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POVERTY IN TIMOR-LESTE 2014

DIRECÇÃO GERAL DE ESTATISTICA TIMOR-LESTE

WORLD BANK GROUP

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PREFACE

This report provides a detailed assessment of the methodological approaches and headline poverty results from the Timor-Leste Survey of Living Standards 3. The survey is the third in a series of mutually comparable, detailed surveys to assess a wide range of aspects of living standards in Timor-Leste. Over time, the Timor-Leste Surveys of Living Standards (TLSLS) have become larger to allow for greater precision and depth of analysis. TLSLS-1 was conducted in 2001 soon after Timor-Leste became an independent nation. TLSLS-1 surveyed 1,800 households over a period of three months. Six years later, TLSLS-2 began, in 2007, and included 4,477 households surveyed over 12 months.

This survey, TLSLS-3, is the latest in the series. It was conducted over a 12 month period from April 2014 to April 2015 and involved surveys of 5,916 households, 30 percent more than the previous survey. A focus of the series has been to conduct high-quality surveys that provide a sound basis for the monitoring of household living standards, and the critical task of designing public policy to help improve living standards for all. TLSLS-3 marks the highest level of survey design and implementation by the General Directorate of Statistics, with technical support from the World Bank. The result is a very comprehensive, high-quality survey.

As opposed to the first two TLSLS which both followed periods of instability and upheaval, the intervening period between TLSLS-2 and TLSLS-3 has been one of peace, development and stability in Timor-Leste. It is therefore important to reflect upon the impact that a stable country with an ambitious development agenda can have on improving living standard when not set back by periods of conflict or disasters.

This report focuses on providing key results from the TLSLS-3 and a detailed account of the survey methods. These is not the end but marks the beginning of an exercise to exploit the rich detail of the data-source, and the Government of Timor-Leste in coordination with its development partners and research community will be conducting further work to assess the drivers of poverty, and help to design policy and interventions that have the biggest positive impact for the most people.

Dili, September 2016

Helder Lopes
Vice-Minister of Finance

EXECUTIVE SUMMARY

INTRODUCTION

Data from the recently completed 2014-15 Timor-Leste Survey of Living Standards (TLSLS-3) show a significant reduction in poverty in the country since 2007. At the national poverty line, which represents the cost of meeting basic needs in relation to food, shelter and non-food items in Timor-Leste, the proportion of Timorese living in poverty declined from 50.4% in 2007 to an estimated 41.8% in 2014. At the internationally comparable extreme poverty line of $1.90 (in 2011 purchasing power parity dollars), poverty in Timor-Leste fell from 47.2% to 30.3% over the same period.

This Executive Summary provides an overview of: 1) key design features of the household survey; 2) the main steps used in arriving at the above estimates; and 3) key findings on poverty in Timor-Leste.

TIMOR-LESTE SURVEY OF LIVING STANDARDS-3

TLSLS-3 is the third in the series of nationally representative surveys conducted by the General Directorate of Statistics (DGE). These surveys are designed to help measure and monitor living standards in Timor-Leste. They do this by collecting information on a broad range of topics including consumption expenditures, health, education, employment, housing and access to services. A total of 5,916 households were interviewed by trained and closely supervised enumerators over 12 consecutive months from April 2014 to March 2015, and the sample was distributed across the country so as to obtain reliable district-level poverty estimates. The survey was deliberatively designed such that poverty estimates could be directly compared with those estimated from TSLSS-2, the household survey conducted in 2007.

METHODOLOGICAL STEPS IN POVERTY ESTIMATION

Even though the understanding of poverty generally differs across people, places, and social contexts, it is based on some underlying notion of deprivation. That is, poverty is defined as having fewer resources than would be needed to meet basic human needs, even though what are considered "basic needs" might differ across countries and across people. Deprivations also exist in different dimensions (e.g. food, shelter, health, education etc.), and for practical purposes, there is need for a summary measure that captures these multiple dimensions.

This report provides key results using (i) a consumption-based indicator that aggregates deprivations in multiple dimensions in monetary terms and (ii) a set of non-monetary indicators that directly capture specific deprivations in key dimensions. A consumption-based rather than income-based measure is used because information on consumption is more easily and accurately collected than information on income given the large subsistence and informal sectors in the economy. In addition, non-monetary indicators are used to assess deprivations in specific dimensions that are not completely captured by monetary measures, such as health, education, and ownership of essential assets.

Consumption-based poverty measures. The consumption-based indicator is per capita total household expenditure which consists of three key components: 1) the value food expenditures (purchased as well as own-produced); 2) the rental value of dwellings (actual or imputed); and 3) the value of all other non-food, non-rent expenditures. The values of food and non-food consumption were directly computed from TLSLS-3 responses. For rent, as most dwellings are owner-occupied and few people actually pay rent, the value of rent is imputed with the commonly-used hedonic regression approach. The hedonic model uses the relationship between respondents' estimates of actual rent paid (when available) or how much their dwelling could be rented for and the characteristics of the dwelling to estimate market values of dwellings with specific characteristics.

The consumption-based poverty line is the sum of three components: 1) the food poverty line; 2) the rental poverty line; and 3) the non-food non-rent poverty line. The food poverty line is derived as the cost of the typical local food basket that yields a nutrient value of 2,100 calories per person. The rental poverty line is the average estimated rental cost of a reference dwelling that has 2 rooms, good external walls, proper sanitation and access to electricity. Finally, the non-food poverty line is specified as the average non-food expenditure of those households whose food expenditures are close to the food poverty line.

BOX 1

KEY STEPS IN MEASURING POVERTY

1. Per capita total consumption expenditure is used to measure welfare.
2. A poverty line, also expressed in per capita consumption expenditure, is specified as the monetary value of a 2,100 calorie per day diet, living in a 2 room home with proper sanitation and access to electricity, and a corresponding consumption level of non-food goods and services.
3. The following poverty indices are used to summarize the level of poverty:
   Poverty headcount index: The proportion of the total population below the poverty line.
   Poverty gap Index: A measure of the average amount by which a family's consumption falls short of the poverty line expressed as a proportion of the poverty line, while the consumption shortfall of those above the poverty line is taken to be zero.

FIGURE 01: NOMINAL CONSUMPTION

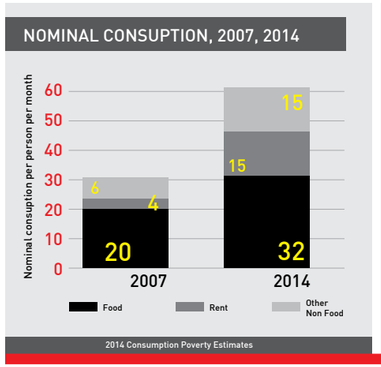
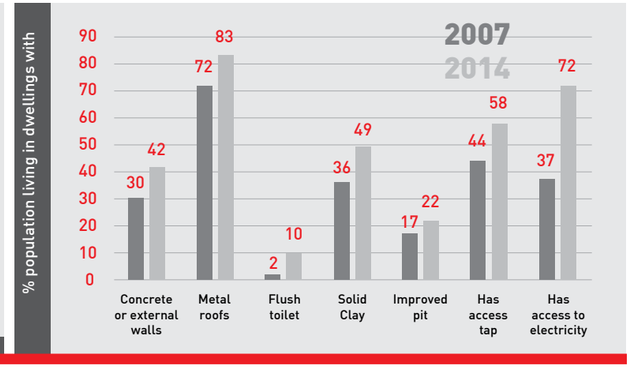


FIGURE 2: CHANGES IN DWELLING AMENITIES 2007 TO 2014



Given the objective of generating district-level poverty estimates, poverty lines were estimated separately for each district, accounting for differences in consumption patterns as well as commodity prices. Given the smaller sample sizes at district level, the margins of error are higher for district-level estimates. The key steps used in estimating poverty prevalence are summarized in the Box 1. Details on these steps are discussed in Sections 2 and 3.

NOMINAL CONSUMPTION GROWTH

Between 2007-2014, per capita consumption expenditure at least doubled in nominal terms for all households except for those poorest 5% of households. Figure 1 shows the change in nominal consumption for the average Timorese person. The largest component of that increase was in rental expenditures, especially for households in the bottom 50%. The increase in rental expenditures is consistent with a marked improvement in the quality of dwellings, and also improvements in public infrastructure that serve these dwellings, as reflected in improved access to water and electricity (see Figure 2). All of these factors indicate increased rental value, and partly explain the increase in estimated rental expenditure. Food expenditures, on the other hand, grew the most slowly for practically all households.

POVERTY LINES FOR TIMOR-LESTE

While nominal expenditures grew significantly over 2007-2014, so did the cost of living for the poor. The national poverty line, which represents the average cost of meeting basic needs, grew by 84.5%, from $25.14 per person per month in 2007 to $46.37 per person per month in 2014. Within the country in 2014, the poverty line was the highest in Dili, the most urbanized district, reflecting its higher cost of living.

TABLE 1: National poverty lines in 2007 and 2014 (US$ per person per month, current prices)

	2007	2014
Food	15.40	25.01
Rent	4.57	11.50
Non-food (excluding rent)	5.17	9.86
Total	25.14	46.37

TABLE 2: Poverty lines in 2014 (US$ per person per month)

	Food	Rent	Other non-food	Total
Timor-Leste	25.01	11.50	9.86	**46.37**
Dili	29.07	12.64	14.45	**56.16**

ESTIMATES OF POVERTY

Estimates based on TLSLS-3 data indicate that in 2014, just under 42% of people in Timor-Leste lived below the poverty line. While this is still a high proportion of the population, it represents significant progress, with poverty incidence reducing by almost 9 percentage points from 50.4% in 2007 (Table 3).

TABLE 3: Poverty indicators

	Percent of population in poverty (%)		Poverty gap index	
	2007	2014	2007	2014
Timor-Leste	**50.4**	**41.8**	**13.8**	**10.4**
Rural	**54.7**	**47.1**	**15.5**	**12.2**
Urban	**38.3**	**28.3**	**9.0**	**5.9**

There was also a significant fall in the poverty gap index, indicating that welfare improvements were not just limited to those near the poverty line. The larger decline in the poverty gap index relative to the headcount index implies the average shortfall in consumption levels experienced by the poor in 2014 was smaller than that in 2007. Poverty fell in both rural and urban areas, though the decline was larger in urban areas.

REAL CONSUMPTION GROWTH AND CHANGES IN INEQUALITY

A reduction in poverty reflects an increased real purchasing power for lower-income households – they have a greater capacity to consume essentials. However, there has also been growth in real purchasing power overall both in rural and urban areas, as seen in Table 4.

TABLE 4: Real consumption (US$ per person per month, 2014 constant average national prices)

	2007	2014
Timor-Leste	**53.9**	**60.1**
Rural	**50.3**	**55.5**
Urban	**64.2**	**71.7**

Inequality is usually measured using the Gini coefficient which varies between 0 and 1 with higher values indicating greater inequality. The Gini coefficient for per capita consumption estimated from the TLSLS-3 data is 0.29 reflecting relatively low level of inequality by international standards, and only very slightly higher than the level of 0.28 estimated for 2007.

PERFORMANCE IN NON-MONETARY INDICATORS

Both TLSLS-2 and TLSLS-3 capture information on a range of non-monetary indicators, both at the household and the individual level. These indicators supplement poverty measures based on changes in consumption expenditure over time. Analysis of a subset of these indicators, reported in Table 5, shows significant nationwide improvements in access to basic services (especially electricity), children's health and education. Improvements can also be seen in access to sanitation facilities and safe drinking water.

There is also a noticeable growth in the ownership of consumer durables between 2007 and 2014. Ownership of mobile phones and televisions has increased, as also the ownership of motorcycles, and appliances such as fans and

TABLE 5: Overall performance in key poverty dimensions

INDICATORS (% of Population Living in Households .....)	2007	2014	Improvement
With no electricity connection	64	28	56%
With poor sanitation	58	40	31%
With no access to safe drinking water	40	25	38%
With poor quality floor in their dwelling	61	48	21%
Using poor cooking fuel	97	87	10%
With very few assets	83	56	33%
With at least one child not attending school	42	17	60%
Without anyone with at least 5 years school	17	13	24%
With at least one underweight child under 5 years of age	35	16	54%
With at least one stunted child under 5 years of age	38	24	37%
With at least one child under 5 years of age with wasting	20	7	65%

FIGURE 3:
OWNERSHIP OF CONSUMER DURABLES

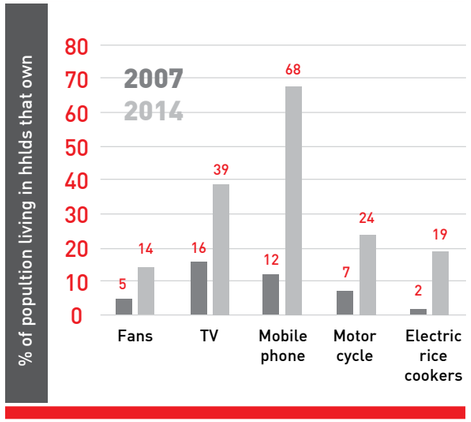
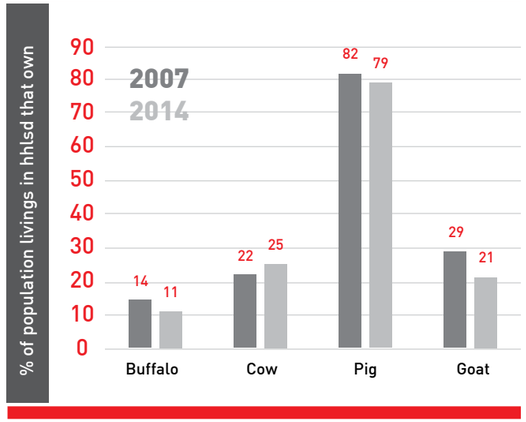


FIGURE 4:
OWNERSHIP OF LIVESTOCK



electric rice cookers (Figure 3). However, there was no apparent increase in the proportion of the population owning livestock, the principal productive asset aside from land in Timor-Leste (Figure 4), although amongst those who owned any livestock there was some increase in the number of livestock owned.

In conclusion, data from TLSLS-3 indicates that there has been visible reduction in poverty in Timor-Leste over 2007-2014: a 9 percentage point decline when Timor-Leste national poverty lines are used, and a 16 percentage point decline when the lower international extreme poverty line is used. Several non-monetary indicators also suggest substantial improvement in living standards over time. TLSLS data also confirm that consumption inequality has remained largely unchanged over this period.

Despite this progress, finding pathways out of poverty for the remaining poor remains a continuing challenge. Further analysis of TLSLS-3 data can shed new light on the conditions of the poor and the constraints they face in overcoming poverty. This will be important in developing an evidence base to identify and implement policies and programs for future poverty reduction.

INTRODUCTION

While the Timorese economy has shown signs of faster growth in recent years, and public spending has increased substantially, how the poor have fared through this period has remained largely unknown. The successful conclusion of the third round of the Timor-Leste Survey of Living Standards (TLSLS-3) in April 2015 provides an opportunity to update our understanding of poverty and of many other economic and social conditions.

The TLSLS-3 is a comprehensive multi-topic survey and the content covered is very broad. It encompasses most of the content covered under more specialized surveys such as the Demographic and Health Survey, the Multiple Cluster Indicators Survey and a typical labor force survey.

