both Mali and Tanzania, while it is very low in Malawi¹⁴. Given that the three dimensions are constructed in a very similar way in all three countries, it appears that in Malawi these issues

¹⁴Note that the percentage of children deprived in Water and Sanitation refers to children deprived only in water and sanitation simultaneously.

benefit from a sectoral approach, while in Tanzania and Mali it would be beneficial to approach these issues in a more holistic way. Unsurprisingly, substantial differences exist between rural and urban settings, e.g. in Mali the overlap between the three dimensions is 24 percent in rural areas and 2.3 percent in urban ones.

The bottom section of the table reports the overlap of three important and often related, dimensions for children under five: Nutrition, Health and Water. The degree of overlap for this combination ranges widely from Malawi with a nearly non-existent overlap to Mali where 15 percent of children under five are simultaneously deprived in all three. In this case, part of the difference can be attributed to the different ways in which dimensions are constructed, and it is therefore more difficult to draw general conclusions. While overlap analysis can be informative to policy-makers in a national context, comparisons across countries should be made with due caution given the differences in definition.

Monetary poverty and deprivation

The overlap between multidimensional and monetary poverty is a crucial part of a comprehensive understanding of child poverty. The extent to which monetary metrics can identify poor children is crucial for social protection policies, since monetary poverty lines are the tool usually used to identify poor children. However, due to the specific needs of children and their position in the household we assume that child poverty is more complex than living in a monetary poor household.

The overlap between multidimensional and monetary poverty reveals four groups of children: those who are both monetary poor and deprived, those who are only deprived, those who are only monetary poor, and those who are neither poor nor deprived. Since the policy response to these situations differ, it is important to understand to what extent these groups of children share similar characteristics, or if they are completely separate groups.

The relationship between the consumption measure and deprivation is not linear in all of the three countries under examination. Figure 6 illustrates this relationship between consumption by area and the average number of deprivation experienced for each country, with the vertical line representing the national monetary poverty line. Consumption lines with a high negative slope suggest a strong negative relation between the number of deprivations and consumption. In all countries, the lines are steep at the beginning, especially below the poverty line, and flatten out as consumption increases. In the case of Mali, for rural children the line is already flat on the left side of the poverty line, meaning that an increase in consumption does not reduce deprivation among children.

All countries show a clear divide between rural and urban children, however in Mali the difference is largest. Furthermore, the rural line remains relatively flat throughout the whole consumption distribution, suggesting that regardless of the level of consumption children in rural areas experience at least two deprivations. The relationships between consumption and deprivation in Tanzania and Malawi show similar patterns; both lines are very steep below the poverty line, and as consumption increases, the urban lines become flatter than the rural ones. As consumption increases, the effect on the average number of deprivation becomes similar between rural and urban areas, showing the two lines closing the gap.

Since the relationship between deprivation and consumption is non-linear, we expect the degree of mismatch between poverty and multidimensional poverty to be quite substantial. Table 7 shows the extent that monetary poverty and multidimensional deprivation overlap for children in each of the countries included in the analysis.

There are three key observations to be drawn from this table. First, in each country, the vast majority of children experience some form of poverty ranging between 70 percent in Mali and 77 percent in Tanzania who are either poor or deprived or both. Second, between a quarter and a third of children is both poor and deprived. This means that a consistent share of children in each country needs priority targeting in interventions. Third, in each country there is a considerable share of children who are deprived, despite not living in a monetary poor household. This proportion ranges from 25 percent in Mali to 48 percent in Tanzania. The large discrepancy between monetary poverty and deprivation suggests that children are at particular risk of missing out on social assistance if only one of poverty measures is used to determine eligibility.

In order to determine differences in characteristics between the aforementioned groups, Table 8 reports the average percentage of children with a given characteristic among children who are poor and deprived, children who are only deprived, and children who are neither. Figure 6a and 6b show the share of children living in rural areas (6a) and the share of children whose head of household is self-employed not in the agricultural sector, who are part of each respective poverty group (see Appendix A2 for the percentage of all children having these characteristics).

