Multidimensional Poverty Index – Summer 2016: Brief Methodological Note and Results

***OPHI Briefing* 42**

Sabina Alkire, Christoph Jindra, Gisela Robles and Ana Vaz*

June 2016

Acknowledgements
We warmly acknowledge the contribution of many colleagues and co-workers who participated in the summer update of the MPI 2016. In particular, we are grateful to our colleagues at the UNDP Human Development Report Office for their substantive engagement, especially Milorad Kovacevic, Cecilia Calderon and Selim Jahan. We are grateful as well to Sunita Kishor, Shea Rutstein and Trevor Croft at DHS/ICFI, Paulo de Martino Jannuzzi at the Brazilian Ministry of Social Development and Combating Famine, Prof. Ahmed Abdel Monem at the Pan Arab Project for Family Health (PAPFAM) of the League of Arab States, Alison Kennedy and Friedrich Huebler, from the Education Indicators and Data Analysis Section at UNESCO Institute for Statistics, Lo Thi Duc at the Social Environmental Statistics Department of the Viet Nam General Statistics Office, Attila Hancioglu at MICS, UNICEF Partnership, Daniela Gregr at UNICEF Mauritania, Nguyen Quynh Trang at UNICEF Viet Nam, Pauline Yongeun Ahn at KOICA-UNICEF Partnership Cambodia, Eliaba Yona Damundu at UNICEF South Sudan, Muktar Minbaev at UNICEF Kyrgyzstan, for answering detailed survey-related queries. We are thankful to Denise Folkes, Suzette Thompson and Frederick Gordon from the Policy Research Unit and the Statistical Unit at the Planning Institute of Jamaica for granting open access to the Jamaican Survey on Living Conditions (JSLC). We are also grateful to the Department of Economics of the Pontifical Catholic University of Rio de Janeiro for making publicly available the Data Zoom package which was used to read the Brazilian Pesquisa Nacional por Amostra de Domicílios (National Household Survey) 2014.

We are deeply appreciative of the competent support at some stages of new MPI calculations from Lu Gram, Monica Pinilla and Yangyang Shen; and the support of Christian Oldiges, Usha Kanagaratnam and Yangyang Shen for the harmonisation of datasets. We also wish to thank other OPHI team members and associates, including Miroslawa Alunowska, Paola Ballon, Adriana Conconi, Paddy Coulter, Heidi Fletcher, James Foster, Natasha Francis, Emma-Jane Grieg, John Hammock, Bouba Housseini, Mashrur Khan, Maarit Kivilo, Alejandro Olayo, Rachel Pearson, Conway Reinders, Odile Rimbert, Felipe Roa, Matthew Robson, Jose Manuel Roche, Maria Emma Santos, Suman Seth, Yangyang Shen, Joanne Tomkinson and Diego Zavaleta, for their support and substantive input.

Christoph Jindra designed, programmed and coordinated the analysis of changes over time, Gisela Robles coordinated the analysis of the figures for the global MPI and Ana Vaz conducted a Quality Check and advice on the analysis of changes over time.

This analysis uses data from the USAID Demographic and Health Surveys (DHS), UNICEF Multiple Indicator Cluster Surveys (MICS), and the Pan Arab Family Health Survey (PAPFAM) collected by the League of Arab States and local Bureaux of Statistics.

Citation: Alkire, S., Jindra, C., Robles, G. and Vaz, A. (2016). "Multidimensional Poverty Index - 2016: Brief methodological note and results." *OPHI Briefing* 42, University of Oxford.

* The Oxford Poverty and Human Development Initiative (OPHI), Oxford Department of International Development, University of Oxford. Contact details: ophi@qeh.ox.ac.uk Tel +44 1865 271915 Fax +44 (0)1865 281801.

This note has been prepared within the OPHI theme on multidimensional poverty measurement.

Contents

Introduction

The Multidimensional Poverty Index (MPI) 2016 updates use the same parameters (dimensions, indicators, cutoffs and weights) and the same functional form (Alkire and Foster Adjusted Headcount Ratio M_0) as in previous years.[1] This brief methodological note presents the 2016 MPI updates, and releases the tables with the full results: national MPI, destitution and vulnerability results, rural, urban, subnational region, changes over time, and complete estimations, as well as complementary data, dimensional breakdowns, and confidence intervals. Destitution data are now available for 100 countries. It first explains the main updates in the 2016 MPI, following the guidelines for updates presented in the 2014 Methodological Note (Alkire, Conconi and Seth 2014b). It uses the MPI methodology that has been presented in detail in previous methodological notes (Alkire and Santos 2010; Alkire, Roche, Santos and Seth 2011; Alkire, Conconi and Roche 2013; Alkire, Conconi and Seth 2014b). Then it briefly describes the methodological assumptions considered for the estimation of each dataset. The results of these estimations are presented in the form of 7 main tables, 102 country briefings and the interactive databank, all available on OPHI's website (www.ophi.org.uk).

1. 2016 MPI Updates

Updated MPIs from new data

The 2016 MPI presents updated estimations for 15 datasets for 14 countries. Thirty-eight datasets for 37 countries were updated in June 2015. Thirty-three countries were updated in 2014; in 2013 there were updates for 16 countries and in 2011, for 25 countries. MPI estimations for 13 countries are carried out

[1] From January 2015, the global MPI estimations are updated twice per year. This methodological note appends the considerations for the new country estimations.

with data that are 2005 or 2006, 30 estimations are carried out with data collected between 2007 and 2010, and the number of analyses with data from 2011 onwards has increased to 58.

The countries in June 2016, together with the surveys used and years are as follows.[2]

Updated countries: Bangladesh (MICS 2012-13), Bangladesh (DHS 2014), Brazil (PNAD 2014), Cambodia (DHS 2014), Ghana (DHS 2014), Jamaica (JSLC 2012), Kenya (DHS 2014), Kyrgyzstan (MICS 2014), Malawi (MICS 2013-14), Nepal (MICS 2014), Palestine (MICS 2014), Rwanda (DHS 2014-15), Turkmenistan (MICS 2006), Viet Nam (MICS 2013-14), Yemen (DHS 2013).The survey data used to estimate the MPI is dated from 2005 to 2014. In 2014, the MPI reported estimations from 2003 to 2013 along with China WHS 2002. In 2013, MPI estimations were carried out using data from 2002-2011; in 2011 from 2000-2010; and in 2010 from 2000-2008.

Changes over time: The 2016 Global MPI table 6, which previously covered 34 countries, now presents harmonised inter-temporal estimations using 41 datasets of 19 countries. Harmonised datasets are presented in order to make rigorous comparisons of changes in MPI and its associated statistics over time.

Policies regarding population figures and complementary information

As stated in the 2014 Methodological Note, the surveys are dated according to the year in which the fieldwork took place, as detailed in the survey report. If the fieldwork took place during two calendar years, the data will be labelled with both years, e.g. 2010/11.

In this case, the population figures indicated as those of the year of the survey, as well as the complementary information, will correspond to the second calendar year, or the closest available year with information.

