

Poorer than Adults and Deprived in Almost All Counts

Welfare Status of Children in Nigeria

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Abstract

Analyzing data from four waves of the Nigerian General Household Survey and the Nigerian Multiple Indicator Cluster Survey, covering the period from 2010 through 2019, this study provides evidence that poverty levels of children exceed those of adults. Overall, rural children throughout the country and children in the North face higher poverty and chronic poverty rates than urban children and those living in the South without clear trends of a closing of those gaps. These findings hold for monetary poverty as well as, for severe health, education, food, shelter, water, information deprivation and improved sanitation deprivation across Nigeria's six regions. One exception is severe sanitation deprivation, for which especially rural areas in the Southwest stand out with higher levels of severe sanitation deprivation than in rural areas in the north and

any other region. Large inter-state heterogeneity of estimates within regions, ranging up to 50 percentage points, for all except severe food deprivation however highlight the importance of looking beyond regional poverty estimates and regional differences. Only state specific, but no systematic evidence has been found for a gender difference in severe educational deprivation and school enrollment rates. Existing gender gaps though seem negligible compared to the overall level of deprivation and urban-rural and north-south gaps. Moreover, the parents' literacy and more so the educational level is highly correlated with the probability of being poor or deprived in any dimension, in particular in rural and northern areas. Interestingly, up to about half of the monetary non-poor children at the top of the consumption distribution still face at least one severe deprivation.

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Poorer than Adults and Deprived in Almost All Counts: Welfare Status of Children in Nigeria

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1. Introduction

Nigeria has been steadily growing and was considered one of the fastest growing economies in the world in the decade surrounding the global financial crisis. At the same time home to the largest number of people living in extreme poverty. In 2018, it surpassed India that had been leading this rank before. “End poverty in all its forms everywhere” by 2030 defined as the Sustainable Development Goal (SDG) 1 is thus an ambitious goal for Nigeria. Given the established consensus that children may suffer more and in different ways from poverty than adults (Abuda and Delamonica, 2018), it is important to study poverty distinguishing between these two groups. Along these lines, Newhouse et al. (2016) showed based on data from 2010 that Nigeria is facing one of the highest child poverty rates among a sample of 89 developing countries and that children are disproportionately more affected by poverty than adults. Considering that 44 percent of the Nigerian population is estimated to be below the age of 15¹, reducing child poverty is therefore particularly important to achieve SDG 1. While some may argue that economic growth will bring along poverty reduction, there is a concern that Nigeria’s strong economic growth has not been inclusive, as its effects on poverty remain unclear (Ajakaiye et al., 2016a,b). This view is supported by Dang and Dabalén (2019) and Ichoku et al. (2012) findings, that Nigeria has experienced non pro-poor growth. Moreover, World Bank (2016) showed that despite estimating a poverty growth elasticity of -0.6 and a reduction in the share of the population considered poor, Nigeria nevertheless experiences an increase in the number of poor. This means that Nigeria’s population is growing at a higher rate, than the growth elasticity of poverty needed to result also in the reduction in the absolute number of poor people.

However, the United Nations definition of poverty extends beyond monetary poverty that may be directly affected through growth, also reflected in the SDGs 2, 3, 4 and 6. During the 1995 world summit in Copenhagen absolute poverty was defined as “Absolute poverty is a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information. It depends not only on income but also on access to social services.” (UN,1995, p.38).

While Nigeria is working on improving its human capital through different programs and policy interventions, there is a need for evidence on where to find the neediest children along these dimensions, to allow for more targeted and evidence-based policy making and interventions, given limited resources.

¹ See World Bank Indicators Population ages 0-14 (% of total population)
<https://data.worldbank.org/indicator/SP.POP.0014.TO.ZS?locations=NG>

However, there is a general lack of up-to-date evidence on child poverty and specifically so on children in Nigeria. Even irrespective of age groups, the latest detailed poverty assessment for Nigeria was published in 2016 (see World Bank, 2016), using data up until 2013. This is, apart from survey specific reports, the latest systematic analysis of poverty indicators available for Nigeria and does not provide detailed child poverty estimates. The current, post-economic crisis poverty situation may though well be different, as also the pattern of child versus adult poverty in its different dimensions.

The objective of this study is therefore threefold: It aims at providing a) an evidence base of the extent and heterogeneity of monetary and multi-dimensional poverty of children and households with children throughout the country and how these types of poverty overlap; b) insights to what extent poverty appears to be an intergenerational concern, coinciding with the children's parents' level of education; and c) insights to whether poverty is chronic or transitory over the years these survey spans. Study results may provide an evidence base for policy makers and development partners to design anti-poverty policies and targeted interventions under circumstances with limited resources.

This study will proceed with a review of the existing literature on poverty measurement, in particular child poverty in Nigeria. Thereafter the methodology and datasets used in this analysis will be discussed, followed by the presentation of results. The final section concludes.

2. Literature Review on Defining (Child) Poverty and Poverty Measurement

2.1 General

Poverty has by the World Bank and others traditionally been measured using income in relation to a certain poverty line threshold, and in the absence of income data, consumption and expenditure data has been used to estimate a welfare aggregate as a proxy for income (see Haughton and Khandker, 2009). While there had long been strands of literature arguing in favor of alternative and multi-dimensional approaches to poverty measurement, such as Amartya Sen's (1987) capability approach, only around the change of the millennium there has been a surge in recognizing child poverty and poverty in general as multi-dimensional and measuring it more systematically (Abuda and Delamonica, 2018).

However, there is not just one definition of multi-dimensional poverty or one set of multi-dimensional poverty indicators. Gordon et al. (2003a) distinguishes between eight severe deprivations related to food, health, education, water, sanitation, shelter, information and access to basic services. Others have only analyzed poverty among a subset of these deprivations, imposed stricter deprivation criteria, following the MDG and SDG indicators, requiring for instance a child to have access to improved sanitation, rather than just any sanitation facility in order to count it as non-deprived of sanitation or added other dimensions, such as energy deprivation (Poppola and Adetola, 2016; Ajakaiye et al., 2016). Over time, there has been a convergence to a core set of child poverty dimensions; namely, Health, Nutrition, Education, Information, Water, Sanitation, and Housing as discussed in Abdu and Delamonica (2018). These are also the dimensions, which were adopted in a 2006 resolution by the UN general assembly defining child poverty as multi-dimensional (UN, 2007).²

While some studied one or several poverty dimensions in isolation, others have mapped the poverty incidence probability combining various dimensions using a first order dominance approach (Arndt et al., 2012), whereas others have constructed multi-dimensional poverty indices of several dimensions whereby the latter have sometimes attempted to attach weights to the different dimensions, such as Alkire and Foster (2011). Considering however that all dimensions are also one of the child's rights as defined in the Convention of the Child, a child being deprived of any right is thus poor. Therefore, it is argued that the dimensions should not be weighted when constructing indexes (see Abdu and Delamonica (2018)).

2.2 Poverty in Nigeria

There exists limited evidence on aggregate poverty and child poverty in Nigeria. As in the literature in general, there is a lack of evidence on child poverty that connects the findings of studies focusing on specific poverty indicators and or in specific regions in isolation. Related to education Kazeem and Musalia (2016) highlight the historical colonial roots of the ethnic and socio-economic education discrepancy observed based on data from 2004. Western style education brought by Christian missionaries initially only spread in the Southern Igbo and Yoruba ethnic group dominated regions, whereas it was longer resisted by the Muslim Hausa and Fulani dominated ethnic groups with nomadic lifestyles in the North. Besides, poorer children needing to provide for their family face higher opportunity costs of completing

² "Recognizes that children living in poverty are deprived of nutrition, water and sanitation facilities, access to basic health-care services, shelter, education, participation and protection, and that while a severe lack of goods and services hurts every human being, it is most threatening and harmful to children, leaving them unable to enjoy their rights, to reach their full potential and to participate as full members of society" (UN, 2007, paragraph 46).

school (Kazeem and Musalia, 2016). Also studying the education dimension of poverty, Bertoni et al. (2018) measured the impact of Boko Haram violence on school enrollment and attendance rates in Nigeria's Borno state and found a negative impact of violence. Likewise, Nwokolo (2019) and Rotondi and Rocca (2019) studied the effect of Boko Haram violence on nutrition and birth weight, and found that violence reduces birth weight.

Popoola and Adetola (2016) studied five dimensions of multi-dimensional poverty (safe drinking water, sanitation, housing, health, and nutrition) based on the DHS survey of 2008, but limit the analysis to children under 5. Not distinguishing between adults and children, Ajakaiye et al. (2016a,b) measured multi-dimensional poverty based on a slightly different set of dimensions (including housing, water, sanitation, electricity and education) over four waves of the DHS from 1999-2013. All three studies, however, show irrespective of dimensions included that poverty is concentrated in the North and in rural areas. In a state level analysis, Ajakaiye et al. (2016a) also showed that the most deprived states are, while concentrated, not solely in the North.

To the best of the authors' knowledge, Adetola and Olufemi (2012) and the World Bank's 2016 poverty assessment are the only available studies, which analyzed multi-dimensional poverty indicators in relation to monetary poverty with data from 2008 and reaching up until 2013 respectively, whereby latter does not have a specific focus on child poverty. This analysis hence aims at filling the gap in the literature by providing more up to date monetary and multi-dimensional child poverty estimates and insights on how these measures overlap.

2.3 Children's Rights in Nigeria

The Federal Government of Nigeria adopted the Child's Rights Act in 2003 in line with both the United Nation's Convention on the Rights of the Child and the African Charter on the Rights and Welfare of the Child to provide and protect the rights of Nigerian children. It is a 24-part Act that factors in different dimensions to ensure that the best interest of a child is safeguarded in all actions concerning a child undertaken by an individual, public or private body including the court of law.

The Child's Rights Act is put in place by the Federal Government for all children of the federation, but a federal Act does not automatically get applied to all States until State legislature make the national law applicable in its territory. 25 out of 36 States in Nigeria so far have adopted the Child's Rights Act. 11

States in the northern part of the country are yet to adopt the Act³. An Act does not automatically address children's rights and deprivations and improve on conditions unless there are targeted interventions and programs.

But regardless of the Child's Rights Act signatory status, the Federal Government is working on implementing several policies and interventions to improve on the condition and status of children in Nigeria, including National Routine Immunization Plan, Universal Basic Education Act, National Strategic Health Development Plan, National Plan of Action for Nutrition, Home Grown School Feeding Program, Open Defecation Free Program and Water and Sanitation Policy. All these policies and interventions have focuses to improve the condition of children as well as to improve on different aspects of deprivations studied in this paper. But the big question is whether these efforts are enough to address the poor state of children in Nigeria and have shown any impact on child poverty?

3. Methodology

To identify the extent and heterogeneity of poverty, this study analyses child poverty applying both, the World Bank's monetary poverty definition and a multi-dimensional poverty definition. Irrespective of the poverty measure, individuals below the age of 18 are considered children, as defined in article-1 of the Convention of the rights of the child (United Nations, 1989). Monetary poverty is defined in terms of headcount poverty rate, the proportion of people with income below the poverty line. This is the most commonly used poverty measure (Haughton and Khandker, 2009). For national and international comparison this analysis uses both, the Nigerian national poverty line of 51482.14 Naira a year⁴, as well as the international poverty line of USD 1.90\$ a day. Hence, any individual with a per capita household income less than the respective poverty line is considered poor. As common for developing countries with largely informal economies and large shares of the population living on subsistence agriculture, this study estimates household income based on the mean of post-planting and post-harvest consumption. In this case equal weights are assigned to each household member, irrespective of household composition in terms of age and gender.

³ Bauchi, Yobe, Kano, Sokoto, Adamawa, Borno, Zamfara, Gombe, Katsina, Kebbi, and Jigawa (see Adebowale, 2019)

⁴ This poverty line only applies only to data collected before 2019. In 2019, a new national poverty line of 137,430 Naira per person per year has been established. Given this break in series and the fact that the new national poverty line is composed of slightly different components than the former national poverty line, the analysis refrains from comparing monetary poverty estimates based on the old and new national poverty line.

While academics and international organizations have adopted various methodologies to measure multi-dimensional poverty, as discussed earlier, this study follows the approach taken by UNICEF (2011) to measure severe deprivations of children. This approach is based on operational definitions developed by Gordon et al. (2003a) and relies on the absolute poverty dimensions identified during the World Summit for Social Development in Copenhagen. Given the data available, this analysis distinguishes between three severe deprivations in the areas of food, health and education with information available at the individual child level, and four severe deprivations concerning water, sanitation, shelter and information with only household level information available for each child. See Table 1. While Gordon et al. (2003a) suggest an eighth deprivation, considering the access to basic services, defined as distance to school and health care services >20km, this study restricts itself to the beforementioned seven deprivations. Reasons for this being that there is no such information available from the MICS and GHS datasets, used in this analysis. The datasets only include distance to school at individual level, whereas distance to health care services is available at community level only. However, in both cases, it is defined in time used, rather than kilometers, thus requiring a conversion. Moreover, this deprivation has been criticized as access does not inform about quality of access.

Besides the seven severe deprivations, this study however analyses a few additional, even stricter but milder deprivation definitions relating to education, water and sanitation. The milder educational deprivation counts every child of school going age who is not currently in school as schooling deprived. For water deprivation, the study further analyses protected water deprivation, counting additionally those with only access to unprotected wells/springs and unprotected tap water in any season as deprived.⁵ The improved sanitation deprivation definition additionally considers those deprived, who only have access to open pit latrines, latrines without slaps or toilets hanging over the water of any sort. The latter definitions for protected water and improved sanitation are both in line with the definition handled by WHO and UNICEF (2017a).

To inform on the extent of child poverty and its heterogeneity, descriptive statistics of the monetary poverty levels for both poverty lines and deprivation levels for each of the severe and milder deprivation levels are calculated as an aggregate for all children (or for the age group with data available) and for

⁵ An attempt to analyze additionally the share of children deprived of drinkable water, counting only those as non-deprived, who had access to sachet, bottled or pure water, showed very little variation across regions, and deprivation levels close to 100%.

different age groups and demographic subgroups, such as by region, state, rural-urban, north-south and gender given the data availability.⁶

Table 1: Definitions used to identify severe deprivations from GHS and MICS datasets

Deprivations	Definition
Severe Food Deprivation	“children whose heights [or] (...) weights for their age [or weight for height] were more than –3 standard deviations below the median of the international reference population, that is, severe anthropometric failure” ⁷
Severe Health Deprivation	“children who had not been immunised against any diseases” ⁸
Severe Education Deprivation	“children aged between (...) [5 and 17] who had never been to school and were not currently attending school (no professional education of any kind)” ⁹
Severe Safe Drinking Water Deprivation	“children who only had access to surface water (for example, rivers) for drinking or who lived in households where the nearest source of water was more than 15 minutes away (indicators of severe deprivation of water quality or quantity)”
Severe Sanitation Facilities Deprivation	“children who had no access to a toilet of any kind in the vicinity of their dwelling, that is, no private or communal toilets or latrines” ¹⁰
Severe Shelter Deprivation	“children in dwellings with more than five people per room (severe overcrowding) or with no flooring material (for example, a mud floor)” ¹¹
Severe Information Deprivation	“children aged between (...) [5 and 17] with no access to radio, television, telephone (...)” ¹²

Source: Authors’ own table taking definitions provided in Gordon et al. (2013, pp.7-8), partly adjusting to Nigerian context and data availability. Age corresponds to completed years of age.

⁶ The level of disaggregation differs by wave and data set. Results will only be presented for sub-groups of at least 30 individuals.

⁷ Z-scores are calculated using Stata’s zscore06 command. This study adapts this definition following Gordon et al. (2003b) considering not joined height and weight for age, but any anthropometric failure be it stunting, wasting or underweight as severe food deprivation. Individuals with height/length for age beyond 6 standard deviations from the mean are excluded as well as those with weights for age below 6 and above 5 standard deviations from the mean and weights for height beyond 5 standard deviations, as suggested by DHS (n.d.), because these are considered implausible values.

⁸ The original definition by Gordon et al. (2003a) included “or young children who had a recent illness involving diarrhea and had not received any medical advice or treatment” (p.7). This analysis only considers immunizations for this deprivation as diarrhea treatment information is not coherently available across data.

⁹ The age range has for this analysis been adjusted from the original definition of 7-18 to the Nigerian education context. While the official school starting age is 6 years, children can start earlier, and as a large share starts at age 5 this study used 5 as starting age until age 17, considering that there are 6 years of primary and 6 years of secondary school.

¹⁰ Buckets were not considered a toilet facility.

¹¹ Apart from mud, this incorporates earth, dung and sand.

¹² The original definition included additionally newspaper as information source, which is not available in this study’s data sources. Moreover, the original definition ranged from 3-18, whereas this study applied the schooling age range. Also, household asset ownership is assumed to be a good proxy for access.

This descriptive analysis is followed by an analysis concerning the overlap of monetary poverty with the various deprivations for different demographic sub-groups. Thereafter, this study presents results on the extent of chronic/transitory poverty and upward and downward mobility of the households in which the sample children live in monetary and deprivation terms. It thereby exploits the panel structure of parts of the data. A child's household is counted as chronically poor if it is always poor and or deprived; transitory poor, if poverty and deprivation status changes over time; and never poor if it is never poor or deprived in any of the periods, largely following the approach developed by Jalan and Ravallion (1998)¹³. This analysis thereby extends the estimations concerning chronic poverty in Nigeria by Dang and Dabalen (2019) over time.

The final part of this study consists of a probit model analysis to provide an indication on the correlation of parent's education on their children's monetary poverty (equation 1) and deprivations (equation 2). In these equations D_{poor} and $D_{deprivation_i}$ represent binary variables of the poverty and deprivation status, which takes the value 1 if the child is poor or deprived respectively and the value 0 otherwise. The subscript i identifies the respective deprivation. The variable a represents a constant. The categorical variable $parenteducation$ is included in the analysis to inform about a potential role of inter-generational poverty in particular in terms of educational deprivation. In addition, the analysis controls for region, survey wave, and the urban/rural status with respective dummies. Besides, ε represents an error term.

$$(1) D_{poor} = a + parenteducation + D_{region} + D_{rural} + D_{year} + \varepsilon$$

$$(2) D_{deprivation_i} = a + parenteducation + D_{region} + D_{rural} + D_{year} + \varepsilon$$

Using these equations, this study will test the hypothesis that the parent's level of education is negatively correlated with the likelihood of a child being poor or deprived even when controlling for regional and urban/rural effects and time, to provide additional external and internal validity on evidence available in the literature in general and on Nigeria in specific using other or earlier datasets, and to establish evidence on other correlations.

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¹³ Instead of using mean income over all periods, allowing for consumption smoothing, meaning income transfers between periods, this study considers each income observation as a binary poverty status, so that only children poor in all periods are considered chronically poor.

4. Data

This study is based on data of four waves of the Nigerian General Household Panel¹⁴ Survey (GHS 1 – 2010/2011; GHS2 – 2012/2013; GHS3 – 2015/2016; GHS4 – 2018/2019), and one wave of the Nigerian Multiple Indicator Cluster Survey (MICS 5 – 2016/2017). The GHS surveys have been conducted by the Nigerian National Bureau of Statistic in collaboration with the World Bank’s Living Standard Measurement Study (LSMS) team. Each wave covers close to 5,000 households and consists of two visits covering different survey modules; one post-planting and another post-harvest season to account for seasonal variation. The monetary poverty analysis relies on the household roster of the post-harvest visit and the per capita consumption aggregate values.¹⁵ For the multi-dimensional poverty analysis this study complements the post-harvest modules with those from the post-planting survey (see footnote).¹⁶ The MICS covers close to 34,000 households and was conducted by the Nigerian National Bureau of Statistics together with UNICEF¹⁷. Estimates based on both surveys are presented in weighted form.

While both surveys are nationally representative, the GHS is only representative up to the regional level whereas the MICS is representative at the state level. Even though Nigeria is a very heterogeneous, country that may suggest advantages of using surveys representative at the state level, there are important benefits of also using the GHS survey data for this analysis. Though only representative at the regional level, the GHS surveys allow a comparison of the overlap of monetary poverty and multi-dimensional poverty in terms of deprivations and provide evidence on the time trend. The MICS, though representative at the state level, allows only the calculation of deprivation levels, as it does not include information to infer about monetary poverty.

¹⁴ Though a panel survey, the data can be used as an individual level panel across visits within a wave, but only as a household level panel across waves. The GHS wave 4 sample only includes a subset of the earlier waves’ sample households in addition to a refresh sample. (For a discussion see NBS and World Bank (2019).). Though a representative long panel is kept in wave 4, the part of the analysis relying on panel data, only uses data up until wave 3 as sample sizes in the long panel up until wave 4 are considered too small for the purpose of this analysis.

¹⁵ Due to the unbalanced nature of the panel and household members joining and leaving the household between post-planting and post-harvest, thus leading to slightly different household sizes, whereas the mean per capita consumption figure of the household remains constant, results in slightly different individual level post-planting versus post-harvest poverty rates. Hence, these also slightly differ from the aggregate poverty rates based on household level data.

¹⁶Health deprivation can only be estimated from waves 1 and 2, as the survey module is missing in waves 3 and 4. Education deprivation is based on the education module in the post-planting surveys in waves 1 and 2 and the post-harvest survey in waves 3 and 4. For information deprivation household asset ownership data, only available in the post-planting survey, is assumed to be a proxy for access to these assets. While an access question exists, in wave 3, tv and radio access questions were dropped, so that this not allow consistent comparisons. Thus, household ownership of these assets was chosen to be a good proxy. Charity and tanker water were assumed to be protected, but not directly drinkable water sources. Drinking water source, sanitation and shelter data was in waves 1 and 2 only available in the post-harvest surveys and in wave 3 and 4 only in the post-planting survey.

¹⁷ Information concerning Education and current school enrollment deprivations is taken from the household roster and supplemented by information provided in the men and women surveys.

Limiting the samples to only children, defined in the previous section as individuals below 18 years of age, leads to sample sizes of about 13,000 children in the GHS surveys and 89,033 in the MICS survey. Table 1 provides an overview of the exact sample sizes for each wave and poverty measure. Sample sizes vary following the definition of the various deprivations, data availability only for a limited age group and response rate. In the case of the GHS, the survey limits itself to individuals of households with consumption data.

As the table below shows, the non-response rates are particularly high for the severe health and food deprivations and hence, results of these deprivations should be treated with caution. Moreover, these large non-response rates or responses falling beyond the biologically possible in terms of weight and length or height for the food deprivation measurement, urges for more emphasis on quality data collection.

Another, more general regional limitation relates to the ongoing conflicts in the country. Any results based on the data sources used here in particular from the North-East and to a certain extent the South-South regions need to be treated with caution, as both the GHS and MICS data collection were limited to only the accessible areas. Even though (Azad et al. 2018) did not find a correlation between conflict and poverty status, as conflict seems to be affecting also non-poor households, there is a concern that conflict increases deprivations, such as educational deprivation suggested in work by Bertoni et al. (2018) and that excluding highly conflict affected areas may underestimate results. While conflict is a concern in three regions of Nigeria, the North East (Boko Haram insurgency), North Central (farmer – herder conflict over land access) and South-South (militant and pirate groups targeting in particular the oil sector), it is only in the North East and to some, but much lesser extent, in the South-South that enumeration areas were declared not accessible for data collection, due to security concerns. This limits in especially the representativeness of the data of Borno, Adamawa, Yobe and Delta states, likely resulting in underestimates of poverty in those states.

Table 2: Sample Sizes by Poverty Measure and Survey

Age in completed years	Monetary Poverty Measures		Multi-Dimensional Poverty Measures – Deprivations						
	National poverty line	International 1.9\$ a day poverty line	water	sanitation	shelter	information	education	Food	Health
1								GHS1 – 2010/2011: 4,405 (4,205) GHS2 – 2012/2013: 3,463 (1,075) GHS3 – 2015/2016: 2,986 (659) GHS -2018/2019: 3,256 (649) MICS – 2016/2017: 28,578 (3,137)	GHS1 – 2010/2011: 1,548 (462) GHS2 – 2012/2013: 1,160 (331) GHS3 – 2015/2016: Missing GHS -2018/2019: Missing MICS – 2016/2017: 11,255 (4,297)
2	GHS1 – 2010/2011: 13,947	GHS 1 – 2010/2011: 13,947	GHS1 – 2010/2011: 13,947 (473)	GHS1 – 2010/2011: 13,947 (563)	GHS1 – 2010/2011: 13,947 (61)				
3			GHS2 – 2012/2013: 13,403 (71)	GHS2 – 2012/2013: 13,403 (135)	GHS2 – 2012/2013: 13,403 (45)				
4	GHS2 – 2012/2013: 13,403	GHS2 – 2012/2013: 13,403	GHS3 – 2015/2016: 12,850 (116)	GHS3 – 2015/2016: 12,850 (62)	GHS3 – 2015/2016: 12,850 (58)				
5									
6	GHS3 – 2015/2016: 12,850	GHS3 – 2015/2016: 12,850	GHS4 -2018/2019: 13,157 (-)	GHS -2018/2019: 13,157 (-)	GHS -2018/2019: 13,157 (-)				
7			MICS – 2016/2017: 89,033 (200)	MICS – 2016/2017: 89,033 (248)	MICS – 2016/2017: 89,033 (1,619)	GHS1 – 2010/2011: 9,542 (-)	GHS1 – 2010/2011: 9,542 (406)		
8						GHS2 – 2012/2013: 9,940 (-)	GHS2 – 2012/2013: 9,940 (776)		
9						GHS3 – 2015/2016: 9,864 (51)	GHS3 – 2015/2016: 9,864 (6)		
10						GHS -2018/2019: 9,901 (-)	GHS -2018/2019: 9,901 (-)		
11						MICS – 2016/2017: 33,040 (45)	MICS – 2016/2017: 60,455 (9)		
12									
13									
14									
15									
16									
17									

Source: Authors' own estimates based on GHS 1 – 2010/2011, GHS2 – 2012/2013, GHS3 – 2015/2016, GHS4 – 2018/2019 and MICS 2016/2017

Note: Numbers represent sample sizes of the respective age samples with numbers in parentheses representing the number of observations with missing information for the respective poverty measure. For the health deprivation, additional completed age categories are marked in blue, indicating that there is data available for individuals in these age groups from the MICS, but for comparison not used in the main analysis of this study. For the additional deprivations sample sizes are as follows: Not-in-school deprivation: Wave 1: 9,542 (454), Wave 2: 9,940 (1,078), Wave 3: 9,864 (6), Wave 4: 9,895 (-); protected water deprivation: Wave 1: 13,947 (377), Wave 2: 13,403 (175), Wave 3: 12,850 (187), Wave 4: 13,148 (-); improved sanitation deprivation: Wave 1: 13,947 (563), Wave 2: 13,403 (135), Wave 3: 12,850 (62), Wave 4: 13,148 (-).

