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Intra-household inequalities in child rights and wellbeing

A barrier to progress?

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Cover image: Grandmother Marta, 60, and her family in Nicaragua. © Nikola Ivanovski / CAFOD.

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A father plays with his daughter and family friend in Beirut, Lebanon. Photo: © Dominic Chavez / World Bank.

Abstract

This paper attempts to measure the extent of inequality between boys and girls within households and its contribution to overall levels of inequality in child wellbeing. This fills an important gap. We now have much better data to assess progress towards achieving child rights and improving children's wellbeing, but little is yet known about the distribution of this progress. The neglect of intra-household inequalities affects the assessment of levels of poverty and inequality because it assumes an equal distribution of resources among household members. This could lead to a skewed view of progress towards eliminating child poverty and the effective realisation of children's rights by making invisible those children whose outcomes are below their household average.

The paper proposes a new methodology to measure inequality among boys and girls within households. It analyses the distribution of outcomes between girls and boys for four indicators: nutrition, birth registration, school attendance and time spent doing work and chores, with data obtained from UNICEF's Multiple Indicators Cluster Surveys. It assesses total inequality and its within-household component for two periods for up to 20 developing countries, depending on data availability.

An L-Theil index is used to measure the extent of inequality and decompose it into the between-household and within-household components. Overall inequality is sizeable. It tends to be higher in nutrition (stunting) and work hours, and relatively lower in school attendance and birth registration, where average outcomes tend to be higher. Nevertheless, the share of gender inequality that occurs within households is largest for school attendance, accounting for nearly half of the total inequality.

Intra-household inequality is an issue in countries even when there is, on average, progress towards increased child wellbeing. Across the four indicators of child wellbeing, intra-household inequalities can represent a significant proportion of total inequality. They range from a minimum of 6% in working hours, and can go up to 48% in school attendance, on average, but with great variability across countries. When looking at individual countries and years, the contribution of intra-household inequality is lowest in Gambia, Swaziland and Mongolia (1% of inequality in school attendance in Gambia and in work time in Swaziland and Mongolia), and highest in Albania (79% of inequality in birth registration).

At the country level, disparities inside households do not show a consistent bias towards either boys or girls. In school attendance and birth registration more households tend to favour girls, while in work time and stunting, they tend to disadvantage them. This pattern is reinforced when looking at biases across pairs of indicators, albeit with a weak favouring of boys.

Key messages

- Inequality within households is rarely measured despite its analytical importance. A new methodology allows for its measurement between girls and boys in four indicators of child wellbeing: stunting, birth registration, school attendance and work hours.
- Disparities in child wellbeing are large. Across our sample of countries, the average Gini coefficient for school attendance is 0.47, for birth registration it is also 0.47, for stunting 0.78 and for working hours 0.85.
- Inequalities between boys and girls within households can be pronounced, ranging between 6% and 48% of total inequality on average per indicator but varying depending on the country and the time period.
- It is not possible to eliminate child poverty without addressing disparities within households. Even in countries where total and within-household inequalities are not large in absolute terms, or when average child wellbeing is higher, intra-household inequalities can still pose a constraint to realising progress.
- At the country level, disparities inside households do not show a consistent bias towards either boys or girls. In school attendance and birth registration more households tend to favour girls, while in work time and stunting, they tend to disadvantage them. This pattern is reinforced when looking at biases across pairs of indicators, although boys tend to be somewhat favoured overall.

1. Introduction

Girls and women are believed to bear a heavy share of the burden of poverty, yet good data and detailed analysis for a wide range of countries are needed to corroborate this claim (Marcoux 1998). Knowing more about inequalities inside households, as well as about inequalities occurring across multiple aspects of wellbeing, would be of great value to enhance our understanding of the magnitude and nature of poverty and gender inequality. Until recently, most measures of wellbeing have treated households as if their members enjoy an equal share of all household resources. For analytical convenience, most policy analysis assumes that, within households, individual wellbeing is the adult-equivalent average of the household to which the individual belongs (Haddad and Kanbur 1990). However, when household resources—whether money, consumption goods, or investments—are not equally distributed among household members, particular individuals may be worse off than others, and could effectively be in poverty, even when household averages indicate the contrary. In terms of child wellbeing, the neglect of intra-household inequalities conceals the outcomes for those children who fare below their household average, affecting the assessment of the levels and trends of child poverty. This paper attempts to measure the extent of inequality within households and to show how it contributes to overall inequality.

There is now much better data on progress towards improving child wellbeing. International household survey programmes such as the Demographic and Health Surveys (DHS) and especially the Multiple Indicator Cluster Surveys (MICS) have made it possible to conduct an exhaustive review of progress towards the responsibilities adopted in 1989 in the Convention on the Rights of the Child (CRC), and the targets defined in the 1990 World Summit for Children, and to monitor progress towards the child-focused Millennium Development Goals (MDGs). Nevertheless, little is yet known about the distribution of this progress, in particular the distribution within households.[1]

Examining unequal household investments in children is important because they tend to carry over into adulthood. Although other factors can still affect wellbeing over an individual's life-course, systematic biases against boys or girls during childhood are linked to poverty traps and to the intergenerational transmission of poverty.

Preferential treatment of sons is evident in many societies, 'whereby the needs of girls, and resulting allocation of resources, are secondary to those of boys' (Bolt and Bird 2003: 20), resulting in unequal outcomes in child development with life-long implications.[2] Patterns of bias in favour of boys or girls, however, differ across wellbeing indicators and countries. Biases in land and productive asset inheritance have been found to favour boys (Bird 2011; Cooper 2011; Doss et al. 2011; Estudillo et al. 2001), while girls have relatively lower survival rates in Asia (Klasen 2008; Sen 1992)[3] and perhaps in Africa as well (Klasen 1996). They also have lower education achievements, and are subject to lower parental aspirations in India and Ethiopia (Dercon and Singh 2013). However, this last study also found that in the other two countries analysed, Peru and Vietnam, the bias ran in the opposite direction. Similarly, nutrition indicators show a bias against boys, especially for younger children in sub-Saharan Africa (Sahn and Stifel 2002; Svedberd 1988), and also in India (Andhra Pradesh), Ethiopia, Peru and Vietnam (Dercon and Singh 2013). At the same time, nutrition indicators have also been found to be biased against girls in some South Asian countries (e.g. for India, see Deaton 1989; Sen 1984; Sen and Sengupta 1983; for Bangladesh, see Chen et al. 1981), highlighting that the direction of the bias can vary across different countries. Sometimes, inequalities in different dimensions may balance out each other. For example, Estudillo et al. (2001) found that, in the Philippines, parents compensate lower inheritance transfers of land with higher investments in schooling for girls, resulting in very little difference in lifetime incomes between sons and daughters. A multidimensional approach to the measurement of inequalities in child wellbeing is necessary to gain a fuller understanding of these biases and to identify areas in which some children are being left behind.

Institutions and norms surrounding gender roles, patterns of inheritance, marriage and divorce, all matter to understand the varying degree and direction of intra-household inequality bias. Yet these too are likely to differ across countries. For example, where matrilineal systems are present, women may have more autonomy (Soto Bermant 2008) and thus biases against girls could be less strong. Other institutions such as dowry and marriage practices may also play a role. In sub-Saharan Africa daughters have been found to be favoured because a bride price is paid upon marriage (Bird 2010), while in South Asia, marriage practices interact with household income

1 Group-based differences on the basis of ethnicity, location and wealth can also influence the analysis of progress (See Lenhardt, forthcoming).

2 Inheritance practices, for example, reflect these preferences (e.g. see Bird 2011; Cooper 2011; Doss et al. 2011; Estudillo et al. 2001).

3 Even if these are aggregate differences, rather than differences captured within households, they can be indicative of the type of parental preference for one gender over the other.

status in determining child preference; discrimination against daughters is more common in upper-strata households than in lower-strata ones, because investments in sons are more efficient in property-owning households than in poorer ones (Bird 2010).

The age of the children, on its own or combined with their gender, may be more important in some societies than in others. While children with higher birth order are often preferred in the allocation of family resources, there can be important variations. In China, female children with older siblings have higher mortality rates, whereas in North India and Bangladesh, excess female mortality is noted among girls with higher birth order (Soto Bermant 2008). In Nepal, by contrast, girls tend to work more than boys, irrespective of their birth order (Edmons 2003). Parental assumptions about the benefits of investing in education may be reinforced by labour market functioning. In countries where gender discrimination in the labour market is high, parents may invest more in their boys' education foreseeing future financial help and higher future returns to education, as found for example by Buchmann (2000) in Kenya.

Family structure is also important. Where polygamy is an accepted cultural practice, discrimination is based not only on gender but also on family structure. For example, in northern Ghana, children of first wives have been found to have better nutrition outcomes (in terms of height and food diversity) than those of second wives in polygamous households (Leroy et al. 2008). Similarly, where extended families lived together, evidence suggests that children of the most 'powerful' male or the head of the household have been favoured: in rural Pakistan, Fafchamps and Quisumbing (2003), for example, found daughters-in-law tend to work more than daughters.

In sum, different institutions may explain different patterns in gender inequality within households. Identifying where these inequalities are salient and determining whether they systematically occur across different dimensions of child wellbeing are important aspects of diagnosing the barriers to progress.

The aim of this paper is to use existing data to shed light on unequal investments in the wellbeing of different children within the household. Inequality in four key indicators of child wellbeing is analysed: stunting, birth registration, school attendance, and time spent on work and chores (working hours). Section 2 briefly reviews some approaches to measuring intra-household inequalities and child wellbeing and situates the current work in this literature. Section 3 presents the results for the four indicators. The final section discusses some of the implications of these results.

Poverty is not transferred as a 'package', but as a complex set of positive and negative factors that affect an individual's chances of experiencing poverty, either in the present or at a future point in their life-course […] The factors influencing an individual's likelihood of being poor include both the 'private' transmission (or lack of transmission) of capital and the 'public' transfer (or lack of transfer) of resources from one generation to the next. These can be positive or negative (Bird 2010: 8)

2. Measurement issues and methodology

Three generations at a family-owned village store in Kabul, Afghanistan. Photo: © Michael Foley / World Bank.

2.1 Intra-household inequalities

Debates over how to measure gender inequality are wide-ranging and complex, including consideration of whether separate indicators are more appropriate to track men and women, whether equality in all indicators is necessary, and how to incorporate men's and women's expressed needs and wants—as well as whether composite indicators of gender (in)equality add value (Klasen 2007). A crucial discussion concerns where to measure inequalities. Some spaces may be more problematic than others. For example measuring income poverty may be more suitable at the household rather than the individual level as intra-household income flows are complex (ibid.). A monetary metric would be even more unfit for the focus on children. This paper aims to capture inequalities in various indicators of wellbeing, and to see whether a consistent picture of inequality emerges from such an analysis.

The lack of data for individual children is the main impediment to measuring inequalities inside households. Even detailed consumption surveys may lack this information. Deaton (1989) has pointed to some of the empirical difficulties in directly analysing individual allocations of resources: for instance, budget surveys record consumption at the household level rather than at the individual level; direct observation of allocations such as meals can be intrusive and affect the behaviour of those being observed; and determining the equal/unequal enjoyment of public goods or jointly consumed goods within the household (e.g. housing, sanitation and water supply) is problematic, even if they are privately provided. This focus can mask differences in the wellbeing of household members, in particular between men and women, children and adults, and across children.

Even when such detailed information exists, most inequality measures (such as the Gini coefficient or the General Entropy (GE) measures) require cardinal data for their computation, but most information we have on child wellbeing is either ordinal or binary, for example indicating

Box 1: Measuring intra-household gender inequalities

Different approaches have tried to measure the distribution of resources or outcomes within households. A first approach is to compare the gender distribution of resources to track differences between boys and girls. Data availability is perhaps the main limitation. Deaton (1989) approximated individual budget allocations to boys and girls using non-child expenditures (i.e. tobacco, alcohol and adult clothing). Compared to childless households, one would expect a reduction in the income available for non-child expenditures in households with children. If this reduction were systematically larger in households with male children than in those with female children, it would suggest that households were diverting more resources to the male children. Similarly, the Gender Parity Index used in the Women's Empowerment in Agriculture Index (Alkire et al. 2013a) computes the gap between outcomes for women and men in each household to get a sense of the shortfall between genders.

A second approach is to measure differences in average outcomes between boys and girls. Dercon and Singh (2013) used longitudinal data to measure inequalities in child nutrition, educational achievements, educational aspirations, subjective wellbeing, and psychological competencies. First, they compared the average achievements between girls and boys at various ages to assess gender inequalities. Second, they used a regression-based approach in which the different outcomes were regressed on a gender dummy and some household characteristics (i.e. total consumption expenditure, education of the mother, household size, ethnicity/caste and location (urban/rural)). The significance and direction of the gender dummy indicated the presence of gender inequality. Quisumbing (1994) followed a similar approach to analyse parental decisions about inheritance and education investments in their children, adding family fixed-effects as an attempt to capture differences in siblings within the same family. Her analysis reveals that in the Philippines education investments are gender-neutral within the household, and that daughters receive more total inheritance, but less land inheritance than sons.

Another approach is to measure overall inequality using an aggregate inequality index and break it down into two components: within-household and between-household inequality. Sahn and Younger (2009) used this to measure gender differences in the standard of living. Using Body Mass Index of adults as an individual measure of the standard of living, they constructed a household-specific L-Theil Index and measured within- and between-household inequality using the decomposability property of the General Entropy (GE) indices. Their findings show that at least 55% of overall inequality in the seven countries examined can be attributed to the within-household component. This paper follows a similar approach.

whether a child is undernourished or not, attends school or not, or has been vaccinated or not. Perhaps for this reason, common strategies are to compare average outcomes for boys and girls (i.e. the percentage of girls and boys in a country who are undernourished), using a regression-based approach in which the different outcomes are regressed on a gender dummy, or limiting the analysis to expenditure or nutrition indicators (using Z-scores) which are cardinal (see Box 1).

