1 NO POVERTY

Options Paper: Understanding and Measuring Multidimensional Poverty in Timor-Leste

November 2021

Contents

Tables

Executive Summary

SDG target 1.2 states: "*By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.*" This definition specifically calls for a national measure of poverty that goes beyond monetary metrics and can capture the poverty of different demographic groups. Constructing a national Multidimensional Poverty (MDP) measure is therefore fundamental to monitor SDG 1.2, as well as to have a complete picture of the conditions of the population.

The General Directorate of Statistics (GDS) engaged in a process of reviewing options for the construction of an MDP measure in Timor-Leste, with support from UNICEF. This included presentations by a UNICEF international consultant, discussions of the different methodologies and core elements to measure MDP, and decisions by GDS about the final elements of the national MDP measure. The leadership of GDS has been crucial to the successful completion of this work, as well as the involvement of UNICEF, the World Bank, UNDP, and UN Women.

This paper is a synthesis of this process. It first reviews and presents the central elements needed to construct a national measure of multidimensional poverty. Different methodologies to construct and aggregate indicators and dimensions are presented, and their features discussed. The second part discusses the choices made by GDS regarding data, indicators, dimensions and other aspects.

Indicators and dimensions were defined with GDS starting from international standards and always keeping in mind the international comparability. However, the resulting measure is more tailored to national complexities. The dimensions chosen are WASH (Water and Sanitation), Living Standards, Information (for adolescents and youth), Nutrition (for children under 6 only), Health, Education (for individuals 6 years and older), Employment (adolescents and youth), and Child Protection (for children under 6) (see table 9 for full details). The resulting measure agreed upon is an individual-based one. Therefore, each age group has specific indicators and dimensions. However, the resulting index is aggregated in one final score for the whole population.

As for data, the decision taken by GDS was to use the Timor-Leste Survey of Living Standards (TLSLS) of 2014 as the base of data. Other data sources were considered: DHS 2016 and the Population and Housing Census of 2015. The census was quickly discarded as it does not provide enough indicators. TLSLS was preferred to DHS as it can allow to compare multidimensional and monetary poverty.

Finally, different options for aggregation of indicators were considered, and the final choice was to adopt an equal weighting approach, and a cut-off of 0.33. The resulting multidimensional poverty headcount is 55%, higher in rural areas (70%) and lower in urban ones (29%). The multidimensional poverty headcount is 54.3% for children 0-17 (55.4% for boys and 53.2% for girls) and 55.6% for adults aged 18 and above (54.2% for men, and 56.5% for women). Young children and older individuals (60 and over) are the groups with the highest rates of MDP, as well as adolescent boys 15-17. Adult women are more likely to be deprived than men, while boys are more likely to be deprived than girls. Geographically, the municipalities of Ermera and Ainaro have the highest headcount of deprivation (75% and 68% respectively).

I.   Introduction

This paper's goal is to provide a theoretical overview and to map options to measure multidimensional poverty (MDP) in Timor-Leste, in order to develop a national measure of multidimensional poverty, in line with SDG target 1.2. Constructing a national measure of MDP requires decisions around the core elements of MDP including dimensions, indicators, data source, and aggregation method.

After reviewing the rationale for measuring multidimensional poverty, the paper provides some theoretical background, including an explanation of key elements common across different methods to measure multidimensional poverty, as well as considerations on data.

The paper then reviews the available options for the Timor-Leste context, including their strong points and weaknesses, and presents the options retained by GDS.

The paper was developed through a series of remote meetings between staff from the General Directorate of Statistics (GDS) and UNICEF, and a UNICEF international consultant. Inputs were received from the World Bank, UNDP and UN Women, which greatly enriched the process.

II.   Rationale for measuring multidimensional poverty

Identifying, locating, and profiling the poor and deprived individuals in a society are crucial steps to designing and implementing good policies. Understanding why people are – and remain – poor and why and where poverty persists is pivotal in the pursuit of human development.

The recognition that poverty encompasses a concept that is broader than monetary metrics has long been accepted in both academia and international and national organizations. It follows from the notion that development is more than the mere growth of the GDP. The revolutionary work of Amartya Sen (1981; 1990) has broadened our understanding of economic and social progress, and contributed to making the notion of human development a cardinal point of the development agenda.

The multidimensional conception of poverty is now well established and has been highlighted in the Agenda 2030's Sustainable Development Goals (SDGs), the Report of the Commission on the Measurement of Economic Performance and Social Progress (Stiglitz et al., 2009), and, more recently, by the Atkinson Commission's report on Monitoring Global Poverty (World Bank, 2017).

Therefore, understanding and monitoring multidimensional poverty is a central point to the success of the Five Ps in the Agenda 2030: People, Planet, Prosperity, Peace, and Participation.

Target 1.2 of Goal 1 of the SDGs aims to:

"By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions."

While defining the target of poverty reduction, SDG 1 explicitly recognizes three fundamental aspects of poverty: 1) that it needs to be measured and reduced in all its dimensions, 2) that it needs to take into account different groups of people affected by poverty: men, women, and children, and 3) that international estimates of global poverty need to be complemented by national poverty lines, both monetary and multidimensional.

The SDGs, therefore, offer the unique opportunity for countries to construct a baseline indicator to measure progress in reducing multidimensional poverty, besides monetary poverty, and to do so with a measure tailored to their specific context.

In the 20 years since its independence, Timor-Leste has made substantial progress in several key areas for human development, such as child and maternal mortality, undernutrition, access to electricity, etc. However, the recent decrease in national income, coupled with the current COVID-19 pandemic and likely world-wide economic slowdown, could slow progress, and even reverse it in some areas. **Multidimensional poverty is a useful tool to look at the needs of the population in a more holistic way, beyond looking at different indicators separately.** Showing the extent of multiple deprivations, it offers a different perspective on the well-being of the population and of different groups (e.g., children, women, etc.). It can be a powerful tool for both advocacy and policy.

A multidimensional poverty measure can assist in identifying challenges and priorities of interventions. As such, it can help design policies and interventions in a more effective way, helping multisectoral analysis. For example, a region in which most people are deprived in education and water requires a different strategy from an area in which most people are deprived in housing conditions and access to health care. Additionally, using multidimensional poverty to integrate and complement standard monetary poverty assessment can be a powerful way to highlight different needs. For example, some groups or areas may be better served by policies to increase their income, while others need other types of interventions to address their deprivations. Using multidimensional poverty can also improve the analysis of budgeting allocations, for example showing if the social expenditures are addressed to the most deprived or not (Jellema et al, 2020).

Box 1: Country examples of using MDP measurements

Mexico: Using a multidimensional poverty measure to target municipalities in Oaxaca State. Using multidimensional poverty analysis, a strategy was developed to fight poverty in 40 top-priority municipalities out of the State of Oaxaca's 570 municipalities. Interactive maps were created, even indicating by street the areas with the highest concentration of the population experiencing specific deprivation, in order to identify the areas of the municipality requiring extra interventions.

Vietnam: Using a multidimensional poverty index to redistribute resources to certain regions. The MPI in Vietnam has informed budget allocation decisions, helping to redistribute resources into regions with a high proportion of people living in poverty.

Cambodia: Multidimensional child poverty guiding annual budget formulation. The launch of a multidimensional child poverty report in 2018 led to the inclusion of multidimensional child poverty in the strategic results framework of the Rectangular Strategy Phase IV – a key document that guides annual budget formulation and the prioritization of programmes and activities that contribute to achieving key results.

Bhutan: Multidimensional poverty as the key criteria for allocation of resources to local governments. As a budgeting tool, the MPI has been used as one of the five criteria for allocation of national resources to local government since 2013. A resource allocation formula (RAF) considers multidimensional poverty as a crucial factor by putting 45 per cent weight in its calculations.

(UNICEF, 2021)

III.   Theoretical background

The multidimensionality of poverty has long been recognized, and both academia and United Nations (UN) agencies have increasingly adopted a multidimensional perspective in analyzing and addressing poverty and well-being. In the last decade, studies on multidimensional child poverty and deprivation have proliferated.

The most relevant theoretical approaches to multidimensional poverty (MDP) are the capabilities, and basic needs approaches. They have been the first to show the limitations of a purely monetary approach in capturing deprivations (Hicks and Streeten, 1979; Sen, 1998, 1999; Biggeri and Mehrotra, 2011). Empirically, several studies have found that deprivation in several relevant dimensions (for example, health, education, nutrition) often does not overlap with monetary poverty, further demonstrating the limits of the monetary approach to fully capturing the conditions of individual or familial deprivation (Laderchi, 1997; Atkinson 2003; Bourguignon and Chakravarty, 2003; Laderchi et al., 2003; Alkire and Santos 2013; Alkire 2014, Burchi et al., 2018; Cuesta, Jellema and Ferrone 2020).

The indexes used in the literature to measure well-being and deprivation can be distinguished by the dimensions of well-being used, the subject of the analysis (countries, households, individuals), the weighting of their variables, and aggregation methods (Alkire and Foster, 2011; Alkire 2018).

Parallel to the measurement of MDP for the whole population, specific measurements of multidimensional child deprivation have been developed and increasingly used in the past decade. Gordon et al. (2003) first developed a child-specific multidimensional poverty measurement methodology at the request of UNICEF, known as the Bristol Approach. That study measured multidimensional child poverty (MDCP) across 46 developing countries, anchoring MDCP to the notion of deprivation of basic human needs and child rights and defining absolute child poverty as deprivation in at least two out of seven dimensions among food, safe drinking water, sanitation facilities, health, shelter, education, and information. Subsequent studies operationalizing the MDCP from the child rights perspective include that of Roelen, Gassmann and de Neubourg (2010) in Vietnam. Building on these studies, UNICEF developed its own MDCP measure based on child rights in the domains of child survival, development, protection, and participation (Biggeri and Cuesta, 2020). The resulting measure, the Multiple Overlapping Deprivation Analysis (MODA), focuses on the type and number of deprivations experienced simultaneously by each child, rather than on the proportion of children deprived in each dimension, respectively.

In multidimensional analyses, the concepts of 'poverty' and 'deprivation' are often used interchangeably. While traditionally, poverty is firmly linked to some form of monetary measurement, multidimensional poverty analyses often simultaneously incorporate monetary and (non-monetary) material deprivation measures, composing aggregate indices. However, the concepts refer to different forms of poverty while occurring to the same individuals. As argued below, incorporating these different concepts into a single measure and applying this to the entire population denies researchers the possibility of analyzing the complex relationships between monetary poverty and other forms of (non-monetary) deprivation. Furthermore, composite indices are mostly based on household level data. This, however, is problematic when analyzing the well-being of specific groups, such as children or women, as the needs of people differ depending on their age and as the intra-household resource distribution is not always equal.

1. Core elements of Multidimensional Poverty Measurements

Any MDP measure should include the following core elements:

- Dimensions: the domains of the measure, such as Health, Education, Nutrition, etc.
- Indicators with thresholds: indicators are what defines a dimension in practice. They need to have a threshold that defines deprivation. For example, a child is deprived in Education if she does not attend school.
- Aggregation function: how dimensions and indicators are aggregated into a final measure.
- Weights: the importance that is given to each dimension and/or indicator.
- Cut-off(s): similar to a poverty line, a cut-off defines who is multidimensionally poor versus who is not.

In this section, these elements are presented and discussed.

a) Dimensions

Dimensions are fundamental in defining the MDP measure from a more conceptual standpoint. They can be capabilities, or basic needs, or human rights, or defined by a participatory approach. They should reflect the domains that are important to define deprivation and poverty.

The main methodologies and indexes of MDP all define similar dimensions: health, education, nutrition, some form of living standards, access to water, access to sanitation. Dimensions should mostly reflect outcomes rather than inputs. For example, including income or monetary poverty among the dimensions risks being misleading, in that it mixes a means with an end.

The table shows an example of some of the dimensions that can be defined for different demographic groups.

