

Oxford Poverty and Human Development Initiative (OPHI)
 Oxford Department of International Development
 Queen Elizabeth House, University of Oxford
www.ophi.org.uk



Global MPI Country Briefing 2023: Tonga (East Asia and the Pacific)

The Global MPI

The global Multidimensional Poverty Index (MPI) was created using the multidimensional measurement method of Alkire and Foster (AF).¹ The global MPI is an index of acute multidimensional poverty that covers over 100 countries. It is computed using data from the most recent Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS), Pan Arab Project for Family Health (PAPFAM) and national surveys. The MPI has three dimensions and 10 indicators as illustrated in figure 1. Each dimension is equally weighted, and each indicator within a dimension is also equally weighted.² Any person who fails to meet the deprivation cutoff is identified as deprived in that indicator. See table A.1 of the appendix for a definition of each deprivation indicator.

Figure 1. Structure of the Global MPI



In the global MPI, a person is identified as multidimensionally poor or MPI poor if they are deprived in at least one third of the weighted MPI indicators. In other words, a person is MPI poor if the person's weighted deprivation score is equal to or higher than the poverty cutoff of 33.33%. Following the AF methodology, the MPI is calculated by multiplying the **incidence** of poverty (H) and the average **intensity** of poverty (A). More specifically, H is the proportion of the population that is multidimensionally poor, while A is the average proportion of dimensions in which poor people are deprived. So, $MPI = H \times A$, reflecting both the share of people in poverty and the degree to which they are deprived.

Table 1. Global MPI in Tonga

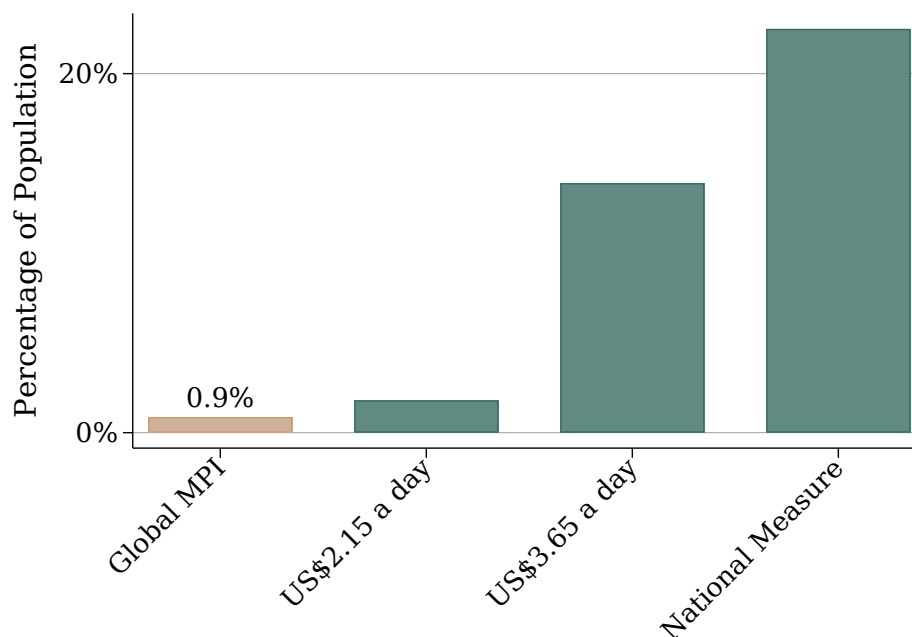
Area	MPI	H	A	Vulnerable	Severe Poverty	Population Share
National	0.003	0.9%	38.1%	6.4%	0.0%	100.0%
Urban	0.000	0.0%	–	3.3%	0.0%	22.7%
Rural	0.004	1.1%	38.1%	7.3%	0.0%	77.3%

Source: Alkire, Kanagaratnam and Suppa (2023a,b) based on MICS year 2019.

¹The method is presented in Alkire and Foster (2011). An early and prominent application was the global MPI (Alkire and Santos, 2014). For its revision in 2018 see Alkire and Kanagaratnam (2021), Alkire, Kanagaratnam, Nogales and Suppa (2022), Vollmer and Alkire (2022).

²It should be noted that the AF method can be used with different indicators, weights and cutoffs to develop national MPIs that reflect the priorities of individual countries. National MPIs are more tailored to the context but cannot be compared.

Figure 2. Headcount Ratios by Poverty Measures



Sources: for global MPI [Alkire, Kanagaratnam and Suppa \(2023a\)](#) based on MICS, year 2019. Monetary poverty measures are the most recent estimates from World Bank ([Azevedo, 2011](#)). Monetary poverty measure refer to 2015 (\$2.15 a day), 2015 (\$3.65 a day), and 2009 (national measure).

A headcount ratio is also estimated for two other ranges of poverty cutoffs. A person is identified as **vulnerable** to poverty if they are deprived in 20–33.33% of the weighted indicators. Concurrently, a person is identified as living in **severe poverty** if they are deprived in 50–100% of the weighted indicators. A summary of the global MPI statistics is presented in table 1 for national, rural, and urban areas.