In this paper, intra-household inequality is presented in two ways. The first is the share of households with a gender bias: that is, households that display higher outcomes for either boys or girls. This is derived from household ratios of the achievement of girls to that of boys in each of the indicators. A ratio of one indicates complete parity; ratios greater than one indicate that girls' achievements are higher than boys' achievements, and vice versa for ratios lower than one. A bias for girls is evident when girls have more favourable outcomes than boys (i.e. a lower share of them are stunted or work fewer hours, or a higher share of them are registered at birth or attend school).[4] This, however, only shows gender differences in each household, or the average gender differences across the country; it does not show the extent of intra-household inequalities in total inequalities. Here, an aggregate measure of inequality—the Theil index—is used to capture these magnitudes.

To provide evidence of within-household inequalities, this paper trials an innovative approach to the measurement of inequality. It follows Sahn and Younger's (2009) approach to measuring inequality by breaking up a total inequality index into its within- and between-group components, using households as the defining groups (see Box 1). The innovation consists of adapting the methodology for a greater number of indicators, ordinal as well as cardinal, and thus allowing for a broader understanding of inequality in different areas of child wellbeing.

The method used is to obtain two cardinal values for each household from the original binary indicators, so that an inequality index can be constructed and then de-constructed to assess the contribution of its components, particularly to capture the share of within-household inequality.

Binary variables are recalculated as the share of girls and boys within a household above a certain threshold.[5] Thresholds are defined following international standards

4 Variables are recoded to match this interpretation.

5 This method is only able to capture whether some difference exists between boys and girls. Other methods (e.g. Alkire et al. 2013a) can be used to estimate the gap between both genders, but they make sense only for cardinal indicators (or composite multidimensional poverty measures).

set by UNICEF's guidance on Indicators for Global Reporting (Annexe 1). In the case of stunting, for example, two observations are noted for each household: one corresponding to the share of girls who are stunted and the other to the share of boys who are stunted (Box 2, overleaf). For work time, the reconstructed household variable expresses the average number of hours worked by girls and boys in each household. The unit of analysis are the girls or boys within a household, so the objective is to have a household-level variable separately representing the outcomes of girls and boys in each household.[6] Only households that have at least one boy and one girl are kept in the sample for analysis, limiting the number of observations and reducing the sample considerably.[7] A possible limitation of this approach is that the inequality measure does not control for the original size of the groups, in this case households. This may limit the comparability of the measure across countries, where the average household size varies—but it is not clear that this results in any systematic bias.[8] Although the implications for the measurement of inequality require further investigation, this still bypasses the main problem of measuring inequality using non-cardinal indicators and allows for the examination of inequality in multiple dimensions of wellbeing.[9]

Although this method proves useful for the gender analysis, it does not reflect other biases that may occur inside households. An important one relates to age. Because child age patterns within each household may affect the level of intra-household inequality—for example, older children are likely to work more hours—indicators are 'cleaned' of the age effect before using them for the analysis[10] so that the inequality presented in the paper is a more accurate reflection of gender differences.

With the household-level recalculated variables, a GE index can be computed for each indicator. This study uses an L-Theil index (mean log deviation), which is a summary measure of the difference between the (natural logarithm of the) shares of the wellbeing measure and the shares of population. It reflects the extent to which the distribution of wellbeing between groups differs from the distribution of the population in those groups. When all the groups have a share of wellbeing equal to their population share, the distribution is completely equal (the overall Theil index is zero). It also gives a higher weight to the lower end of the distribution, giving higher relevance to those who are more deprived, and is sub-group decomposable. Because the Theil index is unbounded and depends on the unit of measurement, it is difficult to interpret in absolute terms and to make meaningful comparisons of inequality levels across variables measured in different units. On the other hand, a Gini coefficient, which ranges from zero to one, gives an indication of the extent of overall levels of inequality, placing higher weight on the middle of the distribution. However, unlike the Theil index, the Gini coefficient is not perfectly decomposable (Bellù and Liberati 2006),[11] impeding the assessment of the share of inequality within households. For this reason the Theil index, rather than the Gini coefficient, is the main measure of inequality used in this study, although the latter is presented to give a sense of the level of overall inequality for each indicator.

In the decomposition of the Theil index, the within-group component reveals how much of the inequality

6 At this point, the household-level variables are cardinal but can be highly discontinuous, especially for smaller households. The discontinuity of the variable is unlikely to affect the mean value for each household, and thus the inequality measure.

7 On average, for all countries, the share of households kept in the analysis is 18% for stunting, 19% for birth registration, 38% for school attendance, and 20% for work time.

8 The average household size varies from 6 to 8 members in the sample of countries in this study. There is no conceptual reason to believe that the household size would be correlated with intra-household gender bias. Moreover, empirical testing for this paper showed inconclusive results.

9 The final variable is cardinal, and thus differs from the common approach of assigning ordered numerical values to an ordinal variable (say 1, 2, 3 representing points in a happiness scale), which is sensitive to the scale used (e.g. see Allison and Foster 2004; Dutta and Foster 2013; Kobus and Piotr 2012).

10 By regressing each of them on age (using a logit for binary indicators), and then taking the residual—the part that is not explained by age—as the clean indicator. This procedure also reduces the discontinuity of the variables.

11 Apart from the within- and between- components, the Gini coefficient has a non-zero residual term and is not sub-group consistent; that is, if inequality declines in one sub-group (region, ethnic group, etc.) and remains unchanged in the rest of population, then the overall inequality does not decline. The following equation shows the decomposition of the L-Theil index. The first term corresponds to the within-group component and the last to the between-group component.

$$GE(0) = \frac{1}{N}\sum_{i-1}^{N} ln\frac{\overline{y}}{Y_i}$$

$$= \sum_j \frac{N_j}{N} L_j + \sum_j \frac{N_j}{N} \ln\left(\frac{\overline{y}}{y_j}\right)$$

where N is the entire sample size, N_j is the sample size in the household, Nj is the sample size in the household, y =Y/N is the average score of the variable for the entire sample, yj is the average for household j, and Lj is the inequality (mean log deviation) of each household j.

could be attributed to inequalities inside the household. When there is no such inequality across household members, the contribution of the within-group component is null. Households with no inequality within can still contribute to the between-group component if their mean outcomes differ from the mean outcome of the country as a whole. The share of inequality that can be attributed to differences within households is presented for two periods in time. Inequality measures and corresponding standard errors are computed taking into account sample design, using the sample weights designed and incorporated into each survey by MICS. Computations are made with the Distributive Analysis Stata Package (DASP) (Araar and Duclos 2013) in Stata/SE V.12, which allows the sample design to be included in the estimation of standard errors. A standard t-test is used to assess the statistical significance of the changes in inequality and its components across the two periods. A test of proportions (F-test with a 95% significance level) is used to assess the difference between the shares of households favouring boys or girls for each indicator.

2.2 Child wellbeing and multidimensional inequality

This study, as its point of departure, takes an interest in measuring child wellbeing from a multidimensional perspective, but it seeks to expand this multidimensional lens to the analysis of inequality. New ground was broken in the measurement of child poverty and wellbeing with UNICEF's 'Global Study on Child Poverty and Disparities' (UNICEF 2007), which combined the household income poverty measure with the multidimensional Bristol deprivations approach (Gordon et al. 2003), the methodology used to produce the first internationally comparable estimates of child poverty across a large number of developing countries.[12] Although it captured the multidimensionality of poverty and was useful for analysing disparities across countries, it could mask child disparities within households, affecting the assessment of poverty levels and excluding less-well-off children.

The way in which child poverty is measured has an impact on policy responses. There is a considerable shortage of data analysis on children per se, and assessments of child wellbeing are often made on the basis of proxy information about the wellbeing of their household or carers (Gordon et al. 2003). The use of household-level data not only conceals differences between household members, particularly children, but also poses an additional problem. If child poverty is made equivalent to overall household poverty—'(A)' in Figure 1—policy responses may address the main underlying causes of poverty but fail to account for child-specific concerns and experiences as well as for intra-household inequalities. A stronger focus on child outcomes and non-material aspects of deprivation—'(C)' in Figure 1—would be more appropriate for capturing disparities in child poverty and more useful for addressing the protection of child rights (Fajth and Holland 2007). Lack of data, however, may restrict this type of analysis (UNICEF 2007).

The dimensions relevant to measuring child wellbeing in this study are defined by drawing from the CRC. The core set of dimensions that are essential to any child's development can be classified in three groups: survival, development, and protection and participation. Due to data limitations, the dimensions analysed are restricted to those that can be measured at the individual level and for boys and girls separately. Some indicators are measured at the individual level, but only for one child in the household, rendering them insufficient for analysis. This exacerbates the data shortcomings: of the 17 dimensions of child wellbeing in the CRC, data constraints restrict this study's analysis to only four of them: nutrition, education, birth registration/nationality, and some components of leisure and child labour. These indicators are measured only for children of a relevant age range, following

Box 2: Household-level variable: stunting

$$\text{Stunting} = \begin{cases} \text{Stunting Girls}_h = \dfrac{\textit{number of girls stunted}_h}{\textit{total number of girls}_h} \\ \text{Stunting Boys}_h = \dfrac{\textit{number of boys stunted}_h}{\textit{total number of boys}} \end{cases} \quad \text{for each household } h$$

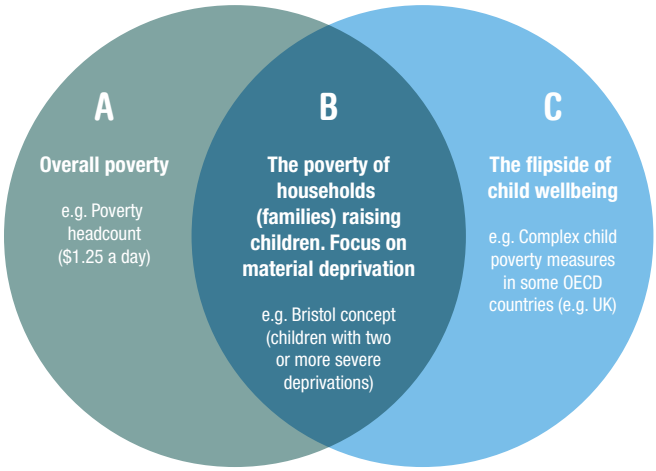
12 Developed by a research team from the Townsend Centre for International Poverty Research at the University of Bristol. It examined child deprivations in seven dimensions of wellbeing: shelter, sanitation, safe drinking water, information, food, education and health.

UNICEF's standards for global reporting (Annexe 1 shows these age ranges and operational definition of the indicators). Table 1 (overleaf) expands the table presented by UNICEF's CC-MODA methodology to analyse child deprivations (Neuborg et al. 2012: 9) with information relevant to this study.

Data is obtained from MICS. The two latest surveys available for each country are used, corresponding roughly to a five-year distance between surveys (2000 and 2005–06 or 2005–06 and 2010–11). The actual period depends on the specific surveys available for each country. A total of 20 countries is available for analysis (see Annexe 2 for details) but some countries chose to omit certain questions or add modules to the survey. Consequently, not all indicators are available for all countries or years. For each country, indicators are analysed only if present in both periods (Table 1, overleaf).

Children can be deprived in one or many of the dimensions of wellbeing. This paper analyses the distribution of each dimension separately, opting for a dashboard approach to the measurement of inequality (see the first approach in Box 3, overleaf). In addition, it aims to analyse the joint distribution of inequalities (see the third approach in Box 3). For each indicator, using the household ratios of achievement of girls to boys, it is possible to create a discrete variable showing whether there is a bias against boys or girls or none in each household. This in turn is used to compute a measure of association for each combination of indicators (e.g. stunting–birth registration, stunting–school attendance, etc.) to see whether there is a systematic gender bias.[13] (This will be further explained in Sub-section 3.6.)

Figure 1: Three models of child poverty approaches



Source: Based on Fajth and Holland (2007).

13 Other possibilities—for example, measuring multidimensional inequality using the count vector in the Alkire–Foster method (see Alkire and Foster 2011)—would render a different picture of inequality. This would indicate how multiple outcomes are unequally distributed (i.e. whether one child suffers from more deprivations than other children), as opposed to how deprivations themselves are distributed across children and how much of that occurs within households.

Table 1: Child wellbeing dimensions, indicators and data availability

Categories	Dimensions	CRC article no.	Indicators available	No. countries analysed
Survival	Food nutrition	24	Stunting and underweight	15
	Water	24	No*	
	Health care	24	Immunisation (DPT)****	
	Shelter, housing	27	No*	
	Environment, pollution	24	No	
Development	Education	28	School attendance and support for learning***	18
	Leisure	31	Housework and chores	12
	Cultural activities	31	No	
	Information	13, 17	No*	
Protection	Exploitation, child labour	32	House work and chores	
	Other forms of exploitation	33–36	Female genital mutilation***	
	Cruelty, violence	19, 37	Child discipline***	
	Violence at school	28	No	
	Social security	16, 26, 27	No	
Participation	Birth registration/ nationality	7, 8	Birth registration	19
	Information	13, 17	No*	
	Freedom of expression, views, opinion; being heard; freedom of association	12–15	No	

** Indicators for water and sanitation, information and shelter are measured at the household level.*
**** Indicator available in the Multiple Indicator Cluster Surveys (MICS) for some countries but not suited for the current analysis.*
***** Indicator available in MICS but excluded from this analysis due to different immunisation schedules in different countries, which makes it difficult to use for comparative purposes.*
Source: Adapted from Neuborg et al. (2012: 9) and author's assessment.