Information was collected on, among other things, consumption expenditures, the health and education status of households, anthropometric measurements of children, and occupational and employment status of household members.

A total of 5,916 households were interviewed by trained and closely supervised interviewers over 12 consecutive months from April 2014 to March 2015, and the sample was distributed across the country so as to obtain reliable district-level poverty estimates.

Survey instruments were deliberatively designed such that the TLSLS-3 poverty estimates could be reliably compared with the TLSLS-2 estimates. Consumption estimates for the TLSLS-3 are based on data from three sections of the questionnaire that remained almost identical to

1 The sections are: household information (section 1), housing (section 2) and consumption/expenditure on food, non-food and durables (section 4).

2 The TLSLS-3 added two new items (mobile phone cards/credit and bottled water) and one item was split into two categories (`Prepared food and drinks' has become `Foods and drinks prepared and consumed outside the house' and `Foods and drinks prepared outside and brought to be consumed at home'). The TLSLS-3 also introduced a single reference period for non-food consumption: each non-food item was associated with the last month, the last 3 months or the last 12 months rather than having each non-food item associated with two reference periods –the last month and the last 12 months– as it was the case in the TLSLS-2. These changes are relatively minor and should not raise any significant concerns for the comparability of the consumption aggregate.

the TLSLS 2007. The two surveys followed highly comparable fieldwork protocols, even though the TLSLS-3 canvassed a substantially larger sample. Further details on TLSLS-3 are provided in Annex A.

Using these new data, this report presents comparable estimates of poverty. The primary focus is on poverty measured in terms of household consumption expenditure, an important indicator of wellbeing. The construction of this consumption-based poverty measures is discussed in Sections 2 through 5.

Of course, consumption poverty provides only a partial window on deprivation and well-being of the population. So this assessment is supplemented with a further look at progress in other "non-income" dimensions of welfare. The last section of this report presents estimates for several such non-income indicators as building blocks for an analysis of multidimensional poverty in Timor-Leste. Finally, Annex F suggests options for future work on constructing multidimensional poverty measures for the country.

POVERTY MEASUREMENT METHODOLOGY I: CONSUMPTION-BASED WELFARE INDICATOR

The main methodological consideration in constructing new estimates of poverty with the TLSLS-3 data is to construct estimates that are comparable with the 2007 TLSLS-2 poverty estimates and are consistent across space. This in turn implies considerations relating to (a) using consumption as the welfare indicator, (b) constructing comparable estimates of nominal consumption, and (c) constructing a set of poverty lines for 2014 that reflect, as far as possible, the same standard of living as the poverty lines for 2007. Section 2 covers the first two considerations, and the latter will be covered in Section 3.

CONSUMPTION AS THE WELFARE INDICATOR

The decision to use total consumption expenditure (including some imputed expenditures as discussed below) rather than income as the measure of individual welfare is motivated by two main considerations. First, consumption is arguably a more appropriate indicator if we are concerned with realized, rather than potential welfare, since not all income is consumed, nor all consumption financed out of income. Individuals use savings and credit to smooth fluctuations in income and therefore consumption provides a more accurate measure of an individual's welfare over time. Second, similar to many other developing countries with large informal sectors, in Timor Leste, consumption tends to be measured more accurately than income in household surveys. This is largely due to the difficulties in defining and measuring income for the self-employed who account for a relatively large proportion of the work force.

As in the TLSLS-2 poverty estimates, per capita household consumption is used as the basic measure of individual welfare. While this measure does not incorporate some important aspects of individual welfare, such as consumption of public goods (for example, schools, health services, public sewage facilities), it is a useful aggregate money metric of welfare that reflects individual preferences conditional on prices and incomes, and for that reason, is widely used in welfare assessment and poverty monitoring.

CONSTRUCTING COMPARABLE NOMINAL CONSUMPTION

Having selected consumption as the measure of welfare, the first task in constructing comparable poverty measures is to construct comparable estimates of nominal consumption for every household. Household nominal consumption has three components: (i) food, (ii) rent as the value

of housing services consumed by the household, and (iii) other non-food goods and services.

The food and non-food components are directly estimated from the survey data based on the reported value of the food and non-food items consumed. This follows the same procedures as in the TLSLS-2 survey (see Annex B for details).

However, most houses in Timor-Leste are owner occupied and the rental market in the country is thin. Hence reported rent in the survey is not actual rent, but respondents-estimated rent and this is subject to measurement errors. For this reason, information on estimated rents is not used directly. Instead, when constructing the rental component, actual rents are used whenever available, and predicted (imputed) rents are used otherwise. These predictions are obtained from a hedonic rental model that estimates the relationship between reported rental values and a number of observable dwelling characteristics (number of rooms, building materials used etc.). Such a model had earlier been estimated with the TLSLS-2 data to evaluate the rental component of household consumption in 2007 (World Bank, 2008). A similar model is estimated now with TLSLS-3 data to calculate the rental component of household consumption in 2014. The estimated rental models for 2007 and 2014 are shown in Annex C.

CHANGES IN NOMINAL CONSUMPTION EXPENDITURE 2007-2014

Figure 1 shows the growth in nominal consumption per capita between 2007 (TLSLS-2) and 2014 (TLSLS-3). It is notable that at least in nominal terms, rent has been the fastest growing component of consumption and food has been the slowest component. Correspondingly, food budget shares have declined over the two survey periods, which in view of Engel's law (income elasticity of food being typically less than one) is suggestive of improvements in the standards of living. The substantial increase in nominal rents and the rental share of consumption also point to the need for more attention to the rental component of the poverty lines.

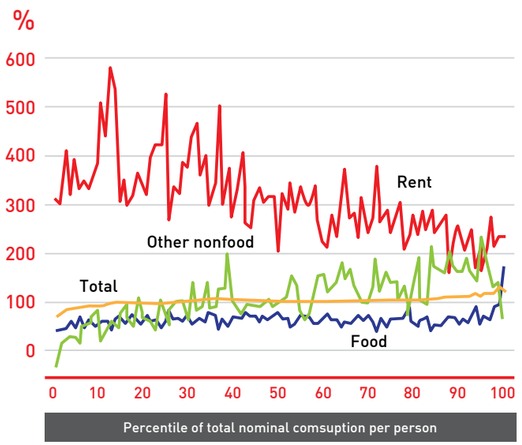


FIGURE 1: GROWTH IN NOMINAL CONSUMPTION BY CENTILE, 2007-2014 (PERCENT INCREASE)

Source: TLSLS 2007 and TLSLS 2014.

POVERTY MEASUREMENT METHODOLOGY II: POVERTY LINES

DISTRICT-LEVEL POVERTY LINES

In the case of the TLSLS-2, poverty lines were constructed for six domains: the rural and urban segments of three regions (Table 1) as the TLSLS-2 sample size permitted only this degree of spatial disaggregation of the poverty lines.

TABLE 1: REGIONS, DOMAINS AND DISTRICTS

Regions	Domains	Districts
EAST	East Urban and East Rural	Baucau, Lautem and Viqueque
CENTRE	Centre Urban and Centre Rural	Aileu, Ainaro, Dili, Ermera, Liquica, Manufahi, Manututo
WEST	West Urban and West Rural	Bobonaro, Cova Lima and Oecussi

Given the above, two main approaches can be considered for the construction of poverty lines for the TLSLS-3 in 2014: (i) updating the 2007 poverty lines for the six domains using estimates of changes in the cost of living for the six domains, or (ii) constructing a new set of poverty lines using TLSLS-3 data and achieving comparability by using the same methodology as in 2007.

Updating the poverty lines is restrictive in that it limits the spatial disaggregation of the poverty lines for 2014 to the same six domains for which poverty lines were constructed for 2007. The TLSLS-3, on the hand, has a 33 percent larger sample size so that poverty statistics can be disaggregated at the district level. Statistics at the district level have greater policy relevance because districts are the key administrative units. Given that poverty statistics at the district level are best constructed with poverty lines determined at the district level, a continuation of the legacy of the TLSLS-2 of six domains for determining poverty lines appears now both undesirable as well as unnecessary. Hence, exploiting the larger sample size of the TLSLS-3, which is representative at the district level, poverty lines in 2014 are estimated separately for the 13 districts.

The minimum sample size in the TLSLS-3 amongst the 13 districts was 254 households in Aileu district and the median sample size was 419 households. These sample sizes are somewhat lower than corresponding sizes for the six domains for 2007 (Table 2), but nonetheless offer an acceptable level of precision for the estimation of poverty line. This new opportunity for further spatial disaggregation is the primary motivation for a move to district-level poverty lines with the TLSLS-3.

TABLE 2: COMPARING MINIMUM SAMPLE SIZES

	TLSLS-3	TLSLS-2
Total sample size	5,916 households from 400 PSUs	4,477 households from 300 PSUs
Minimum sample size in district or domain	254 households in Aileu district	375 households in East Urban domain
Median sample size per district or domain	419 households	695 households

It is also worth noting that developing district-level poverty lines is a more forward-looking approach. It is reasonable to presume that the sample size for future rounds of the TLSLS will grow. Thus, it will be increasingly inappropriate and less defensible to continue with the framework of six spatial domains inherited from the 2007 TLSLS for the future. Establishing a new baseline of district-level poverty lines now will assist in monitoring district-level trends in poverty in the future.

Before describing the new approach in detail, it is also worth noting that in moving to the district as the level of disaggregation for poverty lines, we, in the process, lose the urban-rural split. The TLSLS-3 sample size is simply not large enough to disaggregate by both district and urban-rural segments. However, this does not imply that urban-rural cost of living differentials are totally ignored under this approach. To the extent districts differ in their degree of "urbanity", the district-specific poverty lines will build in cost of living differentials due to higher or lower representation of urban areas across districts. For instance, a higher poverty line for Dili will reflect, in part, the higher urban cost of living for its largely urban population.

The comparability of district-level poverty lines in 2014 with 2007 is achieved by using exactly the same approach to the construction of poverty lines in 2014 as in 2007, although at a lower level of aggregation (i.e., for 13 districts for 2014 relative to the six domains in 2007).

Poverty lines for both years are determined using the cost of basic needs approach (Ravallion 2008). This method effectively calculates the poverty line as the cost of a consumption bundle that is (i) consistent with the consumption pattern of the poor and (ii) deemed adequate for meeting basic needs. The poverty line has three main components: food, rent and non-food.

Food poverty line

The food poverty line is anchored to the recommended nutritional norm of 2,100 calories per person. For each of the six domains in 2007 and for each of the 13 districts in 2014, representative food bundles for the poor are constructed to correspond to the average food consumption pattern of the poor in that domain.

A national reference group representing the poor is identified, and the food bundle for a particular domain (6 in 2007 and 13 in 2014) is then determined as the average (per capita) quantities of food items consumed by households belonging to the reference group of the poor who live in that particular domain.

The domain-specific average food bundles of the poor are scaled up (or down) to yield the recommended 2,100 calories per person per day. The scaled bundles are then valued using median prices (unit-values) of food items paid by the poor in each domain to obtain the food poverty line for that domain.

Rent poverty line

The rent poverty lines represent the average imputed rental cost per person of a reference dwelling in each domain. These lines are constructed using a hedonic rental model where the actual or estimated rents reported by households are modelled as a function of a number of the dwelling characteristics and domain fixed effects. This is the same model as that used for estimating the rental component of household consumption as discussed in section 2.1 above. The model uses similar specifications for 2007 and 2014, the only difference between the two years is that the fixed effects refer to the six domains for 2007, while they refer to the 13 districts for 2014.

The estimated parameters are then used to derive the cost of a reference dwelling that is kept fixed across domains and over the two surveys and the rent poverty lines by domain are calculated by dividing the predicted cost of the reference dwelling in each domain by the corresponding average household size of the poor in that domain[3].

As the procedure involves making predictions over samples for two periods, a parsimonious specification with only six dwelling characteristics is used[4]. The reference dwelling for the rent poverty lines is assumed to have 2 rooms, good external walls, proper sanitation and access to electricity. The estimated models are shown in Annex C.

Non-food (excluding rent) poverty line

The non-food (excluding rent)[5] poverty lines are estimated in terms of what the poor actually spend on non-food items. For any given domain, the non-food poverty line corresponds to the average per capita non-food consumption of the population whose actual combined per capita food and rent consumption is within plus/minus 5% of the sum of the food and rent poverty lines for that domain.

Overall poverty line

The overall poverty line for a domain is the sum of the food poverty line, the rent poverty line and the non-food poverty line for that domain.

3 The average household size of the poor by domain is estimated taking into account only households that belong to the same national reference group of poor households used for the estimation of the food poverty lines.

4 A parsimonious specification helps ward against "out-of-sample" forecasting errors that may result from the inclusion of variables that are only marginally significant or insignificant in one of the two periods.

5 Hereafter, non-food always refers to remaining non-food excluding rent.

There is one practical issue in implementing the above procedure because it relies on the initial identification of a reference group representative of the poor to determine the poverty lines. Yet, without the poverty lines, we do not know who the poor are. To get around this circularity, an iterative method is used. In the first iteration, the reference group for determining the food poverty line is taken to be the bottom 40% of the national population ranked according to constant-prices per capita consumption.[6] The 40% cutoff is chosen based on the TLSLS 2001 estimate of 40% poverty incidence (World Bank, 2003). From the second iteration onwards, the reference group of the poor is the population consuming below the level of the poverty line developed in the previous iteration.

The iterative method thus involves the following series of steps:

1. Use the temporal price indices to express all consumption values in constant prices. Identify the reference group of the poor in the first iteration as the bottom 40% of the national sample ranked by consumption per person at constant-prices.
2. Generate food poverty lines by domain:
   a. Estimate the quantities of food items consumed per person per day amongst the reference group by domain.
   b. Rescale to ensure that the rescaled bundle for each domain provides 2,100 calories per person per day.
   c. Estimate median prices for food items amongst the reference group by domain.
   d. Generate food poverty lines by domain by using rescaled bundles and median prices from steps (2) and (3).
3. Generate the value of the rent poverty lines by domain by dividing the predicted cost of a fixed reference dwelling in each area[7] by the average household size of the households that belong to the reference group of the poor.
4. Estimate the remaining non-food component of the poverty line using non-parametric Engel functions for each domain:
   a. Estimate the non-parametric relationship between non-food consumption per person and total consumption per person using a locally weighted regression.
   b. Predict non-food consumption per person from the non-parametric regression.
   c. Derive predicted food and rent consumption as the difference between actual total consumption per person and predicted non-food consumption per person.
   d. Derive the non-food poverty line as the average predicted non-food consumption of the population whose predicted food and rent consumption lies within plus/minus 5% of the sum of the food and rent poverty lines.
5. Derive the first iteration total poverty line for any domain as the sum of the food, the rent and the non-food poverty lines for that domain.
6. Calculate the poverty incidence with the first iteration total poverty lines, and those identified as poor will serve as the reference group for the next iteration, which repeats step (2) to (5). The algorithm stops when the average of the absolute percentage change in the total poverty lines over the previous iteration is less than 5%. For both 2007 and 2014, it took only two iterations for the poverty lines to converge to the final estimates.

6 Constant prices imply monetary values deflated over time by the temporal price index, but not spatially.

7 The cost of a fixed reference dwelling in each area is estimated before the iterative method starts and hence does not change over iterations

The estimated poverty lines

The poverty lines resulting from the application of the methodology set out above are shown in TABLE 3 for 2007 for the 6 domains and TABLE 4 for 2014 for the 13 districts.