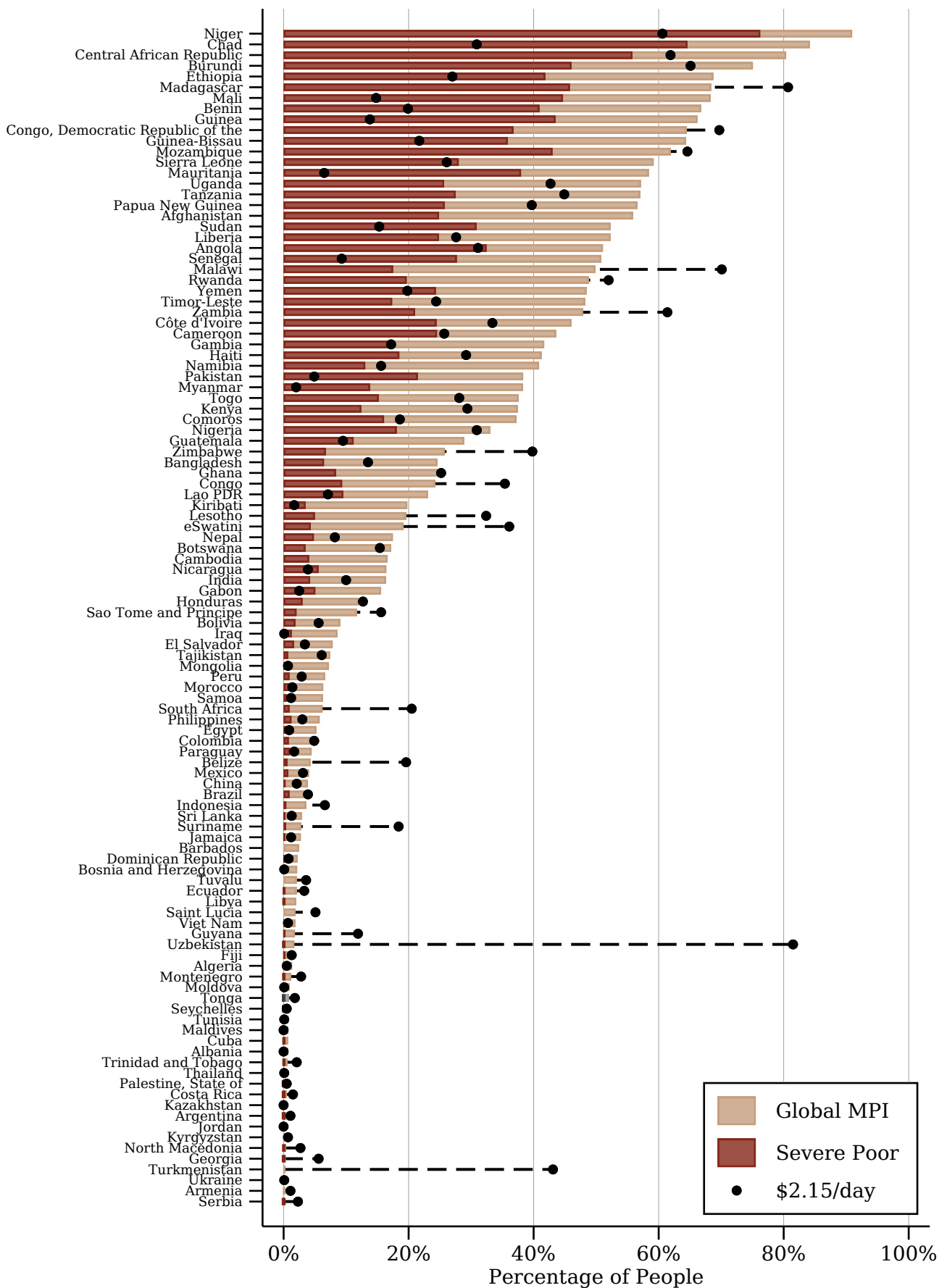
Please refer to [Alkire, Kanagaratnam and Suppa \(2023a,b\)](#) for information on country specific decisions and methodology for disaggregation.³ The estimates underlying this briefing have been produced using the Stata package `mpitb` developed by [Suppa \(2023\)](#).

Poverty Headcount Ratios

Figure 2 compares the headcount ratios of the global MPI and monetary poverty measures. The height of the first bar of figure 2 shows the percentage of people who are MPI poor. The second and third bars represent the percentage of people who are poor according to the World Bank’s \$2.15 a day and \$3.65 a day poverty line. The final bar denotes the percentage of people who are poor according to the national income or consumption and expenditure poverty measures.

³Previous methodological notes, published for each round of update, are made available on the OPHI website: <https://ophi.org.uk/publications/mpi-methodological-notes/>.