Population figures are reported for 2011 and 2012, using the 2012 Revision of World Population Prospects (UNDESA 2012). When, for illustrative purposes, regional aggregates are presented, 2012 population data are employed. Aggregate MPI estimates in 2015 used 2011 population data, in 2014 used 2010 population data, and in 2013 used 2009 population data. The population year used for aggregate estimates changes by one year annually in the summer updates.

2 Recent surveys for other countries/years (Uruguay MICS 2014, Egypt HIS 2015, Cuba MICS 2014, and Panama MICS 2013) were also considered but eventually dismissed from the calculations of the MPI 2016 because they do not satisfy the policies for updating, which are explained in the 2013 Methodological Note.

2. The MPI Methodology: Poverty, Vulnerability, and Severe Poverty

The MPI is a measure of acute global poverty developed by the Oxford Poverty and Human Development Initiative (OPHI) with the United Nations Development Programme's *Human Development Report* Office (Alkire and Santos 2010, 2014; UNDP 2010 and previous methodological notes). The index belongs to the family of measures developed by Alkire and Foster (2007, 2011); Alkire, Foster, Seth, Santos, Roche and Ballon (2015). In particular, it is an application of the adjusted headcount ratio, M_0. This methodology requires determining the unit of analysis (here the household), identifying the set of indicators in which each person is deprived at the same time and summarizing their poverty profile in a weighted deprivation score. Persons are identified as multidimensionally poor if their deprivation score exceeds a cross-dimensional poverty cutoff. The proportion of poor people and their average deprivation score (i.e. the 'intensity' of poverty or percentage of simultaneous deprivations they experience) become part of the final poverty measure. A more formal explanation of the methodology is presented in Alkire and Santos (2014) and in Alkire and Foster (2011).

The 2016 global MPI assesses multidimensional poverty for people in 102 countries for which data from 2005 onwards are available.[3] As summarized in Table 1, the MPI uses information from 10 indicators which are organised into three dimensions:[4] health, education and living standards, following the same dimensions and weights as the Human Development Index (HDI). Each person is identified as deprived or non-deprived in each indicator based on a deprivation cutoff (more details in Alkire and Santos 2010). Health and Education indicators reflect achievements of all household members. Then, each person's deprivation score is constructed based on a weighted average of the deprivations they experience using a nested weight structure: equal weight across dimension and equal weight for each indicator within dimensions. Finally, a poverty cutoff of 33.33% identifies as multidimensionally poor those people whose deprivation score meets or exceeds this threshold.

The MPI reflects both the **incidence** or headcount ratio (H) of poverty – the proportion of the population that is multidimensionally poor – and the average **intensity** (A) of their poverty – the average proportion of indicators in which poor people are deprived. The MPI is calculated by multiplying the incidence of poverty by the average intensity across the poor ($H \times A$). A person is identified as poor if he or she is deprived in at least one third of the weighted indicators. Those identified as 'Vulnerable to Poverty' are

3 MPI estimations prior to 2004 are available on table 7 of the MPI online resrouces.

4 For a more detailed description of the indicator definitions, see Alkire and Santos (2010) and Alkire Roche Santos and Seth (2011).

deprived in 20% – 33.33% of weighted indicators and those identified as in 'Severe Poverty' are deprived in 50% or more of the dimensions.

Table 1 presents the dimensions, indicators, deprivation cutoffs, and weights used in the global MPI 2016, which have not changed.

Table 1: The dimensions, indicators, deprivation cutoffs and weights of the MPI

Dimensions of poverty	Indicator	Deprived if…	Weight
Education	Years of Schooling	No household member aged 10 years or older has completed five years of schooling.	1/6
	Child School Attendance	Any school-aged child[+] is not attending school up to the age at which he/she would complete class 8.	1/6
Health	Child Mortality	Any child has died in the family in the five-year period preceding the survey	1/6
	Nutrition	Any adult under 70 years of age, or any child for whom there is nutritional information is undernourished in terms of weight for age[*].	1/6
Living Standard	Electricity	The household has no electricity.	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[**].	1/18
	Improved Drinking Water	The household does not have access to improved drinking water (according to MDG guidelines) or safe drinking water is at least a 30-minute walk from home, roundtrip[***].	1/18
	Flooring	The household has a dirt, sand, dung or 'other' (unspecified) type of floor.	1/18
	Cooking Fuel	The household cooks with dung, wood or charcoal.	1/18
	Assets ownership	The household does not own more than one radio, TV, telephone, bicycle, motorbike or refrigerator and does not own a car or truck.	1/18

Note for Table 1:
[+] Data Source for age children start school: United Nations Educational, Scientific and Cultural Organization, Institute for Statistics database, Table 1. Education systems [UIS, http://stats.uis.unesco.org/unesco/TableViewer/tableView.aspx?ReportId=163].
[*]Adults are considered malnourished if their BMI is below 18.5 m/kg^2. Children are considered malnourished if their z-score of weight-for-age is below minus two standard deviations from the median of the reference population.
[**]A household is considered to have access to improved sanitation if it has some type of flush toilet or latrine, or ventilated improved pit or composting toilet, provided that they are not shared.
[***]A household has access to clean drinking water if the water source is any of the following types: piped water, public tap, borehole or pump, protected well, protected spring or rainwater, and it is within a distance of 30 minutes' walk (roundtrip).
Source: Alkire and Santos (2010). For details on the rationale behind each indicator, please see Alkire and Santos (2010, 2013). If survey reports use other definitions of 'adequate' sanitation or 'safe' drinking water we follow the survey reports.

3. The Measurement of Destitution and of Inequality among the Poor

Since 2014, to illustrate the ability of the MPI to consider the 'depth' of deprivations rigorously although data may be ordinal, OPHI have estimated a linked poverty measure, referred to as 'destitution'. The destitution measure has precisely the same dimensions, indicators, weights, and poverty cutoffs as the MPI. Only one set of parameters changes: the deprivation cutoffs. The cutoffs for 8 of the 10 indicators reflect more extreme deprivations. As a result, the destitution measure identifies a strict subset of the MPI poor who are also deprived in at least one-third of the indicators according to the destitution cutoffs.

That is, those identified as 'destitute' are deprived in at least one third or more of the same weighted indicators with more extreme deprivation cutoffs (as described in Table 2). Data on destitution is available for 101 of the 102 countries analysed in the 2016 MPI. For details, see Alkire, Conconi and Seth (2014b).

Table 2: The dimensions, indicators, deprivation cutoffs and weights for measuring destitution

Dimensions of poverty (same as for standard MPI)	Indicator (same as for standard MPI)	Deprived if…
Education	Years of Schooling	No household member has completed **at least one** year of schooling.
	Child School Attendance	**No children** are attending school up to the age at which they should finish **class 6.**
Health	Child Mortality	**2 or more children have died** in the household.
	Nutrition	There is **severe undernourishment** of any adult under 70 years of age (**BMI<17kg/m²**) or of any child (**-3 standard deviations** from the median).
Living Standard	Electricity	The household has no electricity (**no change**).
	Improved Sanitation	There is **no sanitation facility (open defecation).**
	Improved Drinking Water	The household does not have access to safe drinking water, or safe water is more than a **45-minute** walk (round trip).
	Flooring	The household has a dirt, sand, or dung floor (**no change**).
	Cooking Fuel	The household cooks with dung or wood (**coal/lignite/charcoal are now non-deprived**).
	Assets ownership	The household has **no assets (radio, mobile phone, refrigerator, etc.)** and no car.