A further bias and potential underestimate stems from the exclusion of Nigeria's nomadic population, estimated to amount to 9.4 million¹⁸, and households living in IDP camps, due to the non-permanent nature of the settlement and challenge to trace households across visits and waves. This represents a sizable share of Nigeria's population considering that about 2.1 million¹⁹ Nigerians are estimated to be internally displaced and likely more deprived. Despite their limitations, these are the best currently available data sets, and the results presented in this study hence the best estimates currently available, though likely underestimates.

5. Results

5.1 Descriptive Results

5.1.1 Monetary Child Poverty in Nigeria

Figures 1 and 2 present the headcount poverty rates based on Nigeria's national poverty line for different age groups as an aggregate and differentiating by urban and rural sector respectively. Figures 3 and 4 present the same statistics but instead using the USD 1.90\$ a day international poverty line. Irrespective of the poverty line four points stand out: (1) poverty increases the younger the children (2) aggregate child poverty has been increasing over the three waves of the GHS survey²⁰ (3) aggregate child poverty rates are driven by up to almost three times higher and rising poverty rates for children in rural areas and (4) the child poverty gap between those living in the northern versus the southern regions is comparable to the rural urban gap. For children aged 0-4 the rural poverty rate according to the national poverty line is 62% whereas in urban areas it is 19%. Poverty rates according to the international poverty line are slightly higher but show the same gap.

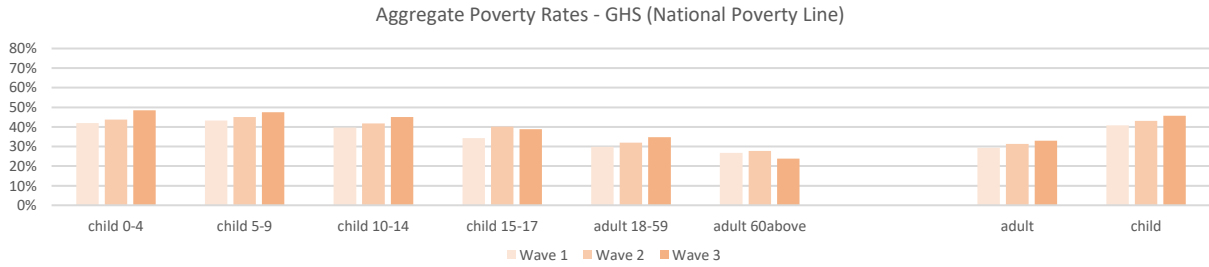
¹⁸ Figures based on National Commission for Nomadic Education estimates retrieved 29th May 2019: <http://www.ncne.gov.ng/about-us/>

¹⁹ Figures based on Internationally Displaced Monitoring Center estimates retrieved 29th May 2019: <http://www.internal-displacement.org/events/workshops-on-internal-displacement-data-in-nigeria> and UNHCR website, retrieved 29th May 2019: <https://www.unhcr.org/nigeria-emergency.html>

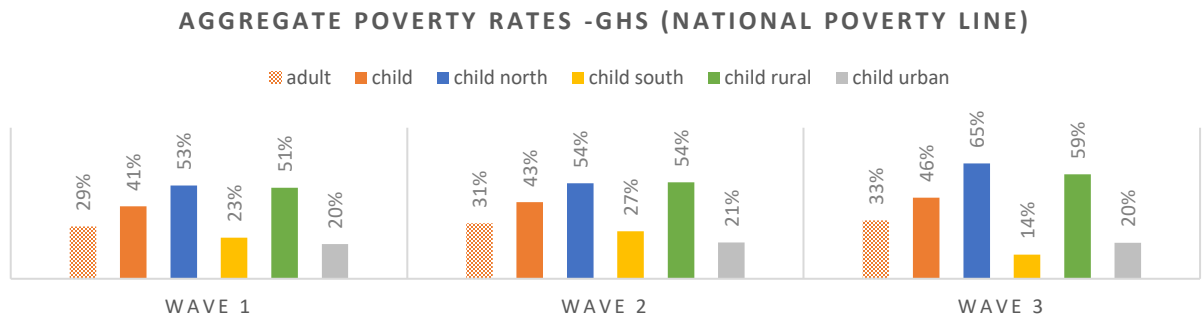
²⁰ As the consumption aggregate for wave 4 contains slightly different components than that of waves 1 to 3, due to the change in the components comprising the new national poverty line, monetary poverty estimates are only presented for wave 1 to 3. Given the break in series, monetary poverty estimates for wave 4 are considered not fully comparable to those of waves 1 to 3.

Figure 1: Aggregate Headcount Poverty Rates – GHS (National Poverty Line)

a)



b)



Source: Authors' estimations based on GHS Wave 1-3.

Note: Individuals with missing age were dropped from the analysis.

Figure 2 a): Rural- Urban Headcount Poverty Rates – GHS (National Poverty Line)

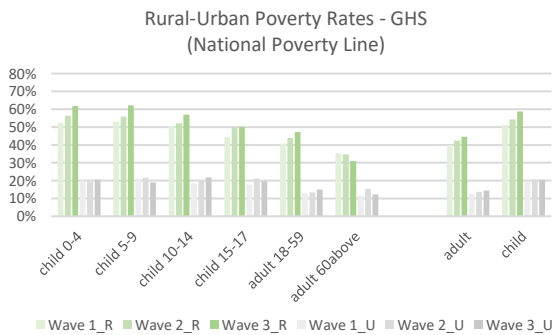
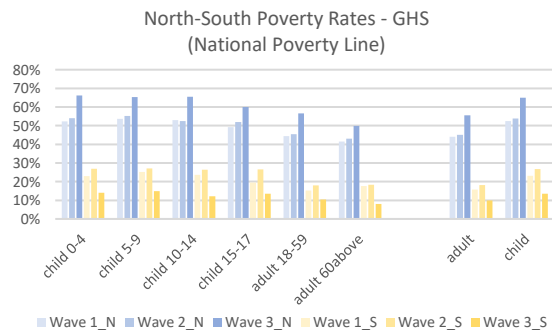


Figure 2 b): North - South Headcount Poverty Rates – GHS (National Poverty Line)

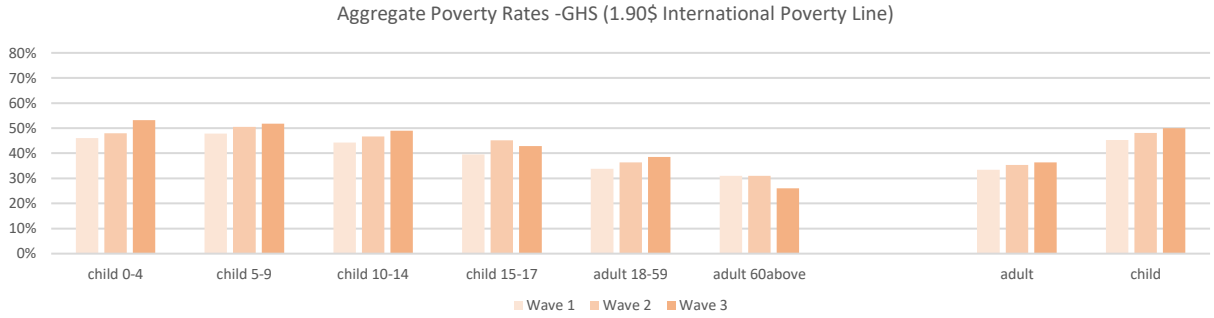


Source: Authors' estimations based on GHS Wave 1-3.

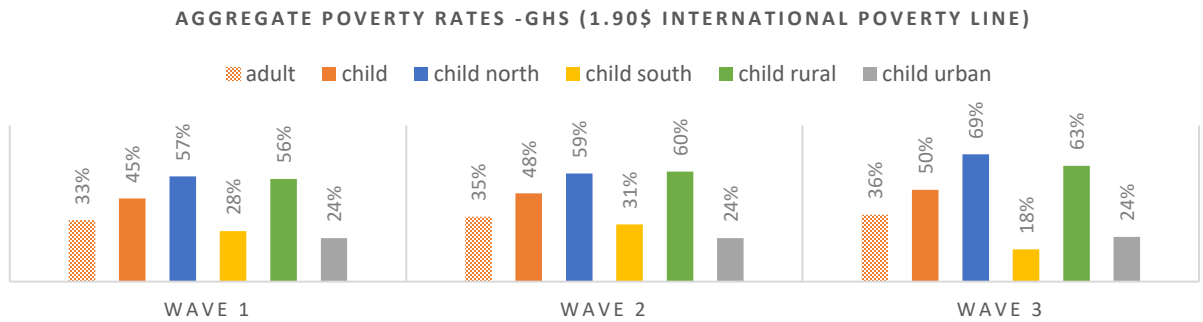
Note: Individuals with missing age were dropped from the analysis.

Figure 3: Aggregate Headcount Poverty Rates – GHS (USD 1.90\$ International Poverty Line)

a)



b)



Source: Authors’ estimations based on GHS Wave 1-3.

Note: Individuals with missing age were dropped from the analysis.

Figure 4 a): Rural- Urban Headcount Poverty Rates (USD 1.90\$ International Poverty Line)

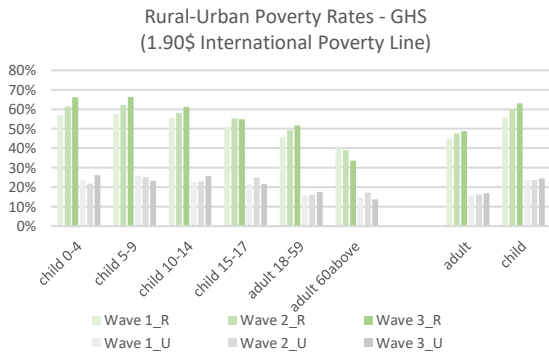
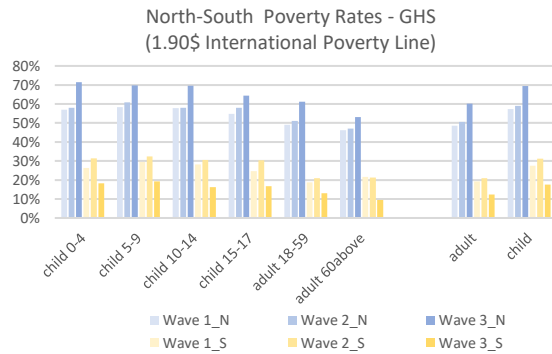


Figure 4 b): North-South Headcount Poverty Rates (USD 1.90\$ International Poverty Line)



Source: Authors’ estimations based on GHS Wave 1-3.

Note: Individuals with missing age were dropped from the analysis.

Looking beyond national aggregates, Figure 5a presents a breakdown by region and child age group throughout the waves. Figures 5 b and c further differentiate between rural and urban sector in each

region. Apart from the urban-rural divide these display also a north-south divide. The North-South gap is particularly striking, as even regional level urban poverty rates in the north do not come close to the rural poverty rates in south.

However, poverty trends over time display different patterns across regions. While urban and rural poverty rates seem to follow a longer-term decreasing trend in the southern regions, both are increasing in the northern regions, with the exception of urban poverty rates for the 0-9 year olds in the North Central region, who experienced lower poverty rates over time. Monetary poverty rates appear to have continuously increased over the three waves in the North East, and that despite the likely poorest households living in the most conflict affected areas not being included in the latest survey. South-South urban child poverty has, as Figure 6e shows, been decreasing visibly faster than rural poverty, hence resulting in a widening of the urban rural gap. Moreover, comparing Figures 5b and 5c for wave 3 indicates very similar urban child poverty rates throughout the South of between 9 and 12 percent, whereas children living in rural areas in the South West, especially the youngest, face somewhat higher poverty rates than rural children in other Southern regions. Rural poverty rates between 24 and 32 percent in the south can only be compared with urban poverty rates in the North Central and the North East of 33 and 37 percent. The respective figures based on the national poverty line are available in the Appendix (see Figures A.1a-c)

Figure 5 a): Poverty Rates by Geopolitical Zone – GHS (USD 1.90\$ International Poverty Line)

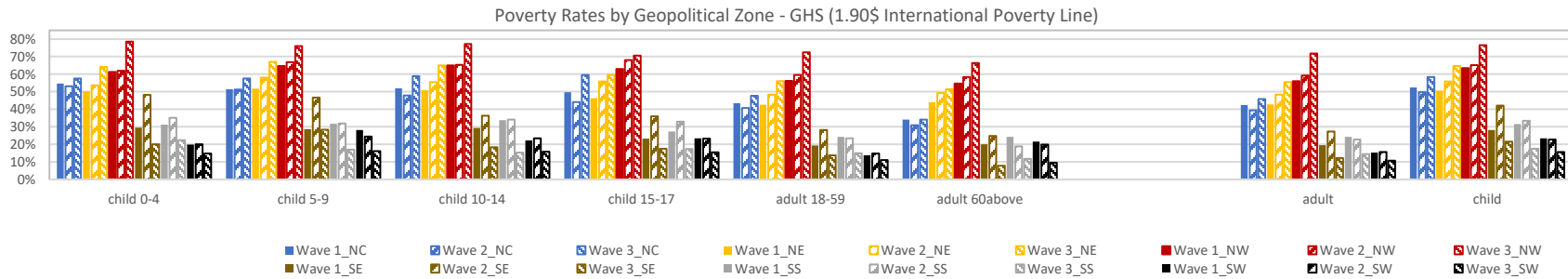


Figure 5 b): Urban Poverty Rates by Geopolitical Zone – GHS (USD 1.90\$ International Poverty Line)

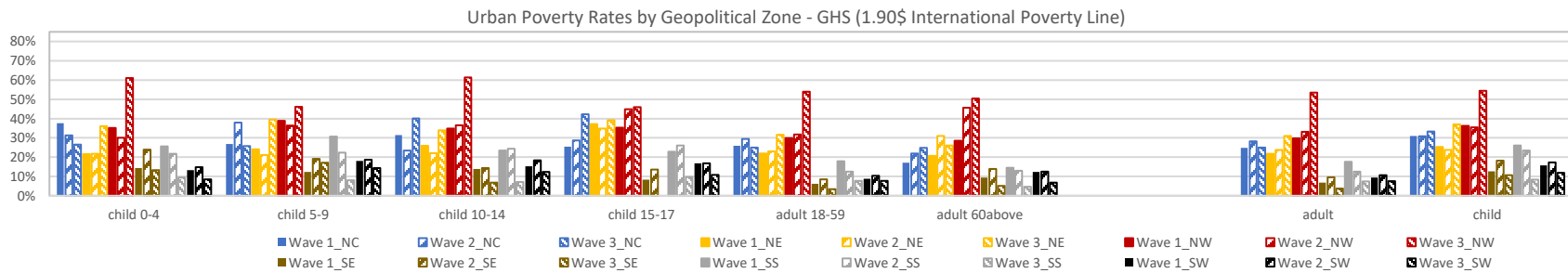
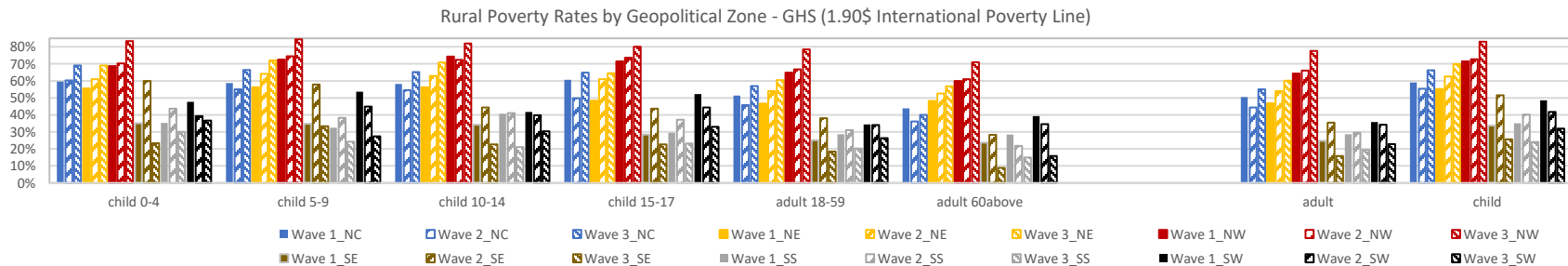


Figure 5 c): Rural Poverty Rates by Geopolitical Zone – GHS (USD 1.90\$ International Poverty Line)



Source: Authors' own estimations based on GHS Wave 1-3.

Note: Individuals with missing age were dropped from the analysis. Total refers to all individuals with known age.

Also, by age group Figures 5a-c display notable differences across and within regions. Peak poverty rates of 85 percent for children aged 5-9 in rural areas in the North West in wave 3 stand in stark contrast to urban poverty rates for the 10-17-year old in the South West of below 10 percent. Even though rural poverty rates appear based on this data in wave 3 higher in the North West than in the North East, which currently receives a lot of attention from donor agencies, it needs to be kept in mind that the data from the North East is biased towards accessible areas. In the inaccessible rural conflict affected areas child poverty rates may likely be higher than the already high 70% rural child poverty rates in wave 3 in the accessible areas.

5.1.2 Multi-Dimensional Poverty in Nigeria

As poverty goes beyond monetary poverty, this section presents poverty estimates based on different deprivations using the four waves of the GHS and the MICS 2016/2017 data set. The results of the individual level deprivations (education, food and health) are presented for different age groups, followed by the child deprivations (water, sanitation, shelter, information) measured at the household level over the complete child age range²¹. For each deprivation, first national level figures are presented for each GHS wave and the MICS data, distinguishing by urban and rural sector. Subsequently, estimates by geopolitical zone are presented by survey and sector. Finally, state level estimates based on the MICS data are displayed, with a further breakdown by gender for severe education and food deprivation.

Education Deprivation

By reaching the age category 15-17 years, according to Figure 6a, around 1 in 10 children has never been to school and is not currently in school with little change over time. However, educational deprivation seems very much a rural phenomenon. Moreover, rural and northern do children start schooling later. Among the 5-9-year olds living in urban areas, around 10 percent has not yet been to school while still close to 30 percent of their peers in rural areas has never been to school. Between the north and the south this gap is even more extreme, 32 versus 3 percent respectively, as Figures 6 b-c display. Whereas the in Figure 6 presented GHS and MICS data suggest no clear change in educational deprivation over time, the Figures 6 b and c show that children in rural and northern areas have over time started to attend school at an earlier age.

While there has been a strong emphasis on girls' education among the donor community with projects and policy recommendations targeted at increasing the rate of girls' education around the world (see Bill

²¹ Severe information deprivation is presented for children of school going age 5-17, as it is considered that only in this age range children can actively consume and look for information.

and Melinda Gates Foundation, n.d.; OHCHR, n.d.; Plan International, n.d. ; UNICEF, n.d.; Woodon et al., 2018) and in Nigeria (see UNICEF, 2017; UNGEI, 2008; World Bank, 2018), education deprivation shares do not display noteworthy differences across gender neither in the rural nor urban areas, nor when comparing north to south, when solely considering national or regional figures, as displayed in Figure 6 d) to i) and Figure A.2 in the Appendix.²² One exception is the higher share of rural girls aged 15-17 that has never been to school in the NW compared to boys, 20% versus 11% in wave 4. For the North East, the graph however displays the opposite.

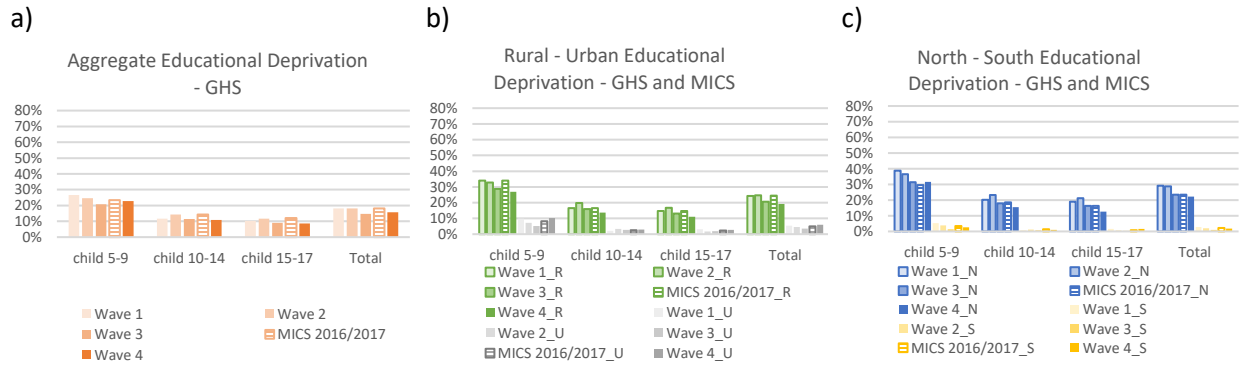
As severe education deprivation however does not inform about the length of education and early drop-out rates of those not deprived, estimates for the share of children not in school while of school going age are presented in Figures 11 to 15.

Apart from a rural – urban education deprivation divide, there is an even more extreme north-south divide, with children living in the North-East and North-West regions facing the highest though over time decreasing severe education deprivation rates, as displayed in Figure 7. Nevertheless, still even in the fourth GHS wave, close to 30 percent of children in the oldest rural age group in these regions compared to less than 1 percent of the children of this age group in the South-South have never received any education. While the pattern of the GHS and MICS estimates across regions is generally consistent, the GHS data suggests higher education deprivation rates for the rural North-West, whereas the MICS data suggests even higher rates in the rural North-East. This discrepancy may be related to differential access to conflict affected areas of the rural North-East by the survey teams of the GHS and the MICS survey, which may suggest that the temporarily inaccessible areas display notably higher education deprivation rates than the more accessible ones. Such a discrepancy would confirm findings by Bertoni et al. (2018) that the conflict does notably effect schooling of children in the North-East. It is also worth noting that while children in the rural South-West similar to the children in the northern regions, appear to start schooling later and used to have slightly higher education deprivation rates than the other southern regions, towards GHS wave 3 also in the South West almost all children have been at some point in school by the time they reach the oldest child category.

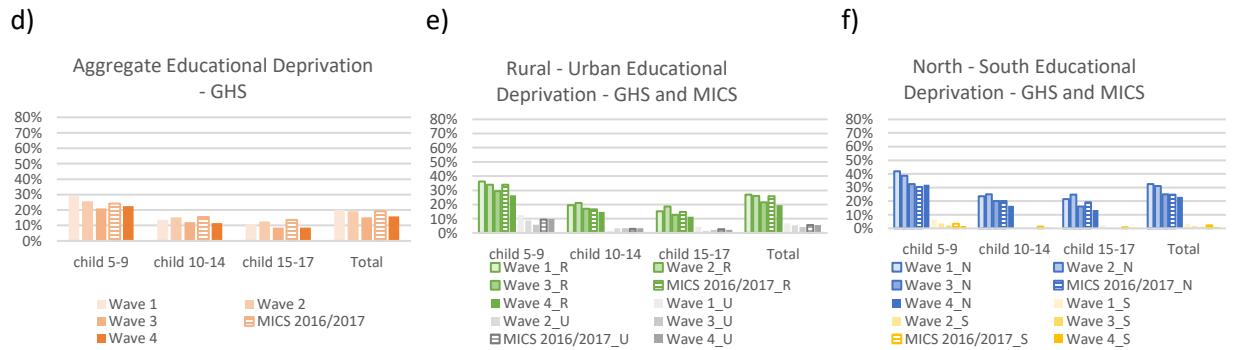
Figure 6: National Level Severe Education Deprivation

²² UNICEF (2017) evaluates for instance the unconditional cash transfer program ranging from 2014-2016 with the primary objective of increasing the enrolment, retention and completion of basic education of girl's in specific areas of Niger and Sokoto States, presented in.

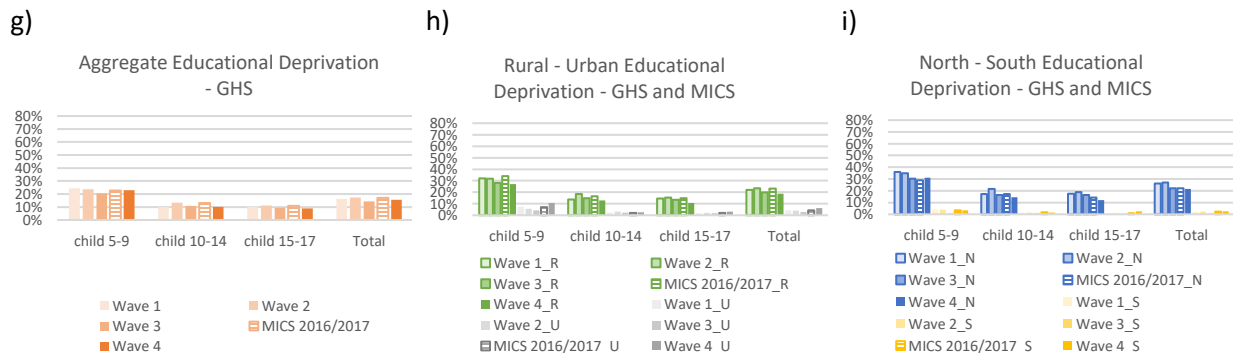
All Children



Girls only



Boys only

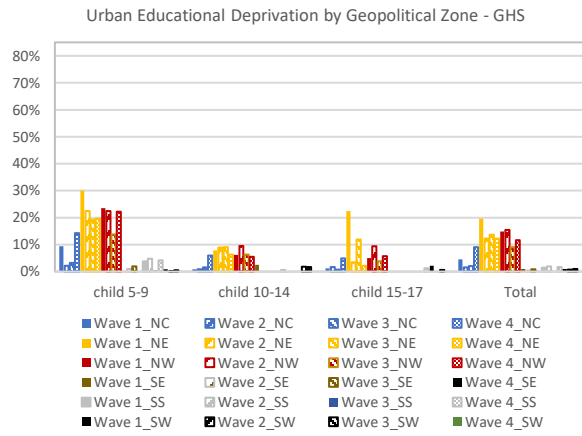


Source: Authors' estimates based on GHS Waves 1-4 and MICS 2016/17.