Figure 3. Headcount Ratios for Global MPI, Severe Poverty and \$2.15/day



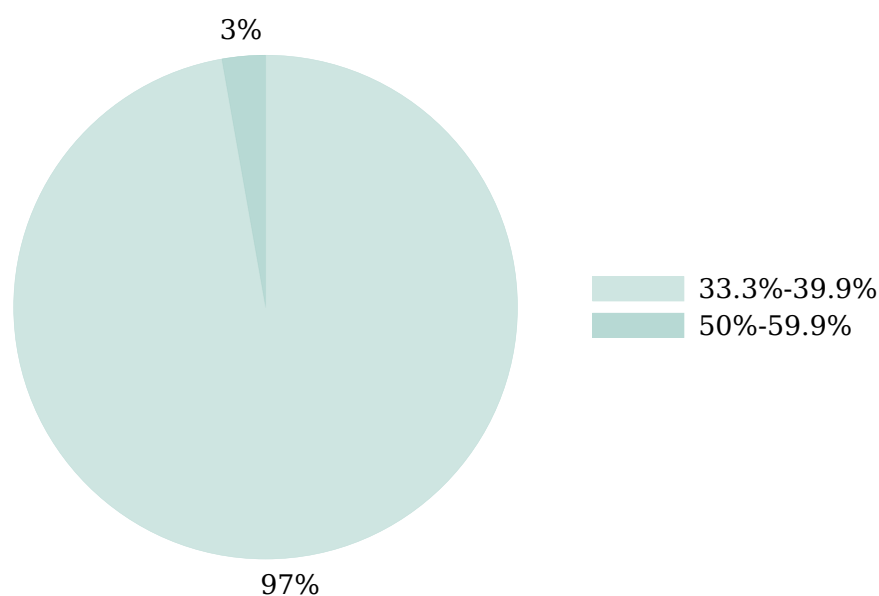
Source for global MPI and severe poor is [Alkire, Kanagaratnam and Suppa \(2023a\)](#), for \$2.15/day is [Azevedo \(2011\)](#).

Figure 3 shows the percentage of people who are MPI poor in the countries analyzed. The bar denoting this country is in grey, with other countries shown in color. The percentage of people who are MPI poor is shown in beige. The height of each dot denotes the percentage of people who are monetary poor according to the \$2.15 a day poverty line in each country. The monetary poverty statistics are taken from the year closest to the year of the survey used to calculate the MPI. The year of the survey is provided in the footnote of figure 2 and 3. In cases where a survey was conducted over two calendar years, the later period is taken as the reference year.

Intensity of Multidimensional Poverty

Recall that the intensity of poverty (A) is the average proportion of weighted indicators in which poor people are deprived. A person who is deprived in 90% of the weighted indicators has a greater intensity of deprivation than someone deprived in 40% of the weighted indicators. Figure 4 shows the percentage of MPI poor people who experience different intensities of deprivation. For example, the first slice of the pie chart shows deprivation intensities of greater than 33.33% but strictly less than 40%.

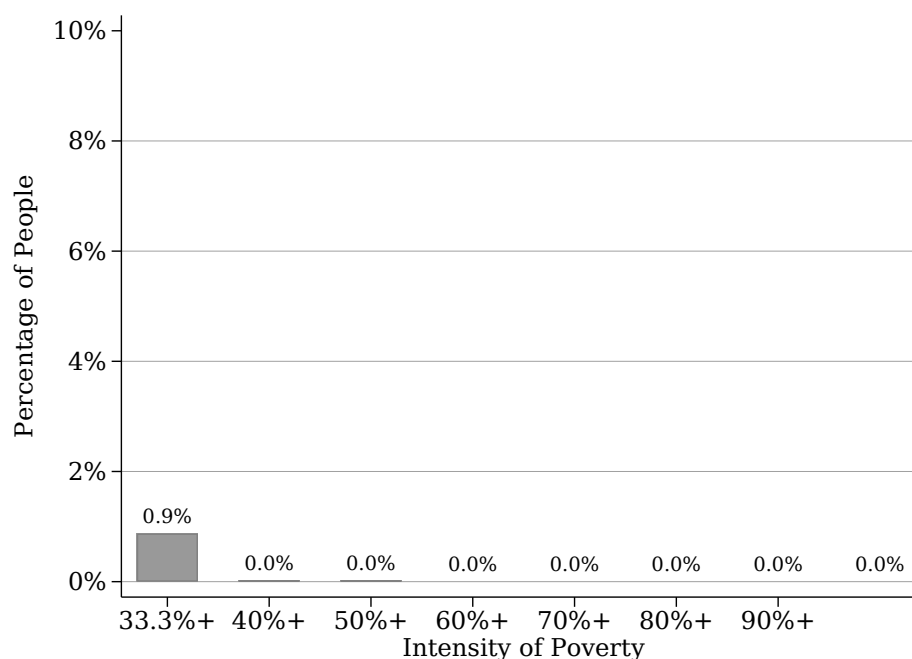
Figure 4. Intensity of Deprivation among MPI Poor



Depicted slices without label account for 1% or less. Source: [Alkire, Kanagaratnam and Suppa \(2023a\)](#) based on MICS year 2019.

In contrast, the bar graph in figure 5 reports the proportion of the population in a country that is poor in that percentage of indicators or more. For example, the number over the 40%+ bar represents the percentage of people who are deprived in 40% or more of weighted indicators. For example, people who are deprived in 50% or more of the indicators are the subset of MPI poor people who are identified as living in **severe** poverty.

