

**LIVING WAGE REPORT FOR**  
**RURAL AREAS AND SMALL TOWNS**  
**IN YUCATAN, MEXICO**  
(with focus on garment industry)

**JULY 2022**

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JESÚS DAVID ABAN TAMAYO • MARTHA ANKER • RICHARD ANKER

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Photo: Courtesy of Vertical Knits

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Institute

GLOBAL  
LIVING WAGE  
COALITION

# ABSTRACT

## LIVING WAGE REPORT FOR RURAL AREAS AND SMALL TOWNS IN YUCATAN, MEXICO (with focus on garment industry)

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**Abstract:** We estimate a living wage of MXN 12,350 (USD 602) per month for formal full-time workers in the rural areas and small towns of Yucatan, Mexico, as of July 2022. Our analysis utilizes data from primary sources collected in focus groups with workers in the fabric and clothing manufacturing industry, and through surveys of local food prices, rental prices, and costs of health care services. It also utilizes data from secondary sources, such as the household income and expenditure survey, the employment survey, and the population census, for thirty municipalities of the Northwest (excluding Mérida and eastern municipalities), Central Coast, and Northeast regions of the state of Yucatan. The net living wage (take-home pay) of MXN 10,174 (USD 496) is the estimated cost per month of a basic but decent life for a family of 4 (2 adults and 2 children) of MXN 17,296 (USD 842) per month divided by the average number of full-time equivalent workers per household of 1.70 in the study area. The gross living wage (aka living wage) of MXN 11,550 (USD 563) also includes MXN 1,376 (USD 67) for income tax and social security contributions.

**Keywords:** living income, Anker Methodology, Mexico.

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Only the authors are responsible for the results of this study. The opinions and conclusions expressed here do not necessarily coincide with those of the aforementioned individuals and institutions.

# SECTION I. INTRODUCTION

This report presents results of a study on the living wage for rural areas and small towns in Yucatan, Mexico. Section I discusses the background and the socio-economic context of the study area. Section II estimates the cost of a basic but decent life for a worker and her/his family, and section III presents and discusses our living wage estimate for the study municipalities. This study uses the Anker Methodology described in Anker and Anker (2017) to estimate the cost of a basic but decent life for a typical reference size family and the living wage in the study area. The Anker Methodology has been used in about 50 studies in more than 44 countries. The methodology uses experts' opinions, and worker and producer views along with an exhaustive investigation of the needs and cost of living of the population in the study area using primary and secondary data. Thus, it is at the intersection between studies that are based exclusively on primary information sources and those that exclusively use secondary data. The present report is part of a series of living wage reports of the Anker Research Institute (ARI) and the Global Living Wage Coalition (GLWC) which are done using the Anker Methodology.<sup>1,2</sup> This includes three previous studies in Mexico for Michoacan, Baja California, and Nayarit.

## 1. DEFINITION OF LIVING WAGE

There is a consensus regarding the definition of a living wage even if slightly different wording is sometimes used. This report uses the definition of the Global Living Wage Coalition (GLWC):

“[...] The remuneration received for a standard work week by a worker in a particular place sufficient to afford a decent standard of living of the worker and her or his family. Elements of a decent standard of living include food, water, housing, education, healthcare, transport, clothing and other essential needs including provision for unexpected events.”

**(Global Living Wage Coalition, 2016).**

## 2. CONTEXT

Yucatan is a state of Mexico located in the southeast of the country, bordered by the states of Campeche and Quintana Roo and the Gulf of Mexico (Map 1A). It has a territorial extension of 39,524.4 km<sup>2</sup> and a population of 2.32 million people (50.9% women and 49.1% men), which is 1.8% of the country's total in 2020. Thus, the population density is 58.7 persons/km<sup>2</sup>.

Yucatan has a young population with a median age of 30 years, and a large proportion of children and adolescents. The age ranges that concentrate the largest population are 20 to 24 years (199,525 persons) and 15 to 19 years

1 The GLWC is a partnership between influential sustainability standard setting organizations in association with ISEAL and the Anker Research Institute. The GLWC has the shared mission of constantly improving the wages of workers in the farms, factories and supply chains that participate in their respective certification systems, with the long-term goal of workers receiving a living wage. Every living wage estimate anywhere in the world commissioned by the GLWC is made public with the goal of promoting the payment of a living wage.

2 See *Global Living Wage Coalition* (<https://www.globallivingwage.org/>)

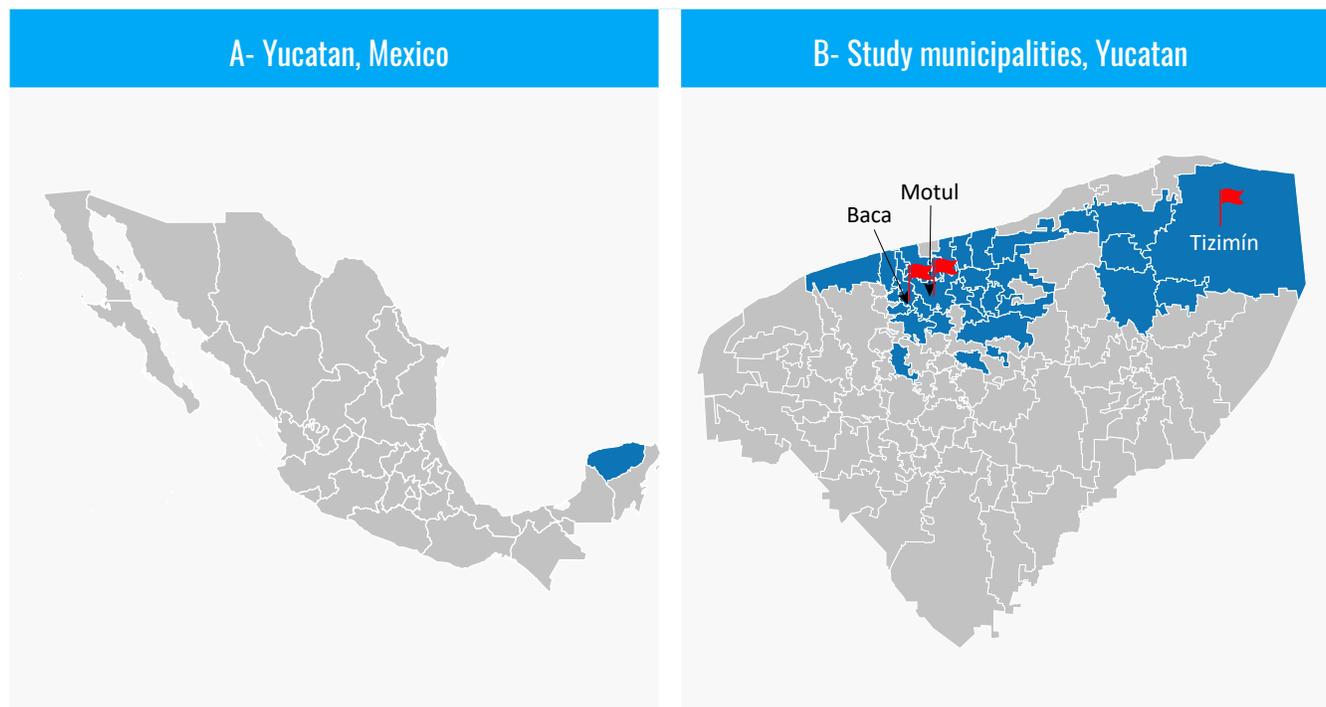
(196,363 persons). Life expectancy has increased during the last decades, reaching 74.7 years in 2020, but there is a wide gap in life expectancy between men (71.7 years) and women (77.9 years). This age structure implies a dependency rate of 48 persons for every hundred people of working age.<sup>3</sup>

Indigenous people are widely present in Yucatan, and represent 42.4% of the total population, or some 983,257 people. The 2020 Census furthermore indicates that 22.6% of the population aged over 3 years speaks an indigenous language, 525,092 people. In this region, Mayan is the most spoken indigenous language, accounting for over 98.9% of indigenous-language speakers.

Yucatan is geographically divided into one hundred and six municipalities, among which Merida (995,129 inhabitants), Kanasin (141,939 inhabitants) and Valladolid (85,460 inhabitants) are the municipalities with the largest populations. In our analysis of the living wage, we focus on thirty municipalities in the following regions: Northwest (excluding Mérida and western municipalities), Central Coast, and Northeast regions, where most of the fabric and clothing manufacturing industry is located (Map 1B).<sup>4</sup>

When compared with the rest of the municipalities of Yucatan, the study municipalities are relatively average in terms of population density (Map 2A) but some of them have poverty rates above the state average (Map 2B). Poverty rates are discussed in more detail in section 2.1.

### Map 1. Location of the state of Yucatan and the study municipalities in Yucatan



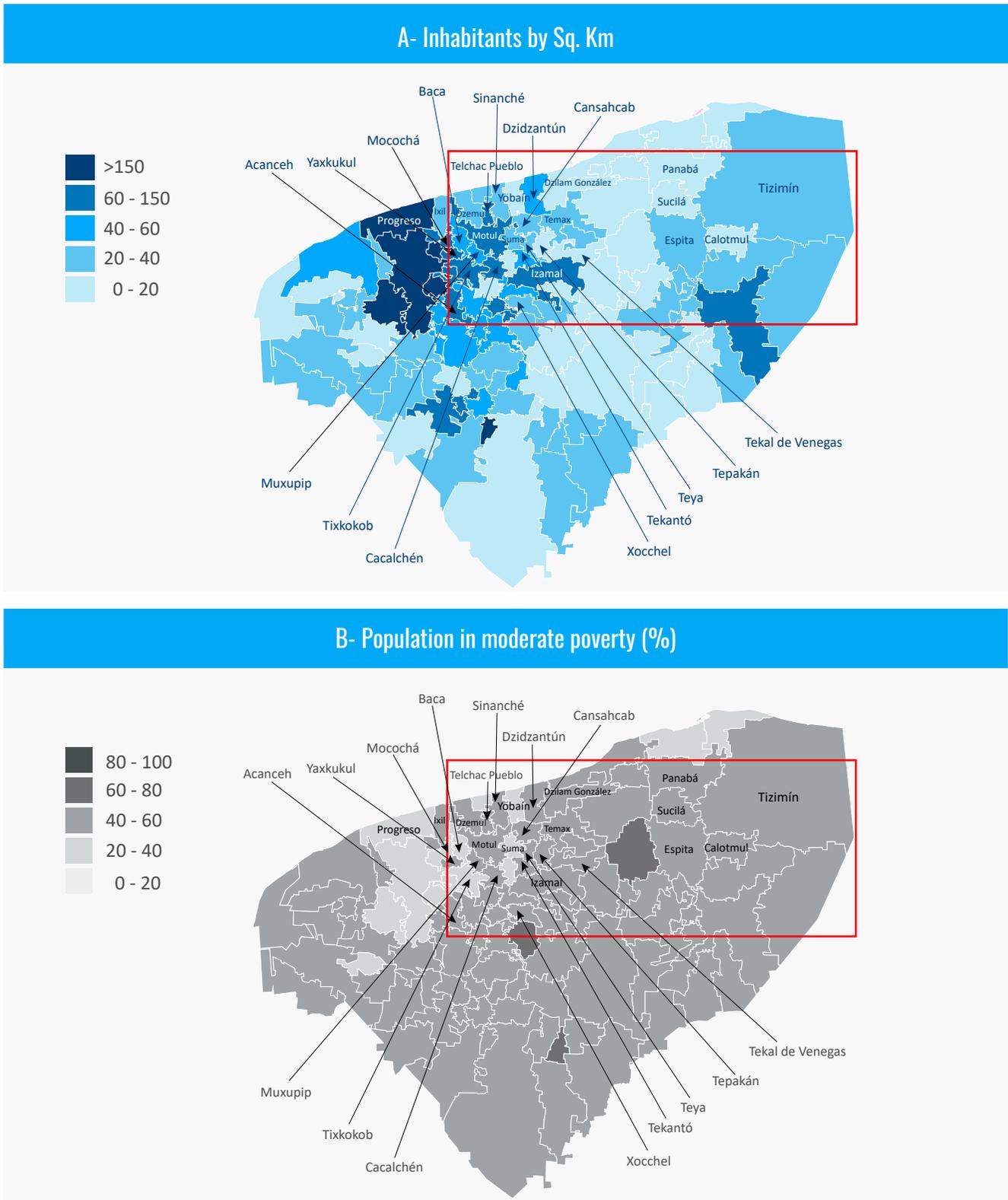
**Note:** Red flags indicate the municipalities where the authors organized focus group meetings with workers.

**Source:** INEGI (n.d.).

<sup>3</sup> Data are from the 2020 Population and Housing Census (INEGI, National Statistics and Geography Institute). The dependency ratio is the number of persons under age 15 years and over 64 years) for every 100 persons ages 15-64.

<sup>4</sup> The complete list of municipalities can be found in Table 1.