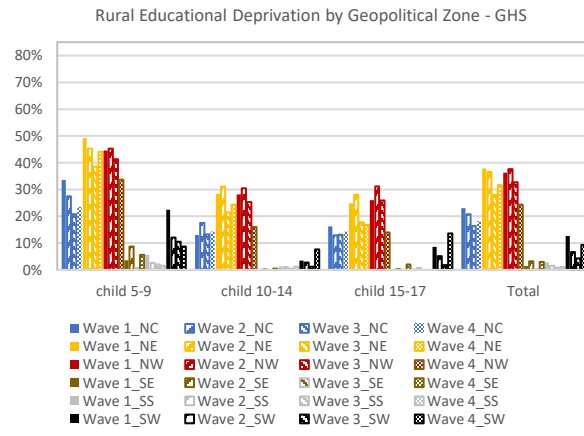
Note: Individuals with missing age were dropped from the analysis. Total refers to all individuals with known age.

Figure 7: Regional Level Education Deprivation

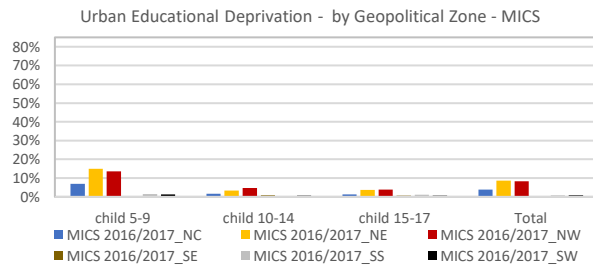
a)



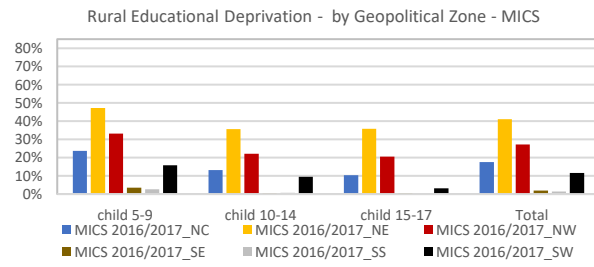
b)



c)



d)

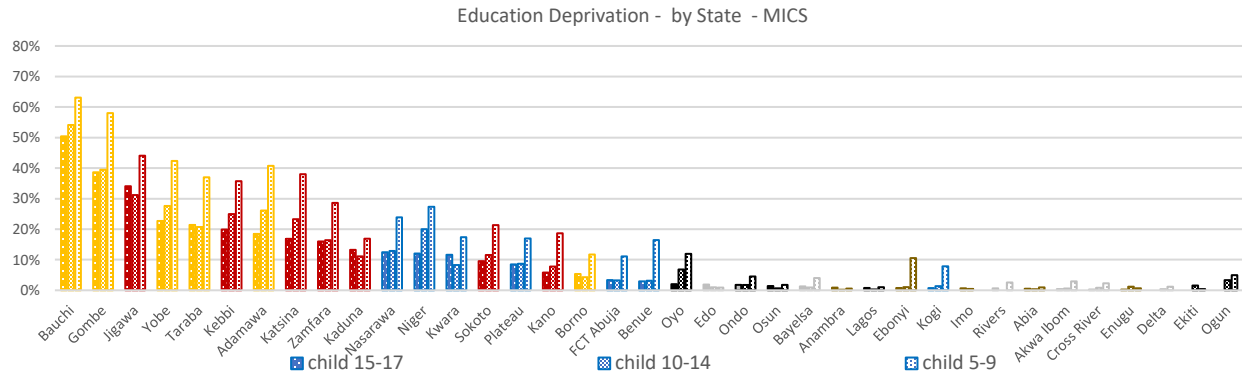


Source: Authors' estimates based on GHS Wave 1-4 and MICS 2016/17.

Note: Individuals with missing age were dropped from the analysis. Total refers to all individuals with known age.

The below Figures 8 and 9 show the existence of an enormous heterogeneity in educational deprivation between states. In Bauchi 50% of the children of the age group of 15-17 years, have never attended and are not currently attending school, whereas there are also states where close to 100% of the children have at some point attended school. It however also shows that at least some of the over 60% of children in Bauchi not in school when 5-9 years old, as Figure 8 displays, will have likely been in school at least at some point when reaching towards the oldest child age category.

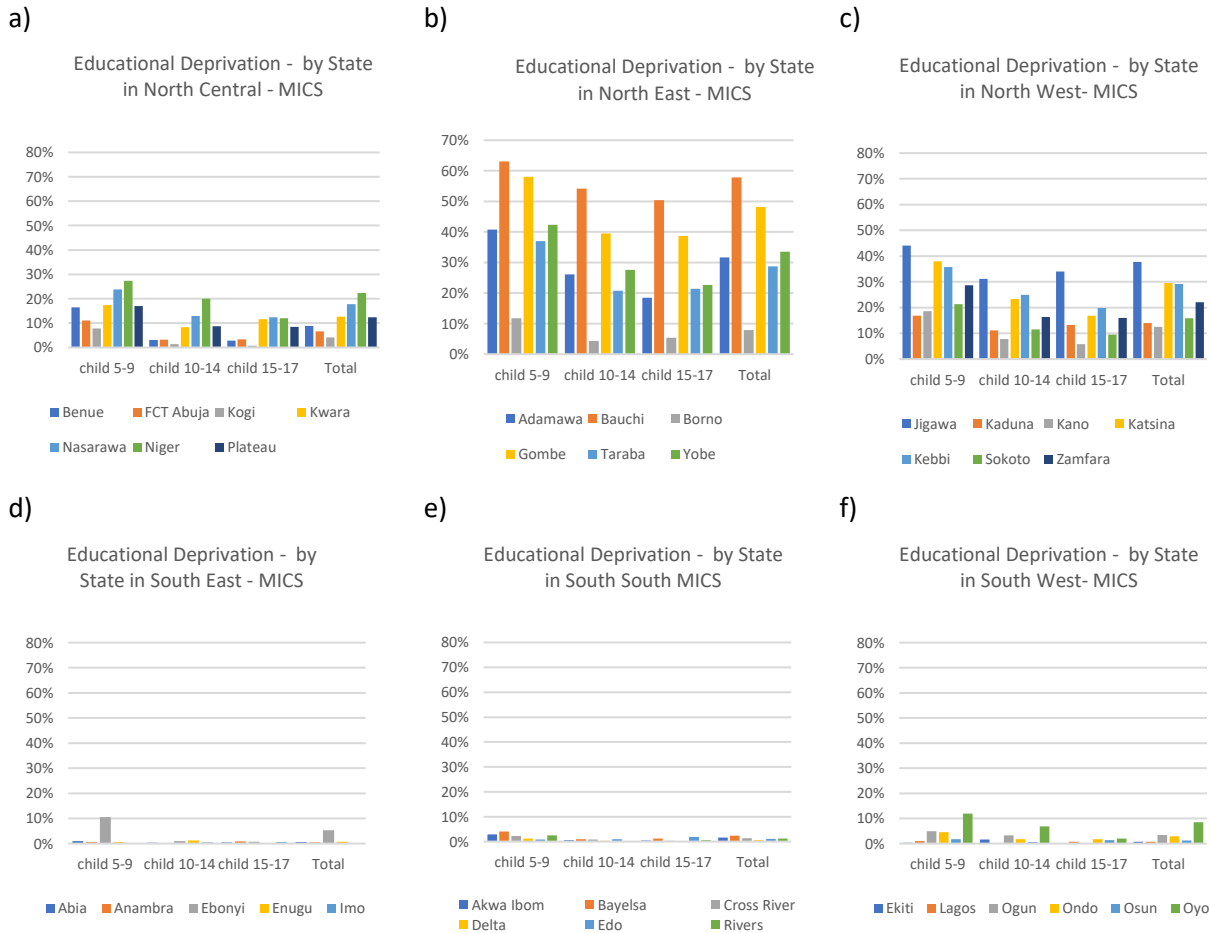
Figure 8: State- Level Education Deprivation



Source: Authors' estimates based on MICS 2016/17.

Note: Individuals with missing age were dropped from the analysis. Total refers to all individuals with known age. States are sorted by the highest deprivation rate of the oldest child category.

Figure 9: State-Level Education Deprivation by Region

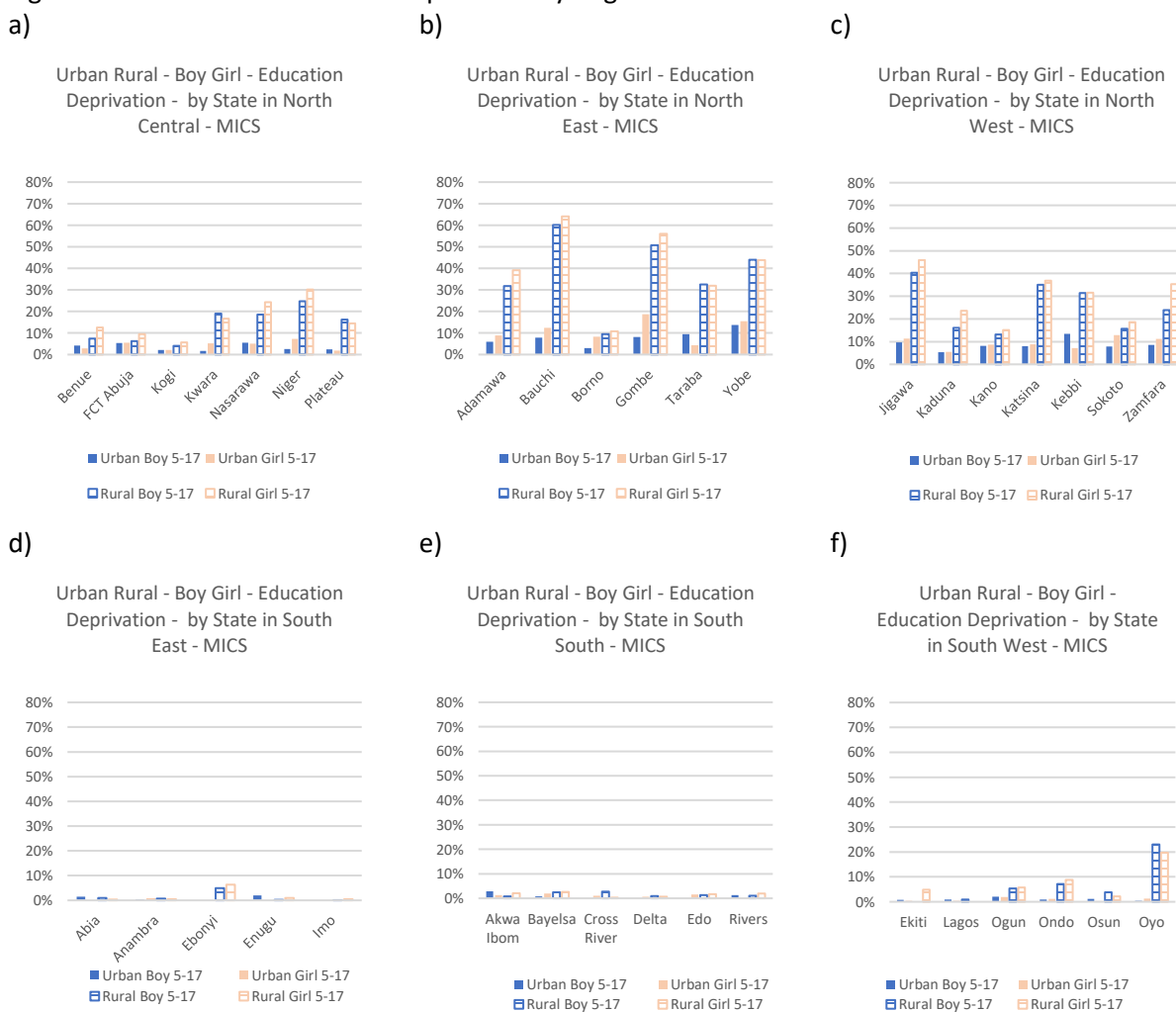


Source: Authors' estimates based on MICS 2016/17

Note: Individuals with missing age were dropped from the analysis. Total refers to all individuals with known age.

In terms of a gender gap with respect to severe education deprivation at the state level, estimates displayed in Figure 10 shows that there are especially in rural areas in several northern states, cases of girls being about five percentage points more likely to have never been to school than boys. However, the gender gap is much smaller than the rural-urban and north-south gap. Interestingly, Figure 10 displays also cases wherein higher shares of boys are severely education deprived than girls, such as in Taraba, Kebbi and Oyo.

Figure 10: State-Level Education Deprivation by Region and Gender

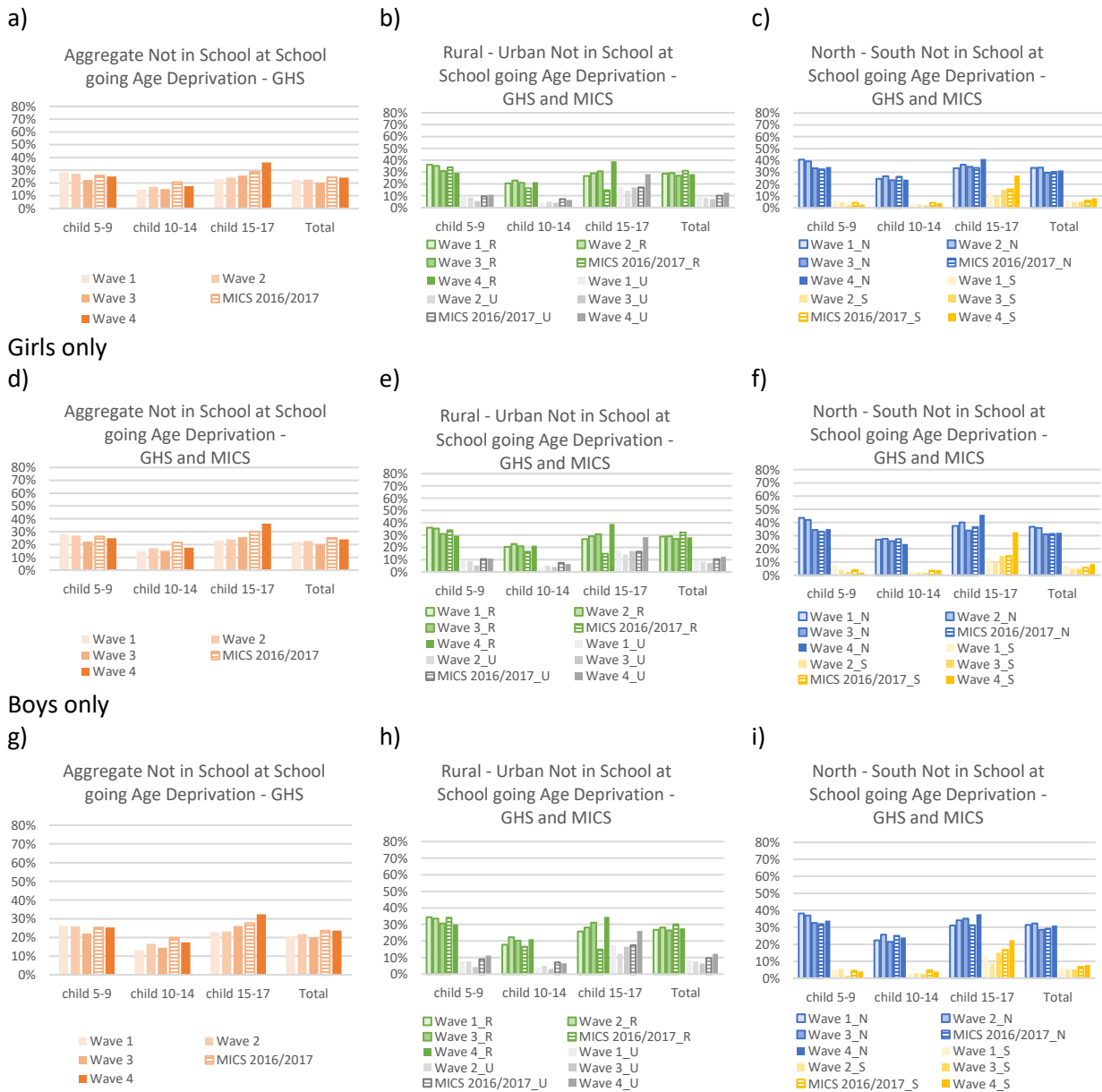


Source: Authors' estimates based on MICS 2016/17

Note: Individuals with missing age were dropped from the analysis. For Ebonyi the shares for urban boys and girls are excluded because of too limited sample size. The threshold for exclusion is set at less than 30 observations per demographic group.

While severe education deprivation considers any child not deprived if he/she ever went to school, the findings suggest the need to also consider the rate of those children not being currently enrolled while of school going age. Being a milder form of educational deprivation, this is important though in the analysis of school enrollment and drop out ages in different demographic groups.

**Figure 11: National Level Share of Children of School-going-age Not in School
All Children**



Source: Authors' estimates based on GHS Wave 1-4 and MICS 2016/17.

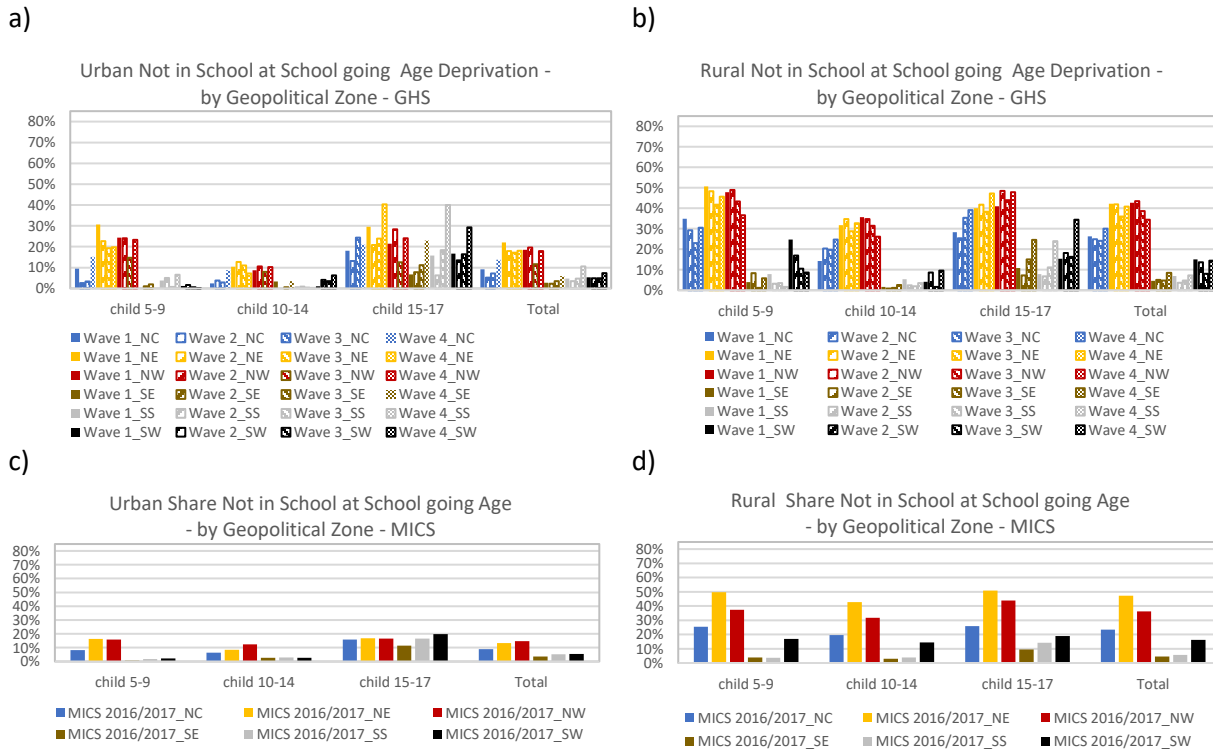
Note: Individuals with missing age were dropped from the analysis. Total refers to all individuals with known age.

Figures 11 a) to i) display a clear urban rural and north south divide, with lower shares of children of school going age being out of school in the urban and southern areas. Moreover, the figures demonstrate a difference in age group behavior. While in urban areas the share of children not in school doubled in wave 3 when moving from the 10-14 year olds to the 15-17 year olds age group; in rural areas, children appear to start attending school in larger shares only at 10-14 years and results do not display the a similar decrease in school attendance among the older children. When comparing northern and southern areas this pattern is even more extreme. A potential reason might be that in urban and southern areas the opportunity costs of staying in school are higher with more job opportunities available than in rural and northern areas. The observed pattern is consistent among the GHS and MICS surveys and does not seem to have changed much over time until wave 4. Interestingly also school attendance patterns do not seem to differ by gender until wave 3, not even in rural areas - at least not at the aggregate level, despite education projects oftentimes targeting rural girls. Wave 4 shows a jump in drop-out rates for children aged 15-17 in all areas and most extreme in urban and southern areas, whereby the surge of southern girls compared to a limited increase in southern boys dropping out of school is particularly noteworthy. More research is needed whether this is a result of higher opportunity costs for girls staying in school due to the availability of jobs, or girls being forced to work to provide for their families as monetary poverty rates started to rise for households with children in this age group in the South East and South South, as displayed in Figure 5.

Looking beyond aggregates into the potential heterogeneities across the six regions, Figure 12 shows in addition to the rural-urban divide a north-south divide at a regional level. The highest share of children not in school, hence, the lowest school enrollment rates are observed for rural children of any age groups in the North-East and the North-West, with the shares comparing the third GHS wave and the MICS data being relatively close. Moreover, similar to the rural-urban observations discussed in relation to the national level findings, children in the North-East and North-West seem to start attending school at a later age but not facing such a surge in non-attendance in the older age categories as the children in South. Besides, school dropout rates from the middle to the oldest age category appear to rise faster in the rural areas than in the urban areas in the North East and North-West, whereas the reverse seems to hold in the North-Central and South-West, and to a lesser extent also in the South-East and South-South where there is a surge in non-enrollment rates in the urban areas for the oldest children. Further research may want

to look into the underlying mechanisms, which may potentially coincide with the opportunity costs children face by continuing school, instead of working, or be related to the pace of completing school related to the first enrolment age and school quality.

Figure 12: Regional Level Share of Children of School-going-age Not in School



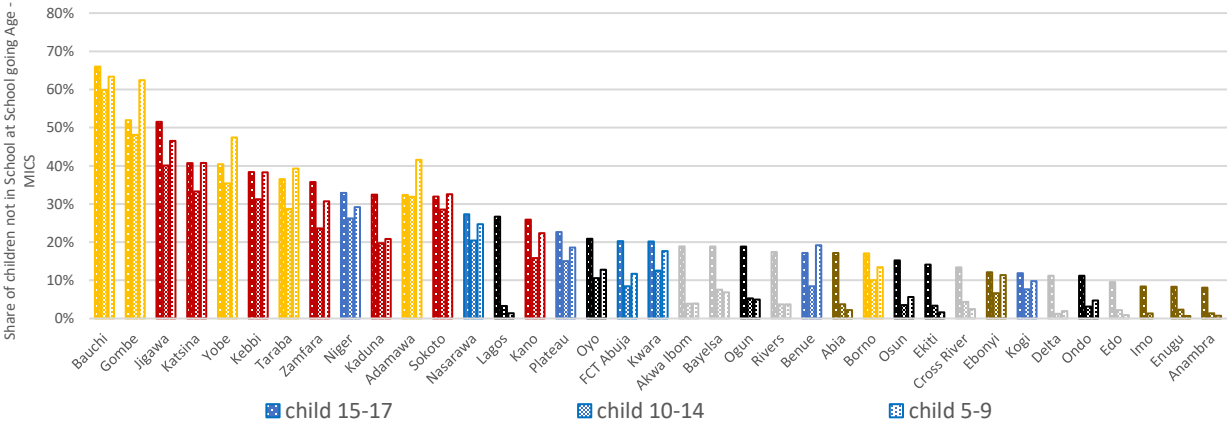
Source: Authors' estimates based on GHS Wave 1-4 and MICS 2016/17.

Note: Individuals with missing age were dropped from the analysis. Total refers to all individuals with known age.

Comparing state level severe education deprivation rates in Figure 9 with state level non-enrollment rate in Figures 13 and 14 shows that high shares of education deprivation do not necessarily imply high drop-out rates, the difference between the shares displayed in Figures 10 and 13/14 for those who ever attended school. Rather it seems to suggest, that while children in some states may be less severely deprived of education, it does not inform about the duration of schooling for those non-deprived children, leaving quality all aside. Overall, however, state level school non-enrollment rates in Figures 13, 14 and 15 largely display the same urban rural and north-south pattern as estimates of severe education deprivation in Figures 9 and 10 though with even higher inter-state discrepancies. The highest share of children of school going age not in school is found in Bauchi, where 68 percent of rural girls and 66 percent of rural boys are out of school, meaning only roughly one third of rural children is attending school. It is worth noting though that there is a large inter-state discrepancy between ever having been to school and

attending school at the time of the survey. Education deprivation rates for rural girls and boys are 64 and 60 percent respectively. This means that of those few children that ever attended school in Bauchi, almost all keep going to school. In contrast comparing Figures 10 d) and 15 d) shows that in Anambara, close to all children have been to school at some point, however, 43 percent of rural girls and 36 percent of rural boys are currently not in school while of school going age. Hence, this shows the importance to look at both severe education deprivation of having never been to school and school enrollment rates independently.