Figure 5. Share of People by Minimum Deprivation Score



Category 33.3+% is equivalent to headcount ratio of global MPI, category 50+% corresponds to Severe Poverty of global MPI. Source: [Alkire, Kanagaratnam and Suppa \(2023a\)](#) based on MICS year 2019.

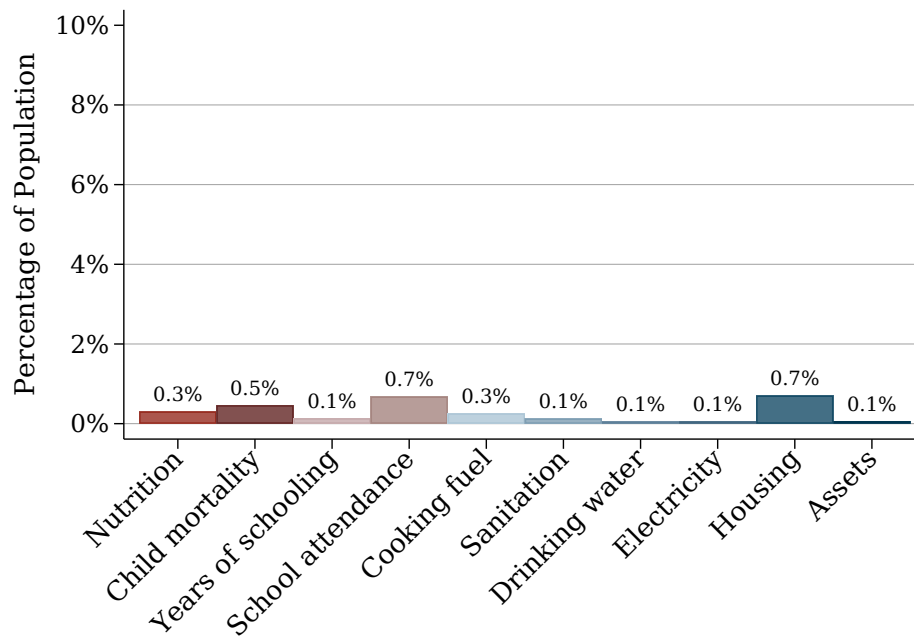
Analyzing the Composition of Multidimensional Poverty

Dimensional Breakdown. The AF methodology has a property that makes the global MPI even more useful—dimensional breakdown. This property makes it possible to compute the percentage of the population who are multidimensionally poor and simultaneously deprived in each indicator. This is known as the **censored headcount ratio** of an indicator. Figure 6 shows the censored headcount ratio of each indicator at the national level. Poverty information, however, becomes even more valuable when it is disaggregated by urban and rural areas. Figure 7 illustrates the breakdown by indicators by country, and urban and rural areas. This analysis shows the contribution of different indicators to poverty in different areas, which can reveal structural differences in urban and rural poverty. This in turn could mean different policy responses in different areas, making the MPI useful for monitoring the effects of policy shifts and program changes.

Percentage Contribution. The censored headcount ratio shows the extent of deprivations among the poor but does not reflect the relative value of the indicators. Two indicators may have the same censored headcount ratios but different contributions to overall poverty, because the contribution depends both on the censored headcount ratio and on the weight assigned to each indicator. As such, a complementary analysis to the censored headcount ratio is the **percentage contribution** of each indicator to overall multidimensional poverty.

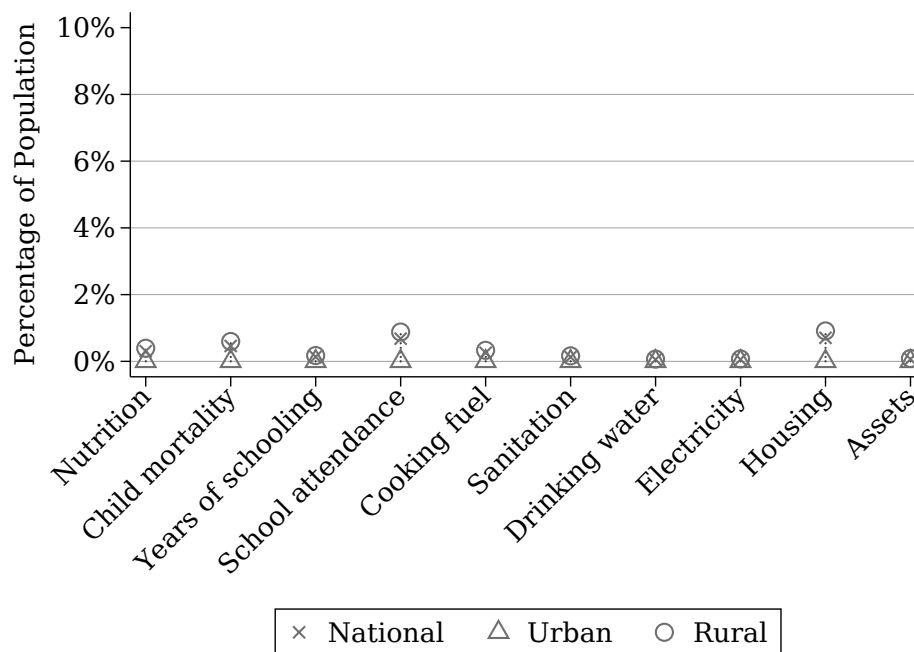
Figure 8 contains two bar graphs that compare the percentage contribution of each indicator to national, rural and urban poverty. In the bar graph on the left-hand side, colors denote the percentage contribution of each indicator to the overall MPI, and all bars add up to 100%. In the bar graph on the right, the height of each bar shows the absolute contribution of each indicator to MPI, and the height of each bar is the MPI value. This enables an immediate visual comparison of the composition of poverty across areas.