Table 1: Examples of dimensions and age groups

CHILD	MAN	WOMAN
Access to education	Employment	Reproductive health
Nutrition	Education	Education
Health	Improved WASH	Employment
Improved WASH	Access to ICT	Gender equality
Housing	Housing	Access to ICT
		Housing
		Improved WASH

Multidimensional poverty is concerned by the actual access to goods and services ('outcomes') rather than the means to acquire them ('inputs'), such as income. Even when we use a measure of consumption, this is limited by several factors. Consumption captures the *ability* of people to purchase goods and services at the market prices. However, heavily subsidized public and/or private goods and services may not be reflected in consumption. For example, if education is free, access to education will not be reflected in the consumption data. Factors that depend heavily on infrastructure, such as access to sanitation and water, will also not be reflected adequately by private consumption. This should therefore be considered when we select

dimensions to complement monetary poverty, and one important consideration is that the dimension should reflect the notion of poverty in a given setting.

However, there needs to be a balance between information and synthesis. An MDP measure selects the most effective proxies to measure deprivation, to avoid doubling information or adding information that is not relevant. This is crucial in defining an MDP measure, as adding indicators and dimensions has consequences on the resulting headcount. For example, indicators related to ante-natal care, skilled birth attendance, and post-natal care, are all important per se. However, they reflect a similar underlying construct, access to maternal and neonatal care. Therefore, using all three is expanding the measure in a way that is not really adding information.

Having a theoretical framework is, therefore, useful in guiding the choice of dimensions to include in the measure. Some studies have used participatory methods to define dimensions of deprivation, *i.e.*, they have used focus groups and other qualitative methods to define the items of the MDP measure (Main & Bradshaw, 2012; UNICEF Uganda, 2019). It is however important to highlight that even when using participatory methods, many of the dimensions remain the same, or at least very similar. Across contexts, people value similar things for a meaningful life.

b) Indicators

Indicators are *how* dimensions are operationalized in practice. They will inevitably reflect data availability; however, data availability should not be the sole justification for them.

The choice for or against an indicator may change the incidence and the nature of the observed deprivation. It matters, for example, whether access to education is measured by formal enrolment, by actual attendance or by school attainment (or by a combination of indicators). The choice of indicators is crucial because it also determines what types of analyses on determinants of deprivation are possible in the later stages of the research.

Some general principles on indicators are that they should:

1. Reflect as much as possible the dimension they refer to.
2. Not refer to correlates or drivers of deprivation.
3. Have a defined and consistent reference population.

1) The first point is the most crucial: how indicators for a dimension are defined has a strong impact on the resulting MDP measure. Indicators should be consistent with the dimension they proxy. They should, as much as possible, reflect aspects of that dimension. If more than one indicator is used, they should be formative, rather than reflective (Maggino, 2014): *i.e.,* they can relate to different aspects of the same underlying dimension. For example, we can measure deprivation in education by children not going to school and also by children being behind in school. The first indicator measures basic access (enrollment), the other gives a measure of quality (if a child is behind in school, she/he is likely not learning much).

2) An important distinction should be made between indicators and what are correlates of deprivation. Living in a rural area, for example, can make a person or a household more likely to suffer a particular deprivation, but it is not a deprivation in itself. Similarly, having a non-educated mother or parents should not be considered a deprivation for a child, but rather a factor in the probability to be deprived.

In general, characteristics of a person that cannot be changed such as disability, orphanhood, migration status, etc., should not be treated as deprivation, as they are states of being. Rather, they should be used as factors to analyze deprivation. A similar argument can be made for input-indicators: how far a child lives from school may be used as a proxy for access to education; however, it says nothing about whether the child is

attending school and learning effectively; even children living far from school may be attending and learning depending on the conditions of (public) transport and the quality of the school.

3) It is important to define the reference population of an indicator. Indicators of MDP are substantially different from aggregate indicators because they need to reflect the deprivation of each individual.

One indicator can be a good aggregate indicator at the country level, but not necessarily good as an MDP indicator. For example, consider the common health indicator of "Percentage of children who suffered from a fever in the two weeks before the survey". As a population indicator, it is a good health indicator: it reflects the diffusion of a certain pathology among children in a given time period. However, using this indicator for deprivation can be complicated.

The first thing to consider is if having a fever can, in itself, be a proxy for deprivation in health. If not, can one consider not having received any treatment by a medical professional as an indicator of deprivation? This indicator has a skewed reference population: because the information on treatment is only available for those individuals who have been ill, then how should we consider individuals who have not been ill in the reference period? Should they count as non-deprived? But that would bias the result because *we do not know what would have happened* otherwise. A better suited question would be something akin to *'If [name] was ill with fever, where would you go?'* or *'Could you afford medicine?'*.

Another example is gendered indicators: early pregnancy, for example, is something that can happen only to girls. This would result in a biased reference population because boys can never be deprived in this indicator.[1]

c) Thresholds

Some indicators are already defined in the binary space (*i.e.*, they are either 0 or 1, for example a child either goes to school or not). Others will require the definition of a threshold. While not necessarily true for all approaches to multidimensional poverty (see for example Biggeri and Bortolotti, 2020), most common methodologies rely on binary indicators of deprivation that require a defined threshold. A threshold can be defined by national or international standards or by other considerations, such as the distribution of the indicator itself. The table below reports an example of an indicator and its threshold, defined by international standards.

Therefore, a good indicator should have enough variability in the data: indicators with too many 'deprived' or 'not deprived' values are not very informative. However, this principle is only secondary to the first principle of being a conceptually good indicator for the dimension it pertains to.

---

[1] However, this could be used on purpose to highlight the higher vulnerability of girls.

Table 2: Example of threshold for a sanitation indicator

Sanitation: Household members use an improved toilet	Threshold: WHO Standards – MDG Improved?
Flush to piped sewer system	Yes
Flush to septic tank	Yes
Flush to pit latrine	Yes
Flush to somewhere else	No
Improved ventilated pit latrine	Yes
Pit latrine with slab	Yes
Pit latrine without slab/open pit	No
Composting toilet	Yes
Bucket toilet	No
Hanging toilet/hanging latrine	No
No facility/bush/field	No

d) Aggregation function

An MDP measure is defined by using an aggregation function. An aggregation function is how indicators and/or dimensions are aggregated to make up the final measure.

There is an ongoing debate on how to aggregate the various components of deprivation into an overall deprivation measure that identifies the deprived.

If M is the measure of multidimensional poverty for individual i and D are the dimensions/indicators that compose M:

$$Mi = g(Di)$$

The MDP measure of each person i is a function g of the value of the dimensions D for that person. The function g can, theoretically, be - almost - whatever one decides it to be. However, the vast majority of MDP measures uses a counting approach. They count the number of dimensions/indicators and sum them:

$$Mi = \Sigma Di$$

The multidimensional poverty measure of any person i is the sum of the dimensions/indicators. This is the easiest and most intuitive way of constructing an MDP measure.

The major difference is between measures that aggregate indicators directly —such as the Multidimensional Poverty Index (MPI), and measures that have an intermediate step aggregating indicators first into dimensions, such as MODA. The latter requires first to define what is a deprivation in each given dimension. This step can be useful to complement the MDP analysis with a dashboard and overlapping analysis: describing the share of deprived people in nutrition, education, etc. However, it increases the complexity of the measure.

There are three options to define deprivation in a dimension: the union, the intersection and the intermediate cut-off approaches (Atkinson, 2003; Bourguignon and Chakravarty, 2002, 2003; Duclos et al., 2003; 2006). The union approach identifies as deprived any individual with at least one deprivation in that dimension; the intersection approach considers only those who are deprived in all indicators. The

intermediate cut-off approach defines as deprived individual deprived in a number k of indicators, lower than the total but greater than one. In this way, it prevents the dominance of one indicator.

The table shows how the different approaches work to define deprivation in a given dimension.

Table 3: Example of aggregating indicators into dimension

Dimension	Indicator	Deprived in indicator (1=yes)	Union approach	Intersection approach	Intermediate approach (2 out of 3 indicators)
WASH	Improved source of water at home or near	1	= Deprived in WASH	= Not deprived in WASH	= Deprived in WASH
	Improved sanitation	0			
	Hands washing facility	1			

e) Weights

Weighting is the assignment of a value, i.e., relative importance to each of the components of the deprivation measurement, which are the indicators and/or the dimensions used to measure deprivation.

Weights can be of different types: equal weights, data driven, and normative-based weights, i.e., based on a principle that has been decided a priori: for example, we can decide that education is worth twice as access to water (Decanq and Lugo, 2008). Weights can be applied to indicators and/or dimensions.

Most measures use equal weights for each dimension and/or indicator. This is the most practical choice in many respects. Weights are ultimately an arbitrary choice, which needs to be justified and defended theoretically. Even weights that are constructed starting from the data distribution are not particularly better performing than normative chosen weights. For this reason, relying on equal weights is the simplest and most practical route in many instances.

The combination of weights and aggregation function determines the resulting measure. Because of the interaction between weighting and aggregation, one needs to be especially careful when considering the number of indicators per dimension. With the union approach, each indicator increases substantially the probability to be deprived. With a nested weight system, having many indicators in a dimension means that each of them has relatively low importance, and the more indicators, the less important each one is. With an equal weight scheme, one needs to be mindful that the higher the N of indicators or dimensions, the lower the weight of each of them (since each one weights 1/N).

The table below shows four examples of aggregation and weighting combinations, and the results obtained.

The first one aggregates indicators into dimensions using the union approach, the second one uses the intersection approach (see table 3 above). Both then sum dimensions. The third one weights indicators and sums them directly. The fourth one uses a system of nested weights, similar to the MPI: each dimension has equal weight, and each indicator within the dimension has equal weight. So, if there are three dimensions, each one weights 1/3. If one dimension has one indicator, that indicator weights one third, if a dimension has 2 indicators, each of them weights 1/3 divided by 2, 1/6, and so on.

The last row shows the resulting score of the MDP measure defined in the four different ways discussed above. It is clear that the major difference is found with the intersection approach: with this approach, the resulting score is 0 deprivation. This, however, hides the fact that the household is deprived in four out of seven indicators. The union approach yields a completely opposite result, defining the household as deprived in all dimensions (3 out of 3). The last two columns sum indicators rather than dimensions, with two different

weighing schemes. The results, however, are quite similar: 0.57 and 0.56. Overall, they define the household as deprived in slightly over half of the total possible deprivation. In this case, the number of indicators and dimensions were balanced enough to produce similar results, which indicates that the two options are robust.

Table 4: Examples of aggregation methods and weighting schemes

Dimension	Indicator	Deprived (1=yes)	Option 1: Union approach	Option 2: Intersection approach	Option 3: Indicators with equal weights	Option 4: Nested weights
Education	School attendance (age 6-14)	0	1	0	0*1/7=0	0*1/6=0
	Compulsory school completion (age 15+)	1			1*1/7=1/7	1*1/6=1
Labour	Child labour	0	1	0	0*1/7=0	0*1/6=0
	Employment (age 18+)	1			1*1/7=1/7	1*1/6=1
WASH	Improved source of water at home or near	1	1	0	1*1/7=1/7	1*1/9=1/9
	Improved sanitation	0			0*1/7=1/7	0*1/9=0
	Handwashing facility	1			1*1/7=1/7	1*1/9=1/9
TOTAL			**3**	**0**	**=4/7 (0.57)**	**=5/9(0.56)**

f) Cut-off(s)

The final step is deciding a cut-off to define MDP. The cut-off point(s) in an MDP analysis delineates the demarcation between those who are deprived and those who are not, in a way similar to a monetary poverty line.

The choice of the cut-off can be guided by similar approaches than those applied to the definition of dimensions: using the union approach, then MDP is defined by suffering even one deprivation. With the intersection approach, only those suffering the maximum amount of deprivation are considered deprived. In practice, the cut-off is usually somewhere in between. Often, results are reported for multiple cut-offs, to show the extent of the distribution. This is a standard practice in multidimensional child poverty analysis, for example, and the MPI as well reports the share of the population living at different levels of MDP.

It is important to understand that the decision on the cut-off point involves a certain degree of arbitrariness, which will influence the overall results. That is why it is crucial to be transparent about the choice.