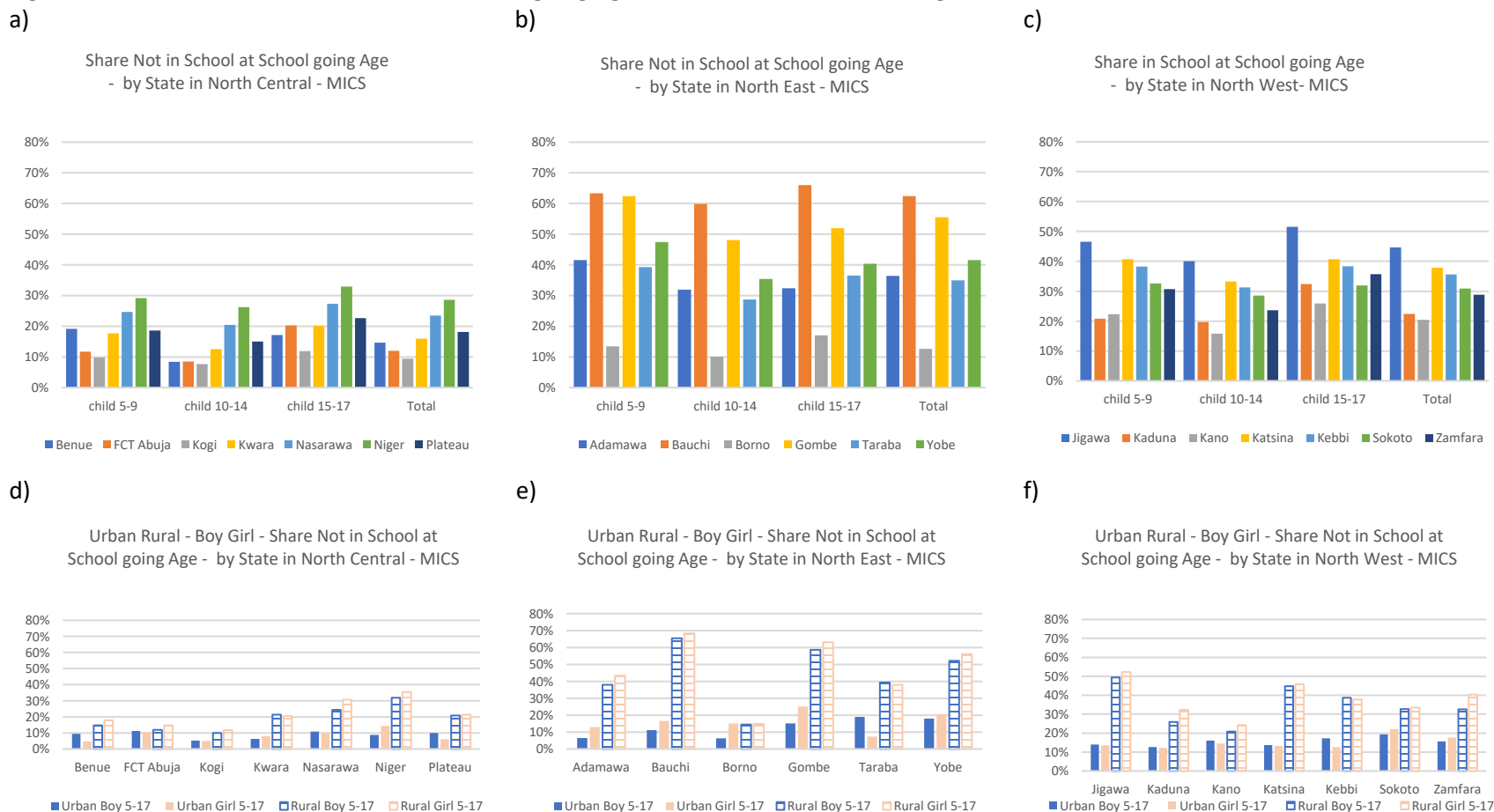
Figure 13: State Level Share of not in School at School going Age Deprivation



Source: Authors’ estimates based on MICS 2016/17.

Note: Individuals with missing age were dropped from the analysis. Total refers to all individuals with known age. States are sorted by the highest deprivation rate of the oldest child category.

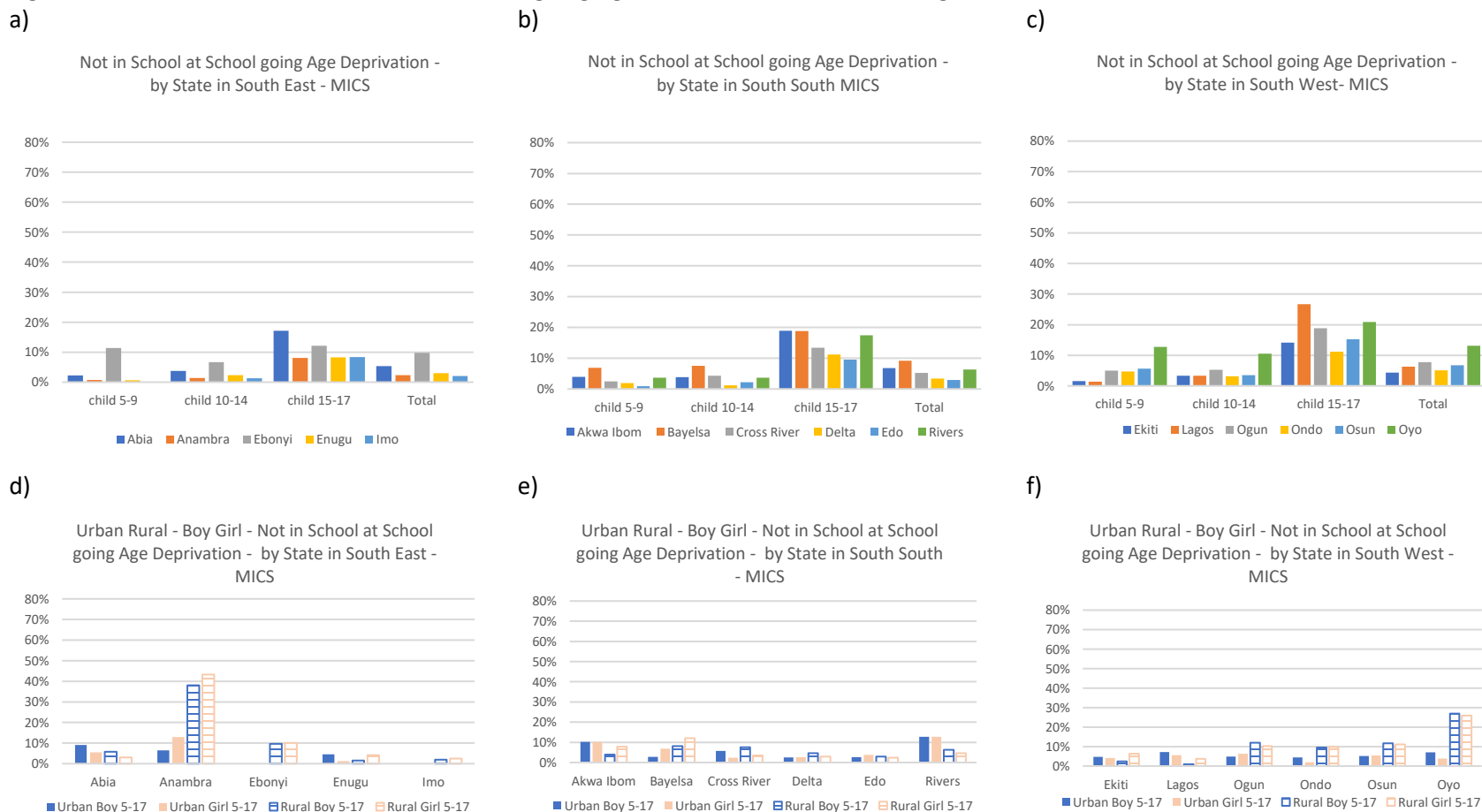
Figure 14: State Level Share of Children of School-going-age Not in School – Northern Regions



Source: Authors' estimates based on MICS 2016/17 data

Note: Individuals with missing age were dropped from the analysis. Total refers to all individuals with known age.

Figure 15: State Level Share of Children of School-going-age Not in School – Southern Regions



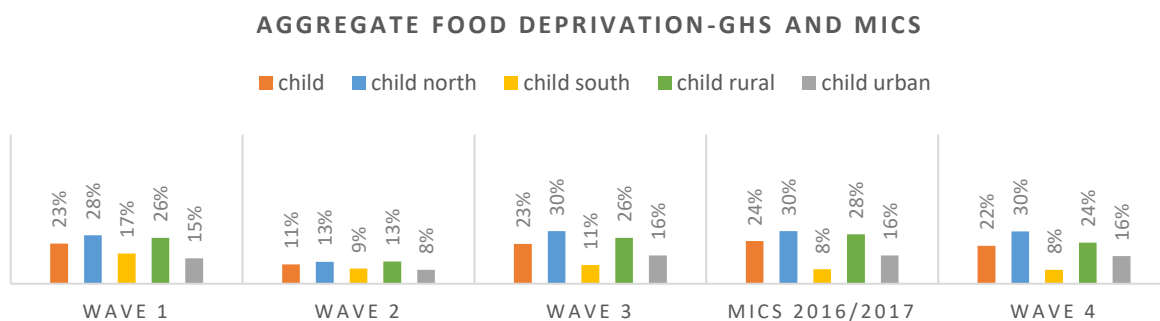
Source: Authors' estimates based on MICS 2016/17 data

Note: Individuals with missing age were dropped from the analysis. Total refers to all individuals with known age. For Ebonyi the shares for urban boys and girls are excluded because of too limited sample size. The threshold for exclusion is set at less than 30 observations per demographic group.

Food deprivation

National averages of severely food deprived children have remained constant in urban and in rural areas over 2009 through 2017. A temporary drop in food deprivation estimates based on the GHS wave 2 data may be a result of data quality concerns. While the data food deprivation throughout all survey waves of GHS and MICS suffers from high proportions of missing information, the consistency of the GHS wave 3 and 4 and MICS estimates give the results little more credibility. Food deprivation is not as widely dispersed between urban and rural as it is between northern and southern regions. Despite widespread subsistence farming in rural areas across regions, which might suggest that rural children have better access to food than urban children, an on average 10 percentage points higher share of rural compared to urban children is food deprived.

Figure 16: National Level Severe Food Deprivation

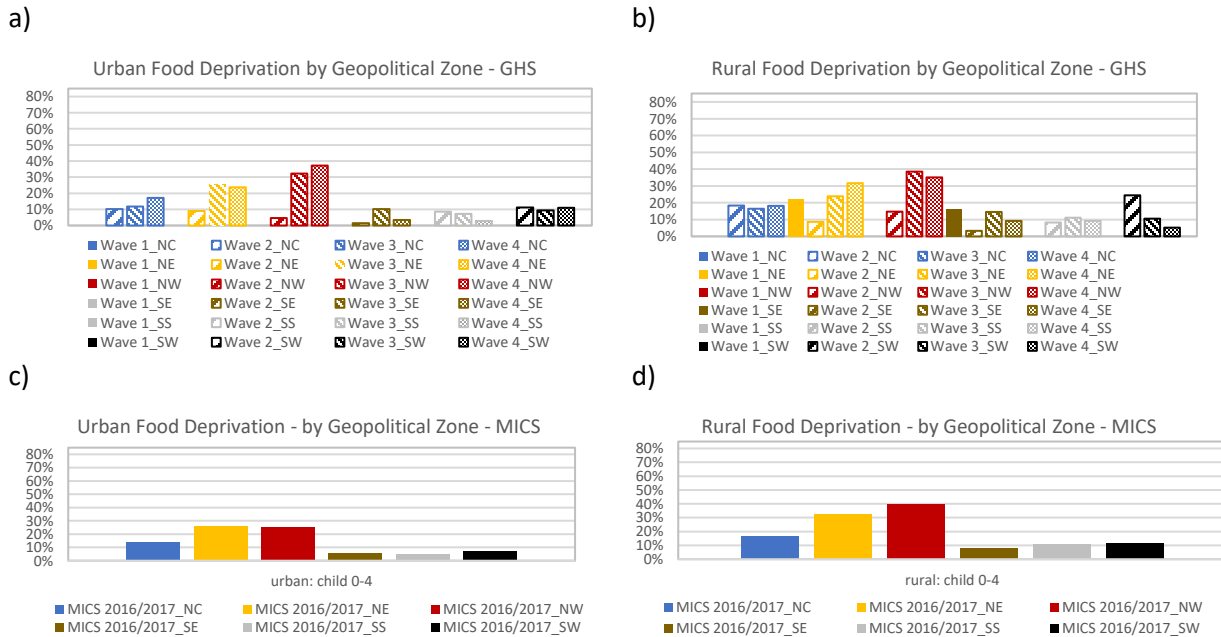


Source: Authors' estimates based on GHS Wave 1-4 and MICS 2016/17

Note: Individuals with missing age were dropped from the analysis. Total refers to all individuals with known age.

In line with the findings of rural children facing higher rates of severe food deprivation, children in the largely rural north are found to be more food deprived than the south. This is consistent across regions as per GHS and MICS data sets.

Figure 17: Regional Level Severe Food Deprivation

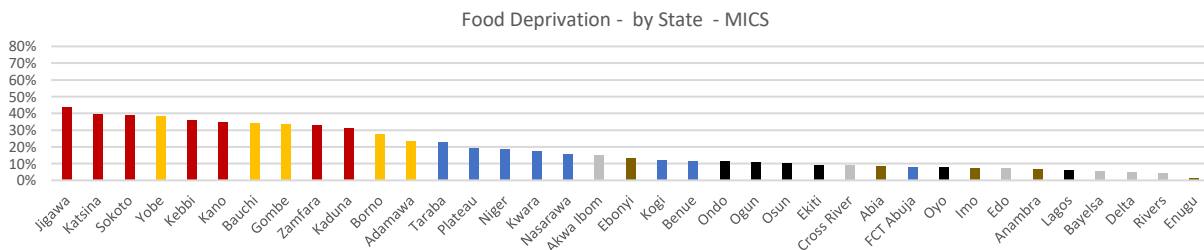


Source: Authors' estimates based on GHS Wave 1-4 and MICS 2016/17

Note: Individuals with missing age were dropped from the analysis.

Further disaggregation by state, based on the MICS data in Figure 18, shows enormous heterogeneity between states ranging from 43 percent of children stunted, wasted or underweight in Jigawa to only 2 percent in Enugu. Here however most heterogeneity is along the north-south divide, as Figure 19, sorting state level estimates by region, shows more homogeneous estimates across states within the same region.

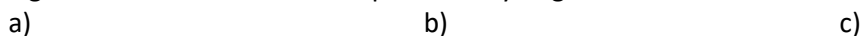
Figure 18: State Level Food Deprivation

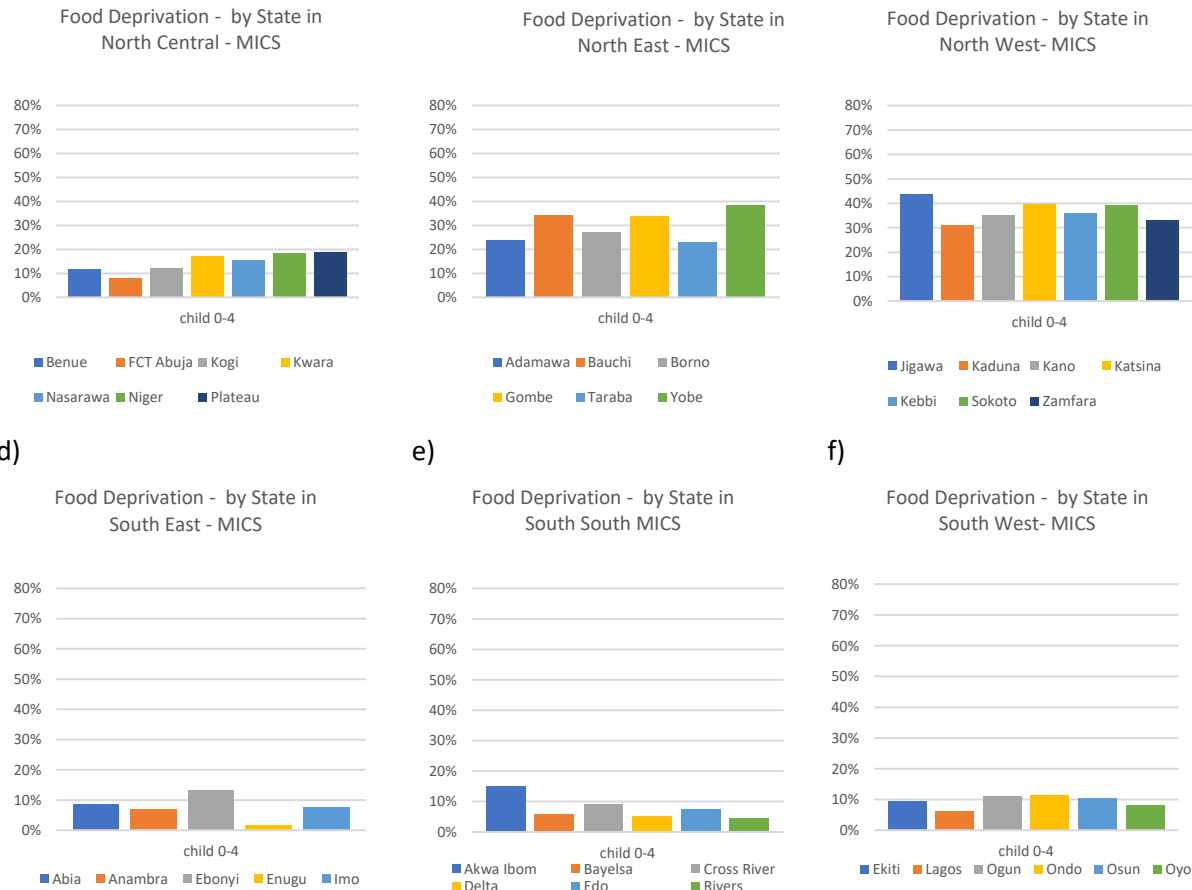


Source: Author's estimates based on MICS 2016/17

Note: Individuals with missing age were dropped from the analysis. Estimates are based on children aged 0-4.

Figure 19: State-Level Food Deprivation by Region



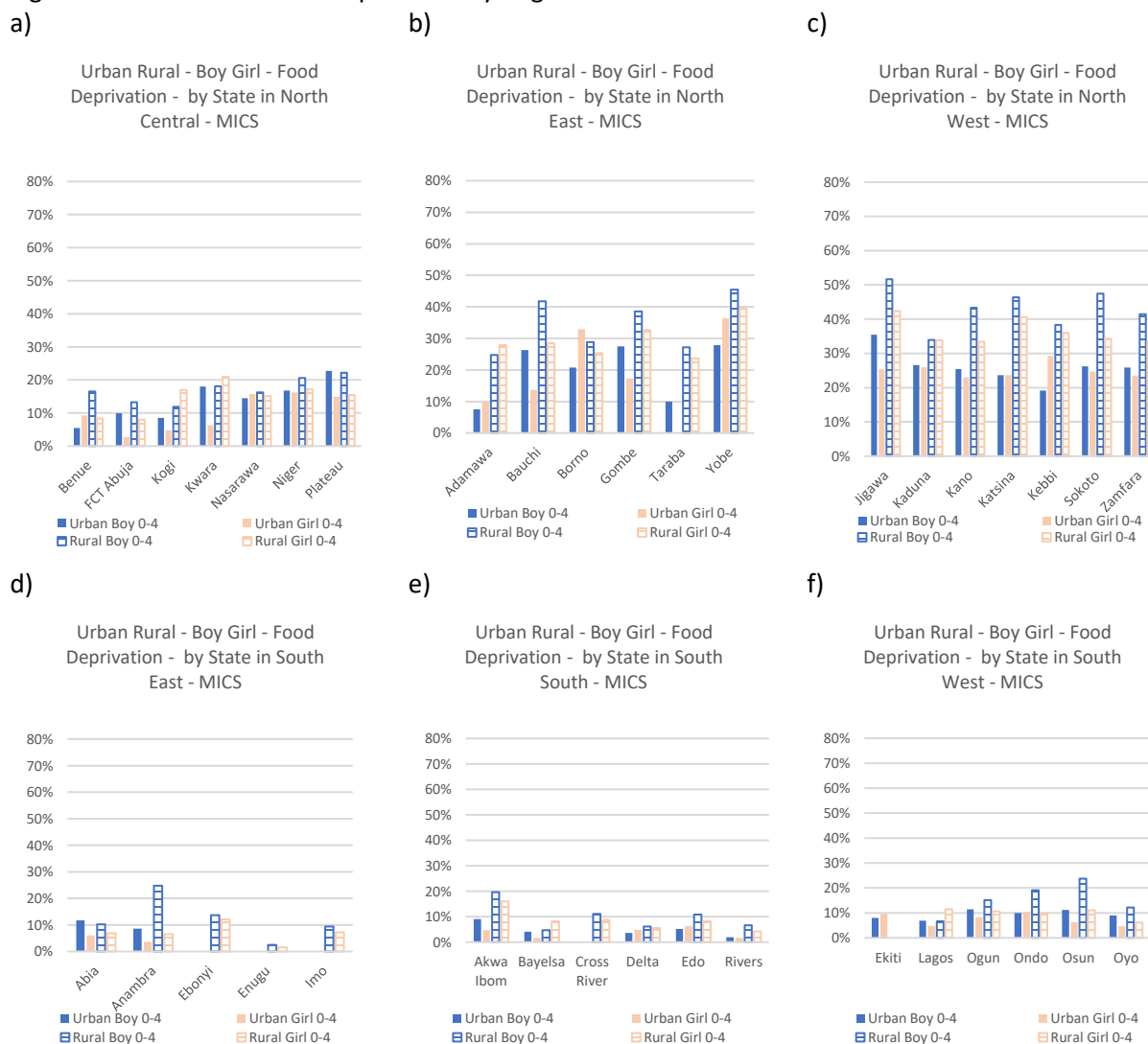


Source: Author’s estimates based on MICS 2016/17

Note: Individuals with missing age were dropped from the analysis. Total refers to all individuals with known age.

Figure 20 displays a further breakdown of the state level estimates by gender and sector. While evidence from Bangladesh and India (see Khatun et al. 2004; Pande, 2003) as well as different development programs suggests that girls are disadvantaged compared to boys in terms of nutrition, the estimates based on the 2016/2017 MICS show that only in certain states, such as urban Borno and Kebbi and rural Lagos such hypothesis is found to be in line with Bangladesh and India. But in most cases, evidence for the opposite is found. The finding that boys are in many states more likely to be food deprived than girls is though consistent with results of girls and boys overall based on the National Nutrition and Health Survey 2018 data discussed in NBS (2018). This finding is also consistent with findings from a meta-analysis using DHS data from 10 Sub-Saharan African countries by Wamani et al. (2007). Also, there are sizeable differences between urban and rural findings within states in the north, which may call for further research. These estimates should however be treated with caution since a detailed breakdown has severely reduced sample sizes.

Figure 20: State-Level Food Deprivation by Region and Gender



Source: Authors' estimates based on MICS 2016/17

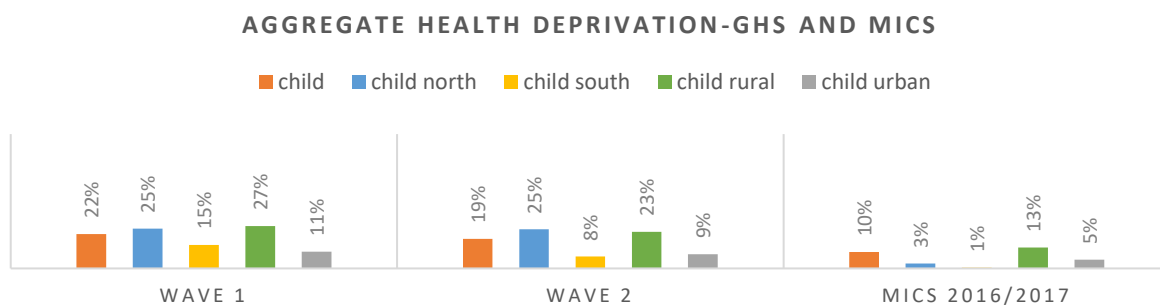
Note: Individuals with missing age were dropped from the analysis. Estimates for Taraba urban girls, Ebonyi urban boy and girls, Enugu urban boys, Imo urban boys and girls, Cross River urban boys and girls and Ekiti rural boys and girls are excluded because of too limited sample size. The threshold for exclusion is set at less than 30 observations per demographic group.

Health Deprivation

Health deprivation estimates, the share of children 0-1 not having received any vaccination based on the GHS waves 1 and 2 and the MICS 2016/17 are inconsistent. The aggregate rate of 17 percent from GHS wave 2 is however very close to the finding of 19 percent of children not having received any vaccination based on the latest Demographic and Health Survey (DHS) report with data from 2018 (see NPC and

UNICEF (2019))²³. The estimates based on the MICS 2016/17 data presented here are however close to those reported in the MICS official survey report restricted to a slightly older age group (see NBS and UNICEF (2017)). Therefore, the regional health deprivation analysis is based on the GHS survey findings. Figure 21 again shows higher deprivation rates for children living in rural areas, whereby, as Figure 22 displays, deprivation rates in both sectors are driven by much higher rates in the North-East and North-West compared to the rest of the country. Also, these findings coincide with those of DHS (2018).

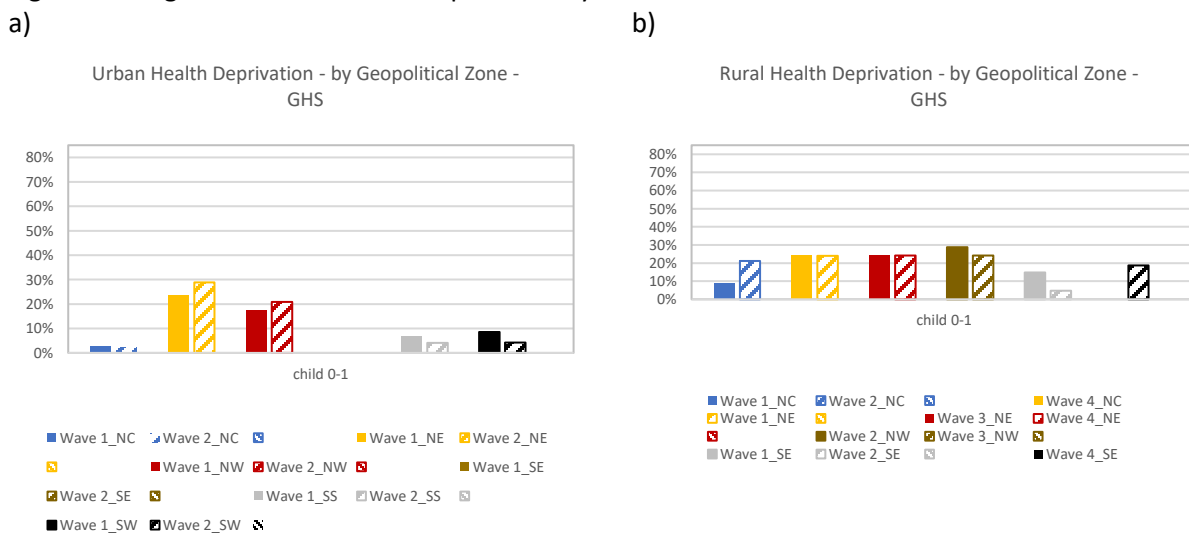
Figure 21: National Level Health Deprivation



Source: Authors' estimates based on GHS wave 1-2 and MICS 2016/17.