Figure 6. Censored Headcount Ratios



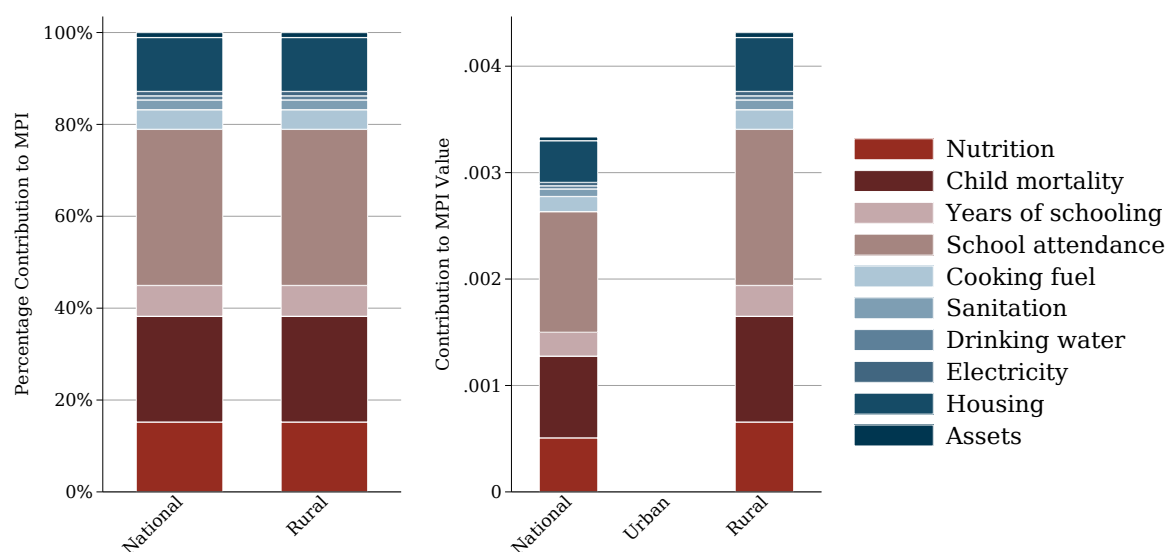
Source: [Alkire, Kanagaratnam and Suppa \(2023a\)](#) based on MICS year 2019.

Figure 7. Censored Deprivations by Area



Source: [Alkire, Kanagaratnam and Suppa \(2023a,b\)](#) based on MICS year 2019.

Figure 8. Indicator Contribution to Overall Poverty by Area



Source: [Alkire, Kanagaratnam and Suppa \(2023a,b\)](#) based on MICS year 2019.

Table 2. Global MPI in Tonga by Subnational Region

Region	MPI	<i>H</i>	<i>A</i>	Vulnerable	Severe Poverty	Population Share
Eua	0.005	1.3%	42.2%	10.7%	0.4%	5.6%
Ha'apai	0.009	2.2%	38.7%	9.4%	0.0%	7.2%
Ongo Niua	0.012	3.6%	33.3%	4.9%	0.0%	1.3%
Tongatapu	0.003	0.7%	38.6%	5.9%	0.0%	70.1%
Vava'u	0.003	0.8%	35.3%	6.0%	0.0%	15.9%

Source: [Alkire, Kanagaratnam and Suppa \(2023b\)](#) based on MICS year 2019.

Subnational Analyses

In addition to providing data on multidimensional poverty at the national and urban-rural level (as shown in table 1), the MPI can also be computed by subnational regions to show disparities in poverty within countries. Subnational disaggregations are published when the survey used for the global MPI is representative at the subnational level, see [Alkire, Kanagaratnam and Suppa \(2023b\)](#) for details.