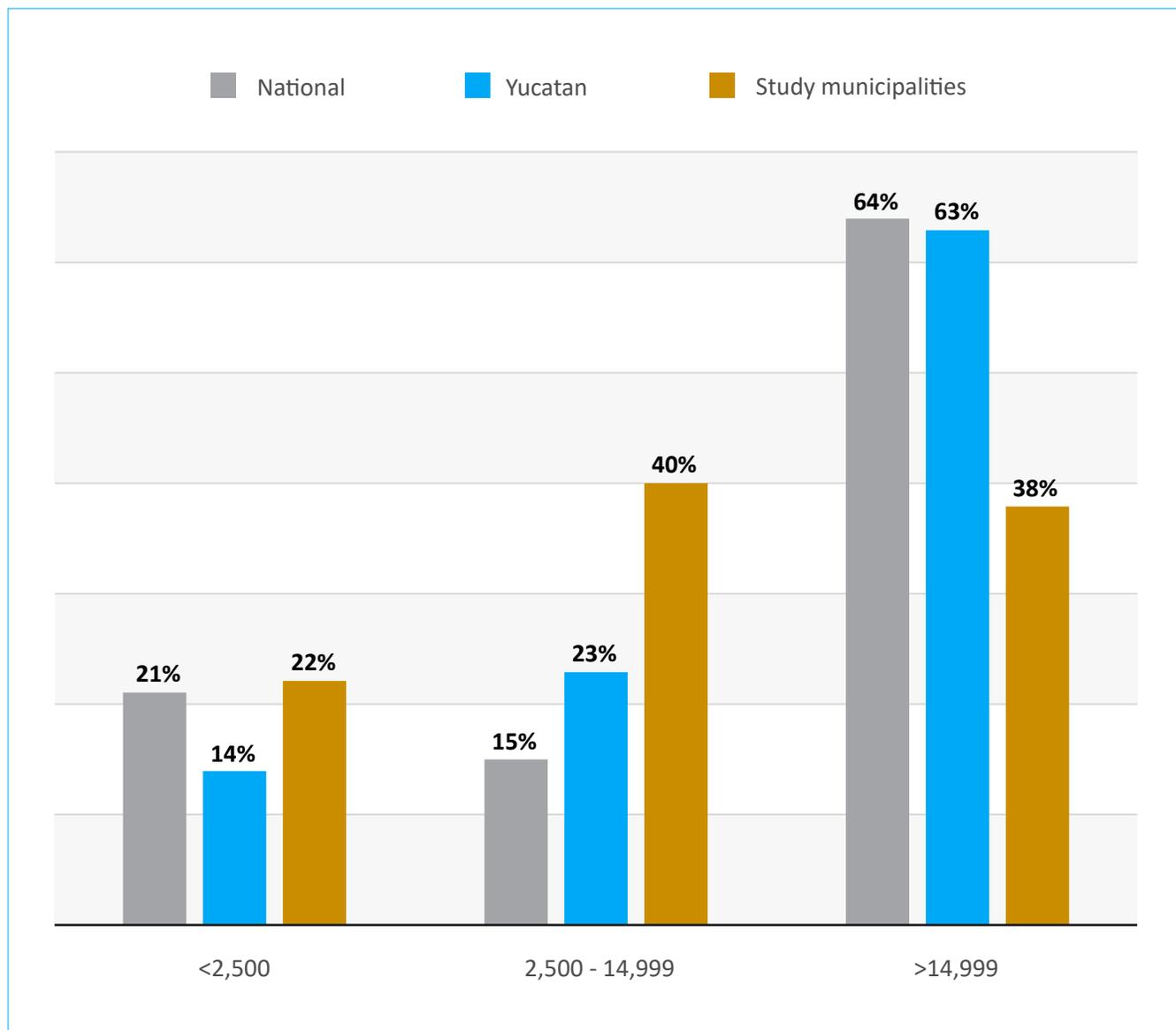
Map 2. Population density and poverty rate in Yucatan



**Note:** The red box indicates the area of Yucatan where most of the municipalities studied are located.  
**Source:** A- 2020 Population and Housing Census; B- Coneval (National Council for the Evaluation of Social Policy).

Analysis of 2020 Population Census data shows that 86% of the population of Yucatan lives in an urban area (with more than 2,500 inhabitants) and 14% in rural areas. It has a higher degree of urbanization compared to Mexico as a whole, although if we exclude the municipalities of Mérida, Kanasin and Valladolid the share of rural population is higher at 25%. The study municipalities have a slightly lower degree of urbanization than the state as a whole, with 22% of the population living in rural areas. (Figure 1). However, among these municipalities four are predominantly urban: Motul, Tizimín, Progreso and Izamal – with more than 60% of the population living in towns with more than 15,000 inhabitants; and five municipalities are mostly rural: Mocochoá, Suma, Tepakán, Teya and Yobaín – with 100% of the population living in villages with less than 2,500 inhabitants (Figure 1).

**Figure 1. Distribution of the population of Yucatan and study municipalities by the population size of locality**



Source: 2020 Population and Housing Census (INEGI, 2021a).

The following images provide views of streets and houses in small towns and main urban areas for our study areas.

Image 1. Degrees of urbanization in the study municipalities



Street views and houses in main urban areas



Motul



Motul



Tizimín



Tizimín



Tizimín



Tizimín

Source: Authors' fieldwork.

## 2.1. Poverty and social deprivation

The importance of studying poverty stems from its effects on people's wellbeing. Poverty is a multidimensional phenomenon that includes aspects related to living conditions that undermine people's dignity, limit their fundamental rights and freedoms, prevent the fulfillment of their basic needs, and impede their full social integration (CONEVAL, 2019).

In Mexico, the methodology for measuring multidimensional poverty, in addition to measuring income, includes indicators of social deprivation such as the educational gap, access to health services, access to food, access to social security, quality and spaces of the dwelling, and access to basic services in the dwelling. These components make it possible to follow the evolution of social deprivations and the economic wellbeing of the Mexican population (CONEVAL, n.d.).

Although the percentage of the population that is socially vulnerable<sup>5</sup> is lower in Yucatan than at the national level, the level of poverty (49.5%) is higher than at the national level (43.9%) (Table 1). In addition, the poverty and social deprivation indicators are higher in some of our study municipalities, especially those that are largely rural and semi-urban.

In 21 of the 30 study municipalities, the percentage of population in poverty is higher than average for Yucatan (Table 1). It is remarkable that the percentage of population in poverty situation is higher than 80% in three of the municipalities: Tekal de Venegas (82.0%), Calotmul (87.4%) and Espita (90.5%).

The prevalence of extreme poverty is higher in Yucatan and the study municipalities than average for Mexico (11.3% vs 8.5%). Two of the locations visited by the researchers during the study, Calotmul and Espita, have very high extreme poverty rates of 29.3% and 38.9% respectively (i.e., 3.5 and 4.5 times the national average).

Regarding the prevalence of specific deprivations, the percentage of population lacking access to social security is slightly higher in study municipalities (53.8%) than average for Yucatan (49.4%) and Mexico (52.0%). The population without access to social security is particularly high in Dzilam González (71.8%), Sucilá (72.1%), Calotmul (74.6%), Panabá (79.9%) and Espita (85.2%) (Table 1). Low schooling achievement, low quality housing, and lack of basic household services are also more prevalent in Yucatan than average for Mexico. However, food insecurity is on average lower in the study municipalities (20.4%) than for the state (24.6%) and the country (22.5%). Nonetheless, in some of the study municipalities, food insecurity affects a relatively large percentage of the population: Temax (30.3%), Motul (32.2%) and Espita (40.7%).

## 2.2. Economic activity

The product of the state of Yucatan represents 1.5% of Mexico's GDP (while its population is 1.8% of the country's population). Output comes from farming and fishing (4.1%), manufacturing, mining and construction (25.8%), and services industries (70.1%).

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<sup>5</sup> The vulnerable population are people who suffer from at least one social deprivation despite having enough income to acquire the food and non-food baskets.

The state of Yucatan stands out in the national economic panorama because of its important contribution to the national production of various agricultural, livestock and fishery products. Regarding agricultural production, the state is the number one national producer of beans, sisal and mamey sapote; the second national producer of annatto and dragon fruit; and comes third in the production of sapota and coriander seed (AGRICULTURA, 2022). Agriculture accounts for 3.2% of the workforce (37,635 workers) in Yucatan (ECONOMIA, 2020). Regarding livestock production, the state of Yucatan is the most important producer of turkey (28.8%), 31.8% of which is produced in Baca, 4.7% in Kanasin and 2.8% in Izamal; and it is the third producer of honey (9%), 7.2% of which is produced in Tizimín and 4.9% in Izamal.

Yucatan's level of fish production represents 7.6% and 5.9% of Mexico's total gross fishing production and employment. According to the economic census, Progreso, Celestun and Dzilam de Bravo had the most important gross production in 2018. There are 1,045 establishments working on aquaculture and fishing activities in the state, and they are mostly concentrated in Progreso (INEGI, 2020). According to the volume of production, the state is the number one national producer of Mexican snapper, octopus and grouper; and comes third in the production of lobster. In terms of employment in fishing, the municipality of Progreso ranks eighth at the national level with 1.9% of national employment (INEGI, 2021b), and ranks first at the state level with 28% of state employment in that sector.

Yucatan is not a manufacturing powerhouse in Mexico, with only 4.6% of the establishments, 1.7% of the employees and 0.7% of the sector's national gross production. However, manufacturing is important at the state level, and accounts for 23.7% of the establishments, 21.4% of the workforce and 36.1% of the total gross production at the state level. The study municipalities contribute 6.6% of Yucatan's total gross production in manufacturing and 16.1% of state's employment in manufacturing, textiles being one of the most important sectors. As of 2018, there were about 26,715 manufacturing establishments in Yucatan, with approximately 11.9% of them working in textile industry. The study municipalities contribute 36.4% of the total gross production, 29.4% of the workforce and 14.6% of the establishments of state's textile industry (Table 2).

Regarding tertiary activities, Yucatan does not stand out at the national level. Nevertheless, services are the most important economic activity in the state, with a total of 74.4% of the establishments, 71.1% of the employees and 52.8% of the total gross production in the state. The sectors with the highest total income in 2019 in Yucatan were retail trade (30.9%) and wholesale trade (26.2%).<sup>6</sup> Tourism is the third most important activity in the state, with 13.6% of the establishments, but only 3.3% of the state's total gross value added. Employment in this sector accounts for 11.6% of the total personnel employed in Yucatan (INEGI, 2021c).

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<sup>6</sup> Yucatan: Economy, employment, equity, quality of life, education, health and public safety | Data México ECONOMIA (2020).

**Table 1. Indicators of poverty in Mexico, Yucatan, and the study municipalities**

Municipalities	Poverty (%)						Social deprivation (%)		Indicators of social deprivation (%)						Well-being (%)	
	Population in poverty	Moderate poverty	Extreme poverty	Vulnerable population due to social deprivation	Vulnerable population due to low income	Non-poor non-vulnerable population	Population with at least one social deprivation	Population with at least three social deprivation	Low schooling achievement	Lack of access to health services	Lack of access to social security	Low quality housing	Lack of basic household services	Food insecurity	Population with income below the extreme poverty line	Population with income below the poverty line
<b>Mexico</b>	<b>43.9</b>	<b>35.4</b>	<b>8.5</b>	<b>23.7</b>	<b>8.9</b>	<b>23.5</b>	<b>67.6</b>	<b>23.0</b>	<b>19.2</b>	<b>28.2</b>	<b>52.0</b>	<b>9.3</b>	<b>17.9</b>	<b>22.5</b>	<b>17.2</b>	<b>52.8</b>
<b>Yucatán</b>	<b>49.5</b>	<b>38.2</b>	<b>11.3</b>	<b>22.1</b>	<b>9.1</b>	<b>19.3</b>	<b>71.6</b>	<b>28.1</b>	<b>21.8</b>	<b>24.7</b>	<b>49.4</b>	<b>12.0</b>	<b>34.6</b>	<b>24.6</b>	<b>21.3</b>	<b>58.6</b>
Acanceh	47.8	41.0	6.9	24.3	14.1	13.8	72.1	25.0	19.5	21.8	33.9	13.1	49.1	17.2	20.2	62.0
Baca	39.9	35.6	4.3	30.6	8.1	21.4	70.5	17.2	20.0	15.6	30.9	12.6	41.1	16.2	11.1	48.0
Cacalchén	56.8	47.5	9.2	23.0	8.6	11.6	79.8	25.1	26.1	22.2	45.0	12.6	51.6	11.5	19.7	65.4
Calotmul	87.4	58.2	29.3	9.7	1.7	1.2	97.1	46.9	31.1	16.1	74.6	28.0	78.9	19.3	54.5	89.2
Cansahcab	53.8	44.3	9.5	26.4	5.4	14.5	80.2	28.8	23.0	13.5	41.4	21.1	57.5	22.0	18.6	59.1
Dzemul	46.2	40.2	5.9	28.9	8.1	16.9	75.0	20.9	22.9	16.7	38.9	9.7	42.2	20.4	13.8	54.3
Dzidzantún	54.6	43.6	11.0	20.8	7.2	17.3	75.5	24.3	17.6	16.3	54.0	15.0	41.5	17.1	24.4	61.8
Dzilam González	76.9	56.8	20.1	13.8	4.2	5.1	90.7	36.2	29.1	27.6	71.8	14.5	49.4	20.9	40.4	81.1
Espita	90.5	51.7	38.9	6.6	1.2	1.6	97.2	60.4	32.2	17.0	85.2	17.9	84.0	40.7	60.5	91.8
Ixil	59.7	48.6	11.1	19.4	9.7	11.2	79.1	26.5	21.2	28.2	52.3	10.8	45.1	13.3	24.4	69.4
Izamal	58.7	48.6	10.1	21.3	11.1	9.0	80.0	29.6	22.8	16.3	42.3	12.2	55.9	29.4	26.5	69.8
Mocochá	28.4	25.1	3.2	41.7	5.2	24.8	70.0	15.9	23.3	17.7	42.4	10.2	28.9	10.2	9.1	33.5
Motul	50.6	40.3	10.3	27.2	9.4	12.8	77.8	33.5	20.2	29.2	49.9	11.4	40.1	32.2	20.1	60.0
Muxupip	48.6	43.7	4.9	39.0	3.0	9.5	87.6	25.5	22.5	10.0	46.0	18.3	68.0	13.7	10.9	51.6