The estimates in Tables 3 and 4 indicate that while there is variation across the six spatial domains and across districts, on average, the new food poverty line for 2014 increased by 62.4% since 2007, which is comparable with the increase in food CPI of 69.5%. However, the average total poverty line for 2014 rose by 84.5%, which is appreciably higher than the total CPI increase of 66.5%. The estimated poverty lines are thus indicative of the cost of basic non-food having risen significantly more than the increase implied by the non-food component of the CPI.

An important factor behind this is the large increase in the rent poverty line. Recall that the rent poverty line is estimated by valuing the rental cost of a fixed reference dwelling at the two dates. As noted before, rent has been the fastest growing component of nominal household consumption. Between 2007 and 2014, the average value of rent per person tripled in nominal terms. By comparison, the rental valuation of the reference dwelling rose two-and-a-half times, thus still indicating a substantial increase in the rental component of consumption in real terms. However, despite the large increase in the rent poverty line, its contribution to the increase in the total poverty line was limited by the initial (2007) low share of the rental component of the poverty line of about 18%.

The estimates in Tables 3 and 4 indicate also that the cost of living for the poor has risen faster in the Eastern districts than in the Centre or the West.

TABLE 3: POVERTY LINES PER PERSON PER MONTH, 2007

	Food	Rent	Other	Total
East rural	11.10	3.25	4.07	18.42
East urban	13.02	2.87	4.95	20.84
Centre rural	16.55	4.54	4.50	25.59
Centre urban	18.89	5.71	6.33	30.92
West rural	14.38	4.97	6.10	25.44
West urban	15.92	4.98	6.99	27.88
Timor-Leste	**15.40**	**4.57**	**5.17**	**25.14**

Note: At average prices of January 2007/January 2008 of each domain.
Source: TLSLS 2014

TABLE 4: POVERTY LINES PER PERSON PER MONTH, 2014

	Food	Rent	Other	Total
EAST				
Baucau	24.86	10.64	7.83	43.33
Lautem	21.29	12.94	7.34	41.57
Viqueque	24.06	12.37	8.07	44.51
CENTRE				
Ainaro	24.38	11.15	8.75	44.28
Aileu	23.89	8.80	8.45	41.14
Dili	29.07	12.64	14.45	56.16
Ermera	21.74	8.82	7.42	37.97
Liquiça	23.00	8.57	6.22	37.79
Manufahi	25.57	11.79	10.51	47.87
Manatuto	24.16	11.15	8.51	43.81
WEST				
Bobonaro	24.83	9.73	9.89	44.45
Covalima	25.66	11.68	12.11	49.45
Oecussi	24.05	17.69	9.37	51.12
Timor-Leste	**25.01**	**11.50**	**9.86**	**46.37**

Note: At average prices of April 2014/April 2015 of each district.
Source: TLSLS 2014

POVERTY ESTIMATES

POVERTY INDICES

Using per capita consumption as the measure of individual welfare, members of a household are considered poor if the per capita consumption of the household is below the poverty line. The poverty line is "absolute" in the sense that it fixes a given welfare level, or standard of living, over the domains of analysis. Three poverty indices within the Foster, Greer and Thorbecke (1984) class of poverty measures are evaluated. This family of measures can be written as:

$$P_\alpha = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{z - y_i}{z}\right)^\alpha$$

where is some non-negative parameter, z is the poverty line, y denotes consumption, i represents individuals, n is the total number of individuals in the population, and q is the number of individuals with consumption below the poverty line.

HEADCOUNT INDEX

The headcount index (α=0) measures the percentage of the population whose consumption is below the poverty line. This index is the most widely used poverty measure mainly because it is very simple and easy to interpret. However, the headcount index has some well-known limitations. It does not take into account how close or far the average consumption levels of the poor are relative to the poverty line. Nor is it sensitive to the distribution of consumption amongst the poor.

POVERTY GAP INDEX

The poverty gap index (α=1) is the average consumption shortfall of the population relative to the poverty line. The shortfall is expressed as a proportion of the poverty line and the non-poor are assigned a zero shortfall. The poverty gap index takes into account the average consumption level of the poor and is often referred to as a measure of the depth of poverty.

SQUARED POVERTY GAP INDEX

Finally, the squared poverty gap index (α=2) is sensitive not only to the mean consumption shortfall of the poor relative to poverty line, but also to the distribution of consumption amongst the poor. In contrast to the poverty gap index, which gives equal weight to the consumption shortfalls of all the poor, the squared poverty gap index assigns higher weights to the larger poverty gaps, thus making the measure sensitive

to transfers amongst the poor. The squared poverty gap index is also referred to as a measure of the severity of poverty.[8]

RESULTS

Average consumption and inequality

Table 5 shows real consumption expenditure per person and the Gini index of inequality at the national level, and disaggregated for urban and rural areas. Nationally, average real consumption per person grew by a little over 10% during 2007-14 to about $2 per person per day in 2014. Though modest, this growth in mean consumption enabled the poverty reduction observed over this period. Also, there was no significant change in inequality (as measured by the Gini index) between 2007 and 2014.

TABLE 5: REAL PER CAPITA CONSUMPTION AND INEQUALITY, 2007 AND 2014

	CONSUMPTION PER PERSON ($/person/month)		GINI COEFFICIENT	
	2007	2014	2007	2014
Timor-Leste	**53.9**	**60.1**	**0.28**	**0.29**
Rural	50.3	55.5	0.26	0.27
Urban	64.2	71.7	0.29	0.29

Note: Consumption per person at average national prices of April 2014/April 2015.
Source: TLSLS 2007 and TLSLS 2014.

Poverty estimates: national, sectoral and regional

Table 6 reports the new estimates of poverty for 2014 at the national level, and disaggregated by urban and rural areas, together with comparative estimates for 2007.

8 These measures satisfy some useful properties. For instance, all three poverty measures are subgroup decomposable in that the aggre gate poverty measure equals the population-weighted average of the subgroup poverty measures. The poverty gap and the squared poverty gap measures satisfy the monotonicity axiom, which requires that a welfare reduction for a poor household should cause mea sured poverty to increase. Finally, the squared poverty gap measure also satisfies with the transfer axiom, which requires that a re gressive transfer from a poor to a richer person should lead to an increase in measured poverty. Sen (1976) proposed the monotonicity and transfer axioms. For a discussion of these and other properties of poverty measures, also see Foster (2005).

TABLE 6: POVERTY INDICES, 2007 AND 2014

	Headcount (Incidence)			Poverty gap (Depth)			Squared poverty gap (Severity)	
	2007	2014		2007	2014		2007	2014
Timor-Leste	**50.4**	**41.8**	***	**13.8**	**10.4**	***	**5.1**	**3.7*** **
Rural	54.7	47.1	***	15.5	12.2	***	5.9	4.4***
Urban	38.3	28.3	***	9.0	5.9	***	3.0	1.8***
East	31.6	33.8		6.0	7.1		1.7	2.1
Centre	54.6	40.0	***	15.4	9.8	***	5.8	3.4***
West	60.3	55.5		18.2	15.8		7.2	6.2
East rural	32.2	36.0		6.1	7.7		1.7	2.3
East urban	25.4	21.0		5.1	3.8		1.5	1.0
Centre rural	64.4	48.3	***	19.4	12.6	***	7.6	4.5***
Centre urban	39.1	26.4	***	9.2	5.3	***	3.1	1.6***
West rural	62.7	57.6		19.2	16.8		7.7	6.7
West urban	42.5	46.0		10.6	11.5		3.7	3.8

Note: *, ** and *** indicate significantly different from 2007 at 10, 5 and 1 per cent, respectively.
Source: TLSLS 2007 and TLSLS 2014.

The estimates in TABLE 6 indicate a significant decline in poverty between 2007 and 2014. The proportion of population below the poverty line declined from about 50% to 42%. There was also a significant fall in the poverty gap and squared poverty gap measures, indicating that welfare improvements are not just limited to those near the poverty line. Poverty fell in both rural and urban areas, though the decline is larger in the urban sector. Across regions, the largest decline in poverty is witnessed for the Central region. Poverty also declined in the West, while there was a modest (though not statistically significant) increase in poverty in the East driven by the rise in rural poverty.

District-level poverty estimates

TABLE 7 shows the district profile of poverty together with average real consumption and Gini inequality indices for 2014.

There is considerable variation in levels of poverty rates across the 13 districts. For instance, the headcount index ranges from 29% for Dili to 63% for Oecussi. More generally, with some exceptions, poverty levels are lower in eastern districts and higher in western districts, with the central districts in the middle. (Annex D shows the 2014 poverty estimates along with their standard errors and confidence intervals.)

Disparities in mean consumption levels largely mirror those in the poverty rates. There is also some variation in inequality indices across districts, although there does not seem to be a systematic relationship between average living standards and level of inequality. For instance, while Dili has the highest mean consumption (of $72) and Oecussi has the lowest (of $49), they both have relatively high and very similar Gini indices of 0.30 and 0.31 respectively. In particular, the high level of poverty in Oecussi seems to be the product of low average consumption as well as high levels of inequality.

TABLE 7: POVERTY INDICES AND REAL PER CAPITA CONSUMPTION BY DISTRICT, 2014

	POVERTY INDICES				
	Headcount (Incidence)	Poverty gap (Depth)	Squared poverty gap (Severity)	Consumption per person ($/month)	Gini coefficient
Timor-Leste	**41.8**	**10.4**	**3.7**	**60.1**	**0.29**
EAST					
Baucau	32.6	6.8	2.0	63.0	0.25
Lautem	32.2	6.8	2.1	64.7	0.28
Viqueque	36.9	7.8	2.4	61.7	0.26
CENTRE					
Aileu	35.1	8.1	2.7	59.8	0.24
Ainaro	43.2	9.4	3.0	58.6	0.26
Dili	29.1	6.0	1.9	72.0	0.30
Ermera	56.7	17.1	6.6	52.9	0.31
Liquiça	43.0	11.7	4.4	54.7	0.26
Manufahi	47.7	11.1	3.6	54.1	0.24
Manatuto	43.1	9.2	2.9	59.8	0.26
WEST					
Bobonaro	51.7	12.6	4.4	53.0	0.26
Cova Lima	53.1	15.9	6.8	50.2	0.27
Oecussi	62.5	19.8	7.9	49.3	0.31

Note: Consumption per person at average national prices of April 2014/April 2015.
Source: TLSLS 2014.

POVERTY REDUCTION: TIMOR-LESTE IN THE INTERNATIONAL CONTEXT

Table 8 juxtaposes the rate of poverty reduction in Timor-Leste over 2007-2014 with rates of poverty reduction observed in selected g7+ conflict-affected countries, CPLP countries as well as some key Asian countries for which data is available over a similar time period.

Because national poverty thresholds differ across countries, the comparison is made in terms of achievements in poverty reduction using the internationally comparable extreme poverty line of $1.90 at 2011 Purchasing Power Parity prices (PPP).

The 2011 PPP exchange rate for most countries were estimated from International Comparison Program (ICP) price surveys conducted in 2011. As this survey was not undertaken in Timor Leste, PPP exchange rate for the country was "estimated" to be 0.56, implying that $0.56 in Timor Leste had the same purchasing power as $1.00 in the US in 2011. As a result, the PPP for Timor Leste

BOX 2

NATIONAL VERSUS INTERNATIONAL POVERTY LINE

NATIONAL POVERTY LINE

The national poverty line presented in this report is the most relevant measure of what it means to be poor in Timor-Leste and is based on consumption patterns and prices prevailing in Timor-Leste. The national poverty line is the most useful threshold for monitoring national poverty and for national policy making.

INTERNATIONAL EXTREME POVERTY LINE

Given that the national poverty line varies from country to country, it is difficult to compare national poverty results internationally. Hence an international line which is based on the average national poverty lines of some of the poorest countries in the world and equivalent to $1.90 a day at 2011 Purchasing Power Parity prices is used. This is equivalent to $40.45 per person per month at 2014 Timor-Leste prices, $5.92 less than the Timor Leste national poverty line.

is less reliable than for other countries where actual price surveys were conducted. Using the 2011 PPP of 0.56 and after adjusting for inflation between 2011 and 2014, the international poverty line in 2014 Timor Leste prices is equivalent to $1.33 per person or $40.45 per person per month. This is considerably lower than the 2014 national poverty line of $46.37 per person per month. It should therefore be noted that the international line has less firm grounding than the national poverty line in the basic need requirements in Timor Leste. In fact the minimum living standard is lowered when moving from the national poverty line to the international poverty line.

Table 8 shows that poverty in Timor-Leste declined by 16.9 percentage points, from 47.2% in 2007 to 30.3% in 2014. The rate of poverty reduction in Timor-Leste took place at a more rapid rate than in Haiti, Sierra Leone, and Togo (among the g7+ countries) as well as China and Indonesia.

TABLE 8: POVERTY REDUCTION IN SELECTED COUNTRIES

Selected countries	Period	Rate of poverty decline at $1.90 (2011 PPP) poverty line Average percentage points per year
Selected g7+ countries		
Chad	2003-2011	3.1
Congo	2004-2012	1.9
Haiti	2001-2012	0.2
Sierra Leone	2003-2011	0.8
Togo	2006-2011	0.3
Timor Leste	2007-2014	2.4
Selected CPLP countries		
Angola	2000-2008	0.3
Mozambique	2002-2008	1.9
Cabo Verde	2001-2007	1.8
Others		
China	2002-2010	1.5
Indonesia	2005-2010	0.9
India	2004-2011	2.5

Source: TLSLS 2014 and World Bank.

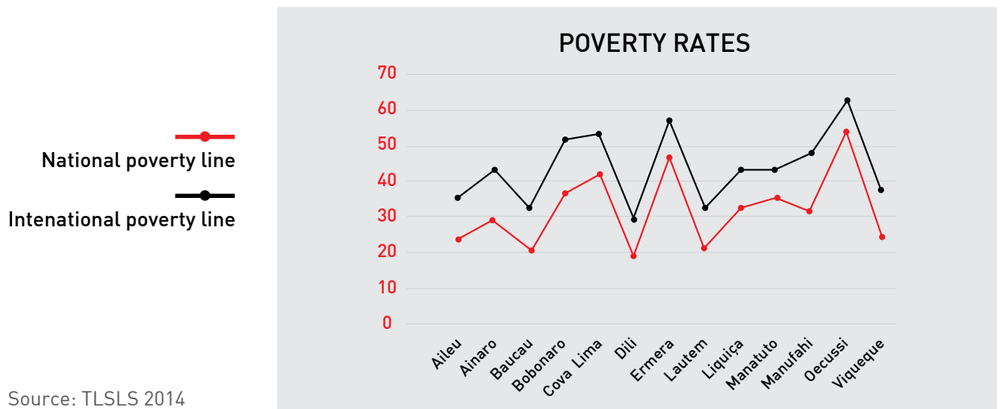
DISTRICT-LEVEL POVERTY RATES USING THE INTERNATIONAL POVERTY LINE

BOX 3

In order to estimate district level prevalence of poverty using the international $1.90 (2011 PPP) line, district level household expenditures were adjusted to national level prices using the ratio between the district poverty lines and the national poverty line, reflective of the price difference across districts. District level international poverty rates are not computed for 2007 for the same reason district level national poverty rates are not computed for 2007: the TLSLS2 sample size does yield reliable estimates at the district level.

