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Oxford Department of International Development
Queen Elizabeth House (QEH), University of Oxford

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Strengthening the Policy Impact of Multidimensional Metrics Given Attention Constraints: Constructing Linked Metrics

Sabina Alkire*, Ana Vaz** and Christian Oldiges***

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Abstract
Calls for integrated multi-sectoral policy approaches recognize that dimensions of development are interlinked and often multidimensional measures. Yet this may generate a proliferation of multidimensional metrics focused on different vulnerable groups, and create competition between advocacy groups, diluting their collective impact. It also may overlooks the cognitive and time constraints that limit policymakers' attention and form an important bottleneck to effective institutional responses. This paper therefore recommends developing linked and synergistic measures for vulnerable groups that maximize common ground, while offering population-specific insights. We illustrate our general proposal by building an individual linked Child Multidimensional Poverty Index (MPI) that uses the already-identified deprivations of each child according to Nepal's National MPI, and appends to this two age-specific indicators using parameters cohere with the National MPI. The results illuminate wider facets of child poverty (by gender, age and indicator among others) and identifies as poor all children formerly identified as poor plus additional children. The linked National and Child MPIs have consistent policy messages on shared indicators, while the Child MPI provides additional group- and child-specific insight. This general strategy could be applied to many groups and might consolidate rather than partition the vital attention of both policymakers and advocacy groups.

Keywords: development policy, governance, child poverty, multidimensional poverty, Nepal, poverty measurement

JEL classification: I32, I38, D63, O15, Q01

*Sabina Alkire: Oxford Poverty and Human Development Initiative (OPHI), University of Oxford. Corresponding author. sabina.alkire@qeh.ox.ac.uk
** Ana Vaz: Oxford Poverty and Human Development Initiative (OPHI), University of Oxford.
*** Christian Oldiges: Oxford Poverty and Human Development Initiative (OPHI), University of Oxford.

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The Oxford Poverty and Human Development Initiative (OPHI) is a research centre within the Oxford Department of International Development, Queen Elizabeth House, at the University of Oxford. Led by Sabina Alkire, OPHI aspires to build and advance a more systematic methodological and economic framework for reducing multidimensional poverty, grounded in people's experiences and values.

Oxford Poverty & Human Development Initiative (OPHI)
Oxford Department of International Development
Queen Elizabeth House (QEH), University of Oxford
3 Mansfield Road, Oxford OX1 3TB, UK
Tel. +44 (0)1865 271915 Fax +44 (0)1865 281801
ophi@qeh.ox.ac.uk http://www.ophi.org.uk

I. Introduction

Platforms such as the Sustainable Development Goals (SDGs) recognize that development is multidimensional and that its components are interlinked Roelen (2017, Shigute et al. 2019, Merritt et al. 2022). Hence prospectively analysts advise integrated multi-sectoral approaches to advance multiple goals efficiently and synergistically (UN, 2016). Relatedly, they urge measurement experts to consider the policy relevance of metrics (Atkinson 2019, Cameron et al., 2021, Santos and Villatoro 2019). However, they simultaneously overlook the cognitive and time constraints that limit policymakers' attention and are an important bottleneck to effective institutional responses. Hansson, Arfvidsson, and Simon (2019) observed that the 230 SDG indicators were established 'with a double function of being a report card and a management tool' but argue that the latter was underdeveloped and clearly not prioritized. James et al. (2020) found that the emphasis on metrics has neglected 'cognitive limitations and biases in people's identification, perception, understanding and use of information.' Hansen and Haas (2001)'s classic observation in a different context remains apt for the SDGs: 'The relatively recent explosion of information makes attention, rather than information, the scarce resource in organisations' (see also Cairney and Kwiatkowski, 2017).

The sheer abundance of indicators runs counter to assessments at the mid-point of the Millennium Development Goals (MDGs) about the technical and policy value of even a limited number of indicators. For example, Murray (2007: 871) called for further prioritization of MDG health indicators: 'National and worldwide efforts to improve health statistics should focus on a smaller set of priority indicators rather than the thousands that are currently recommended.' Boerma and Abou-Zahr (2007: 872) argued 'there is a need to strengthen and simplify measurement strategies and methods, and to refrain from contributing to the proliferation of indicators …' Having copious indicators creates fertile ground for issue-based advocates, the accuracy of whose ostensibly evidence-based arguments can be difficult for policy actors to assess (Walker, Bryce, and Black, 2007; Mayne et al., 2018).

One approach to managing a wider information base while recognizing interlinkages across indicators and informing integrated policies, has been to use multidimensional metrics. For example, the 2014 United Nations (UN) Secretary-General's report argued that poverty measures should reflect the multidimensional nature of poverty (UN Secretary-General, 2014). The 2014 UN General Assembly also recognized the need to develop complementary measurements that better reflect the multidimensionality of poverty and wellbeing (UN, 2014; Atkinson, 2017, Roelen 2017), while the 2015 Addis Ababa Accord called on the UN and international financial institutions to develop multidimensional measures (UN, 2015).

A clear example of such measures are multidimensional poverty indices (MPIs), that are reported against Target 1.2 as SDG indicator 1.2.2, and usually draw together 10 to 15 indicators, most of which are themselves either SDG indicators or closely related to them. MPIs define poverty based on deprivations that are directly interlinked: a poor person experiences a multiple of deprivations simultaneously. An additive structure means that MPIs can be broken down by each component indicator, disaggregated by different subgroups (if the data permit) and guide interventions to prioritize multidimensionally poor people (Alkire and Foster, 2011; Alkire et al., 2015; Atkinson, 2017).

Yet even in this case, a justified ambition to 'leave no one behind' has led in practice to additional multidimensional metrics focused on differently vulnerable groups. For example, studies have developed multidimensional poverty indices for children, elderly people, persons living with disabilities, youth, workers, care workers, women, and indigenous groups.[1] Bernards (2023) argues that multidimensional poverty metrics needs to be linked integrally to the relational mechanisms that generate poverty.

Yet the familiar problem re-emerges: a proliferation of rigorous and precise yet disjointed multidimensional metrics may not lead to better planning nor to better outcomes for the poorest people. It may instead create competition across advocates for diversely vulnerable populations (be these NGOs, government offices, social movements, academics, or international agencies), potentially diluting their collective impact. As Mayne et al. (2018: 3) observed, 'researchers often make the mistake of trying to increase the supply of high-quality research evidence in a highly crowded environment.'

Previous generations of literature on health and policy statistics recommended common indicator frameworks and other coordination procedures that support data quality and parsimony (Murray, 2007). For multidimensional metrics, this paper recommends developing linked and synergistic measures that maximize common ground, while still offering population-specific insights. It provides an example using data from Nepal, in which we build an individual Child MPI linked to the National MPI. The Child MPI identifies as poor each child who was already identified as poor in the National MPI. It further extends the indicators assessed, to include individual age-specific deprivations across the life-cycle of childhood. Results find that additional children are now identified as poor, and elaborate subnational and dimensional details. The Child MPI provides additional useful insights for policy makers into age-specific indicators throughout childhood. Yet the National and linked Child MPIs have congruent rather than competing policy messages on shared indicators, hence consolidate policy messaging. Similar linked measures can be

1 For example, see Amarante and Colacce (2022) on older people; Mitra, Posarac, and Vick (2013) on disabilities; Bessell (2015) on gender; Roelen and Notten (2013) on children; and also Dirksen and Alkire (2021) and the references therein.

constructed to deepen understanding of other vulnerable groups, or to probe additional dimensions such as the environment, conflict or empowerment or even monetary poverty (Evans et al. 2023).