Since 2014 OPHI has also reported the level of inequality in deprivation scores among the poor, both at the national level and within subnational regions, by using a separate, decomposable inequality measure. OPHI also uses the measure to assess disparity across subnational MPIs. Seth and Alkire (2014) proposed an additively decomposable inequality measure which is a positive multiple of "variance" and which can be broken down into a within-group and a between-group component. For measuring inequality among

the poor at the national or subnational level, the inequality measure I^q uses the vector of deprivation scores of the q poor people $c_i(k)$.

$$I^q = \frac{\tilde{\beta}}{q}\sum_{i=1}^{q}[c_i(k) - A]^2.$$

The difference between each poor person's deprivation score and average intensity is squared, and the squared distances summed and multiplied by a constant $\tilde{\beta}$ to create the measure of inequality. The deprivation scores of the poor range between 1/3 and 1, and so we set $\tilde{\beta} = 1/9$. This is the maximum possible value the inequality measure can take given the range of deprivation scores and thus ensures that the inequality measure is bounded between zero and one. In the 2015/16 MPI estimations, inequality among the poor at the national level varies from 0.006 to 0.300, and inequality among the poor at the subnational level varies from 0 to 0.351.

A lower level of inequality among the poor or a reduction in the level of inequality among the poor, however, may not mean that poverty has uniformly gone down in all regions or population subgroups.

For further details of the measure and how it is applied, see Seth and Alkire (2014).

4. Changes over Time

A strong motivation for computing multidimensional poverty is to track and analyse changes over time. This section describes how to compare M_0 and its associated partial indices (as well as Destitution measures) over time using repeated cross-sectional data, which are the most widely available data.

The basic component of poverty comparisons is the absolute pace of change across periods. The **absolute rate of change** is the simple difference in poverty levels between two periods. We denote the initial period by t^1 and the final period by t^2, and the corresponding achievement matrices for these two periods by X_{t^1} and X_{t^2}, respectively. The same set of parameters – deprivation cutoff vector z, weight vector w and poverty cutoff k – are used in each period.

The **absolute rate of change** (Δ) is the difference in MPIs between two periods and is computed as

$$\Delta MPI = MPI(X_{t^2}) - MPI(X_{t^1}).$$

Similarly, for H and A:

$$\Delta H = H(X_{t^2}) - H(X_{t^1}).$$

$$\Delta A = A(X_{t^2}) - A(X_{t^1}).$$

The absolute rate of change is indifferent to the initial level. For example, a 5 percentage point reduction of H could mean that H decreased from 75% to 70% or from 10% to 5%.

Changes (increases or decreases) in poverty across two time periods are also evaluated using relative rates. The **relative rate of change** is the difference in poverty as a percentage of the initial poverty level. Interpreting the analysis of absolute and relative changes together provides a clear sense of overall progress.

The **relative rate of change** (δ) is computed for the MPI (and similarly for H, and A which are not presented) as

$$\delta MPI = \frac{MPI(X_{t^2}) - MPI(X_{t^1})}{MPI(X_{t^1})} \times 100.$$

The absolute and relative changes, however, are not comparable for different countries when the reference periods are of different length. To compare the rates of poverty reduction across countries that have different periods of reference, annualized changes are used. The **annualized absolute rate of change** ($\overline{\Delta}$) is the difference in the MPI between two periods divided by the difference in the two time periods ($t^2 - t^1$) and is computed for the MPI as

$$\bar{\Delta} MPI = \frac{MPI(X_{t^2}) - MPI(X_{t^1})}{t^2 - t^1}.$$

The **annualized relative rate of change** ($\overline{\delta}$) is the compound rate of reduction in the MPI per year between the initial and the final periods, and is computed for the MPI as

$$\bar{\delta} MPI = \left[\left(\frac{MPI(X_{t^2})}{MPI(X_{t^1})} \right)^{\frac{1}{t^2 - t^1}} - 1 \right] \times 100.$$

The same formula can be used to compute and report annualized changes in the other partial indices, namely H, A, censored headcounts, or percent contributions. And all of these formulas may be used for MPI or for destitution measures.

The reductions in MPI can be broken down by dimensions. An analysis of changes in MPI considers both changes in the raw or uncensored headcount ratios (h_j) and in the censored headcount ratios ($h_j(k)$). The changes in censored headcount ratios depict changes in deprivations among the poor.

Changes in the national MPI can be decomposed by subnational regions, ethnic groups, or other population subgroups. That is, poverty in each period can be expressed as: $\text{MPI} = \sum_{\ell=1}^{m} v^{\ell} \text{MPI}(X^{\ell})$, where $\text{MPI}(X^{\ell})$ and $v^{\ell} = n^{\ell}/n$ denote the MPI and the population share of subgroup ℓ, respectively. It can be extremely useful to analyse poverty changes by population subgroups, to see if the poorest

subgroups reduced poverty faster than less poor subgroups, and to see the dimensional composition of reduction across subgroups (Alkire and Seth 2013, Alkire and Roche 2013, Alkire, Roche and Vaz 2014, Alkire, Jindra, Robles and Vaz 2016). Population shares for each time period must be analysed alongside subgroup trends in order to take into account demographic shifts such as migration or population growth.

Note that if the time period between two surveys is shorter than 3 years, we additionally calculate and compare the annualised rates of change for countries with significant absolute reductions in MPI using the actual months that passed between fielding of the two surveys.

Countries, data, and time periods

For this round of changes in multidimensional poverty over time, additional data for 19 countries are harmonised and analysed. These additional countries are Burundi, Burkina Faso, Central African Republic, Cote d'Ivoire, The Democratic Republic of the Congo, The Republic of the Congo, Comoros, Guinea, Gambia, Liberia, Mali, Mauritania, Nigeria, Senegal, Sierra Leone, Sao Tome and Principe, Togo, South Africa and Zimbabwe.

The main data source for the analysis of the changes over time for the first round of countries was DHS. For the second round, different surveys are used to calculate the changes in multidimensional poverty (see table 3). Still most - 10 out of 25 - of the comparisons use DHS data in both time periods.[5] The countries for which DHS data only are used are The Democratic Republic of the Congo, The Republic of the Congo, Liberia, Mali, Nigeria, and Sierra Leone. The comparisons for the Central African Republic and Mauritania are based on MICS data for both years. Four comparisons use MICS data in t_1 and DHS data in t_2 (Burundi, Gambia, Sao Tome and Principe, and Togo), while the comparison for Comoros is based on MICS data in t_1 and DHS/MICS data in t_2 and for Zimbabwe on a DHS in t_1 and MICS in t_2. For Burkina Faso, Cote d'Ivoire, Guinea and the first Senegal comparison, the data for t_1 are DHS while the data for t_2 are DHS/MICS. The second comparison for Senegal is based on DHS/MICS data in t_1 and DHS – continuous in t_2. The comparison of the first and the last available time period for Senegal is based on DHS in t_1 and DHS – continuous in t_2. Lastly, the calculations for South Africa use NIDS data.[6]

The average range between the two time periods is 2.4 years for the 25 comparisons. 80 percent of the comparisons have a time range between 3.5 and 8.5 years. In the case of two comparisons the survey

5 16 countries have only one comparison. For three countries, Senegal, Nigeria, and The Republic of Congo, three time periods are used and thus 3 comparisons for each of these countries conducted.