While living in rural area is fairly common in all countries, there is a striking difference between children who are poor and deprived, and children who are neither. Almost all children who are poor and deprived live in rural areas, in all the three countries, while, among the children who are neither poor nor deprived, the share living in rural areas is far lower. At the same time (fig. 6b), a consistent share of children who are not poor and not deprived, lives with a household head who owns a business out of the agricultural sector.

Poor and deprived children are also more likely to have an uneducated (or lower educated) head of household, to live in female-led household (in Malawi and Tanzania), and to live in a farmer's household, while they are substantially and significantly less likely to live in a household whose head is a waged employed (see Table 8).

5 Conclusions

The objectives of this paper have been twofold. First, it described the process in which the development of the country-specific child poverty analyses in the three countries took place. Second, it highlighted some of the key results found when comparing the child poverty studies of the three selected sub-Saharan African countries.

The process through which the national child deprivation measures were established serves as a guidance for future conduct of multidimensional child poverty analyses and national analyses as suggested by the SDGs. The process across the three countries shows a considerable input of technical working groups, consisting of local partners and experts, in

the determination of the final poverty measure. In particular, the input on the selection of indicators relevant to the local context and defining of dimensions fitting the scope and perspective of the analysis.

Across the three sub-Saharan African countries similarities were found with regards to the selection of age groups and dimensions. All three countries, opted for using four age groups, covering infancy, early and middle childhood and adolescence. With regards to the selected dimensions, all three countries included information on health, nutrition, protection, education, information, sanitation, housing. Indicators within each dimension, as well as the focus on some subcomponents of dimensions (e.g. child labour, food security) varied by country.

Concerning the second aim, the comparison between the results of the three countries show that the various tools provided in the multidimensional child poverty measures at hand give a complete overview of the distribution and the type of deprivation. In addition, the analysis between multidimensional deprivation and monetary poverty put forward some interesting considerations on how to approach child-focused social policy. The mismatch between the two measures of child poverty suggest that targeting children or their households solely based on the level of income would disregard considerable proportions of children being only deprived. Besides, the relation between monetary poverty and multidimensional deprivation can direct policy design telling whether cash, in-kind assistance or a combination thereof is more appropriate. When deprivations do not stem from a lack of household consumption the government might want to address these issues through structural (demand-side) interventions.

Lastly, the paper also highlighted some of the challenges that can occur while creating a multidimensional child poverty indicator and carrying out the subsequent analysis. Foremost, the main difficulty is finding an appropriate dataset, which includes sufficient child-level data, such as e.g. anthropometric measures and vaccination results, while at the same time having information available on household assets and income or consumption. The inclusion of the latter is highly preferable because it allows to perform an overlap analysis between the monetary poverty and deprivation, as to know whether on the individual level both are experienced simultaneously. Incorporation of monetary poverty can be done following the Mali example including an expenditure module in an existing survey. Alternatively, in countries with an established integrated household expenditures survey items can be included which can be used to construct a robust multidimensional child poverty indicator. The principal challenge here is to include a subsection for children under 5 to collect information on key issues such as nutrition and health.

Appendix

Appendix A1:

Indicators and dimensions for each country by age group

		Malawi		Tanzania		Mali	
		0–59 months	5–17 years	0–59 months	5–17 years	0–59 months	5–17 years
Nutrition	Wasting	x (0–23m)				x	
	Stunting	x (24–59m)		x		x	
	Underweight	x (0–23m)				x	
	Exclusive breastfeeding					x (0–5m)	
	Infant and young child feeding					x (6–23m)	
	No. Meals	x (24–59m)		x	x (5–13y)		
	No Breakfast				x (5–13y)		
	BMI				x		
Food security	No Breakfast		x (5–14y)				
Health	Antenatal care	X(0–23m)		X			
	Skilled birth attendant	X(0–23m)		X		x (0–23m)	
	Sleeps under bednet	X					
	BCG/DPT3 vaccination					x	
	Health card					x (24–59m)	
Child protection	Birth registration/certificate			x	x	x	
	Left alone or with a child					x	
	Child labour		x		x		
	Early marriage		x		X(14–17y)		
Information	Mother's knowledge on handwashing					x	
	Mother's knowledge on illness					x	
	Information devices		x		X(14–17y)		x
Education	Attendance preschool	x		x			
	School enrolment		x		x		x
	Grade-for-age		X		X		x (5–14y)
	On time prim. completion		x		X (14–17y)		