The table and chart below provides poverty rates by districts using the $1.9 (2011 PPP) line. Note that while poverty rates obviously fall when using international line, its distribution across districts remains almost the same (more apparent in the chart).

District	Poverty rate using the national poverty line	Poverty rate using the international poverty line
Aileu	35.1	23.7
Ainaro	43.2	28.9
Baucau	32.6	20.8
Bobonaro	51.7	36.2
Cova Lima	53.1	41.8
Dili	29.1	18.9
Ermera	56.7	46.8
Lautem	32.2	20.8
Liquiça	43	32.9
Manatuto	43.1	34.8
Manufahi	47.7	31.1
Oecussi	62.5	54.0
Viqueque	36.9	24.3
Timor Leste	41.8	30.3



Source: TLSLS 2014

SENSITIVITY OF POVERTY INCIDENCE

This section investigates the robustness of the poverty estimates presented above to different methodological choices. The first subsection deals with robustness with respect to correcting for household members' age and sex in calorie requirements, the second subsection looks at changes in the poverty estimates due to the inclusion of expenses on festivities and ceremonies in total household consumption, and the third subsection assesses robustness against potential biases due to fieldwork team effects. For brevity, this section presents results pertaining to the measure of poverty incidence only (the headcount index); however results for the other poverty measures (the poverty gap index and the squared poverty gap index) are similar.

CALORIE REQUIREMENTS

Poverty lines in 2007 and in 2014 were constructed using a caloric norm of 2,100 calories per person per day. One may, however, want to allow for differences in caloric requirements by age and sex. This issue is investigated by replacing the uniform per capita calorie requirement with a set of age-gender-specific requirements, as shown in Table 9.

TABLE 9: DAILY CALORIE REQUIREMENTS BY AGE AND SEX

Age (years)	Male	Female
Less than 1	584	584
1 to 3	1060	1060
4 to 6	1350	1350
7 to 9	1690	1690
10 to 12	2190	2010
13 to 15	2750	2330
16 to 17	3020	2440
18 or more	2730	2230

Source: TLSLS 2014.

The calorie norms in Table 9 are drawn from the recommendations of the National Institute of Nutrition and the Indian Council of Medical Research (NIN-ICMR, 2010). Similar recommended caloric intakes are not available for Timor-Leste, but the NIN-ICMR norms offer a reasonable benchmark to investigate potential sensitivity to equivalence scales.

Table 10 (middle panel) reports the results of this exercise for poverty incidence (headcount index).[9] As indicated in the table, the poverty lines underlying these estimates are based on a norm of 2,730 calories per male adult equivalent for both 2007 and 2014. This translates into a requirement of 2,100 calories per person for 2007 and a slightly higher requirement of 2,168 calories per person for 2014, reflecting a change in the underlying age-sex distribution of the population.

TABLE 10: SENSITIVITY OF POVERTY INCIDENCE, 2007, 2014

	Current estimates		Equivalence scales		Including festivities	
	2007	2014	2007	2014	2007	2014
Timor-Leste	**50.4**	**41.8**	**50.4**	**44.6**	**50.1**	**41.6**
Rural	54.7	47.1	54.7	50.5	54.3	46.8
Urban	38.3	28.3	38.3	29.8	38.5	28.2
Poverty lines *	25.1	46.4	25.1	47.7	26.5	50.1
Food	15.4	25.0	15.4	26.0	15.5	25.5
Rent	4.6	11.5	4.6	11.6	4.6	11.6
Nonfood	5.2	9.9	5.2	10.2	6.4	12.9
kcal/day/person	2,100	2,100	2,100	2,168	2,100	2,100
kcal/day/adult male	-	-	2,730	2,730	-	-

* Poverty lines per person per month at average national prices of each year.
Source: TLSLS 2007 and TLSLS 2014.

The resulting poverty lines for 2014 are slightly higher than the estimates based on the uniform caloric norm. The estimated poverty incidence for 2014 is about 3 percentage points higher, though the decline in poverty relative to 2007 is maintained.

9 The results for poverty gap and squared poverty gap measures are similar.

FESTIVITIES AND CEREMONIES

The second piece of sensitivity analysis deals with spending on festivities and ceremonies, which includes expenses on marriages, births, funerals, festivals and similar events. Conceptually, these expenses are part of consumption, but previous poverty analyses excluded them largely for two related practical considerations: (a) such expenses are incurred infrequently, so even the longest recall period in the survey (the last 12 months) may not adequately reflect their occurrence for many households, and (b) these expenditures are often rather large (reflecting their lump sum nature), which can distort the "usual" consumption and poverty status of households reporting such expenses. However, since Timor-Leste is a country where festivities and ceremonies are a more frequent part of the social and cultural tradition, it is worth exploring whether their inclusion in household consumption makes a difference.

Table 10 (right panel) reports the relevant results, which show that this makes little difference to either the levels or changes in poverty incidence.[10] Compared with the benchmark estimates of a

TABLE 11: DISTRIBUTION OF 2014 SAMPLE BY DISTRICT AND TEAM

District	Team								Total
	1	2	3	4	5	6	7	8	
Ainaro	30	14	0	30	0	60	120	120	374
Aileu	15	45	59	75	60	0	0	0	254
Baucau	0	0	0	0	0	210	194	180	584
Bobonaro	45	120	119	72	149	0	0	0	505
Covalima	45	90	76	104	104	0	0	0	419
Dili	120	201	257	261	0	12	0	0	851
Ermera	45	60	73	59	177	60	0	0	474
Liquiça	30	45	45	29	248	0	0	0	397
Lautem	0	0	0	0	0	100	150	148	398
Manufahi	45	60	60	43	0	60	30	60	358
Manatuto	0	15	37	60	0	90	97	88	387
Oecussi	375	90	0	0	0	0	0	0	465
Viqueque	0	0	0	0	0	150	150	150	450
Total	**750**	**740**	**726**	**733**	**738**	**742**	**741**	**746**	**5,916**

Source: TLSLS 2014.

10 Though not reported, the results are similar for the poverty gap and squared poverty gap indices.

decline from 50.4% in 2007 to 41.8% in 2014, these estimates indicate a decline from 50.1% to 41.6%. The main reason for this small change is easy to appreciate. The inclusion of festivities and ceremonies certainly increases non-food and total consumption of households, but it also raises the allowance for the non-food component of the poverty line. Recall that the latter is estimated as the non-food (excluding rent) expenditure of the population whose food and rent expenditure is in the neighbourhood of the food and rent poverty lines. Thus, effectively, the methodology used for the estimation of poverty lines offers an element of built-in stability to the poverty estimates, which is also reflected in the results reported in Table 10.

FIELDWORK TEAM EFFECTS

The TLSLS-3 deployed 8 teams to carry out the entire fieldwork for the yearlong survey. All teams received the same centralized training prior to the launch of fieldwork. As noted in Annex A, for quality assurance purposes, the sample was randomly distributed across quarters, districts and teams. Thus, the sample of each district, with the exception of Oecussi, was randomly allocated to at least three different teams of fieldworkers (interpenetrating sampling) whose fieldwork was spread over the four quarters. Oecussi was surveyed by two teams, with a different team visiting each quarter. The distribution of the final sample by team and district is shown in Table 11.

TABLE 12: SENSITIVITY OF POVERTY INCIDENCE TO EXCLUSION OF TEAMS

	All teams	When excluding team 1	2	3		4	5	6	7	8
Timor-Leste	**41.8**	**41.2**	**42.2**	**46.2**	**	**44.3**	**44.5**	**40.3**	**40.5**	**40.3**
Ainaro	43.2	44.6	44.3	50.0		44.6	45.3	45.3	45.9	37.9
Aileu	35.1	34.0	34.0	44.8		35.4	35.9	33.4	32.7	34.3
Baucau	32.6	34.0	34.0	34.0		34.6	35.1	34.2	33.8	29.7
Bobonaro	51.7	50.0	42.4	64.3	*	49.6	60.1	51.1	45.2	51.2
Covalima	53.1	52.3	55.6	53.3		55.0	52.9	51.8	51.5	51.9
Dili	29.1	23.6	30.4	32.7		34.8	30.5	24.7	26.4	27.8
Ermera	56.7	56.4	58.4	60.3		61.2	57.2	57.6	55.5	55.5
Liquiça	43.0	39.8	43.4	45.7		48.2	49.0	42.8	40.6	41.3
Lautem	32.2	34.0	36.6	36.8		32.2	36.0	31.7	37.7	28.4
Manufahi	47.7	46.2	49.4	52.5		47.6	50.3	47.3	49.6	45.7
Manatuto	43.1	45.1	44.0	46.0		47.3	46.2	34.6	40.7	41.4
Oecussi	62.5	72.4	60.4	64.5		62.8	64.3	62.0	60.3	61.6
Viqueque	36.9	37.8	41.0	42.9		38.7	41.4	32.8	35.0	39.2

Note: *, ** and *** indicate a significant difference from the full sample ("All teams") estimate at 10, 5 and 1 per cent, respectively.
Source: TLSLS 2014.

For a sufficiently large total sample size, the households surveyed by each team could be considered an independent random subsample of the overall sample. However, in smaller samples, this would only be approximately so, thus raising the possibility of team effects in finite samples. Could this bias district-level poverty estimates? We investigate this by conducting the following experiment for each team. We consider ignoring the subsample surveyed by one particular team, say team j. Thus, the households surveyed by team j are assigned a sampling weight of zero, and correspondingly, for each district team j was active in, the sampling weights of households surveyed by other teams are increased to achieve the same total population for the district. Consumption, poverty lines and poverty measures are then recalculated for such a reweighted sample, and then we test for any statistically significant difference with respect to the benchmark poverty estimates using the full sample for all teams. The presence of statistically significant differences would be suggestive of finite sample biases due to team effects. The experiment is repeated for each team j=1,2...8. The results are summarized in Table 12.[11]

The first column of Table 12 reproduces the poverty incidence estimates for the full sample as in Box 3. The remaining columns report the poverty estimates when the subsample for one of the 8 teams is excluded with reweighting of the remaining sample. The results show that in almost all cases the differences between the full sample poverty estimate (at both the national and district levels) and those excluding a particular team's subsample are not statistically significant. The only exception is in the case of team 3, for which the national poverty estimate is significantly different at the 5% level and the estimate for Bobonaro is significant at the 10% level.

As there is just one exception involving a significant difference between the full sample and reweighted subsample estimates, the benchmark poverty measures based on the full sample can be considered to be robust overall to the presence of fieldwork team effects. As in the case of consumption including festivities and ceremonies (section 6.1), this is on account of the robustness of the underlying poverty estimation methodology, which recalibrates the poverty lines in accordance with measured consumption. As shown in the detailed results in Annex E, any understatement or overstatement of nominal consumption due to potential team effects is compensated by a recalibration of the district poverty lines in the same direction.

11 The full set of results of excluding teams is shown in Annex E.

HOUSEHOLD CHARACTERISTICS AND POVERTY

This section looks at several poverty correlates, from household demographics and health status of children to ownership of consumer durables and livestock, and assesses the extent to which the change in observed in consumption poverty matches changes in poverty correlates such as child malnutrition or patterns of consumption expenditure. It also assesses the extent to which households characteristics differ between the poor and the non-poor.

DEMOGRAPHY AND POVERTY

Table 13 shows the distribution of the poor by age and gender. As children under the age of 15 account for more than 40% of the population in 2014, they, as in 2007, also account for almost half of the poor population of the country. While poverty incidence has declined overall, except for a small rise in the proportion of poor that are elderly, there is very little change in the age and sex distribution of the poor population 2007-2014 (Table 13).

As in 2007, poverty incidence is lower among female-headed households than male-headed households, but the difference in the incidence rates between the two groups has more than doubled in 2014 (Table 14). This reflects the 22 and 14 percentage point declines in poverty incidence among female headed households in urban and rural areas respectively over 2007-2014. Overall, comparing female-headed with male-headed households, poverty incidence declined more steeply among female-headed households over 2007-2014, by 17.4 percentage points relative to a decline by about 8 percentage points amongst male-headed households. At the national level, more than 90% of the poor live in male-headed households.

It is also worthwhile to point out that in 2007, female-headed households were less poor mainly because of their small household size. In contrast, in 2014, poverty incidence among female-headed households is lower than male headed households even among similar household sizes (Table 15).

TABLE 13: DISTRIBUTION OF POOR BY AGE AND GENDER

AGE GROUPS	PERCENTAGE OF THE POOR			POVERTY INCIDENCE		
	National	**Male**	**Female**	**National**	**Male**	**Female**
Total 2007	100.0	51.0	49.0	50.4	50.6	50.2
‹15	48.8	25.0	23.8	56.7	57.1	56.4
15-24	17.6	9.4	8.1	47.1	48.2	45.8
25-34	10.0	4.6	5.5	43.7	41.1	46.2
35-44	10.3	5.1	5.3	50.5	47.8	53.5
45-60	10.0	5.3	4.7	44.2	47.5	41.0
61+	3.3	1.8	1.6	35.9	36.6	35.2
Total 2014	100.0	50.7	49.3	41.8	42.3	41.2
‹15	47.3	24.1	23.3	49.0	49.5	48.6
15-24	17.2	9.0	8.2	39.5	40.3	38.6
25-34	10.6	4.8	5.8	37.3	35.6	38.7
35-44	9.6	4.5	5.1	40.3	38.0	42.6
45-60	9.9	5.6	4.3	36.4	39.2	33.5
61+	5.3	2.8	2.6	26.8	29.3	24.6

Source: TLSLS 2014, TLSLS 2007

TABLE 14: POVERTY AMONGST FEMALE AND MALE-HEADED HOUSEHOLDS

	POVERTY INCIDENCE (%)			PERCENTAGE OF THE POOR		
	National	**Rural**	**Urban**	**National**	**Rural**	**Urban**
Total 2007	50.4	54.7	38.3	100.0	100.0	100.0
Female-headed	45.0	47.2	39.2	9.0	8.6	10.9
Male-headed	51.0	55.5	38.2	91.0	91.4	89.1
Total 2014	41.8	47.1	28.3	100.0	100.0	100.0
Female-headed	27.6	32.8	16.9	6.9	6.9	7.3
Male-headed	43.4	48.6	29.9	93.1	93.2	92.7

Source: TLSLS 2014

TABLE 15. POVERTY AMONGST FEMALE AND MALE-HEADED HOUSEHOLDS BY HOUSEHOLD SIZE

% HOUSEHOLD SIZE	POVERTY INCIDENCE		
	National	**Male**	**Female**
Total 2007	50.4	51.0	45.0
1 or 2	8.1	6.4	10.5
3	20.4	17.8	26.8
4	32.4	31.9	36.2
5	43.8	42.5	53.1
6	53.6	53.0	61.4
7+	61.6	61.4	64.9
Total 2014	41.8	43.4	27.6
1 or 2	1.4	1.7	0.8
3	11.5	13.2	6.1
4	22.7	22.6	23.6
5	27.5	27.4	28.0
6	43.8	44.2	39.8
7+	56.2	57.1	43.4

Source: TLSLS 2014

CONSUMPTION PATTERN AND POVERTY

Table 16 shows the share of major consumption categories in total consumption. The share of food in total consumption expenditure declined from 66% to 54% over 2007-2014. Not only that, the decline was larger for the poor (14 percentage points) than for the non-poor (11 percentage points). However, the most significant change was in the share of rental expenditures, especially for the poor: rental share more than doubled from 12.6% in 2007 to 27.2% in 2014. Share of non-food expenditures increased marginally for both poor and non-poor while shares of utilities, health, and education declined.