6 Due to difficulties in identifying the correct approach to take into account the complex survey design for the NIDS panel data, we treated both waves as single cross-sections and used the PSUs from wave one in both waves to estimate standard errors. However, we did not take into account stratification for wave two. This approach should lead to conservative variance estimates and is thus justifiable.

periods are 2 or 2.5 years apart, while for another two we compare surveys that are done 10 years apart. For one comparison the second survey is conducted twelve years after the first one. The effective sample size ranges from 10258 for Sao Tome and Principe in 2000 to 173218 in Nigeria in 2013, while the average sample size is 43920.

Table 3 - Countries, time periods, and data

Country	Time period	Surveys
Burundi	2005 - 2010	MICS-DHS
Burkina Faso	2003 - 2010	DHS-DHS/MICS
Central African Republic	2000 - 2010	MICS-MICS
Cote d'Ivoire	2005 - 2011/12	DHS-DHS/MICS
Congo, Democratic Republic of the	2007 - 2013/14	DHS-DHS
The Republic of the Congo	2005 - 2009	DHS-DHS
The Republic of the Congo	2009 - 2011/12	DHS-DHS
The Republic of the Congo	2005 - 2011/12	DHS-DHS
Comoros	2000 - 2012	MICS-DHS/MICS
Guinea	2005 - 2012	DHS-DHS/MICS
Gambia	2006 - 2013	MICS-DHS
Liberia	2007 - 2013	DHS-DHS
Mali	2006 - 2012/13	DHS-DHS
Mauritania	2007 - 2011	MICS-MICS
Nigeria	2003 - 2008	DHS-DHS
Nigeria	2008 - 2013	DHS-DHS
Nigeria	2003 - 2013	DHS-DHS
Senegal	2005 - 2010/11	DHS-DHS/MICS
Senegal	2010/11 - 2012/13	DHS/MICS-Continuous DHS
Senegal	2005 - 2012/13	DHS-Continuous DHS
Sierra Leone	2008 - 2013	DHS-DHS
Sao Tome and Principe	2000 - 2008/09	MICS-DHS
Togo	2010 - 2013/14	MICS-DHS
South Africa	2008 - 2012	NIDS-NIDS
Zimbabwe	2010/11 - 2014	DHS-MICS

5. Considerations by Country

This section comments on the methodological details for the analysis of 15 country datasets updated in June 2016 and 41 harmonised datasets of 19 countries for changes over time.

a) New country datasets

Bangladesh (MICS 2012-13): Nutritional information was collected for every child under 5; children with the presence of oedema were considered as being underweight for MPI and destitution purposes.

Child mortality information is provided by ever-married women aged 15 to 49. Page 49 of the MICS report does not consider 'no food cooked' and 'other' responses to types of fuel to reflect inadequate clean cooking fuel, and this MPI estimation follows that categorization for cooking fuel. Table WS.5 on page 60 reports that 'no facility/bush/field' is neither improved nor unimproved toilet, but the MPI considers no facility/bush/field as deprived. Table WS1 on page 54 states 'missing' source of water as unimproved but it has been considered as missing information for the MPI. The same table states that 'spring and other' sources of non-drinking water are non-improved when drinking water is bottled, and so likewise it is considered as deprived for the purpose of MPI. Survey estimates are disaggregated by rural and urban areas and 64 zilas or districts. This MPI was first published in December 2015.

Bangladesh (DHS 2014): Nutritional information was collected for every eligible child under 5 and women aged 15 to 49 years old; there are 60 children not listed in the household roster yet they were considered as part of household because they have a valid anthropometric measure. Child mortality information is provided by eligible women aged 15 to 49. Table 2.6 on page 15 of the report does not consider 'no food cooked' and 'other' responses to types of fuel to reflect inadequate clean cooking fuel, and this MPI estimation follows that categorization for cooking fuel. Table 2.2 on page 11 establishes that toilet which 'flush to somewhere else / do not know where' are not improved sources of toilet and are considered as such for the MPI. 'Other' toilet facility is not classified in the report, but the MPI considers it as deprived. Table 2.1 on page 10 states all types of bottled water are considered as improved water source. 'Other' source of water is considered as unimproved for the MPI. Survey estimates are disaggregated by rural and urban areas and 7 regions. This MPI was first published in June 2016.

Brazil (PNAD 2014): This survey lacks of information on nutrition, floor and bicycle in the household. Child mortality information is provided by all women aged 10 and above, but this MPI calculation considers only occurrences of child mortality among women aged 15 to 49 years old, in order to maintain comparability with other estimations. The report specifies that adequate sanitation is when toilet is piped to the general sewage net or septic tank linked to general collection net and this definition guided the code of this MPI; 'fossa rudimental' is considered as non-improved. The report specifies that adequate water is when it is piped or comes from the general network, and this definition guided the code of this MPI. The time to fetch water is not available and so the water indicator has the same definition for MPI and destitution. The report does not offer guidelines on fuel so 'other' fuel was considered as solid fuel. Survey estimates are disaggregated by rural and urban areas and by units of the federation. This MPI was first published in June 2016.

Cambodia (DHS 2014): The DHS report establishes that 2/3 of the households were eligible to gather children's and 15-49-year-old women's anthropometric measures, which also follows the hemoglobin subsample (p. 7-8). Following guidelines from the Methodological Note 2013 (Alkire, Conconi and Roche 2013), the MPI estimation is based on this subsample. Child mortality information was provided by all eligible women and 1/3 of the men aged 15-49. Table 6.2 on p. 19 considers sources of water in both wet and dry seasons, and establishes that 70% of households use the same source of water in both seasons. This MPI calculation considers the sources of water during dry season only. The same table also considers 'other' sources as non-improved, and so does this MPI estimation. The report does not consider 'no food cooked at home' as solid fuel (p. 22), and this MPI calculation follows the report. The DHS report considers toilets that 'flush to somewhere else' and 'flush don't know where' as non-improved toilet (p. 20), and so does this estimation of MPI; missing information of toilet is considered as non-improved toilet in the report, but missing information is considered as missing for the purpose of MPI. Floating house was considered as having improved flooring. Survey estimates are disaggregated by rural and urban areas and 19 domains (subnational areas). This MPI was first published in December 2015.