Note: Individuals with missing age were dropped from the analysis.

Figure 22: Regional – Level Health Deprivation by Sector



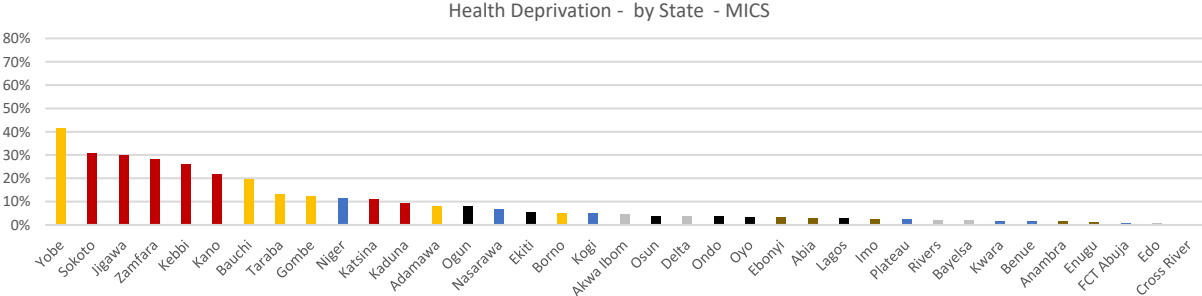
Source: Authors' estimates based on GHS Wave 1-2

Note: Individuals with missing age were dropped from the analysis.

²³ The estimates in the official report on the MICS 2016/2017 data and DHS 2018 data are however based on children aged 12-23 months, whereas those presented here based on GHS and MICS data refer to children 0-1 year thus 0-23 months.

Unlike the GHS data, the MICS 2016/17 data however allows for the calculation of estimates of severe health deprivation according to the original definition by Gordon et al. (2013) considering additionally those children deprived if not having received any treatment when suffering from diarrhea. While the inconsistency with the GHS and DHS data in terms of rate of children not vaccinated raise concerns about data quality in the survey, still the estimated inequality between the southern and northern states, especially in the North-East and North-West regions ranging up to 42% of children under 5 not receiving diarrhea treatment whereas this share lies below 5 percent in most southern states. This seems alarming and requires more in-depth research.

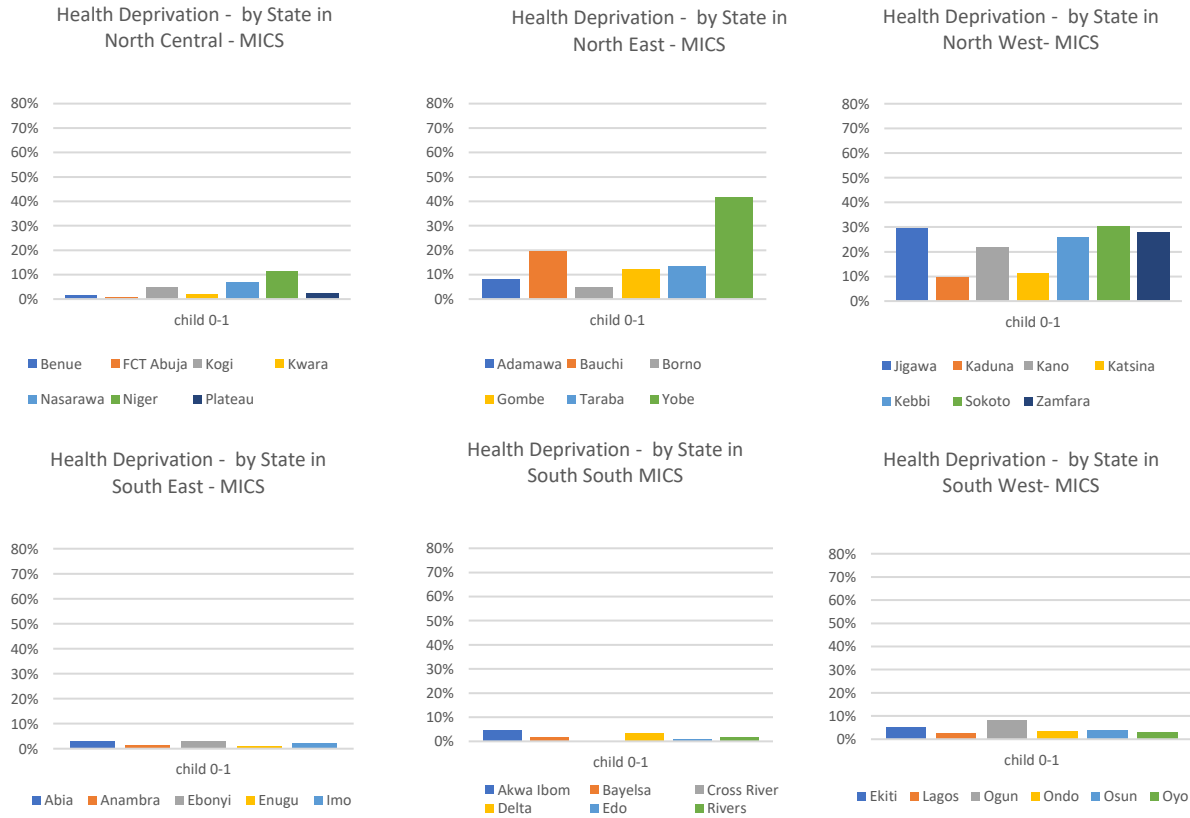
Figure23: State Level Health Deprivation



Source: Authors’ estimates based on MICS 2016/17.
 Note: Individuals with missing age were dropped from the analysis.

As discussed in the data section, data on certain deprivations are only collected at the household level. Hence, any variation in deprivation levels across age groups is limited to varying shares of younger or older children living in more or less deprived households. This section therefore only represents the estimates of water, sanitation, shelter and information for children in general.

Figure 24: State Level Health Deprivation (Immunization and Diarrhea Treatment
 a) b) c)



Source: Authors' estimates based on MICS 2016/17

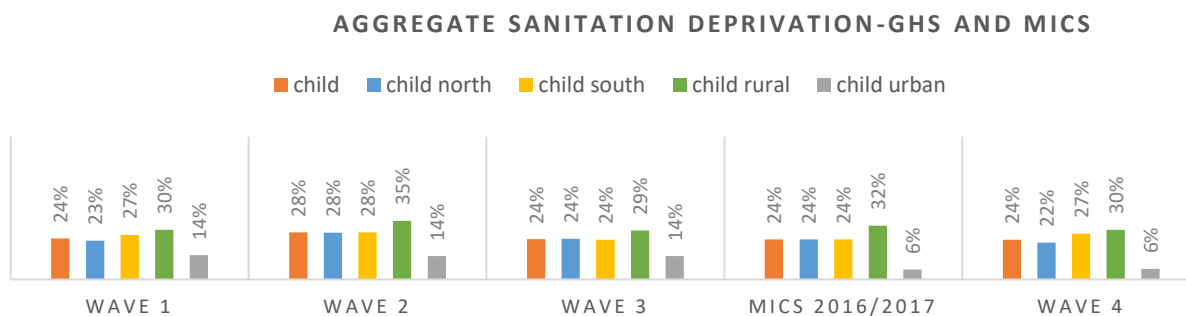
Note: Individuals with missing age were dropped from the analysis. These Health Deprivation shares are based on the original definition by Gordon et al. considering those deprived that did not receive any immunization or no diarrhea treatment, when having diarrhea. As the age range is so small, the sample size does not allow a disaggregation by gender.

Sanitation Deprivation

Severe sanitation deprivation has at the aggregate national level remained unchanged, but is especially a rural concern where about a third of the children are deprived, compared to the national average of around one quarter of the children. Unlike for other deprivations here little difference between deprivation rates for children living in the north versus south are observed. These estimates also closely coincide with the share of households overall practicing open defecation as reported in a joint UNICEF and WHO progress report on sanitation (UNICEF and WHO, 2019), but are around 10 percentage points higher than those based on the National Water Supply and Sanitation survey 2015 presented in WB (2017)²⁴.

²⁴ WB 2017 discusses data quality concerns of NWSS survey on page 17 Box 3.1

Figure 25: National Level Sanitation Deprivation

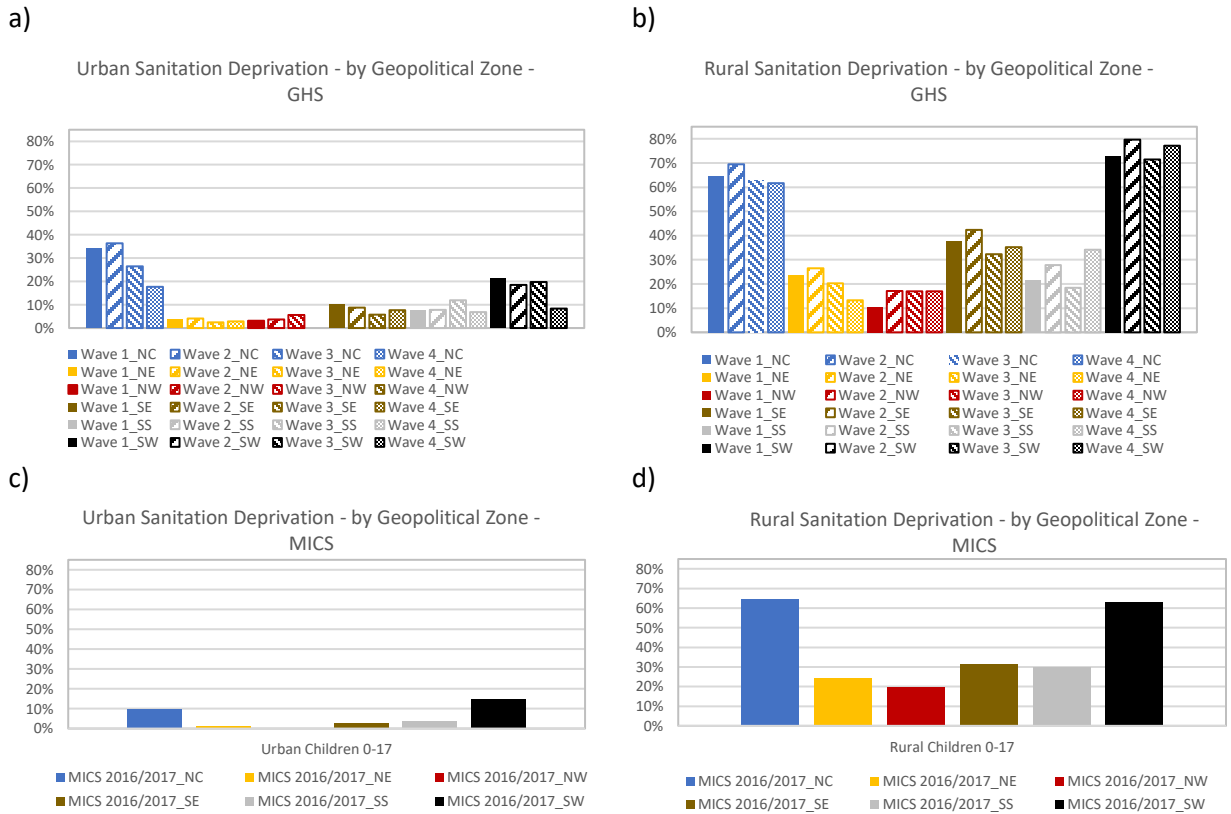


Source: Authors' estimates based on GHS Wave 1-4 and MICS 2016/17

Note: Individuals with missing age were dropped from the analysis. Estimations are based on children age 0-17.

Unlike in other deprivation dimensions the North-East and North-West do not stand out in terms of severe sanitation deprivation, which is in line with findings of the World Bank's WASH report (WB, 2017). Instead these face lower levels of deprivation. Children in the North-Central and South-West are facing the highest shares of severe sanitation deprivation. These are according to both surveys and in both sectors, much higher than in all other regions without a clear change over time. One exception is the urban South-West in wave 4. Figure 25 suggests rather a temporary increase in rural sanitation deprivation in the second wave, with the estimates based on GHS wave 3 falling back the levels in GHS wave 1.

Figure 26: Regional Level Sanitation Deprivation

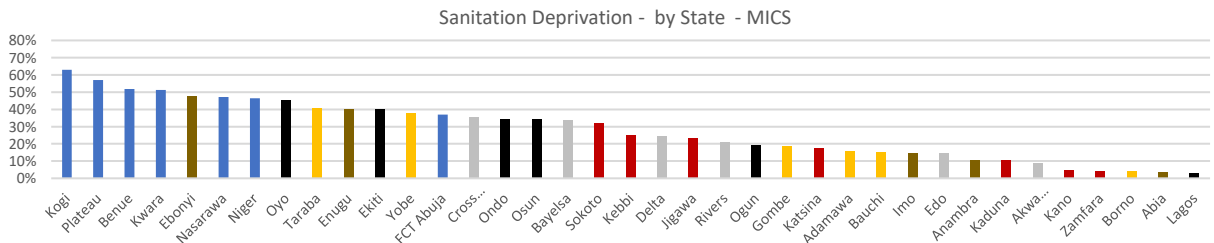


Source: Authors’ estimates based on GHS Wave 1-4 and MICS 2016/17

Note: Individuals with missing age were dropped from the analysis. Estimations are based on children aged 0-17.

The state level estimates display further enormous discrepancies. Whereas in Abia, Borno, Kano, Lagos and Zamfara 5 percent of the children or even less are deprived of toilet facility, 63 percent of their peers in Kogi are living without access to a toilet facility. More than half of the children are also sanitation deprived in Benue, Kwara and Plateau state.

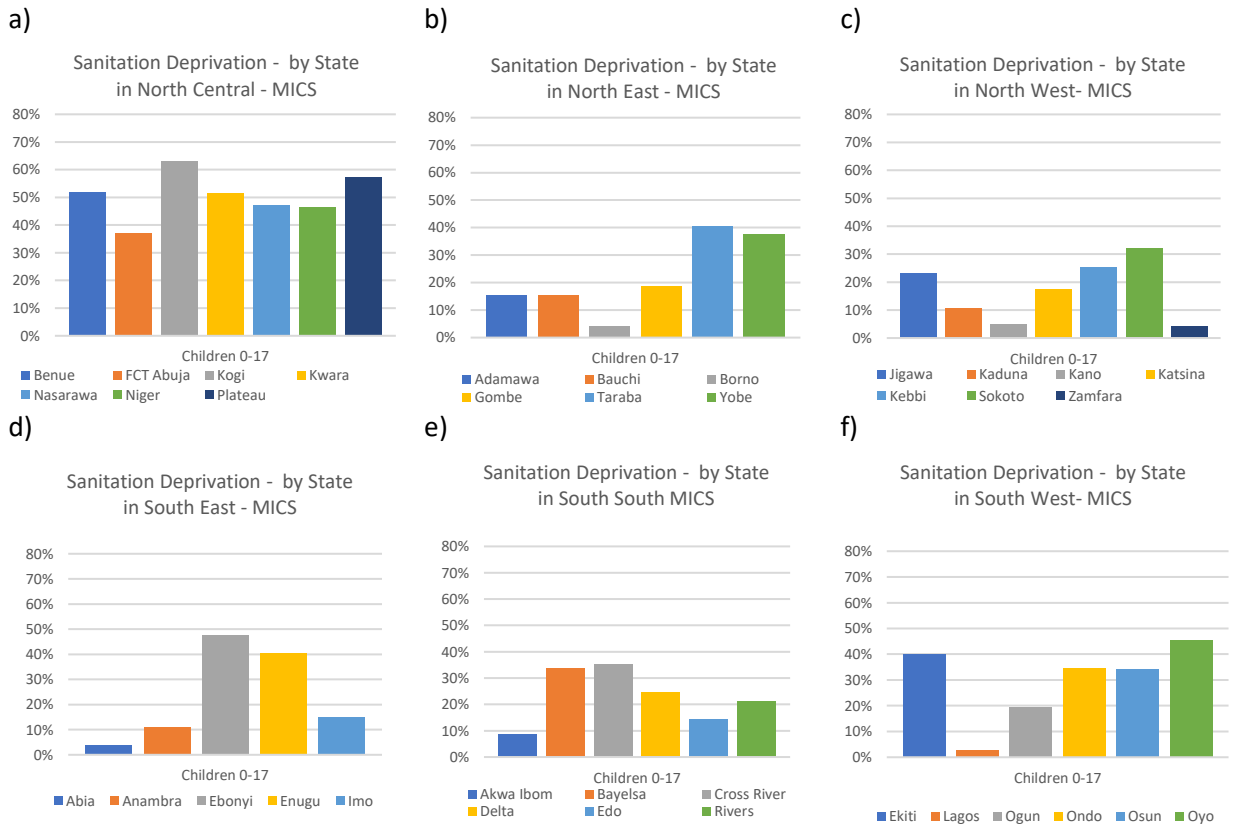
Figure 27: State Level Sanitation Deprivation



Source: Authors’ estimates based on MICS 2016/17

Note: Individuals with missing age were dropped from the analysis.

Figure 28: State Level Sanitation Deprivation by Region



Source: Authors' estimates based on MICS 2016/17

Note: Individuals with missing age were dropped from the analysis.

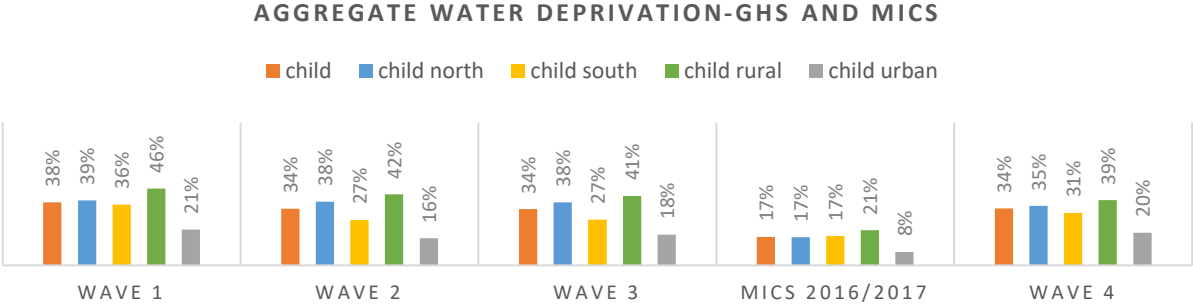
Children in some states are comparatively less severely sanitation deprived than in others, but it does not mean that they have access to high quality toilet facilities. Also, a household having access to a sanitation facility may not necessarily result in all children having access to it as qualitative evidence from Ekiti and Enugu state presented by Abramovsky et al. (2015) suggests scenario. Estimates for improved sanitation deprivation, presented in Appendix Figures A.5 and A.6, consider additionally those children deprived that only have access to open pit latrines, latrines without slaps, or toilets hanging over the water of any sort. In Ebonyi state 81 percent of children are deprived of improved sanitation facilities. In rural Ebonyi state this share is likely to be even higher, at the South West regional average around 80 percent of rural children are deprived of improved sanitation compared to in the most recent survey round solely 10 percent in the urban South West. Comparing the regional level Figures for severe and improved sanitation deprivation, Figures 26 and A.5, respectively shows that despite the inexistent severe sanitation deprivation in the urban North West, improved sanitation deprivation levels exceeds even the levels of the urban South West which leads the statistics of severe sanitation deprivation.

At the state level, Ebonyi and Yobe are by a large margin overtaking Kogi and Plateau state in the ranking of most improved sanitation deprived in contrast to most severely sanitation deprived. Most children in the former states, thus, have only access to poor sanitation facilities. On the other hand, states with a narrower gap between improved sanitation deprivation and severe sanitation deprivation, have, if at all, improved facilities for children and household members in general. Hence, this difference may be a useful consideration while designing and targeting sanitation projects.

Water deprivation

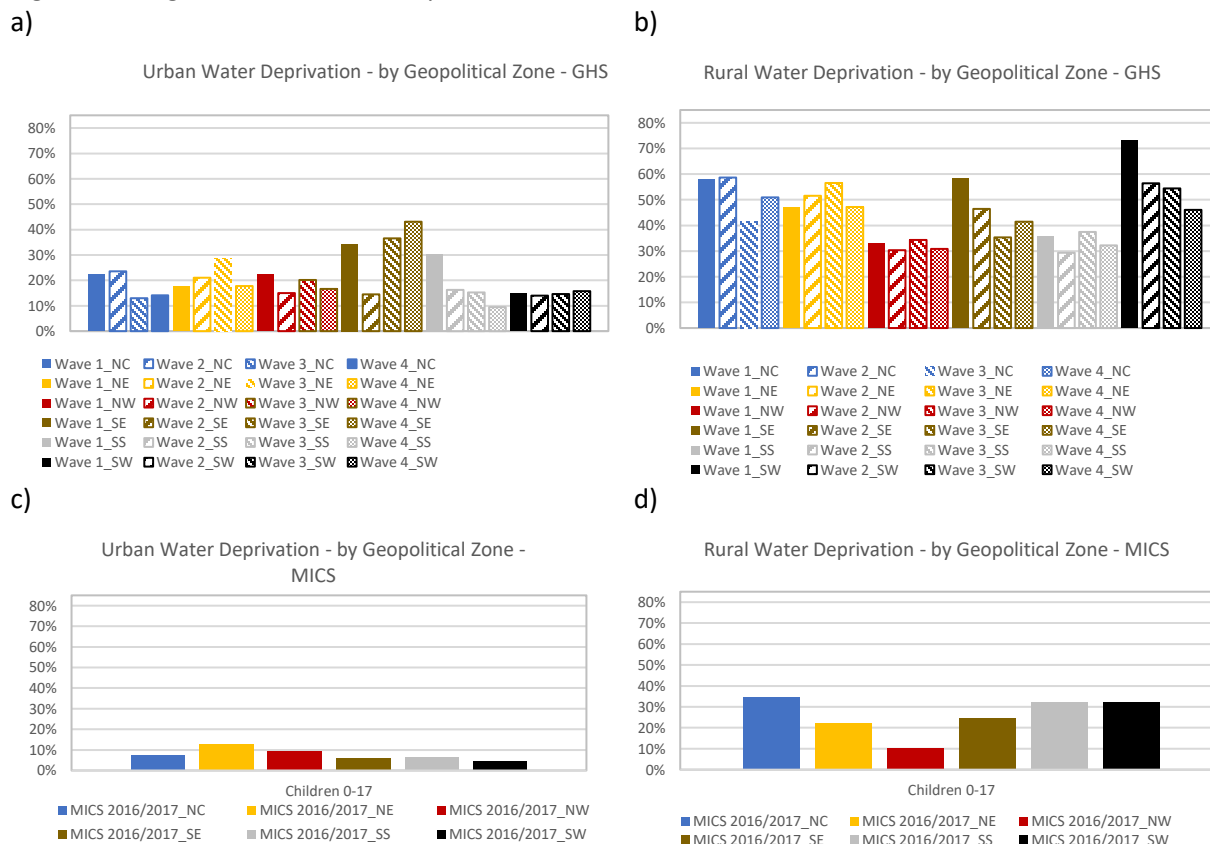
Water deprivation is widespread in Nigeria. Well over 30% of the children nationally are deprived of water access, which could be seasonal (see Figure 29). While little reduction in the share of severely water deprived children is observed at national over the three waves of the GHS, the share dropped by half, from the third wave of the GHS to the MICS being just one year apart. Unlike the GHS survey, the MICS survey does not distinguish between dry and wet season drinking water access and source. The stricter condition applied to the GHS data, considering children deprived, if they have even in just one of the seasons no or only surface water access, suggests the potential importance to consider both seasons when preparing water deprivation statistics and requires future research. Nevertheless, the MICS estimates display overall a similar pattern at national as well as regional geopolitical zone level. Water deprivation is double as high for rural as for urban children. The North West is an exception. Moreover, the estimates do not display the clear north south discrepancy observed for education.

Figure 29: National Level Water Deprivation



Source: Authors’ estimates based on GHS Wave 1-4 and MICS 2016/17
 Note: Individuals with missing age were dropped from the analysis. Estimations are based on children aged 0-17.

Figure 30: Regional Level Water Deprivation



Source: Authors' estimates based on GHS Wave 1-4 and MICS 2016/17

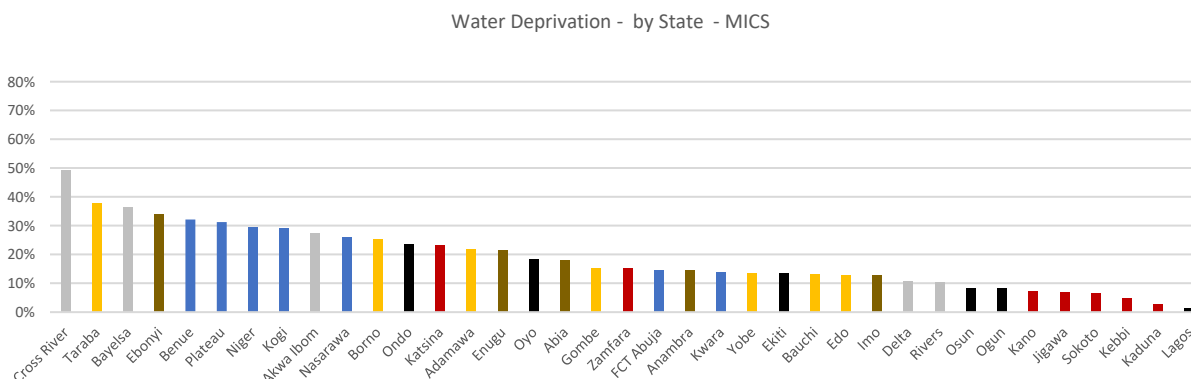
Note: Individuals with missing age were dropped from the analysis. Estimates are based on children aged 0-17.