Using table 4 (above) as an example, if the cut-off is 2, then with the union approach the household is multidimensionally (MD) poor, but not with the intersection approach. In this case, the household would be considered as not deprived at all. Using option 3, with the weighted score with equal weights, if we use the cut-off of the MPI (=0.33) then the household is multidimensionally poor as well. The same is true using option 4 (nested weights). The fact that the household is poor using three out of four methods can be a good indication of the fact that the household is, indeed, multidimensionally poor.

2. Considerations on data

Further to the core elements presented above, considerations about the choice of data, about options related to different population groups, and about the use of a national or international measure also need to be reviewed.

a) Choice of data

Data for an MDP measure should come from the same survey. While it is technically possible to combine different surveys using imputing methods, it is not advisable to use different surveys to obtain different indicators. To use imputing techniques to connect two surveys, they need to be close in time (ideally the same year), and imputing methods are technically complex.

While possible, this is not advisable because MDP should be used to monitor progress: the data used to construct a national MDP measure needs to be reliable and consistent over time. Therefore, the data source used needs to be dependable: data collection should be done with a regular cadence and be consistent from year to year.

For the same reason, it is not advisable to change indicators over time. If, for example, modules change and are no longer repeated in subsequent rounds of the survey, then indicators could be lost and the measure would no longer be comparable over time. For this reason, it is better to choose a data source over which the county's statistical office has more control.

Finally, the level of geographical representativeness should be considered. Different surveys can have different sampling designs. Many MDP measures use Demographic and Health Surveys (DHS) or Multiple Indicator Cluster Surveys (MICS). These surveys refer to different populations: MICS, for example, over sample children under five to obtain reliable indicators of children's and maternal health. DHS's primary purpose is to report indicators concerning women's reproductive health and history. The main purpose is, therefore, to have a representative sample of women of reproductive age. Living standard surveys are usually employed to obtain monetary measures of consumption and poverty, so they are designed to collect a representative sample of households. These differences can affect the availability of indicators for sub-groups of the population and the geographical representativeness of indicators. For example, a living standard survey may not have a sufficient number of individuals in a specific age group to allow disaggregation by district, because the number of observations for each district would be too low.

In this case, techniques of small area estimation (also called 'Poverty Mapping') can be used to explore the geographical distribution of indicators or MDP. In order to do this, it is necessary to have a Population and Housing Census that is close in time with the survey used to calculate MDP.

b) Disaggregation by groups versus constructing multiple measures.

SDG target 1.2 mentions specifically the reduction of poverty in all its dimensions, for men, women, and children. This implies that any MDP measure should consider different population groups and differentiate between adult and child poverty, and between women and men.

This can be done either by disaggregating a measure by group or by constructing different measures of MDP for each group, and, in particular, differentiating between general MDP and Multidimensional Child Poverty (MDCP).

On the one hand, even when disaggregated by group, a household measure cannot fully capture specific deprivation: assuming equal sharing of resources, it ignores intra-household inequalities, exactly as the monetary poverty measure does. This is particularly problematic with women and children. For instance, children have a different experience of poverty than adults, and their needs change rapidly and are often dependent on adult choices. Evidence also indicates that women do not participate equally in household resources in many societies.

On the other hand, having two or multiple measures can be difficult to communicate to the public and policymakers, when a general 'headline number' is usually required.

One possible solution to minimize the trade-off between the two approaches is to devise a measure that has the same number of dimensions and ideally the same dimensions for all groups, but different indicators depending on age and, in some cases, gender, in a similar way as the Multiple Overlapping Deprivation Analysis does, accounting for the different ages of children.

The drawback of this approach is that it requires more complicated decisions and is more data demanding.

c) National versus international measures

As stated above, SDG target 1.2. specifically calls for national definitions of poverty, and constructing a national measure of MDP sets a benchmark to monitor SDG 1.2. However, there can be advantages in using an internationally defined measure.

International MDP measures are the Global Multidimensional Poverty Index (Global MPI), produced by the Oxford Poverty and Human Development Initiative (OPHI) and the United Nations Development Programme (UNDP), or the recently introduced World Bank multidimensional poverty measure. Additionally, UNICEF has recently produced a global measure of multidimensional child poverty, in addition to MODA.

The first two measures are both household-based, which means that all members of an MD poor household are considered multidimensionally poor, and vice-versa. The next tables show the indicators and weights used by the OPHI/UNDP and World Bank measures.

Table 5: Multidimensional Poverty Index (OPHI/UNDP)

Dimensions	Indicator	Threshold (household is deprived if…)	Weight
Health	Nutrition	Any adult under 70 years of age or any child for whom there is nutritional information is undernourished	1/6
	Child mortality	Any child has died in the family in the five-year period preceding the survey	1/6
Education	Years of schooling	No household member aged 10 years or older has completed six years of schooling	1/6
	School attendance	Any school-aged child is not attending school up to the age at which he/she would complete grade 8	1/6
Living standards	Cooking fuel	The household cooks with dung, wood, charcoal, or coal	1/18
	Sanitation	The household's sanitation facility is not improved (according to SDG guidelines) or it is improved but shared with other households	1/18
	Drinking water	The household does not have access to improved drinking water (according to SDG	1/18

		guidelines) or safe drinking water is at least a 30-minute walk from home, round trip	
	Housing	At least one of the three housing materials for roof, walls and floor are inadequate: the floor is of natural materials and/or the roof and/or walls are of natural or rudimentary materials	1/18
	Electricity	The household has no electricity	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	1/18

Source: OPHI and UNDP, 2018

Table 6: *Multidimensional Poverty Measure – World Bank*

Dimension	Indicators	Threshold	Weight
Monetary	Consumption/Income	Daily consumption or income is less than US$ 1.90 per person	1/3
Education	School attendance	At least one school-age child up to the age of grade 8 is not enrolled in school	1/6
	Primary completion	No adult in the household (age of grade 9 or above) has completed primary education	1/6
Access to basic infrastructure	Water	Access to basic infrastructure	1/9
	Sanitation	The household lacks access to limited-standard sanitation	1/9
	Electricity	The household has no access to electricity	1/9

Source: World Bank, 2018

Finally, UNICEF's global measure of child poverty provides standardized estimates of child poverty. The measure is based on Multiple Indicators Cluster Surveys (MICS) or Demographic and Health Surveys (DHS) data. This measure uses two different thresholds: a severe one and a moderate one, and it uses different age groups for different dimensions: for example, Nutrition only refers to children under 5, while Education only refers to school-age children. This is because children under 5 are not attending school (usually), while nutrition is particularly important for young children.

Table 7: *UNICEF Global Multidimensional Child Poverty measure*

Dimension	Deprivation Definition (includes severe deprivation)	Severe Deprivation Definition	Unit of Analysis
Shelter	Children living in a dwelling with three or more persons per room.	Children living in a dwelling with five or more persons per room.	Children 17 years of age and younger
Sanitation	Unimproved facilities (i.e. on-site sanitation consisting of pit latrines without slabs, hanging latrines, or bucket latrines) or no facilities at all.	Children with no access to a toilet facility of any kind, i.e. open defecation	Children 17 years of age and younger

Water	Unimproved facilities (i.e. non-piped supplies) or no facilities at all	Children with no access to water facilities of any kind, i.e. using surface water	Children 17 years of age and younger
Nutrition	Stunting (2 standard deviations below the international reference population).	Stunting (3 standard deviations below the international reference population).	Children under 5 years of age
Education	Children who are not currently attending school.	Children who have never been to school.	Children between 7-14 years of age
	Children who are not currently attending secondary school.	Children who have not completed primary school.	Children between 15-17 years of age
Health	Children who received less than 4 vaccines (out of measles and three rounds of DPT).	Children who did not receive immunization against measles nor any dose of DPT.	Children 12-35 months of age
	Children with an acute respiratory infection who did not receive professional medical treatment.	Children with an acute respiratory infection who received no treatment of any kind.	Children 36-59 months of age
	Unmet contraception needs (traditional methods or none at all).	Unmet contraception needs (none at all)	Children 15-17 years of age

Source: UNICEF, 2020

International measures have several advantages: they are constructed to be comparable between countries and over time, they have been tested, they are usually easier to calculate, and there is no need to conceptualize and construct a new measure. However, these characteristics also mean that they are inadequate to capture national characteristics and priorities. Because they are constructed to capture extreme poverty, they may not be able to capture poverty adequately at the national level. They are also not flexible in the choice of indicators and dimensions.

In the next section, different option for Timor-Leste will be explored.

IV.   Defining a national MDP measure in Timor-Leste

1. Process

To define an MDP measure for Timor-Leste, staff from the General Directorate of Statistics (GDS) and from UNICEF met in several instances (remotely) with the international consultant, who briefed them on the existing methodologies and facilitated the reflection process on possible options for Timor-Leste. Initial consultations were also made with the World Bank and UNDP. The consultant had also prepared a short survey (in appendix), shared with GDS, UNICEF, UNDP, and the World Bank, to understand the main priorities and the consensus around the measure.

The initial selection of indicators was done by GDS during a remote workshop in April 2021, and were then further reviewed, including after the first draft of this paper, and once more at the end of June 2021. The consultant provided guidance and suggestions to this process. Comments on the indicators and other aspects of the MDP measure were received from UNICEF, UNDP, and UN-WOMEN.

2. Options chosen and rationale

a) Data choice

One of the first question was related to data choice. In Timor-Leste, two datasets were good candidates for the development of an MDP measure:

- Demographic and Health Survey (DHS) 2016
- Timor-Leste Survey of Living Standards (TLSLS) 2014

Other surveys do not present the characteristics needed in either topics covered or repeatability. Data from the Census of 2015 were considered but deemed not adequate to support MDP. One main concern is that the data source for an MDP needs to be reliable and be repeated with a predictable schedule to allow effective monitoring. At the time this paper was written, because of the COVID-19 pandemic and other emergencies, data collection has been delayed in Timor-Leste, and new surveys and Census are expected to take place in 2022 and 2023.

As mentioned above, living standard surveys have the general purpose to assess the welfare of the population: consumption, assets, labor market indicators, as well as education and health expenditures. The DHS is mostly focused on women's and young children's health, while also concerning other subjects. In general, both surveys cover a wide array of topics, with a slightly different focus. The table summarizes the subjects covered by each survey.

Table 8: Topics covered by TLSLS and DHS

Topic	TLSLS 2014	DHS 2016
Household roster	X	X
Access to facilities	X	X
House condition, access to water and sanitation	X	X
Assets	X	X
Consumption/Expenditure	X	
Education	X	X
Health: health expenditures	X	

Health: biomarkers, non-communicable diseases		X
Health: health seeking behavior	X	X
Health: reproductive health	Partial	X
Health: AIDS and HIV knowledge	X	X
Fertility	Partial	X
Anthropometrics of under 5	X	X
Anthropometrics of adults		X
Newborn/small children care		X
Maternal mortality		X
Birth registration	X	X
Early childhood development		X
Disability		X
Domestic violence		X
Women's status and empowerment		X
Work (employment and unpaid labor)	X	
Farming, livestock, forestry and fisheries	X	
Remittances	X	
Loans, borrowing and savings	X	
Transfer and social capital	X	
Subjective well-being	X	
Time use	X	

The TLSLS was seen as more tailored to national priorities, and it measures also monetary poverty, allowing for a double analysis of multidimensional and monetary poverty. It has detailed information on the employment and economic activities of the household members. However, it lacks detailed information on young children and on issues related to health and nutrition, as well as information on domestic violence/intimate partner violence and women's empowerment.

The DHS, on the other hand, has detailed information on a wide array of health topics and nutritional status of women and young children, as well as information on topics of gender equality and similar issues. The DHS also includes information on men, migration, youth, and disability. However, it lacks more detailed information on education, employment, and it does not provide information on monetary metrics.