Ghana (DHS 2014): Anthropometric measures were gathered among 50% of eligible women aged 15 to 49, their children aged zero to five, and men aged 15-59 (p. 5). Following guidelines from the Methodological Note 2013 (Alkire, Conconi and Roche 2013), the MPI estimation is based on this subsample. Moreover, the report considers 'no food cooked in household' as improved fuel (p. 15) and this estimation of MPI considers the latter category as improved. This MPI calculation considers 'flush somewhere else' and 'flush do not know where' as non-improved toilet following the report (p. 14) and 'other' type of toilets are also considered as non-improved. Table 2.1, footnote 1 on p. 13 mentions that 2014 Ghana DHS did not collect information on the secondary source of water, and the quality of bottled/sachet water is not known, but they consider this source of water as improved to ensure consistency with 2008 GDHS. 'Other' sources of water are considered as non-improved in this MPI calculation. Section 2.8.2 on p. 28 establishes the primary school age at 6 to 11 years old. Survey estimates are disaggregated by rural and urban areas and 10 administrative regions. This MPI was first published in December 2015.

Jamaica (JSLC 2012): The survey lacks of information on child mortality and floor. It can provide representative information if disaggregated at urban and rural areas and parishes. The MPI estimation is based on *de facto* household members as only those have information on education. Information on child mortality and type of floor was absent from the survey. Kindergarten and adult education are not considered as part of the years of schooling indicator. Distance to water equal or larger than 1000 meters is considered as non-MDG standard. Distances equal or larger

than 100,000 meters are considered as missing information. It is assumed that the household has no reliable access to electricity when its main source of lightening is kerosene or other. Following our guidelines to compute subnational figures (Alkire, Roche and Seth 2011), subnational decomposition is reported after a bias analysis due to a sample loss greater than 15% in St. Ann and St. James, as no significant bias was detected. This MPI was first published in June 2016.

Kenya (DHS 2014): Anthropometric measures are available for children under five and women aged 15 to 49 living in 50% of the households interviewed, so this MPI estimation is based on that subsample. Child mortality information is available from eligible men and women. Toilets that 'flush to somewhere else' or flush to unknown place were considered as non-improved following table 2.2 on p. 14 of the report. Table 2.1 on p. 12 does not consider 'other' sources of water as improved nor non-improved, but the MPI considers it as non-improved; and all types of bottled water are considered as improved water source in the report. Table 2.3 on p. 15 of the report establishes that 'no food cooked' and 'other' types of fuel do not reflect inadequate cooking fuel and this MP follows the report. Information is disaggregated at urban, rural and regional level and this MPI was first published in June 2016.

Kyrgyzstan (MICS 2014): Anthropometric measures are available for all children under five and the presence of oedema was considered as severe malnutrition. Education beyond 'basic secondary' was assumed to be preceded by 9 years of schooling, according to communication with the country survey team. Information is disaggregated at urban and rural level, but disaggregation at regional level is not reported because the MPI value is low to provide meaningful estimates. This MPI was first published in June 2016

Malawi (MICS 2013-14): Anthropometric information was collected for all children under 5. Child mortality information was collected from all women aged 15-49, and 1/3 of men in the same age group. Definitions of non-improved toilet and source of drinking water followed the report. Page 166 of the report establishes 6 as the age to start primary education. 'No food cooked in household' is considered as an improved source of cooking fuel according to the report and this approach was followed in this estimation. Survey estimates are disaggregated by rural and urban areas and 27 districts. This MPI was first published in 2015.

Nepal (MICS 2014): Anthropometric measures are available for all children under five and the presence of oedema was considered as severe malnutrition. Missing type of toilet and water were considered as missing information. Information is disaggregated at urban and rural level and for 15 ecozones. This MPI was first published in June 2016.

Rwanda (DHS 2014/15): Anthropometric information of women aged 15 to 49 and children aged 0 to 5 was gathered from a subsample of half of the households interviewed. The remaining 50% of households were selected for measurement of height and weight of men aged 15 to 59. However, 10% of the households had no one eligible to provide anthropometric information and in some of them some people may have been excluded from the measurement because they did not belong to the assigned sample. Following guidelines from the Methodological Note 2013 (Alkire, Conconi and Roche 2013), the MPI estimation is based on the households that provided information on nutrition depending their subsample, effectively being 90% of the original sample. Child mortality is available from men and women eligible in the household. The DHS report considers toilets that 'flush to somewhere else' and 'flush do not know where' are non-improved toilet facilities and this estimation of MPI follows the report. 'No food cooked' and 'other' sources of cooking fuel are considered as improved cooking fuels. Information is disaggregated at urban, rural and regional level and this was first published in June 2016.

State of Palestine (MICS 2014): Anthropometric measures are available for all children under five. Child mortality is only available for married women aged 15 to 49. Missing type of toilet and water were consider as missing information, contrary to the report. Table WS.5 on page 89 of the report stablishes no facility/bush/field is neither improved nor unimproved toilet, but this MPI calculation considers 'no facility' as deprived for the purposes of destitution. Page 49 of the report considers that 'no food cooked' and 'other' types of fuel do not reflect inadequate cooking fuel and this MP follows the report. Table WS1 on p. 82 states that 'bottled water' as a main source of drinking water is unimproved if the source of non-drinking water is unimproved, and this MPI follows the report on this. The information for smart mobile telephone was considered as part of mobile phone. The survey does not have information on bicycles or motorbikes. Information is disaggregated at urban and rural level, but disaggregation at regional level is not reported because the MPI value is too low to provide meaningful estimates. This MPI was first published in June 2016.

Turkmenistan (MICS 2006) Anthropometric information was collected from all children under 5. Information on child mortality was collected from women aged 15-49. All cases of bottled water are considered as improved sources of water on p. 75. Page 49 of the report does not establish that 'no food cooked in household' and 'other' fuels are inadequate cooking fuel. The MPI follows this definition. Information is disaggregated for urban and rural areas, as well as for 5 regions and this MPI was firstly published in June 2016.

Viet Nam (MICS 2013/14) Anthropometric information was collected from all children under 5. Information on child mortality was collected from women aged 15-49. Cases of bottled drinking water are classified as non-improved if the household has a non-improved source of non-drinking water, following p. 113 of the report. As opposed to the report, this MPI estimation considers 'no facility and open air defecation' as non-improved toilet and missing type of toilet as missing information. 'No food cooked in household' is improved cooking fuel on table CH12 on p. 107 of the report. The MPI follows this definition and is disaggregated at urban level and for 6 regions. This MPI was firstly published in June 2016.