Box 3: Measuring inequality in multidimensional poverty

When measuring inequality across multiple dimensions, three approaches are generally used. The first measures vertical inequality analysing **each of the individual distributions** of the dimensions of wellbeing, without regard to its correlation with other dimensions. This approach is widely used by studies focused on non-income inequalities, particularly health and education. An example of the latter is found in the studies conducted by Thomas et al. (2001) and Checchi (2000), who constructed a Gini concentration index of educational achievement measured by the average years of education. With regard to health, Gakidou and King (2002) measured inequalities in expected child survival to age two, while the 2000 World Health Organization report (WHO 2000) used a similar approach by measuring inequalities in life expectancy at birth. Sahn and Younger (2006) also used this approach to measure changes in inequality in both health and education in Latin America. These inequality measures can be computed using individual-level variables, but can also be used to see differences in sub-group outcomes. For example, Thomas et al. (2001) used sub-groups defined by educational levels (i.e. higher education, secondary education, primary education, and no education) to construct a Gini index, measuring inequality as the difference between sub-group averages.

A second approach aggregates the various dimensions into a **uni-dimensional index of deprivation and then analyses its distribution for different sub-groups**. For example, the Alkire–Foster method (Alkire and Foster 2011), used in the Oxford Poverty and Human Development Initiative's (OPHI) Multidimensional Poverty Index, aggregates multiple deprivations at the individual and household level to measure poverty. Roche's (2013) study applied this methodology to the measurement of child poverty in Bangladesh using six dimensions corresponding to those in the Bristol approach. The index can be de-constructed to analyse how many children experience overlapping deprivations (incidence) and how many deprivations they face on average (intensity). UNICEF's Multiple Overlapping Deprivation Analysis (MODA), and its cross-country version (CC-MODA), combines the Bristol approach with the Alkire–Foster method and analyses deprivations in six dimensions* used to construct an aggregate deprivation index.** Although these indices were developed to measure poverty, the resulting aggregate index can be used to measure disparities, using a traditional GE measure, for example, or analysing how the index is distributed across regions or population sub-groups.

A third approach takes into consideration possible correlations between the various dimensions of welfare by considering **joint distributions of the dimensions** of wellbeing, but without integrating them into a single index. Wagstaff (2002), for example, measured mortality, malnutrition and disease prevalence across socioeconomic status quintiles defined by a measure of household wealth. In analogy to a Lorenz curve, he defined a concentration curve ranked across socioeconomic quintiles. If the curve coincided with the diagonal or line of equality, it was concluded that all children irrespective of their socioeconomic status enjoyed the same health outcomes. As pointed out by Sahn and Younger (2006), the problem of this approach is that it gives primacy to income above the other dimensions of wellbeing by ordering the distribution by socioeconomic categories; inequalities in other dimensions are only relevant if they are correlated with socioeconomic inequality. A way to avoid the income primacy is to compute distributional measures across the full set of pairwise combinations of dimensions. For example, Justino et al. (2004) used this approach in Brazil, constructing GE measures of income, health, and political participation for each education quintile and repeating the exercise for all other pairwise combinations (i.e. for health, political participation and income categories).

* Water, sanitation, housing, and protection against domestic violence are used for all children (0–17 years old); nutrition and health are also used for children under 5 years old, and education and information for children 5–17 years old.

** It also outlines the construction of a multidimensional Gini coefficient (Decanq and Lugo 2009; Tsui 1995, 1999) to analyse the distribution of the deprivation index, although to date results are still unpublished.

Inequality between girls and boys in nutrition*

How much takes place **within** households?

Key

% of inequality between girls and boys **within** the same household (as opposed to gender differences across households)

% of households favouring **boys**

% of households favouring **girls**

% of households with no preference

*Measured by the stunting rate

ALL COUNTRIES AVERAGE

1st year

21% — 78% boys / 22% girls

20% — 79% boys / 21% girls

2nd year

BY COUNTRY

	1st year		2nd year	
	% within	% households favouring boys / girls	% within	% households favouring boys / girls
Lao PDR	41%	67% / 32%	36%	64% / 36%
Sierra Leone	32%	68% / 30%	37%	63% / 35%
Swaziland	32%	65% / 35%	25%	73% / 27%
Nigeria	28%	72% / 27%	27%	67% / 32%
Mongolia	24%	75% / 24%	13%	85% / 14%
Togo	23%	76% / 23%	26%	68% / 31%
Iraq	23%	76% / 23%	19%	79% / 20%
Albania	29%	74% / 24%	27%	77% / 22%
Gambia	20%	77% / 23%	27%	71% / 29%
Belize	19%	81% / 19%	17%	83% / 16%
Kazakhstan	14%	84% / 16%	11%	91% / 9%
Guyana	13%	85% / 15%	13%	79% / 21%
Suriname	8%	91% / 9%	7%	89% / 11%
Serbia	8%	88% / 12%	4%	95% / 5%
Bosnia Herzegovina	7%	89% / 11%	6%	94% / 6%

Inequality between girls and boys in school attendance

How much takes place **within** households?

Key

% of inequality between girls and boys **within** the same household (as opposed to gender differences across households)

% of households favouring **boys**

% of households favouring **girls**

% of households with no preference

ALL COUNTRIES AVERAGE

1st year

42% — 43% boys / 56% girls

48% — 48% boys / 51% girls

2nd year

BY COUNTRY

	1st year		2nd year	
Burundi	38%	44% boys / 55% girls	48%	49% boys / 51% girls
Belize	56%	49% boys / 50% girls	46%	51% boys / 49% girls
Trinidad and Tobago	52%	44% boys / 53% girls	46%	46% boys / 50% girls
Lao PDR	49%	50% boys / 50% girls	49%	50% boys / 49% girls
Viet Nam	60%	46% boys / 50% girls	41%	45% boys / 54% girls
Côte d'Ivoire	52%	49% boys / 50% girls	46%	48% boys / 50% girls
Togo	51%	50% boys / 49% girls	56%	53% boys / 46% girls
Swaziland	52%	44% boys / 55% girls	55%	50% boys / 49% girls
Guyana	41%	44% boys / 54% girls	51%	49% boys / 50% girls
Cameroon	31%	41% boys / 58% girls	49%	48% boys / 51% girls
Albania	7%	20% boys / 80% girls	77%	44% boys / 54% girls
Nigeria	42%	47% boys / 52% girls	42%	46% boys / 53% girls
Sierra Leone	44%	52% boys / 47% girls	52%	49% boys / 50% girls
Mongolia	56%	45% boys / 54% girls	58%	45% boys / 53% girls
Suriname	43%	45% boys / 54% girls	46%	47% boys / 52% girls
Serbia	37%	42% boys / 57% girls	30%	44% boys / 52% girls
Gambia	1%	9% boys / 91% girls	36%	47% boys / 52% girls
Kazakhstan	41%	54% boys / 45% girls	41%	53% boys / 47% girls

3. Results

Young family members in Suleja, Niger State. Photo: © Arne Hoel / World Bank.

This section presents the results by indicator and looks at patterns in the findings across countries. Given that the sample of countries and indicators relies on data availability, these results are illustrative and not representative of the world or any country grouping. The group averages presented should be treated as such, recalling that the range of results can vary considerably. Moreover, comparisons across countries are not straightforward: as noted, differences in average household sizes in particular may affect the assessment of inequality; and the definition and measurement of indicators, although mostly standardised by UNICEF, are not always kept, especially in earlier rounds of the surveys, leading to differences in the way the information is captured for some countries. The results for individual countries can be found in tables in Annexe 3. Summary statistics can be found in Annexe 5. This section concludes by analysing the degree to which gender biases are jointly distributed within households.

Total inequalities between girls and boys across indicators of child wellbeing are of varying magnitude. On average, across all countries and years the Gini coefficient for working hours is 0.85, showing a large degree of inequality. Inequality in stunting is similarly high: on average, the Gini coefficient is 0.78 for this indicator. The Gini coefficient for birth registration and for school attendance is 0.47. Intra-household inequalities are also quite different across indicators and countries. Sub-sections 3.1–3.4 examine how much of this overall inequality can be explained by differences within households.

3.1 Nutrition (stunting)

A strong body of evidence shows the detrimental effects of undernutrition. It is a risk factor for poor motor and cognitive child development (Black et al. 2013), which in turn lowers educational attainment and carries into adulthood, directly affecting labour productivity and life-long earnings. The harmful effects of malnutrition also carry over from mothers to children, compromise maternal health, and increase the risk of transmission of diseases such as HIV and tuberculosis (World Bank 2006).

Different indicators can be used to determine whether a child is malnourished. Although the MDG indicator is underweight prevalence, stunting reflects better the cumulative effects of nutrition deprivation and thus is a

better indicator of chronic malnutrition (Black et al. 2013; WHO 2010).[14]

On average, for all 15 countries and periods in the sample, 24% of boys and 23% of girls are stunted (summary statistics for all indicators are available in Annexe 5), figures that are consistent with previous evidence showing that differences in nutrition between girls and boys are not generally very large (UNICEF 2011). At the country level, stunting rates for boys range from 5% (Serbia, 2010) to 41% (Lao PDR and Albania, 2000), and for girls, from 3% (Serbia, 2010) to 46% (Albania, 2000).

Even if, on aggregate, girls are as likely to be undernourished as boys, this could still hide other inequalities. Controlling for the age of children in the households, and looking at the ratio of stunting prevalence of girls to boys within households, the analysis here shows that on average for all countries about 78% of households have a bias for boys and 21% a bias for girls. Less than 1% of households have no bias in favour of children of either gender (see Annexe 4 for all countries and indicators). The percentages of households with and without biases differ, but the pattern of male bias is similar across countries. Moreover, these differences are large, so this results in a significant difference between the shares of households favouring boys and girls (see also Figure 3, overleaf).

Intra-household inequality varies across average levels of wellbeing and in relation to total inequality (Figure 2, overleaf). Pooling all country–year observations, the Figure shows that where average stunting levels are higher, total inequality is lower. However, the opposite occurs with within-household inequality, which is higher where average stunting is higher in absolute and relative terms. For instance, in the Lao People's Democratic Republic (Lao PDR), a country with high levels of stunting, close to 40% of inequality occurs within households. The opposite occurs in countries like Serbia. This suggests that, for nutritional outcomes, intra-household inequality should be a stronger concern in countries with higher levels of deprivation.

According to the inequality decomposition of the Theil index, on average 80% of the inequality in stunting rates can be attributed to inequality across households, whereas 20% occurs within households. However, in seven countries (Nigeria, Albania, Togo, Lao PDR, Sierra Leone, Swaziland and Gambia) in both periods, the within-household component contributes to more than 20% of the total inequality, reaching 41% in Lao PDR.

In six of the 15 countries with stunting data, overall inequality measured by the Theil index increases between the two periods; in four countries, it decreases; and in five countries, it remains virtually unchanged. But overall, as seen in Figure 3 (overleaf), there is little change in stunting inequality and its relative components from the first to the second period. Within-household inequality falls only in two countries (Mongolia and Iraq). Yet, neither of them managed to reduce total inequality because of a rise in between-household differences, and total inequality remained high (the Gini coefficient for Mongolia rose from 0.72 to 0.85 while in Iraq it remained virtually at the same level). For the rest of the countries, the change in the within-household component of inequality is not statistically significant and thus changes in total inequality are driven by the between-household component.

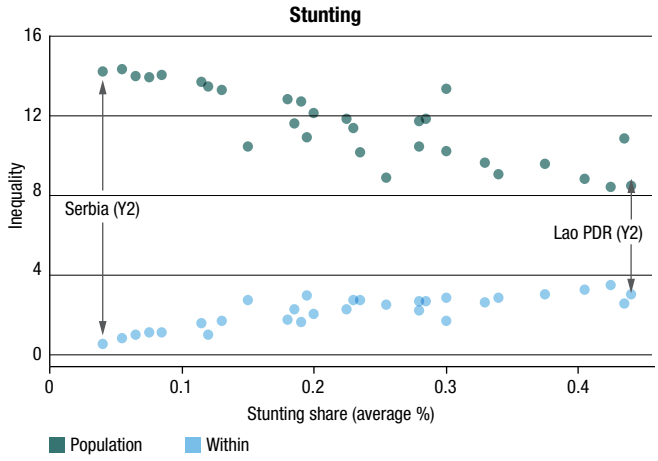
3.2 Birth registration

Unregistered children are deprived of their right to have an identity and may not be able to claim services and protections on an equal basis with other children (UNICEF 2014). Birth registration is costly and difficult for some families. In some countries, parents need to pay a fee to register their children; in others, late registration carries a sanction that can place a heavy economic burden on the family, or may involve other external costs incurred through travel or accommodation and loss of earnings and work time. Sometimes the barriers are not monetary. For example, in Bhutan, children whose father is unknown cannot be registered, and in Indonesia, a marriage certificate is required to register a child's birth (UNICEF 2014). It is possible that given these difficulties, parents may not always be willing or able to register all their children. They may choose to register only one child, who may be either randomly selected by chance or circumstances or more instrumentally chosen to allow them access to services which could help them to support their family in the future.

On average, for the 19 countries analysed, 53% of girls and 54% of boys are registered, but with large differences across countries, ranging from 2% in Trinidad and Tobago (2006) to 90% in Guyana (2006–07). On average, the percentage of children registered increases for girls and boys alike, from 50% in the first year in which registration was measured, to about 57% in the second. Again, the actual rates differ in each country, but the similar trend for boys and girls is common. Disparities inside the household in terms of ratios of registration for girls and boys occur in about 98% of households, and in most countries there is a

14 There are also differences in the standards for measuring nutrition indicators, which largely depend on the underlying population reference group. Patterns differ substantially depending on whether the old National Center for Health Statistics (NCHS)/World Health Organization (WHO) standards or the more recent 2006 WHO standards are used: in particular, stunting is likely to be higher when using the new standards (de Onis et al. 2006). For example, in an experiment using the Demographic and Health Survey (DHS) for Bangladesh, both underweight and stunting rates are about 10% higher with the WHO standards (de Onis et al. 2006). Even though the WHO standards are probably better at capturing the extent of malnutrition in a given country, because their base population reference is a sample of breast-fed children selected from a wide geographical distribution, the old NCHS/WHO population reference standards have been used in this study to compute stunting rates and the respective inequality indicators. This was done to ensure comparability over time, because MICS from round 2 and most of round 3 were conducted when this was the standard in place, and the data was reported accordingly.