Municipalities	Poverty (%)						Social deprivation (%)		Indicators of social deprivation (%)						Well-being (%)	
	Population in poverty	Moderate poverty	Extreme poverty	Vulnerable population due to social deprivation	Vulnerable population due to low income	Non-poor non-vulnerable population	Population with at least one social deprivation	Population with at least three social deprivation	Low schooling achievement	Lack of access to health services	Lack of access to social security	Low quality housing	Lack of basic household services	Food insecurity	Population with income below the extreme poverty line	Population with income below the poverty line
Panabá	75.5	57.3	18.1	18.2	2.5	3.9	93.6	40.7	29.5	8.7	79.9	21.1	61.2	26.4	35.9	77.9
Progreso	42.1	35.8	6.3	35.8	5.9	16.2	77.9	27.1	19.5	34.1	62.2	14.3	10.1	29.4	12.8	48.0
Sinanché	65.5	54.3	11.2	22.3	5.4	6.8	87.9	28.5	23.2	11.5	65.1	17.7	46.1	22.4	25.8	70.9
Sucilá	76.8	57.2	19.6	14.1	4.4	4.7	90.9	36.2	22.3	14.2	72.1	14.9	62.0	24.0	39.9	81.2
Suma	46.9	39.8	7.1	36.3	5.0	11.8	83.2	22.6	20.5	20.2	42.4	14.1	60.3	7.6	17.7	51.8
Tekal de Venegas	82.0	57.4	24.7	10.1	4.9	3.0	92.1	44.4	29.6	14.5	59.9	29.4	74.7	24.1	43.7	86.9
Tekantó	65.3	54.2	11.1	22.9	4.4	7.4	88.3	29.3	25.7	14.6	47.8	22.5	67.9	11.6	24.9	69.7
Telchac Pueblo	56.4	42.5	13.9	19.2	9.6	14.8	75.6	28.4	18.7	34.0	49.8	12.1	39.9	19.1	25.5	66.0
Temax	77.9	56.8	21.1	14.1	3.4	4.7	91.9	44.4	32.4	13.4	55.6	25.7	76.4	30.3	36.2	81.2
Tepakán	56.9	45.1	11.8	33.8	2.5	6.8	90.7	36.1	28.5	7.5	37.2	32.4	77.4	28.4	23.0	59.4
Teya	62.9	52.3	10.6	26.4	4.4	6.3	89.3	26.5	26.1	4.6	43.9	27.7	72.2	11.9	29.3	67.4
Tixkokob	36.6	30.7	5.8	32.3	10.9	20.3	68.8	21.6	16.8	28.1	41.2	7.5	33.1	17.7	14.8	47.5
Tizimín	71.8	47.4	24.5	14.9	5.6	7.7	86.7	43.9	26.9	33.3	68.2	16.4	59.4	23.0	41.3	77.4
Xocchel	77.0	56.0	21.0	15.9	3.2	3.9	92.9	47.2	26.5	29.4	60.7	30.2	74.9	19.8	32.2	80.1
Yaxkukul	50.0	43.6	6.4	24.5	10.5	15.0	74.5	17.7	15.8	19.6	51.0	9.9	33.2	13.9	18.0	60.5
Yobaín	42.3	34.9	7.5	45.6	2.0	10.1	87.9	28.4	19.0	10.5	67.6	19.2	52.5	19.5	14.1	44.3

Source: (CONEVAL, 2021).

**Table 2. Textile industry in Yucatan and study municipalities**

Municipality	Number of establishments	Employed personnel	Total gross production (millions of pesos)
Acanceh	21	2,009	463.4
Baca	2	NA	NA
Cacalchén	12	83	5.9
Calotmul	2	NA	NA
Cansahcab	3	3	0.2
Dzemul	7	285	16.5
Dzidzantún	4	28	3.3
Dzilam González	6	6	0.2
Espita	42	57	1.9
Ixil	19	216	22.2
Izamal	92	163	15.6
Motul	29	1,867	322.4
Muxupip	3	8	NA
Panabá	16	17	0.7
Progreso	12	24	1.6
Sinanché	4	4	0.2
Sucilá	13	14	0.6
Suma	2	NA	NA
Tekantó	20	62	3.0
Telchac pueblo	1	NA	NA
Temax	8	334	37.0
Tepakán	2	NA	NA
Teya	4	3	0.1
Tixkokob	16	1,421	1,116.0
Tizimín	90	227	52.0
Xocchel	30	43	1.4
Yaxkukul	3	NA	NA
Yobaín	2	NA	NA
Yobaín	2	NA	NA
<b>Study municipalities</b>	<b>467</b>	<b>6,874</b>	<b>2,064.2</b>
<b>Yucatan's total</b>	<b>3,190</b>	<b>23,344</b>	<b>5,675.9</b>

Notes: NA indicates not available, usually because value is low.

Source: (INEGI, 2020).

### 3. HOW LIVING WAGE IS ESTIMATED

The Anker Methodology used in this report estimates a living wage that reflects the situation at the local level but allows comparisons between different countries. To ensure that the living wage estimate is robust and credible for the study location, information from local primary data and secondary data from state or national surveys are used. That is, food prices and housing costs are collected locally through fieldwork, as well as the costs of children’s education, medical care, and transportation, to ensure that there are sufficient funds available to satisfy these needs. In the case of local food prices, these are obtained from a representative survey of the different types of establishments where people buy food in the study area. In the case of local housing, the costs are estimated based on the rental price of homes that meet both international and national standards for decent healthy housing.<sup>7</sup>

The Anker Methodology also requires the participation of local people and organizations to increase its credibility and acceptance by stakeholders. Before our fieldwork and collection of local prices and costs, the study team had discussions with three focus groups of local workers in the garment and clothing manufacturing industry in the study area (one group in Tizimin, and two groups in Baca). In these group discussions, we talked to the workers about their diets and eating habits, and about the establishments where they buy their food. We discussed about the main characteristics of their houses, and in general about housing and rental prices in the area. We discussed with them about their health care and educational needs, and how they usually solve them. In particular, we asked their opinion about the availability and quality of public provision of health care and education, and also transport, and how much they pay for these services out of their own pockets. All this information allowed us to adjust our international and national standards to local conditions; that is, what is considered acceptable currently in Yucatan. It is important to mention that the estimation of the living wage is independent of whether workers receive a living wage or whether individual employers pay a living wage.

The secondary data we use in this study are mainly from the National Survey of Occupation and Employment (ENOE) 2022 (second quarter), the National Household Income and Expenditure Survey (ENIGH) of 2018 and 2020<sup>8</sup>, and the Population and Housing Census of 2020. All of these are coordinated by Mexico’s statistical office, the National Institute of Statistics and Geography (INEGI). We also relied on the 2021 National Health and Nutrition Survey, coordinated by the Ministry of Health and the National Institute of Public Health, as well as on the official methodology for measuring the poverty rate (CONEVAL, 2019).

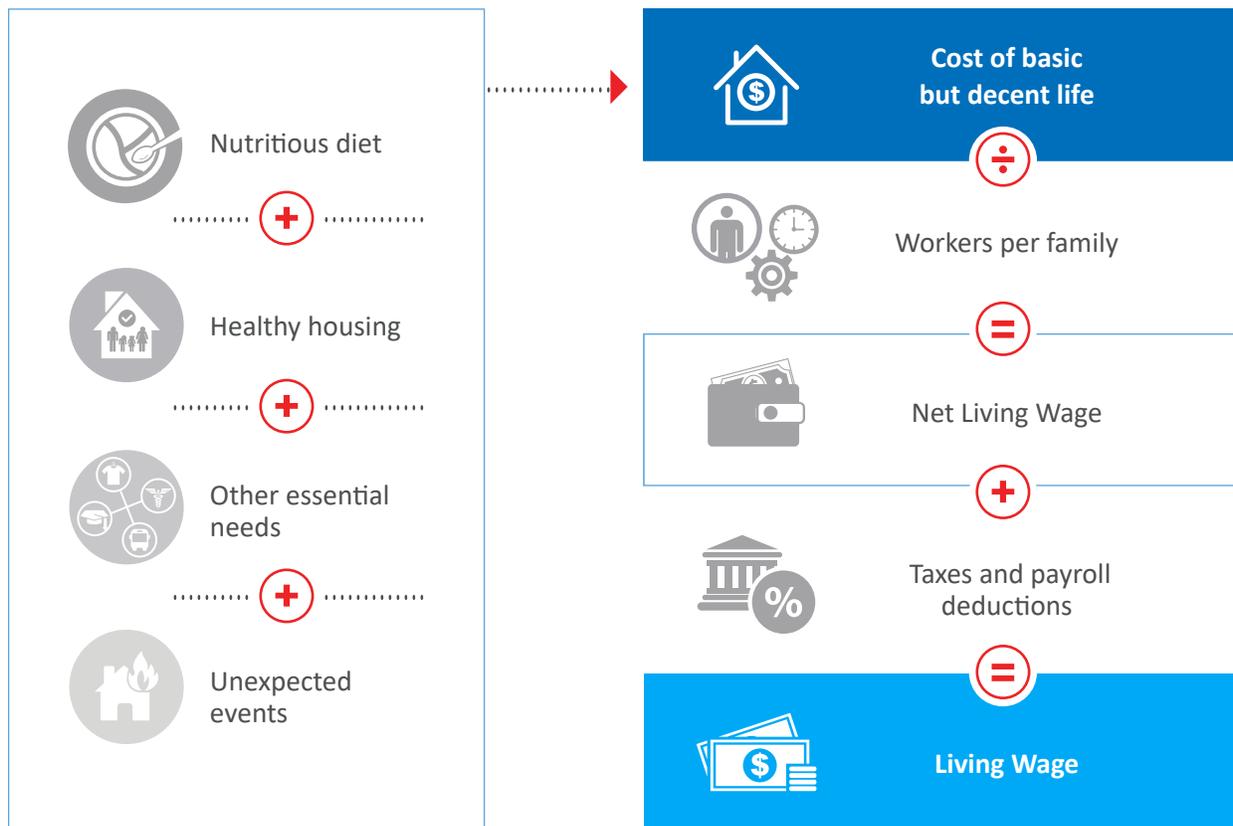
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7 The survey and opinion polling company Suasor Consultores carried out a survey of food prices and rental costs in the municipalities of Motul, Baca, Tixkokob, Cacalchén, Izamal, Suma, Cansahcab, Dzempl, Tizimín, Sucilá, Espita y Calotmul, during the first two weeks of July 2022. Additionally, they collected information on the cost of basic privately provided medical services in the area. The survey company did not collect information on educational costs. These costs were obtained from interviews and focus group discussions with workers. We used the same data collection forms as those from other Anker living income studies previously carried out in other countries—although we adapted and translated them to the Mexican reality. Prior to this fieldwork, the survey team was trained by the authors to ensure that the survey was carried out in accordance with the methodology adopted for the project.

8 The 2020 ENIGH was carried out in the third quarter of that year, and both household income and expenses were still deeply affected by the extraordinary circumstances generated by the COVID-19 pandemic. In particular, the relationship between spending on food and on non-food and non-housing goods and services was affected by restrictions on movement, high unemployment, low income, the closure of schools, businesses and other establishments. Given these circumstances, we think that the ENIGH 2018 better reflects the expected relationship between the different components of household spending in Yucatan, Mexico. Therefore, this is the edition of the ENIGH that we utilize in this study.

A summary of the Anker Methodology is depicted in Figure 2. The box on the left-hand side of the figure indicates the four components of the cost of a basic but decent living standard. The definition and estimation of the living wage considers these four relevant aspects of the cost of living: the cost of food, the cost of housing, the costs of other essential needs, and a margin to face unforeseen expenses. The upper part of the right-hand side of the figure indicates how the net living wage (i.e., take-home pay required for decency) is estimated from the living costs by taking into consideration the number of full-time equivalent workers in the reference family. The bottom part indicates how the gross living wage is estimated by also taking into consideration mandatory payroll deductions and income tax that reduce take home pay and would need to be considered when estimating the living wage.

**Figure 2. Living wage calculation**



Source: Anker and Anker (2017).

## 4. FOOD COSTS

The estimation of food cost is based on the cost of a nutritious low-cost model diet that complies with recommendations of the World Health Organization (WHO) on calories, macronutrients, and micronutrients for people, which depends on their sex, age, height, and physical activity level. This model diet is also consistent with the local food preferences, local relative food prices and the country's level of development. This approach to establishing a low-cost nutritious diet uses a much stricter nutrition standard than those other approaches that only guarantee a sufficient number of calories.

### 4.1. Establishing a model diet with adequate nutrition

Based on the Schofield equations, recommended by the WHO, it was estimated that the calories required per person per day for our reference family of four (2 adults and 2 children) is 2,336 calories. This requirement is determined taking into account the average height in the state of Yucatan for the population in the age range from 15 to 59, which is 1.62 meters for men and 1.51 meters for women (National Health and Nutrition Survey - Ensanut, 2021). Adults are on average taller at the national level at 1.68 meters for men, and 1.55 meters for women. The calorie requirement also assumes that one of the adults in the reference family has vigorous physical activity and that her/his spouse/partner and children have a moderate level of physical activity.

To develop our model diet, we first started with the food basket used in the official poverty estimate for Mexico (CONEVAL, 2019). Then, we adjusted consumption levels and basket components to achieve adequate nutritional levels. This was done while maintaining consistency with local food preferences and keeping the cost of the diet relatively low. We increased the amount of beans, eggs, and chicken in the diet and decreased the amount of cheese (“queso blanco”), pork and beef, products that are a more expensive source of protein. However, given local preferences, among meats chicken and pork dominate over steak. For the same reason, fish has not been included in the model diet. In the same way, we replaced spinach and lettuce, which are relatively little consumed in this area, with cabbage, which is a green leafy vegetable used in salads, sandwiches, and stews. We included plantain in the diet, as it is common in the local diet, and decreased the amount of potato, which is a more expensive starchy food. Regarding fruits, we kept banana and apple in the diet, but we increased the consumption of the former and reduced the consumption of the latter for cost reasons. We also replaced orange with watermelon as it is a cheaper source of nutrients and a fruit commonly included in the workers’ diets. Likewise, we included instant coffee in the diet, instead of ground coffee, since the former is preferred to the later by workers and their families and cheaper.