Yemen (DHS 2013): Table 5.4 on p. 45 establishes that information on child mortality was not gathered from never-married women who are assumed to have 0 events of child mortality. This calculation of MPI assumes the same premise. The definition of deprivation in source of drinking water coincides with the non-improved categories reported in table 2.1, where the category of 'container' is included among the non-improved 'other' water sources and in page 9 of the report. Section 2.8 of the report establishes that the fundamental level of education lasts for 9 years. We use UNESCO reported starting school age which is 6 years old. Anthropometric information was gathered among all eligible women and their children. The report warns that the proportion of children with complete anthropometric data was only 87% and that the interpretation of results for Hadramout, Shabwah, and Sadah may be biased due to missing values. However, given the fact that the nutrition indicator is aggregated at household level and is formed by both child and adult malnutrition, the missing information on child nutrition in the household may be complemented by other household members' nutrition information: if there is data and a deprivation can be observed in one household member, then the data are not missing. In this case, the nutrition indicator was considered of good quality as taking all household members together it has only 1.32% of missing values at national level and less than 10% of missing values at any given region. MPI estimates are disaggregated by rural and urban areas and by 21 governorates. This MPI was first published in December 2015.

b) Harmonised datasets for changes over time

A harmonization process was performed to create rigorous comparability across surveys of different years for the same country, in order to permit statements of how MPI had changed. The harmonised surveys use precisely the same indicator and response category definitions, and the same list of assets in the asset ownership indicator. Details are given in Alkire Roche and Vaz (2014). The modifications performed on each dataset are detailed below by country.

Burundi: The age range for compulsory schooling was changed to 7 to 15 years for the harmonised school attendance indicator for 2005. In 2005, information on nutrition was not collected and thus the comparable MPI for 2009 is recomputed without it. Missing values for floor material and cooking fuel were treated as such for the comparable floor and cooking fuel indicators in 2005. The published figures were 0.530 and 0.454. The comparable data show a decrease from 0.503 to 0.434.

Burkina Faso: Households that do not cook food at home are coded as non-deprived for the harmonised cooking fuel indicator 2010 to fit the indicator definition in 2003. Other was coded deprived for the comparable indicator for floor in 2010 to mirror the coding of the 2003 MPI. In 2003, households were not asked whether they possess a mobile phone and thus this information was not taken into account for the comparable asset indicator in 2010. For the comparable MPI 2010, people are deprived of access to safe water if the water source is equal to or more than 30 minutes away. Individuals aged 10 years and older are used as the reference population for the indicator of years of schooling for the comparable 2010 years of schooling indicator and the indicator is treated as missing if more than 2/3 of the usual residents of the household have missing information on years of schooling. 2003 is a backward calculation, therefore there are no published results. The published global MPI value for 2010 is 0.535, while the comparable MPI is slightly higher at 0.545. The comparable results indicate a decrease in poverty from 0.62 to 0.545.

Central African Republic: In 2000, the survey did not collect information on the material of the floor of the dwelling. Hence the comparable MPI for 2010 was estimated without taking the available information into account. Individuals aged 10 years and older are the reference population for the indicator of years of schooling. We also considered the years of schooling indicator as missing for the comparable MPI indicator in 2000 if more than 2/3 of the usual residents of the household have missing information on years of schooling. Missing values for electricity were treated as missing for the comparable MPI 2000, not the published. Following the report for the Central Africa Republic 2000, missing values on sanitation were coded as unimproved for the comparable MPI 2000. In 2000 there was no information on whether households share a toilet. Hence for the comparable MPI for 2010, this information was not taken into account. Public tap/standpipe was coded as non-improved for the published MPI 2000 for the water indicator but coded as improved for the comparable MPI 2000 to match the report. There was no information on either mobile phone or phone in 2000. The 2010 asset indicator was therefore recomputed without taking into account this information. Results for the comparable MPI are not representative of the entire country because the province Vakaga was not included in 2010 due to insecurity. While the published results were 0.512 and 0.43; the strictly harmonised findings show a decrease from 0.503 to 0.44 for the comparable MPI.

Comoros: There was no anthropometric information for women in 2000, hence in order to harmonize the indicator for nutrition, the anthropometric information for women in 2012 was not taken into account for the comparable 2012 MPI indicator. In order to match the indicator definition of 2000, rainwater was coded as improved category for the comparable water indicator in 2012. Other was coded as improved category for the comparable 2000 cooking fuel indicator to match the 2012 definition. In 2000 there was no information on household possession of mobile phones, bicycles and motorcycles. To harmonise the indicator definition of the asset indicator, the comparable indicator for 2012 does not take this information into account. The published data were 0.408 and 0.173, the strictly harmonised findings show a decrease from 0.408 to 0.159.

Côte d'Ivoire: There was no information on nutrition and cooking fuel in 2005, thus both indicators were not used for the comparable MPI for 2011/12. Additionally, information on whether the household shares the sanitation facilities was not collected in 2005, hence this information was not taken into account for the comparable MPI in 2011/12. Information on time to water was missing for 2005 as well and thus for the computation of the water indicator for 2011/12 this was not used in the comparable version. Mobile phone was not included in the list of assets for 2005 due to lack of data, thus the information was not taken into account when computing the comparable asset indicator for 2011/12. The published results for Côte d'Ivoire were 0.353 and 0.310. The reduction in poverty based on the comparable indicators is from 0.353 to 0.304.

Democratic Republic of Congo: For the published version of the global MPI for 2007 the anthropometric subsample was not taken into account. For the comparable MPI 2007, we use information for those households only that were part of the anthropometric subsample. In order match the indicator definition for 2013/14, flush to don't know where and flush to somewhere else are coded as improved categories for 2007 for the comparable version of the sanitation indicator. The indicator definition for cooking fuel was harmonized by defining no food cooked in household as improved category for the comparable MPI 2007. The results are not representative for the entire country as we faced issues reproducing the strata variable for the region Maniema and hence dropped this region for the calculations. The comparable results show a decrease of MPI from 0.527 to 0.401.

The Republic of Congo: In 2009, no information on anthropometric measures was collected. The comparable MPIs for 2005 and 2011/12 were recomputed without the nutrition indicator. In 2009, only female participants were asked the child mortality questions, hence the child mortality indicators for 2005 and 2011/12 were recomputed matching the definition from 2009. In 2009, the data do not contain information on the time to water. In order to match the indicator definition

for 2009, the comparable MPI indicators for safe drinking water for 2005 and 2011/12 were recomputed without taken into account the information on time to source of drinking water. Between 2005 and 2009, the published results show a decrease from 0.27 to 0.208, while the comparable results show a slightly smaller decrease from 0.26 to 0.208. For the time period between 2009 and 2011/12, the published results were 0.208 and 0.181. The comparable results show decrease from 0.208 to 0.167.

Guinea: There was no information on household possession of mobile phones in 2005, hence the comparable asset indicator for 2012 was calculated without taking the available information into account. The anthropometric subsample was not taken into account for the previously published results of 2005 but was for the comparable global MPI for 2005. The published results were 0.506 and 0. 459. The comparable results show a decrease from 0.557 to 0.472.

Gambia: Anthropometric measures for women were not available for 2006 but for 2013. Thus the comparable MPI for 2013 was recalculated without taking the anthropometric information for women into account. For 2013, other was recoded as improved for the comparable floor indicator, while for 2006 wood was coded as improved for the comparable indicator. To make the indicator for cooking fuel comparable across the time periods, other was coded as unimproved for 2013. The published data were 0.324 and 0.323, but the comparable results show a decrease in poverty from 0.336 to 0.253.