		Malawi		Tanzania		Mali	
		0–59 months	5–17 years	0–59 months	5–17 years	0–59 months	5–17 years
	Literacy		X(15–17)		X		x (15–17y)
Child labour	Child labour						x
Sanitation	Type of toilet	x	x	x	x	x	x
	Disposal of stools			x	X		
Water	Water source	x	x	x	x	x	x
	Distance to water	x	x	x	x	x	x
Housing	Overcrowding	x	x	x	x	x	x
	Roof, walls, floor	x	x	x	x	x	x

Appendix A2:

Characteristics of children

	Malawi	Tanzania	Mali
Male	49.83	48.86	50.90
Age	8.00	10.45	7.00
Age of the head of HH	41.26	46.84	53.44
Orphan	2.01	1.22	7.79
Head is married	79.09	79.27	93.81
Head is separated	12.29	7.56	0.44
Head is widowed	8.62	1.90	4.27
Head has less than primary	77.76	88.76	79.61
Head has completed primary	15.24	1.33	9.96
Head has secondary or more	7.00	6.17	10.43
Head does not work	17.53	21.31	5.47
Head is a waged employee	10.25	14.50	10.73
Head is self-employed not in agriculture	13.65	14.50	21.44
Head works on farm	58.57	49.30	62.35
Head is female	20.63	23.29	6.50
Rural Area	85.41	76.97	75.11

References

- Alkire S, & Foster J (2011). Counting and multidimensional poverty measurement. *Journal of Public Economics*, 95(7), 476–487.
- Alkire S, & Santos ME (2010). Acute Multidimensional Poverty: A New Index for Developing Countries.
- Chauzal G, & Van Damme T (2015). The roots of Mali's conflict: Moving beyond the 2012 crisis (CRU report).
- de Milliano M, & Handa S (2014). Child Poverty and Deprivation in Mali: The first national estimates. Innocenti Working Paper, (20).

- de Milliano M, & Playgo I (2014). CC-MODA - Cross Country Multiple Overlapping Deprivation Analysis: Analysing Child Poverty and Deprivation in sub-Saharan Africa. Innocenti Working Paper, 19.
- De Neubourg C, Chai J, de Milliano M, Playgo I, & Wei Z (2012). Step-by-Step Guidelines to the Multiple Overlapping Deprivation Analysis (MODA). Innocenti Working Paper, 10.
- De Neubourg C, de Milliano M, & Playgo I (2014). Lost (in) Dimensions. Innocenti Working Paper, 4.
- Gordon D, & Nandy S (2012). Measuring Child Poverty and Deprivation In Global Child Poverty and Well-Being - measurement, concepts, policy and action. Bristol: The Policy Press.
- Gordon D, Nandy S, Pantazis C, Pemberton S, & Townsend P (2003). The distribution of child poverty in the developing world.
- National Bureau of Statistics, & UNICEF. (2016). Child Poverty in Tanzania. Dar es Salaam.
- UNDESA. (2016). Retrieved from <https://sustainabledevelopment.un.org/index.html>
- UNICEF. (Forthcoming). Child Poverty in Malawi.
- White H, Leavy J, & Masters A (2003). Comparative perspectives on child poverty: A review of poverty measures. *Journal of Human Development*, 4(3), 379–396.
- World Bank. (n.d.). World Bank DataBank. Retrieved from <http://databank.worldbank.org/data/home.aspx>
- World Health Organization. (2011). Preventing early pregnancy and poor reproductive outcomes among adolescents in developing countries.