Our model diet, which meets WHO nutrition standards, has:

- 2,336 calories.
- 13.4% of calories come from proteins, which is between the 10-15% recommendation of WHO for upper-middle income countries like Mexico. Proteins come from a variety of sources and in particular beans and animal sources.
- 27.5% of calories come from fats. This is within the WHO recommended range of between 15% and 30%.
- 59.1% of calories come from carbohydrates. This is within the WHO recommended range of between 55% and 75% of calories should come from carbohydrates.
- The diet includes 1 ½ cups of milk per day for children.
- 280 grams of vegetables and fruits per day (350 grams per day including legumes), to provide enough micronutrients and minerals.
- Limited number of grams of sugar (30) and cooking oil (25).

Foods included in our model diet are consistent with local preferences. For example:

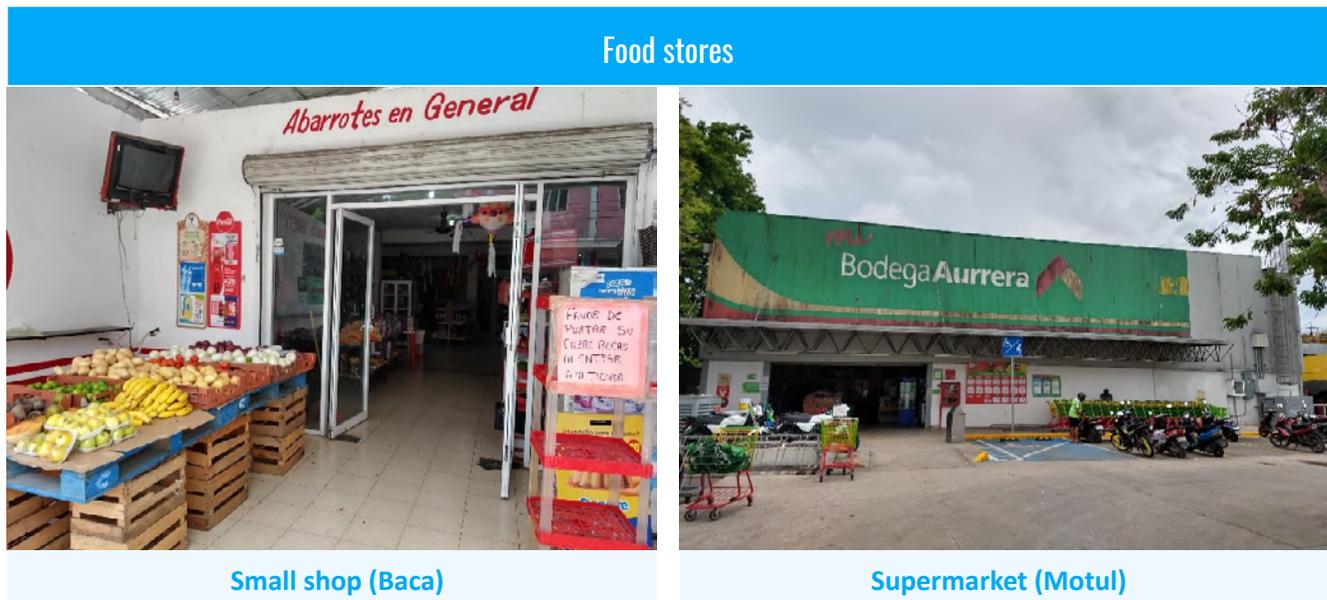
- Chili peppers and tortillas were included in the model diet. Bottled water is included in the model diet because its consumption is very common in the study area, as well as in Mexico in general. In this case, one liter of bottled water is included per person per day.
- Specific fruits and vegetables are those which are less expensive and widely consumed in the Yucatan.
- The amount of bread (dulce) was limited to 2 pieces per week, due to its high cost per protein, and the amount of pasta was increased slightly, as it is a good and cheaper source of calories from carbohydrates.

## 4.2. Determining local food prices

To estimate the cost of the model diet, a survey company collected prices of fresh and processed foods in the study municipalities during the first fortnight of July 2022. Prices of local foods were collected for the types, qualities, and quantities/sizes of foods that families in the study area usually buy. The set of establishments visited was determined based on the results of focus group discussions with workers about where they typically shop for each type of food such as from local grocery and retail stores, supermarkets, and open markets (Image 2). Information was collected on the price, weight, presentation, and brand of 4,725 products for 219 different types of food. Food items were not included in the final model diet when they were not widely available or when less expensive acceptable options were available. Therefore, we used the prices of 2,268 food items to estimate the cost of our model diet.

To determine the price of each food item (e.g., chicken, tomato, potato, rice, pasta, coffee, sugar, etc.) in the study municipalities to use to cost our model diet, we proceeded as follows. First, we discarded the highest prices and lowest prices of each product. Second, we computed the average, median, standard deviation, and quartiles of the distribution of the remaining prices. In a third step, we used box-plot diagrams to identify extreme prices (outliers). We used the convention that a price is an outlier or extreme if it lies outside the bounds of the box-and-arms plot. The lower bound was determined by [quartile 1 - 1.5 × (quartile 3 - quartile 1)], while the upper bound was [quartile 3 + 1.5 × (quartile 3 - quartile 1)]. Finally, the fourth step depended on the presence or absence of extreme values. For products without outliers or extreme prices, we used the median price calculated in the second step. For products with extreme prices, we eliminated the outliers and recalculated the median price over the remaining observations. We also explored if any unusually high prices were due to packaging with small quantities (such was the case of bread-dulce, white-bread and coffee), or to expensive brands (as was the case with queso blanco, milk, cooking oil, and coffee) which we excluded from our calculation.

**Image 2. Photos of food stores in the study municipalities, Yucatan**



## Food stores



Small shop (Espita)



Small shop (Calotmul)



Small shop (Calcalchen)



Small shop (Suma)

### 4.3. Cost of the model diet

Once we estimated the median price for each food item for the study municipalities as a whole, these prices were entered into the model diet, and the cost of the model diet per person per day was computed. The resulting value was MXN (Mexican pesos) 48.84 (Table 4). We, then, added some additional expenses after considering that the food budget must be sufficient, not only to cover the cost of nutrients and minimum calories but also to contribute to the goals of dignity and well-being associated with food. These additional expenses are: Salt, spices, sauces, and condiments (1% of the cost of the model diet as this is the percentage found in household expenditure survey data); food not consumed because it is lost during cooking or storage, or because it is not in good condition, or because it is discarded (4%); an allowance for additional variety in the model diet, whether for taste, quality, or seasonal availability of food and variation in prices (15%).

**Table 4. Composition and cost of the model diet per person per day, Yucatan (MXN, July 2022)**

Food	item	Edible grams	Purchased grams	Cost per kilio	Cost
1.A Cereals and grains	Tortilla (maize)	231	231	22.00	5.08
	Rice, white medium	36	36	22.00	0.79
1.B Prepared cereals	Bread, dulce	13	13	128.34	1.67
	Bread, white	33	33	61.76	2.02
	Macaroni, spaghetti, dry, whole wheat	45	45	37.50	1.69
2.A Roots and tubers (starchy)	Potato	21	28	34.00	0.95
	Maize (corn) whole grain yellow or white	46	46	15.32	0.70
2.B Starchy fruit or vegetable (e.g. plantains)	Plantains	15	23	18.00	0.42
3. Pulses, legumes, beans	Beans, pinto	70	70	29.33	2.05
4.A Milk	Milk (cow)	180	180	19.50	3.51
4.B Other Dairy (for example: sour milk, cheese, yoghurt)	Queso blanco	9	9	168.00	1.51
5. Eggs	Chicken egg	44	50	45.83	2.29
6. Meats & Fish	Chicken broiler or fryer meat & skin raw (no giblets or neck)	61	82	65.00	5.31
	Sausage, raw, pork	24	24	74.96	1.82
	Bottom round 1/8" fat	12	13	140.00	1.75
	Pork, loin and shoulder trimmed	36	49	110.00	5.42
7.A Dark green leafy vegetables (GLV)	Cabbage	36	45	11.00	0.50
7.B Other vegetables	Carrots	32	36	15.00	0.54
	Onion	40	44	20.00	0.89
	Tomato	42	46	22.00	1.02
8. Fruits	Apple	29	32	50.00	1.61
	Watermelon	42	81	12.00	0.97
	Banana	59	92	18.00	1.66

Food	item	Edible grams	Purchased grams	Cost per kilio	Cost
9. Oils & fats	Oil (soybean, peanut, palm, canola, etc.)	25	25	48.50	1.21
10. Sugar	White sugar	30	30	22.26	0.67
11. Nonalcoholic beverages	Coffee	1.8	1.8	330.00	0.59
12. Other	Chili peppers	10	12	40.00	0.47
	Drinking water	1,000	1,000	1.73	1.73
<b>Subtotal excluding additional costs</b>					<b>48.84</b>
<b>Total excluding additional costs</b>					<b>58.61</b>

**Additional cost 1:** Percentage added for salt, spices, sauces, and condiments (1%)

**Additional cost 2:** Percentage for spoilage & waste (4%)

**Additional cost 3:** Percentage added for variety (15%)

With these additional expenses, the final cost of the model diet per person per day is MXN 58.61 (USD 2.85) (Table 4). To obtain the family's food budget per day, we multiplied the cost per person per day of the model diet by the number of members of a typical family in the study area (4 persons, see below). To obtain the monthly cost, we multiplied the family's cost per day by 365 days and divided it into 12 months. Our model diet is more expensive than Coneval's model diet for Mexico's rural areas (MXN 52.23) but cheaper than Coneval's model diet for Mexico's urban areas (MXN 68.10) as of July 2022. In addition, our living wage model diet is closer to the concept of a decent diet, because it entails a more adequate balance of nutrients and allows for a greater variety of meals to be prepared.

## SECTION II. COST OF BASIC BUT DECENT LIFE FOR REFERENCE SIZE FAMILY

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### 5. HOUSING COSTS

The cost of local healthy housing is determined by first developing a local healthy housing standard and then estimating its cost using: (i) primary data on the rental prices of houses in the study areas that meet our healthy housing standard, and (ii) utility costs based on data from INEGI household surveys.

#### 5.1. Local healthy housing standard

To determine our local housing standard, we used the principles of international standards for healthy housing from the WHO, UN, ILO, and UN-Habitat, as reported in Anker and Anker (2017), as well as official national Mexican standards and norms. Table 5, column 2, presents the minimum international standards, while column 3 lists the national standards, adjusted to local conditions. Coneval uses these national standards to identify the population that suffers from deprivation in relation to housing and, therefore, lives in conditions associated with poverty. Column 4 of Table 5 present figures on the percentage of homes that meet the Coneval standard in the thirty study municipalities in Yucatan (according to the 2020 Population Census). Given that the Coneval standard reflects minimum requirements for a healthy home and that the degree of local compliance with these standards is high, we decided to adopt the national standard to determine the local standard. The only aspect of our local healthy housing standard that is missing from the Coneval standard is the amount of living space. In past Anker Methodology studies for Mexico, we used the minimum size of 50 square meters recommended by the National Housing Commission for adequate housing in Mexico. However, based on the information we obtained during our visit to the study area, we have determined a size between 50 and 85 square meters as a local standard.

According to 2020 Census figures, 98% of the homes in the study municipalities meet the national standard for walls, roof and floor; 90% meet the minimum standard for safe toilet; and 98% of the houses conforms to the standard for electricity. The Census does not report the percentage of houses that are in a poor state of repair or the environment around the house regarding safety or hazards. During our visit to the area, we observed that it is common for houses to be in poor state of repair. Therefore, we determined that a home does not meet our healthy housing standard if it is visibly damaged, partially collapsed, or has serious moisture problems or mold, or cracks in the walls or foundation, or it is in a slum or area with an environmental hazard. The 2020 Census does not provide data on the square meters of floor space that the dwellings have, which we were able to determine in our visits.

The 2020 Population Census reports that 94% of homes in the study municipalities have the kitchen in a separate room inside the home with good ventilation (Table 5). During our visit to the study area, we learned that people in rural areas and small towns often cook outside, usually in the backyard and utilize wood as fuel, if the house is too small. Therefore, the standard that we used to define acceptable housing in this regard was that the stove either runs on LP gas and is located inside the home in a separate room with good ventilation; or that when wood is the cooking fuel the kitchen is in a separate room and has a chimney and good ventilation. The kitchen is not considered acceptable if wood or charcoal is used as cooking fuel, and the kitchen is inside the house without a chimney or good ventilation because of the danger of indoor air pollution.

Compliance with our housing standard is relatively high in the study area in terms of having piped water in the house. In the study municipalities, 91% of homes meet this requirement according to the Population Census 2020. This is important, because it is a minimum requirement for a house not to be considered officially poor in terms of housing. However, during focus groups with workers in the study area, we found that the quality of piped water is poor or the service is not always available or working properly in some of the rural villages. For this reason, drinking water is usually bought in 20 liter jugs. Workers mentioned that many homes in rural areas have a private well to pump their own water. Given this situation, we adjusted our standard for access to safe water. We consider an acceptable level of compliance for water is when the dwelling has a connection to the public network inside the house or on the property, or water is pumped from a private well – as long as the water is suitable for cooking and bathing. Access to water is not acceptable if the dwelling has access to the public network, but outside the house or the property, or when the water is from a well but is not suitable for cooking and bathing, or if it is rainwater, or it is collected from rivers or lakes. And also keep in mind that our model diet includes bottled drinking water because of poor quality water in the study area.

The 2020 Census does not report the environmental situation around the home. For example, it does not report if there are sewage drains on the surface, or pollution, or if the house is built in a place exposed to floods or landslides. Nor does it report if houses are in slums or unsafe areas. To get an idea of the situation in this regard, in Table 5, in the last row of column 4, we report the percentage of homes with drainage connected to the public network or to a septic tank in each municipality. This reaches 89% of the houses in the study area. However, this figure is not very indicative of the proportion of houses in the area that are subject to some environmental hazard. During our visit to the study area, we were informed of serious risks to houses related to the regular occurrence of storms and hurricanes. We thus considered that homes with palm leaf roof do not comply with our healthy housing standard.