Figure 2: Average levels and inequality in stunting



Source: Author's calculation based on Multiple Indicator Cluster Survey (MICS) data.
Note: Stunting average is the mean stunting level for all children in the sample. Overall and within- household inequalities refer to the L-Theil index results in each country.

bias favouring girls (about 65% of cases on average). Only in Iraq does the bias run in the opposite direction, with less than a quarter of households favouring girls.

Figure 4 (overleaf) shows that the higher the average birth registration in the country, the lower the total inequality in absolute terms (e.g. Albania). The relationship with within-household inequality is less clear; if anything, within-household inequality is also slightly higher for countries in the middle of the distribution (e.g. Togo).

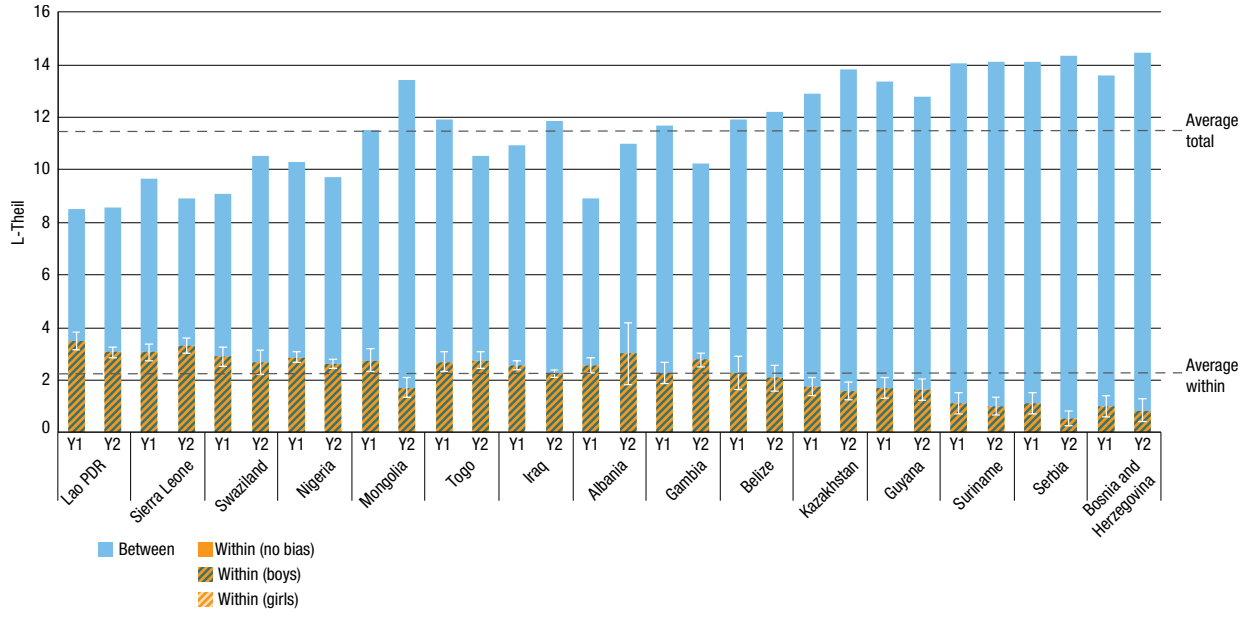
The between-household component accounts for 78% of total inequality, whereas the remaining 22% corresponds to inequality within households. There is a 20% or higher share of within-household inequality in both periods in Togo, Iraq, Mongolia, and Guyana. For eight countries, the share is below 20% in both periods while for the remaining seven countries, it fluctuates above and below 20% across the two time periods.

With the general increase in birth registration rates, overall inequality falls over the two periods. Of the 19 countries with birth registration data, overall inequality between the two periods decreases in eight countries but increases in two (Lao PDR and Swaziland) (Figure 5, oveleaf). In the remaining nine countries, inequality remains virtually unchanged. The within-group component rises sharply, from 17% of total inequality in the first period to 25% in the second. The share of within-household inequality increases to above 20% in seven countries, although this change is statistically significant in only Vietnam, Lao PDR and Swaziland. Total inequality accompanies that upward trend in Lao PDR and Swaziland. Only in Iraq, within-household inequality decreases between the two periods; that reduction is accompanied by a reduction in total inequality.

3.3 School attendance

Education is critical to strengthening people's capabilities and freedoms. Greater equity in access to education has critical effects on advances in human development (Jespersen 2011). Education can also be a route to greater social mobility and a way out of poverty

Figure 3: Inequality decomposition of stunting



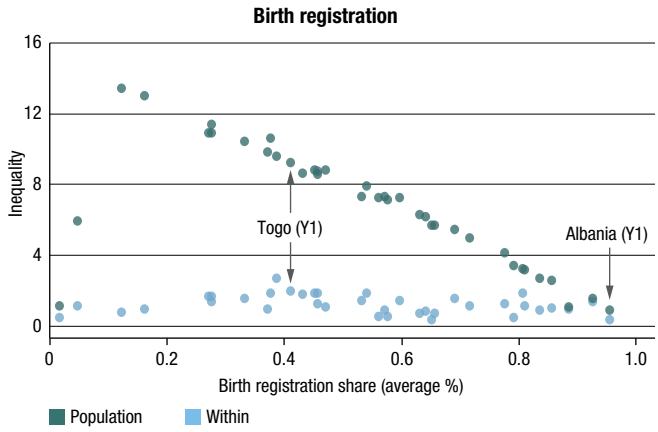
Source: Author's calculation based on MICS data.

(UNESCO 2010). An extra year of schooling can increase a person's earnings, lead to better employment, and reduce the chances of falling back into poverty. For instance, in Pakistan literate working women earn 95% more than women with weak literacy skills, whereas in rural Indonesia, literacy has been linked to a 25% decrease in the chance of falling back into poverty (UNESCO 2013). Education is also linked to better health and is conducive to full participation in society. Educated mothers are less likely to be pregnant when they are teenagers and more likely to have a say in the number of children they want; they are also less likely to die during childbirth because they are better informed about specific diseases and can take measures to prevent them (UNESCO 2013).

The school attendance indicator refers to the number of children reported going to school (primary, or secondary) during the year of the survey. It is a gross attendance rate, because it includes all children regardless of whether they are attending the appropriate level of education for their age. It does not control for attrition levels or the quality of education, which can vary substantially. Further indicators would be needed to incorporate these important aspects of children's right to education, where starker inequalities could be present.

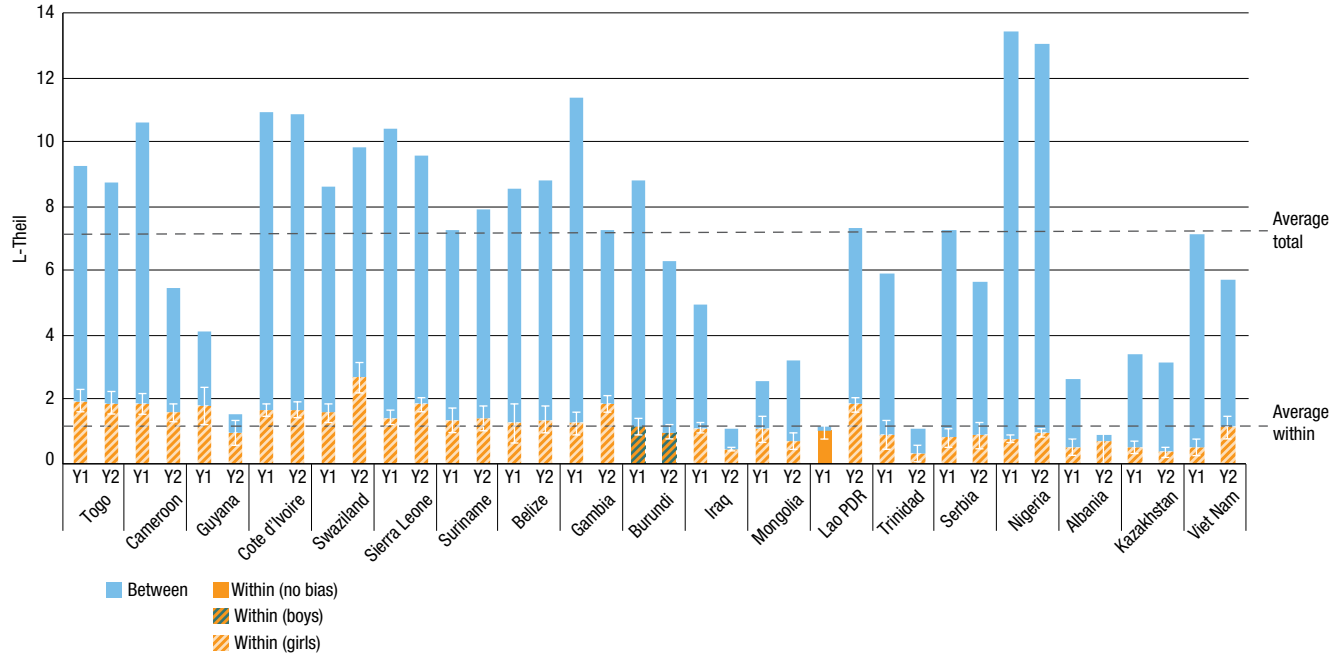
Several factors can restrict access to education for some children. The affordability of education, social and cultural barriers, social stigmatisation, and disability are among the most salient (UNESCO 2010). Physical barriers and lack of infrastructure may also limit access to education for some. For example, as a consequence of the Syrian crisis, two million children had to leave school because of bombing or displacement (Watkins 2013). Even in more stable situations, physical barriers can still play a role. Reducing distance to school, for example, had a significant effect in increasing girls' attendance in secondary schools in rural Tanzania, although it had less of an impact for boys (Burke and Beegle 2004). In fact, inequalities in education have a strong relationship with characteristics of groups (e.g.,

Figure 4: Average levels and inequality in birth registration



Source: Author's calculation based on MICS data.
Note: Average levels of birth registration are the mean birth registration levels for all children in the sample. Overall and within-household inequalities refer to the L-Theil index results in each country.

Figure 5: Inequality decomposition of birth registration



Source: Author's calculation based on MICS data.

wealth, ethnicity, location, gender), which often overlap.[15] Commonly cited barriers to school attendance, such as disability and distance to school, are more relevant for some groups than for others. For example, Rousso (2003) found that, in terms of school attendance, disabilities tend to be less important for boys than for girls—a result of the way they interact with perceptions about gender roles and the lower value that parents place on their girls' education.

On average, school attendance exceeds 80% for both boys and girls for the 18 countries with data, but again the range is wide across the sample. For boys, the range is from 44% in Gambia to 96% in Cameroon, while for girls the range is from 45% to 94% for the same two countries, respectively. In half the number of countries school attendance rates increase between the two periods for girls and boys alike. Once controlling for the different age composition of households, most households have some bias in the distribution of schooling and, interestingly, it runs in favour of girls in both periods for 11 of the 18 countries (see Figure 7, overleaf). However, the differences are not as pronounced as they are for the remaining indicators: on average, 53% of households favour girls and 46% favour boys.

There is no clear pattern between average progress in school attendance and either total or within-household inequality (Figure 6, overleaf), in contrast to the other indicators of child wellbeing. The absolute levels of total and within-household inequality are roughly similar in countries with lower and higher average rates of school attendance. However, when deprivations are low, intra-household inequality accounts for a greater share of total inequality, even if its absolute magnitude is smaller. This suggests that even if average deprivation is low, within-household inequality can be the main barrier to closing the gap and ensuring schooling for all children.

In fact, for this indicator, the share of within-household inequality is 45%, meaning that the within-household component accounts for almost half of the total inequality. For three countries (Togo, Mongolia and Swaziland), the within-household component makes the largest contribution to inequality in both periods.

On average, total inequality falls over the two periods. In eight of the 18 countries with schooling data, overall inequality decreases (Figure 7, overleaf).[16] In one country (Côte d'Ivoire) inequality rises between the two periods, while for the remaining countries the change is not statistically significant. The distribution of inequality also changes with the general increases in school attendance across the countries. Within-household inequality falls in Trinidad and Tobago and Swaziland, which also show reduced overall inequality, but significantly increases in one country (Gambia), where the within-household inequality jumps from less than 1% to 36% mainly because of the large drop in the between-household component. The changes in within-household inequality are statistically insignificant in the remaining 15 countries.

3.4 Working hours (economic, domestic and chores)

Many children engage in work activities. Some work to 'help their families in ways that are neither harmful nor exploitative, but others are put to work in ways that interfere with their education, drain their childhood of joy and crush their right to normal physical and mental development' (UNICEF 2014). Education and leisure form part of children's fundamental rights: regardless of whether or not the activity produces economic value, both paid and unpaid work and household chores such as cooking, cleaning or caring for other children are a drain on the time children have to learn and play. The term 'work' is used hereafter to refer to the sum of the time spent doing economic work, domestic work and chores.

Child labour is typically measured in terms of the number of hours a child is engaged in economic activity, and the thresholds to classify work as child labour vary with children's age. However, such cut-offs can be arbitrary. They carry assumptions about an ideal minimum age of work as well as the amount of time children should have free for education and leisure. For this reason, this study does not use this definition of child labour to measure whether there is inequality in this respect, preferring instead to measure it by the total number of hours that children spend on these activities.

On average, across all 12 countries, girls spend more hours a week (12 hours) working and doing chores compared to boys (10 hours),[17] but this includes countries like Suriname, where boys and girls alike work only 0.31 hours a week, and Cameroon, where boys spend more than 26 hours and girls more than 31 hours each week working. In seven of the 12 countries, the time that children (both girls and boys) spend working reduces between the two periods. In Nigeria, the reduction is only significant for boys, while in Gambia, there is an increase in the average number of hours that girls work (of more than three hours per week).