Box 2: A note on domestic violence

Domestic violence modules can and in fact have been implemented within Living Standard Surveys (see, for example, Tanzania Living Standards Measurement Study (LSMS) 2008/09). However, one should be mindful of the challenge presented by this endeavor, and it should be considered with caution. Adding domestic violence requires specific training of enumerators, additional female enumerators, and capacity to ensure privacy of respondents. Additionally, there needs to be an adverse event protocol in place, and a referral system that works for victims.

The DHS generally uses a larger sample than most living standard surveys, and its specific modules and topics covered (domestic violence, anthropometrics, biomarkers etc.) need careful training of enumerators, additional ethical clearance, privacy for respondents, and so on. All these factors make DHS very valuable for the information collected, but at the same time more costly and more time-intensive.

Both sources have strengths and weaknesses, and several factors have been considered, including what kind of indicators a national MDP measure should contain.

After several consultations with GDS, **the decision was made to use the Timor-Leste Survey of Living Standards of 2014, and to construct an MDP for the whole population, but differentiated by demographic**

20

group. The rationale for preferring the TLSLS lies in that the implementation of the TLSLS is under the direct control of GDS, and they have the faculty to add or change indicators and modules to it. On the other hand, some of the optional modules conducted in the DHS 2016 may not necessarily be repeated in the next round. A possible solution would be to incorporate in the TLSLS some of the most relevant indicators present in the DHS. The survey already collects a module of similar issues (section 7); it could therefore be expanded and modified to make it more comparable with DHS's, for example, adding questions on women's empowerment (the current indicators on women's status in the DHS are comprised of 4 main questions), expanding the birth history period to 5 years, and including a few key child development questions.

b) Choice of dimensions and indicators

From the start, GDS expressed a preference to use indicators and targets rooted in the Global MPI (see table 3 above), and/or the SDG targets. While international comparability was not reported as the main concern when discussing the measure per se, it was remarked as important for indicators. Another point that was remarked as important was that the measure should be for the whole population but not household based. This required the definition of different indicators, and to an extent, dimensions, for different demographics groups.

The selected dimensions, indicators and age groups resulting from this process are presented in table 9 below. Table A1 in the appendix reports the chosen thresholds for each indicator.

Box 3: On the choice of indicators and thresholds

The choice of indicators and thresholds has been a process informed both by international standards, national priorities, and data availability.

The indicators relative to living standards and access to water and sanitation are standard indicators found in many MDP measures, such as the MPI and MODA. The thresholds are defined using international definitions, adapted to the survey. For example, for Water, the indicator used is the basic water services definition used by the Joint Monitoring Program on Water and Sanitation.

'Basic water services: Drinking water from an improved source, provided collection time is not more than 30 minutes for a roundtrip including queuing. Improved drinking water sources are those that have the potential to deliver safe water by nature of their design and construction, and include: piped water, boreholes or tube wells, protected dug wells, protected springs, rainwater, and packaged or delivered water'. JMP does not provide indications on treatment of water.

In the data, this is found in question 10 of section 2:

```
****************************Code from
Stata*************************************
codebook q02_10, tab(15)
        449    1     BOTTLED WATER
        18,921 2     TAP WATER
        836    3     PUMP
        2,199  4     PROTECTED WELL
        1,756  5     UNPROTECTED WELL
        2,330  6     PROTECTED SPRING
        3,201  7     UNPROTECTED SPRING
        1,915  8     RIVER, STREAM, LAKE,POND
        34     9     RAINWATER
        522    10    OTHER (SPECIFY___)
***********************************************************
```
In this case, all the answers coded 5, 7, 8, and 10, are considered unimproved.

Table 9: *Dimensions, indicators and age groups*

Dimensions	Indicators	Children 0-5	Children 6-9	Adolescents 10-14	Adolescents 15-17	Youth 18-24	Adults 25-59	Adults 60+
WASH	No access to basic water services (JMP definition)	X	X	X	X	X	X	X
	No access to basic sanitation services (JMP definition)	X	X	X	X	X	X	X
Living standards	Access to energy: unimproved cooking fuel (SDG definition)	X	X	X	X	X	X	X
	Access to energy: no electricity	X	X	X	X	X	X	X
	Housing: unimproved housing materials (floor, roof, walls) + overcrowding	X	X	X	X	X	X	X
	HH does not have minimal assets	X	X	X	X	X	X	X
Information	No access to ICT (mobile or internet)			X	X	X		
Nutrition	Stunting	X						
Health	Unskilled birth attendance	X						
	Not completed vaccinations	X						
	Unmet need for contraception					Women 18-24	Women 25-49[2]	
	Distance to health services over 30 minutes		X	X	X	X	X	X
Education	Does not attend school		X	X				
	Did not complete 9 years of schooling					X	X	X
	Literacy							X
Employment	Child labor			X	X			
	Not in Education, Employment and Training (NEET)					X	X	
Child protection	Not registered at birth	X						

---

[2] Health for women 50-59 is defined by distance to health facility only.

Many indicators use international standards, such as stunting, which is defined by WHO as having a height for age score lower than two standard deviations from the reference average. For other indicators, different considerations were made. For schooling, 9 years of schooling is considered the threshold as this is the length of compulsory education in Timor-Leste. However, it was considered that such a requirement would be too high, for older people, as they belong to an older generation and attended a different school system. The education dimension is defined for them by literacy. Access to ICT was deemed important for adolescents and young people especially in the light of the COVID-19 pandemic and consequent school closure. It is defined as lack of access to the internet or a mobile phone. Skilled birth attendance is recorded as a child indicator, for different reasons. It helps avoid an unbalance for women, as described above: as an indicator for women, it refers only to those who had a child in the three years before the survey. However, it is by construction available for all young children whose mother is still alive in the household. This indicator is also commonly used in multidimensional child poverty measures, since it also captures the access of mothers and newborns to healthcare.

Some indicators have been considered but discarded, such as child marriage: very few children 15 to 17 reported being married. Indicators concerning employment status were first considered and then discarded, while the employment dimension has been maintained in the NEET dimension for adolescents and youth.

Indicators regarding women's health have been considered, for example ante- and post- natal care. However, these also pose some challenges. The questions are asked to women between 15 and 49 years of age who are married (or living together) and women who have had children in the past three years. This imbalances the age groups and makes it difficult to weight indicators, and as they refer only to a specific subgroup of women, they risk skewing the MDP estimates. The resulting decision for women 18-49 was to use the unmet need for contraception. Unmet need of contraception is defined following the DHS guidelines, with the caveat that there is less information available in the TLSLS module on fertility. The definition includes women who are not currently using any contraception, and the reason for not using it is one of the following: 1) expensive, 2) side effects, 3) not available, 4) not comfortable, 5) husband/partner disagrees, 6) other.

Some indicators have a slightly different definition than what is usual: the indicators referring to the women's module refer to pregnancy in the last three years before the survey, which is fewer than the typical 5-years recall period asked in the DHS. Regarding child labor, because the employment information is only available for individuals 10 years and older, it is not possible to construct this indicator for the younger children (6 to 9). Additionally, there is no information on household chores, so the information refers only to economic activities (paid or unpaid).

The number of dimensions and indicators is well balanced between groups. Most dimensions for each group are defined by one or two indicators, which makes it effective in capturing the underlying deprivation, following the principle of synthesis and parsimony. The only exception is the dimension of Living Standards, which follows a well-established definition in MDP. The decision to separate water and sanitation from Living Standards provides appropriate weight to two fundamental needs. The other dimensions all reflect basic needs/capabilities, providing a comprehensive but synthetic proxy of deprivation for each demographic group.

Some important indicators and dimensions are missing, partially due to the data chosen, and in part because they are not routinely collected in surveys. Namely, indicators regarding gender equality are lacking from the data: gender-based and intimate partner violence are missing, as well as indicators on early childhood education and care for small children, and indicators on violence against children.

Other missing indicators include nutrition and health information for older children and for all household members, although it is not easy to devise and collect adequate indicators in these domains.

One important factor that is missing from indicators is the quality of services, especially for school and health facilities. It is not easy to collect these indicators in surveys, and it is not simple to include them as part of MDP measures, especially if they need to be at the individual level, as information on the quality of services is usually collected at the community level. Some proxies for school quality could be how much children are behind in school, or a measure of actual attendance during the last week before surveys. However, they are not the best measures since they can also reflect personal/family issues. Indicators of school and education quality are usually collected by school-based surveys, which poses some issues to the inclusion in an MDP measure. One solution could be to provide a mapping of MDP with a corresponding mapping of services and their quality (see, for example, UNICEF Jordan report 2020, on Geographic Multidimensional Vulnerability Analysis). This could provide very useful information for policies and programming.

Table 10 reports the prevalence of each chosen indicator by area. **These rates reflect the situation in 2014.** The next Standard of Living Survey will provide updated data that will provide a measure of MDP at a second point in time and make it possible to identify a trend.

The prevalence changes depending on the municipality, with Dili showing consistently lower rates of deprivation in all indicators with respect to other municipalities. The one notable exception is vaccination. At the national level, the indicators with the highest prevalence are: shelter (dwelling is made of unfinished materials or is overcrowded), which reaches 66%, no access to ICT (65%), stunting (57%), and lack of access to basic sanitation (54%). Deprivation in birth registration presents a substantial lower rate than what is reported by the Census. After consultation with GDS, it was established this depends on different classification and codification of some form of registration such as Baptism Certificate. The indicator is included with the caveat that it will be modified in the next round of the TLSLS.

Table 10: *Prevalence of deprivation in each indicator by municipality*

	National	Rural	Urban	Ainaro	Aileu	Baucau	Bobonaro	Covalina	Dili	Ermera	Liquiça	Lautem	Manufahi	Manatuto	Oecussi	Viqueque
House has unfinished materials or is overcrowded	**66.0**	77.7	36.3	79.4	76.5	74.2	69.5	82.2	29.0	81.5	72.4	69.7	78.3	65.7	78.2	83.6
HH not using basic water services (JMP)	**22.5**	26.8	11.4	31.3	18.8	40.4	18.1	33.4	5.8	22.1	18.3	25.8	41.4	16.1	11.7	40.3
HH not using basic sanitation services (JMP)	**54.3**	63.7	30.4	68.1	46.9	68.3	61.6	56.2	27.7	58.7	55.4	54.3	62.9	63.0	68.6	66.6
HH has no access to electricity	**27.0**	36.4	3.1	52.9	43.7	15.3	34.8	14.1	2.4	44.2	48.3	13.2	49.4	25.1	54.6	24.8
HH uses unimproved cooking fuel	**21.8**	23.7	16.9	11.4	36.8	17.3	36.7	34.0	20.1	20.9	12.3	10.3	37.8	18.4	10.0	26.8
HH does not have minimal assets	**50.2**	62.7	18.2	65.0	63.1	51.6	62.4	52.7	15.1	70.3	69.2	46.5	51.9	55.1	68.3	57.9
No access to ICT	**87.7**	89.6	83.6	90.7	85.9	92.2	88.0	89.5	80.9	91.2	91.9	90.0	89.0	89.3	94.5	85.0
Child 6-14 not in school	**12.2**	13.3	9.1	11.6	9.2	15.2	12.8	9.4	9.9	18.6	11.9	10.6	9.8	15.2	12.1	8.2
Did not complete 9 years of school	**12.4**	13.3	10.3	12.3	14.4	13.5	11.6	13.4	10.6	11.7	13.1	13.3	13.7	16.5	11.5	13.4
Cannot read and write	**38.3**	43.2	25.9	39.0	35.7	39.1	47.5	37.6	23.7	48.9	49.4	37.8	34.0	41.4	49.5	38.8
Child doesn't have all vaccines	**47.2**	46.6	49.1	61.1	43.0	36.1	49.8	53.0	53.3	46.2	42.9	44.9	51.5	45.5	37.6	48.6
Unskilled birth attendance	**51.3**	60.4	24.5	64.4	45.2	44.6	56.9	53.8	24.5	70.4	56.6	65.9	56.7	56.8	66.4	47.9
Unmet need for contraception	**20.7**	23.0	16.0	22.9	16.9	25.9	19.9	18.5	14.9	20.1	18.2	27.2	15.8	25.0	32.3	26.7
No health facility visited within 30 min	**6.8**	8.7	1.8	5.7	9.7	3.3	11.2	9.2	1.4	14.1	13.8	4.2	4.7	4.6	12.8	3.2
Child is stunted (hfa<-2sd)	**57.5**	59.7	51.3	63.4	57.7	58.9	62.9	59.0	47.6	61.2	63.3	58.4	59.0	53.8	60.1	56.6
Child labor	**28.7**	30.8	20.1	21.7	31.7	28.7	30.4	23.0	16.8	39.4	22.0	29.4	20.1	27.2	53.1	25.4
Not in education employment training	**19.1**	18.7	19.9	13.0	21.5	18.0	23.1	23.8	20.9	21.4	20.8	17.0	12.6	17.1	6.4	18.8
Child not registered at birth	**15.2**	15.4	14.6	16.4	19.9	5.1	28.2	25.1	17.5	17.9	21.4	5.7	17.3	11.1	9.2	5.0

Source: Author 's elaboration on TLSLS 2014

c) Choices on method of aggregation and cut-off

As discussed above, there are different ways to aggregate indicators into a final score. Here two options are presented: one that uses 'nested weights', and another one that uses equal weights for each indicator. For brevity, the first option is called 'nested weights' and the other one 'equal weights.' The different weighting schemes are reported in the appendix.