**Table 5. Standards for healthy housing in Yucatan**

Housing characteristics	International minimum requirements	Housing standard for study area based on national standard	Compliance in study area
<b>Materials</b>			
Walls	Durable material providing protection from elements.	Durable material providing protection from elements: the non-acceptable standards are waste material, cardboard, metal or asbesto sheet, mud.	98%
Roof	Durable material without leaks.	Durable material without leaks: the non-acceptable standards are waste material, cardboard sheet or palm leaf.	98%
Floor	Durable material.	Durable material: the non-acceptable standard is dirt floor.	98%
<b>Amenities</b>			
Toilet	At least pit latrine with slab.	Flush toilet or pit latrine with slab.	90%
Electricity	Yes generally, but not required if not common in study area.	Household with electricity.	98%

Housing characteristics	International minimum requirements	Housing standard for study area based on national standard	Compliance in study area
Water	Safe water not far from home (maximum 30 minutes total collection time per day).	Safe water not far from home (maximum 30 minutes total collection time per day): the non-acceptable standard is borehole, river, lake; piped from other dwelling, pipe truck or rainwater.	91%
<b>Ventilation &amp; Lighting</b>			
Ventilation quality	Good ventilation. Especially important when cooking indoors.	Good ventilation. Kitchen with good evacuation if cooking is done indoors.	N.A.
Lighting	Adequate	Electricity	N.A.
Number of windows	Sufficient for adequate lighting and ventilation.	Sufficient for adequate lighting and ventilation. Generally at least one window per room.	N.A.
<b>Living Space</b>			
Number of square meters of living space	≥30 sq. m. (increases with economic development).	50-85 sq.m, according to National Housing Commission.	N.A.
Kitchen location	If kitchen is inside house, adequate ventilation for cooking needed.	If kitchen is inside house, adequate ventilation for cooking needed.	94%
<b>Condition</b>			
	In good state of repair.	In good state of repair.	N.A.
<b>Environment</b>			
	Not a slum.	Not a slum.	N.A.
	No site hazards such as: surface water drainage, industrial pollution, danger of landslides, flood zone.	No site hazards such as: surface water drainage, industrial pollution, danger of landslides, flood zone.	89%

The study municipalities are: Acanceh, Baca, Cacalchén, Calotmul, Cansahcab, Dzemul, Dzidzantún, Dzilam González, Espita, Ixil, Izamal, Mocochoá, Motul, Muxupip, Panabá, Progreso, Sinanché, Sucilá, Suma, Tekal de Venegas, Tekantó, Telchac Pueblo, Temax, Tepakán, Teya, Tixkokob, Tizimín, Xocchel, Yaxkukul and Yobaín.

**Note:** N.A. indicates data not available from sources.

**Sources:** 2020 National Population and Housing Census for compliance in study area, and Conavi's guidelines for national healthy housing standard.

## 5.2. Rental cost for local healthy housing

We obtained the data on housing characteristics and costs in the study area through visits to local housing. These data allowed us to identify homes that meet our housing standard (including considering their condition and environment) and estimate their cost. In the field survey, complete information was collected on 100 homes, which were available for rent or already rented in the first fortnight of July 2022 in the study area.<sup>9</sup> Image 3 includes a selection of photos of acceptable and unacceptable houses mainly in the small towns of the study area.

We thus obtained information on the materials of the walls, floors, and roofs; access to utilities and services; living space; number and types of rooms; general conditions of the house, particularly regarding kitchen and toilet, and of the surrounding areas. We also obtained information on the rent per month, and reported monthly costs of electricity, water, cooking fuel, and maintenance.<sup>10</sup> Analysis of this information made it possible to identify 31 homes that met our healthy housing standard, and 69 that did not.<sup>11</sup> Based on their rental prices, we estimated a median rental cost of MXN 1,250 for acceptable houses, and median rental cost of MXN 1,000 for unacceptable houses.

Most of the dwellings that did not meet our standards for healthy housing failed to have a kitchen in a separate room, used wood as cooking fuel, had insufficient ventilation, had an unsanitary toilet/bathroom (usually a latrine in bad condition), or was without piped water. Some of them were also considered unacceptable because they were too small, or had maintenance and repair problems, or had a dirt floor, or failed to have access to water or electricity. A few of the houses were not considered useful for determining rent for a basic acceptable house because their size far exceeded our size standard and thus were very expensive for the study area. In Table 6A, we present a selection of unacceptable homes and show the dimensions in which they failed to satisfy the standard for healthy housing.

Acceptable dwellings have an average size of 68 square meters, and are in good state of maintenance and repair. They have a kitchen in a separate room, have good ventilation, and the toilet complies with the standard. Additionally, there are no environmental or security problems in the surroundings - such as high perception of insecurity in the area, presence of garbage in the streets, poorly lit streets at night, and sanitary waste or stagnant water in the streets. However, the dwellings that we consider acceptable may have 1 or 2 bedrooms, be located in rural areas or small towns, and be near or far (> 1km) from the center of the town. These features certainly help determine the price but not acceptability. In Table 6B, we present a selection of acceptable homes together with their main characteristics.

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9 The information was collected in the municipalities of Baca, Tizimin, Tixkokob, Sucila, Calotmul, Cacalchen, Dzemul, Cansahcab, Suma, Izamal, Motul, and Espita, where about 75% of the garment industry workers who participated in the focus groups live.

10 These costs for utilities, services and maintenance were obtained from the person in charge of showing the house to the price investigator, so they are only indicative. In our calculation of the living costs, we estimate the cost of these items in rural and urban areas of Yucatan with inflation-adjusted data from the National Household Income and Expenditure Survey (2018).

11 It is interesting to note that we found a considerably lower percentage of acceptable houses in our field investigation compared to the percentage based on Population Census data – undoubtedly because we observed and recorded the condition and environment of each house.

Image 3. Homes available for rent in the study municipalities, Yucatan

Selection of acceptable housing



Selection of unacceptable housing



**Table 6A. Characteristics and monthly rental price of unacceptable homes for living wage costing (MXN of July 2022). Selection of homes in study municipalities, Yucatan**

Size of population	Municipality	Size (sq.m.)	No of bedrooms	Kitchen (Separate)	Maintenance and repair	Ventilation	Toilet	Rent (MXN per month)	Comments
Rural	Cacalchen	60	1	Yes	Good	Good	Good	\$6,000	Relatively safe area, but public lighting is poor. Standard size house, with only one bedroom. Good conditions of construction, ventilation and toilet. Above standard.
Town	Tizimin	88	2	Yes	Very Good	Good	Good	\$4,000	Safe zone. Slightly larger than standard size. It is in very good condition. It is rented with furniture. Above standard.
Town	Tizimin	80	2	Yes	Poor	Poor	Poor	\$2,000	Relatively unsafe area. Good size, two bedrooms. Dirt floor. It is not in good condition. The bathroom is small. The ventilation is not good.
Town	Tizimin	70	2	No	Good	Poor	Good	\$1,800	Safe zone. Good size, two bedrooms. It is in good condition. Not very good ventilation. The kitchen is not in a separate room.
Town	Izamal	56	1	Yes	Poor	Good	Good	\$1,500	Relatively unsafe area, and with drainage problems. House with adequate size, one bedroom. General conditions are not good. Kitchen and bathroom meet the standard.
Town	Motul	56	2	No	Poor	Good	Poor	\$1,200	Relatively safe area. Small house within the standard, two bedrooms. It is in good condition, but the sink, which is shared with other houses, is in poor condition. The kitchen is not in a separate room (the stove works on gas). The bathroom is not in good condition.
Town	Baca	32	1	No	Poor	Good	Poor	\$1,000	Relatively unsafe area. Weeds and poor street lighting. House has a single room, smaller than standard size. General condition is not good. The kitchen is not separated from the bedroom, poor ventilation. Latrine without slab.
Village	Sucila	67	1	No	Poor	Poor	Poor	\$1,000	Safe zone. Good size, but with only one bedroom. The ventilation is not good. The kitchen is not in a separate room.
Town	Motul	53	1	Yes	Good	Poor	Poor	\$850	Safe area, but with garbage collection and water supply problems. Small house but within the standard. In good condition, except the toilet. The ventilation is not very good.
Town	Motul	53	1	No	Good	Good	Poor	\$800	Relatively unsafe area, with robberies. Small size house within the standard. It is in good condition, but with water and electricity supply problems. In addition, the kitchen is not in a separate room and the stove works with wood. The bathroom has no water supply.
Town	Motul	53	1	No	Good	Poor	Poor	\$700	Safe zone. Small size house but within the standard. It is in good condition, except for the bathroom. The kitchen is not in separate room, and it has poor ventilation.

Size of population	Municipality	Size (sq.m.)	No of bedrooms	Kitchen (Separate)	Maintenance and repair	Ventilation	Toilet	Rent (MXN per month)	Comments
Village	Suma	112	3	Yes	Good	Good	Good	\$650	Safe zone. House with size greater than the standard and three bedrooms. In not very good condition, it is old and requires maintenance. ventilation, kitchen and toilet in good condition.
Village	Calotmul	74	1	Yes	Good	Good	Poor	\$500	Relatively safe area. There is no good garbage collection service. Size within standard, with a single bedroom, and in good construction conditions. Wood stove, but there is no ventilation problem. The bathroom is in poor condition.
Rural	Dzemul	50	1	No	Good	Poor	Poor	\$300	Safe zone. House with minimum size within the standard, but with good construction materials. It has ventilation problems. Kitchen is not in separate room. It has no toilet.

Source: Authors' fieldwork.

**Table 6B. Monthly rental price of acceptable homes by size of dwellings (MXN of July 2022). Selection of homes in study municipalities, Yucatan**

Size of population	Municipality	Size (sq.m.)	No of bedrooms	Kitchen (Separate)	Maintenance and repair	Ventilation	Toilet	Rent (MXN per month)	Comments
Town	Tizimin	64	1	Yes	Good	Good	Very good	\$2,800	Safe urban area, without environmental hazards. General condition is very good. It has a water heater.
Village	Cacalchen	85	2	Yes	Good	Good	Good	\$2,500	Safe zone. House with relatively large size, two bedrooms, separate kitchen, good ventilation and toilet in good condition.
Town	Izamal	72	2	Yes	Good	Good	Good	\$2,000	Safe zone. Good size house, two bedrooms. General conditions are good. Kitchen and bathroom meet the standard.
Village	Cacalchen	50	1	Yes	Good	Good	Good	\$2,000	Relatively safe area. Small size but within the standard, in good condition although not pretty. Wood stove, but in a separate room with ventilation, and toilet meets standard.
Town	Izamal	52	2	Yes	Good	Good	Good	\$1,600	Safe zone. House with size close to the minimum, two bedrooms. The house is in good condition.
Town	Espita	80	2	Yes	Good	Very good	Good	\$1,500	Safe area. Good size, with two bedrooms, and it is in good condition. The bathroom is outside, although not far and in good condition.
Rural	Dzemul	66	2	Yes	Good	Good	Good	\$1,400	Safe zone. House of adequate size, with two bedrooms and in good condition.
Rural	Dzemul	65	1	Yes	Good	Good	Good	\$1,300	Safe zone. Good sized house. One bedroom. In good conditions. Meets the standard in kitchen, toilet and ventilation.
Town	Izamal	60	2	Yes	Very good	Good	Good	\$1,200	Safe area, but noisy. House with adequate size, two bedrooms. The whole house is in very good condition.
Town	Espita	57	1	Yes	Good	Very good	Good	\$1,200	Safe zone. The house has a good size, but with one bedroom, and is in good condition.
Village	Calotmul	66	1	Yes	Good	Good	Good	\$1,000	Safe zone. Good size with one bedroom, and is in good condition. The bathroom is outside, although not far and in good condition.
Rural	Cansahcab	56	1	Yes	Good	Good	Good	\$900	Safe zone. House with adequate size and one bedroom. In good conditions.
Rural	Cansahcab	54	1	Yes	Good	Good	Good	\$800	Safe zone. House with size close to the minimum required, one bedroom. In good conditions. Toilet is a latrine with a slab.
Rural	Suma	72	2	Yes	Good	Good	Good	\$700	Safe zone. House with adequate size and two bedrooms. In good conditions. Ventilation, kitchen and toilet in good condition.

Source: Authors' fieldwork.

### 5.3. Utility costs and routine maintenance and repairs

For the estimation of utility costs, basic housing services, and routine maintenance and repairs, we used the data from the 2018 National Income and Expenditure Survey (ENIGH) updated by inflation to July 2022. These data include expenditures on maintenance and housing repair services, water, garbage collection, electricity, gas, and other fuels, etc.

We estimated these expenses for rural and urban households of the state of Yucatan for household expenditure deciles 4, 5 and 6 as the reference group. This group is clearly above the poverty while not being high income. In the case of the urban (rural) population, average monthly household expenses for utilities, housing services and maintenance and repairs are MXN 373 (MXN 242). These figures include: maintenance and repairs: MXN 44.8 (MXN 54.5), services (water, garbage collection, etc.): MXN 11.5 (MXN 0.6), electricity, gas and other fuels: MXN 316 (MXN 187). As mentioned in Section 2, 22% of the population of the study municipalities live in rural localities and 78% in urban localities. We use these percentages to calculate the weighted average cost of utilities, MXN 344 per month. We then updated these values by the inflation rate of the CPI subindex for energy and state tariffs during the period between August 2018 and July 2022 (17.40%) to reach the final estimate of MXN 404.