The rest of the paper is organized as follows. The next section provides a brief background on the recent growth and adoption of multidimensional poverty measures, including national and child-specific ones. Section 3 proposes a general methodology, whereby national and group-based (for example, Child) MPIs can be linked meaningfully to support deeper analyses. Section 4 demonstrates the value-added by comparing estimates from both a National and Child MPI in Nepal. The last section concludes.

II. Background

The proliferation of metrics is often due to a salutary concern that certain disadvantages be advanced consciously. This paper illustrates a synergistic approach, by using the example of linked child and household poverty measures as the logic is common to many concerns that drive the proliferation of metrics.

Worldwide, children tend to be over-represented among poor people (Alkire et al., 2017; Newhouse, Becerra, and Evans, 2017) and the experience of spells of poverty during childhood can have negative lasting effects on their lives (Brooks-Gunn and Duncan, 1997; Duncan, Ziol-Guest, and Kalil, 2010). Yet ensuring children's wellbeing requires specific investments (UNICEF, 1989), so measures of household poverty might not provide sufficient information to guide child-specific policies. The 2030 Agenda put a spotlight on these issues, and child advocacy groups rightly mobilize around them. But how should child poverty be measured?

Many countries already use an official national Multidimensional Poverty Index (MPI) based on household-level identification to complement their monetary poverty measure. The MPIs use a dual-cutoff counting approach to identify poor people, then measure multidimensional poverty using a straightforward expansion of the Foster–Greer–Thorbecke measures (Foster, Greer, and Thorbecke, 1984) to multidimensional situations (Alkire and Foster, 2011). The measurement methodology is flexible as regards the structure of the index (e.g. unit of identification, dimensions, indicators, cutoffs and weights), so has been tailored to various contexts.

National MPIs are used extensively in management and policy design (UNDP and OPHI, 2019a, 2019b, and the references therein; UNDP, 2021). First, MPIs are used for budget allocation, to ensure that the level of allocation reflects the extent of different deprivations included in the MPI, as well as the cost savings from integrated policies. MPIs are also used to target the poorest areas for specialized

interventions. MPIs that proxy the national MPI are also developed based on registry data to target beneficiary households with bespoke packages of services.

Because National MPIs cover multiple dimensions and SDG indicators, they are used for policy planning and coordination via policy roundtables at the most senior level in countries. A clearly documented example is Colombia, where the MPI indicators have been used (often with the assistance of management consultancies) to create management structures for accelerating change (Santos, 2023). Viewed as a performance indicator (Atkinson 2019), the MPI has created a positive kind of competition between states or provinces for example in Mexico or India to improve the fastest, motivated by both ethical and electoral gain.

This relates to child poverty in that National MPIs typically define poverty status at the household level and usually include child-specific indicators (e.g., a household is deprived in school attendance if any school-aged child is not attending school), as well as others capturing household features that affect children (e.g., safe water). National MPIs are disaggregated by children and this, often striking, information is reported in the SDG global database for Indicator 1.2.2. Also, the global MPI covering over 100 countries finds that half of the 1.1 billion poor people in the world are children: one in three children are poor, compared to one in seven adults (UNDP and OPHI, 2023). In no country are children less poor than adults, according to their National MPI.

Most countries have longstanding poverty reduction policies as well as bespoke child policies. In an effort to further strengthen, integrate and align these with wider multidimensional poverty strategies, countries including Sri Lank and Nigeria have developed official national Child MPIs, often using indicators that reflect certain child rights (Evans and Abdurazakov, 2018). These aimed to provide deeper insights on children, because MPIs defined at the household level: (1) usually cover only a few child-specific deprivations; (2) previously have not illuminated intra-household or gendered patterns;[2] and (3) may include indicators that do not affect children. The objective was to introduce a stand-alone child-specific multidimensional poverty measure at the individual child level, and use this for policy advocacy, also for the same policy exercises of budgeting, targeting, policy planning and coordination, management, and competition that the National MPI informs.

In some countries that have a National MPI, child measures use the same method as the National MPI but apply it to different indicators. Disjoint Child MPIs were introduced in Panama and Thailand (MIDES 2019; OPHI and NESDC, 2019). In these cases, the measurement methodology is the same as the National

2 Alkire and Ul Haq (2018) offer a methodology to design linked analyses of gendered and intra-household patterns for individual indicators like school attendance, nutrition, employment, or completed years of schooling.

MPI, but all dimensions, weights and indicators of the Child MPI are different. This creates cognitive challenges for using both child and national MPIs, which is the central concern of this paper.

Related child poverty measures use the Multiple Overlapping Deprivation Analysis (MODA) approach, an adaptation of the Alkire-Foster or MPI method (De Neubourg et al., 2012) focused on advocating child rights. Ordinarily one child measure is created for children under 5 years of age, and a separate and independent measure for children aged 5–17. MODA collapses indicators into dimensional sub-indices, which creates a very high poverty headline for advocacy, but creates challenges for monitoring and policy.[3] In the case of MODA, the dimensions, indicators and structure of two, rather than one, Child MPIs must be explained, in addition to the National MPI – creating an additional cognitive load.

Thus, in countries where an official National MPI can guide policy, the adoption of one or two independently defined child measures creates challenges. First, how can policy actors confidently manage using two or more disjoint sets of dimensions and indicators, given a binding constraint of 'attention'? This challenge is amplified if measures use different methodologies, which requires policy actors to master both, and often elicits the question: 'Why use different methodologies?' Even with just two measures: a) some actors may only have the possibility to understand and use one measure, so the other is side-lined; b) policy actors may not all emphasize the same measure, leading to inconsistencies; c) advocates of child-specific policies based on a Child MPI may compete with national poverty policies (or those for the elderly or indigenous people, or persons living with a disability etc) based on the official National MPI, creating transaction costs and diluting collective gains. This could happen even when there should be significant common priorities (such as education, water and sanitation, housing, safety, and decent work). These familiar issues have many constructive administrative responses.