Each score can be used to define MDP according to different cut-offs. It is generally good practice to report other cut-offs as well, together with the intensity of MDP (i.e. how much the poor are poor). This gives a more complete picture.

As figure 1 below illustrates, the distribution of the two scores is quite similar. Their average is 0.31 for the 'nested weights' score (the blue solid line), and 0.35 for the 'equal weights' score (the red dashed line).

Figure 1: *Distribution of the two scores*
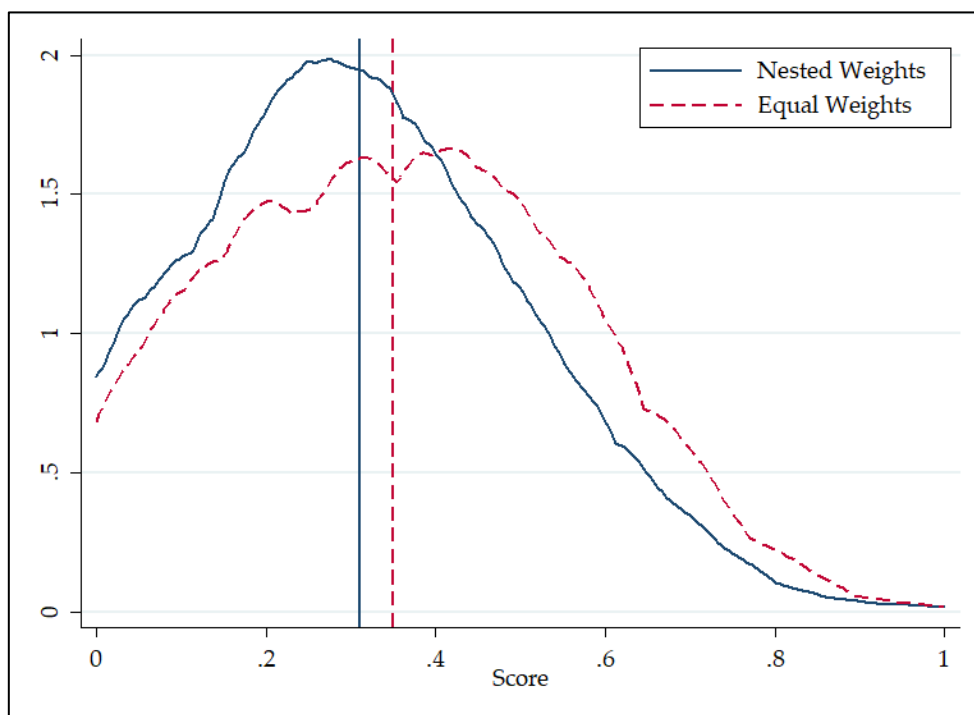
Source: Author's elaboration on TLSLS 2014

Option 1: Nested weights

This weighting scheme is calculated in two steps: first, the number of dimensions is counted for each demographic group and weighs are distributed equally between dimensions. The table below reports the weighs of each dimension for the different groups.[3]

---

[3] Please note that the age groups reported for the weighting scheme are more disaggregated than those reported in table 9 to make it easier to calculate weights.

Table 11: Weighting of dimensions for each group

Dimensions	Children 0-5	Children 6-9	Adolescents 10-14	Adolescents 15-17	Young women 18-24	Young men 18-24	Women 25-49	Men 25-49	Adults 50+
WASH	1/5	1/4	1/6	1/6	1/6	1/6	1/4	1/4	1/4
Living standards	1/5	1/4	1/6	1/6	1/6	1/6	1/4	1/4	1/4
Information			1/6	1/6	1/6	1/6			
Nutrition	1/5								
Health	1/5	1/4	1/6	1/6	1/6	1/6	1/4	1/4	1/4
Education		1/4	1/6	1/6	1/6	1/6	1/4	1/4	1/4
Employment			1/6	1/6	1/6	1/6			
Child Protection	1/5								

Weights for indicators are calculated equally within each dimension. Therefore, if WASH has two indicators, they will weight 1/5 divided by 2, or 1/10, for children under 6, while they will weight 1/4 divided by 2, or 1/8, for children 6-9. This implies that if a dimension has only one indicator, that indicator will weigh more, and vice-versa. This weighting method is the same approach that is used in the MPI, however it is important to clarify that, while we are using some parts of the same methodology, we are not calculating the MPI or a similar index in this case.

The MDP score is calculated for each group separately, because each group has its own weighting scheme, and then the scores are aggregated to have only one final score for the whole population. **It is important to remember that while we see only one score, it reflects different definitions of MDP for the different groups of the population.** Tables 12 and 13 below show the resulting headcount for different cut-offs of poverty, using nested weights.

At the cut-off of 0.33, which is the most used internationally, 41% of the population is multidimensionally poor, and, on average, experiences an intensity of 50% of all total possible deprivations. In other words, people who are multidimensionally poor at the cut-off of 0.33 are poor in about half of the indicators. At the higher cut-off of 0.50, only one-fifth of the population is multidimensionally poor, with an intensity close to 60%. There are large differences between rural and urban areas (in the latter, only 25% is multidimensionally poor at the cut-off of 0.33, while 51% of the rural population is multidimensionally poor), and between municipalities. Dili is the one with the lowest headcount (21%) while the highest headcounts are found in Ermera (56%) and Ainaro (48%).

The age groups with the highest headcount are the adults over 60, adolescents 15-17, and young children 0-5, while the groups with the lowest headcount are adults 50-59 and adults 25-49. There are considerable gender differences, and it is interesting to note how girls are less deprived up to adolescence, and in some categories of age in adulthood. However, young women 18-24 and women over 60 are more deprived than men in the same age groups. For young women, this can be due in part to the use of an additional indicator for women 18-49 (contraception need).

Table 12: Multidimensional poverty by area and municipality - nested weights

	National	Rural	Urban	Ainaro	Aileu	Baucau	Bobonaro	Covalina	Dili	Ermera	Liquiça	Lautem	Manufahi	Manatuto	Oecussi	Viqueque
Poor at k=20	**68.8**	78.1	52.4	78.0	68.8	71.7	73.1	70.9	47.5	80.3	71.1	66.3	74.2	69.3	76.3	72.8
	(0.3)	(0.3)	(0.5)	(0.8)	(1.1)	(0.8)	(0.8)	(0.9)	(0.7)	(0.8)	(1.0)	(1.0)	(0.9)	(1.0)	(0.9)	(0.9)
Poor at k=33	**41.2**	50.5	24.8	47.6	40.3	42.7	45.6	42.2	20.7	55.8	47.2	37.2	45.4	43.0	45.7	46.5
	(0.3)	(0.3)	(0.4)	(1.1)	(1.3)	(0.9)	(1.0)	(1.1)	(0.5)	(1.0)	(1.1)	(1.1)	(1.1)	(1.1)	(1.1)	(1.0)
Poor at k=50	**19.6**	25.5	9.2	22.8	17.1	19.8	23.6	20.3	6.9	27.3	23.0	15.8	21.4	24.0	24.3	23.3
	(0.2)	(0.3)	(0.2)	(1.0)	(1.0)	(0.7)	(0.9)	(0.9)	(0.3)	(0.8)	(1.0)	(0.8)	(1.0)	(0.9)	(1.0)	(0.9)
Intensity at k=20	**40.5**	42.4	35.6	40.9	39.4	40.4	41.7	40.7	34.4	43.1	42.6	38.8	41.7	42.2	41.6	41.7
	(0.1)	(0.1)	(0.1)	(0.4)	(0.4)	(0.3)	(0.3)	(0.4)	(0.2)	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)
Intensity at k=33	**49.5**	50.5	46.0	49.2	48.4	49.3	50.4	50.0	45.0	49.9	50.4	48.0	50.8	51.6	50.6	49.7
	(0.1)	(0.1)	(0.2)	(0.4)	(0.5)	(0.3)	(0.4)	(0.4)	(0.3)	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)
Intensity at k=50	**59.6**	60.0	57.2	58.3	58.8	59.4	59.7	60.1	56.9	59.8	60.9	58.4	61.7	60.3	59.9	58.8
	(0.1)	(0.1)	(0.2)	(0.5)	(0.7)	(0.4)	(0.4)	(0.5)	(0.4)	(0.4)	(0.5)	(0.5)	(0.5)	(0.5)	(0.4)	(0.4)

Source: Author's elaboration on TLSLS 2014. Standard errors in parenthesis.

Table 13: Multidimensional poverty by age group and gender - nested weights

	Children 0-5		Children 6-9		Adolescents 10-14		Adolescents 15-17		Youth 18-24		Adult 25-49		Adult 50-59		Adult 60+	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Men	Women	Men	Women	Men	Women	Men	Women
Poor at k=20	81.5	81.2	59.1	56.0	82.8	82.8	86.4	83.0	75.8	80.1	54.3	53.7	31.9	24.9	85.7	94.5
	(0.8)	(0.8)	(1.1)	(1.1)	(0.8)	(0.8)	(1.0)	(1.1)	(1.0)	(1.0)	(0.8)	(0.8)	(1.4)	(1.3)	(0.9)	(0.6)
Poor at k=33	55.7	53.8	33.4	29.0	37.4	36.1	60.3	53.3	42.8	50.5	30.5	27.8	15.7	10.9	72.6	80.3
	(1.1)	(1.1)	(1.1)	(1.0)	(1.0)	(1.0)	(1.4)	(1.5)	(1.2)	(1.2)	(0.7)	(0.7)	(1.1)	(1.0)	(1.2)	(1.0)
Poor at k=50	28.8	25.9	17.8	14.9	9.3	8.9	30.1	24.7	15.5	21.2	15.1	10.8	1.1	0.6	52.9	58.9
	(1.0)	(0.9)	(0.9)	(0.8)	(0.6)	(0.6)	(1.3)	(1.3)	(0.9)	(1.0)	(0.5)	(0.5)	(0.3)	(0.3)	(1.3)	(1.3)
Intensity at k=20	42.5	41.6	41.1	39.9	35.4	35.0	42.3	40.5	38.1	40.2	40.3	38.1	34.5	33.4	51.5	51.4
	(0.4)	(0.4)	(0.4)	(0.5)	(0.3)	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.3)	(0.5)	(0.6)	(0.5)	(0.4)
Intensity at k=33	50.4	49.8	51.2	50.9	45.1	44.9	48.8	48.1	46.5	47.8	50.1	47.4	42.2	41.8	55.7	55.5
	(0.4)	(0.4)	(0.5)	(0.6)	(0.3)	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.3)	(0.5)	(0.7)	(0.4)	(0.4)
Intensity at k=50	60.3	60.4	60.3	60.5	58.5	59.0	56.9	56.3	58.4	58.1	59.6	58.1	63.0	66.0	61.1	60.7
	(0.4)	(0.4)	(0.5)	(0.7)	(0.6)	(0.7)	(0.4)	(0.4)	(0.5)	(0.4)	(0.4)	(0.4)	(1.4)	(2.1)	(0.4)	(0.4)

Source: Author's elaboration on TLSLS 2014. Standard errors in parenthesis.