## 6. COSTS OF NON-FOOD NON-HOUSING (NFNH) GOODS AND SERVICES

For practical reasons, the cost of all other goods and services (in addition to food and housing) to satisfy essential needs is estimated based on household income and expenditure survey data. This is done by multiplying the cost of our model diet by the NFNH/Food ratio reported in data from the National Income and Expenditure Survey of 2018 for households at deciles 4-6 of the household expenditure distribution. As it was mentioned before, this group is clearly above the poverty line while not being high income. NFNH costs include expenses such as alcohol, tobacco (which we exclude from the basket), clothing and footwear, home equipment and household furnishings, medical care, education, transportation, telecommunications, recreation and culture, restaurants and hotels, personal care, and other miscellaneous costs. It is important to note that we then revised these estimated NFNH costs (see the next subsection) for health care and children's education – when needed - to ensure that sufficient funds for medical care and education are included in NFNH, because adequate health care and children's education through secondary school are considered as human rights in the Anker Methodology.

Before using these survey data to estimate the NFNH/Food ratio, we made several adjustments. First, we excluded tobacco expenses (which we do not consider necessary for reasons of decency). Second, we assumed that half of the cost of the meals purchased outside the home is properly due to the food included in these meals, and the other half is due to services, profits, and overheads. For this reason, we assigned one-half of these costs to be food expenditures and the other half to be NFNH expenditures.

We did not adjust the reported transport spending from the household survey, which includes the cost of private and passenger transportation. In our focus groups discussions with local workers it was clear that a private motorbike is necessary for decency, as it is a common private means of transportation, used to commute to work every day, to travel to nearby small towns, to go to the supermarket, and to visit the doctor.<sup>12</sup> Transport costs are

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12 In 2020, 23.9% of households in Yucatan owned a motorcycle or scooter, 38.5% of households owned a car or truck, and 39.4% owned a bicycle that was used for transportation of household members, according to that year's National Population and Housing Census.

particularly important in more distant rural areas and villages than in urban areas and for this reason, notice that private transport expenditures are, as expected, higher in rural areas (6.6%) compared to urban areas (5.1%).

We estimated the NFNH/Food ratio with data from the National Income and Expenditure Survey of 2018, which is available for rural and urban populations of the state Yucatan. For reasons akin to those mentioned above in sections 2 and 5c, here we estimated household expenditures as a weighted average of expenditures reported for rural and urban areas. This allowed us to estimate the NFNH/Food ratio for rural areas (1.06) and urban areas (1.04) (Tables 7A and 7B). The weighted average NFNH/Food ratio is 1.05. This similarity of NFNH/Food ratios for rural and urban areas in Yucatan is unusual in the world, but not in Mexico, and reflects that NFNH expenditure patterns in rural areas and urban areas in Yucatan are not all that different up to decile 6 of the household expenditure distribution. Since the most affluent households live in urban areas, in the highest deciles of household spending the NFNH/food ratio is certainly higher and grows faster with total spending in urban areas than in rural areas. Finally, we estimated the preliminary non-food and non-housing expenses (NFNH) by multiplying the NFNH/Food ratio indicated above by the cost of our model diet for the reference size family. This equals MXN 7,487 (1.05 x the cost of the model diet) for the reference family in the study municipalities.

## 7. POST CHECKS TO ENSURE SUFFICIENT FUNDS AVAILABLE FOR EDUCATION AND HEALTH CARE

Adequate health care for all and education through secondary school for children are considered human rights in the Anker Methodology, which is why we investigated in this section whether the amount needed to cover these services included in our preliminary estimate of non-food non-housing (NFNH) costs of goods and services is sufficient.

### 7.1. Health care

In this section, we document why the post check of health care costs reveals the need to increase the budget of the reference family for medical care above the amount already included in the preliminary estimate of NFNH costs. We first explain how the social protection and health insurance system is organized in Mexico, and then we present our estimate of out-of-pocket expenses needed for health care of the reference family in the study area based on our fieldwork. Finally, we show how much the budget for health care included in the preliminary NFNH costs needs to be increased.

In Mexico, social security is a countrywide system consisting of two institutions (IMSS and ISSSTE) that provide health care, disability and retirement insurance for workers formally employed in the private and public sectors, and health insurance for their dependent family members. Additionally, other workers and their families have access to an insurance package similar to social security's through autonomous and private systems, such as those provided by the company Petróleos Mexicanos (PEMEX) and the Mexican armed forces to their employees. Workers in the informal sector (55.7% of the national labor force and 61.7% in Yucatan, as of the 2<sup>nd</sup> quarter of 2022, according to the National Employment and Occupation Survey, ENOE) and their families can access medical insurance in two different ways. First, through a private company's pre-paid scheme or through voluntary affiliation to IMSS, for which they have to pay a fee as well. Second, by joining without charge the Mexican government's health institute (INSABI), which serves people without formal coverage, but provides medical attention of a lower quality relative to that provided by IMSS or ISSSTE. A part of the population (about 26.8% nationwide, according to the Population Census of 2020) does not have access to health care through any of these insurance schemes, and only a very small portion of this group has private insurance for major medical expenses.

**Table 7A. Monthly household expenses in Yucatan: Rural**

Major expenditure group	Secondary data		Adjustments	
	Sub-major expenditure group	% Exp. in secondary data	Adjustments explanation	% after adjustment
<b>FOOD</b>				
	Food & non-alcoholic beverages	39.5%	2.6% added for the food in meals away from home (Restaurants)	42.1%
<b>HOUSING</b>		13.4%	No adjustment	13.4%
<b>NON-FOOD AND NON-HOUSING (NFNH)</b>				
Alcohol and tobacco	Alcohol	0.5%	No adjustment	0.5%
	Tobacco	0.0%	Excluded as unnecessary	Excluded
Clothing & footwear		3.6%	No adjustment	3.6%
Household contents and appliances		0.8%	No adjustment	0.8%
Healthcare		2.6%	No adjustment	2.6%
Education		6.4%	No adjustment	6.4%
Transport	Purchase of personal vehicles	0.8%	No adjustment	0.8%
	Maintenance and operation of personal vehicles	5.8%	No adjustment	5.8%
	Passenger transport services	8.6%	No adjustment	8.6%
Communication		1.9%	No adjustment	1.9%
Recreation & culture		0.7%	No adjustment	0.7%
Restaurants		5.3%	Transfer 50 % of this to food as around 50 % of cost of meals away from home is for the food in them	2.6%
Accommodation services		0.6%	No adjustment	0.6%
Miscellaneous goods & services		9.6%	No adjustment	9.6%
<b>TOTAL NFNH</b>		<b>47.1%</b>		<b>44.5%</b>
<b>NFNH/Food ratio</b>		<b>1.19</b>		<b>1.06</b>

Source: INEGI (2018). The percentages presented in this table correspond to the average for deciles 4, 5 and 6 of the rural household expenditure distribution.

**Table 7B. Monthly household expenses in Yucatan: Urban**

Major expenditure group	Secondary data		Adjustments	
	Sub-major expenditure group	% Exp. in secondary data	Adjustments explanation	% after adjustment
<b>FOOD</b>				
	Food & non-alcoholic beverages	36.5%	3.1% added for the food in meals away from home (Restaurants)	39.5%
<b>HOUSING</b>		19.1%	No adjustment	19.1%
<b>NON-FOOD AND NON-HOUSING (NFNH)</b>				
Alcohol and tobacco	Alcohol	0.3%	No adjustment	0.3%
	Tobacco	0.0%	Excluded as unnecessary	Excluded
Clothing & footwear		3.5%	No adjustment	3.5%
Household contents and appliances		1.1%	No adjustment	1.1%
Healthcare		1.5%	No adjustment	1.5%
Education		7.2%	No adjustment	7.2%
Transport	Purchase of personal vehicles	1.2%	No adjustment	1.2%
	Maintenance and operation of personal vehicles	3.9%	No adjustment	3.9%
	Passenger transport services	7.2%	No adjustment	7.2%
Communication		2.3%	No adjustment	2.3%
Recreation & culture		0.7%	No adjustment	0.7%
Restaurants		6.1%	Transfer 50 % of this to food as around 50 % of cost of meals away from home is for the food in them	3.1%
Accommodation services		0.2%	No adjustment	0.2%
Miscellaneous goods & services		9.1%	No adjustment	9.1%
<b>TOTAL NFNH</b>		<b>44.4%</b>		<b>41.3%</b>
<b>NFNH/Food ratio</b>		<b>1.22</b>		<b>1.04</b>

Source: INEGI (2018). The percentages presented in this table correspond to the average for deciles 4, 5 and 6 of the urban household expenditure distribution.

An undesirable result of this fragmentation of health care coverage is that, while one part of the population has double or triple coverage (they have access to health insurance from two or three institutions), a large part of the population does not have any type of protection.<sup>13</sup> Workers affiliated with social security, or with health care coverage from PEMEX or the armed forces, have access to free medical care. Overall, out-of-pocket spending on health care is relatively low in this group. In contrast, workers with health insurance from prepaid systems, INSABI, or without any coverage have a relatively higher out-of-pocket expense for health care. In the latter case, out-of-pocket expenses can reach catastrophic levels in the case of chronic diseases. It is important to mention that the share of the population subject to the possibility of catastrophic health expenditures greatly decreased during the last 20 years. According to Aban Tamayo et al (2020), however, even Mexicans affiliated with social security consider that social security health services are not very good or timely in case of an emergency, and that there is a need for some medical specialties, dental care, and ophthalmology care that are not generally covered. Therefore, Mexicans consider that it is necessary to have an additional budget for such occasional or regular health care expenses.

As noted above, the preliminary NFNH cost estimate includes 1.5% for health care expenditures for urban areas and 2.6% for rural areas of Yucatan (e.g., a weighted average of 1.74%, which is 4.1% of adjusted NFNH expenditures, 1.74/42.0). This implies that the preliminary estimate of NFNH costs includes MXN 311 for health care (i.e., 4.1% x MXN 7,487).

To determine the out-of-pocket health care expenditures needed to achieve a decent standard of living, during our fieldwork we spoke with workers about medical costs and visited twenty medical services providers such as hospital, clinics and pharmacies in the study municipalities. We collected the costs of consultations, treatment, laboratory tests and medical examinations. We then used these costs along with assumptions on the number of visits per year to public and private health care providers to determine typical routine out-of-pocket expenditure for health care per person and per family per year and per month. We found that these amounts are higher than the amount for health care spending included in our preliminary NFNH estimate – and therefore a health care post check adjustment is needed of about MXN 200 per month for formal sector workers who pay into the social security system and so are covered by it for health care (Table 8). Interestingly, we also find that informal sector workers, who do not contribute to social security and so are not covered by it, have much higher medical costs (Table 8).

We took into account four elements to estimate local out of pocket health care costs for families. First, we used the suggestion in Anker and Anker (2017) of 3.5 medical visits per year per person (or every 3-4 months). Second, we used the opinion of the Mexican population reported by Aban Tamayo et al (2020) indicating the quality and timeliness of medical care provided by social security medical services. Third, we used the IMSS recommendation to allow one visit a year to the dentist. Fourth, we used the assumption that all members of the reference family are in good health. This means that in the event of a chronic illness or disability or major illness or injury, people will use the medical services of social security or INSABI (both in principle free of charge). Our health care cost

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13 According to an analysis by INEGI (Mexico's national statistics office) carried out with data from the 2020 Population and Housing Census, 92.6 million people are affiliated with some type of insurance or have some health coverage, while about 33 million people have no affiliation whatsoever. 51.0% of the total population of Mexico is affiliated with the IMSS, 8.8% with the ISSSTE, and 35.5% with INSABI. Additionally, 1.3% is in the PEMEX or the armed forces system and 2.8% is in an institution or private company. Finally, 2.2% of the country's population has health insurance from another public or private institution. These percentages add up to more than 100% due to double or triple affiliations. In the same analysis, INEGI reports that 26.8% of the population is not affiliated with any institutions or health systems. Source: [https://www.inegi.org.mx/temas/derechohabiencia/#Informacion\\_general](https://www.inegi.org.mx/temas/derechohabiencia/#Informacion_general)

estimates are, thus, based on the following assumptions: 2.5 visits per year to either a general doctor or a specialist; 1 consultation at a pharmacy; 1 laboratory test per year; 1 visit per year to the dentist; and 1 visit every two years to the ophthalmologist for every other person in the family. We consider that family members purchase medicines, and undergo a procedure, or require a nurse's care only on every other visit to the general practitioner or specialist. Likewise, we assume that family members undergo a procedure or require the equivalent of an X ray exam only every other visit to the dentist. Finally, we assume that every other member of the family changes glasses and frames every two years.

The prices, the assumptions of the number of visits, and our estimate of out-of-pocket health care expenditures are shown in Table 8. Prices are quite reasonable by international standards. For the cost of consultations with the general practitioner or specialist physician, we used the median amount indicated by hospital and clinic staff that we visited during the field information survey carried out in July 2022. These data show that consultations with specialists cost twice as much as consultations with general practitioners (median cost of MXN 400 vs. MXN 200). Doctors who work in a private practice charge less than doctors who work in a clinic. The cost of a consultation and medicines in the pharmacy, essentially anti-flu and painkillers, was estimated at MXN 100. For the price of the consultation with an ophthalmologist or a dentist, we used the price in the specialized clinics that we visited during our fieldwork. The median cost of a consultation with a dentist in fourteen dental clinics and private practices visited is MXN 200. The median cost of the dentist's procedure turned out to be MXN 493. We calculated this value as the sample weighted average of the cost of a basic procedure (cleaning, extraction, and resins, with a median cost of MXN 262.50) and the cost of an advanced procedure (root canal, crown, and surgery, with a median cost of MXN 1,600). The median cost of a dental X Ray was MXN 80. The cost of a consultation with the ophthalmologist was more expensive at MXN 700. The cost of eyeglasses and frame is the value reported by the staff of the specialized clinic we visited. The median cost of the lab test is MXN 205. Basic laboratory tests (urine and blood, pregnancy) cost on average MXN 132; advanced tests (COVID, influenza, HIV, parasites, coagulation time, preoperative) MXN 350; and imaging studies (ultrasound, x-rays and tomography) MXN 525. Finally, the average cost of exam/healing estimated from our survey was MXN 500, which is the median price of mammography, pap smears, IUDs, chiropractic adjustments, colonoscopy, basic surgery, fractures and sutures.