As metrics are increasingly being used as management tools and performance indicators, we propose that those commissioning and creating multidimensional metrics to guide policy, in a context where the binding constraint for policy action is the limited attention of policy actors, should deliberately construct consolidated and consistent measures which align the objectives and information systems of linked

3 Some features of the MODA approach might hinder the usefulness of these measures to inform policy making. Two requirements that might be particularly problematic are: inflexible requirements for equal weights across indicators, and the aggregation of indicators into a dimensional indicator; that is, an individual is identified as deprived in a dimensional indicator if they are deprived in at least one of the indicators within that dimension. The disadvantage of the dimensional subindex approach is that, when looking at each dimensional contribution to poverty, policy actors therefore cannot infer which of the indicators combined in a given dimensional subindex is driving the level of deprivation in that dimension, making it difficult to design an appropriate policy response. The strict requirement of equal weights can lead to situations where two deprivations with arguably disparate levels of impact on children's wellbeing are ascribed equal weights simply because they are verbally linked to different rights. For example, in MODA, household ownership of an information device is as important as both school attendance and highest household education attainment together, which seems surprising. MODA also generates multiple child measures for different age cohorts, which can be hard to compare. For a detailed comparison of the measurement properties of categorical-counting indices and Alkire-Foster measures, see Evans and Abdurazakov (2018).

measures to the greatest degree possible. The following sections illustrate such a methodology applied to child poverty.

III. Method

3.1 Proposal: Linked Multidimensional Measures

We provide a general methodology that embodies our proposal technically and empirically. For ease of exposition we explain it with reference to a linked household and child multidimensional poverty indices in Nepal. The linked Child MPI extends the National MPI to include child-specific deprivations while maintaining policy consistency. However alternative population subgroups could be addressed instead of children. In addition, a similar strategy can be and has been used to extend a national measure to incorporate additional indicators – for example of environmental vulnerabilities (Alkire et al. 2024, OPHI and UNDP 2023).

A linked Child MPI, defined at the individual child level, includes the same dimensions and indicators as the National MPI. It adds one or more child dimensions with age-specific indicators that track children's individual deprivations across the lifecycle of childhood. Any similar household-level indicators from the National MPI can be interpreted as reflecting children's deprivations associated with their household, while the individual-level indicators in the child dimensions can be seen as capturing the child's own situation. The weights and cutoffs are likewise linked, such that all children who are identified as poor by the national measure are poor according to the Child MPI. Additional children may also be, and often are, identified poor according to the Child MPI because the sum of their national MPI plus additional Child deprivations is equal to or greater than the poverty cutoff.

A linked Child MPI allows us to identify poor children living in non-MPI-poor households, as well as additional child deprivations carried by individual children living in MPI-poor households. This measure can be disaggregated to show how deprivations vary according to age and gender, and analysed to ascertain whether all children are poor within a household or just a subset. In addition, it is easy to communicate, as it uses the same structure as the National MPI, plus just a small number of child indicators.

3.2 A National Multidimensional Poverty Index (Household)

The Alkire-Foster (AF) method is a general framework for multidimensional poverty measurement (Alkire and Foster, 2011). A prominent application of this method is the global MPI computed by OPHI and UNDP for more than 100 countries (Alkire and Santos, 2014; Alkire, Kanagaratnam, and Suppa, 2022). The AF method consists of an identification and an aggregation step. Identification is based on dual cutoffs. First, deprivation cutoffs for each indicator (z) are used to define whether a person is deprived in

that indicator or not. Second, the poverty cutoff (k) is used to determine whether a person is identified as multidimensionally poor, based on the sum of their weighted deprivations. Once poor people are identified, the AF method aggregates information on poor people's deprivations into meaningful indices. The most commonly used are the multidimensional poverty headcount ratio (H), the intensity of poverty (A), and the adjusted multidimensional headcount ratio ($M0$), or MPI. National measures can be disaggregated by any population sub-group for which the data are representative. Thus often they would be disaggregated by age cohort (including children), as well as rural and urban areas, subnational regions, gender of the household head, and other categories such as disability status or race and ethnicity.

As National MPIs tend to include indicators focused on children (e.g. child nutrition and school attendance), these indicators can also be unpacked for individual children within the National MPI framework. Alkire, Ul Haq, and Alim (2019) demonstrate this for South Asia. They show what proportion of children individually are deprived; what proportion of deprived children are poor; parse these figures by gender; show what proportion of children live in households with intrahousehold inequality (at least one child is deprived and another child is non-deprived in the same indicator); and explore how the indicator composition of poverty varies for poor children who are themselves deprived or non-deprived in a child indicator.

3.3 A Linked Multidimensional Poverty Index: 'The Drawer Approach'

The National MPI and linked Child MPI are both built from the same dataset. The Child MPI first replicates the deprivations for the indicators of the National MPI. Each child receives the same weighted deprivation profile as its household does in the National MPI. The Child MPI then adds new age-specific individual indicators. Each indicator must be exhaustive, in that every child (within the age limit defined for this measure; usually 0–17 years) must be eligible for one defined deprivation across the age period covered.

Child development requires different capabilities at different ages. For example, for education, early learning material or parental care are crucial investments for infants and young children, and are replaced with preschool and then school attendance for older children, as well as not being required to undertake child labour, or to marry and bear children as a child. Therefore, while trying to capture the same capability of, say, having a healthy life or enjoying education, it is natural to draw on different indicators to capture pertinent deprivations of children across their lifecycle. The choice of indicators is also often constrained by the data, but survey modifications may subsequently expand the data environment.[4] Assuming that the

4 Particularly important child-level indicators might replicate indicators that are already included in the National MPI for children of relevant ages. The inclusion of such indicators both at household and individual levels allows the measure to

National MPI and the Child MPI aim to inform policy making jointly, the information provided by the Child MPI should expand the information obtained from the age decomposition of the National MPI.

The indicator weights and poverty cutoff for the linked Child MPI are set such that all children who live in poor households according to the National MPI are still identified as poor in the Child MPI, regardless of whether they also experience child-specific deprivations. In particular, the Child MPI proportionally re-weights the indicators of the National MPI to sum to the proportion of dimensions it now has. For example, if the original National MPI has three dimensions weighted at one-third, and the Child MPI adds one additional dimension, all dimensions would be weighted by one-fourth. The weight of the original indicators would then be proportionally the same but now sum to 3/4. More generally, if dimensions are equally weighted, the weight on each Child MPI dimension would correspond to their original weight in the National MPI (w_j) multiplied by the ratio of the original number of (equally weighted) dimensions and the expanded number of dimensions in the Child MPI.

A parallel adjustment applies to the poverty cutoff, which must likewise be proportional to the original poverty cutoff. For example, if in the three-dimensional National MPI the poverty cutoff was one-third, in the four-dimensional Child MPI it would be one-fourth. This creates an important link, in that every child without exception that is identified as poor by the National MPI is poor by the Child MPI. Furthermore, the common indicators of the National MPI remain convergent areas of policy concern for the Child MPI. The Child MPI adds an in-depth analysis to a restricted population (children) by extending to indicators relevant to this population. Similar linked measures can be created for other population groups (elderly people, youth, mothers, Indigenous peoples, etc.).