NUTRITIONAL STATUS OF CHILDREN

Table 17 provides information on the nutritional status of children based on anthropometric measurements. It is clear that both the incidence of underweight children (weight lower than that of a reference child of a particular age) and wasting (weight lower than that of a reference child of a particular height) decreased significantly over 2007-2014. The incidence of wasting almost halved while the incidence of underweight children declined by about 16 percentage points indicating a substantial decline in acute malnutrition among children. However such rates of progress are not observed for stunting (height lower than that of a reference child of a particular age) where the decline was only about 5 percentage points. The stunting prevalence rate itself remains high at 49.2% implying that about half the children in the country continue to suffer from chronic malnutrition, most likely due to inadequate intake of essential micronutrients.

OWNERSHIP OF LIVESTOCK AND OTHER DURABLE GOODS

There are some noticeable changes in ownership of consumer durables between 2007 and 2014. As Table18 shows, ownership of mobile phones and

TABLE 16: SHARES OF MAJOR CONSUMPTION CATEGORIES IN TOTAL CONSUMPTION, BY POVERTY STATUS

(%)

	2007			2014		
	National	**Non-poor**	**Poor**	**National**	**Non-poor**	**Poor**
Total	100.0	100.0	100.0	100.0	100.0	100.0
Food	66.2	64.3	70.6	54.0	53.1	57.0
Non-food	10.4	11.4	8.2	12.9	14.1	9.2
Utilities	8.7	9.4	7.0	8.0	8.6	5.9
Rent	12.7	12.8	12.6	24.2	23.2	27.2
Health	0.6	0.6	0.4	0.2	0.2	0.2
Education	1.4	1.5	1.1	0.7	0.7	0.6

Source: TLSLS 2014

TABLE 17. NUTRITIONAL STATUS OF CHILDREN UNDER 5 YEARS, 2007, 2014

(%)

	2007			2014		
	Male	Female	National	Male	Female	National
Underweight (weight for age)						
Total	52.5	44.5	48.6	36.2	28.5	32.4
Severe	16.3	12.9	14.6	6.1	5.6	5.9
Moderate	36.2	31.6	33.9	30.1	22.8	26.5
Stunting (height for age)						
Total	56.3	51.5	53.9	53.9	44.3	49.2
Severe	24.6	22.9	23.8	22.7	12.7	17.8
Moderate	31.7	28.6	30.2	31.2	31.5	31.4
Wasting (weight for height)						
Total	29.2	19.6	24.5	14.1	10.2	12.2
Severe	7.6	7.3	7.5	3.0	2.2	2.6
Moderate	21.6	12.3	17.0	11.1	8.1	9.6

Note: Severe malnutrition refers to children with z-scores ‹ -3 and moderate malnutrition refers to children with z-scores between -3 and -2.
Source: TLSLS 2014

TABLE 18: DURABLE GOODS OWNERSHIP BY URBAN AND RURAL AREAS

(% of the population living in households that own durable goods)

	Timor-Leste		Rural		Urban	
	2007	2014	2007	2014	2007	2014
Fans	5	14	0	4	19	38
Televisions	16	39	5	24	46	75
Video players	2	15	1	10	6	28
Tape players/CD players	10	10	5	6	25	19
Mobile phone	12	68	4	62	35	83
Motorcycles/scooters	7	24	3	17	18	44
Electric rice cooker	2	19	0	9	6	46

Source: TLSLS 2014

TABLE 19: LIVESTOCK OWNERSHIP BY CONSUMPTION QUINTILE

(% of the population living in households that own livestock)

	Buffalo	Bali cow	Cow	Pig	Goat	Sheep	Chicken	Duck
Timor-Leste 2007	**14**	**0**	**22**	**82**	**29**	**1**	**72**	**3**
Quintile I	11	0	23	81	27	1	73	2
Quintile II	11	0	23	84	28	1	72	1
Quintile III	14	0	22	84	32	2	73	2
Quintile IV	16	0	23	83	31	2	73	3
Quintile V	16	0	19	79	29	2	67	4
Timor-Leste 2014	**11**	**1**	**25**	**79**	**21**	**1**	**70**	**1**
Quintile I	10	2	27	81	23	1	73	0
Quintile II	10	1	29	81	24	1	73	1
Quintile III	13	1	23	84	22	2	75	2
Quintile IV	12	1	25	78	19	1	70	1
Quintile V	12	0	22	68	16	1	61	2

Note: Each quintile comprises 20% of the population.
Source: TLSLS 2014

TABLE 20: AVERAGE NUMBER OF LIVESTOCK PER HOUSEHOLD

(Among households that own livestock)

	Buffalo	Bali cow	Cow	Pig	Goat	Sheep	Chicken	Duck
Timor-Leste 2007	**5.7**	**2.9**	**3.9**	**2.8**	**4.1**	**7.0**	**6.4**	**4.7**
Rural	5.6	1.2	3.8	2.8	4.1	7.0	6.4	4.1
Urban	6.5	8.4	4.5	2.9	4.0	7.0	6.8	5.9
Timor-Leste 2014	**6.5**	**3.4**	**5.1**	**3.1**	**4.5**	**9.0**	**7.3**	**5.3**
Rural	6.4	3.3	5.1	3.2	4.2	8.5	7.4	5.1
Urban	7.2	8.6	4.9	2.7	6.8	11.7	6.7	5.6

Source: TLSLS 2014

televisions has increased, as also the ownership of motorcycles, and appliances such as fans and electric rice cookers. Changes are large in both rural and urban areas.

However, the ownership of livestock, the principal productive asset aside from land in Timor-Leste, shows a mixed picture. Over the period 2007-2014, there was no apparent increase in the proportion of the population owning different types of livestock in any of the expenditure quintiles and nationally (Table 19). However, there was some increase in the average numbers of different livestock amongst those who owned any livestock (Table 20).

MULTIDIMENSIONAL DEPRIVATION AND POVERTY

The case for a separate focus on multidimensional poverty over and above poverty in terms of consumption or income has both a conceptual foundation as well as a basis in pragmatic empirical considerations.

The conceptual foundation of the term 'multidimensional poverty' is rooted in viewing poverty as "capability failure"[12] and evaluating a range of specific capabilities including those relating to health, education, shelter, and access to basic amenities. While consumption and income can themselves be considered multidimensional indicators of welfare, the case for a distinctive focus on "multidimensional poverty" rests in the proposition that there are many aspects of poverty that may not be adequately captured by consumption or income[13], mainly due market failures of one sort or another. If consumption were indeed synonymous with achievements in a range of multiple dimensions, then a reduction in consumption poverty would also result in multidimensional poverty reduction. But because such spontaneous "trickle down" to other dimensions cannot be taken for granted, monitoring of multidimensional poverty offers an important "dual check" on poverty reduction. And indeed, in some cases a country may perform better in the non-income than in the income space. In addition, the focus on multidimensional poverty also has the potential to draw attention to "government failures" too, especially in relation to provision of public goods and how markets function.

Table 21 presents results on a selection of non-income indicators of deprivation for 2007 and 2014. The selection of indicators in this table is illustrative and is not intended to be comprehensive. The 11 indicators shown in Table 21 broadly encompass the three dimensions of education, health and living standards that

12 Sen (1980, 1985, 1999) is the most notable exponent of this view. Sen's writings on this subject are many; referenced here are only a few examples (including one of the early ones).

13 Even from the welfarist perspective of consumption expenditure as a money-metric of utility, consumption may be inadequate as there are other arguments in individual utility functions for which either markets (and hence prices) may either not exist or if they exist, they may be distorted.

underpin the Multidimensional Poverty Index (MPI) produced and published by the UNDP for over 100 countries since 2010.

The estimates in Table 21 demonstrate substantial improvement between 2007 and 2014 for most of the 11 indicators. The reductions in deprivation incidence are large, often larger than the reduction in incidence of consumption poverty reported earlier. The improvement is notable across all (the East, Centre and West) regions of the country.

Deprivation rates for individual dimensions cannot of course inform us of their joint distribution. Nonetheless, the estimates in Table 21 are certainly suggestive of sizeable reductions in multidimensional poverty over this period. The analysis undertaken for this paper however stops short of constructing an aggregate multidimensional poverty measure, which remains a topic for future analytical work. Key issues that need to be addressed in undertaking such multidimensional poverty analysis and some possible options that may be considered in the Timorese context are discussed in Annex F.

TABLE 21: MULTIDIMENSIONAL DEPRIVATION INDICATORS, 2007, 2014 (% OF POPULATION IN HOUSEHOLDS WITH THE FOLLOWING DEPRIVATIONS)

	No electricity	No improved sanitation	No safe drinking water	Poor quality floor	Poor cooking fuel	Few assets	Any child not attending school	No member with at least 5 yrs of school	Any child who is underweight	Any child who is stunted	Any child who is wasted
2014											
Timor-Leste	**28**	**40**	**25**	**48**	**87**	**56**	**17**	**13**	**16**	**24**	**7**
Rural	37	48	29	60	91	68	18	17	17	25	6
Urban	3	18	16	17	76	24	12	5	14	21	8
East	18	49	39	60	86	58	19	13	13	19	5
Centre	29	32	20	43	84	51	16	12	15	24	6
West	37	50	23	47	96	67	15	19	21	28	10
2007											
Timor-Leste	**64**	**58**	**40**	**61**	**97**	**83**	**42**	**17**	**35**	**38**	**20**
Rural	81	68	47	71	99	93	46	21	34	36	21
Urban	18	27	18	32	94	55	31	7	38	43	19
East	66	59	54	70	100	90	49	17	28	33	14
Centre	57	51	30	56	96	78	41	15	38	43	20
West	81	74	49	63	99	91	36	24	33	30	2

Source and notes: TLSLS 2007 and TLSLS 2014. The indicators are defined as below.

No improved sanitation:
The household's sanitation facility is not improved or it is improved but shared with other households. A household is considered to have access to improved sanitation if it has some type of flush toilet or latrine, or ventilated improved pit or composting toilet, provided that they are not shared.

No safe drinking water:
The household does not have access to safe drinking water or safe drinking water is more than a 30-minute walk roundtrip from home.

Safe drinking water is water sourced from any of the following:
piped water, public tap, borehole or pump, protected well, protected spring or rainwater.

Poor quality floor:
Refers to floors of dirt, sand or dung.

Poor cooking fuel:
Refers to dung, wood or charcoal.

Few assets:
Households not owning more than one of radio, television, telephone, bike, motorbike or refrigerator and not owning a car or truck.

Any child not attending school:
Households with at least one child aged 6 to 11 currently not attending school.

Any child who is underweight/stunted/wasted:
Households with at least one child below 5 whose has z-score ‹-2 for weight-for-age/height-for-age/weight-for-height.

ANNEX A:

TIMOR-LESTE SURVEY OF LIVING STANDARDS-3

The 2014 Timor-Leste Survey of Living Standards (TLSLS-3) is the third national survey of living standards for the country. TLSLS-3 is also a comprehensive multi-module survey and scope of topics covered is very broad, and encompasses most of those that would be covered under more specialized surveys such as the Demographic and Health Survey, the Multiple Cluster Indicators Survey and a typical labor force survey. Information was collected on, among other things, consumption expenditures, health and education status of households, anthropometric measurements of children, and occupational and employment status of household members.

Sample size

The first two national surveys were undertaken in August-November 2001 and in January 2007-January 2008. The 2001 TLSLS, being the first national living standards survey of its kind following the independence referendum of August 1999, had a modest, though nationally representative, sample of 1,800 households from 100 sucos covering one per cent of the population. About five and a half years later, the TLSLS 2007 considerably expanded the sample size to a final cross-sectional sample of 4,477 households,[14] which was spatially stratified with the intention of delivering estimates for the urban and rural segments of five regions, each comprising of one to three districts (Region 1: Baucau, Lautem and Viqueque; Region 2: Ainaro, Manufahi and Manatuto; Region 3: Aileu, Dili and Ermera; Region 4: Bobonaro, Cova Lima and Liquiçá; and Region 5: Oecussi); see Figure A 1.

FIGURE A 1: TIMOR-LESTE: DISTRICT MAP

14 The TLSLS 2007 also included a panel component of 900 households, which correspond to half of the 2001 TLSS sample of 1,800 house holds that were randomly selected and re-interviewed.

TABLE A 1: TIMOR-LESTE SURVEY OF LIVING STANDARDS 2014: SAMPLE DESIGN

Domains	CENSUS 2010 Enumeration Areas			CENSUS 2010 Households			LFS 2012 Enumeration Areas			TLSLS 2014 (TLS-3) Sample Size (HHs)			Max Std Errors		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
District															
01 Aileu	15	84	99	1845	7819	9664	10	15	25	150	225	375	6.1%	4.8%	4.1%
02 Ainaru	3	75	78	444	6521	6965	3	14	17	45	210	255	10.6%	3.9%	3.7%
03 Baucau	20	185	205	3107	18148	21255	14	37	51	165	420	585	5.9%	3.5%	3.1%
04 Bobonaro	33	175	208	2721	14162	16883	17	35	52	165	345	510	5.8%	3.9%	3.4%
05 Cova Lima	13	98	111	1235	9870	11105	10	26	36	120	300	420	6.7%	3.9%	3.5%
06 Dili	228	69	297	28894	6330	35224	41	19	60	615	270	885	3.1%	4.7%	2.7%
07 Ermera	12	192	204	1148	18132	19280	9	23	32	135	345	480	6.3%	3.5%	3.1%
08 Liquica	6	103	109	755	9596	10351	6	27	33	75	330	405	8.5%	3.2%	3.0%
09 Lautem	16	107	123	2044	9403	11447	12	28	40	120	285	405	6.9%	4.3%	3.7%
10 Maufahi	14	71	85	1769	6087	7856	10	14	24	150	210	360	6.1%	5.0%	4.1%
11 Manatuto	12	63	75	1236	5688	6924	11	22	33	120	285	405	6.7%	4.0%	3.5%
12 Oecussi	10	110	120	1580	12310	13890	9	27	36	120	345	465	6.8%	3.7%	3.4%
13 Viqueque	7	88	95	945	12862	13807	7	26	33	90	360	450	7.8%	3.2%	3.0%
Regions															
01 Bau/Lau/Viq	43	380	423	6096	40413	46509	33	91	124	375	1065	1440	4.0%	2.0%	1.8%
02 Ain/Man/Man	29	209	238	3449	18296	21745	24	50	74	315	705	1020	4.4%	2.7%	2.4%
03 Ain/Dil/Erm	255	345	600	31887	32281	64168	60	57	117	900	840	1740	3.1%	2.7%	2.1%
04 Bob/Cov/Liq	52	376	428	4711	33648	38339	33	88	121	360	975	1335	3.7%	2.0%	1.8%
05 Oe cussi	10	110	120	1580	12310	13890	9	27	36	120	345	465	6.8%	3.7%	3.4%
Total Timor-Leste	**389**	**1420**	**1809**	**47723**	**136928**	**184651**	**159**	**313**	**472**	**2070**	**3930**	**6000**	**2.0%**	**1.1%**	**1.0%**

Note: The table presents the number of Enumeration Areas (EAs) and households from the 2010 Census (left-hand panel), the number of EAs visited by the 2012 Labor Force Survey (middle panel) and the number of EAs and households from the TLSLS 2014, the maximum absolute standard errors for the estimation of prevalence, by geographic and urban/rural domains.