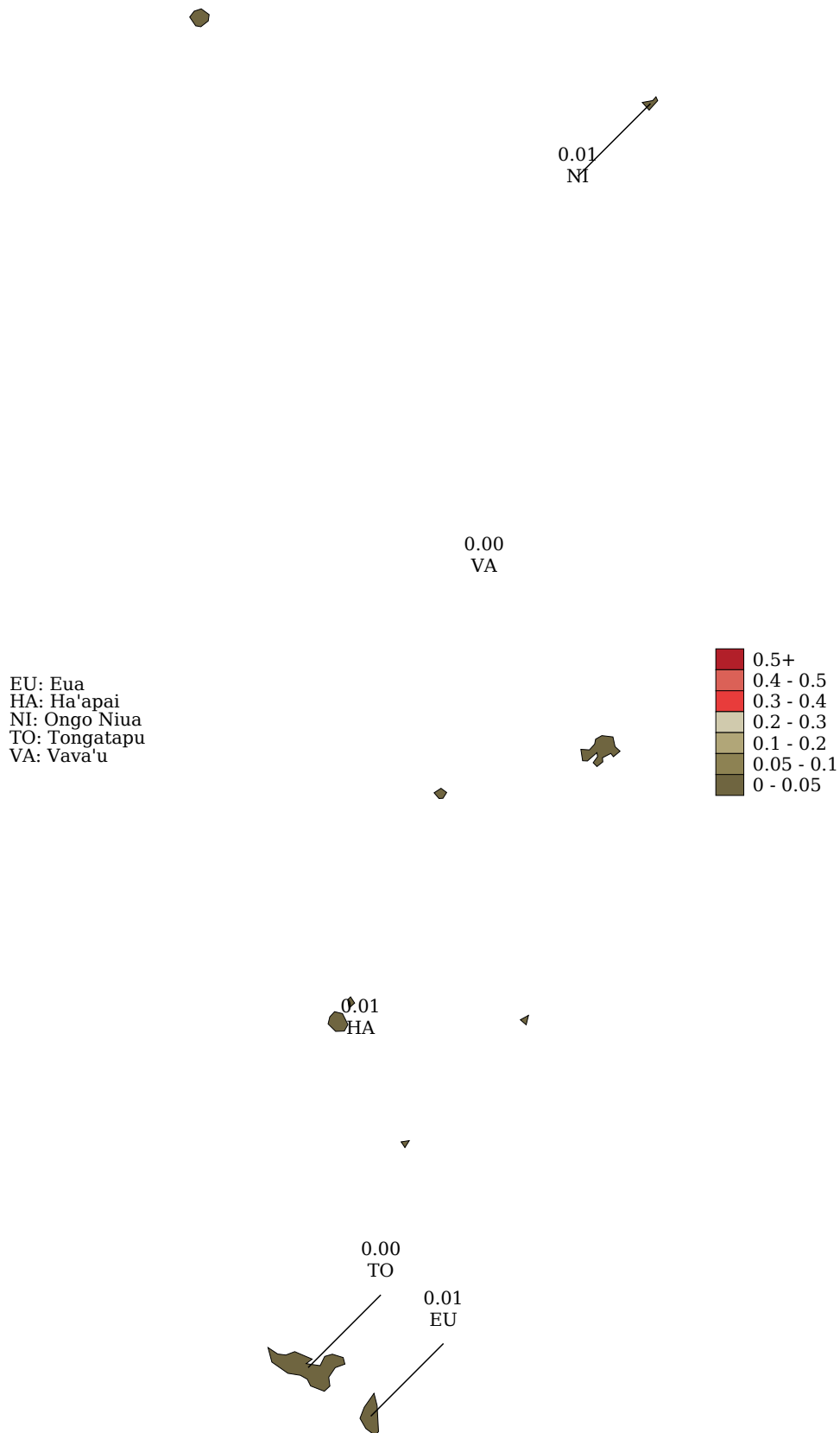
Table 2 shows a summary of the global MPI statistics by subnational region. The last column of the table also presents the population share of each region. The population share was obtained by applying the sampling weight in the respective survey dataset to the final sample used to compute the reported poverty statistics in this country profile. The population-weighted regional figures on *MPI*, *H* and *A* add up to the national figures.

Figure 9 shows how the MPI varies across regions. Dark red indicates a higher MPI and therefore greater poverty, while dark green indicates a lower MPI and therefore lower poverty.

Figure 10 shows the contribution of each indicator to overall MPI at the subnational level. The regions are sorted by increasing values of the global MPI with the poorest region on the right.