Liberia: The 2007 DHS survey contained anthropometric measures for women and children only. For the comparable MPI 2013, the anthropometric measures for men were not taken into account to assure comparability. In order to match the definition of the sanitation indicator in 2013, flush to don't know and flush to somewhere else are considered unimproved categories for the 2007 comparable MPI estimate. To match the definition of the 2013 MPI estimate, households who do not cook food at home are considered as non-deprived in the cooking fuel indicator in the comparable 2007 MPI indicator of cooking fuel. The published results were 0.485 and 0.374. The harmonised comparable results show decrease from 0.485 to 0.358.

Mali: For Mali 2005, the threshold for 'time to water' was set to be greater or equal to 30 mins, in order to match the 2013 definition. Other is considered part of solid cooking fuel for the comparable MPI 2005. For years of schooling, individuals aged 10 years and older are considered to be the reference population and the indicator is missing if more than 2/3 of the usual residents of the household have missing information on it for 2005. Results are not representative for the whole country because some regions could not be visited in 2012/13 due to armed conflicts. These

regions are Gao, Timbuktu and Kidal. The published data were 0.558 and 0.457. The harmonized results show decrease from 0.559 to 0.469.

Mauritania: In order to make the 2007 years of schooling indicator comparable, individuals aged 10 years and older are the reference population for the indicator of years of schooling for the comparable MPI indicator 'years of schooling for 2007' and the indicator is considered missing if more than 2/3 of the usual residents of the household have missing information. To match the indicator definition for improved sanitation of 2007, flush don't know where was recoded as improved for the comparable 2011 indicator. For the comparable MPI 2007 people with safe drinking water are defined as being deprived if their walking distance to the safe source of water is greater or equal than 30 minutes round trip. In order to match the 2007 definition of improved floor, other was coded as non-deprived for the comparable floor indicator for 2011. Other was coded as deprived for the 2007 comparable cooking fuel indicator to match the indicator definition of 2011. There was no information on the possession of bicycles for 2007. Hence the comparable MPI was computed based on an asset indicator without this information. While the published results were 0.352 and 0.285, the comparable results show a reduction from 0.355 to 0.285.

Nigeria: For Nigeria 2003 and 2008, individuals aged 10 years and older are the reference population for the indicator of years of schooling for the comparable version of the MPI and the indicator is considered missing if more than 2/3 of the usual residents of the household have missing information. In order to match the definitions of improved sanitation for 2003 and 2008, flush to somewhere else and flush don't know where were coded as improved for the comparable MPI 2013. The surveys for 2008 and 2013 have information on the possession of mobile phones, while 2003 did not include the question. The comparable asset indicators for 2008 and 2013 were computed without the information on mobile phones. The 2003 MPI value of 0.368 is comparable. The published MPI values for 2008 and 2013 were 0.31 and 0.303, but the comparable MPI takes a value of 0.313 for 2008 and 0.311 for 2013.

Senegal: In the original published MPI for 2005 the anthropometric subsample was not considered. For the comparable MPI 2005, it was taken into account. Additionally, the 2012/13 survey has information on anthropometric measures for children only. The comparable nutrition indicators for 2005 and 2010/11 were recomputed based on the information on children only. To adjust the child mortality indicator, only information from women was taken into account for the comparable indicators for 2005 and 2010/11. To match the indicator definition of cooking fuel in 2012/13, other was recoded as non-deprived for 2005 and 2010/11. There was no information on mobile phone possession in the early surveys. The 2012/13 comparable MPI indicator was recomputed

without mobile phone to match the earlier indicator definitions. The age range for the school attendance indicator in 2005 was coded as 7-15. This was corrected to 6-14 for the comparable 2005 MPI. The published results were 0.384 and 0.439 for 2005 and 2010/11. The comparable results show a non-significant decease from 0.383 to 0.351. For the time period from 2010/11 to 2012/13, the published data were 0.439 and 0.332. The comparable MPI values are 0.351 and 0.352.

Sierra Leone: The DHS 2008 had information on anthropometric measures for children and women, while DHS 2012/13 additionally had information for men. The comparable MPI for 2012/13 was recalculated using a nutrition indicator without the anthropometric measures for men. In 2012/13 the survey additionally collected information on the possession of mobile phones, while 2008 did not. To make the results comparable, the MPI in 2012/13 is calculated without taking this information into account. While the published data were 0.439 and 0.464, the comparable results indicate a small decrease in poverty from 0.470 to 0.464.

Sao Tome and Principe: The indicator for nutrition had to be taken out for the comparable MPI as the amount of missing values was too high, leading to concerns about the unbiasedness of the MPI estimates. Without nutrition, the sample loss is negligible. The age range for the years of schooling indicator was corrected for the comparable MPI. Information on child mortality was only available for women in 2000. The comparable MPI indicator for 2009 was recomputed using the same information only. In 2000 there was no information on either landline phone or mobile phone. For the comparable asset indicator in 2009, the information was not taken in to account. The published data were 0.236 and 0.154; the comparable MPI shows a decrease from 0.272 to 0.182.

Togo: Anthropometric measures are only available for children in MICS 2010. Comparable results for 2013/14 were recalculated using a nutrition indicator that only takes into account anthropometric measures for children. Rainwater was originally coded as deprived for 2010. In order to make the indicators comparable across time, rainwater was coded as non-deprived for the comparable MPI for 2010. In order to make the indicator for floor comparable, 'other' was recoded as non-deprived for 2013/14. No food cooked in household was recoded as non-deprived for the comparable MPI in 2010 to match the indicator definition of 2013/14. While the published results were 0.250 and 0.252, the comparable results show a non-significant decrease from 0.250 to 0.239.

South Africa: There was no information on floor materials in NIDS 2008. The comparable MPI for 2012 was calculated without taking the information on floor into account. In order to match the indicator definition for deprivation with respect to cooking fuel in 2012, solar energy is coded as non-deprived for the comparable 2008 indicator. In order to harmonise the indicator for water,

the 2008 indicator was recalculated taking into account the distance of the water source. The published are 0.057 and 0.044, while the comparable results show a decrease from 0.076 to 0.043.

Zimbabwe: For 2010/11, individuals aged 10 years and older are the reference population for the indicator of years of schooling for the comparable MPI indicator and the indicator is considered missing if more than 2/3 of the usual residents of the household have missing information on years of schooling. While there were anthropometric measures for women, men, and children in 2010/11, there was only information on nutrition for children in 2014. Thus the comparable MPI for 2014 is based on anthropometric measures for children only. To match the definition of water in 2014, people with safe drinking water are defined as being deprived if their walking distance to the safe source of water is greater or equal than thirty-minute round walk for the comparable MPI in 2010/11. In order to match the definition of improved cooking fuel for 2014, the indicator for 2010/11 was recoded such that a household which was not cooking food and the category 'other' are improved for the comparable MPI. While the published results were 0.172 and 0.127, the comparable results show a non-significant decrease from 0.136 to 0.127.

References

Alkire, S. and Robles, G. (2015). "Multidimensional Poverty Index 2015: Brief methodological note and results." *OPHI Briefing* 36, University of Oxford.