With an expansion of statistical capacity within the country as well as a maturing of government institutions and operations, greater demands were placed on the third round of the living standards survey. The TLSLS 2014 faced the challenge of delivering estimates of comparable quality for each of Timor-Leste's 13 districts, leading to a further expansion of the sample size. To meet this challenge within the existing resource and time constraints, it was decided not to have a panel component in the TLSLS 2014, but to augment the total sample size to 6,000 households with 15 sample households in each of 400 enumeration areas (EAs) stratified across rural and urban sectors of the 13 districts.

Sample design

The TLSLS 2014 sample was selected in two stages: Census Enumeration Areas (EAs) as Primary Sampling Units (PSUs) and individual households as secondary units. A cluster of 15 households was visited in each PSU.

The sample frame for TLSLS 2014 makes use of the recent 2010 Census, but indirectly, taking advantage of the household listings prepared for the Labor Force Survey (LFS) in 2012. The LFS distributed its sample of 472 EAs across the urban and rural segments of the 13 districts, with an allocation that was considered adequate for the TLSLS 2014.

The TLSLS 2014 only needed to visit a subsample of 400 out of the 472 EAs for the LFS. The TLSLS 2014 subsample was allocated to the same strata as the LFS, and the 400 PSUs were randomly selected with equal probabilities within each stratum. The detailed sample design is shown in Table A1.

The right-hand panel of Table A1 above presents the sample size and the maximum absolute standard errors of the TLSLS 2014, by district and urban/rural domains. The left-hand panel shows the number of EAs and households of the 2010 Census, and the number of EAs visited by the LFS. The figures are broken down by district on top, and according to the regions used by the TLSLS 2007 (TLSLS-2) at the bottom.

The standard errors for most indicators of interest will be between 3 and 4 percentage points at the district level, but larger for the urban/rural subdivisions of each district. In other words, the survey can be expected to allow basic comparisons between districts, but not for the urban/rural portions of each district. Urban/rural comparisons would be possible at the national level and marginally possible within the five regions used by the TLSLS-2.

Like its predecessor, the TLSLS 2014 was fielded over a yearlong period and the sample was randomly distributed across the four quarters of the year to capture seasonality. For quality assurance purposes, the sample of each district was also randomly allocated to at least three different teams of fieldworkers (interpenetrating sampling). The two criteria (random allocation into quarters and teams) could be satisfied simultaneously in all districts except Oecussi, which was visited by a different team each quarter.

Fieldwork organization and data management

The fieldwork organization for the TLSLS 2014 is similar to that used successfully for the TLSLS-2 in 2007. The fieldworkers were organized into 8 independent teams, each of them composed of one supervisor, three enumerators, one data entry operator and one driver. Each team was responsible for 50 EAs and visited one enumeration area per week. Each enumerator within the team was responsible for interviewing 5 households, with the enumeration of each household spread over four visits.

The data for each PSU were transmitted on a continuous basis to the Directorate General of Statistics (DGE) Office in Dili. The transfer was done through the internet using USB-modems.
Data quality control

Three layers of supervision were utilized to assure high data quality of the TLSLS 2014:

1. **Human supervision**. This layer consists of (i) team supervisors re-visiting some randomly selected households to ask selected questions again; (ii) the core team from the DGE re-visiting some households to supervise the supervisors. The DGE prepared standard supervision forms that were used for this purpose.
2. **Computer-based quality controls.** This second layer of supervision involved the data entry program that complemented human supervision, applying consistency checks to each households' data. The information registered on the questionnaires was immediately entered into laptops, using an "intelligent" data entry program that allows for both data entry and consistency checks.

   Possible inconsistencies were resolved by asking the household members the same questions again, during the next visit. Teams did not move to another enumeration area until all inconsistencies were resolved in all of the 15 questionnaires.

   Examples of the multiple consistency checks included in the data entry program are: (1) checking that the per capita calorie intake of each household (as reported by the food consumption sections of the questionnaire) is within a reasonable range for the household's composition (the distribution of household members by age and sex), (2) checking for the consistency of each child's anthropometric measures (weight and height), using the World Health Organization reference tables.
3. **Monitoring selected indicators.** As there is perverse incentive for the interviewers to modify some answers to reduce work, the third layer of data quality control involved DGE Office in Dili monitoring the evolution of several indicators using partial national databases, periodically received from the field. Some examples of the indicators monitored were average household size, average number of food items consumed, average number of children under five, and average number of women between 15-49 years that can be expected to remain similar all four quarters of the survey and across teams.

ANNEX B:
CONSUMPTION-BASED WELFARE INDICATOR

Two key elements of poverty measurement relate to (i) the construction of an individual welfare indicator, and (ii) the construction of an appropriate poverty line against which the chosen welfare indicator will be compared in order to classify individuals as poor or non-poor, and if poor, to measure their consumption shortfalls (relative to the poverty line) . This Annex describes the procedures adopted in relation to the first element.

Following well-established practice and consistent with the approach in earlier poverty assessments for Timor-Leste, per capita household consumption is taken to be the measure of welfare at the individual level.[15] Thus, the first step in estimating poverty measures is to construct a measure of total household consumption or the "consumption aggregate" at the household level, which could then be normalized by household size.

For poverty measures to be comparable over time, the consumption aggregate also need to be constructed in a comparable manner over time. As noted already, the consumption-related modules of the TLSLS-2 in 2007 and the TLSLS-3 in 2014 were kept virtually identical to allow such comparability, and we follow the same procedures for constructing consumption aggregates for the two rounds of the survey. The following describes how the three main components of consumption –food, rent and remaining non-food– were constructed.

Food

The food component is based on information that was obtained using a recall period over the last seven days.

The survey collects information on 131 food items in 2007 and 135 food items in 2014. The reason for the small difference in the number of items is that (i) both local rice and imported rice have been split into two subcategories each: subsidized and non-subsidized, (ii) bottled water has been added as a new food item, and (iii) prepared food and drinks has been split into `Foods and drinks prepared and consumed outside the house' and `Foods and drinks prepared outside and brought to be consumed at home'.

These food items are organized according to 14 broad categories: cereals, tubers, fish, meat, eggs and milk products, vegetables, legumes and nuts, fruit, oil and fat, beverages and drinks, ingredients, miscellaneous, alcoholic drinks, and tobacco and betel.

The monetary value reported by the household refers to the actual consumption of these items and includes all possible sources, including purchases, self-production and gifts or transfers. Food consumption is constructed by adding up the consumption of all food items and is expressed on a monthly basis.

Non-food

The non-food component introduces a couple of practical issues: the choice of items to include and the selection of the reference period.

Items to include

Regarding the first issue, the survey gathers information on 73 non-food items. Two small changes occurred between the two surveys: deposits on savings accounts was dropped in 2014 and expenses on mobile phones was added in 2014. These non-food items are organized in categories such as clothing and footwear, education, health, taxes, festivities, utilities and household maintenance, etc.

15 See Deaton (1997) and Ravallion (2016) for theoretical and practical arguments for using consumption as the measure of welfare for poverty estimation.

The general principle followed was to (a) to exclude items that do not directly contribute to household consumption, (b) to exclude items that are lumpy and highly infrequent in nature. Following this principle, expenses related to taxes, festivities and ceremonies, jewelry, furniture, household equipment and other durables, donations, gambling/cash losses and bank deposits, were excluded: 21 non-food items in 2007 and 20 non-food items in 2014 (deposits on savings accounts no longer needed to be excluded in 2014 because this non-food item was not included in the questionnaire). Altogether, 52 non-food items in 2007 and 53 non-food items in 2014 were included in the measure of household consumption. The additional item in 2014 relating to mobile phone expenses was largely irrelevant for 2007 because of the very limited usage of mobile phones at that time.

Reference period

As for the reference period, the TLSLS-2 captures non-food consumption using two reference periods: the last month and the last 12 months. The chosen reference period is the last month. However, households do not buy many non-food items every month. In order to better capture the overall non-food consumption of the population, whenever households do not purchase a non-food item in the last month but report its consumption in the last 12 months, the latter is converted to a monthly basis and included as part of the non-food consumption. By contrast, the TLSLS-3 assigned a single reference period to all non-food items depending on how frequently they are purchased: the last month, the last 3 months and the last 12 months. Expenses over the last month entered directly into the monthly consumption aggregate, whereas expenses recorded over the last 3 or 12 months were converted to a monthly basis.

Rent

The last component of consumption relates to rent. The objective is to try to measure the value of the flow of "housing" services received by households from living in their dwelling. When a household rents its dwelling and rental markets are well-established, that value would be the actual rent paid by the household. However, in Timor-Leste, only a handful of households rent their dwellings. Thus, paid rent cannot be used to determine housing values for the vast majority of non-renting households.

The survey asks households for estimates of how much their dwelling could be rented for, so these "imputed" rents can be included in the consumption aggregate. But self-reported imputed rents are subject to measurement error. Hence, in order to minimize potential errors, a hedonic housing rental regression was estimated and the predicted imputed rent from this regression was included as part of consumption for all non-renting households. For those renting their dwellings, the actual rent paid was included in their consumption aggregate.

The sum of food, non-food and housing rentals (actual or imputed) gives the aggregate nominal consumption of the household. This nominal consumption was further adjusted by a price index to reflect temporal differences in the cost of living. [16]

16 Spatial cost of living differences are also taken into account, but this is done by way of estimating the poverty lines for six domains (the rural and urban areas of the East, Centre and West regions) in 2007 or by district in 2014, as discussed before.

Adjusting for temporal differences

Temporal differences arise because households are interviewed throughout the year, and on account of inflation over the year, nominal consumption for, say, a household interviewed in March 2007 cannot be compared with another interviewed in December 2007.

Laspeyres price indices for urban and rural areas were constructed based on urban and rural households' respective reported consumption. In 2007, a quarterly food and fuel price index was estimated having All-Urban January 2007/January 2008 as the base for the urban price index and All-Rural January 2007/January 2008 as the base for the rural price index. The proxies for prices were the unit-values of food and fuel consumed, and the weights were the average shares of individual items in the total annual food and fuel consumption for urban and rural households, respectively.

This temporal price index is limited to food and fuel (kerosene and firewood). This because the survey does not collect quantities of other non-food items because these quantities are not well defined and thus meaningful unit-values for these items cannot be constructed.[17] The procedure therefore has to assume that prices of other non-food items changed proportionally with the prices of food and fuel.

A similar approach was taken in 2014, with the base for the price indices being the entire fieldwork period also: All-Urban April 2014/April 2015 in urban areas and All-Rural April 2014/April 2015 in rural areas. Table B1 shows the temporal price index for urban and rural areas for 2007 and 2014.

TABLE B 1: THE TEMPORAL PRICE INDEX FOR RURAL AND URBAN AREAS, 2007, 2014

	Rural	Urban
TLSLS-2 *		
January/March 2007	1.16	0.97
April/June 2007	1.06	1.00
July/September 2007	1.01	1.04
October 2007/January 2008	0.98	1.04
TLSLS-3 **		
April/June 2014	1.02	1.05
July/September 2014	1.02	1.04
October/December 2014	1.00	0.97
January/April 2015	1.03	0.97

* The base for the rural price index is All-Rural January 2007/January 2008 and for the urban price index is All-Urban January 2007/January 2008.

** The base for the rural price index is All-Rural April 2014/April 2015 and for the urban price index is All-Urban April 2014/April 2015.

Source: TLSLS 2007 and TLSLS 2014.

17 Only items that were consumed in all quarters and with at least 30 observations per quarter were included.

The final step in constructing the welfare indicator involves going from a measure of standard of living defined at the household level to one at the individual level. Following common practice, this adjustment requires dividing the household consumption aggregate by the number of household members.

ANNEX C:

RENTAL MODEL

Annex C describes the rental model used to estimate the rental component of consumption and the rent poverty lines.

TABLE C 1: RENTAL MODELS, 2007, 2014

	2007	2014
Walls of concrete or brick	0.65 ***	0.35 ***
Numbers of rooms	0.19 ***	0.13 ***
Flush toilet of VIP latrine	0.24 ***	0.15 ***
Access to electricity	0.27 ***	0.06 ***
Floor of ceramic, tiles, cement, concrete or brick	0.28 ***	0.20 ***
East rural	1.30 ***	-
East urban	1.27 ***	-
Center rural	1.55 ***	-
Center urban	1.90 ***	-
West rural	1.50 ***	-
West urban	1.66 ***	-
Ainaro	-	3.35 ***
Aileu	-	3.10 ***
Baucau	-	3.35 ***
Bobonaro	-	3.06 ***
Covalima	-	3.16 ***
Dili	-	3.52 ***
Ermera	-	3.05 ***
Liquiça	-	2.87 ***
Lautem	-	3.49 ***
Manufahi	-	3.36 ***
Manatuto	-	3.36 ***
Oecussi	-	3.50 ***
Viqueque	-	3.45 ***
N	4422	5768
Adjusted R-squared	0.92	0.97

Source and notes: Estimated with TLSLS 2007 and TLSLS 2014 data. The dependent variable is the actual or imputed rent. All independent variables except number of rooms are binary. *, ** and *** indicate significance at 10, 5 and 1 per cent, respectively.

ANNEX D:

STANDARD ERRORS AND CONFIDENCE INTERVALS

Annex D demonstrates the standard errors and confidence intervals of the 2014 poverty estimates for the poverty incidence, poverty gap and the squared poverty gap measures.

TABLE D 1: POVERTY INCIDENCE, 2014

	Poverty incidence	Standard error	(95% confidence interval) Lower bound	Upper bound
Timor-Leste	**41.8**	**1.4**	**39.0**	**44.5**
Rural	47.1	1.8	43.6	50.5
Urban	28.3	2.0	24.3	32.2
East	33.8	2.4	29.1	38.4
Centre	40.0	2.0	36.1	43.9
West	55.5	2.9	49.9	61.2
East Rural	36.0	2.8	30.6	41.5
East urban	21.0	3.6	13.9	28.1
Centre rural	48.3	2.7	43.0	53.7
Centre urban	26.4	2.4	21.6	31.3
West rural	57.6	3.4	51.0	64.2
West urban	46.0	4.3	37.5	54.5
Aileu	35.1	5.1	25.2	45.1
Ainaro	43.2	5.2	33.1	53.4
Baucau	32.6	3.7	25.3	39.8
Bobonaro	51.7	5.2	41.5	61.9
Cova Lima	53.1	5.7	41.8	64.3
Dili	29.1	2.5	24.2	34.0
Ermera	56.7	5.8	45.4	68.1
Lautem	31.2	4.9	22.6	41.8
Liquiça	43.0	8.1	27.1	59.0
Manufahi	47.7	5.4	37.0	58.4
Manatuto	43.1	6.1	31.1	55.0
Oecussi	62.5	3.5	55.6	69.3
Viqueque	36.9	3.7	29.6	44.2

Note: The estimation of standard errors and confidence intervals takes into account the three key features of survey design: strata, primary sampling units and sampling weights.
Source: TLSLS 2014.