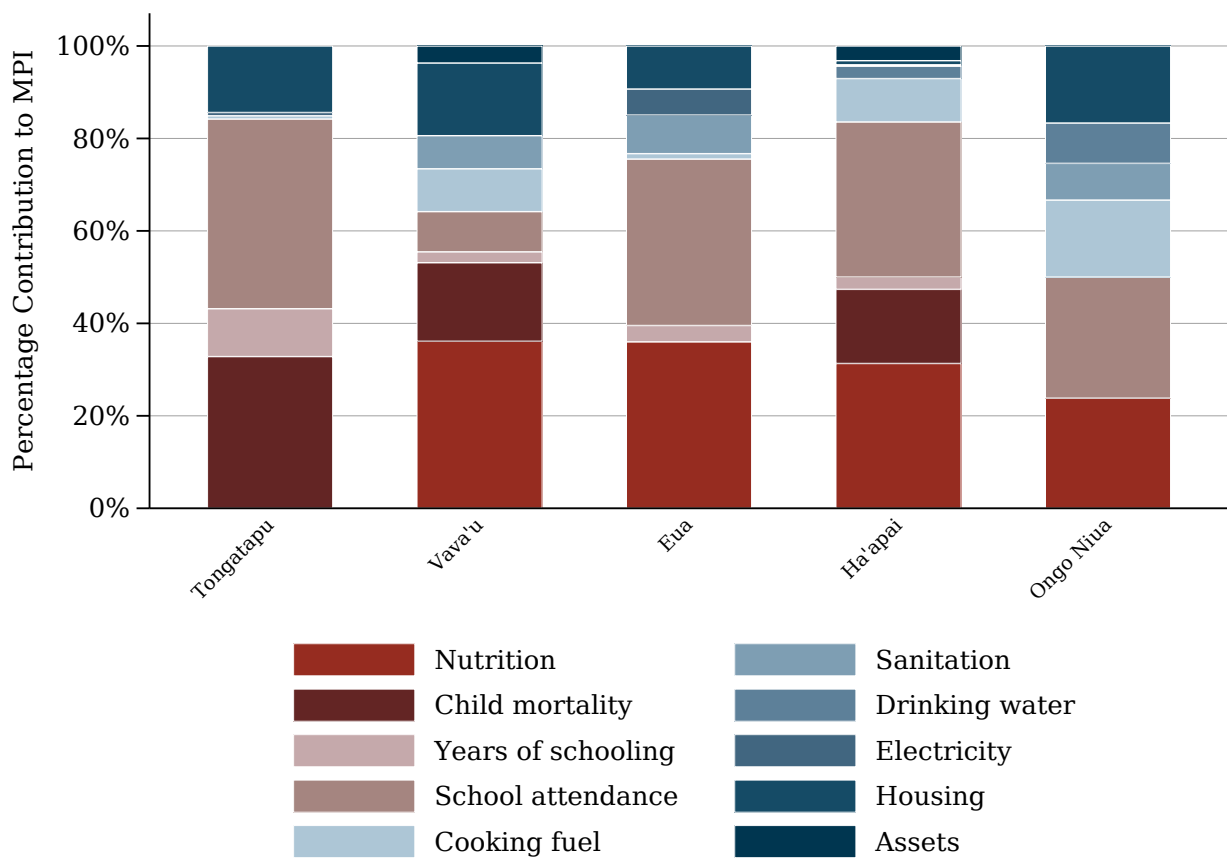
Figure 9. Mapping MPI Value by Subnational Region

National MPI 0.003



Source: [Alkire, Kanagaratnam and Suppa \(2023b\)](#) based on MICS year 2019. Underlying shp-file from [Global Administrative Areas \(2019\)](#).

Figure 10. Indicator Contribution to Global MPI of Subnational Regions



Source: [Alkire, Kanagaratnam and Suppa \(2023b\)](#) based on MICS year 2019.

Changes over Time

For some countries trends over time analysis is not possible. This is because countries (i) lack surveys for earlier time period or (ii) the older and newer surveys have incomparable sampling design. For further information on individual country with missing trends over time analysis, please refer to [Alkire, Kanagaratnam and Suppa \(2023c\)](#).

Appendices

Table A.1. Global MPI

Dimension of Poverty	Indicator	Deprived if living in a household where...	SDG area	Weight
Health	Nutrition	Any person under 70 years of age for whom there is nutritional information is undernourished . ¹	SDG 2	$\frac{1}{6}$
	Child mortality	A child under 18 has died in the household in the five-year period preceding the survey. ²	SDG 3	$\frac{1}{6}$
Education	Years of schooling	No eligible household member has completed six years of schooling . ³	SDG 4	$\frac{1}{6}$
	School attendance	Any school-aged child ³ is not attending school up to the age at which he/she would complete class 8 . ⁴	SDG 4	$\frac{1}{6}$
Living Standards	Cooking fuel	A household cooks using solid fuel , such as dung, agricultural crop, shrubs, wood, charcoal or coal. ⁵	SDG 7	$\frac{1}{18}$
	Sanitation	The household has unimproved or no sanitation facility or it is improved but shared with other households. ⁶	SDG 6	$\frac{1}{18}$
	Drinking water	The household's source of drinking water is not safe or safe drinking water is a 30-minute walk or longer walk from home, roundtrip. ⁷	SDG 6	$\frac{1}{18}$
	Electricity	The household has no electricity . ⁸	SDG 7	$\frac{1}{18}$
	Housing	The household has inadequate housing materials in any of the three components: floor, roof, or walls . ⁹	SDG 11	$\frac{1}{18}$
	Assets	The household does not own more than one of these assets : radio, TV, telephone, computer, animal cart, bicycle, motorbike, or refrigerator, and does not own a car or truck.	SDG 1	$\frac{1}{18}$

Notes: For more details see [Alkire, Kanagaratnam and Suppa \(2023a\)](#); the global MPI is related to the following SDGs: No Poverty (SDG 1), Zero Hunger (SDG 2), Health & Well-being (SDG 3), Quality Education (SDG 4), Clean Water & Sanitation (SDG 6), Affordable & Clean Energy (SDG 7), Sustainable Cities & Communities (SDG 11).

¹ Children under 5 years (60 months and younger) are considered undernourished if their z-score of either height-for-age (stunting) or weight-for-age (underweight) is below minus two standard deviations from the median of the reference population. Children 5–19 years (61–228 months) are identified as deprived if their age-specific BMI cutoff is below minus two standard deviations. Adults older than 19 to 70 years (229–840 months) are considered undernourished if their Body Mass Index (BMI) is below 18.5 kg/m².