Fig. 1:
Distribution of number of dimension - All children

Fig. 2:
Deprived children by area

Fig. 3:
Children under 5

Fig. 4:
Children 5–17

Fig. 5:
Consumption and Average Number of Deprivations – All children

Fig. 6a:
Share of children living in rural areas.

Fig. 6b.
Share of HH head who are self employed (non agr.)

Table 1:

Dimensions of deprivation derived from the Convention on the Rights of the Child (CRC)

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

Source: De Neubourg et al, 2012

Table 2:

Dimensions selected by each country

	Malawi	Tanzania	Mali
Children below age 5	Nutrition	Nutrition	Nutrition
	Health	Health	Health
			Protection
			Information (mother)
Children age 5–13/14	Education	Education	Education
	Protection	Protection	Child Labor
	Food security	Nutrition	Information
	Information		
Children age 14/15–17	Education	Education	Education
	Protection	Protection	Child Labor
	Information	Nutrition	Information
		Information	
Household dimensions	Water	Water	Water
	Sanitation	Sanitation	Sanitation
	Housing	Housing	Housing

Table 3:

Deprivation rates at different cut-offs

	Malawi	Tanzania	Mali
Deprived in 1+	86.0	96.9	90.9
Deprived in 2+	62.6	89.5	75.5
Deprived in 3+	36.5	74.3	54.7
Deprived in 4+	16.3	51.4	32.3
Deprived in 5+	5.0	25.4	14.9

Table 4:

Deprivation rates by indicator

Dimensions	Indicators	Malawi	Tanzania	Mali
Health		7.1	30.9	55.8
	Ante Natal Care	1.6	2.6	
	Skilled birth attendance	10.7	42.7	70.3
	Bed-net	3.6		
	Health card			12.7
	BCG vaccination			25.7
	DPT3 vaccination			26.4
Nutrition		30.2	34.0	48.1
	Underweight	9.2		16.6
	Wasting	7.2		8.7
	Stunting	30.5	33.6	24.6
	Infant feeding and breastfeeding			74.3
	No. Meals for under 5	29.7	10.7	
	No Breakfast	27.7	13.1	
	BMI		6.5	
Food Security	No. Meals for children 5–13		37.5	
Protection		10.3	66.0	45.2
	Negligence			16.9
	Child left alone			35.3
	Birth registration		61.6	23.5
	Child Labour	9.3	18.5	
	Early marriage	2.8	3.3	
Child Labour				29.7
	Child labour			29.7
Education		44.1	42.0	42.2
	Attended preschool	55.0	65	
	School enrolment	6.4	17.6	35.7
	On time attendance	47.5	16.8	20.4
	On time primary completion	85.9	32.1	
	Literacy	18.0	19	47.8
Information		34.3	16.7	27.0
	Mother knowledge about illnesses			31.2
	Mother knowledge about hand washing			36.2
	Information devices	34.8	16.7	14.4
Water		21.4	59.9	34.1

Dimensions	Indicators	Malawi	Tanzania	Mali
	Unsafe water source	18.2	34.5	30
	Time to water	4.1	43.6	6.4
Sanitation		32.7	77.7	64.2
	Unimproved toilet	32.7	77.6	64.2
	Disposal of stools		12.1	
Housing		62.5	64.3	47.7
	Overcrowding	13.0	50.1	12.6
	Floor, Roof (and walls)	59.3	34.3	39.6

Table 5:

Marginal effects of selected characteristics on the probability of being deprived - All children