Contrary to the national level Figure 30 shows that water deprivation did not decrease across all zones. In the North East and North West urban and rural areas water deprivation of children has been slightly increasing instead comparing estimates from wave 1 to wave 3 and then slightly decreasing to its initial level in wave 4. It is also worth noting that children in the rural North West, that are one of the or the most deprived in many other dimensions, are least deprived in term of severe water deprivation. The reverse holds for the South West where just under half of the rural children are severely water deprived, while in other dimensions children in this region are one of the least deprived. This however does not yet reflect the access to quality water. Just conditioning the water access to be from a somehow protected source, meaning in addition to surface water excluding untreated piped water and unprotected wells from water access options, changes the order of the region in which children are most or least water deprived, as estimates in Appendix Figures A. 3 and A.4 show. Then rural children in the North East and North West

are the most deprived, closely followed by the South East, where over and close to 70 percent of the children have no access to water from a protected source.²⁵

State level estimates of severe water deprivation from the MICS survey are highest for Cross River. Despite the MICS estimates generally being lower than the GHS, still half the children in Cross River are considered severely water deprived. Also, in Taraba, Bayelsa and Ebonyi over a third of the children are considered severely water deprived. Differences of up to 30 percentage points of the share of children being considered severely water deprived between states in the same geopolitical zone underline the importance to look beyond regional difference.

Figure 31: State Level Water Deprivation

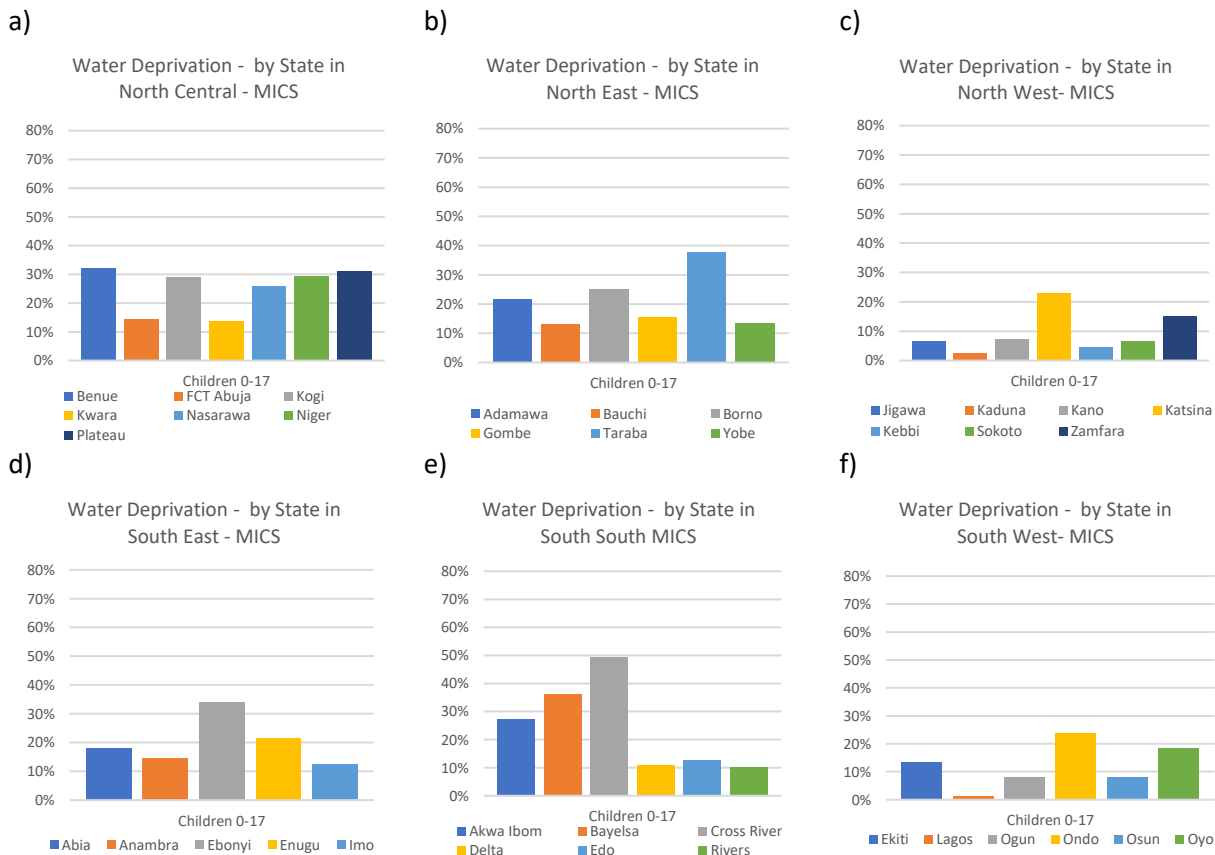


Source: Authors’ estimates based on MICS 2016/17

Note: Individuals with missing age were dropped from the analysis

²⁵ Further conditioning water access to being directly drinkable water, such as bottled or sachet water, to consider a child not water deprived, would raise water deprivation levels to over 90 percent in almost all states. Though as discussed in WB (2017) Box 3.2 even sachet water may not convincingly quality as directly drinkable water due to seasonal high levels of contamination detected.

Figure 32: State Level Water Deprivation by Region



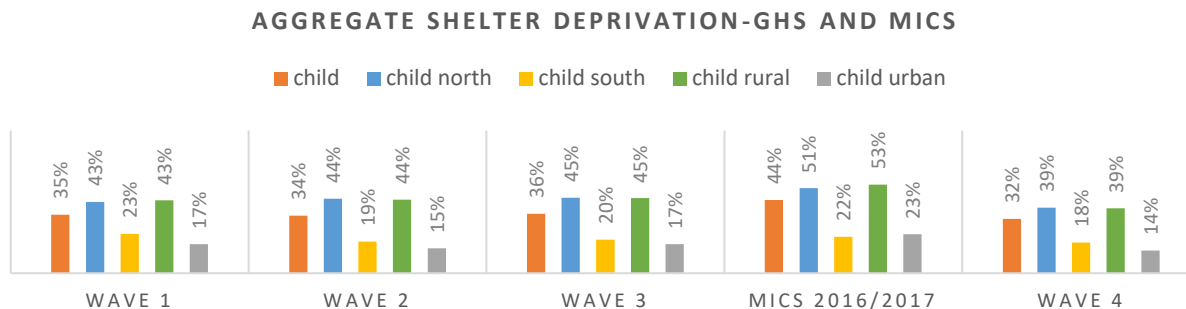
Source: Authors’ estimates based on MICS 2016/17

Note: Individuals with missing age were dropped from the analysis

Shelter Deprivation

National level severe shelter deprivation has remained basically unchanged over the GHS waves 1-4, with around one third of the children living in conditions without sealed flooring. If considered comparable, shelter deprivation, meaning having no flooring in the house, has even been increasing from the GHS to the latest MICS estimates. Irrespective of the survey, the national average is however driven by the rural higher deprivation rate of rural children, where close to half the children are severely shelter deprived.

Figure 33: National Level Shelter Deprivation



Source: Authors' estimates based on GHS Wave 1-4 and MICS 2016/17

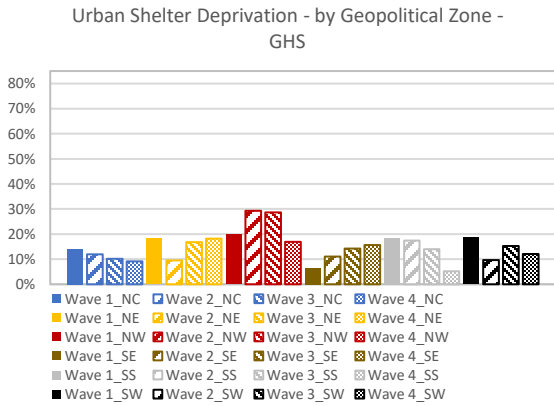
Note: Individuals with missing age were dropped from the analysis. Child refers to children aged 0-17.

There are noteworthy differences though across regions.

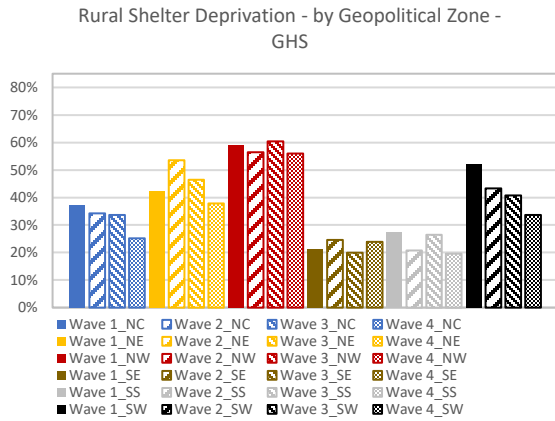
Irrespective of the survey, a higher share of children in the rural North East and North West are severely shelter deprived than in the South East and South South. The share of deprived children in the rural South West, initially second highest and at par with those in North West clearly decreased over time but is in levels still more comparable to other northers rather than southern regions. Urban shelter deprivation estimate are less than half compared to the ones in rural areas and lie around 10 percent, slightly lower according to the GHS and slightly higher according to the MICS estimates, with only the North East and North West facing higher levels of urban shelter deprivation. In terms of levels both surveys rank regions in the same order except for the MICS finding contrary to the GHS urban shelter deprivation levels in the North East exceeding that of the north West, which might be due to non-random accessibility differences of sample areas in the North East. Further, it is worth noting, that whereas over time the share of severely shelter deprived children clearly decreased in the South West, there appears to be a rising share of children shelter deprived in the urban South East and in both urban and rural North West.

Figure 34: Regional Level Shelter Deprivation

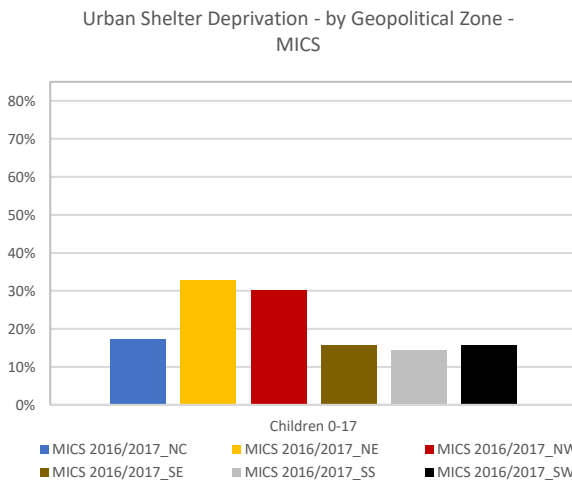
a)



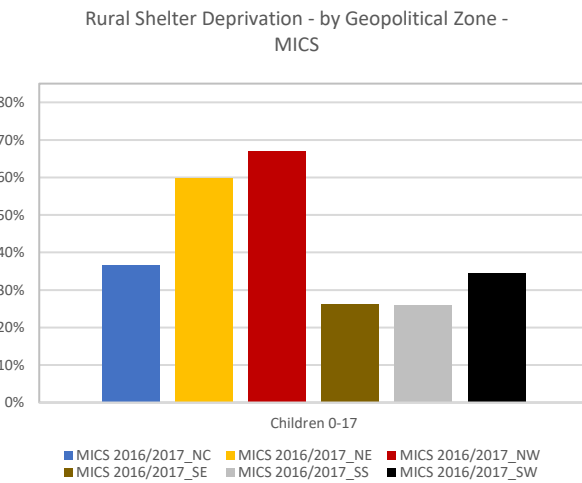
b)



c)



d)

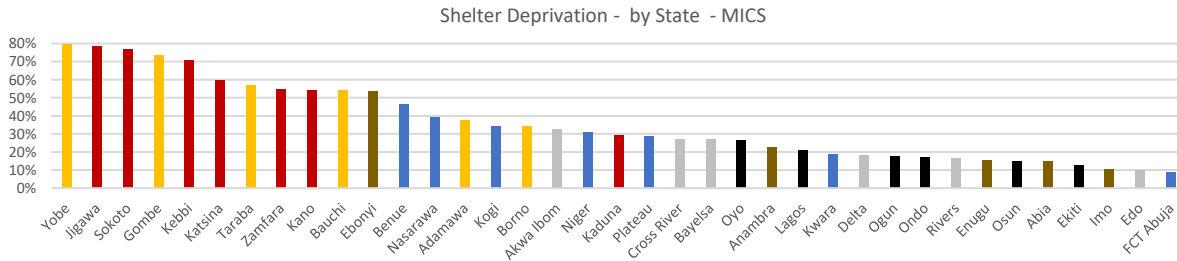


Source: Authors' estimates based on GHS Wave 1-3 and MICS 2016/17

Note: Individuals with missing age were dropped from the analysis

State levels estimates show that the regional level estimate cover up extreme differences of severe shelter deprivation of within regions. In the North Central and South East regions the share of shelter deprived children varies by close to 40 percentage points between FCT Abuja and Benue and Ebonyi and Imo state respectively (see Figure 35). In the North West, the share of shelter deprived children in Kaduna is even close to 50 percentage point lower than in Jigawa, with almost 80 percent of children living in either severely overcrowded rooms or houses without flooring material. Overall, five states are identified as having 70 or more percent of children being severely shelter deprived, which are Yobe, Jigawa, Sokoto, Gombe and Kebbi in descending order.

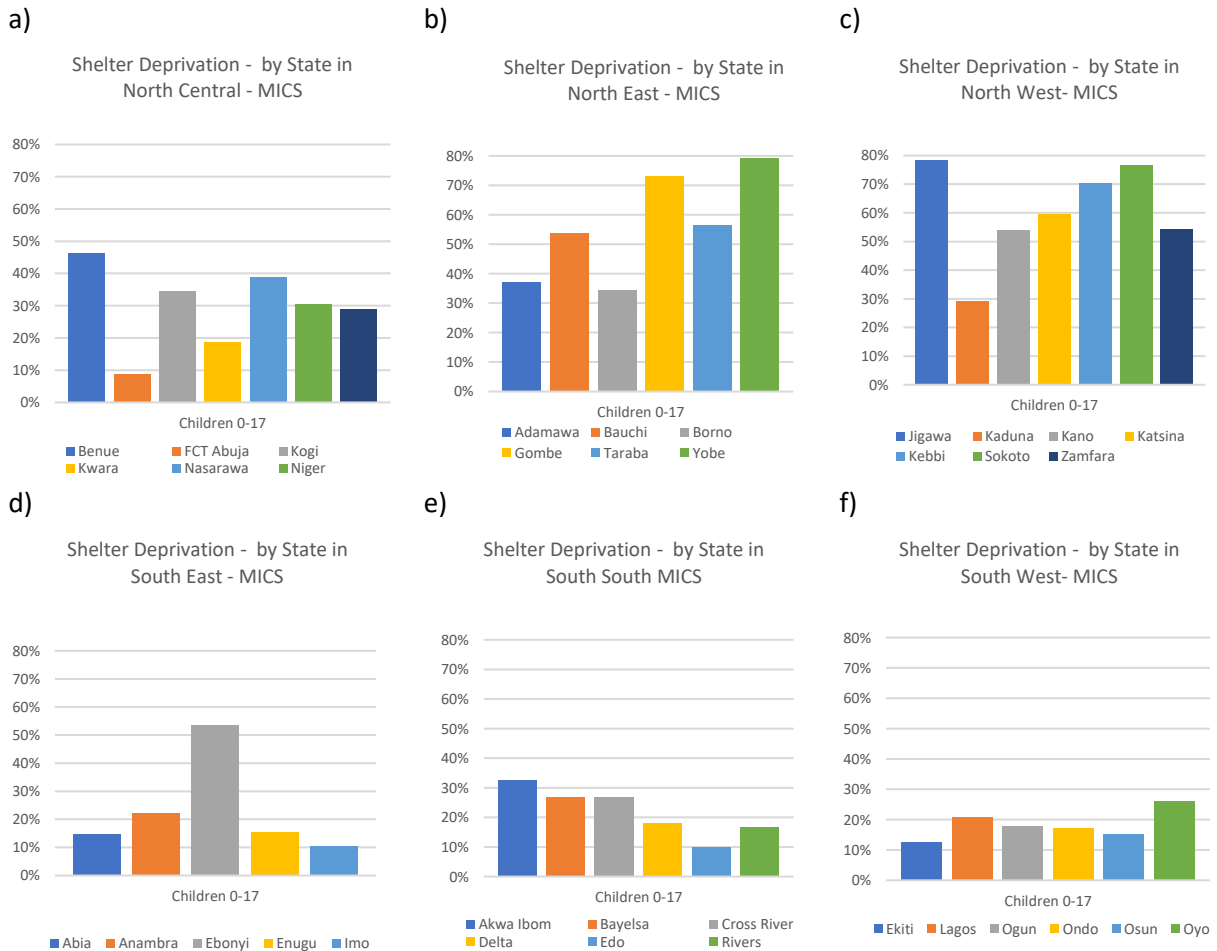
Figure 35: State Level Water Deprivation



Source: Authors' estimates based on MICS 2016/17

Note: Individuals with missing age were dropped from the analysis. Estimates are for children aged 0-17.

Figure 36: State Level Shelter Deprivation



Source: Authors' estimates based on MICS 2016/17

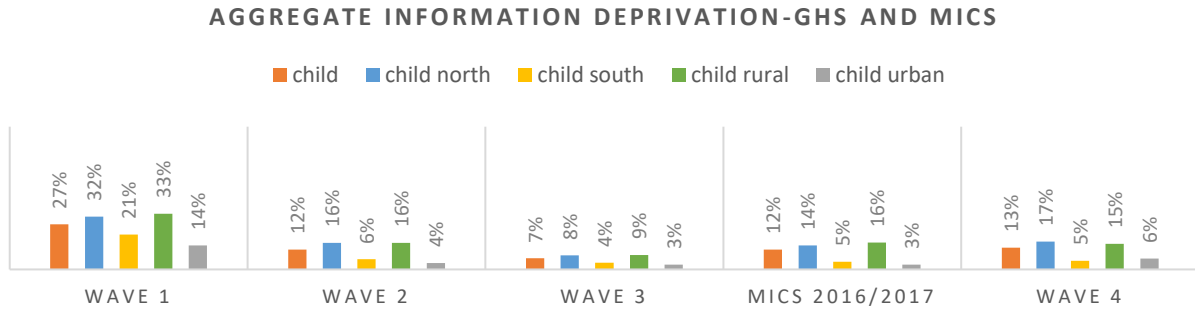
Note: Individuals with missing age were dropped from the analysis

Information Deprivation

National level information deprivation has been drastically decreasing over time, in the urban and the rural areas alike (see Figure 36). In 2010, 33 percent of rural children of school going age were, according to the GHS data, deprived of information, such as phone, TV and radio, while this share had dropped to 9 percent over the subsequent 6 years period. This large reduction in severe information deprivation of children, holds, as Figures 37 a and 37 b show, across all geo-spatial zones. While the estimates from the MICS 2016/2017 survey, do not continue the trend of the third wave of the GHS survey these are very much in line with the GHS wave 2 estimates. One explanation for this discrepancy may be large heterogeneity at the state level, that the GHS, only representative at the regional level, cannot capture.

Unlike other deprivations, there is not such a clear north-south divide in terms of information deprivation. While North Eastern and North Western rural zones have the largest shares of information deprived children, the share of information deprived children in the North Central urban and rural areas is according to both surveys in the last wave comparable to the South Eastern and South Western zones. Figures 38 and 39 rather show that particular states stand out. Ebonyi stands out with about 15 percentage points more children being severely information deprived compared to neighboring states in the South East. Children living in the at the time of the survey accessible areas of Borno on the other hand are one of the least information deprived, even compared to those in the least deprived southern states and the FCT. Considering that most accessible enumeration areas of Borno were in and around it's state capital city Maiduguri and exclude IDP camps, results hence suggest that children living in these areas are despite the conflict in the state still doing quite well in terms of household access to information. The surge in information deprivation in the urban North East from wave 3 to wave 4 may however be linked to the rising level of conflict and potentially a need to sell assets to meet consumption needs even in the accessible areas that will only in later rounds show as surge in monetary poverty in this region. This finding also gives reason to expect even larger within state heterogeneity in the non-accessible conflict affected areas, considering that above 20 percent up to a quarter of the children in other northern states with remote rural areas, such as Gombe, Taraba, Jigawa and Kebbi, live in household without access to any means to information.

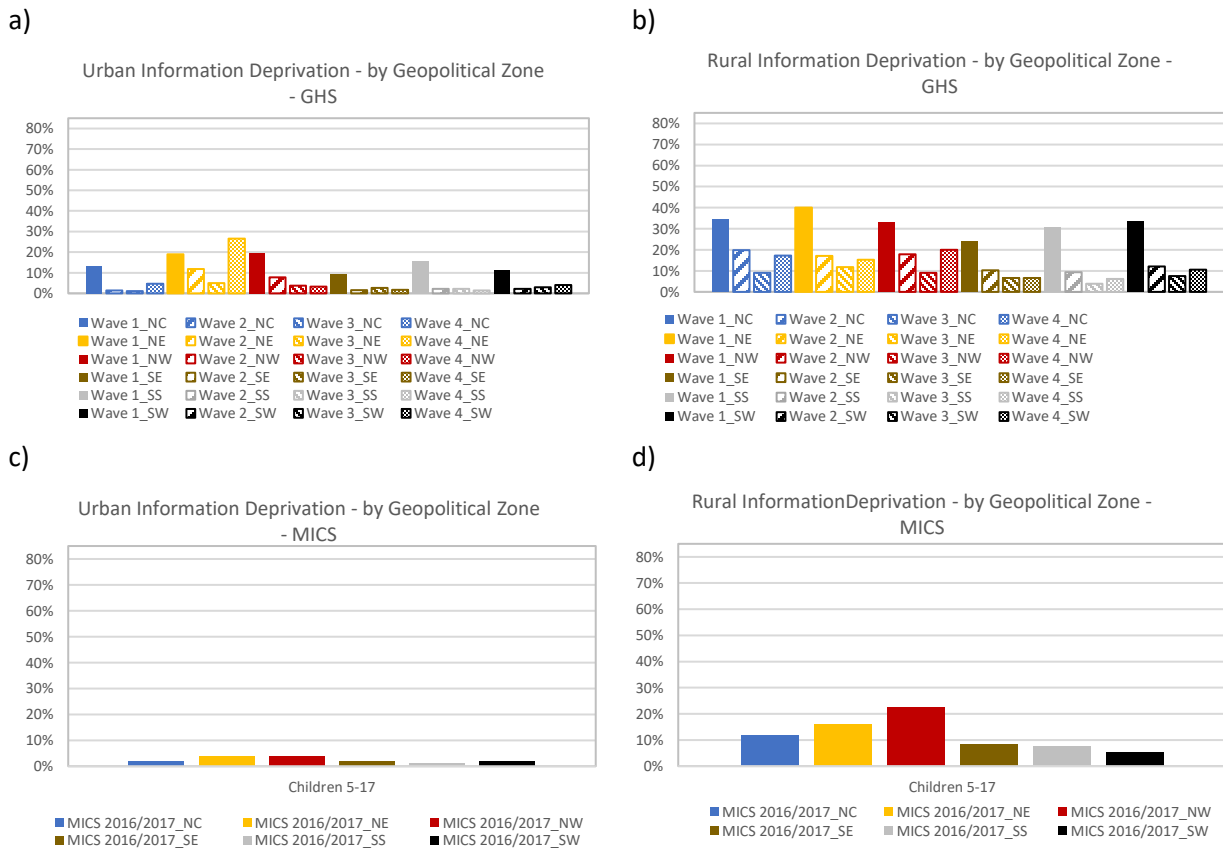
Figure 37: National Level Information Deprivation



Source: Authors' estimates based on GHS Wave 1-3 and MICS 2016/17

Note: Individuals with missing age were dropped from the analysis. Estimations include children aged 5-17.

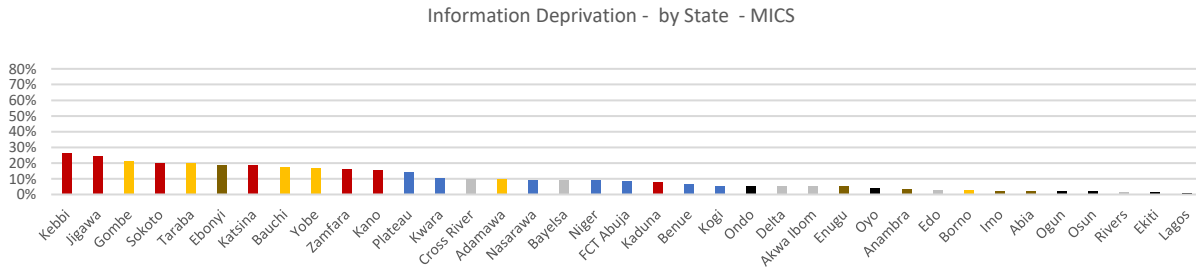
Figure 38: Regional Level Information Deprivation



Source: Authors' estimates based on GHS Wave 1-4 and MICS 2016/17

Note: Individuals with missing age were dropped from the analysis.

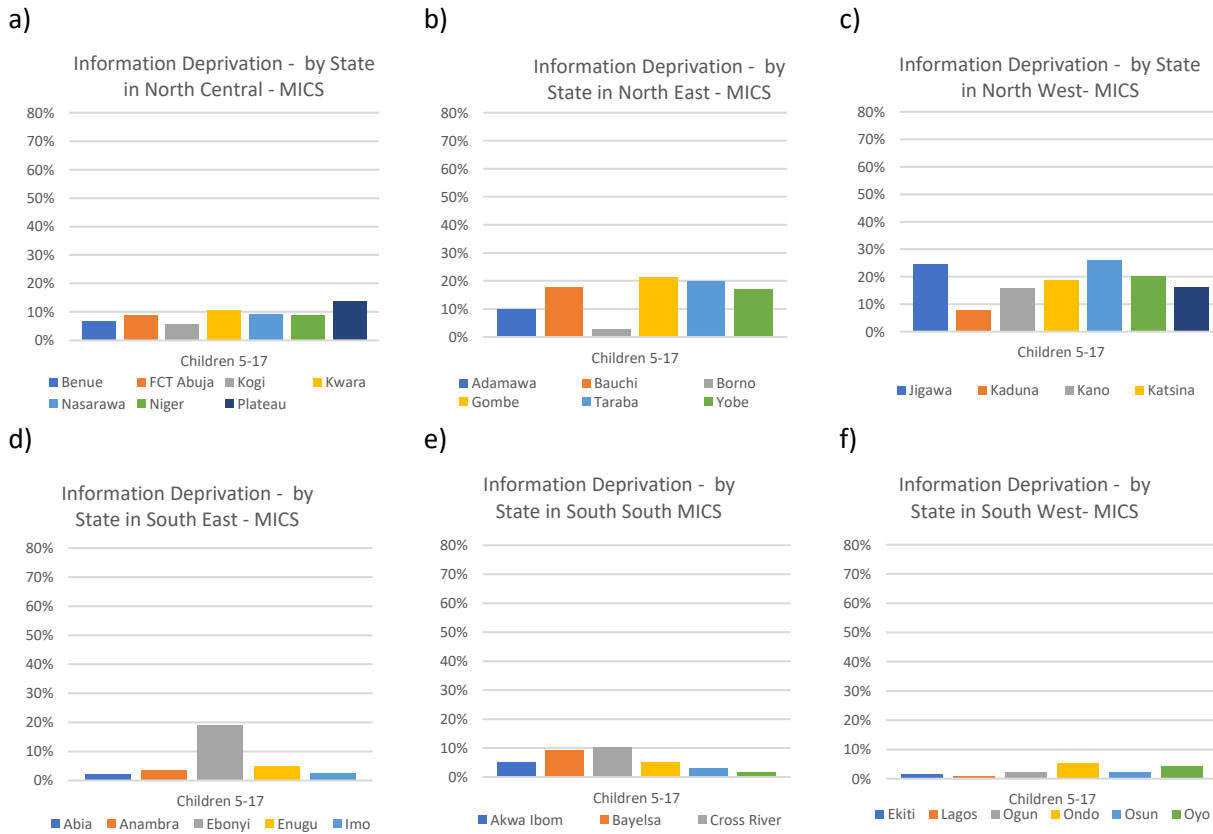
Figure 39: State Level Information Deprivation



Source: Authors' estimates based on MICS 2016/17.