Option 2: Equal weighting

With equal weighting, each indicator (rather than each dimension) has the same weight. Equal weighting implies that each indicator has the same weight within each age group. Consequently, the more indicators are included for a group, the lower the weight of each of them. The next table summarizes the weight of the indicators for each group.

Table 14: Indicators' weight with equal weighting

	N of indicators	Weights (each indicator has the same weight)
Children 0-5	10	0.10
Children 6-9	8	0.13
Adolescents 10-14	10	0.10
Adolescents 15-17	11	0.09
Young women 18-24	11	0.09
Young men 18-24	10	0.10
Women 25-49	9	0.11
Men 25-49	8	0.13
Adults 50+	8	0.13

The next tables (tables 15, 16 and 17) report the headcount of MDP using the equal weighting.

In general, the headcounts are consistent, but higher using this approach. At national level, 55% of the population is multidimensionally poor at a cut-off of 0.33, and, on average, experiences an intensity of 51% of all total possible deprivations. In other words, people who are multidimensionally poor at the cut-off of 0.33 are poor in about half of the indicators. At the higher cut-off of 0.50, only close to one-third of the population is multidimensionally poor, with an intensity of 59%.

Differences between rural and urban areas are large: 29% of people are multidimensionally poor in urban areas, versus 70% in rural areas. There are significant variations among municipalities, with Ermera (75%) and Ainaro (68%) having the highest headcount, and Dili the lowest (23%).

The multidimensional poverty headcount is 54.3% for children 0-17 (55.4% for boys and 53.2% for girls) and 55.6% for adults aged 18 and above (54.2% for men aged 18 and above, and 56.5% for women aged 18 and above). Older people over 60, adolescent boys ages 15-17, boys ages 6-9 and children ages 0-5 are the most likely to be multidimensionally poor. Up to adolescence, girls are less likely to be multidimensionally poor than boys, but this reverses from age 18, with the exception of the 50-59 age group.

MD deprivation can be visualized across Timor-Leste's municipalities using either the headcount (figure 2) or the score (figure 3). Using the score, instead of the headcount of MDP, can show the different patterns

of MD deprivation in a more nuanced manner. This information can provide additional depth to the analysis and help locate areas of specific concern.[4]

Figure 2: *Multidimensional poverty headcount by municipality – equal weights method*
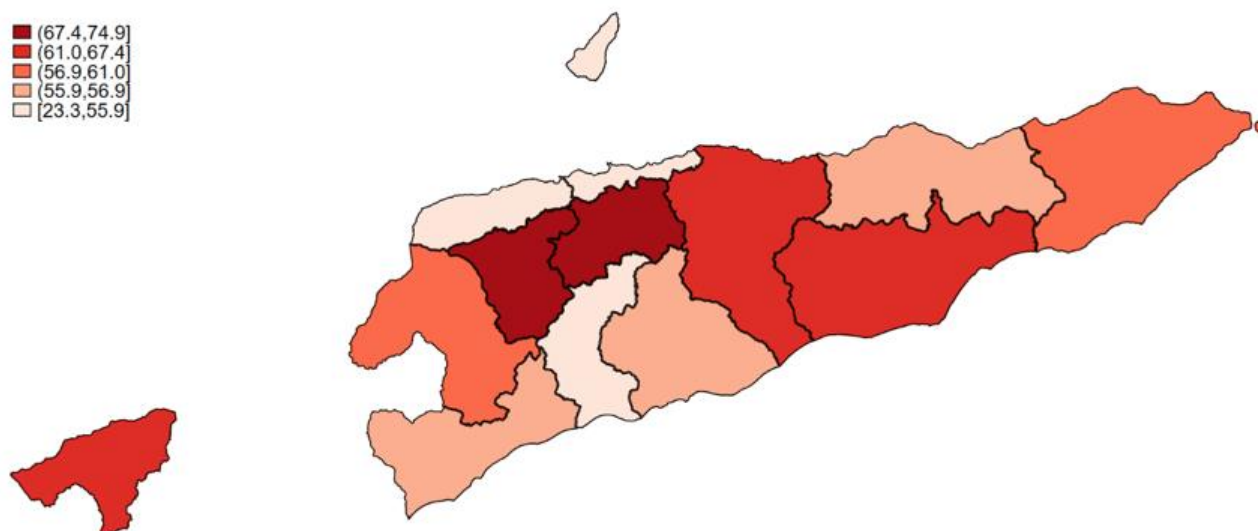
Source: Author's elaboration on TLSLS 2014.

Figure 3: *Multidimensional score average by municipality – equal weights method*
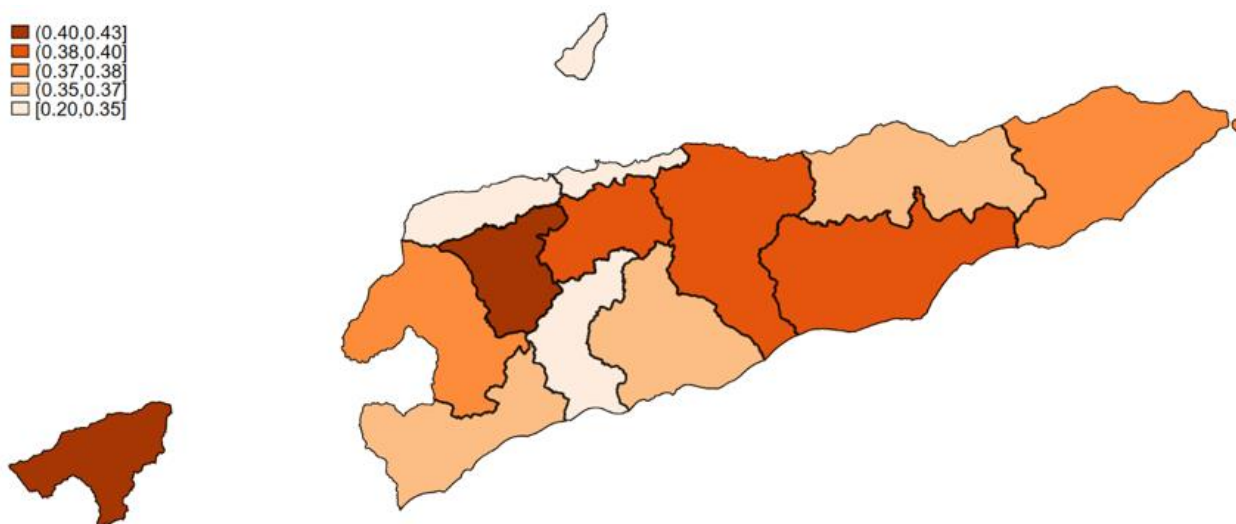
Source: Author's elaboration on TLSLS 2014.

---

[4] These type of map can be obtained with both scores, equal weights and nested weights. Here only the equal weights one is reported.

Table 15: *Multidimensional poverty by area and district - equal weights*

	National	Rural	Urban	Ainaro	Aileu	Baucau	Bobonaro	Covalina	Dili	Ermera	Liquiça	Lautem	Manufahi	Manatuto	Oecussi	Viqueque
Poor at k=20	76.7	88.5	56.0	88.1	78.4	81.5	82.6	80.3	48.2	90.3	77.9	75.4	84.4	76.6	85.6	83.2
	(0.2)	(0.2)	(0.5)	(0.6)	(0.9)	(0.6)	(0.7)	(0.7)	(0.7)	(0.6)	(0.8)	(0.9)	(0.7)	(0.9)	(0.7)	(0.7)
Poor at k=33	55.0	70.1	28.6	68.4	55.9	56.8	61.0	56.8	23.3	74.9	60.1	46.3	63.3	56.9	67.4	63.6
	(0.3)	(0.3)	(0.4)	(0.9)	(1.2)	(0.9)	(0.9)	(1.0)	(0.5)	(0.8)	(1.1)	(1.1)	(1.0)	(1.1)	(1.0)	(1.0)
Poor at k=50	32.2	43.3	12.9	38.3	33.6	32.2	37.1	30.3	10.1	46.8	41.0	23.0	37.8	36.3	41.4	39.4
	(0.3)	(0.3)	(0.3)	(1.1)	(1.3)	(0.8)	(1.0)	(1.0)	(0.3)	(1.0)	(1.1)	(0.9)	(1.1)	(1.0)	(1.1)	(1.0)
Intensity at k=20	43.3	46.0	35.9	44.1	42.9	42.4	44.3	42.5	34.8	47.1	46.9	39.5	45.4	46.1	45.5	44.9
	(0.1)	(0.1)	(0.2)	(0.3)	(0.4)	(0.3)	(0.3)	(0.4)	(0.2)	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.3)
Intensity at k=33	50.6	51.5	46.9	49.5	50.0	49.7	51.2	49.7	45.8	51.6	53.6	48.5	52.1	53.5	50.9	51.0
	(0.1)	(0.1)	(0.2)	(0.3)	(0.4)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.4)	(0.4)	(0.4)	(0.3)	(0.3)
Intensity at k=50	58.9	59.2	56.9	57.6	57.1	58.2	59.0	58.9	55.4	59.0	60.2	58.6	61.0	61.9	58.3	58.3
	(0.1)	(0.1)	(0.2)	(0.3)	(0.4)	(0.3)	(0.3)	(0.4)	(0.3)	(0.3)	(0.3)	(0.4)	(0.4)	(0.4)	(0.3)	(0.3)

Source: Author's elaboration on TLSLS 2014. Standard errors in parenthesis.

Table 16: *Multidimensional poverty by age group and gender- equal weights*

	Children 0-5		Children 6-9		Adolescents 10-14		Adolescents 15-17		Youth 18-24		Adult 25-49		Adult 50-59		Adult 60+	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Men	Women	Men	Women	Men	Women	Men	Women
Poor at k=20	86.4	86.7	72.8	70.9	84.3	84.4	73.0	69.9	82.7	68.0	67.9	68.8	72.5	72.3	86.5	89.5
	(0.7)	(0.7)	(1.0)	(1.0)	(0.7)	(0.8)	(1.3)	(1.3)	(0.9)	(1.2)	(0.7)	(0.7)	(1.3)	(1.4)	(0.9)	(0.8)
Poor at k=33	56.8	56.2	57.3	53.3	51.1	50.9	58.1	52.1	46.6	51.6	50.3	51.6	55.3	54.2	75.1	78.4
	(1.0)	(1.1)	(1.1)	(1.1)	(1.0)	(1.0)	(1.4)	(1.5)	(1.2)	(1.2)	(0.8)	(0.8)	(1.5)	(1.5)	(1.1)	(1.0)
Poor at k=50	38.3	38.4	37.6	35.1	31.8	31.6	22.7	20.0	28.5	16.9	31.4	15.3	33.5	32.5	59.9	63.8
	(1.0)	(1.1)	(1.1)	(1.1)	(1.0)	(1.0)	(1.2)	(1.2)	(1.1)	(0.9)	(0.7)	(0.6)	(1.5)	(1.5)	(1.3)	(1.2)
Intensity at k=20	43.8	43.5	45.6	44.7	40.3	40.0	43.8	42.6	39.2	42.3	43.9	39.2	43.9	43.0	52.7	53.3
	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.3)	(0.5)	(0.5)	(0.5)	(0.5)
Intensity at k=33	53.5	53.4	51.2	51.2	50.1	49.8	48.1	47.8	50.3	47.1	50.5	44.9	49.8	49.0	56.9	57.3
	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.2)	(0.5)	(0.5)	(0.4)	(0.4)
Intensity at k=50	60.0	59.6	58.4	58.4	56.2	55.8	59.3	58.9	56.8	59.8	58.4	59.5	57.8	56.7	61.8	61.8
	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.3)	(0.5)	(0.5)	(0.4)	(0.4)

Source: Author's elaboration on TLSLS 2014. Standard errors in parenthesis.