3.4 Illustration: A National MPI and a Linked Child MPI for Nepal

We use data from the Nepal Multiple Indicator Cluster Survey (MICS) 2014 to extend the original National MPI for Nepal (Government of Nepal, 2018), to a linked Child MPI.[5] The National MPI consists of three dimensions – health, education and living standards – and 10 indicators.

distinguish different deprivation profiles. Suppose a Child MPI includes a household-level indicator of school attendance, which considers all members to be deprived if at least one school-age child is not attending school, and a child indicator, which considers a school-age child deprived if she/he is not attending school. The inclusion of the two indicators distinguishes two kinds of deprivation: (1) the risk of living in a household where school attendance is not guaranteed for every child; and (2) the child's personal experience of not attending school.

5 This example illustrates a rigorous methodology but, importantly, does not claim to offer apt indicators for each child age cohort. Deprivations vary greatly across age cohorts in part due to a lack of data – which is particularly acute for children aged 14–17. For meaningful comparisons, the different indicator definitions across age cohorts should reflect a rough 'comparability' in the seriousness of deprivations for each cohort. This is not possible in the current dataset, but could be if indicators were set following discussions between measurement and child experts.

Table 1. Dimensions, Indicators, and Weights

Dimension	Indicator	Age-specific indicator/deprivation cutoff	Age group	Indicator weight	
				Child MPI	National MPI
Individual child indicators	Child development	**Nutrition:** if z-score of weight-for-age is below minus two standard deviations from the median of the reference population.	Age: 0–4 years	1/8	
		School attendance: if not attending school.	Age: 5–13 years		
		Schooling or working: if not attending school and is working and (has less than 8 years of schooling or is working under dangerous conditions).	Age: 14–17 years		
	Childhood conditions	**Early childhood conditions:** 0-5m: if not exclusively breastfed; 6-23m: if has no vaccination card or has never been vaccinated; 24-35m: if has no toys or was left alone or at the care of another child for more than 1 hour in the last week; 36-59m: if an adult member of the household did not engage with the child in four or more activities during the last week.	Age: 0–4 years	1/8	0
		Child labour: 5-11y: if spent at least 1 hour performing economic activities during previous week; 12-13y: if spent at least 14 hours performing economic activities during previous week.	Age: 5–13 years		
		Child labour: 14y: if spent at least 14 hours performing economic activities during previous week; 15-17y: if spent at least 43 hours performing economic activities during previous week.	Age: 14-17 years		
	Years of schooling	No household member has completed five years of schooling.		1/8	1/6

Household education	Child school attendance	Any school-aged child is not attending school up to class 8+.		1/8	1/6
Household health	Child mortality	Any child in the family has died.		1/8	1/6
	Nutrition	Any adult or child for whom there is nutritional information is malnourished.		1/8	1/6
Living standards	Electricity	The household has no electricity.		1/24	1/18
	Improved sanitation	The household's sanitation facility is not improved (according to MDG guidelines), or it is improved but shared with other households.		1/24	1/18
	Improved drinking water	The household does not have access to improved drinking water (according to MDG guidelines) or safe drinking water is more than a 30-minute roundtrip walk from home.		1/24	1/18
	Housing	The household has a dirt, sand, dung, or other (unspecified) type of floor or has roof made of thatch/palm leaf, sod, rustic mat, wood planks, or other.		1/24	1/18
	Cooking fuel	The household cooks with dung, wood or charcoal.		1/24	1/18
	Assets ownership	The household does not own more than one radio, TV, telephone, bike, motorbike or refrigerator and does not own a car or truck.		1/24	1/18

Note: Weights in the individual child dimension sum to 1/4 within each age group.

The three dimensions are equally weighted, and the indicators within each dimension are also equally weighted. The poverty cutoff (k) is one third (1/3). Table 1 presents all the indicator definitions, with indicator weights for the National MPI.

As Table 1 shows, the linked Child MPI builds on the National MPI by adding a dimension of 'individual child' that includes two age-specific child indicators: child development and childhood conditions. The age groups covered to proxy the lifecycle of childhood are 0–4 years, 5–13 years, and 14–17 years. For children under 5 years of age, recognizing the fundamental role that nurturing care plays in early childhood development (Black et al., 2017), child poverty is assessed based on nutrition (weight-for-age) (child development) and early childhood conditions (childhood conditions).[6]

For children aged 5–13, the age-specific indicators are school attendance and child labour, while for children aged 14–17, the indicators are schooling or working and child labour. All cutoffs and age-specific definitions are reported in Table 1.

Table 2. Comparing the National MPI and Child MPI values for Children 0–17

	MPI	Incidence (H)	Intensity (A)
National MPI for children 0–17 (k = 1/3)	0.154	33.8%	45.5%
Child MPI (k = 1/4)	0.159	40.9%	38.9%

Note: Authors' calculations based on MICS 2014 for children aged 0–17.

Table 2 reports key results of the National and linked Child MPI for Nepal's child population. These include the MPI-score (MPI), the incidence or headcount ratio of poor children (H), and the average intensity of multidimensional poverty (A). According to the National MPI, 33.8 percent of all children are poor. However, given its extended set of deprivations (including child-specific deprivations), the Child MPI identifies over 7 percent more children as poor than the National MPI, or 40.9 percent[7] of all children. These additional poor children do not live in MPI-poor households according to the National MPI.[8]

6 The early childhood conditions indicator has different definitions depending on the precise age of the child. For children under 6 months, it corresponds to exclusive breastfeeding; for children 6 to 23 months old, it corresponds to immunization; for children 24 to 35 months, it considers the availability of toys and adequate care; and for children 3 to 4 years old, it considers time spent with adults in activities such as reading books, looking at picture books, telling stories, singing songs, and taking children outside the home.

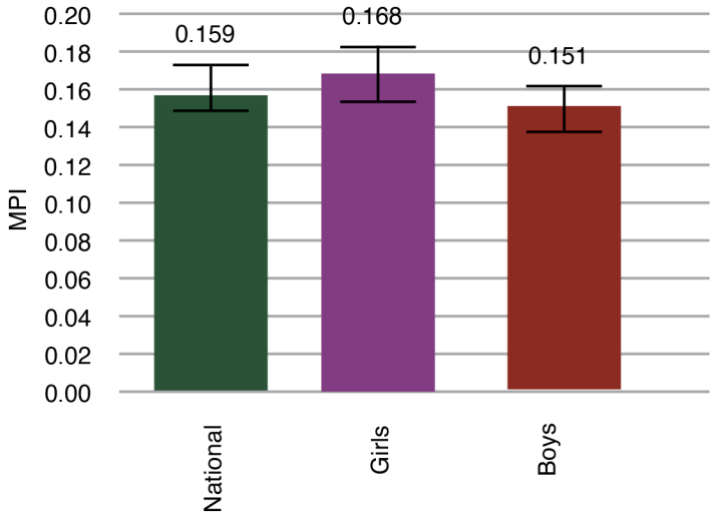
7 Tables A1 and A2 in the Appendix present results with confidence intervals nationally, by area and province.

8 If we convert the intensity of the National MPI into a number comparable to that of the Child MPI (by effectively giving zero weight to the child indicators), the intensity for the National MPI 34.1 percent compared to 38.9 percent for the Child MPI.