TABLE D 2: POVERTY GAP, 2014

	Poverty gap	Standard error	(95% confidence interval) Lower bound	Upper bound
Timor-Leste	**10.4**	**0.5**	**9.4**	**11.4**
Rural	12.2	0.7	10.8	13.5
Urban	5.9	0.6	4.8	7.1
East	7.1	0.7	5.7	8.5
Centre	9.8	0.7	8.3	11.3
West	15.8	1.3	13.3	18.3
East Rural	7.7	0.8	6.0	9.3
East urban	3.8	0.8	2.2	5.4
Centre rural	12.6	1.1	10.4	14.7
Centre urban	5.3	0.7	3.9	6.7
West rural	16.8	1.5	13.8	19.7
West urban	11.5	1.5	8.6	14.4
Aileu	8.1	2.1	3.9	12.3
Ainaro	9.4	1.6	6.2	12.5
Baucau	6.8	1.0	4.9	8.7
Bobonaro	12.6	1.8	9.1	16.2
Cova Lima	15.9	3.1	9.8	22.0
Dili	6.0	0.7	4.6	7.5
Ermera	17.1	2.7	11.8	22.4
Lautem	6.8	1.6	3.8	9.9
Liquiça	11.7	2.4	7.0	16.5
Manufahi	11.1	1.6	8.0	14.2
Manatuto	9.2	2.3	4.8	13.7
Oecussi	19.8	0.1.7	16.5	23.1
Viqueque	7.8	1.3	5.2	10.4

Note: The estimation of standard errors and confidence intervals takes into account the three key features of survey design: strata, primary sampling units and sampling weights.
Source: TLSLS 2014.

TABLE D 3: SQUARED POVERTY GAP, 2014

	Squared poverty gap	Standard error	(95% confidence interval) Lower bound	Upper bound
Timor-Leste	**3.7**	**0.2**	**3.2**	**4.2**
Rural	4.4	0.3	3.8	5.1
Urban	1.8	0.2	1.4	2.3
East	2.1	0.3	1.6	2.7
Centre	3.4	0.3	2.7	4.1
West	6.2	0.7	4.9	7.5
East Rural	2.3	0.3	1.7	3.0
East urban	1.0	0.3	0.4	1.6
Centre rural	4.5	0.5	3.5	5.5
Centre urban	1.6	0.3	1.1	2.1
West rural	6.7	0.8	5.1	8.2
West urban	3.8	0.6	2.6	5.1
Aileu	2.7	1.0	0.8	4.6
Ainaro	3.0	0.6	1.8	4.2
Baucau	2.0	0.4	1.3	2.7
Bobonaro	4.4	0.8	2.9	6.0
Cova Lima	6.8	1.8	3.3	10.2
Dili	1.9	0.3	1.3	2.5
Ermera	6.6	1.3	4.0	9.1
Lautem	2.1	0.7	0.7	3.4
Liquiça	4.4	1.0	2.4	6.3
Manufahi	3.6	0.6	2.3	4.8
Manatuto	2.9	1.0	0.9	4.8
Oecussi	7.9	0.9	6.2	9.6
Viqueque	2.4	0.6	1.2	3.5

Note: The estimation of standard errors and confidence intervals takes into account the three key features of survey design: strata, primary sampling units and sampling weights.
Source: TLSLS 2014.

ANNEX E:

SENSITIVITY ANALYSIS: FIELDWORK TEAMS

Annex E shows the results of the analysis examining sensitivity of poverty incidence with respect to fieldwork teams.

TABLE E 1: THE IMPACT OF EXCLUDING TEAM 1, 2014

	ALL TEAMS			EXCLUDING TEAM 1			
	Nominal Consumption per person	Poverty line	Poverty Incidence P	Nominal Consumption per person	Poverty line	Poverty Incidence P_ex1	t (P-P_ex1)
Timor-Leste	**61.4**	**46.4**	**41.8**	**60.8**	**44.9**	**41.2**	**0.3**
Ainaro	56.7	44.3	43.2	56.8	44.0	44.6	-0.2
Aileu	54.2	41.1	35.1	54.6	40.0	34.0	0.1
Baucau	59.6	43.3	32.6	59.7	42.9	34.0	-0.3
Bobonaro	51.5	44.5	51.7	52.3	43.3	50.0	0.2
Covalima	54.4	49.4	53.1	54.5	48.0	52.3	0.1
Dili	87.8	56.2	29.1	89.1	53.5	23.6	1.5
Ermera	44.0	38.0	56.7	41.7	36.3	56.4	0.0
Liquiça	45.4	37.8	43.0	45.5	36.1	39.8	0.3
Lautem	59.3	41.6	32.2	59.6	41.4	34.0	-0.3
Manufahi	56.3	47.9	47.7	56.8	47.1	46.2	0.2
Manatuto	57.5	43.8	43.1	57.8	43.7	45.1	-0.2
Oecussi	54.8	51.1	62.5	40.3	46.3	72.4	-0.9
Viqueque	60.0	44.5	36.9	60.4	44.1	37.8	-0.2

Source: TLSLS 2014.

TABLE E 2: THE IMPACT OF EXCLUDING TEAM 2, 2014

	ALL TEAMS			EXCLUDING TEAM 2			
	Nominal Consumption per person	Poverty line	Poverty Incidence P	Nominal Consumption per person	Poverty line	Poverty Incidence P_ex2	t (P-P_ex2)
Timor-Leste	**61.4**	**46.4**	**41.8**	**62.5**	**47.5**	**42.2**	**-0.2**
Ainaro	56.7	44.3	43.2	57.1	44.9	44.3	0.1
Aileu	54.2	41.1	35.1	55.9	41.7	34.0	0.2
Baucau	59.6	43.3	32.6	59.7	43.6	34.0	-0.3
Bobonaro	51.5	44.5	51.7	52.5	41.9	42.4	1.2
Covalima	54.4	49.4	53.1	52.5	49.1	55.6	-0.3
Dili	87.8	56.2	29.1	89.9	60.1	30.4	-0.3
Ermera	44.0	38.0	56.7	44.9	38.5	58.4	-0.2
Liquiça	45.4	37.8	43.0	44.2	37.8	43.4	0.0
Lautem	59.3	41.6	32.2	59.4	42.8	36.6	-0.7
Manufahi	56.3	47.9	47.7	58.4	49.8	49.4	-0.2
Manatuto	57.5	43.8	43.1	58.6	44.9	44.0	-0.1
Oecussi	54.8	51.1	62.5	58.9	52.2	60.4	0.4
Viqueque	60.0	44.5	36.9	60.2	45.6	41.0	-0.8

Source: TLSLS 2014.

TABLE E 3: THE IMPACT OF EXCLUDING TEAM 3, 2014

	ALL TEAMS			EXCLUDING TEAM 3			
	Nominal Consumption per person	Poverty line	Poverty Incidence P	Nominal Consumption per person	Poverty line	Poverty Incidence P_ex3	t (P-P_ex3)
Timor-Leste	**61.4**	**46.4**	**41.8**	**60.5**	**47.1**	**46.2**	**-2.2****
Ainaro	56.7	44.3	43.2	56.6	47.1	50.0	-0.9
Aileu	54.2	41.1	35.1	47.7	40.7	44.8	-1.2
Baucau	59.6	43.3	32.6	59.4	43.4	34.0	-0.3
Bobonaro	51.5	44.5	51.7	44.7	44.4	64.3	-1.8*
Covalima	54.4	49.4	53.1	51.2	46.9	53.3	0.0
Dili	87.8	56.2	29.1	91.3	59.5	32.7	-0.9
Ermera	44.0	38.0	56.7	41.1	36.8	60.3	-0.4
Liquiça	45.4	37.8	43.0	43.4	36.7	45.7	-0.2
Lautem	59.3	41.6	32.2	59.2	43.1	36.8	-0.7
Manufahi	56.3	47.9	47.7	53.8	47.7	52.5	-0.6
Manatuto	57.5	43.8	43.1	57.0	43.9	46.0	-0.4
Oecussi	54.8	51.1	62.5	54.7	52.3	64.5	-0.4
Viqueque	60.0	44.5	36.9	59.9	45.8	42.9	-1.2

Source: TLSLS 2014.

TABLE E 4: THE IMPACT OF EXCLUDING TEAM 4, 2014

	ALL TEAMS			EXCLUDING TEAM 4			
	Nominal Consumption per person	Poverty line	Poverty Incidence P	Nominal Consumption per person	Poverty line	Poverty Incidence P_ex4	t (P-P_ex4)
Timor-Leste	**61.4**	**46.4**	**41.8**	**58.6**	**45.1**	**44.3**	**-1.2**
Ainaro	56.7	44.3	43.2	55.9	43.7	44.6	-0.2
Aileu	54.2	41.1	35.1	51.8	38.0	35.4	0.0
Baucau	59.6	43.3	32.6	59.4	43.5	34.6	-0.4
Bobonaro	51.5	44.5	51.7	50.2	42.6	49.6	0.3
Covalima	54.4	49.4	53.1	51.2	45.9	55.0	-0.2
Dili	87.8	56.2	29.1	79.9	54.1	34.8	-1.3
Ermera	44.0	38.0	56.7	41.1	36.9	61.2	-0.6
Liquiça	45.4	37.8	43.0	43.2	36.0	48.2	-0.5
Lautem	59.3	41.6	32.2	59.1	41.5	32.2	0.0
Manufahi	56.3	47.9	47.7	55.3	47.9	47.6	0.0
Manatuto	57.5	43.8	43.1	54.8	43.4	47.3	-0.5
Oecussi	54.8	51.1	62.5	54.4	50.5	62.8	-0.1
Viqueque	60.0	44.5	36.9	59.8	44.3	38.7	-0.3

Source: TLSLS 2014.

TABLE E 5: THE IMPACT OF EXCLUDING TEAM 5, 2014

	ALL TEAMS			EXCLUDING TEAM 5			
	Nominal Consumption per person	Poverty line	Poverty Incidence P	Nominal Consumption per person	Poverty line	Poverty Incidence P_ex5	t (P-P_ex5)
Timor-Leste	**61.4**	**46.4**	**41.8**	**64.3**	**49.6**	**44.5**	**-1.4**
Ainaro	56.7	44.3	43.2	56.4	44.2	45.3	-0.3
Aileu	54.2	41.1	35.1	59.1	44.7	35.9	-0.1
Baucau	59.6	43.3	32.6	59.2	44.0	35.1	-0.5
Bobonaro	51.5	44.5	51.7	57.7	52.6	60.1	-1.2
Covalima	54.4	49.4	53.1	62.5	56.9	52.9	0.0
Dili	87.8	56.2	29.1	87.4	56.5	30.5	-0.4
Ermera	44.0	38.0	56.7	56.1	47.4	57.2	-0.1
Liquiça	45.4	37.8	43.0	57.6	48.8	49.0	-0.6
Lautem	59.3	41.6	32.2	59.0	42.3	36.0	-0.6
Manufahi	56.3	47.9	47.7	56.0	48.6	50.3	-0.4
Manatuto	57.5	43.8	43.1	57.3	44.3	46.2	-0.4
Oecussi	54.8	51.1	62.5	54.4	51.7	64.3	-0.4
Viqueque	60.0	44.5	36.9	59.7	45.6	41.4	-0.8

Source: TLSLS 2014.

TABLE E 6: THE IMPACT OF EXCLUDING TEAM 6, 2014

	ALL TEAMS			EXCLUDING TEAM 6			
	Nominal Consumption per person	Poverty line	Poverty Incidence P	Nominal Consumption per person	Poverty line	Poverty Incidence P_ex6	t (P-P_ex6)
Timor-Leste	**61.4**	**46.4**	**41.8**	**62.4**	**45.1**	**40.3**	**0.7**
Ainaro	56.7	44.3	43.2	52.7	43.7	45.3	-0.3
Aileu	54.2	41.1	35.1	54.3	39.7	33.4	0.2
Baucau	59.6	43.3	32.6	60.4	44.1	34.2	-0.3
Bobonaro	51.5	44.5	51.7	51.6	44.0	51.1	0.1
Covalima	54.4	49.4	53.1	54.5	48.9	51.8	0.2
Dili	87.8	56.2	29.1	88.7	54.0	24.7	1.3
Ermera	44.0	38.0	56.7	43.9	36.0	57.6	-0.1
Liquiça	45.4	37.8	43.0	45.5	37.6	42.8	0.0
Lautem	59.3	41.6	32.2	59.8	40.2	31.7	0.1
Manufahi	56.3	47.9	47.7	57.1	47.1	47.3	0.0
Manatuto	57.5	43.8	43.1	57.9	41.8	34.6	0.9
Oecussi	54.8	51.1	62.5	55.0	50.5	62.0	0.1
Viqueque	60.0	44.5	36.9	57.4	40.5	32.8	0.7

Source: TLSLS 2014.

TABLE E 7: THE IMPACT OF EXCLUDING TEAM 7, 2014

	ALL TEAMS			EXCLUDING TEAM 7			
	Nominal Consumption per person	Poverty line	Poverty Incidence P	Nominal Consumption per person	Poverty line	Poverty Incidence P_ex7	t (P-P_ex7)
Timor-Leste	**61.4**	**46.4**	**41.8**	**61.4**	**45.7**	**40.5**	**0.6**
Ainaro	56.7	44.3	43.2	55.2	43.8	45.9	-0.3
Aileu	54.2	41.1	35.1	54.1	39.5	32.7	0.3
Baucau	59.6	43.3	32.6	59.4	44.3	33.8	-0.2
Bobonaro	51.5	44.5	51.7	51.6	43.0	45.2	0.9
Covalima	54.4	49.4	53.1	54.3	48.0	51.5	0.2
Dili	87.8	56.2	29.1	87.8	54.6	26.4	0.8
Ermera	44.0	38.0	56.7	44.0	36.8	55.5	0.2
Liquiça	45.4	37.8	43.0	45.4	36.8	40.6	0.2
Lautem	59.3	41.6	32.2	58.6	43.0	37.7	-0.7
Manufahi	56.3	47.9	47.7	56.7	48.8	49.6	-0.2
Manatuto	57.5	43.8	43.1	56.1	41.5	40.7	0.3
Oecussi	54.8	51.1	62.5	54.9	49.6	60.3	0.4
Viqueque	60.0	44.5	36.9	62.6	45.5	35.0	0.4

Source: TLSLS 2014.

TABLE E 8: THE IMPACT OF EXCLUDING TEAM 8, 2014

	ALL TEAMS			EXCLUDING TEAM 8			
	Nominal Consumption per person	Poverty line	Poverty Incidence P	Nominal Consumption per person	Poverty line	Poverty Incidence P_ex8	t (P-P_ex8)
Timor-Leste	**61.4**	**46.4**	**41.8**	**62.1**	**45.6**	**40.3**	**0.8**
Ainaro	56.7	44.3	43.2	64.6	46.2	37.9	0.7
Aileu	54.2	41.1	35.1	54.3	39.9	34.3	0.1
Baucau	59.6	43.3	32.6	59.2	40.8	29.7	0.5
Bobonaro	51.5	44.5	51.7	51.7	43.5	51.2	0.1
Covalima	54.4	49.4	53.1	54.5	48.4	51.9	0.2
Dili	87.8	56.2	29.1	87.8	55.6	27.8	0.4
Ermera	44.0	38.0	56.7	44.1	36.5	55.5	0.2
Liquiça	45.4	37.8	43.0	45.5	36.3	41.3	0.2
Lautem	59.3	41.6	32.2	60.3	39.9	28.4	0.4
Manufahi	56.3	47.9	47.7	56.3	46.5	45.7	0.3
Manatuto	57.5	43.8	43.1	62.2	46.7	41.4	0.2
Oecussi	54.8	51.1	62.5	54.9	49.8	61.6	0.2
Viqueque	60.0	44.5	36.9	60.2	45.7	39.2	-0.4

Source: TLSLS 2014.