Table 17: *Multidimensional poverty headcounts by broad age groups - equal weights*

	Children 0-17			Adults 18+		
	All	Boys	Girls	All	Men	Women
Score	36.0	36.4	35.6	34.3	35.0	33.6
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
MDP poor at k=20	79.8	80.2	79.4	73.8	74.7	72.7
	(0.3)	(0.4)	(0.5)	(0.3)	(0.5)	(0.5)
MDP intensity at k=20	42.8	43.1	42.5	43.9	44.5	43.3
	(0.1)	(0.2)	(0.2)	(0.1)	(0.2)	(0.2)
MDP poor at k=33	54.3	55.4	53.2	55.6	54.2	56.5
	(0.4)	(0.6)	(0.6)	(0.4)	(0.5)	(0.5)
MDP intensity at k=33	51.0	51.1	50.9	50.3	51.8	48.8
	(0.1)	(0.2)	(0.2)	(0.1)	(0.2)	(0.2)
MDP poor at k=50	33.2	33.8	32.6	31.3	35.7	26.2
	(0.4)	(0.5)	(0.5)	(0.4)	(0.5)	(0.5)
MDP intensity at k=50	58.2	58.4	58.1	59.5	59.0	60.1
	(0.1)	(0.2)	(0.2)	(0.1)	(0.2)	(0.2)

Source: author's elaboration on TLSLS 2014-15. Standard errors in parenthesis.

Decision on weights and cut-off

Both methods give similar results. The headcounts are higher with equal weighting but still in the same order of magnitude. This means that the underlying construct is robust and is, in fact, identifying the multidimensionally poor. The differences are likely driven by specific indicators.

Both methods are reliable and used in a variety of settings. The nested weights approach is more widespread, since it is the same approach used for the Global MPI and for National MPIs. For example, the South African MPI (SAMPI) uses the same approach, while adapting indicators to the local context,[5] and many other governments have adopted MDP measures that are derived from the MPI, and therefore use the same aggregation method. However, the equal weights method is also used.

The method of aggregation has implications for the results, but the decision should also reflect broader considerations than just the resulting headcounts.

After consultations and considering both the international comparability and the specificity of the context, **GDS has chosen to adopt the equal weighting method of aggregation, with an official threshold of 0.33.**

3. Further analysis

It is important to complement the assessment of MDP with additional investigations of poverty to have a clearer photograph of the conditions of the people in any given country. Two important analyses are the comparison with monetary poverty, when possible, and the analysis of dimensions of deprivation and their overlaps.

a) Comparison with monetary poverty

The next table reports the comparison between MDP, as defined by GDS, and the monetary poverty rate and poverty gap, calculated with the same TLSLS survey 2014. Data are reported from the official Poverty in Timor-Leste report by GDS and the World Bank.

---

[5] http://www.statssa.gov.za/publications/Report-03-10-08/Report-03-10-082014.pdf

	Monetary poverty headcount	MDP headcount	Poverty gap	Intensity of deprivation
National	41.8	55.0	10.4	50.6
Rural	47.1	70.1	12.2	51.5
Urban	28.3	28.6	5.9	46.9

The MDP poverty headcount is higher than monetary poverty, as it is often the case (see, for example UNICEF Tanzania, 2016). MDP also reflects higher deprivation in rural areas, and a substantially lower one in urban areas: this is due to the fact that MDP captures access to goods and services, as well as outcomes, which tend to be more lacking in rural areas (for example, access to sanitation and water, health facilities, and so on). In order to understand the extent to which people experience which type of poverty (if both, only monetary, or only multidimensional) we should look at the overlap between the two. This is an important tool to help design the right type of interventions. Unfortunately, this is not possible at the moment.

While not measuring the same thing, the poverty gap and the intensity of deprivation are both a measure of 'how poor' the poor are. While the poverty gap is somewhat small, at 10% of the poverty line (*i.e.,* on average the poor have a consumption 10% lower than the poverty line), the intensity of MDP is quite high, showing that the multidimensionally poor people are deprived, on average, in half of the deprivations. This has important implications, because if policies are based only on monetary metrics, they can miss many deprived individuals, and mostly, people and families who need multiple interventions to overcome deprivation.

b) Dimensions of deprivation

Finally, another way to look at MDP is to aggregate indicators into dimensions to have a complementary dashboard of deprivations. This approach is useful to look at different aspects of deprivation and identify priorities. Here dimensions are defined using the union approach, *i.e.* a person is deprived in a dimension if she is deprived in any of the indicators pertaining to that dimension.

The next table reports the prevalence of each dimension of deprivation, aggregated in this way.

Table 18: *Deprivation in each dimension*

	Deprived in water and sanitation	Deprived in living standards	Deprived in information	Deprived in health	Deprived in education	Deprived in employment opportunities
National	59.7	78.4	87.7	78.1	49	20.7
Rural	69.1	90.3	89.6	81.5	51.4	21.2
Urban	35.8	48.1	83.6	64.8	40.9	19.7
Ainaro	74.6	92.3	90.7	84.4	48.7	14.7
Aileu	54.7	90.7	85.9	78.5	48.1	23.2
Baucau	76.2	83.6	92.2	69	52.6	19.8
Bobonaro	65.7	89.5	88	84.4	51.1	24.8
Covalina	66.8	91	89.5	81.7	51	23.6
Dili	29.7	43.7	80.9	65.4	41.4	20.3
Ermera	63.1	94	91.2	84.2	50	25.4
Liquiça	57.5	85.5	91.9	83.3	53.5	20.9
Lautem	62.7	76.2	90	79.5	46.9	19.9

Manufahi	75.4	92.2	89	77.2	51.5	14
Manatuto	66.6	79.5	89.3	76	56.4	19
Oecussi	69.6	88	94.5	82.8	46.9	17.8
Viqueque	75.9	91	85	75.8	49.8	20.1

Source: Author's elaboration on TLSLS 2014.

A relevant aspect of looking at dimensions of deprivation is that they can allow to construct overlap of deprivation, which can be especially useful for policy and programming purposes. The next figure exemplifies how the overlap of deprivations can be illustrated with a Venn diagram[6]: one third of children under six are deprived in WASH, living standards (LS), and nutrition. In rural areas, the overlap is 39%, while in urban areas it is 15% (see table 18). The area with the highest degree of overlap is the rural area of the western region, while the one with the lowest one is the urban area of the central region.

Figure 4: Overlap of WASH, living standards, and nutrition - children under 6 (national)
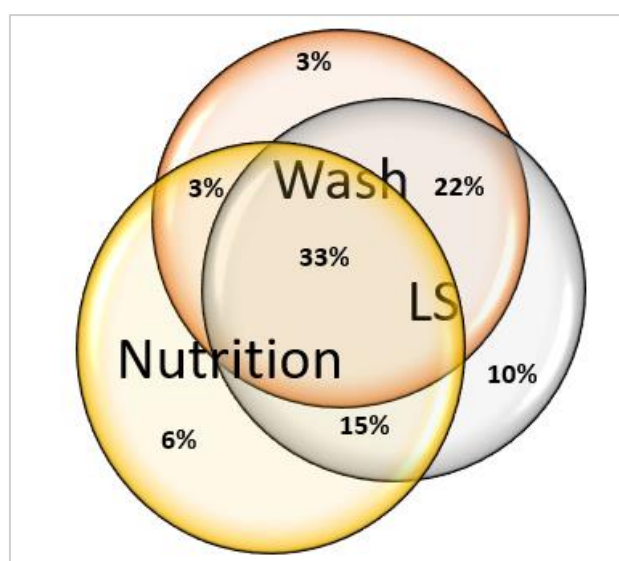
Table 19: Overlaps in WASH, living standards, and nutrition - children under 6

	National	Rural	Urban	East Rural	East Urban	Centre Rural	Centre Urban	West Rural	West Urban
WASH & LS & Nutrition	33.0	39.3	15.4	41.0	20.0	34.3	12.0	47.2	26.4
WASH & LS	22.2	26.4	10.6	29.7	13.1	24.3	9.3	26.9	14.1
WASH & Nutrition	3.0	2.4	4.6	2.3	8.1	3.4	3.4	0.6	7.2
LS & Nutrition	15.2	15.2	15.3	12.5	13.0	18.1	16.3	12.6	13.0
WASH only	2.7	1.5	6.0	1.8	9.6	1.2	6.0	2.0	4.0
LS only	10.1	9.3	12.1	8.1	8.9	11.1	11.8	7.2	15.8
Nutrition only	6.3	2.8	16.0	2.8	13.7	3.4	17.8	1.6	10.3

Source: Author's elaboration on TLSLS 2014-15.

---

[6] Please note that the proportions of the circles may not exactly reflect the percentages.

V. Conclusions

After a process of identifying and discussing options, GDS opted for the following elements for a national MDP measure for Timor-Leste.

The **dimensions** chosen are WASH (Water and Sanitation), Living Standards, Information (for adolescents and youth), Nutrition (for children under 6 only), Health, Education (for individuals 6 years and older), Employment (adolescents and youth), and Child Protection, for children under 6. Eighteen **indicators** were selected (see table 9 for full details). The resulting measure agreed upon is an individual-based one. Therefore, each age group has specific indicators and dimensions. However, the resulting index is aggregated in one final score for the whole population. As for **data**, GDS opted to use the Timor-Leste Survey on Living Standards (TLSLS) of 2014 as the base of data. The chosen options for aggregation of indicators is an **equal weighting approach, and a cut-off of 0.33**.

The **resulting multidimensional poverty headcount is 55%,** higher in rural areas (70%) and lower in urban ones (29%). The multidimensional poverty headcount is 54.3% for children 0-17 (55.4% for boys and 53.2% for girls) and 55.6% for adults aged 18 and above (54.2% for men and 56.5% for women). Young children and older individuals (60 years and over) are the groups more likely to be multidimensionally poor, and women are more likely to be deprived than men, while boys are more likely to be deprived than girls. Geographically, the districts of Ermera and Ainaro have the highest headcount of deprivation (75% and 68% respectively).

Strong GDS engagement has been crucial to the successful completion of this work, as well as the involvement of UNICEF the World Bank, UNDP, and UN Women. Having national ownership is fundamental for the sustainability of the measure. Additionally, having ownership of the national survey ensures that the next data collection will incorporate the necessary indicators, and possibly address some of the issues raised during this process. In conclusion, this work has prepared the ground for Timor-Leste to have its own national measure of MDP, to monitor progress towards SDG 1.2, and provide an additional tool for policy and programming.

References

Alkire, Sabina. "Measuring Acute Poverty in the Developing World. Robustness and Scope of the Multidimensional Poverty Index." *World Development* 99, no. 6 (2014): 251-274.

Alkire, Sabina. "The Research Agenda on Multidimensional Poverty Measurement: Important and As-yet Unanswered Questions ." *OPHI Working Papers*, 2018: N. 119.

Alkire, Sabina, and James Foster. "Counting and multidimensional poverty measurement." *Journal of public economics* 95.7-8 (2011): 476-487.

Alkire, Sabina, and Maria E. Santos. "A Multidimensional Approach: Poverty Measurement and Beyond." *Social Indicators Research* 112, no. 2 (2013): 239-257.

Atkinson, Anthony B. "Multidimensional Deprivation: Contrasting Social Welfare and Counting Approaches." *Journal of Economic Inequality 1(1): 51-65.* 1, no. 1 (2003): 51-63.

Biggeri, Mario, and Jose Cuesta. "An Integrated Framework for Child Poverty and Well-being Measurement: Reconciling Theories." *Child Indicators Research*, 2020.

Biggeri, Mario, and Luca Bortolotti. "Towards a 'Harmonious Society'? Multidimensional Development and the Convergence of Chinese Provinces." *Regional Studies*, 2020.

Bourguignon, François, and Satya R. Chakravarty. "The measurement of multidimensional poverty." *The Journal of Economic Inequality* 1, no. 1 (2003): 25-49.