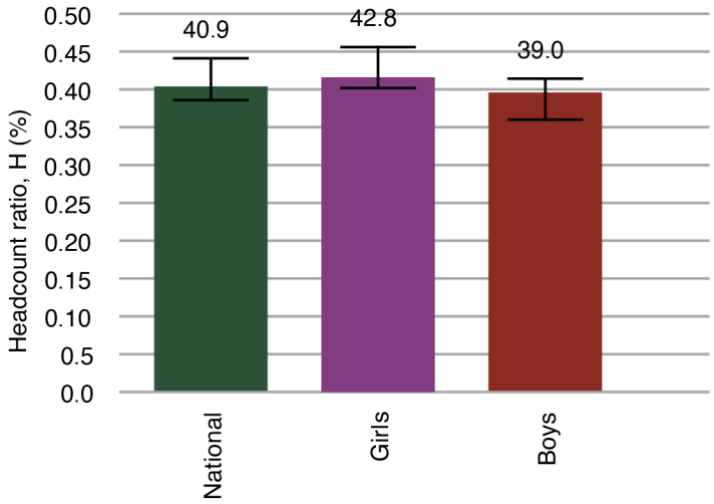
Disaggregating the Child MPI by gender, we find that while the point estimates of poverty are slightly higher for girls than boys, the differences are not significantly different (Figure 1).

Figure 1. Gender Disaggregation of Child-MPI and Incidence with 95 Percent Confidence Intervals

1A: Gender Disaggregation of Child-MPI



1B: Gender Disaggregation of Incidence



Note: Authors' calculations based on MICS 2014 for children aged 0–17

Table 3. Percentage of Children 0–17 Deprived in Individual Child Indicators by their Poverty Status According to the Child MPI and National MPI

	Poor by Child and National MPI	Poor by Child MPI but not National MPI	Nonpoor by Child and National MPI
Deprived only in child indicator 1	7.6	2.5	0.7
Deprived only in child indicator 2	3.9	3.7	2.8
Deprived in both child indicators	3.1	1.0	0.0
Deprived in none of the child indicators	19.1	0.0	55.6
Percentage of children (sum to 100.1% due to rounding)	33.8	7.2	59.1

Note: Authors' calculations based on MICS 2014 for children aged 0–17.

Table 3 looks beyond the headline of 7.2 percent of children who are 'newly poor' according to the Child MPI, and investigates how the additional child indicators affect those who are non-poor and those who were already poor according to the National MPI. Fully 19.1 percent of children are poor by the National MPI, but are not deprived in either of the child indicators, while in total, 14.6 percent of children are poor by the National MPI and also experience at least one child-specific deprivation. In contrast, only 3.5 percent of all children are deprived in one of the child indicators but are not poor. Hence the child indicators do deepen our understanding of children's individual experience of poverty.

3.5 Analysis by Province

One of the reasons why every MPI based on the AF method can be used both for policy design and as a performance management tool is that it can be broken down by each of its indicators. This feature makes National MPIs useful for planning and budget allocation, while planning exercises can also be guided at both provincial and national levels. How then does a linked Child MPI function to consolidate attention to policy priorities that are shared with the National MPI, and to highlight additional child considerations to actors whose programming focuses on children?

Looking at the National and Child MPIs disaggregated by Province, Table 4 shows both convergent and divergent findings across the seven provinces, ranked from poorest to least poor. The provincial ranking is the same by both the National and Child MPIs, with Karnali being the poorest, followed by Madhes. However, in Karnali, the Child MPI incidence of 63.7 percent is 9.7 percentage points higher than the National MPI of 54.4 percent, whereas in Madhes the incidence is only 5.7 percentage points higher. So child poverty is a particular priority in Karnali, as it also is in the large province of Lumbini where the incidence is 8.6 percentage points higher than the National MPI. Using this information together with the population shares can provide general guidance for budgeting. But to move towards policy design it is necessary to ask what needs to be done.

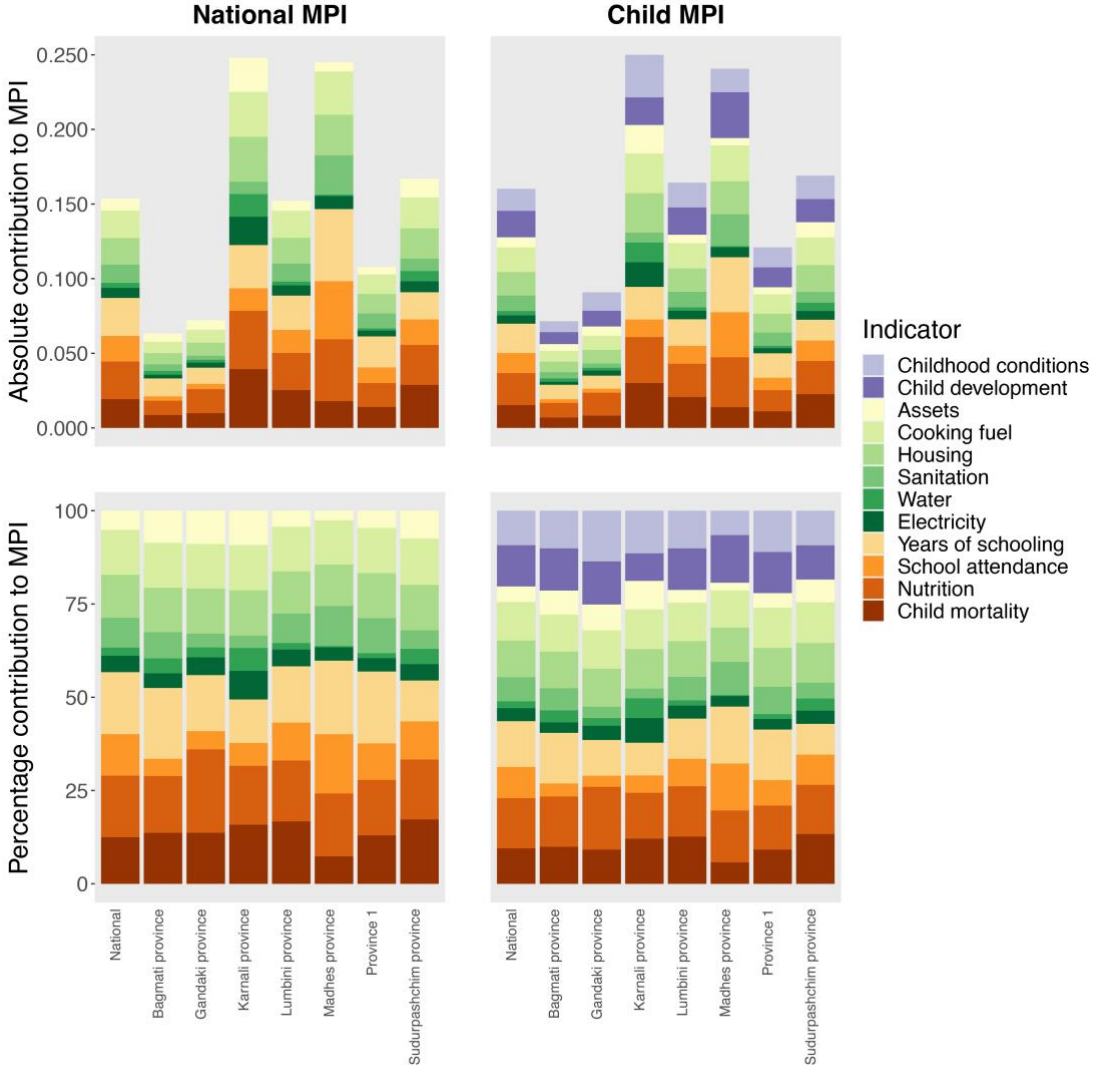
Table 4. Headcount Ratios by Province According to National MPI and Child MPI