	Malawi	Tanzania	Mali
Log of consumption	-0.234 *** (-22.84)	-0.176 *** (-22.10)	-0.168 *** (-29.38)
Gender (male)	0.014 (1.30)	0.005 (0.58)	-0.027 *** (-5.71)
Age	0.016 *** (12.66)	-0.000 (-0.09)	-0.066 *** (-40.91)
Age of the head of HH	-0.002 ** (-2.16)	-0.002 (-1.01)	-0.008 *** (-7.62)
Head is separated	0.040 * (1.78)	0.056 ** (2.48)	-0.027 (-0.57)
Head is widowed	-0.050 * (-1.86)	0.054 (1.48)	0.044 (1.39)
Head has completed primary	-0.118 *** (-6.27)	-0.156 *** (-4.15)	-0.031 *** (-3.95)
Head is a waged employee	-0.143 *** (-6.91)	-0.029 * (-1.84)	-0.019 (-1.42)
Head is self-employed not in agriculture	-0.051 *** (-2.62)	-0.047 *** (-2.78)	-0.009 (-0.38)
Head works on farm	0.003 (0.20)	0.036 *** (2.98)	0.145 *** (12.76)
Head is female	-0.023 (-1.09)	-0.015 (-0.81)	0.007 (0.53)
Rural Area	0.250 *** (15.30)	0.152 *** (13.79)	0.203 *** (32.53)
<i>Observations</i>	<i>9,064</i>	<i>11,494</i>	<i>45,234</i>

t-statistics in parentheses;

p<0.01,**
p<0.05,*
p<0.1

Table 6:

Overlap between 3 dimensions

Overlaps in Water Sanitation and Housing - All children			
	Malawi	Tanzania	Mali
All three	3.7	16.4	18.3
Water and Sanitation	0.7	7.4	10.0
Water and Housing	4.5	2.6	2.3
Sanitation and Housing	9.7	8.7	20.4
Water only	2.5	1.8	3.1
Sanitation only	3.3	6.1	16.2
Housing only	15.4	2.6	8.0
Not deprived in any	13.5	4.6	21.6
<i>total</i>	100	100	100
Overlaps in Nutrition Health Water - Children 0–4 yrs			
	Malawi	Tanzania	Mali
All three	0.6	7.9	15.1
Nutrition and Health	1.0	3.2	18.2
Nutrition and Water	7.4	16.5	6.6
Health and Water	1.6	9.6	5.9
Nutrition only	22.7	9.0	16.3
Health only	3.5	4.7	9.0
Water only	11.6	24.2	8.1
Not deprived in any	48.4	25.0	19.8
<i>total</i>	100	100	100

Table 7:

Overlap between monetary poverty and deprivation

	Malawi	Tanzania	Mali
Poor and deprived	33.5	26.2	31.2
Deprived only	29.1	48.1	24.5
Poor only	9.0	2.9	14.6
Neither poor nor deprived	28.4	22.9	29.7

Table 8:

Characteristics of children poor and deprived vs. neither

	Poor and deprived			Not poor not deprived		
	Malawi	Tanzania	Mali	Malawi	Tanzania	Mali
Male	50.7	49.7	51.4	48.2	48.4	50.2
Age	8	8	7	7	8	8
Age of the head of HH	42	47	56	40	46	51
Orphan	2.5	1.0	6.9	1.5	1.0	9.0
Head is married	74.5	78.5	94.5	84.5	80.3	92.3
Head is separated	15.6	7.0	0.3	8.7	6.0	0.7
Head is widowed	9.9	2.0	3.5	6.7	3.0	5.4
Head has less than primary	90.3	99.1	89.5	55.0	72.1	63.1
Head has completed primary	5.7	0.9	8.0	12.2	16.6	12.5
Head has secondary or more	4.0	0.0	2.4	32.8	11.3	24.5
Head does not work	21.9	25.7	3.2	12.0	19.4	9.6
Head is a waged employee	4.3	9.0	2.4	23.4	28.0	22.9
Head is self-employed (non agr.)	7.0	8.0	8.2	41.6	30.0	39.9
Head works on farm	66.8	71.0	86.1	23.0	36.0	27.6
Head is female	23.7	26.0	4.0	14.5	21.0	9.6
Rural Area	93.6	94.0	93.3	69.4	54.0	47.3