The result is an out-of-pocket expense for our reference family of four members of MXN 521 per month in the study municipalities, if the family is affiliated with social security. The amount rises to MXN 922 if the family does not have access to social security system (Table 8). The difference between the estimated out-of-pocket expenditure for the family with and without social security is due to the fact that each member with social security coverage makes two visits to the general practitioner or specialist without payment, and one visit with payment every two years (0.5 per year). In contrast family members without social security coverage make 2.5 visits per year in the private sector. In the latter case, the lab test and medications are also all out-of-pocket expenses (Table 8).

In sum, our assessment of the cost of adequate health care per month (MXN 521) for workers associated with social security indicates that funds included for health care in the preliminary NFNH estimate (MXN 311) are not sufficient. The post check adjustment amount needed is MXN 210, which we round to MXN 200 for the reference family with access to social security system.

**Table 8. Estimated out-of-pocket medical expenses in study municipalities, Yucatan (for reference family of 4 with two children with and without access to social security system)**

Type of provider	Cost per visit (MXN, July 2022)	Cost per visit (USD, July 2022)	No. of visits per year per person [with social security]	No. of visits per year per person [without social security]	Cost per year per person [with social security]	Cost per year per person [without social security]
	(1)		(2)	(3)	(4) = (1) x (2)	(5) = (1) x (3)
<b>Public provider / General or family doctor</b>						
Consultation fee						
Medicine when provided						
Medicine purchased privately	0	0	2	0	0	0
Laboratory test (every four years)						
<b>Private provider / General or specialty doctor</b>						
Consultation	300	15	0.50	2.50		
Lab test	205	10	0.50	1	378	1,580
Exam/Healing	500	24	0.25	1.25		
<b>Private provider / Ophthalmology</b>						
Consultation	700	34	0.25	0.25		
Glasses	900	44	0.25	0.25	600	600
Frame	800	39	0.25	0.25		
<b>Private provider / Dentistry</b>						
Consultation	200	10	1	1		
Procedure	493	24	0.50	0.50	487	487
X Ray	80	4	0.50	0.50		
<b>Private provider / Pharmacy</b>						
Consultation + medicine	100	5	1	1	100	100
<b>TOTAL cost per person per year</b>					<b>1,564</b>	<b>2,767</b>
<b>TOTAL cost per family per month</b>					<b>521</b>	<b>922</b>

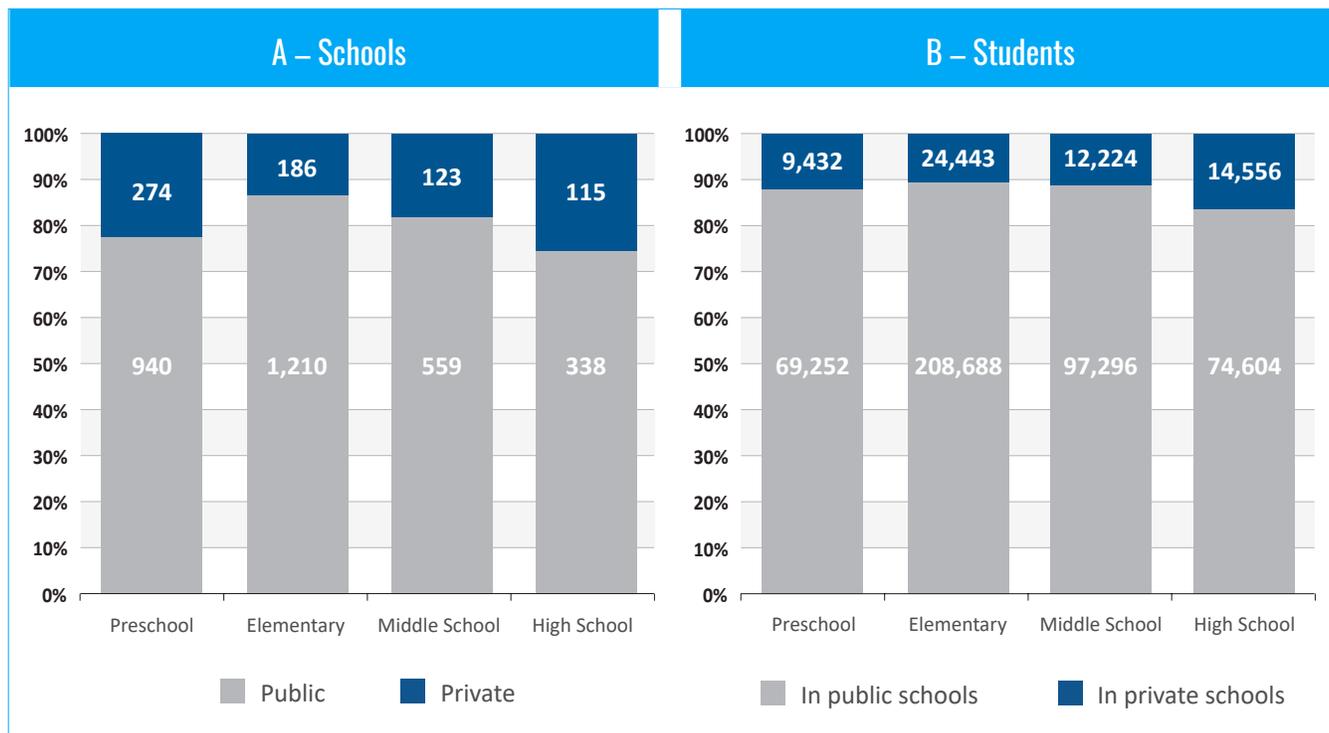
Notes: Exchange to USD used is 20.53, which is the average exchange rate for July 2022.

Source: Authors' fieldwork.

## 7.2. Education

There are about 510,000 students registered in basic mandated education (preschool through middle school) and high school in Yucatan during the school year 2021-2022.<sup>14,15</sup> Boys and girls participate evenly according to their share in the population with males representing 49.5% of the population of students.<sup>16</sup> There are 3,745 schools, of which 81% are publicly funded educational establishments (Figure 3A). From preschool to high school, around 88% of students attend public schools. The share of high school students attending a public school is slightly lower than average (84%) (Figure 3B). Therefore, overall public schools are bigger, and have on average more students than private schools (148 versus 87 students per school).

**Figure 3. Number of schools and students by level and source of funding, Yucatan (2021-2022)**



Source: Secretary of Education (n.d.).

Measured by the number of students, schools are on average smaller in the study municipalities than in the rest of the municipalities of Yucatan at all educational levels. However, the size of schools in the study area increases with the level of urbanization. For example, while there are on average 87 students in elementary schools of the rural municipalities included in this study, there are 136 and 155 students in the elementary schools of semiurban and urban municipalities, and 172 students in the elementary schools of the rest of Yucatan (Figure 4A).

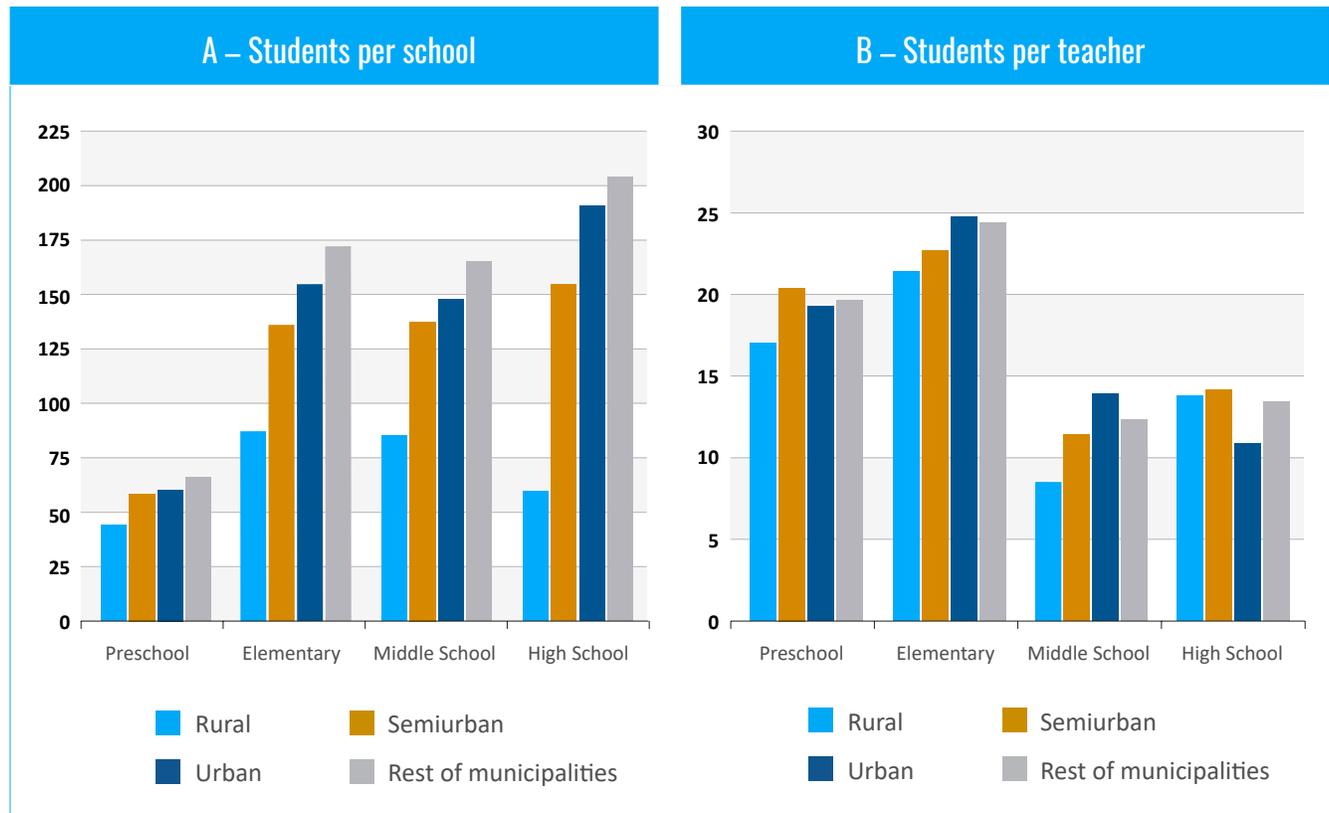
14 All the statistics reported in this section for the state and municipalities of Yucatan refer to the school year 2021-2022, and were obtained from the Federal Secretary of Education website: <http://planeacion.sep.gob.mx/principalescifras/>

15 The preschool period is for children between 3 and 5 years of age.

16 Population data from the National Bureau of Statistics (INEGI) 2020 census.

There is not such a clear pattern across municipalities with different degrees of urbanization for the number of students per teacher. However, the average number of students per teacher is only slightly lower in the study municipalities than in the rest of the state (Figure 4B).

**Figure 4. Indicators of education quality by level of education and degree of urbanization in study municipalities and rest of municipalities, Yucatan (2021-2022)**



Source: Secretary of Education (n.d.).

In relation to the cost of education for the reference family, the amount for educational expenses that is already included in the preliminary NFNH costs for urban and rural areas of Yucatan is MXN 1,250. This value was estimated as an average using information that 7.2% (6.4%) of the total spending of urban (rural) households in income deciles 4-6 is for education (see Tables 7A and 7B). The weighted average, considering that 22 % of the population of the study area lives in rural zones, is 7.0% - which is 16.7% of adjusted NFNH expenditures (7.0/42.0). When multiplied by the preliminary NFNH estimate of MXN 7,487, this yields MXN 1,250 for education. This amount is how much is available for education in the preliminary NFNH estimate for reference families in the study's municipalities.

In the rest of this section, we analyze the educational expenditures of households in the study area and conclude that the amount already included in the preliminary NFNH is sufficient when children attend public schools in the study municipalities based on our discussions with focus groups of garment workers in Baca and Tizimín. This means that we do not make a post check adjustment for educational expenses.

During the focus groups with workers in the study area, all respondents reported that public schools do not typically charge any enrollment fee to students attending grades between pre-school and middle school (that

is, the mandated 12-year basic education program established by the government). It isn't until high school that enrollment fees are charged more commonly, which according to the workers amounts on average to around MXN 1,100 per year. Nevertheless, there are some school monthly fees for pre-highschoolers, related to school maintenance and teacher supplies that add up to around MXN 400 per year.

Most parents consulted agreed that their main educational expenses during the period between preschool and middle school are on school uniforms and school supplies. A simple average of the amounts reported yields MXN 1,400 needed for school uniforms per year and per child in preschool, elementary school, and middle school (uniforms included tops and bottoms but no shoes or sportswear) and MXN 1,500 for high school.

The amounts for school supplies are MXN 575 per year before high school and MXN 1,100 per year for high school respectively. Workers we spoke to indicated that children participate in about 5 special events every year (school celebrations of different kinds), and that they spend around MXN 40 per event on either decorations, costumes or other party costs, totaling MXN 200 per year for all school levels except high school.

Children attending preschool through middle school usually take a lunch bag to school, and most education institutions are within walking distance or a short public bus ride away. Therefore, there are no additional costs for school meals for these grades. Workers, however, typically need to give their high-school children some spending money (about MXN 40 per day) that usually covers transport and snacks. This amounts to MXN 7,200 per year (assuming schools run for twenty days every month, nine months per year).

In sum, we estimate the minimum educational expenses per month to be MXN 589 for the reference family (Table 9). This amount is smaller than the amount for educational expenses included in the preliminary NFNH cost estimate (MXN 1,250). Therefore, a post-check adjustment for education is not necessary.