	Incidence for children (%)		Population share (%)
	National MPI	Child MPI	
National	**33.8**	**40.9**	**100**
Karnali	54.4	63.7	7.2
Madhes	52.6	58.3	22.8
Sudurpashchim	37.4	44.5	10.8
Lumbini	33.5	42.1	18.7
Province 1	24.2	32.3	15.7
Gandaki	16.2	24.3	8.8
Bagmati	14.5	19.7	16

Notes: Authors' calculations based on MICS 2014 for child population only.

To show the deprivations that need to be reduced in order to reduce the MPI, Figure 2 presents the weighted contribution of each indicator to the National MPI and Child MPI.

Figure 2. Indicator Contributions (Absolute and Percentage) to National MPI and Child MPI



The top panels show the absolute contributions, which add up to the National MPI and Child MPI values, respectively. Note that if any deprivation of any poor person goes down, the MPI value decreases.

Stark differences are visible across provinces. The two highest bars are Karnali and Madhes, and the absolute contribution of child indicators is highest in both these provinces. As we saw, the headcount ratio of Karnali changed most, but the intensity of Madhes changed the most of all the provinces, so the change in their MPIs is quite similar. However, the deep purple-coloured child development indicator covering mainly nutrition and school attendance deprivations contributes more to poverty in Madhes, while the light purple indicator of early cognitive development and child labour contributes more in Karnali. The contributions of the National MPI also differ considerably across both provinces, with the green living standard indicators particularly acute in Karnali and the educational deprivations being far more evident in Madhes. We observe that the Child MPI and National MPI give convergent and complementary policy guidance on priorities.

In the lower panel of Figure 2, stark differences are visible across provinces in the percentage contributions of each indicator to the MPI – which all add up to 100 percent. If the composition of poverty was the same, then each stripe would be the same height in all the provinces, but most indicators vary a great deal, except cooking fuel and housing, which are consistently high across the provinces. But the darkest green stripe, which denotes deprivation in electricity, contributes more to the MPI in Karnali than in any other province, while the second stripe from the bottom – child undernutrition – contributes most in Gandaki province.

In the Child MPI, the purple child-specific indicators contribute roughly 25 percent to the MPI at the national level – which is close to the dimensional weight of the child dimension. Interestingly, the individual child dimension contributes relatively more to the MPI in Bagmati province and in Province 1 – which are among the least-poor provinces.

The table of incidence, population shares, and absolute contributions are useful to assess the number of people who are poor and the share of deprivations they experience – which should inform budgeting. Building on this, percentage contributions show how indicator priorities among children vary across provinces, which should inform the design of integrated policies.

IV. Conclusion

This paper has focused on the issue of how to construct linked measurement tools that can be used for policy and can function as management tools as well as report cards. It recognizes that metrics are not all that matter in empowering middle management to use evidence in policy design (Ou et al., 2014). The

paper profiled a bottleneck that is widely recognized in the administration literature but not necessarily among those who design metrics: the cognitive and time constraints of administrators who are expected to use the evidence that measures provide for policy design, management and reporting. It took as a central case the proliferation of metrics related to poverty. This proliferation risks setting different advocacy groups up in competition with each other, rather than deploying them in a congruent multi-pronged attack on poverty.

To mitigate this risk, we proposed that those designing poverty measures for different vulnerable populations coordinate their work by using a central common statistic – such as an official national multidimensional poverty measure – and extend it consistently to their populations of interest.

We illustrated this approach using the National MPI for Nepal, and a linked Child MPI which adds a new dimension of individual child indicators to the National MPI and jointly analyses these for children. Our approach profiled how 7.2 percent of poor children according to the Child MPI live in non-poor households, and showed which provinces have the highest levels of child deprivations. Yet we also showed how the child and National MPI do not compete, but rather offer congruent messaging on core priorities. Finally, because the methodology and most of the indicators are shared, the cognitive load required to understand the relevant value-added of the Child MPI is far lower than it would be for a completely disjoint measure of child poverty.

This paper raises several further research questions related to the ways that multidimensional poverty metrics can best transition into management tools that are also pro-poor (leaving no one behind); how they can use evidence while empowering poor actors; and how to provide positive incentives as poverty declines to sustain momentum. It also shows the need to consider data availability, as core MPI questions might need to be introduced into data sources covering other vulnerable populations. It is hoped that future research will probe both areas.

In a very different context, Hansen and Haas (2001) uncovered 'a paradox of information supply.' They found that the less information a supplier offered, the more it might be used. Furthermore, such a supplier might get a reputation 'for quality and focus.' Yet an overly narrow supplier might overlook very important information – including, in the case of poverty statistics, compounding characteristics such as age, disability status, minority status, and migration. So a new balance is required. Those seeking to offer information-rich metrics that cover all too often overlooked groups might do well to explore linked methodologies that heighten focus without losing important information.