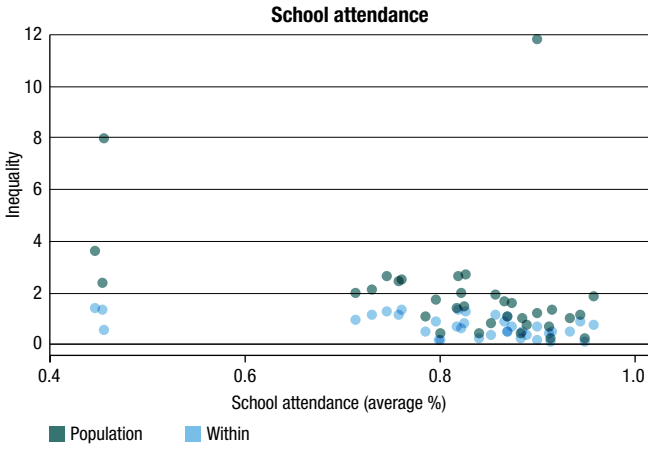
The longer time worked by girls is also reflected when looking at the share of households who show a bias for boys in this indicator (see Figure 9, page 24). On average, across all countries and periods, girls spend less time

15 For data on this type of inequality, see the World Inequality Database on Education (UNESCO 2014).

16 The large jumps in between-household inequality in Albania, Gambia, and to a lesser degree in Burundi can be explained by the behaviour of extreme cases—that is, cases where no children are in school. In the second year, there is a large reduction in these cases, which can be a result of either progress in the dimension or measurement error at the time of collecting the initial survey.

17 These averages include girls and boys who do not engage in work or chores at all (zero hours a week). The average number of working hours is 19.8 for boys and 20.5 for girls.

Figure 6: Average levels and inequality in school attendance



Source: Author's calculation based on MICS data.
Note: Average school attendance is the mean school attendance level for all children in the sample. Overall and within-household inequalities refer to the L-Theil index results in each country.

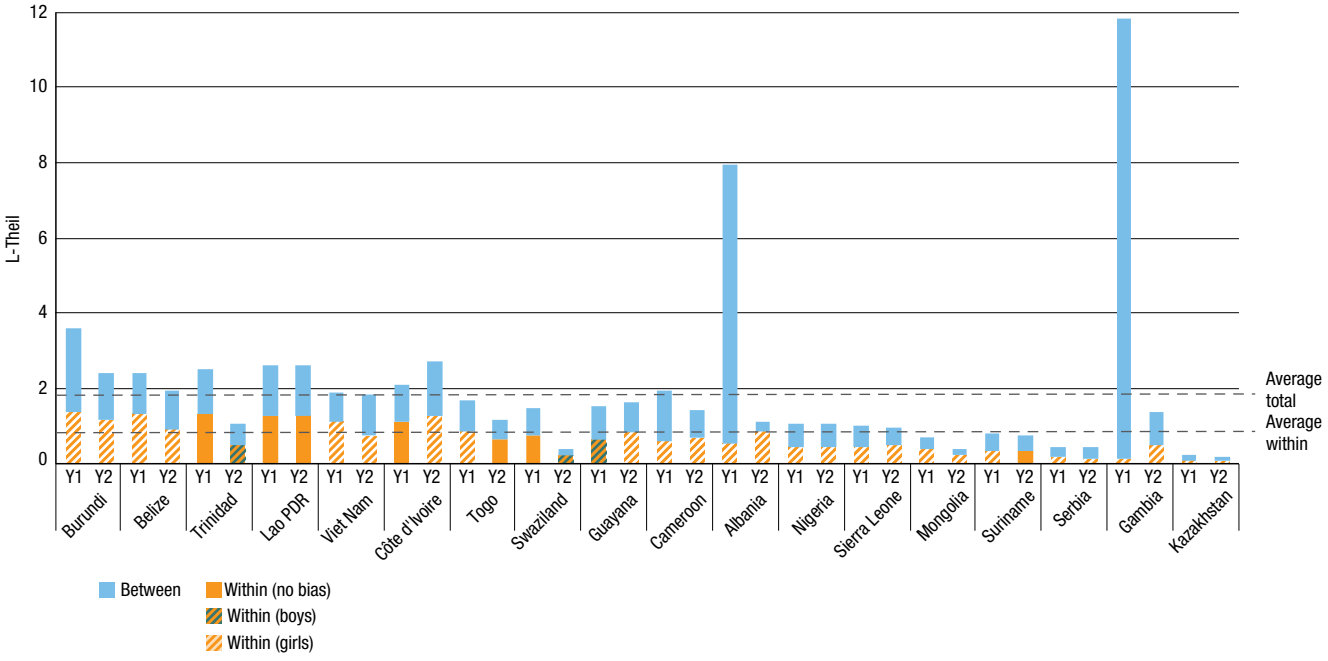
working or doing chores in only 14% of the households, while boys spend less time in 86% of households.

Working hours follow a similar pattern to stunting. The higher the average number of hours worked by children, the lower the total inequality, but within-household inequality is of a similar magnitude across countries (Figure 8, overleaf). For example, while total inequality is lower in Cameroon than in Nigeria, intra-household inequality is of a similar absolute magnitude in both countries. In relative terms, the share of intra-household inequality seems to be large in countries where children work more hours.

Most inequality in working hours is accounted for by inequality across households; only 8% of inequality occurs within them. For this indicator, other group-based inequalities, such as location (urban/rural), economic conditions and regional differences may be more important in explaining inequalities. Only for Vietnam is this not the case: within-household inequality is 34% in the first period and 14% in the second.

Although the number of working hours decreases over the two periods, inequality increases slightly. The Gini index on average is 0.81 in the first year and 0.89 in the second. In fact, total inequality increases in eight of the 12 countries and decreases only in one (Gambia). Within-household inequality on the other hand, falls in absolute and relative terms in six countries (Burundi, Cameroon, Mongolia, Sierra Leone, Swaziland and Vietnam) and increases in none (Figure 9, overleaf).[18]

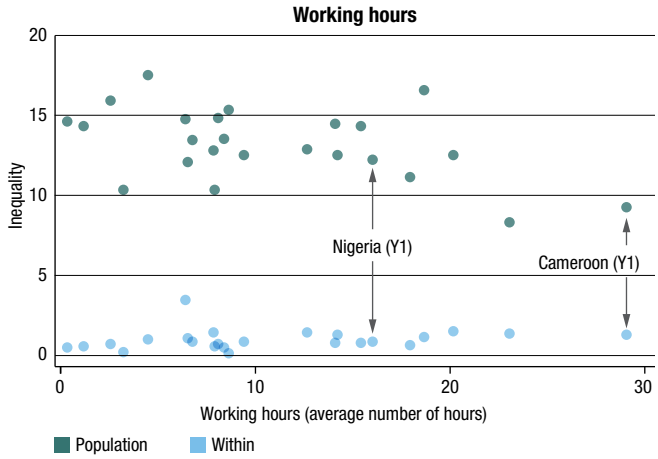
Figure 7: Inequality decomposition of school attendance



Source: Author's calculation based on MICS data.

18 The large jumps in between-household inequality in Burundi and Mongolia can be explained by the behaviour of extreme cases, that is, cases where children work zero hours. In the second year, there is a large increase in these cases, which can be a result of either progress in the dimension or measurement error at the time of collecting the survey.

Figure 8: Average levels and inequality in working hours



Source: Author's calculation based on MICS data.
Note: The average number of working hours is the mean number of hours worked by all children in the sample. Overall and within-household inequalities refer to the L-Theil index results in each country.

3.5 Intra-household inequality as a barrier to 'leaving no one behind'

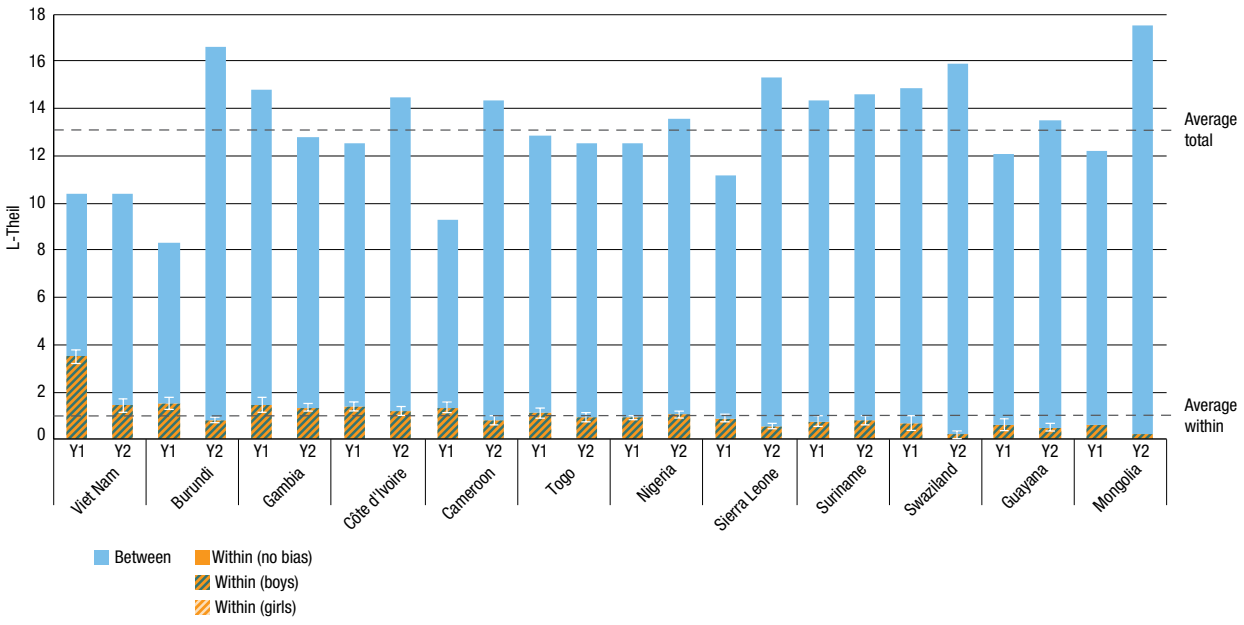
Although the sample of countries and indicators is limited in many respects, the analysis of household survey data for up to 20 countries (depending on the data) is illustrative of the presence of inequalities in four dimensions of child rights and wellbeing. Analysing when such differences exist within households in the realisation of children's rights is an important aspect of identifying the barriers to 'leaving no one behind' and eliminating child poverty.

The analysis of the four variables of child wellbeing used here shows that small aggregate differences between girls and boys often obscure intra-household inequalities. In the aggregate, inequality is particularly high for stunting and working hours. The decomposition of the inequality index (L-Theil) shows that a large amount of inequality can occur within households, but with significant variation by country and indicator. In some areas, mainly work time, inequality occurs mostly between households. In contrast, inequalities inside households are particularly high for school attendance. They account for close to half of total inequality (over 40%) in 13 out of 18 countries, and in a further three countries, for more than half of total inequality in at least one of the periods. Within-household inequality in stunting and birth registration accounts for around one-fifth of total inequality on average for both periods.

The results show that intra-household inequality represents between 6% and 48% of total inequality across the four indicators when looking at averages across all countries. The variability by countries and years is high: the contribution of intra-household inequality is lowest in Gambia, Swaziland and Mongolia (1% in the distribution of school attendance in Gambia and of work time in Swaziland and Mongolia), and highest in Albania (79% in the distribution of birth registration).

Table 2 shows a summary of how the levels of total and within-household inequality evolve with higher levels of wellbeing. Only in countries with lower levels of stunting

Figure 9: Inequality decomposition of working hours



Source: Author's calculation based on MICS data.

Table 2: Direction of inequality with higher levels of wellbeing

Indicator	Total inequality	Within-household inequality (absolute)	Share of within-household inequality (relative)
Stunting	↑	↓	↓
Birth registration	↓	↔	↑
School attendance	↔	↔	↑
Working hours	↑	↔	↓

Source: Author's interpretation based on observations and analysis.
Note: The arrows indicate the direction of the levels of inequality (↑ higher, ↓ lower or, ↔ stable) at higher levels of wellbeing.

is there a lower level of within-household inequality. For the remaining three indicators, that is not the case. In other words, there appears to be no automatic fall in absolute intra-household inequality in countries progressing towards greater child wellbeing Moreover, within-household inequalities can be increasingly important in relative terms, accounting for a greater share of total inequality in birth registration in particular, and in school attendance, to a lesser degree. For example, in schooling, where deprivations are relatively low, the residual gaps are mainly within households rather than across them, highlighting once again the relevance of addressing this type of inequality. This means it is not possible to eliminate child poverty and secure the rights of all children unless disparities within households are addressed. For stunting and working hours, within-household inequalities are less important in relative terms when deprivations are lower.

3.6 Is there evidence of systematic bias against boys or girls?

Previous sections presented a detailed analysis of inequality for each indicator separately. As this study also aims to show whether intra-household inequalities are systematically present, it is important also to analyse their joint distribution: in other words, to see whether households tend to favour girls (or boys) in all areas of wellbeing, or rather to compensate for underinvestment in one area with overinvestment in another, for example, as Estudillo et al. (2001) found in the Philippines.

The previous analysis by indicator shows that for most countries, the bias in some indicators favours girls, and in others, it favours boys. Thus, at the country level, it is hard to conclude that there is a systematic bias against either gender. However, it is still possible that the households that have a bias for boys in nutrition, for example, may also favour boys in birth registration, schooling and working hours: that is, within households there is a systematic bias towards one gender. The share of households that favour girls or boys is used in this section to investigate these patterns.

A measure of association for each pairing of indicators (P statistic) is calculated. Given that the sample size is reduced with each additional indicator,[19] it is not possible to analyse joint distributions for combinations of three or all four indicators at the same time.