Alkire S., Conconi, A., Robles, G., Roche, J. M., Santos, M. E., and Vaz, A. (2015). "The Global Multidimensional Poverty Index (MPI): 5-year methodological note." *OPHI Briefing* 37, University of Oxford.

Alkire S., Ballon, P., Foster, J. E., Roche, J. M., Santos, M. E., and Seth, S. (2015). *Multidimensional Poverty Measurement and Analysis*. Oxford University Press.

Alkire, S., Conconi, A., and Seth, S. (2014a). "Multidimensional destitution: An ordinal counting methodology for constructing linked subsets of the poor." *OPHI Research in Progress* 42a, University of Oxford.

Alkire, S., Conconi, A., and Seth, S. (2014). "Multidimensional Poverty Index 2014: Brief methodological note and results." *OPHI Briefing* 19, University of Oxford.

Alkire, S., Conconi, A., and Roche, J. M. (2013). "Multidimensional Poverty Index 2013: Brief methodological note and results." *OPHI Briefing* 12, University of Oxford.

Alkire, S. and Foster, J. E. (2007). "Counting and multidimensional poverty measures." *OPHI Working Paper* 7, University of Oxford.

Alkire, S. and Foster, J. E. (2011). "Counting and multidimensional poverty measurement." *Journal of Public Economics*, 95(7): 476–487.

Alkire, S., Jindra, C., Robles, G., and Vaz, A. (2016). "Multidimensional poverty in Africa." *OPHI Briefing* 40, University of Oxford.

Alkire, S. and Roche, J. M. (2013). "How successful are countries in reducing multidimensional poverty? Insights from inter-temporal analyses of twenty-two countries." *Mimeo.*

Alkire, S., Roche, J. M., Santos, M. E., and Seth, S. (2011). "Multidimensional Poverty Index 2011: Brief methodological note." *OPHI Briefing* 5, University of Oxford.

Alkire, S. and Santos, M. E. (2010). "Acute multidimensional poverty: A new index for developing countries." *OPHI Working Paper* 38, University of Oxford.

Alkire, S., Roche, J. M., and Seth S. (2011). "Sub-national disparities and inter-temporal evolution of multidimensional poverty across developing countries." *OPHI Research in Progress* 32a, University of Oxford.

Alkire, S., Roche, J. M., and Vaz, A. (2014). "Multidimensional poverty dynamics: Methodology and results for 34 countries." *OPHI Research in Progress* 41a, University of Oxford.

Alkire, S., Roche, J. M., Santos, M. E., and Seth, S. (2011). "Multidimensional Poverty Index 2011." *OPHI Briefing* 7, University of Oxford.

Alkire, S. and Santos, M. E. (2013). "Measuring acute poverty using the Multidimensional Poverty Index: Robust comparisons and future prospects." *OPHI Working Paper* 59, University of Oxford.

Alkire, S., Santos, M. E., Seth, S., and Yalonetzky, G. (2010). "Is the Multidimensional Poverty Index robust to different weights?" *OPHI Research Paper* 22a, University of Oxford.

Alkire, S. and Seth, S. (2013). "Multidimensional poverty reduction in India between 1999 and 2006: Where and how?" *OPHI Working Paper* 60, University of Oxford.

DevInfo Digital Map Library, New York: UNICEF [available at DevInfo, accessed on 29 Dec 2014].

OPHI. (2015). "Multidimensional Poverty Index Data Bank." Oxford Poverty and Human Development Initiative (OPHI), University of Oxford. Available at *OPHI Global MPI*.

UNDESA. (2012). *World Population Prospects: The 2012 Revision*. United Nations, Department of Economic and Social Affairs, Population Division (June). New York.

UNDP. (2010). *Human Development Report 2010: The Real Wealth of Nations: Pathways to Human Development*. New York: Palgrave Macmillan.

Seth, S. and Alkire, S. (2014). "Measuring and decomposing inequality among the multidimensionally poor using ordinal variables: A counting approach'. *OPHI Working paper* 68, University of Oxford.

Rutstein, S.O. and Rojas, G. (2006). "Online guide to DHS statistics." Demographic and Health Surveys. Accessed in January 2013.

WHO Multicentre Growth Reference Study Group. (2006). *WHO Child Growth Standards: Length/Height-for-Age, Weight-for-Age, Weight-for-Length, Weight-for-Height and Body Mass Index-for-Age: Methods and Development*. Geneva: World Health Organization. Available online.

OPHI's Global MPI Data Bank
www.ophi.org.uk/multidimensional-poverty-index/

OPHI's Global MPI Databank contains a wealth of resources on multidimensional poverty in more than 100 developing countries, enabling users to see how poverty is experienced in different parts of the world, zoom in on sub-national regions, or explore the character of poverty by different indicators. Follow the links below to find out more.

- ✓ **MPI Country Briefings:** Short, country-specific summaries on the results of the MPI analyses. A number of the briefings include data at the sub-national level.
- ✓ **MPI Interactive Databank**: An interactive databank that enables you to navigate the world according to the MPI as a whole or by individual dimensions and indicators of MPI poverty. You can zoom in on individual countries, and choose whether you want to see how multidimensional poverty has changed over time.
- ✓ **MPI Policy Briefings**: The key policy briefings from the 2015 analysis include Alkire and Shen (2015) 'Exploring Multidimensional Poverty in China'; Alkire, Conconi, Robles and Vaz (2015) 'Destitution: Who and Where are the Poorest of the Poor?'.
- ✓ **MPI Data Tables - Main MPI Results**: A table which presents the basic MPI results and sorts 101 countries from low to high.
- ✓ **MPI Data Tables – MPI at the Sub-national Level**: This table reports the MPI, its two components - the Headcount Ratio and the Intensity of Deprivation among the poor - and other indicators of multidimensional poverty for nearly 990 regions of 78 countries.
- ✓ **MPI Data Tables – rural-urban areas**: This table gives a breakdown of MPI results by rural and urban areas for 101 countries.
- ✓ **MPI Methodology**: OPHI's MPI methodological notes explain how the global MPI is calculated and shares the updates that have taken place since it was first reported in 2010.
- ✓ **MPI Resources**: MPI publications collected in one place, including working papers and exchanges, and training material for producing a global or national MPI.
- ✓ **MPI Background**: A brief history of the MPI, including how it came to be developed for publication in UNDP's *Human Development Report*, and how it is being used now.
- ✓ **MPI Case Studies**: Stories of people who are poor according to the MPI in their country: their hopes, strengths and challenges.
- ✓ **Making your own MPI**: Adaptations of the global MPI for other purposes, such as national poverty measurement, targeting, child poverty measurement and empowerment.
- ✓ **Online training portal**: Resources on multidimensional measurement techniques, including video and audio files, lecture slides, exercises and reading lists.

Citation of this paper: Alkire, S., Jindra, C., Robles, G. and Vaz, A. (2016). "Multidimensional Poverty Index - 2016: Brief methodological note and results." *OPHI Briefing* 42, University of Oxford.