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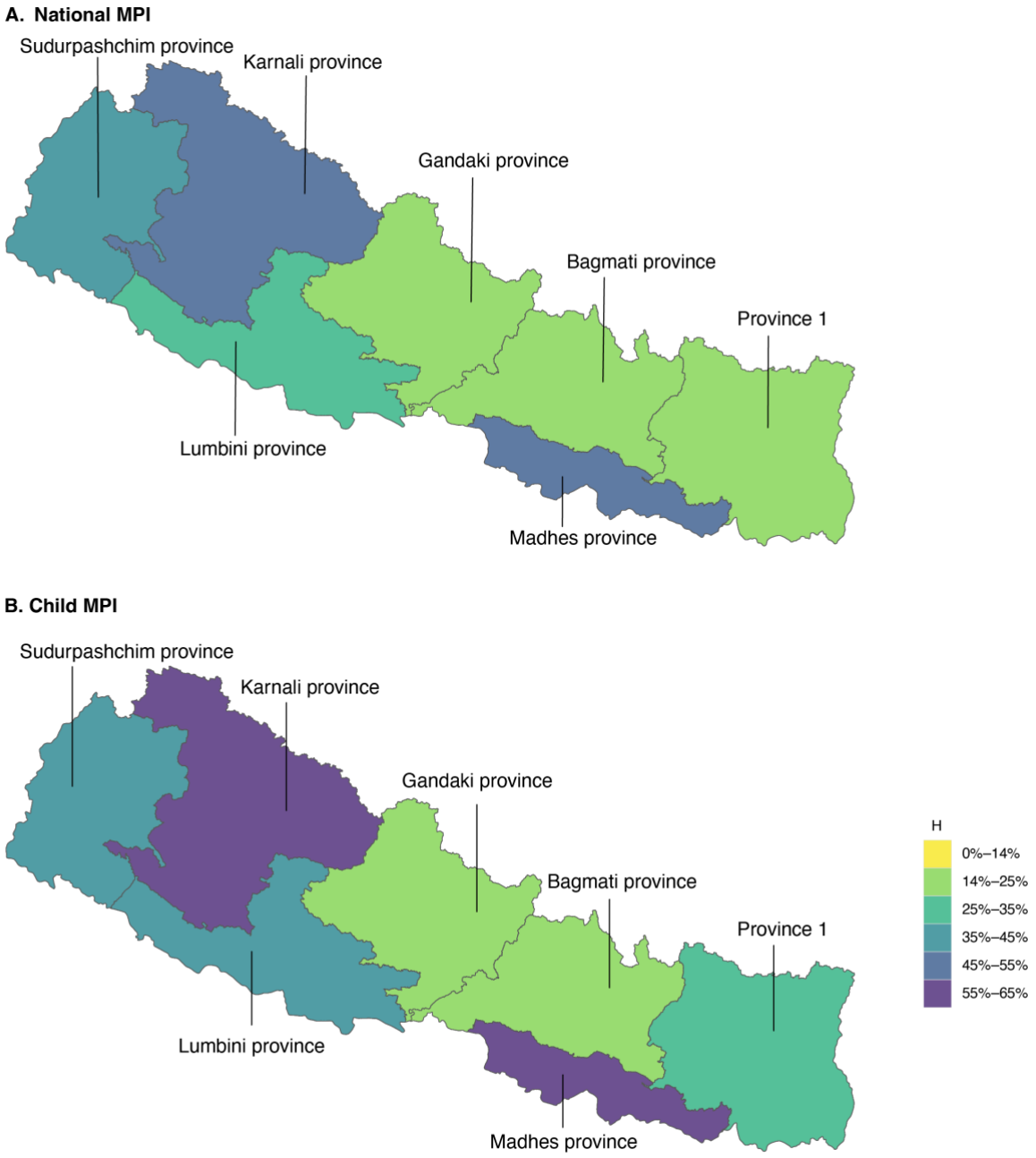
Appendix

Figures

Figure A1. Headcount Ratios for the National MPI and Child MPI by Province



Notes: Authors' calculations with MICS 2014 data for child population only.

Tables

Table A1. Nepal National MPI for Children 0–17 years, Disaggregations

	MPI			H			A			
	Value	Lower bound	Upper bound	Value	Lower bound	Upper bound	Value	Lower bound	Upper bound	Pop. share
National	0.154	0.140	0.168	33.8	31.0	36.6	45.5	44.5	46.4	100.0
Provinces										
Province 1	0.108	0.082	0.141	24.2	18.7	30.7	44.5	42.2	46.8	15.7
Madhes province	0.245	0.207	0.287	52.6	45.4	59.7	46.6	44.4	48.7	22.8
Bagmati province	0.063	0.043	0.093	14.5	10.2	20.2	43.7	40.5	46.9	16.0
Gandaki province	0.072	0.046	0.112	16.2	10.5	24.1	44.6	41.7	47.5	8.8
Lumbini province	0.152	0.126	0.183	33.5	28.2	39.4	45.4	43.6	47.1	18.7
Karnali province	0.248	0.216	0.283	54.4	47.6	61.1	45.6	44.0	47.1	7.2
Sudurpashchim province	0.167	0.146	0.190	37.4	33.4	41.5	44.7	43.3	46.1	10.8

Note: Authors' calculations based on MICS 2014 for child population only.

Table A2. Nepal Child MPI, Disaggregation

	MPI			H			A			
	Value	Lower bound	Upper bound	Value	Lower bound	Upper bound	Value	Lower bound	Upper bound	Pop. share
National	0.159	0.147	0.172	40.9	38.2	43.7	38.9	38.1	39.7	100.0
Provinces										
Province 1	0.120	0.097	0.147	32.3	27.1	38.1	37.2	35.0	39.4	15.7
Madhes province	0.239	0.205	0.278	58.3	50.9	65.3	41.0	39.2	42.9	22.8
Bagmati province	0.071	0.052	0.096	19.7	15.2	25.2	36.0	33.4	38.8	16.0
Gandaki province	0.090	0.065	0.125	24.3	17.8	32.2	37.2	35.2	39.2	8.8
Lumbini province	0.163	0.140	0.190	42.1	36.9	47.6	38.8	37.2	40.3	18.7
Karnali province	0.248	0.221	0.278	63.7	57.3	69.6	39.0	37.6	40.5	7.2
Sudurpashchim province	0.168	0.151	0.187	44.5	40.7	48.3	37.8	36.6	39.0	10.8

Note: Authors' calculations based on MICS 2014 for child population only.

Table A3. Nepal National MPI, Censored Headcount Ratios

	Child Mortality		Nutrition		School Atten-dance		Years of Schooling		Elec-tricity		Water		Sanitation		Housing		Cooking Fuel		Assets	
	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE
National	11.6	0.6	15.2	0.9	10.3	0.9	15.3	1.0	12.1	0.9	6.0	0.5	22.1	1.4	32.0	1.3	33.2	1.4	14.1	0.7
Provinces																				
Province 1	8.4	1.4	9.6	1.6	6.3	1.5	12.4	2.0	7.0	1.3	2.6	0.6	18.2	3.1	23.4	2.8	23.5	2.8	9.0	1.3
Madhes province	10.8	1.4	24.8	2.7	23.4	2.8	28.9	3.2	15.8	3.0	1.6	0.6	47.4	3.8	49.0	3.3	52.2	3.7	11.4	1.6
Bagmati province	5.2	1.3	5.8	1.3	1.7	0.8	7.2	1.3	4.5	1.7	4.6	1.4	8.0	1.7	13.6	2.6	13.7	2.6	9.8	1.7
Gandaki province	5.9	1.7	9.7	1.8	2.1	1.1	6.5	2.0	6.2	2.5	3.5	1.6	4.9	1.2	15.7	3.5	15.5	3.5	11.6	3.5
Lumbini province	15.3	1.8	14.9	1.8	9.3	1.7	13.7	1.7	12.3	1.5	4.8	1.2	21.7	3.0	30.9	2.6	32.7	2.9	11.7	1.7
Karnali province	23.6	2.4	23.5	3.5	9.1	1.4	17.4	1.6	34.1	4.2	27.5	3.6	14.8	3.2	54.2	3.5	54.2	3.5	41.0	3.6
Sudurpashchim province	17.3	1.4	16.1	1.4	10.2	1.4	10.9	1.2	13.3	1.7	12.3	1.7	14.9	2.1	36.6	2.1	37.3	2.1	22.4	2.0

Note: Authors' calculations based on MICS 2014 for child population only. "SE" refers to standard error. "Est" refers to estimate.