As an illustration of the methodology that follows, Table 3 (overleaf) shows the cross-tabulation used to compute association measures between stunting and birth registration for the whole sample of countries.[20] Out of all 27,421 households, 4,597 have a bias for girls in both stunting and birth registration. This corresponds to a relatively small proportion (17%) of the total number of households in the sample, but it is a very large proportion (71%) of the total possible 'match' cases—that is, the households where there is a bias for girls (6,442 households in this example). The P statistic captures this relationship.[21] Because some of the indicators are relevant and/or available only for children of certain age ranges, only the information for those households with observations for each pairwise combination of indicators is used.

Table 4 (overleaf) shows the results of this exercise. In five of the six possible combinations of indicators, households show a preference for boys, and in one, they show a preference for girls. The average across indicators also shows that more households favour boys over girls in two indicators at the same time. Starting with these, 79% of households that tend to favour boys over girls in terms of nutrition (stunting) also favour them in terms of birth registration. The respective percentages are: 71% for stunting and school attendance; 88% for stunting and working hours; 47% for birth registration and school; 86% for birth registration and work; and 84% in school and work.

19 For example, to analyse the joint distribution of stunting and birth registration, only households with data on both indicators are used. Given that some indicators are relevant or collected only for children in certain age ranges, this can considerably reduce the sample size with an increasing number of indicators.

20 All other cross-tabulations are presented in Annexe 6.

21 For a more detailed explanation, see Alkire et al. (2013b).

On average, fewer households favour girls in two indicators at a time, but it is noticeable that in three of the cases where the P statistic indicates a preference for boys, the absolute difference between the P statistic for boys and for girls is relatively small (below 0.20). In some cases, the proportion of households favouring girls is considerable. It is 71% for stunting and birth registration; 52% for stunting and school attendance; 33% for stunting and work; 74% for birth registration and school; 75% in birth registration and work; and 58% in school and work.

These results vary across countries (Annexe 7), with some having a more distinctive pattern than others. For example, take the case of the positive bias for girls in stunting and birth registration. With the pool of observations from all countries, the P statistic is 0.71, but this ranges from 0.52 in Mongolia to 0.91 in Nigeria. Similarly, the bias for boys in school attendance and work time ranges from 0.76 in Vietnam to 0.96 in Swaziland.

In Lao PDR and Trinidad and Tobago, most pairings favour girls, while in the remaining 15 countries, most pairings favour boys.[22] For these countries, the absolute difference between the P statistic for boys and for girls ranges from 0.24 in Kazakhstan to 0.02 in Belize, showing that in the first country there is stronger evidence for boy preference than in the latter. In Albania and Nigeria, the same number of pairings favours girls and boys, but on average, most households favour girls in Albania, whereas most favour boys in Nigeria.

As mentioned in the Introduction, previous studies have produced varying evidence on intra-household distributions and the directions of biases, and this study seems to confirm the evidence. While there is some overall bias for boys, this is not universal across indicators or countries. In particular, it is possible that some household characteristics are systematically associated with a more unequal distribution of resources between boys and girls. For example, there is

Table 3: Number (and percentage) of households with no gender bias or with a bias for either boys or for girls in stunting and birth registration

	None	Bias for boys	Bias for girls	Total
None	56 (0.2%)	7 (0%)	114 (0.4%)	177 (0.7%)
Bias for boys	299 (1%)	6,545 (24%)	13,958 (51%)	20,802 (76%)
Bias for girls	60 (0.2%)	1,785 (7%)	**4,597 (17%)**	6,442 (23%)
Total	415 (2%)	8,337 (30%)	18,669 (68%)	27,421 (100%)

Source: Author's calculation based on MICS data.
Note: Percentages are expressed as a share of the total number of households.

Table 4: Measures of association

Variables	P statistic for boys	P statistic for girls	Absolute difference
Stunting / birth registration	0.79	0.71	0.07
Stunting / school attendance	0.71	0.52	0.19
Stunting / working hours	0.88	0.33	0.55
Birth registration / school attendance	0.47	0.74	(0.27)
Birth registration / working hours	0.86	0.75	0.12
School attendance / working hours	0.84	0.58	0.26
Average	0.76	0.61	0.15

Note: Underlined values show whether the P statistic is higher for boys or girls. Where the absolute difference is in brackets, it indicates that the value for girls is higher than for boys.
Source: Author's calculation based on MICS data.

22 Bosnia and Herzegovina has insufficient data to calculate pairings.

some evidence that female-headed households prioritise investments in children to a greater extent than households headed by men (Chant 2007), and that mothers' education increases equal outcomes in children's education (Dercon and Singh 2013). However, it is likely that these patterns vary across countries and indicators of child wellbeing. The variability in intra-household inequality across countries and indicators found in this study suggests that biases may respond to different aspects in different countries and may relate to different social gender norms and household institutions.[23] A more in-depth analysis would be needed to uncover the specific characteristics that drive intra-household inequalities in each of the dimensions of child wellbeing presented in this study.

23 As an exploratory exercise, the observations for all countries with available data in this study were pooled to carry out a simple OLS regression with country-fixed effects to see whether some types of households would be more prone to certain intra-household bias (as measured by the ratios of girl-to-boy achievements as the dependent variable). The limited availability of comparable information across surveys constrained the selection of explanatory variables, which included: the number of children in the household, the gender of the head of the household, a household wealth index, and the household's location in a rural or urban area. The explanatory power of these regressions was generally very low, indicating that many unexplained factors influence inequalities at the household level, and that, even when controlling for country-specific characteristics, there is little at the cross-country level that can comprehensively explain intra-household inequalities.

4. Discussion and conclusions

Family sitting in doorway, Indonesia. Photo: © Ray Witlin / World Bank.

Progress in improving child wellbeing has occurred across the globe and in many dimensions (UNICEF 2014). However, the way in which progress happens may not be equitable and the patterns of inequality vary across dimensions of wellbeing. This working paper provides an innovative methodological approach to measuring the extent of intra-household inequalities, presenting a broader picture of child wellbeing and its distribution. In all indicators of child wellbeing there have been improvements, but the patterns of distribution that emerge from these improvements are very different. Overall, the paper advances five main findings.

First, assessing inequality, and in particular that which occurs within households, is important, even in the context of country progress towards the realisation of child rights and wellbeing. When comparing averages between girls and boys, while small differences are noted in many areas of wellbeing, some important disparities remain. Across the sampled countries (12–19 depending on the indicator), the average Gini coefficient for school attendance and for birth registration is 0.47; it is 0.78 for stunting, and 0.85 for working hours. To close the gap between girls and boys, it is important to know where these disparities are located.

Second, by using a decomposable measure of inequality (the Theil index) it is shown that significant inequalities occur within households. Between-household inequality in working hours is relatively large (on average, 92% of total inequality) and thus addressing barriers to reduce inequality across households appears to be a priority for closing the gap in this indicator of child wellbeing. For the remaining variables, within-household inequalities are considerable. For stunting and birth registration they are close to a fifth of total inequality, and for school attendance, despite impressive progress, over 40% of gender inequalities occur within households.

Third, even when they are lower in absolute terms, intra-household inequalities might still be considered a priority in terms of an agenda focused on 'leaving no one

behind'. Although the relatively small timeframe (around five years) and country samples are perhaps insufficient to capture long-term global trends in inequality, looking at how inequality stands for countries at different levels of wellbeing can be illustrative of trends. Where average levels of child wellbeing increase and total inequality falls, within-household inequalities are more important in relative terms, accounting for a larger share of the total inequality. For example, the analysis shows that intra-household inequality in birth registration and school attendance tends to be higher in countries where total inequality is lower, suggesting that the gaps that are more difficult to address may be located inside households. These results indicate that it is not possible to eliminate child poverty and secure the rights of all children unless disparities within households are addressed.

Fourth, it is striking that, contrary to popular belief, disparities inside households do not follow the same bias towards one or the other gender and the direction of the bias is not the same across indicators of wellbeing. For example, in stunting and work hours, most households have a bias for boys while in school attendance and birth registration, most households tend to favour girls. When looking at pairs of indicators, in five of the possible six combinations the majority of households show a preference for boys, and in only one there is an overall preference for girls. Even then, for some pairings, a considerable proportion of households show a preference for girls.

Fifth, the gender bias is varied across countries, with some showing a more distinctive preference pattern than others. This has been found elsewhere (e.g. Dercon and Singh 2013) and suggests that biases respond to different social norms and household institutions in different countries.

For all areas of wellbeing, focusing on those children who are most disadvantaged seems key to closing the gap and addressing inequalities. However, additional work is needed to extend this finding. Additional data, which allows for distributional analysis at the household level, is needed to examine how these patterns behave for additional dimensions of wellbeing. Quantitative analysis to examine what drives intra-household inequality on a country basis could contribute to future research. To understand the causes of these patterns of discrimination inside households, it may be necessary to complement this research with qualitative explorations on a country basis to examine the social values and norms, as well as the economic logic, which underpin these inequality patterns. Institutions and norms surrounding gender roles—patterns of inheritance, marriage, divorce and family structure—may be behind the varying degree and direction of some of the intra-household inequality biases. Yet, these are likely to differ across countries. A more in-depth analysis is needed to uncover the specific characteristics that drive intra-household inequalities in each of the countries analysed for this study.

Progress in improving child wellbeing has occurred across the globe in many dimensions, but the neglect of intra-household inequalities affects the assessment of the levels of poverty, and could lead to a skewed view of the patterns of progress. This paper has provided an innovative methodological approach to measuring the extent of intra-household inequalities, presenting a broader picture of child wellbeing and its distribution. Examining and tackling the differences that occur within households is important for ensuring children's wellbeing and the realisation of their rights. The varying and sometimes large amount of intra-household inequality found in most countries poses difficulties for policy-making. Interventions to address inequalities in child wellbeing may need to be targeted more specifically at individuals or sub-groups within households rather than at households in general (Haddad and Kanbur 1992; Roemling and Qiam 2012; Sahn and Younger 2009), with the appropriate response varying depending on the country context.

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Annexe

Annexe 1: Indicators

The indicators and definitions follow as closely as possible those used by UNICEF for global reporting.[24]

- Stunting: Children under five years of age (0–59 months) whose height-for-age is below minus two standard deviations (moderate and severe) from the median height-for-age of the reference population.
- Birth registration: Children less than five years of age (0–59 months) whose births were registered; that is, whose birth certificate was seen by the interviewer or whose mother or caretaker says the birth has been registered.
- School attendance: Children between 6 and 15 years old attending primary school, secondary school, or a higher level.[25]
- Working hours: Number of hours per week of economic work (paid or unpaid work outside the household), of domestic work (work in the family farm or business and/or inside the household), and of chores worked by children of between 6 and 15 years old.

24 See www.childinfo.org/mics4_questionnaire.html

25 The standard definition of the primary attendance rate would exclude children in secondary school and thus slightly underestimate the actual level of participation in the education system. The modified definitions have been applied in the 2006 WHO standards and a later edition of UNICEF's 'State of the World's Children' (2014).

Annexe 2: Country sample

Country	Year of fieldwork
Albania	2000 / 2005
Bosnia and Herzegovina	2006 / 2011
Belize	2006 / 2011
Burundi	2000 / 2005
Cameroon	2000 / 2006
Côte d'Ivoire	2000 / 2006
Gambia	2000 / 2005–06
Guyana	2000 / 2006–07
Iraq	2006 / 2011
Kazakhstan	2006 / 2010–11
Lao People's Democratic Republic (PDR)	2000 / 2006
Mongolia	2000 / 2005
Nigeria	2007 / 2011
Serbia	2005–06 / 2010
Sierra Leone	2005 / 2010
Suriname	2006 / 2010
Swaziland	2000 / 2010
Togo	2000 / 2006
Trinidad and Tobago	2000 / 2006
Vietnam	2006 / 2010–11

Annexe 3: Inequality decomposition

Table A1: Absolute and relative within and overall inequality

(a) Stunting (15 countries)

	Kazakhstan			Nigeria			Albania			Bosnia and Herzegovina			Togo		
Absolute	Y1	Y2		Y1	Y2		Y1	Y2^		Y1	Y2^		Y1	Y2	
Within	1.75	1.57		2.85	2.60		2.53	2.98		0.99	0.84		2.67	2.74	
Overall	12.80	13.70	*	10.22	9.63	*	8.85	10.89	*	13.45	14.32	*	11.84	10.46	*
Relative															
Share of within (%)	0.14	0.11		0.28	0.27		0.29	0.27		0.07	0.06		0.23	0.26	

	Suriname			Belize		Iraq			Lao			Mongolia		
Absolute	Y1	Y2		Y1	Y2	Y1	Y2		Y1	Y2		Y1^	Y2	
Within	1.11	1.00		2.25	2.06	2.54	2.23	*	3.48	3.04		2.73	1.70	*
Overall	13.93	13.98		11.81	12.12	10.83	11.74	*	8.43	8.50		11.39	13.31	*
Relative														
Share of within (%)	0.08	0.07		0.19	0.17	0.23	0.19		0.412	0.36		0.24	0.13	

	Serbia		Sierra Leone			Swaziland			Guyana		Gambia		
Absolute	Y1	Y2	Y1	Y2		Y1	Y2		Y1	Y2	Y1	Y2	
Within	1.10	0.54	3.03	3.28		2.88	2.66		1.70	1.61	2.27	2.75	
Overall	14.02	14.23	9.59	8.82	*	9.03	10.44	*	13.27	12.70	11.61	10.17	*
Relative													
Share of within (%)	0.08	0.04	0.32	0.37		0.32	0.25		0.13	0.13	0.20	0.27	

Stunting	All	Y1	Y2
Absolute			
Within	2.18	2.26	2.11
Overall	11.54	11.40	11.67
Relative			
Share of within (%)	0.21	0.21	0.20
Share of between (%)	0.79	0.79	0.80

** Indicates that the change from the first to the second year is statistically significant (5%). ^ Indicates that less than 10% of the original survey observations were kept for the analysis.*
Source: Author's calculation based on MICS data.