Note: Individuals with missing age were dropped from the analysis. Estimates are based on children aged 5-17.

Figure 40: State Level Information Deprivation



Source: Authors' estimates based on MICS 2016/17.

Note: Individuals with missing age were dropped from the analysis.

5.1.3 Overlap of Monetary and Multi-dimensional Child Poverty in Nigeria

Having analyzed monetary and multi-dimensional deprivation-based poverty in isolation, this section now presents the overlap between the monetary poverty and the different dimensions of deprivation-based poverty.

If monetary poverty would perfectly coincide with multi-dimensional deprivation-based poverty, all monetary non-poor children would be also non-deprived of any dimension, and vice versa all monetary poor children would also be deprived of all dimensions. Hence, in a matrix no children would be monetary poor but non-deprived or monetary non-poor but deprived.

Table 3 displays the overlap in the Nigerian case for the three GHS waves, with those areas of the matrix marked grey, which with perfect overlap should be zero. While being monetary non-poor in wave 3 but currently out of school or never been in school or information deprived seems rather rare, representing only 2, 5 and 2 percent of the children respectively, 12 percent of the children are nevertheless water deprived.

On the other hand, in wave 3, 44 percent of the children are monetary poor but not information deprived, showing that despite low consumption levels, household ownership of a TV, Radio, or phone appears to be a priority over shelter, as in wave 3 only 23 percent are non-deprived of shelter despite being poor. When comparing Table 3a with the overlap in displayed in Tables 3b, 3c and 3d for waves 3, 2 and 1 respectively, it is worth noting that the share of non-poor, but water deprived has been declining over waves 1-3, as well and the non-poor who are information, education or schooling deprived. The share of non-poor, who are health, food, shelter or sanitation deprived remained stable. Region specific overlap tables for the North East for wave 3 are available in the Appendix in Table A.1. In the North East non-poor children are less likely to be deprived than the national average. Overall, the overlap results indicate that not being monetary poor makes a child less likely deprived but not non-deprived, while the reverse holds only to a much lesser extent. Non-deprived children are in much larger shares still monetary poor.

Table 3: Overlap of Monetary Poverty (USD 1.90\$ a day) and Deprivations

a) Wave 3

Monetary Poverty	Individual Level Child Deprivations							
	Health Deprived ²⁶		Food Deprived		Education Deprived		Not in School Deprived	
	non-depr	deprived	non-depr	deprived	non-depr	deprived	non-depr	Deprived
non-poor			42%	7%	49%	2%	46%	5%
Poor			35%	16%	36%	13%	34%	15%

Monetary Poverty	Household Level Child Deprivations							
	Sanitation Deprived		Shelter Deprived		Water Deprived		Information Deprived	
	non-depr	deprived	non-depr	deprived	non-depr	deprived	non-depr	Deprived
non-poor	41%	9%	41%	9%	38%	12%	49%	2%
Poor	35%	15%	23%	27%	29%	21%	44%	5%

b) Wave 2

Monetary Poverty	Individual Level Child Deprivations							
	Health Deprived		Food Deprived		Education Deprived		Not in School Deprived	
	non-depr	deprived	non-depr	deprived	non-depr	deprived	non-depr	Deprived
non-poor	44%	8%	45%	5%	47%	4%	45%	6%
Poor	38%	11%	44%	6%	35%	14%	33%	16%

Monetary Poverty	Household Level Child Deprivations							
	Sanitation Deprived		Shelter Deprived		Water Deprived		Information Deprived	
	non-depr	deprived	non-depr	deprived	non-depr	deprived	non-depr	deprived
non-poor	41%	11%	43%	9%	37%	14%	49%	3%
Poor	31%	17%	23%	25%	29%	19%	40%	9%

c) Wave 1

Monetary Poverty	Individual Level Child Deprivations							
	Health Deprived		Food Deprived		Education Deprived		Not in School Deprived	
	non-depr	deprived	non-depr	deprived	non-depr	deprived	non-depr	deprived
non-poor	49%	9%	47%	11%	49%	6%	47%	8%
Poor	29%	13%	31%	12%	33%	12%	31%	15%

Monetary Poverty	Household Level Child Deprivations							
	Sanitation Deprived		Shelter Deprived		Water Deprived		Information Deprived	
	non-depr	deprived	non-depr	deprived	non-depr	deprived	non-depr	deprived
non-poor	44%	11%	42%	12%	37%	18%	44%	11%
Poor	32%	13%	23%	23%	25%	20%	29%	16%

Source: Authors' estimates based on GHS Wave 1-3.

One hypothesis could be that the imperfect overlap between monetary and deprivation-based poverty is purely driven by those children with consumption levels close to the poverty line, but it does not apply to children at the top of this income distribution. Table 4 however proves this proposition wrong. Unlike one may expect, there are even among the children living in households with the top 1% income, up until wave 3 about half the children facing at least one deprivation. While this share remains constant until the top 10 percent consumption level for wave 3, the share of monetary non-poor children facing at least one deprivation is comparatively rising though when expanding the sample to children with top 5 percent and top 10 percent consumption levels in the earlier waves. This is consistent with findings presented in World Bank Group 's (2017) estimates of the top income quintile, not having complete access to sanitation and water, based on earlier other data sources. Among severe sanitation, shelter and water deprivation, Table

²⁶ Health Deprivation did not exist in wave 3.

4 illustrates that water deprivation is the largest though slowly decreasing personal concern for the best-off children in Nigeria. On the other hand, up until wave 3 rising shares of children at the top of the consumption distribution are severely shelter deprived. Also, the share of sanitation deprived children at the top of the income distribution displays a rising pattern though with shares in wave 3 already lower again than in wave 2. This may suggest that monetary and deprivation-based poverty may be in large shares transient and during the second wave potentially affected by the economic crisis.

Overall, the results in Table 4 however suggest that the majority of the children in top income households still facing at least one deprivation, seem to be facing just one deprivation, as the share of children facing more than one, thus at least two deprivations is much lower. Moreover, results not presented here show that no children in the top 10 percent income level are deprived along all dimensions. Hence, even though still a remarkable share of children at the top of the income distribution is severely deprived on some dimension, the extensiveness of multi-dimensional deprivation-based poverty rises with lower income. This further stresses the importance to look beyond monetary poverty. Results in Table A.2 display unweighted observations. Comparing the total number of individuals in each income group with the column of missing information, however stresses the need to treat especially the results of GHS wave 1 with caution, as up to 20 percent of the individuals in the respective wave's income categories have been excluded given the lack of information on one or more deprivations.

Table 4: Deprivation Status among children living in top consumption level households (weighted)

Monetary Poverty USD 1.90			Multi-Dimensional Poverty in %						
			Not Deprived	At least one Deprivation	At least two Deprivations	At least one Deprivation (incl. Sanitation)	At least one Deprivation (incl. Shelter)	At least one Deprivation (incl. Water)	Missing Information
Wave 3	Top 1% consumption	Not Monetary Poor	45%	48%	7%	12%	20%	21%	6%
	Top 5% consumption	Not Monetary Poor	67%	30%	5%	6%	10%	16%	3%
	Top 10% consumption	Not Monetary Poor	65%	32%	6%	8%	9%	18%	3%
Wave 2	Top 1% consumption	Not Monetary Poor	49%	46%	21%	21%	16%	25%	5%
	Top 5% consumption	Not Monetary Poor	58%	28%	11%	12%	8%	17%	13%
	Top 10% consumption	Not Monetary Poor	58%	29%	11%	12%	8%	18%	13%
Wave 1	Top 1% consumption	Not Monetary Poor	49%	22%	6%	3%	7%	15%	28%
	Top 5% consumption	Not Monetary Poor	44%	30%	7%	9%	6%	19%	25%
	Top 10% consumption	Not Monetary Poor	40%	39%	11%	12%	11%	23%	21%

Source: Authors' estimates based on GHS Wave 1-3.

Note: For each age group the respective maximum number of deprivations is considered. If a child is not deprived along any dimension, it is considered not deprived, if it is deprived along one or more dimensions it is considered deprived, irrespective of missing information on some other dimensions. However, if a child has missing information for one or more deprivations applicable in its age category and is not deprived in the remaining applicable deprivations, it is excluded, as it is unknown whether

the child is indeed not deprived of any dimension or is in fact deprived in the dimension where the information is missing.

5.2 Chronic Poverty and intergenerational poverty regression analysis

5.2.1 Chronic Poverty

The chronic poverty analysis in Figure 40 a and b presents large differences across regions, as well as an urban rural divide, with higher levels of chronic and transient child poverty in rural and northern regions. Whereas in urban South East over 80 percent of the children are never poor, this holds only for about 9 percent of the children in the rural North West. In rural areas in the North West of the country 43 percent of the children are chronically poor, defined as living in households that were always poor during the three waves of the GHS spanning from 2010-2016 with an additional about 47 percent of children transitory poor, meaning, considered poor at least once within the three waves. Compared to an earlier aggregate chronic poverty estimate by Dang and Dabalén (2019), this study’s twice higher chronic poverty estimate over a longer period seems alarming and requires further research.

Figure 41 a: Chronic Poverty Status (USD 1.90\$ International Poverty Line)

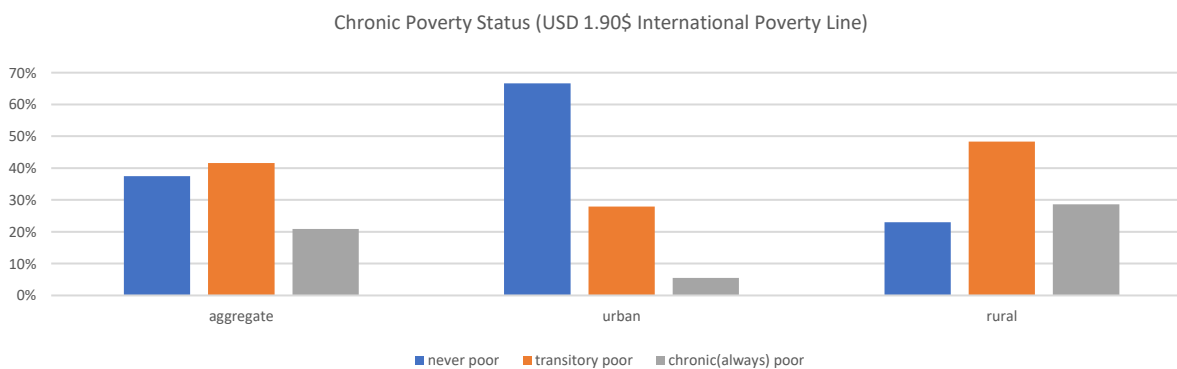
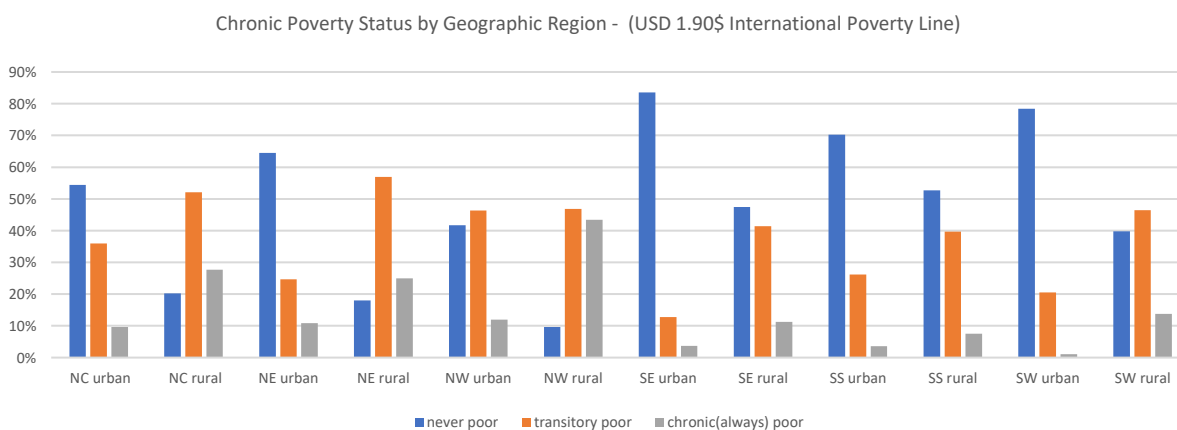


Figure 41 b) Chronic Poverty Status by Geographic Region - (USD 1.90\$ International Poverty Line)



Source: Authors’ estimates based on GHS Waves 1-3

Note: Estimates are presented as an aggregate for children 0-17 years old based on a balanced household panel (households present in each wave).

High chronic poverty rates in the rural north, especially in the rural North West, suggest the need for more longer-term human capital investments. On the other hand, high transitory poverty rates underline the need for more social protection to reduce the risk for these children and households to prevent them falling back into poverty over hovering around the poverty line.

5.2.2 Inter-generational Poverty

This section tests the hypothesis that education deprivation transmits across generations and correlates not only with children's education deprivation, but parent's education deprivation is also correlating with other poverty dimensions of their children. Considering the correlation with monetary poverty the probit models in Table 5 display a negative and significant correlation of the mother's level of education to the probability of being poor according to the 1.90\$ a day international poverty line. The coefficients moreover indicate that the higher the level of education of the mother, the less likely the child being poor. This finding is robust to various types of standard errors and levels of clustering and also holds for the father's education or any parent education level as well as without using proxies for education level.

Second, parent's education level also seems to be significantly negatively correlated with different deprivation-based poverty measures. The only exception is food deprivation, which might however be related to the large number of missing observations on food deprivation. It is also worth noting that the mother's education is only significantly related to sanitation and water deprivations when mothers have completed at least secondary school. The positive significant coefficient of the rural control moreover confirms the descriptive findings that living in a rural area is significantly correlated with the probability of being poor and or deprived.

Table 5: Relationship between parent literacy and education level and monetary poverty

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Dependent variable: Monetary Poor based on the international USD 1.90 a day poverty line</i>								
<i>Mother's* Compl. Education Level</i>								
Completed Primary	-0.213*** (0.000265)	-0.213*** (0.0583)	-0.213*** (0.0670)	-0.0893*** (0.0239)				
Completed Jr. Secondary	-0.312*** (0.000362)	-0.312*** (0.0765)	-0.312*** (0.0795)	-0.127*** (0.0283)				
Completed Sen. Secondary	-0.762*** (0.000277)	-0.762*** (0.0604)	-0.762*** (0.0705)	-0.268*** (0.0245)				
Completed Tertiary	-1.592*** (0.000660)	-1.592*** (0.108)	-1.592*** (0.124)	-0.395*** (0.0272)				
Mother's* Education Level	0.0463*** (0.000232)	0.0463 (0.0497)	0.0463 (0.0566)	0.0157 (0.0193)				
<i>Survey wave</i>								
Wave 2	0.133*** (0.000224)	0.133*** (0.0366)	0.133*** (0.0480)	0.0445*** (0.0154)	0.115** (0.0484)	0.131*** (0.0479)	0.0686 (0.0682)	0.0441 (0.0673)
Wave 3	0.209*** (0.000217)	0.209*** (0.0381)	0.209*** (0.0496)	0.0680*** (0.0157)	0.215*** (0.0504)	0.204*** (0.0499)	0.162** (0.0653)	0.121* (0.0643)
Wave 4	0.0619*** (0.000221)	0.0619 (0.0476)	0.0619 (0.0695)	0.0235 (0.0229)	0.0581 (0.0722)	0.0617 (0.0716)	0.0608 (0.0667)	0.0385 (0.0672)
<i>Sector</i>								
Rural	0.536*** (0.000191)	0.536*** (0.0510)	0.536*** (0.0660)	0.179*** (0.0224)	0.576*** (0.0645)	0.553*** (0.0635)	0.494*** (0.0724)	0.542*** (0.0713)
<i>Region</i>								
North East	0.164*** (0.000269)	0.164*** (0.0601)	0.164 (0.102)	0.0609* (0.0365)	0.167 (0.107)	0.154 (0.106)	0.336*** (0.127)	0.341** (0.136)
North West	0.222*** (0.000242)	0.222*** (0.0568)	0.222** (0.0973)	0.0803** (0.0345)	0.214** (0.0945)	0.199** (0.0929)	0.168 (0.106)	0.127 (0.105)
South East	-0.377*** (0.000329)	-0.377*** (0.0655)	-0.377*** (0.104)	-0.134*** (0.0360)	-0.588*** (0.105)	-0.548*** (0.102)	-0.397*** (0.105)	-0.632*** (0.108)
South South	-0.423*** (0.000301)	-0.423*** (0.0693)	-0.423*** (0.104)	-0.148*** (0.0355)	-0.555*** (0.104)	-0.548*** (0.101)	-0.424*** (0.110)	-0.537*** (0.111)
South West	-0.484*** (0.000320)	-0.484*** (0.0760)	-0.484*** (0.105)	-0.150*** (0.0346)	-0.600*** (0.106)	-0.593*** (0.102)	-0.445*** (0.118)	-0.593*** (0.117)
<i>Father's* Compl. Education Level</i>								
Completed Primary					-0.220*** (0.0745)			
Completed Jr. Secondary					-0.222*** (0.0795)			
Completed Sen. Secondary					-0.467*** (0.0662)			
Completed Tertiary					-1.067*** (0.104)			
Father's* Educational Level					0.0729 (0.0655)			
<i>Parent's* Compl. Education Level</i>								
Completed Primary						-0.162** (0.0667)		
Completed Jr. Secondary						-0.175** (0.0774)		
Completed Sen. Secondary						-0.482*** (0.0654)		
Completed Tertiary						-1.097*** (0.0999)		
Parent's Education Level						0.0901 (0.0658)		
Mother* literate							0.0435 (0.0697)	
<i>Mother's Compl. Education Level</i>								
Completed Primary							-0.250*** (0.0872)	
Completed Jr. Secondary							-0.416*** (0.106)	
Completed Sen. Secondary							-0.805*** (0.0977)	
Completed Tertiary							-1.593*** (0.179)	
Father* literate								0.00590 (0.0771)
Father's Education Level								-0.203*** (0.0265)
Constant	-0.208*** (0.000342)	-0.208*** (0.0788)	-0.208* (0.121)	0.443*** (0.0419)	-0.159 (0.123)	-0.126 (0.121)	-0.173 (0.126)	-0.0802 (0.124)
Observations	311,102,742	311,102,742	311,102,742	52,821	304,379,241	313,731,062	140,524,661	141,199,949
R-squared				0.230				

Robust standard errors in parentheses

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

Source: Source: Authors' estimates based on GHS Waves 1-3

Note: (1) – (3) differ in terms of standard errors, (1) uses robust standard errors, (2) clusters standard errors at the household level and (3) clusters standard errors at the LGA level. (4)-(8) all use clustered standard errors at the LGA level. The highest education level completed and education deprivation status among household members above 18 years of the respective gender is used to proxy for the parent's education deprivation and highest completed education level of existing household members in waves 2 and 3, as the GHS only asks in wave 1 about the parent's education of all individuals, but in the later waves only for new household member. As the GHS data is unfortunately not an individual level panel, it is not possible to merge information from wave 1 to the respective individuals in wave 2 and 3. Controls including the proxy information are marked with an *.

Table 6: Relationship between mother literacy and education level and poverty

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Monetary Poor USD 1.9	National poverty line	Severe Deprivations Sanitation	Water	Shelter	Information	Education	School Attendance	Health	Food
<i>Mother's* education level</i>										
Completed Primary	-0.213*** (0.0670)	-0.161** (0.0682)	-0.0544 (0.0870)	-0.0402 (0.0767)	-0.383*** (0.0847)	-0.203*** (0.0755)	-0.176*** (0.0578)	-0.267*** (0.0519)	-0.286** (0.138)	-0.0528 (0.126)
Completed Jr. Secondary	-0.312*** (0.0795)	-0.235*** (0.0913)	-0.0685 (0.103)	-0.0570 (0.0925)	-0.463*** (0.102)	-0.347*** (0.0895)	-0.389*** (0.102)	-0.492*** (0.0761)	-0.200 (0.200)	-0.0702 (0.174)
Completed Sen. Secondary	-0.762*** (0.0705)	-0.746*** (0.0761)	-0.443*** (0.0929)	-0.294*** (0.0868)	-0.799*** (0.0940)	-0.660*** (0.0838)	-0.484*** (0.0697)	-0.437*** (0.0566)	-0.615*** (0.167)	0.0148 (0.129)
Completed Tertiary	-1.592*** (0.124)	-1.501*** (0.149)	-1.094*** (0.149)	-0.595*** (0.114)	-1.354*** (0.176)	-1.092*** (0.191)	-0.888*** (0.242)	-0.383*** (0.108)	-0.740** (0.344)	-0.246 (0.250)
Mother's* Education Level	0.0463 (0.0566)	0.0113 (0.0642)	0.226** (0.0879)	0.0342 (0.0765)	-0.0938 (0.0664)	0.195*** (0.0684)	0.800*** (0.0586)	0.563*** (0.0555)	0.381*** (0.115)	-0.0181 (0.118)
<i>Survey wave</i>										
Wave 2	0.133*** (0.0480)	0.115** (0.0482)	0.153*** (0.0432)	-0.0865* (0.0450)	0.0176 (0.0458)	-0.590*** (0.0465)	0.00597 (0.0465)	0.0204 (0.0382)	-0.104 (0.0889)	-0.472*** (0.151)
Wave 3	0.209*** (0.0496)	0.207*** (0.0520)	0.0575 (0.0474)	-0.0606 (0.0554)	0.0754* (0.0456)	-0.897*** (0.0583)	-0.156*** (0.0540)	-0.0530 (0.0404)		0.179 (0.151)
<i>Sector</i>										
Rural	0.0619 (0.0695)	0.599*** (0.0812)	0.0166 (0.0835)	-0.120 (0.0788)	-0.135* (0.0716)	-0.561*** (0.0725)	-0.126 (0.0782)	0.0711 (0.0605)	0.366** (0.144)	-0.205 (0.155)
<i>Region</i>										
North East	0.536*** (0.0660)	0.222** (0.109)	0.923*** (0.103)	0.600*** (0.0779)	0.590*** (0.0854)	0.382*** (0.0821)	0.495*** (0.0757)	0.381*** (0.0544)		0.0804 (0.0923)
North West	0.164 (0.102)	-0.0475 (0.109)	-1.298*** (0.139)	-0.0337 (0.138)	0.266** (0.114)	0.0824 (0.0935)	0.472*** (0.110)	0.371*** (0.0895)	0.496** (0.195)	0.222 (0.138)
South East	0.222** (0.0973)	0.293*** (0.109)	-1.496*** (0.123)	-0.475*** (0.129)	0.517*** (0.102)	-0.0322 (0.0936)	0.467*** (0.109)	0.348*** (0.0899)	0.633*** (0.169)	0.374*** (0.118)
South South	-0.377*** (0.104)	-0.451*** (0.122)	-0.557*** (0.150)	0.0827 (0.125)	-9.80e-05 (0.145)	-0.110 (0.0949)	-0.809*** (0.134)	-0.524*** (0.0922)	0.135 (0.240)	-0.255* (0.155)
South West	-0.423*** (0.104)	-0.427*** (0.121)	-0.798*** (0.169)	-0.283** (0.139)	0.0659 (0.130)	-0.0254 (0.0957)	-0.720*** (0.129)	-0.429*** (0.0851)	0.447** (0.210)	-0.145 (0.162)
Constant	-0.484*** (0.105)	-0.483*** (0.120)	-0.00967 (0.162)	-0.162 (0.144)	0.311*** (0.119)	-0.0554 (0.105)	-0.470*** (0.162)	-0.215** (0.0988)	0.634*** (0.230)	-0.0334 (0.162)
Observations	311,102,742	234,905,864	307,172,501	306,378,211	309,905,128	226,711,452	221,335,597	219,014,238	11,454,053	16,158,133

Robust standard errors in parentheses

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

Source: Source: Authors' estimates based on GHS Waves 1-3

Note: The highest education level completed among female household members above 18 years is used to proxy for the mother's highest completed education level of existing household members in waves 2 and 3, as the GHS only asks in wave 1 about the mother's education of all individuals, but in the later waves only for new household members. As the GHS data is unfortunately not an individual level panel, it is not possible to merge information from wave 1 to the respective individuals in wave 2 and 3. Controls including the proxy information are marked with an *.

6 Conclusions and Policy Implications

Motivated by the lack of evidence on the poverty situation specifically of children in Nigeria, this child poverty analysis aims at providing a broad overview on the extent of severe monetary and multi-dimensional child poverty, its recent trends and its overlap which could potentially serve as a base for more targeted policy making.

The analysis is based on the past four waves of the General Household Surveys (GHS-1 2010/11, GHS-2 2012/13, GHS-3 2015/16 and GHS-4 2018/19) and the latest wave of the Multiple Indicator Cluster Survey (MICS 2016/17). Using the GHS surveys has the advantage that it allows the calculation of the overlap between monetary and multi-dimensional poverty estimates. The MICS data on the other hand only allows the estimation of multi-dimensional poverty measures, but provides external validity to the

debated GHS estimates and allows further disaggregation beyond the regional level due to its representativeness at the state level.