ANNEX F:

ISSUE IN DEVELOPING A MULTIDIMENSIONAL POVERTY INDEX FOR TIMOR-LESTE

The UNDP currently estimates a Global Multidimensional Poverty Index for over 100 countries –including Timor-Leste. However, some countries, such as Mexico have chosen to develop a national MPI in order to develop a methodology, that may be more relevant for policymaker's needs, and to have greater ownership and control over the process.

Annex F briefly explains the Multidimensional poverty measure, explains the methodology used by the UNDP for estimating multidimensional poverty, and then discusses a set of key issues that would need to be addressed in developing a multidimensional poverty index (MPI) for Timor-Leste. Each issue involves methodological choices, and in light of these, the Annex also presents some options that could be considered in the Timorese context.

THE MULTIDIMENSIONAL POVERTY INDEX

The MPI is defined following the general methodology of Alkire and Foster (2011) as:

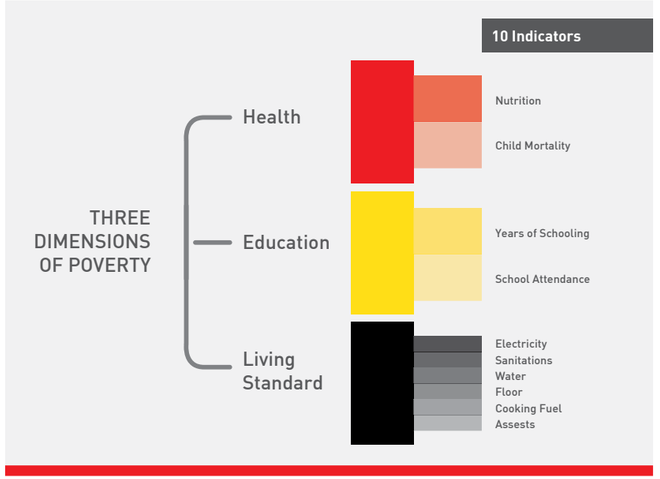
$$MPI=M_0=H.\ A$$

where M_0 is the multidimensional poverty index or what is also referred to as the "adjusted headcount index". It can be expressed as the product of H, the headcount index or the proportion of the population that is multidimensionally-poor, and A, the average intensity of deprivation of the poor. Thus, M_0 is interpretable as either (i) the average intensity of deprivation for the population or (ii) the headcount index adjusted by the average intensity of deprivation of the poor.

UNDP'S GLOBAL MULTIDIMENSIONAL POVERTY INDEX (MPI)

As shown in Figure F1, UNDP's global MPI is based on ten indicators covering the three broad

FIGURE F 1: GLOBAL MPI (UNDP) – TEN INDICATORS



Source: UNDP (2014).

TABLE F 1: GLOBAL MPI: INDICATORS, DIMENSIONAL CUT-OFFS AND WEIGHTS

Dimension	Indicator	Deprived if...	Relative Weight
EDUCATION	**Years of Schooling**	No household member has completed five years of schooling	1/6
	Child School Attendance	No child is attending school up to the age at which they should finish class 6	1/6
HEALTH	**Child Mortality**	Any child has died in the family	1/6
	Nutrition	Any adult or child for whom there is information is malnourished	1/6
LIVING	Electricity	The household has no electricity	1/18
STANDARD	Improved Sanitations	The household's sanitation facility is not improved (according to MDG guidelines), or it is improved but shared other households.**	1/18
	Safe Drinking	The household does not have access to drinking water (accoding to MDG guidelines) or safe drinking water is no more than a 30-minute walk from home, roundtrip.***	1/18
	Flooring	The household has a dirt, sand and dung floor	1/18
	Cooking Fuel	The household cooks with dung, wood, or charcoal	1/18
	Assets	The household does not own more than one radio, TV, telephone, bike motorbike or refrigerator and does not own a car or a truck	1/18

Source: UNDP (2014).

TABLE F 2: MPI FOR TIMOR-LESTE, 2009-10

Survey	Year	Multidimensional Poverty Index (MPI = H x A)	Percentage of poor people (H)	Average deprivation Intensity amongst the poor (A)	
DHS	2009-10	**National**	**0.360**	**68.1%**	**52.9%**
		Urban	0.176	37.3%	47.3%
		Rural	0.414	77.0%	53.7%

Source: OPHI (2014).

The deprivation thresholds for each of the ten indicators are shown in Table F1. The Table also shows the relative importance of each indicator in the overall index, indicated by its weight and the weights sum up to one. A person is considered multidimensionally-poor if deprived in at least 1/3rd of the weighted dimensions.

With this basic set-up, UNDP/ OPHI constructed estimates of multidimensional poverty for Timor-Leste based on the Demographic and Health Survey (DHS) for 2009-10, as reported in Table F2.

MEASUREMENT CONSIDERATIONS

The approach underlying Tables 1 and 2 (the "global MPI" measure) represents one clear option for the construction of an MPI for Timor-Leste. There are some obvious advantages of following this option. First, estimates based on this particular implementation of an MPI already exist for Timor-Leste, and thus set a notable precedent. Second, since UNDP has followed this approach globally, comparable estimates of MPI exist for more than 100 countries which helps put the MPI for Timor-Leste in a comparative international perspective.

This particular implementation of the MPI is feasible with the TLSLS data with the possible exception of the child mortality indicator. However, that indicator may be replaced by one of reproductive health for women, for instance, pre- or post-natal care, professionally assisted deliveries. Such information on women's reproductive health is readily available from the TLSLS.

Should the government of Timor-Leste, however, wish to develop its own approach to measuring multidimensional poverty, there are three main sets of issues to be considered, regarding: (i) The dimensions and weights to include in the index; (ii) the way in which multidimensional poverty will be defined based on the dimensions and weights and; (iii) the method of aggregation.

In particular, the following questions need to be answered:

1. Which indicators (dimensions) should be included in an MPI?
2. How should deprivation be defined in the respective dimensions?
3. How should the different dimensions be weighted?
4. How should dimensional deprivations be aggregated into an overall measure of multidimensional poverty?
5. How should the multidimensionally-poor be identified?
6. How should the multidimensional deprivation of the poor be aggregated?

Additional dimensions

Beyond the global MPI measure, there may be several other options for dimensions and weights that could be considered, such as adding in a consumption poverty dimension, or an employment dimension.

Consumption poverty dimension

The global MPI could be augmented by introducing the additional dimension of consumption poverty itself, which could be assigned a weight of one-third, while the weights of the other dimensions could be scaled down proportionately (such that the weights sum up to one). If the cross-dimensional cut-off of 1/3rd is used for identifying multidimensional poverty, then consumption poverty's weight of 1/3rd will ensure that a consumption-poor person is also multidimensionally poor. However, this still

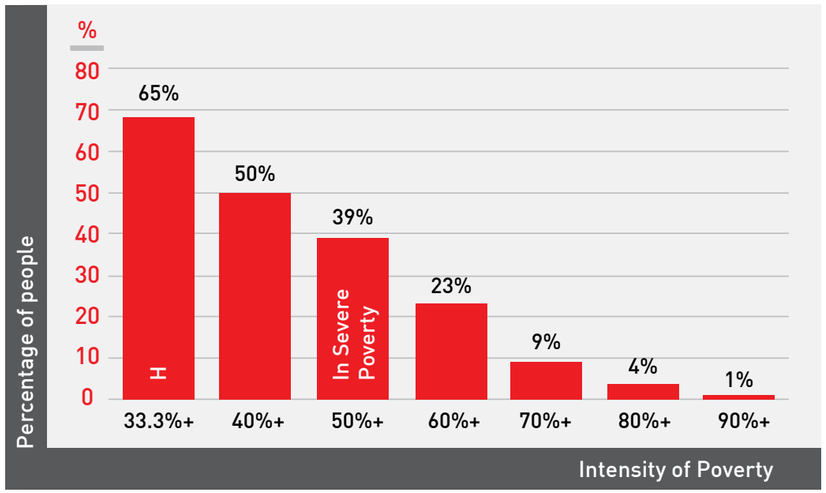
leaves open the possibility that someone who is not poor in terms of consumption is nonetheless multidimensionally-poor if deprived in at least one-third of the other weighted dimensions. The introduction of consumption poverty also has the attraction that it would allow (for a given set of weights and cross-dimensional cut-off) a decomposition of how much of multidimensional poverty is attributable to consumption poverty against other non-consumption dimensions.

Employment dimension

One could consider introducing employment as an additional dimension, in keeping with the significant policy concern of employment generation in Timor-Leste. The variable could be specified, for instance, as the proportion of working-age household members with "gainful" employment, or an ordinal representation of that.[18] Since employment is at least one significant determinant of living standards, the weights for the standard-of-living indicators could be adjusted downward to accommodate this additional dimension.

The above illustrate just a couple of possibilities. There are potentially many other options for indicators and how they should be weighted. Which variant is appropriate for Timor-Leste warrants a thoughtful consideration of the many alternatives by the country's policymaking and statistical agencies, and should ideally also be open to wider public discussion as a means of consensus-building.

FIGURE F 2: MULTIDIMENSIONAL HEADCOUNT (H) FOR TIMOR-LESTE (2009-10) FOR DIFFERENT VALUES OF THE CROSS-DIMENSIONAL OR POVERTY CUT-OFF



Source: OPHI (2014).

18 The notion of "gainful" employment can be made more precise based on information available from the employment module of the TLSLS.

Defining multidimensional poverty

An additional consideration for Timor-Leste is the definition of multidimensionally poor. There are a number of questions here that need answering. Should the definition of multidimensionally poor be based on (i) one cross-dimensional cut-off value, (ii) more than one value, or (iii) no value?

One cross-dimensional cut-off value

The chosen value of the cross-dimensional cut-off can make a big difference to measured multidimensional poverty. Figure F2 shows how sensitive the multidimensional headcount index (H) can be to the cut-off for Timor-Leste. Using a higher cut-off than one-third (the cut-off deployed by the global MPI) dramatically lowers the proportion of multidimensionally-poor; for instance, a cut-off of half (implying, to be mutidimensionally-poor a person must be deprived in at least 50% of weighted dimensions) lowers H from 68% to 39%.

More than one cross-dimensional cut-off value or no value

There is also the possibility of using more than one value for the cross-dimensional cut-off, or of not using the cross-dimensional cut-off at all. The former is in the spirit of investigating robustness of comparisons of multidimensional poverty (changes over time or differences across sub-populations) to the choice of this cut-off. The latter takes us to the so-called "union approach" to identification, where a person is considered multidimensionally-poor if deprived in any dimension. The union approach also has the merit that it ensures regressive transfers from a more to a less deprived person are poverty-increasing – a property that is not always satisfied by measures that use cross-dimensional cut-offs.[19]

Aggregation

A further consideration relates to the choice of which aggregate measures to use when monitoring multidimensional poverty. The headcount index measures incidence, and the adjusted headcount index takes into account intensity. Neither of these are sensitive to inequality, however, and so can be augmented with additional measures.

The multidimensional headcount index (H), though very easy to understand, is not a terribly good measure of multidimensional poverty. M_0 (=H× A), the adjusted headcount index, is a better measure than H as it takes into account the average intensity of deprivations amongst the poor; it thus rules out such incorrect inferences as those of no change in multidimensional poverty when, for instance, while H may not have changed, the average intensity of deprivation amongst the multidimensionally-poor may have declined (or increased).

However, even M_0 may be inadequate as a measure of multidimensional poverty as it is insensitive to dispersion or inequality in the distribution of deprivations amongst the poor. This can be illustrated with an example. Consider 4 dimensions and a population of 100 persons. Suppose 40 of them are multidimensionally-poor, i.e. H = 0.4. Further, suppose on average a multidimensionally-poor person is deprived in

19 See Datt (2014) for a formal statement of this property as well as further discussion of why the union approach may be worth considering.

50% of dimensions (or two dimensions), i.e. A = 0.5. Then, the MPI measure M_0 = 0.4 x 0.5 = 0.2. But note that the measure M_0 can also be written as M_0 = (total number of deprived dimensions of the poor / total number of possible deprivations) = (80 / 400) = 0.2.

M_0 depends on the total number of deprivations but not their dispersion or concentration, which is a limitation if one wants the measure of multidimensional poverty to be sensitive to the degree of inequality in the distribution of deprivations. Measures with such sensitivity do exist and may be worth considering (Datt, 2014). And again, one should not underrate the possibility of using more than one aggregate measure of multidimensional poverty.

REFERENCES

Alkire, S., Foster, J.E. (2011): *Counting and multidimensional poverty measurement*. Journal of Public Economics, 95(7-8): 476-487.

Datt, Gaurav (2014): *Making every deprivation count: multidimensional poverty without the "dual cut-off"*. Working Paper, Monash University.

Deaton, Angus (1997): *The Analysis of Household Surveys*. World Bank and Johns Hopkins University Press, Baltimore.

Foster, J. (2005): *Poverty indices. In: A. de Janvry and R. Kanbur (eds.) Poverty, Inequality and Development:* Essays in Honor of Erik Thorbecke, Kluwer Academic Publishers.

Foster, J., Greer, J. and E. Thorbecke (1984). *A Class of Decomposable Poverty Measures*, Econometrica, 52: 761-765.

OPHI (2014). "*Timor-Leste Country Briefing*", Multidimensional Poverty Index Data Bank. Oxford Poverty and Human Development Initiative (OPHI), University of Oxford. Available at: www.ophi.org.uk/multidimensional-poverty-index/mpi-country-briefings

National Institute of Nutrition and Indian Council of Medical Research (NIN-ICMR) (2011): Dietary Guidelines for Indians – A Manual, Second Edition, Hyderabad.

Ravallion, Martin. (2008). "*Poverty Lines*" in The New Palgrave Dictionary of Economics. 2nd Edition, Larry Blume and Steven Derlauf (eds), Palgrave Macmillan, London.

_____ (2016): *Economics of Poverty: History, Measurement and Policy*. Oxford University Press.

Sen, Amartya (1976). Poverty: An Ordinal Approach to Measurement, Econometrica, 46: 437-446.

_____ (1980): "*Equality of what?*" (Lecture delivered at Stanford University, 22 May 1979), in MacMurrin, Sterling M., The Tanner lectures on human values 1, Salt Lake City, Utah: University of Utah Press.

_____ (1985): *Commodities and Capabilities*. New York, NY: North-Holland.

_____ (1999): *Development as Freedom*. New York: Oxford University Press.

UNDP (2014): *Human Development Report 2014: Sustaining Human Progress: Reducing Vulnerability and Building Resilience.* Macmillan, New York.

World Bank (2003). *Timor-Leste: Poverty in a New Nation*: *Analysis for Action,* Washington DC.

World Bank (2008). *Timor-Leste: Poverty in a Young Nation*. Dili and Washington DC.