(b) Birth registration (19 countries)

	Kazakhstan		Nigeria			Albania			Burundi			Cameroon			Vietnam			Togo	
Absolute	Y1	Y2	Y1	Y2		Y1	Y2^		Y1	Y2		Y1	Y2		Y1	Y2		Y1	Y2
Within	0.51	0.36	0.79	0.94		0.51	0.70		1.15	0.98		1.84	1.57		0.49	1.14	*	1.95	1.88
Overall	3.41	3.15	13.44	13.02	*	2.66	0.89	*	8.80	6.27	*	10.63	5.44	*	7.15	5.71		9.24	8.72
Relative																			
Share of within (%)	0.15	0.11	0.06	0.07		0.19	0.79		0.13	0.16		0.17	0.29		0.07	0.20		0.21	0.22

	Côte d'Ivoire		Suriname		Belize		Trinidad and Tobago			Iraq			Lao			Mongolia	
Absolute	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2		Y1	Y2		Y1	Y2		Y1^	Y2
Within	1.66	1.68	1.34	1.41	1.27	1.36	0.88	0.33		1.11	0.45	*	1.01	1.83	*	1.07	0.69
Overall	10.90	10.89	7.26	7.88	8.56	8.80	5.93	1.12	*	4.98	1.08	*	6.16	7.33	*	2.59	3.22
Relative																	
Share of within (%)	0.15	0.15	0.19	0.18	0.15	0.15	0.15	0.30		0.22	0.42		0.16	0.25		0.41	0.22

	Serbia		Sierra Leone		Swaziland			Guyana			Gambia		
Absolute	Y1	Y2	Y1	Y2	Y1	Y2		Y1	Y2		Y1	Y2	
Within	0.81	0.87	1.43	1.85	1.57	2.68	*	1.80	0.95		1.25	1.85	
Overall	7.26	5.68	10.44	9.59	8.64	9.85	*	4.11	1.56	*	11.40	7.29	*
Relative													
Share of within (%)	0.11	0.15	0.14	0.19	0.18	0.27		0.44	0.61		0.11	0.25	

Birth registration	All	Y1	Y2
Absolute			
Within	1.21	1.18	1.24
Overall	6.87	7.56	6.18
Relative			
Share of within (%)	0.22	0.18	0.26
Share of between (%)	0.78	0.82	0.74

** Indicates that the change from the first to the second year is statistically significant (5%). ^ Indicates that less than 10% of the original survey observations were kept for the analysis. Source: Author's calculation based on MICS data.*

(c) School attendance (18 countries)

	Kazakhstan			Nigeria			Albania			Burundi			Cameroon			Vietnam		
Absolute	Y1	Y2		Y1	Y2		Y1	Y2		Y1	Y2		Y1	Y2		Y1	Y2	
Within	0.09	0.08		0.45	0.46		0.53	0.87		1.38	1.16		0.61	0.69		1.13	0.74	
Overall	0.21	0.19		1.08	1.08		7.93	1.13	*	3.60	2.41	*	1.97	1.40	*	1.88	1.83	
Relative																		
Share of within (%)	0.41	0.41		0.42	0.42		0.07	0.77		0.38	0.48		0.31	0.49		0.60	0.41	

	Togo			Côte d'Ivoire			Suriname			Belize			Trinidad and Tobago			Lao		
Absolute	Y1	Y2		Y1	Y2		Y1	Y2		Y1	Y2		Y1	Y2		Y1	Y2	
Within	0.86	0.65		1.11	1.26		0.34	0.34		1.34	0.90		1.30	0.48	*	1.28	1.29	
Overall	1.69	1.17	*	2.12	2.72	*	0.79	0.75		2.39	1.95		2.51	1.04	*	2.62	2.64	
Relative																		
Share of within (%)	0.51	0.56		0.52	0.46		0.43	0.46		0.56	0.46		0.52	0.46		0.49	0.49	

	Mongolia			Serbia			Sierra Leone			Swaziland			Guyana			Gambia		
Absolute	Y1	Y2		Y1	Y2		Y1	Y2		Y1	Y2		Y1	Y2		Y1	Y2	
Within	0.38	0.23		0.16	0.13		0.44	0.50		0.77	0.22	*	0.64	0.83		0.11	0.49	*
Overall	0.68	0.39	*	0.45	0.42		1.02	0.96		1.47	0.40	*	1.55	1.64		11.81	1.35	*
Relative																		
Share of within (%)	0.56	0.58		0.37	0.30		0.44	0.52		0.52	0.55		0.41	0.51		0.01	0.36	

School attendance	All	Y1	Y2
Absolute			
Within	0.67	0.72	0.63
Overall	1.92	2.54	1.30
Relative			
Share of within (%)	0.45	0.42	0.48
Share of between (%)	0.55	0.58	0.52

** Indicates that the change from the first to the second year is statistically significant (5%). ^ Indicates that less than 10% of the original survey observations were kept for the analysis. Source: Author's calculation based on MICS data.*

(d) Economic or domestic working hours (12 countries)

	Nigeria			Burundi			Cameroon			Togo		Côte d'Ivoire			Suriname	
Absolute	Y1	Y2		Y1	Y2		Y1	Y2		Y1	Y2	Y1	Y2		Y1^	Y2^
Within	0.92	1.04		1.52	0.82	*	1.35	0.78	*	1.10	0.92	1.38	1.20		0.76	0.77
Overall	12.52	13.56	*	8.35	16.62	*	9.27	14.33	*	12.87	12.56	12.57	14.47	*	14.33	14.64
Relative																
Share of within (%)	0.07	0.08		0.18	0.05		0.15	0.05		0.09	0.07	0.11	0.08		0.05	0.05

	Mongolia			Sierra Leone			Swaziland			Guyana			Vietnam			Gambia		
Absolute	Y1^	Y2^		Y1	Y2		Y1^	Y2^		Y1	Y2		Y1	Y2		Y1	Y2	
Within	0.58	0.22	*	0.88	0.56	*	0.69	0.19	*	0.62	0.50		3.49	1.43	*	1.44	1.33	
Overall	12.24	17.51	*	11.16	15.35	*	14.89	15.93	*	12.12	13.49	*	10.38	10.39		14.80	12.80	*
Relative																		
Share of within (%)	0.05	0.01		0.08	0.04		0.05	0.01		0.05	0.04		0.34	0.14		0.10	0.10	

Working hours	All	Y1	Y2
Absolute			
Within	1.02	1.23	0.81
Overall	13.17	12.13	14.22
Relative			
Share of Within (%)	0.08	0.11	0.06
Share of Between (%)	0.92	0.89	0.94

** Indicates that the change from the first to the second year is statistically significant (5%). ^ Indicates that less than 10% of the original survey observations were kept for the analysis. Source: Author's calculation based on MICS data.*

Annexe 4: Direction of the bias within households

Table A2: Share of households by favoured gender

(a) Stunting (% of households)

Bias	Kazakhstan		Albania		Belize		Bosnia and Herzegovina		Gambia		Guyana		Lao PDR		Mongolia	
	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2
None	0.0	0.0	2.1	1.3	0.0	0.8	0.3	0.5	0.7	0.3	0.0	0.5	0.3	0.3	0.9	0.8
Boys	83.8	90.6	74.3	77.2	81.1	83.0	88.9	93.8	76.5	70.6	84.6	78.7	67.2	64.2	75.2	85.4
Girls	16.2	9.4	23.6	21.5	18.9	16.3	10.8	5.7	22.8	29.2	15.4	20.8	32.5	35.5	23.9	13.8
Probability > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bias	Nigeria		Serbia		Sierra Leone		Suriname		Swaziland		Togo		Iraq	
	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2
None	1.0	0.8	0.2	0.6	2.3	1.8	0.0	0.2	0.4	0.7	0.92	0.91	0.5	0.2
Boys	71.9	67.3	87.6	94.5	67.9	63.3	91.0	88.8	64.9	72.6	75.71	68.18	76.1	79.5
Girls	27.0	32.0	12.2	4.9	29.8	34.9	9.0	11.0	34.7	26.7	23.37	30.91	23.5	20.4
Probability > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bias	All	Y1	Y2
None	0.6	0.6	0.6
Boys	78.1	77.8	78.5
Girls	21.2	21.6	20.9

(b) Birth registration (% of households)

Bias	Kazakhstan		Albania		Belize		Burundi		Cameroon		Côte d'Ivoire	
	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2
None	2.2	1.9	4.2	3.8	0.0	0.4	0.8	1.0	1.0	2.2	0.7	1.0
Boys	39.2	40.7	27.8	34.8	24.2	21.1	26.6	33.1	21.1	36.6	21.1	21.3
Girls	58.7	57.4	68.1	61.4	75.8	78.5	72.7	66.0	77.9	61.2	78.3	77.8
Probability > F	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bias	Gambia		Guyana		Lao PDR		Mongolia		Nigeria		Serbia	
	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2
None	1.4	1.5	1.3	2.0	0.6	1.0	3.7	3.5	0.4	0.3	2.0	5.2
Boys	15.9	31.2	35.3	43.6	32.9	32.8	44.7	41.1	9.9	10.9	21.8	36.3
Girls	82.6	67.3	63.4	54.4	66.5	66.3	51.6	55.4	89.8	88.8	76.2	58.5
Probability > F	0.000	0.000	0.000	0.003	0.000	0.000	0.095	0.000	0.000	0.000	0.000	0.000

Bias	Sierra Leone		Suriname		Swaziland		Togo		Trinidad and Tobago		Vietnam		Iraq	
	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2
None	2.4	2.2	1.5	1.1	1.1	0.7	2.48	1.55	3.0	6.3	0.9	1.5	0.5	0.2
Boys	20.2	26.3	29.8	31.6	30.0	27.6	30.39	26.92	32.6	41.3	38.2	32.9	76.1	79.5
Girls	77.4	71.5	68.7	67.2	68.9	71.7	67.13	71.53	64.4	52.4	61.0	65.6	23.5	20.4
Probability > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.042	0.000	0.000	0.000	0.000

Bias	All	Y1	Y2
None	1.8	1.6	2.0
Boys	32.3	30.4	34.2
Girls	65.9	68.0	63.9

(c) School attendance (% of households)

Bias	Kazakhstan		Albania		Belize		Burundi		Cameroon		Côte d'Ivoire	
	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2
None	0.9	0.7	0.4	1.5	1.3	0.4	0.9	0.4	0.7	1.0	1.2	1.5
Boys	54.0	52.7	20.0	44.2	49.0	50.5	43.7	48.8	41.3	47.8	48.8	48.1
Girls	45.1	46.6	79.7	54.4	49.7	49.0	55.5	50.8	58.0	51.2	50.0	50.4
Probability > F	0.000	0.000	0.000	0.000	0.735	0.320	0.000	0.022	0.000	0.000	0.092	0.001

Bias	Gambia		Guyana		Lao PDR		Mongolia		Nigeria		Serbia	
	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2
None	0.58	1.18	1.3	0.6	0.3	0.5	0.6	1.3	0.6	1.0	1.5	3.5
Boys	8.61	47.12	44.5	49.3	50.2	50.3	45.1	45.4	46.9	46.2	41.8	44.4
Girls	90.81	51.7	54.3	50.1	49.6	49.2	54.3	53.4	52.4	52.7	56.7	52.1
Probability > F	0.000	0.000	0.000	0.523	0.493	0.044	0.000	0.000	0.000	0.000	0.000	0.001

Bias	Sierra Leone		Suriname		Swaziland		Togo		Trinidad and Tobago		Vietnam	
	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2
None	1.2	1.2	0.8	0.9	1.3	1.7	1.2	1.3	3.5	4.0	4.2	0.9
Boys	52.2	48.7	45.2	47.3	44.2	49.7	50.0	52.8	43.8	46.4	45.5	44.6
Girls	46.6	50.1	54.0	51.8	54.5	48.7	48.8	45.9	52.7	49.7	50.3	54.5
Probability > F	0.000	0.029	0.000	0.000	0.000	0.403	0.199	0.000	0.000	0.001	0.000	0.000

Bias	All	Y1	Y2
None	1.3	1.2	1.3
Boys	45.5	43.0	48.0
Girls	53.2	55.7	50.7

(d) Working hours (% of households)

Bias	Nigeria		Burundi		Cameroon		Togo		Côte d'Ivoire		Suriname	
	Y1	Y2	Y1	Y2	Y1	Y1	Y1	Y2	Y1	Y2	Y1	Y2
None	0.3	0.2	0.6	0.0	0.4	0.4	0.4	0.0	0.2	0.0	0.7	0.6
Boys	83.4	87.2	75.0	93.0	85.1	85.1	89.5	97.6	88.3	91.4	87.5	94.1
Girls	16.3	12.7	24.4	7.0	14.6	14.6	10.0	2.4	11.6	8.6	11.9	5.3
Probability > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bias	Mongolia		Sierra Leone		Swaziland		Guyana		Vietnam		Gambia	
	Y1	Y1	Y1	Y2	Y2	Y2	Y1	Y2	Y1	Y2	Y1	Y2
None	0.4	0.4	1.0	0.2	0.1	0.0	1.4	1.9	0.05	0.55	2.18	0.60
Boys	82.2	82.2	77.0	90.7	88.4	84.8	75.8	80.6	84.33	89.85	72.48	85.12
Girls	17.4	17.4	22.0	9.1	11.5	15.2	22.8	17.5	15.62	9.60	25.34	14.29
Probability > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bias	All	Y1	Y2
None	0.5	0.6	0.4
Boys	86.0	81.8	90.2
Girls	13.5	17.6	9.4

Source: Author's calculation based on Multiple Indicator Cluster Survey (MICS) data.