Firstly, findings concerning monetary child poverty based on the national and international poverty line are fourfold: First, results confirm the claim that children are more affected by poverty than adults. More specifically, the share of Nigerian children living in households with consumption levels below the poverty line is decreasing with child age but is on average 13 percentage points higher than the share of adults living below the poverty line. Second, rural children face much higher poverty rates than urban children. Third, looking beyond national averages the analysis shows extreme discrepancies in monetary child poverty between different regions in both sectors, whereby child poverty rates in the three northern regions are exceeding those in the southern regions. The largest gap is observed between rural children in the North West and North East and rural children in the South East and South South, where in the latest wave up to over 80 percent compared to around one quarter of children are estimated to live below the international poverty line, respectively. Fourth, in addition, the findings suggest an inequality enhancing trend of monetary poverty between the North and the South. Whereas poverty rates appear to be largely rising over the three waves in the north and in rural areas, the share of children living below the poverty line has been decreasing in the South and in urban areas. These estimates however only quantify the extent of poverty but not the intensity of poverty as the distance to the poverty line.

Secondly, the analysis presents multi-dimensional poverty estimates based on three individual level (education, food and health) and four household level severe deprivations (sanitation, water, shelter and information). With few exceptions the findings confirm the North-South and Rural-Urban poverty gap. Large inter-state heterogeneity in deprivations within each of the six geo-political regions, suggests the need for a more disaggregate analysis beyond the regional level. More in depth analysis of water and sanitation deprivation moreover show, that it is important to look beyond severe deprivations. Children in the North West for instance may not appear as drastically deprived, when solely considering severe water and sanitation deprivation, but deprivation levels are many times higher when considering protected water and improved sanitation deprivation instead. The descriptive analysis cannot provide evidence for a systematic evidence for girls having much lower school enrollment rates or systematically dropping out of school at a younger age. Rather there appear to be state specific findings, whereby in some few states instead boys appear to have lower enrollment rates over the full schooling age range, which might be a result of the higher opportunity costs of staying in school, when there are more jobs available. In any case, observed state specific gender differences are much smaller in magnitude than the

more severe north-south and rural-urban education gap. Gender gaps of a higher magnitude might well be observed for specific age categories at the state-level.²⁷

Third, analyzing the overlap between monetary and multi-dimensional deprivation-based poverty, there is interestingly is only limited overlap between the two. Somewhat surprisingly though, still about half of the children in the top 5 percent in terms of monetary wealth suffer from at least one severe deprivation. Hence, this suggests the importance to not target or analyze monetary and multi-dimensional deprivation-based poverty in isolation or as substitutes, but as all different dimensions of poverty.

Furthermore, this analysis informs about the persistence of child poverty, wherein the north-south and rural-urban discrepancy once again stands out. Northern and rural children not only face higher poverty rates, but also face much higher levels of chronic poverty, children that are poor throughout the first three waves. In addition, there are among the non-poor in the north and in rural areas a much larger share of children at risk of being poor in the next period, given a much higher share of transient poor, children that move in and out of poverty from one wave to another, whereas among the non-poor in the south and in urban areas, there is a larger share of children that were never poor throughout three waves.

Finally, an additional inter-generational analysis shows that northern and rural children are not only at this point facing on average the highest poverty and deprivation rates but also a lower chance of breaking the inter-generational cycle of poverty, as results suggest a stronger link between their parents' education and their own poverty. This finding holds for children's monetary poverty as well as for all seven deprivations.

Further research may want to consider how well the targeting of recent and planned development initiatives of the government and donor community in Nigeria overlap with these findings. It would be particularly interesting to know whether the current efforts show significant impact at a local level, even if not necessarily yet visible as a clear trend at state or regional level, as existing initiatives have been implemented at varying scale across the country. Given the in this study outlined poor condition of children and slow improvement of deprivation levels over the years at national, regional and state level, Nigeria's efforts seem to be inadequate to reduce poverty and inequality between regions at a large scale. The World Bank's 2018 Human Capital Index also indicates Nigeria's poor status, the country is ahead of only five countries: Liberia, Mali, Niger, South Sudan and Chad. Though Nigeria slightly improved its

²⁷ This analysis however refrains from a further breakdown to that level due to concerns about the representativeness of sample sizes.

Human Capital Index score in 2020, it still ranks ahead of only six other countries. The fluctuating nature of budgetary allocations of the Federal Government in areas like health, education, water and sanitation, in Naira terms and in terms of the share of the total government budget, do not seem to be encouraging or indicative of strong commitment to improve on the condition of children or on human capital in general. The additional availability of data on state and local government budget allocations in these areas, as well as the donor communities' initiatives, may allow more focused impact evaluations of these initiatives on monetary and multi-dimensional deprivation-based child poverty across the country.

Further analysis will also be needed to find whether the adoption of the Child's Rights Act is correlated with the level of deprivation. Its adoption though indicates a higher level of commitment and also creates an enabling environment for interventions to address different areas of deprivations of children. The Federal Government along with the States that have adopted the Act should therefore make a concerted effort to encourage remaining states to adopt the Act and to live up to the obligation of the constitution and ensure uniform protection for the children in Nigeria.

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8 APPENDIX

Figure A.1 a): Poverty Rates by Geopolitical Zone – GHS (National Poverty Line)

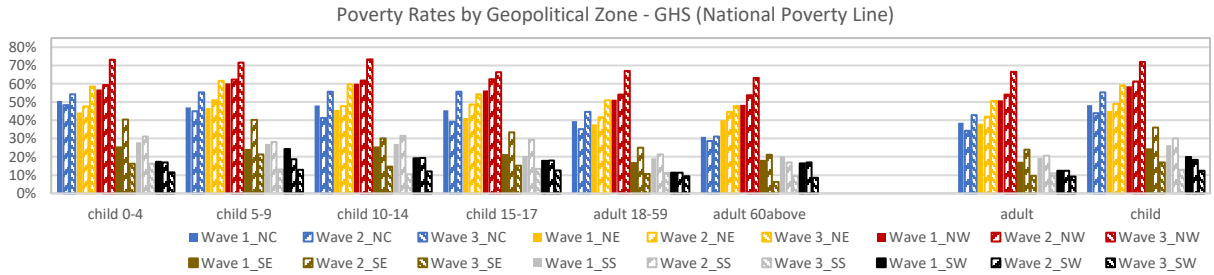


Figure A.1 b): Urban Poverty Rates by Geopolitical Zone – GHS (National Poverty Line)

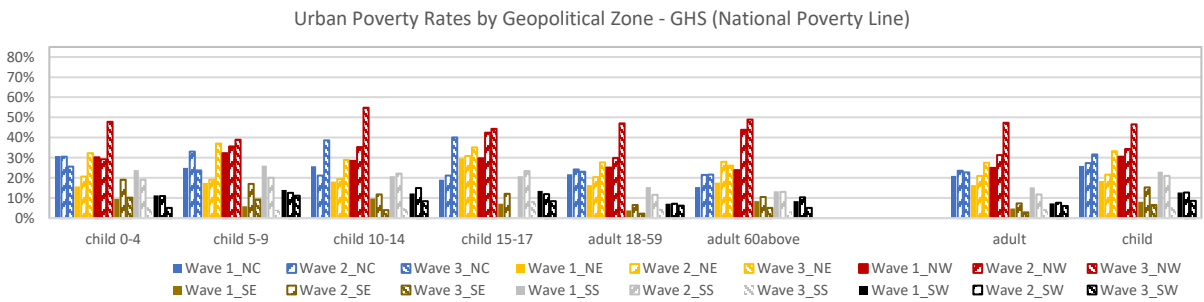
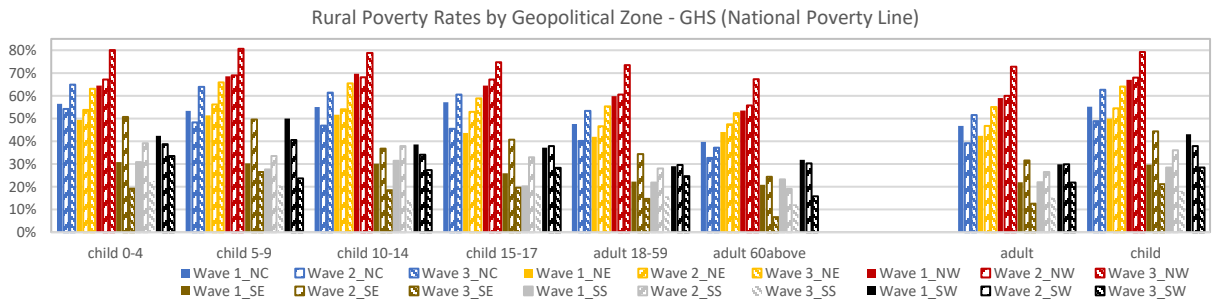


Figure A.1 c): Rural Poverty Rates by Geopolitical Zone – GHS (National Poverty Line)

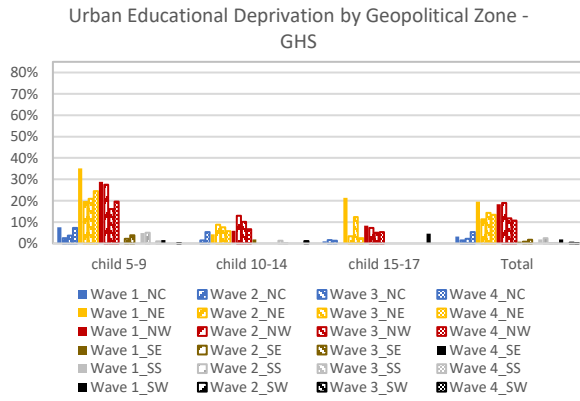


Source: Authors' estimates based on GHS Wave 1-3

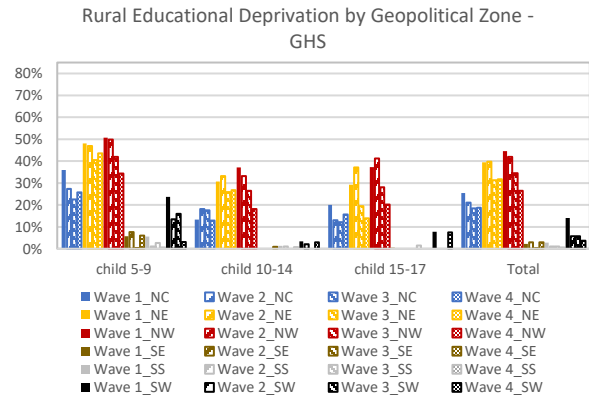
Note: Individuals with missing age were dropped from the analysis.

Figure A.2: Regional Level Education Deprivation by Gender
Girls only

a)

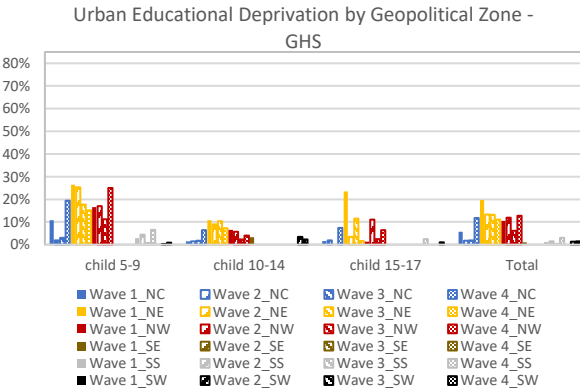


b)

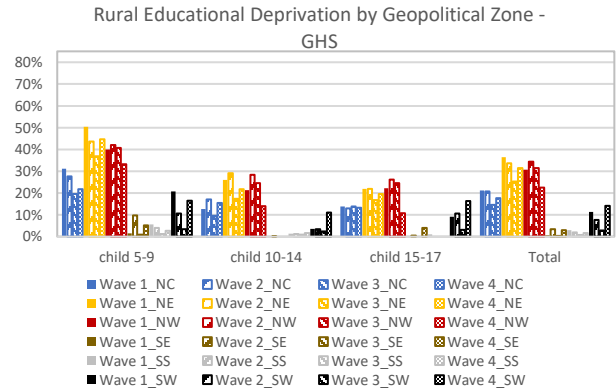


Boys only

c)



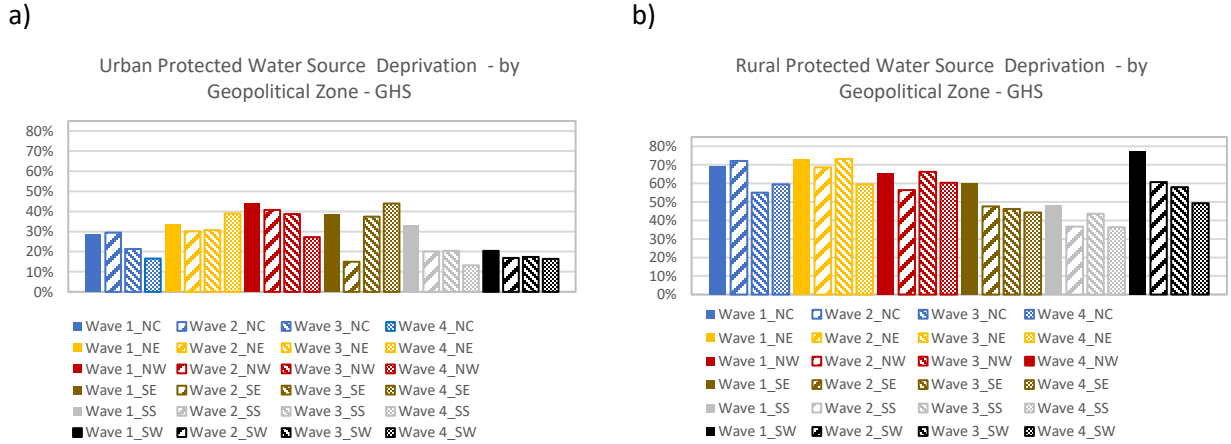
d)



Source: Authors' estimates based on GHS Wave 1-4

Note: Individuals with missing age were dropped from the analysis. Total refers to all individuals with known age.

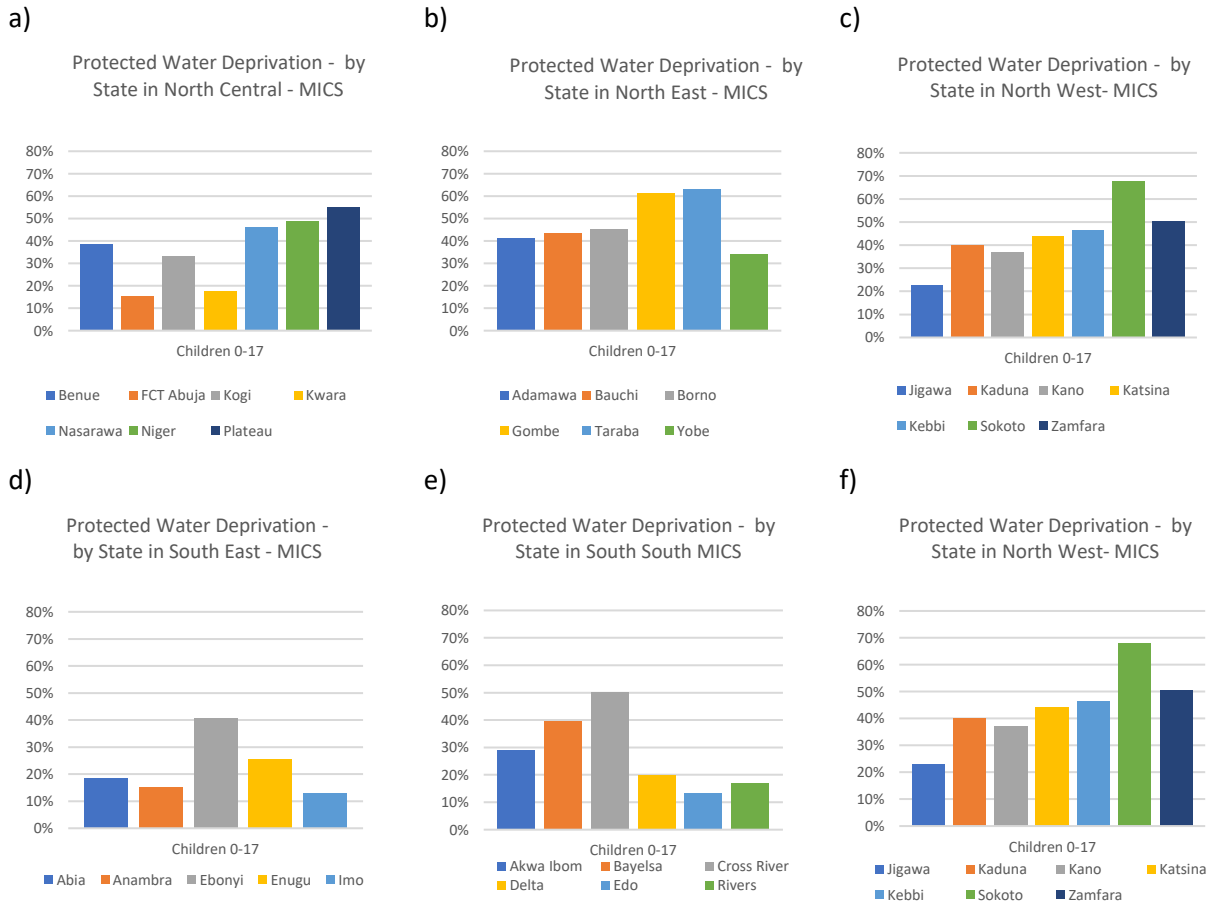
Figure A.3: Regional Level Protected Water Deprivation



Source: Authors' estimates based on GHS Wave 1-4.

Note: Individuals with missing age were dropped from the analysis. Estimates are based on children aged 0-17.

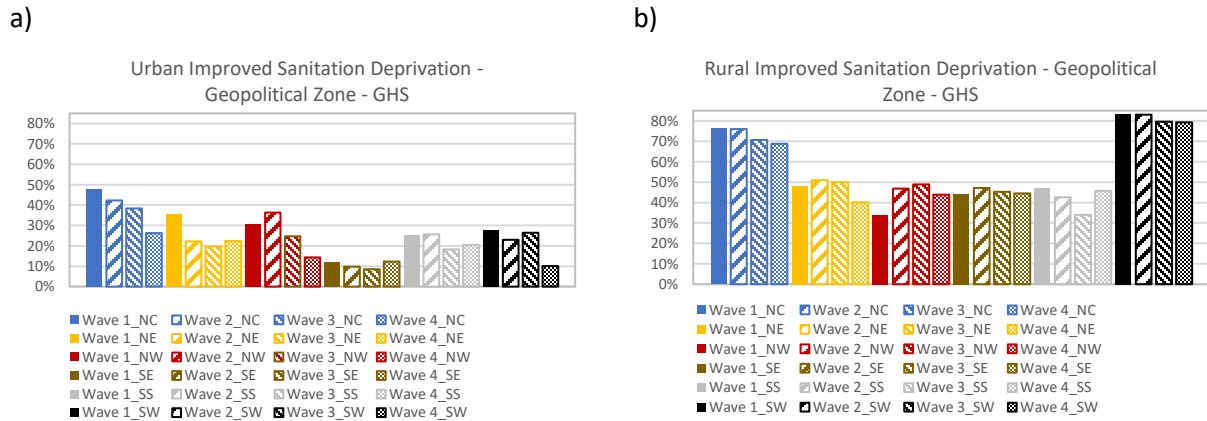
Figure A.4: State Level Protected Water Deprivation by Region



Source: Authors' estimates based on MICS 2016/17

Note: Individuals with missing age were dropped from the analysis.

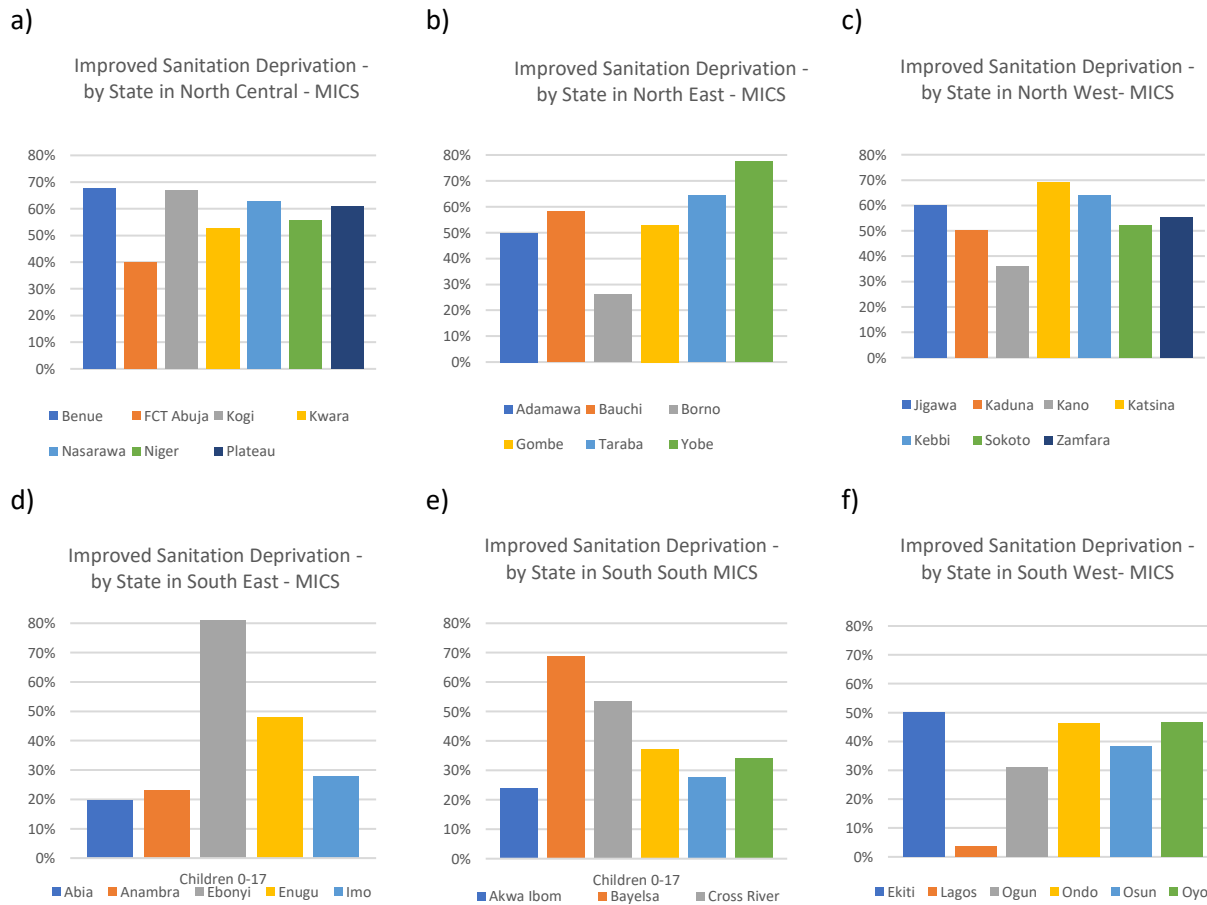
Figure A.5 Regional Level Improved Sanitation Deprivation



Source: Authors' estimates based on GHS Wave 1-4

Note: Individuals with missing age were dropped from the analysis. Estimations are based in children aged 0-17.

Figure A.6: State Level Improved Sanitation Deprivation by Region



Source: Authors' estimates based on MICS 2016/17

Note: Individuals with missing age were dropped from the analysis. Total refers to all individuals with known age. . Estimations are based in children aged 0-17.

Table A.1: Overlap of Monetary Poverty (USD 1.90\$ a day) and Deprivations in the NE in GHS Wave 3

Monetary Poverty		Individual Level Child Deprivations							
		Health Deprived		Food Deprived		Education Deprived		Not in School Deprived	
		non-depr	deprived	non-depr	deprived	non-depr	deprived	non-depr	deprived
non-poor	34%	15%	24%	8%	31%	4%	27%	8%	
Poor	39%	12%	52%	16%	44%	21%	40%	25%	
Monetary Poverty		Household Level Child Deprivations							
		Sanitation Deprived		Shelter Deprived		Water Deprived		Information Deprived	
		non-depr	deprived	non-depr	deprived	non-depr	deprived	non-depr	deprived
non-poor	33%	2%	27%	8%	20%	16%	33%	2%	
Poor	50%	15%	31%	34%	28%	37%	56%	9%	

Source: Authors' estimates based on GHS Waves 3 for the North East.

Table A.2: Deprivation Status among children living in top consumption level households (unweighted)

Monetary poverty 1.9USD			Multi-Dimensional Poverty in %				Multi-Dimensional Poverty in absolute number of observations				
			Not Deprived	At least one Deprivation	At least two Deprivations	Missing Information	Not Deprived	At least one Deprivation	At least two Deprivations	Missing Information	Total
Wave 3	Top 1% consumption	Not Monetary Poor	49%	46%	5%	6%	61	57	6	7	125
	Top 5% consumption	Not Monetary Poor	63%	34%	6%	2%	406	220	36	16	642
	Top 10% consumption	Not Monetary Poor	63%	34%	7%	3%	808	437	89	39	1,284
Wave 2	Top 1% consumption	Not Monetary Poor	32%	63%	35%	5%	43	84	46	6	133
	Top 5% consumption	Not Monetary Poor	52%	38%	19%	10%	351	251	124	67	669
	Top 10% consumption	Not Monetary Poor	53%	36%	16%	11%	709	487	213	142	1,338
Wave 1	Top 1% consumption	Not Monetary Poor	52%	27%	9%	22%	72	37	13	30	139
	Top 5% consumption	Not Monetary Poor	42%	35%	11%	22%	294	245	75	156	695
	Top 10% consumption	Not Monetary Poor	36%	44%	16%	19%	505	618	221	266	1,389

Source: Authors' estimates based on GHS Wave 1-3

Note: For each age group the respective maximum number of deprivations is considered. If a child is not deprived along any dimension, it is considered not deprived, if it is deprived along one or more dimensions it is considered deprived, irrespective of missing information on some other dimensions. If a child is for instance not deprived along four out of possible five dimensions applicable in its age category with missing information on one deprivation, it is excluded, as it is unknown whether the child is indeed not deprived of any dimension or is in fact deprived in the dimension where the information is missing.