Burchi, Francesco, Nicole Rippin, and Claudio E. Montenegro. "From income poverty to multidimensional poverty— an international comparison." *International Policy Center for Inclusive Growth Working Paper*, 2018.

Cuesta, Jose, Jon Jellema, and Lucia Ferrone. "Fiscal Policy, Multidimensional Poverty and Equity in Uganda: A Child-Lens Analysis." *European Journal of Development Research*, 2020.

De Neubourg, Chris, Jingqing Chai, Marlous de Milliano, and Ilze Plavgo. "Cross-country MODA study: Multiple overlapping deprivation analysis (MODA)." *Technical note. inwopa*, no. 696 (2013).

De Neubourg, Chris, Jingqing Chai, Marlous de Milliano, and Ilze Plavgo. "Step-by-step guidelines to the multiple overlapping deprivation analysis (MODA)." *Innocenti Working Papers* 695 (2013).

Gordon, David, Shailen Nandy, Christina Pantazis, Simon Pemberton, and Peter Townsend. *Child Poverty in the Developing World.* Bristol: The Policy Press University of Bristol, 2003.

Hicks, Norman, and Paul Streeten Streeten. "Indicators of development: the search for a basic needs yardstick." *World development* 7.6, no. 6 (1979): 567-580.

Laderchi, Caterina Ruggeri. "Poverty and its many dimensions: The role of income as an indicator." *Oxford Development Studies* 25.3 (1997): 345-360.

Maggino, Filomena. "Indicator Development and Construction." In *Encyclopedia of Quality of Life and Well-Being Research*, edited by A. C. Michalos, 3190-3197. Dordrecht: Springer, 2014.

Main, Gill, and Jonathan Bradshaw. "A Child Material Deprivation Index." *Child Indicators Research*, 2012: 503-521.

Oxford Poverty and Human Development Initiative. *Child Multidimensional Poverty in Thailand.* Bangkok: UNICEF THAILAND, 2019.

Roche, José Manuel. "Monitoring progress in child poverty reduction: Methodological insights and illustration to the case study of Bangladesh." *Social indicators research* 112, no. 2 (2013): 363-390.

Roelen, Keetie, Franziska Gassmann, and Chris De Neubourg. "Child poverty in Vietnam: Providing insights using a country-specific and multidimensional model." *Social indicators research* 98, no. 1 (2010): 129-145.

Sen, Amartya. *Commodities and capabilities.* New Delhi: Oxford University Press, 1999.

Sen, Amartya K. *Development as Freedom.* New Delhi: Oxford University Press, 1999.

Trani, Jean-Francois, Mario Biggeri, and Vincenzo Mauro. "The multidimensionality of child poverty: Evidence from Afghanistan." *Social indicators research* 112, no. 2 (2013): 391-416.

UNICEF. "Global Study on Child Poverty and Disparities." *Global Policy Section Division of Policy and Planning*, 2007.

UNICEF. "A review of the use of multidimensional poverty measures." 2021

UNICEF Jordan. *Geographic Multidimensional Vulnerability Analysis. Assessing the performance and supply capacity of different sectors.* Amman: UNICEF, 2020.

UNICEF Tanzania. *Child Poverty in Tanzania.* UNICEF, 2016.

UNICEF Uganda and UBOS. *The Extent and Nature of Multidimensional Child Poverty and Deprivation.* MULTIDIMENSIONAL CHILD POVERTY AND DEPRIVATION IN UGANDA: VOL 1, Kampala: UNICEF, 2019.

United Nations Economic and Social Commission for Western Asia. *Arab Multidimensional Poverty Report.* Beirut: UN ESCWA, 2017.

Annex 1: Thresholds of indicators

DIMENSIONS	INDICATORS	THRESHOLD
WASH	Water: SDG target/JMP definition	[JMP definitions found at: https://washdata.org/monitoring/drinking-water] Basic water services: Drinking water from an improved source, provided collection time is not more than 30 minutes for a roundtrip including queuing. Improved drinking water sources are those that have the potential to deliver safe water by nature of their design and construction, and include: piped water, boreholes or tube wells, protected dug wells, protected springs, rainwater, and packaged or delivered water. Bottled water counts as improved source of drinking water only is non-drinking water source is safe.
	Sanitation: SDG target/JMP definition	[JMP: https://washdata.org/monitoring/sanitation] Use of improved facilities which are not shared with other households
LIVING STANDARDS	Access to energy: unimproved fuel – SDG definitions	Members of the household are considered deprived if the household cooks with solid fuels: wood, charcoal, crop residues or dung. "Indicators for Monitoring the Millennium Development Goals", p. 63
	Access to energy: electricity	No access to electricity. If HH reports that source of lighting is electricity, then they are not deprived
	Housing: unimproved housing materials (floor, roof, walls) + overcrowding	Members of the household are considered deprived if the household has a dirt, sand or dung floor, wall made of natural or rudimentary materials Members of the household are considered deprived if the household has roof made of natural or rudimentary materials Household is deprived in housing if the roof, floor OR walls uses low quality materials. Overcrowding is defined as more than 4 people per sleeping room (so subtract n of rooms for business (q07) from total number (q06))
	HH minimal assets	MPI assets indicator: 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.
INFORMATION	Access to ICT	No access to Internet nor a mobile (individual information on mobile for members 10 years and older)
NUTRITION	Stunting	Height for age lower than -2 standard deviation from international reference (WHO definition)
HEALTH	Unskilled birth attendance	Birth attendance was one of the following: none, relative/friend, traditional birth attendant, or 'other'
	Vaccinations – uncomplete vaccination	Children over 12 months old are lacking one of the following vaccinations: DTP (all three), BCG, Measles (at least one), Polio (all three)
	Unmet need for contraception	Reasons for not using contraception are: cost, unavailability, husband/partner disagrees

EDUCATION	Distance to health services	Health facility is further than 30 minutes
	School attendance	Child does not attend school
	Completed 9 yrs schooling*	Completed 9 years of schooling
	Literacy	Person cannot read and write
EMPLOYMENT	NEET	Youth 15-24 is not attending school, is not employed and is not in training or other schools
	Child labor	Child 10-14 reports more than 14 hrs of work in the week before the survey. Adolescent 15-17 reports more than 43 hours of work. Domestic activity not available.
CHILD PROTECTION	Birth registration	Child is reported not registered or the certificate has not been seen by enumerators, or 'other'

Annex 2: Weights in the nested weights option

Dimensions	Indicators	Children 0-5	Children 6-9	Adolescents 10-14	Adolescents 15-17	Young women 18-24	Young men 18-24	Women 25-49	Men 25-49	Adults 50+
WASH	Water: SDG target/JMP definition (and treatment)	0.10	0.13	0.08	0.08	0.08	0.08	0.13	0.13	0.13
	Sanitation: SDG target/JMP definition	0.10	0.13	0.08	0.08	0.08	0.08	0.13	0.13	0.13
Living standards	Access to energy: improved fuel – SDG definitions	0.05	0.06	0.04	0.04	0.04	0.04	0.06	0.06	0.06
	Access to energy: electricity	0.05	0.06	0.04	0.04	0.04	0.04	0.06	0.06	0.06
	Housing: improved housing materials (floor, roof, walls) + overcrowding	0.05	0.06	0.04	0.04	0.04	0.04	0.06	0.06	0.06
	HH minimal assets	0.05	0.06	0.04	0.04	0.04	0.04	0.06	0.06	0.06
Information	Access to ICT			0.17	0.17	0.17	0.17			
Nutrition	Stunting	0.20								
Health	Skilled birth attendance	0.10								
	Vaccinations – complete vaccination	0.10								
	Unmet need for contraception					0.08		0.13		
	Distance to health services		0.25	0.17	0.17	0.08	0.17	0.13	0.25	0.25
Education	School attendance		0.25	0.17						
	Completed 9 yrs schooling*				0.17	0.17	0.17	0.17	0.25	0.25
Employment	NEET (not in education, employment, or training)				0.08	0.17	0.17			
	Child labour			0.17	0.08					
Child Protection	Birth registration	0.20								
		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

*For adults 60+ 9 yrs of schooling is substituted by literacy

Annex 3: Weights in the equal weights option

Dimensions	Indicators	Children 0-5	Children 6-9	Adolescents 10-14	Adolescents 15-17	Young women 18-24	Young men 18-24	Women 25-49	Men 25-49	Adults 50+
WASH	Water: SDG target/JMP definition (and treatment)	0.10	0.13	0.10	0.09	0.09	0.10	0.11	0.13	0.13
	Sanitation: SDG target/JMP definition	0.10	0.13	0.10	0.09	0.09	0.10	0.11	0.13	0.13
Living standards	Access to energy: improved fuel – SDG definitions	0.10	0.13	0.10	0.09	0.09	0.10	0.11	0.13	0.13
	Access to energy: electricity	0.10	0.13	0.10	0.09	0.09	0.10	0.11	0.13	0.13
	Housing: improved housing materials (floor, roof, walls) + overcrowding	0.10	0.13	0.10	0.09	0.09	0.10	0.11	0.13	0.13
	HH minimal assets	0.10	0.13	0.10	0.09	0.09	0.10	0.11	0.13	0.13
Information	Access to ICT			0.10	0.09	0.09	0.10			
Nutrition	Stunting	0.10								
Health	Skilled birth attendance	0.10								
	Vaccinations – complete vaccination	0.10								
	Unmet need for contraception					0.09		0.11		
	Distance to health services		0.13	0.10	0.09	0.09	0.10	0.11	0.13	0.13
Education	School attendance		0.13	0.10						
	Completed 9 yrs schooling*				0.09	0.09	0.10	0.11	0.13	0.13
Employment	NEET (not in education, employment, or training)				0.09	0.09	0.10			
	Child labour			0.10	0.09					
Child Protection	Birth registration	0.10								
		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

*For adults 60+ 9 yrs of schooling is substituted by literacy

Annex 4: Questionnaire shared with GDS, UNICEF, UNDP, and WB

How do you value, in a scale between 1 and 10 [Where (10) means you fully agree and (1) I do not agree at all], the main characteristics/properties that a measure of multidimensional poverty in Timor-Leste should have?

	not agree at all agree							fully			NOTES Any suggestion	Please mark with a number the first 10 characteristics/properties the MDP measure should have (i.e. in order of preference):
	1	2	3	4	5	6	7	8	9	10		
Have a strong theoretical framework linked to SDGs												
Include, when possible, SDGs targets												
Have a strong link with human rights												
A life cycle approach (different indicators for different ages)												
Be only one measure (i.e. household based)												
Have different measures for different groups (i.e. one for children, one for women, etc.)												
Be internationally comparable												
Measurable at sub-national level (indicate what level in the notes)												
Be comparable over time												
Be disaggregated for different population groups												
Include subjective assessments of well-being (i.e. life satisfaction)												
Include indicators related to employment												
Include indicators related to access to health services												
Include indicators related to assets and wealth												
Inequality should be included. If yes, how (notes)?												
Threshold should be defined by international standards												
Threshold should be defined only by national standards												
Be easy to communicate to policy makers and to the public												
Produce one headline number (i.e. xx % of people are mdp)												
Be sensitive to policy												
NOT be too sensitive to change												
Be used for advocacy												
Be used for policy and programming												

Annex 5: Additional statistics – MDP scores

The table shows the average MDP score according to the two methods, by area and municipality.

	MDP score with equal weights	MDP score with nested weights
National	**0.351**	**0.309**
Rural	0.418	0.356
Urban	0.235	0.226
Ainaro	0.398	0.344
Aileu	0.354	0.301
Baucau	0.361	0.319
Bobonaro	0.38	0.332
Covalina	0.359	0.318
Dili	0.204	0.204
Ermera	0.435	0.369
Liquiça	0.383	0.329
Lautem	0.319	0.292
Manufahi	0.397	0.337
Manatuto	0.371	0.321
Oecussi	0.402	0.343
Viqueque	0.387	0.332

Annex 5: Additional statistics – MDP scores