² The child mortality indicator of the global MPI is based on birth history data provided by mothers aged 15–49. In most surveys, men have provided information on occurrence of child mortality as well but this lacks the date of birth and death of the child. Hence, the indicator is constructed solely from mothers. However, if the data from the mother is missing, and if the male in the household reported no child mortality, then we identify no occurrence of child mortality in the household.

³ If all individuals in the household are in an age group where they should have formally completed 6 or more years of schooling, but none have this achievement, then the household is deprived. However, if any individuals aged 10 years and older reported 6 years or more of schooling, the household is not deprived.

⁴ Data source for the age children start compulsory primary school: DHS or MICS survey reports; or <http://data.uis.unesco.org/>

⁵ If survey report uses other definitions of solid fuel, we follow the survey report.

⁶ A household is considered non-deprived in sanitation if it has some type of flush toilet or latrine, or ventilated improved pit or composting toilet, provided that they are not shared. If the survey report uses other definitions of improved sanitation, we follow the survey report.

⁷ A household is considered non-deprived in 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. It must also be within a 30-minute walk, round trip. If the survey report uses other definitions of improved drinking water, we follow the survey report.

⁸ A small number of countries do not collect data on electricity because of 100% coverage. In such cases, we identify all households in the country as non-deprived in electricity.

⁹ Deprived if floor is made of natural materials or if dwelling has no roof or walls or if either the roof or walls are constructed using natural or rudimentary materials. The definition of natural and rudimentary materials follows the classification used in country-specific DHS or MICS questionnaires.

References

- Alkire, S. and Foster, J.E. (2011). 'Counting and multidimensional poverty measurement', **Journal of Public Economics**, vol. 95(7-8), pp. 476–487, doi:[10.1016/j.jpubeco.2010.11.006](https://doi.org/10.1016/j.jpubeco.2010.11.006).
- Alkire, S. and Kanagaratnam, U. (2021). 'Revisions of the global multidimensional poverty index: indicator options and their empirical assessment', doi:[10.1080/13600818.2020.1854209](https://doi.org/10.1080/13600818.2020.1854209).
- Alkire, S., Kanagaratnam, U., Nogales, R. and Suppa, N. (2022). 'Revising the global multidimensional poverty index: Empirical insights and robustness', doi:<https://doi.org/10.1111/roiw.12573>, forthcoming.
- Alkire, S., Kanagaratnam, U. and Suppa, N. (2023a). 'The global multidimensional poverty index (mpi) 2022 country results and methodological note', OPHI MPI Methodological Notes 55, Oxford Poverty and Human Development Initiative (OPHI), University of Oxford.
- Alkire, S., Kanagaratnam, U. and Suppa, N. (2023b). 'Global multidimensional poverty index (mpi) 2022 disaggregation results and methodological note', OPHI MPI Methodological Notes 56, Oxford Poverty and Human Development Initiative (OPHI), University of Oxford.
- Alkire, S., Kanagaratnam, U. and Suppa, N. (2023c). 'A methodological note on the global multidimensional poverty index (mpi) 2022 changes over time results for 84 countries', OPHI MPI Methodological Notes 57, Oxford Poverty and Human Development Initiative (OPHI), © 2018 University of Oxford.
- Alkire, S. and Santos, M.E. (2014). 'Measuring acute poverty in the developing world: Robustness and scope of the multidimensional poverty index', **World Development**, vol. 59, pp. 251–274, ISSN 0305-750X, doi:[10.1016/j.worlddev.2014.01.026](https://doi.org/10.1016/j.worlddev.2014.01.026).
- Azevedo, J.P. (2011). 'WBOPENDATA: Stata module to access world bank databases', Statistical Software Components S457234, Boston College Department of Economics. <http://ideas.repec.org/c/boc/bocode/s457234.html>, data downloaded on 30 April 2023.
- Global Administrative Areas (2019). 'GADM database of global administrative areas', Retrieved from <https://www.gadm.org>.
- OPHI (2018). 'Global multidimensional poverty index 2018: The most detailed picture to date of the world's poorest people', University of Oxford, UK.
- Suppa, N. (2023). 'mpitb: A toolbox for multidimensional poverty indices', **Stata Journal**, forthcoming.
- Vollmer, F. and Alkire, S. (2022). 'Consolidating and improving the assets indicator in the global multidimensional poverty index', **World Development**, vol. 158, ISSN 0305-750X, doi:<https://doi.org/10.1016/j.worlddev.2022.105997>.

All figures presented in this brief are obtained from the MPI Data Tables. These and other related statistics are freely available under <https://ophi.org.uk/multidimensional-poverty-index/>. This country briefing was last updated in June 2023.

Please cite this document as:

Oxford Poverty and Human Development Initiative (June 2023). “Tonga Country Briefing”, Oxford Poverty and Human Development Initiative, University of Oxford.

Please report any issues to ophi@qeh.ox.ac.uk.

Available at: www.ophi.org.uk/multidimensional-poverty-index/mpi-country-briefings/.