Table A4. Nepal National MPI, Uncensored Headcount Ratios

	Child Mortality		Nutrition		School Atten-dance		Years of Schooling		Elec-tricity		Water		Sanitation		Housing		Cooking Fuel		Assets	
	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE
National	15.8	0.7	19.2	0.9	11.1	0.9	17.1	1.0	18.5	1.2	12.2	0.9	43.0	1.5	71.9	1.4	79.4	1.2	23.7	0.9
Provinces																				
Province 1	12.0	1.7	12.4	1.6	7.0	1.5	14.7	2.0	13.4	2.1	9.3	1.8	41.9	4.0	71.2	3.6	79.6	3.2	20.6	2.0
Madhes province	12.1	1.4	29.0	2.7	24.8	2.8	30.0	3.2	19.3	3.4	2.0	0.7	73.9	3.4	77.8	3.1	89.5	2.4	14.7	1.8
Bagmati province	9.6	1.2	9.7	1.3	2.2	0.8	11.0	1.3	7.4	2.6	16.7	3.2	34.9	2.7	46.8	4.4	49.0	4.7	19.1	2.5
Gandaki province	10.6	2.1	13.1	1.8	2.3	1.1	9.1	2.0	13.5	4.6	9.8	2.8	26.0	3.1	61.5	5.2	68.1	5.0	26.6	4.6
Lumbini province	23.0	1.8	21.2	2.2	9.9	1.7	15.3	1.6	18.8	2.0	8.6	2.0	37.4	3.7	73.0	2.6	84.0	2.2	18.4	2.1
Karnali province	25.6	2.4	25.4	3.6	9.4	1.4	17.6	1.6	54.4	6.0	44.2	5.0	19.0	3.8	96.1	1.2	97.7	0.7	61.1	3.6
Sudurpashchim province	23.3	1.5	19.6	1.5	11.8	1.5	12.2	1.2	20.1	2.0	18.3	2.1	30.7	3.1	87.9	1.5	92.1	1.3	35.9	2.1

Note: Authors' calculations based on MICS 2014 for child population only. "SE" refers to standard error. "Est" refers to estimate

Table A5. Nepal Child MPI, Censored Headcount Ratios

	Child Mortality		Nutrition		School Attendance		Years of Schooling		Electricity		Water		Sanitation		Housing		Cooking Fuel		Assets		Child Development		Child Conditions	
	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE
National	12.1	0.6	17.1	0.9	10.7	0.9	15.6	1.0	13.4	1.0	7.0	0.6	24.7	1.4	37.6	1.3	39.5	1.4	15.9	0.8	11.7	0.4	14.1	0.7
Provinces																								
Province 1	8.8	1.4	11.3	1.5	6.6	1.5	13.0	2.0	8.2	1.4	3.7	0.8	21.2	3.1	30.1	2.7	31.0	2.7	11.3	1.4	10.6	0.8	10.6	1.2
Madhes province	11.0	1.4	26.6	2.6	24.1	2.8	29.2	3.2	16.2	3.0	1.7	0.6	50.8	3.9	52.8	3.5	57.2	3.8	11.8	1.6	12.5	1.0	24.4	2.0
Bagmati province	5.6	1.2	7.7	1.2	2.0	0.8	7.7	1.3	4.8	1.8	5.6	1.5	10.1	1.8	16.7	2.7	16.9	2.7	11.0	1.8	5.7	1.0	6.4	0.7
Gandaki province	6.6	1.8	12.1	1.8	2.2	1.1	6.9	2.0	8.4	3.0	4.4	1.8	6.6	1.2	22.1	3.8	22.2	3.8	15.0	3.8	9.8	1.4	8.4	1.1
Lumbini province	16.5	1.8	17.7	1.9	9.6	1.7	14.1	1.7	13.7	1.5	5.4	1.3	24.8	3.2	37.5	2.6	40.5	2.9	13.3	1.8	13.2	0.9	14.6	1.2
Karnali province	24.0	2.4	24.5	3.5	9.3	1.4	17.4	1.6	39.4	4.8	31.7	3.9	15.6	3.4	63.1	3.2	63.4	3.1	45.5	3.5	22.6	1.2	14.7	1.2
Sudurpashchim province	18.0	1.4	17.7	1.4	10.9	1.5	11.1	1.2	14.2	1.7	13.2	1.8	17.0	2.2	43.0	2.0	44.0	2.0	24.5	2.0	12.5	0.7	12.3	0.8

Note: Authors' calculations based on MICS 2014 for child population only. "SE" refers to standard error. "Est" refers to estimate.

Table A6. Nepal Child MPI, Uncensored Headcount Ratios

	Child Mortality		Nutrition		School Atten-dance		Years of School-ing		Elec-tricity		Water		Sani-tation		Housing		Cooking Fuel		Assets		Child Devel-opment		Child Condi-tions	
	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE
National	15.8	0.7	19.2	0.9	11.1	0.9	17.1	1.0	18.5	1.2	12.2	0.9	43.0	1.5	71.9	1.4	79.4	1.2	23.7	0.9	14.5	0.4	14.8	0.6
Provinces																								
Province 1	12.0	1.7	12.4	1.6	7.0	1.5	14.7	2.0	13.4	2.1	9.3	1.8	41.9	4.0	71.2	3.6	79.6	3.2	20.6	2.0	14.6	0.9	11.4	1.3
Madhes province	12.1	1.4	29.0	2.7	24.8	2.8	30.0	3.2	19.3	3.4	2.0	0.7	73.9	3.4	77.8	3.1	89.5	2.4	14.7	1.8	13.8	1.0	24.9	1.9
Bagmati province	9.6	1.2	9.7	1.3	2.2	0.8	11.0	1.3	7.4	2.6	16.7	3.2	34.9	2.7	46.8	4.4	49.0	4.7	19.1	2.5	8.3	1.0	8.1	0.8
Gandaki province	10.6	2.1	13.1	1.8	2.3	1.1	9.1	2.0	13.5	4.6	9.8	2.8	26.0	3.1	61.5	5.2	68.1	5.0	26.6	4.6	13.9	1.2	8.5	1.1
Lumbini province	23.0	1.8	21.2	2.2	9.9	1.7	15.3	1.6	18.8	2.0	8.6	2.0	37.4	3.7	73.0	2.6	84.0	2.2	18.4	2.1	16.7	0.9	15.5	1.2
Karnali province	25.6	2.4	25.4	3.6	9.4	1.4	17.6	1.6	54.4	6.0	44.2	5.0	19.0	3.8	96.1	1.2	97.7	0.7	61.1	3.6	24.3	1.0	14.7	1.2
Sudurpashchim province	23.3	1.5	19.6	1.5	11.8	1.5	12.2	1.2	20.1	2.0	18.3	2.1	30.7	3.1	87.9	1.5	92.1	1.3	35.9	2.1	15.1	0.7	12.6	0.8

Note: Authors' calculations based on MICS 2014 for child population only. "SE" refers to standard error. "Est" refers to estimate.