Annexe 5: Summary statistics

Table A3: Average by indicators

(a) Stunting (average %)

Bias	Kazakhstan			Nigeria		Albania			Bosnia and Herzegovina		Togo			Suriname		Belize		Iraq		
	Y1	Y2	**	Y1	Y2	Y1	Y2		Y1	Y2	Y1	Y2		Y1	Y2	Y1	Y2	Y1	Y2	
Boys	0.19	0.10	*	0.31	0.33	0.41	0.30		0.12	0.06	0.24	0.32	*	0.08	0.07	0.23	0.17	0.26	0.20	*
Girls	0.17	0.13		0.29	0.33	0.46	0.26	*	0.12	0.05	0.22	0.28		0.07	0.06	0.22	0.23	0.25	0.19	*
++																				
N	1006	1248		5357	10,247	288	158		714	403	1301	1873		612	1053	254	522	6979	16,968	

Bias	Lao			Mongolia			Serbia		Sierra Leone		Swaziland		Guyana		Gambia	
	Y1	Y2	**	Y1	Y2		Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2
Boys	0.41	0.44		0.28	0.14	*	0.09	0.05	0.38	0.43	0.38	0.29	0.13	0.19	0.21	0.25
Girls	0.44	0.44		0.29	0.16	*	0.08	0.03	0.37	0.38	0.30	0.27	0.13	0.19	0.16	0.22
++											+					
N	1250	3113		568	754		1053	693	1637	2441	1435	853	878	790	1546	3259

Bias	All	Y1	Y2
Boys	0.24	0.25	0.22
Girls	0.23	0.24	0.21

+ Indicates that the difference between boys and girls in each year is statistically significant (5%) (significance between rows).
** Indicates that the difference across periods is statistically significant (5%) for boys or girls, respectively (significance between columns).*
Source: Author's calculation based on MICS data.

(b) Birth registration (average %)

Bias	Kazakhstan			Nigeria			Albania			Burundi			Cameroon			Vietnam		Togo	
	Y1	Y2	**	Y1	Y2		Y1	Y2		Y1	Y2		Y1	Y2		Y1	Y2	Y1	Y2
Boys	0.79	0.82		0.13	0.16		0.83	0.92		0.48	0.63	*	0.38	0.69	*	0.56	0.63	0.42	0.44
Girls	0.79	0.80		0.11	0.16	*	0.84	0.99	*	0.46	0.63	*	0.37	0.69	*	0.59	0.67	0.40	0.47
++																			
N	1006	1248		5257	10,224		288	158		1017	2193		1463	2545		706	547	1294	1866

Bias	Côte d'Ivoire		Suriname		Belize		Trinidad and Tobago		Iraq			Lao	
	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2		Y1	Y2
Boys	0.27	0.27	0.59	0.57	0.44	0.44	0.04	0.02	0.72	0.89	*	0.64	0.57
Girls	0.27	0.28	0.60	0.51	0.47	0.46	0.05	0.01	0.71	0.88	*	0.64	0.57
++													
N	3188	3535	608	1053	252	522			6979	16,968		1257	3105

Bias	Mongolia		Serbia		Sierra Leone		Swaziland		Guyana			Gambia		
	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2	Y1	Y2		Y1	Y2	
Boys	0.85	0.80	0.55	0.64	0.33	0.40	0.44	0.38	0.76	0.90	*	0.28	0.53	*
Girls	0.86	0.81	0.57	0.67	0.33	0.37	0.42	0.36	0.79	0.95	*	0.27	0.53	*
++														
N	568	754	1051	691	1625	2439	1415	842	880	788		1536	3251	

Bias	All	Y1	Y2
Boys	0.53	0.50	0.56
Girls	0.54	0.50	0.57

+ Indicates that the difference between boys and girls in each year is statistically significant (5%) (significance between rows).
** Indicates that the difference across periods is statistically significant (5%) for boys or girls, respectively (significance between columns).*
Source: Author's calculation based on MICS data.

(c) School attendance (average %)

Bias	Kazakhstan			Nigeria		Albania			Burundi			Cameroon			Vietnam	
	Y1	Y2	**	Y1	Y2	Y1	Y2		Y1	Y2		Y1	Y2		Y1	Y2
Boys	0.87	0.85		0.80	0.80	0.46	0.96	*	0.47	0.73	*	0.91	0.96	*	0.90	0.91
Girls	0.87	0.87		0.79	0.80	0.45	0.92	*	0.43	0.70	*	0.91	0.94		0.90	0.92
++																
N	5814	5594		29,016	42,679	2598	1656		6417	12,066		4903	11,089		8097	4429

Bias	Togo		Côte d'Ivoire			Suriname		Belize			Trinidad and Tobago			Lao		
	Y1	Y2	Y1	Y2		Y1	Y2	Y1	Y2		Y1	Y2		Y1	Y2	
Boys	0.84	0.85	0.77	0.85	*	0.86	0.87	0.73	0.83	*	0.83	0.96	*	0.78	0.79	
Girls	0.81	0.82	0.69	0.80	*	0.87	0.87	0.75	0.80	*	0.88	0.96	*	0.74	0.77	*
++			+	+												
N	8802	9769	15,725	13,401		3751	5626	2065	3371		2296	2625		8264	22,243	

Bias	Mongolia			Serbia		Sierra Leone		Swaziland			Guyana			Gambia		
	Y1	Y2		Y1	Y2	Y1	Y2	Y1	Y2		Y1	Y2		Y1	Y2	
Boys	0.87	0.92	*	0.92	0.89	0.83	0.81	0.86	0.89	*	0.79	0.90	*	0.44	0.75	*
Girls	0.90	0.94	*	0.90	0.87	0.81	0.82	0.84	0.88	*	0.80	0.90	*	0.45	0.76	*
++																
N	4283	4497		3193	1821	11,304	17669	8652	5652		5551	5619		7579	13,438	

Bias	All	Y1	Y2
Boys	0.82	0.77	0.86
Girls	0.81	0.77	0.85

+ Indicates that the difference between boys and girls in each year is statistically significant (5%) (significance between rows).
** Indicates that the difference across periods is statistically significant (5%) for boys or girls, respectively (significance between columns).*
Source: Author's calculation based on MICS data.

(d) Work time (economic or domestic; average number of hours per week)

Bias	Nigeria			Burundi			Cameroon			Togo		Côte d'Ivoire			Suriname	
	Y1	Y2	**	Y1	Y2		Y1	Y2		Y1	Y2	Y1	Y2		Y1	Y2
Boys	9.35	7.34	*	23.0	19.3	*	26.80	15.11	*	11.04	11.75	15.61	11.62	*	1.03	0.31
Girls	9.45	9.38		23.5	17.3	*	31.22	15.69	*	14.30	16.68	24.71	16.49	*	1.30	0.31
++		+								+	+	+	+			
N	21,482	19,296		2864	11,727		3923	4183		4913	4018	10,142	12,380		1041	1734

Bias	Mongolia			Sierra Leone			Swaziland			Guyana		Vietnam			Gambia	
	Y1	Y2		Y1	Y2		Y1	Y2		Y1	Y2	Y1	Y2		Y1	Y2
Boys	16.41	5.27	*	17.76	8.35	*	8.18	2.30	*	6.74	6.95	6.29	2.50	*	6.33	5.68
Girls	15.64	3.65	*	18.11	8.90	*	7.93	2.81	*	6.32	6.53	9.54	4.07	*	6.43	9.97 *
++												+				+
N	905	1083		6594	7425		1713	1108		1749	2272	28475	3171		6705	11,284

Bias	All	Y1	Y2
Boys	10.21	12.38	8.04
Girls	11.68	14.04	9.32

+ Indicates that the difference between boys and girls in each year is statistically significant (5%) (significance between rows).
** Indicates that the difference across periods is statistically significant (5%) for boys or girls, respectively (significance between columns).*
Source: Author's calculation based on MICS data.

Annexe 6: Cross-tabulations

Table A4: Cross-tabulation for all indicators

(a) Stunting and school attendance

	None	Bias for boys	Bias for girls	Total
None	0	17	31	48
Bias for boys	30	1,659	1,807	3,496
Bias for girls	21	666	751	1,438
Total	51	2,342	2,589	4,982

(b) Stunting and working hours

	None	Bias for boys	Bias for girls	Total
None	0	40	6	46
Bias for boys	7	2,420	321	2,748
Bias for girls	2	984	160	1,146
Total	9	3,444	487	3,940

(c) Birth registration and school attendance

	None	Bias for boys	Bias for girls	Total
None	0	45	56	101
Bias for boys	28	833	930	1,791
Bias for girls	60	2,435	2,758	5,253
Total	88	3,313	3,744	7,145

(d) Birth registration and working hours

	None	Bias for boys	Bias for girls	Total
None	0	62	10	72
Bias for boys	6	1,199	186	1,391
Bias for girls	13	4,155	580	4,748
Total	19	5,416	776	6,211

(e) School attendance and working hours

	None	Bias for boys	Bias for girls	Total
None	36	340	64	440
Bias for boys	85	9,374	1,662	11,121
Bias for girls	82	10,778	2,424	13,284
Total	203	20,492	4,150	24,845

Source: Author's calculation based on MICS data.

Annexe 7: Measures of association by country

Table A5: Cross-tabulation for all indicators by country

	Kazakhstan	Albania	Belize	Bosnia and Herzegovina	Burundi	Cameroon	Côte d'Ivoire	Gambia	Guyana	Lao PDR
Cramer's V										
Stunting / birth registration	0.037	0.475	0.500	-		-	-	0.128	0.278	0.187
Stunting / school attendance	0.180	0.463	-0.033			-	-	0.018	0.058	0.026
Stunting / working hours	-	-	-	-		-	-	0.047	0.098	
Birth registration / school attendance	0.061	0.375	0.068	-	0.063	0.045	0.051	0.038	0.044	0.016
Birth registration / working hours	-	-	-	-	0.059	0.080	0.067	0.035	0.089	-
School attendance / working hours	-	-	-	-	0.021	0.099	0.030	0.033	0.205	-
P statistic for boys										
Stunting / birth registration	0.893	0.698	0.859	-	-	-	-	0.721	0.821	0.623
Stunting / school attendance	0.836	1.000	0.818	-	-	-	-	0.766	0.807	0.629
Stunting / working hours	-	-	-	-	-	-	-	0.893	0.844	-
Birth registration / school attendance	0.513	0.000	0.529	-	0.420	0.473	0.442	0.423	0.519	0.486
Birth registration / working hours	-	-	-	-	0.930	0.883	0.849	0.888	0.711	-
School attendance / working hours	-	-	-	-	0.892	0.857	0.909	0.891	0.812	-
Average	0.747	0.566	0.736		0.747	0.738	0.733	0.764	0.752	0.580
P statistic for girls										
Stunting / birth registration	0.631	0.578	0.807	-	-	-	-	0.685	0.563	0.624
Stunting / school attendance	0.214	1.000	0.500	-	-	-	-	0.551	0.533	0.525
Stunting / working hours	-	-	-	-	-	-	-	0.294	0.364	-
Birth registration / school attendance	0.667	0.625	0.843	-	0.646	0.679	0.744	0.605	0.631	0.633
Birth registration / working hours	-	-	-	-	0.759	0.780	0.663	0.694	0.639	-
School attendance / working hours	-	-	-	-	0.530	0.630	0.559	0.537	0.634	-
Average	0.504	0.734	0.717		0.645	0.696	0.656	0.561	0.561	0.594
Absolute difference	0.24	0.17	0.02		0.10	0.04	0.08	0.20	0.19	0.01

Table A5: Cross-tabulation for all indicators by country (continued)

	Mongolia	Nigeria	Serbia	Sierra Leone	Suriname	Swaziland	Togo	Trinidad and Tobago	Vietnam	Iraq
Cramer's V										
Stunting / birth registration	0.233	0.080	0.149	0.180	0.224	0.098	0.150	-	-	0.194
Stunting / school attendance	0.124	0.055	0.167	0.083	0.049	0.038	0.058	-	-	-
Stunting / working hours	0.038	0.037	-	0.058	0.143	0.103	0.078	-	-	-
Birth registration / school attendance	0.135	0.006	0.123	0.055	0.071	0.030	0.035	0.149	0.082	-
Birth registration / working hours	0.183	0.024	-	0.018	0.127	0.080	0.084	-	0.016	-
School attendance / working hours	0.408	0.041	-	0.144	0.272	0.189	0.094	-	0.072	-
P statistic for boys										
Stunting / birth registration	0.810	0.757	0.913	0.649	0.909	0.668	0.727	-	-	0.819
Stunting / school attendance	0.697	0.707	0.778	0.640	0.880	0.647	0.712	-	-	-
Stunting / working hours	0.929	0.888	-	0.879	0.931	0.911	0.862	-	-	-
Birth registration / school attendance	0.424	0.459	0.333	0.537	0.444	0.491	0.516	0.481	0.395	-
Birth registration / working hours	0.875	0.907	-	0.872	0.884	0.853	0.858	-	0.681	-
School attendance / working hours	0.866	0.849	-	0.875	0.938	0.955	0.876	-	0.757	-
Average	0.767	0.761	0.675	0.742	0.831	0.754	0.759	0.481	0.611	0.819
P statistic for girls										
Stunting / birth registration	0.522	0.909	0.696	0.725	0.697	0.665	0.692	-	-	0.589
Stunting / school attendance	0.500	0.548	0.429	0.506	0.524	0.445	0.500	-	-	-
Stunting / working hours	0.250	0.363	-	0.362	0.222	0.462	0.273	-	-	-
Birth registration / school attendance	0.538	0.884	0.759	0.742	0.676	0.676	0.699	0.649	0.589	-
Birth registration / working hours	0.250	0.916	-	0.741	0.700	0.615	0.636	-	0.598	-
School attendance / working hours	0.564	0.598	-	0.595	0.765	0.771	0.608	-	0.564	-
Average	0.437	0.703	0.628	0.612	0.597	0.606	0.568	0.649	0.584	0.589
Absolute difference	0.33	0.06	0.05	0.13	0.23	0.15	0.19	0.17	0.03	0.23

Source: Author's calculation based on MICS data.

Sambi Edward and his grandmother in Kampala, Uganda. Photo: © Arne Hoel / World Bank.

This is one of a series of Development Progress research reports.

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