## 8. PROVISION FOR UNEXPECTED EXPENSES TO GUARANTEE SUSTAINABILITY

A marginal amount is also added to the family budget estimated above for unexpected events in order to ensure the sustainability of family income and help prevent families from falling into a poverty trap. The household budget should be large enough to allow households to save for unforeseen expenses. Income fluctuations or unexpected catastrophic health expenditures can jeopardize the economic stability of the household. Instability and unsustainability are not attributes of a decent family life, especially since households' access to savings and credit through the financial system is very limited in Mexico. In general, they only have access to credit informally through family networks. We considered this and added 5% to the household budget for this (i.e., 5% of the amount that results from the sum of the cost of food, housing, and nonfood and non-household expenses).

**Table 9. Educational costs in MXN of July 2022 (for reference family with two children attending public school)**

Type of expense	Pre-school + Elementary school + Middle School	High School	Total
School fees per year	400	1,100	
Special events per year	200	-	
Uniforms per year	1,400	1,500	
School supplies per year	575	1,100	
Transport and meals per year	-	7,200	
Budget per child per year (1)	2,575	10,900	
Number of years in each level (2)	12	3	
<b>Total cost for each level of education (3) = (1) x (2)</b>	<b>30,900</b>	<b>32,700</b>	<b>63,600</b>
<b>Cost per child per year for each level (4) = (3)/18</b>	<b>1,717</b>	<b>1,817</b>	<b>3,533</b>
<b>Cost per month for reference family (5) = (4) x number of children in reference family/12</b>	<b>286</b>	<b>303</b>	<b>589</b>

Source: Authors' fieldwork.

## SECTION III. THE LIVING WAGE IN YUCATAN, MEXICO

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### 9. FAMILY SIZE TO BE SUPPORTED BY THE LIVING WAGE

To determine the size of the reference family, that is, a typical family size for the study area, first we adjusted the total fertility rate in the study municipalities of Yucatan by the mortality rate of children under 5 years (using data from the Population Census 2020). The total fertility rate is 2.03 for study municipalities, while the under-5 mortality rate for Yucatan is 13.4 per 1,000 births. Then, the mortality-adjusted total fertility rate for the study area is 2.01 surviving children per woman.

In a second stage, we estimated the average size of households from the distribution of households by the number of members for the study municipalities in Yucatan, for urban and rural areas, using data from the Population Census of 2020. The results are 3.60 people per household on average in the study municipalities, with 3.61 and 3.57 people per household in urban and rural areas.

Third, with data from the Population Census 2020, we calculated the average household size for households with 2-8 members (i.e., excluding one-person households that definitely do not include children and households with 9+ members that are probably households with more than one nuclear family). The result of this calculation is 3.84 for the study municipalities, with 3.83 and 3.89 for urban and rural areas. The figures for the state of Yucatan are 3.75, 3.73 and 3.92, respectively.

Taking into account the above calculations, we consider the most appropriate reference family size for the study municipalities is four, with 2 adults and 2 children. This is consistent with the child mortality adjusted total fertility rate of around 2 and the adjusted average household size of just under four.

### 10. COST OF A BASIC BUT DECENT LIFE FOR THE REFERENCE FAMILY

We estimated in Section II the cost of a basic but decent life for the typical size family in the study area using the local cost of a low-cost nutritious diet, healthy housing, and non-food non-housing items, and the number of household members in the reference family in the previous subsection.

The basic decency monthly budget for a family of four (two adults and two children) with access to the social security based health care system amounts to MXN 17,296 (USD 842) in the study municipalities of Yucatan (Table 10)

**Table 10. Cost of basic but decent life for reference family, Yucatan, Mexico (MXN and USD, July 2022)**

CONCEPT	With social security	
	MXN	USD
<b>Food cost per month for reference family (1)</b>	<b>7,131</b>	<b>347</b>
Food cost per person per day	58.61	2.85
<b>Housing costs per month (2)</b>	<b>1,654</b>	<b>81</b>
Rent per month for acceptable healthy housing	1,250	61
Utility costs and minor repairs and maintenance per month	404	20
<b>Non-food non-housing (NFNH) costs per month taking into consideration possible post check adjustments (3)</b>	<b>7,687</b>	<b>374</b>
Preliminary estimate of NFNH costs per month	7,487	365
Healthcare post check adjustment	200	10
Education post check adjustment	-	0
<b>Additional amount (5%) for sustainability and emergencies (4)</b>	<b>824</b>	<b>40</b>
<b>TOTAL LIVING COSTS PER MONTH FOR BASIC BUT DECENT LIVING STANDARD FOR REFERENCE FAMILY SIZE (5) [5=1+2+3+4]</b>	<b>17,296</b>	<b>842</b>

In Table 11, we list some of the key parameters we used in the calculation of the cost of a basic but decent life. The exchange rate is the average MXN/USD exchange rate for July 2022 of 20.53. The reference family size is 4, and the number of children is 2. Finally, 1.05 is the ratio of expenses other than housing and food to the cost of the model diet.

**Table 11. Key parameter values**

Variable	Value
Reference family size	4
Number of children in reference family	2
Ratio of non-food non-housing costs to food costs	1.05
Percentage of rural population	22
Exchange rate of local currency to USD	20.53
Date of study	July 2022

## 11. NUMBER OF FULL-TIME EQUIVALENT WORKERS IN REFERENCE FAMILY PROVIDING SUPPORT

The number of full-time equivalent workers in the reference family supporting the cost of a basic but decent life is estimated in this section using data for Yucatan from the National Employment and Occupation Survey (ENOE, 2<sup>nd</sup> quarter of 2022). We calculated the labor force participation rates (LFPR), unemployment rates, and part-time employment rates (less than 35 hours per week) in rural and urban areas for men and women in the prime working ages 25 to 59.

The values we report in Table 12 for men and women are the average for rural and urban areas, taking into account that the percentage of rural population in the study area is 22%. We assumed that one member of the reference family is a full-time worker, while the time dedicated to work by the other adult depends on the three rates just mentioned. We found that the number of full-time equivalent workers in the reference family is 1.70 for this study area of Yucatan.

**Table 12. Number of full-time equivalent workers in reference family in study municipalities of Yucatan, Mexico**

Variable	Males	Females
Labor force participation rate (LFPR)	96.1	69.6
Unemployment rate	1.1	1.4
Part-time employment rate	16.4	46.4
Percentage of full-time work of spouse	87.2	52.7
<b>Number of full-time workers in family equals: 1 + [LFPR x (1.0-unemployment rate/100) x (1.0-part-time employment rate/100/2)]</b>	<b>1.70</b>	

**Note:** Labor force participation rates, unemployment rates, and part-time employment rates are for prime working ages 25-59. Values are for Yucatan in the 2<sup>nd</sup> quarter 2022.

## 12. NET LIVING WAGE, PAYROLL DEDUCTIONS AND INCOME TAXES, AND GROSS LIVING WAGE

As mentioned in subsection 10, the monthly budget for a basic but decent life, according to the definition used in this study, for a family of four (two adults and two children) with access to social security system amounts to MXN 17,296 (USD 842). Given that the number of full-time equivalent workers per family in these municipalities is 1.70, a full-time worker would need to receive a net monthly take-home payment of MXN 10,174 (USD 496) (Table 13).

Formal workers in Mexico, however, have a payroll deduction contribution to social security and have to pay income tax. For this reason, it is necessary to add these taxes to our net living wage estimate - to ensure that workers have enough net salary for decency. We estimate that workers who receives a net salary equivalent to the estimated living wage (MXN 10,174) currently have to pay about MXN 1,091 in income tax and MXN 285 in social security. When we add them to our net living wage (that is, the take home pay), a gross living wage of MXN 11,550 (USD 563) is obtained for the study municipalities of Yucatan (Table 13).

The living wage indicated in the preceding paragraphs applies to formal workers affiliated with social security institutions. The equivalent calculation for informal workers without social security requires different considerations and calculations. On the one hand, informal workers who are not affiliated with the social security system have higher living expenses and so a higher net living wage because they have greater health care costs compared to formal workers who are affiliated with the social security system health care system. On the other hand, informal workers do not have payroll deductions for social security. As a result and after consideration of income tax which we assume informal workers would pay, the gross living wage for informal workers such as farmers would be MXN 11,573 (USD 564), which is slightly higher than that for formal workers at MXN 11,550 (USD 563).

**Table 13. Living wage, Yucatan-Mexico (MXN and USD, July 2022)**

CONCEPT	With social security	
	MXN	USD
<b>TOTAL LIVING COSTS PER MONTH FOR BASIC BUT DECENT LIVING STANDARD FOR REFERENCE FAMILY SIZE (1)</b>	<b>17,296</b>	<b>842</b>
<b>NET LIVING WAGE PER MONTH (2) [2=1/#full time workers]</b>	<b>10,174</b>	<b>496</b>
<b>Statutory deductions from pay (3)</b>	<b>1,376</b>	<b>67</b>
Social security tax (3A)	285	14
Income tax (3B)	1,091	53
<b>GROSS LIVING WAGE PER MONTH (4) [4=2+3]</b>	<b>11,550</b>	<b>563</b>

## 13. WAGE LADDER

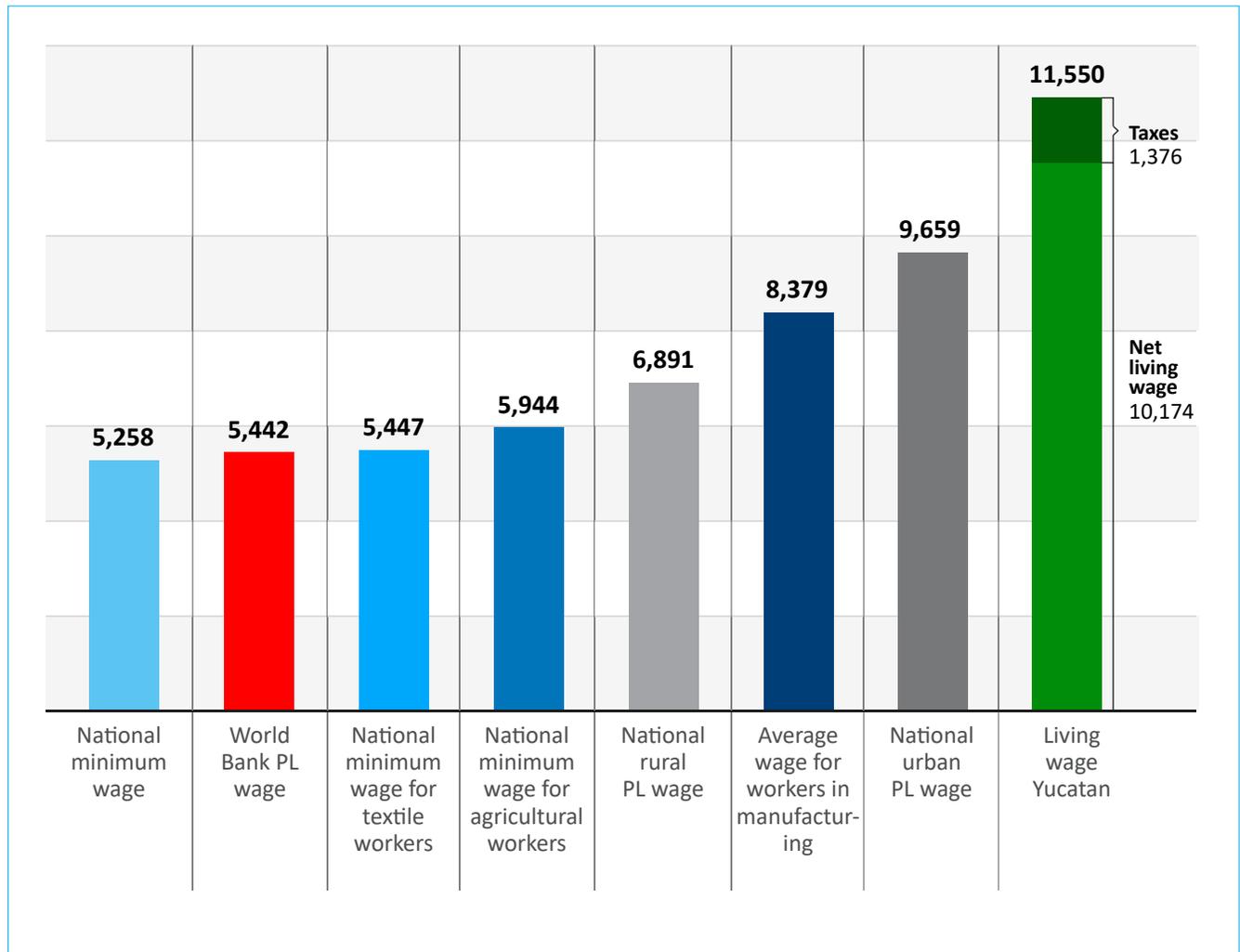
Figure 5 provides a wage ladder where our living wage for Yucatan is compared to other wage indicators. Since January 1<sup>st</sup>, 2022, the national minimum wage in Mexico is MXN 172.87 (USD 8.42) per day. If we assume (365/12) days per month, this is equivalent to a gross monthly payment of MXN 5,258 (USD 256). The estimated living wage in this study for Yucatan is 2.2 times the current national minimum wage. The same is observed in the case of minimum wages for specific sectors that are important in the economy of the study area. The national minimum wage for agricultural workers in 2022 is MXN 195.43 (USD 9.52) per day, which is equivalent to a gross monthly payment of MXN 5,944 (USD 290). For textile workers, the minimum wage is smaller at MXN 179.08 (USD 8.72), equivalent to a monthly payment of MXN 5,447 (USD 265). The estimated living wage for Yucatan is 2.1 times the national minimum wage for textile workers, and 1.9 times the national minimum wage for agricultural workers.

These figures indicate that the national minimum wage is still far too low, in spite of its large increase in 2022 (22%). Note that both the national minimum wage and the national minimum wage for textile and agricultural workers are so low that they would not enable a typical size family in a rural area to live above the poverty level as defined by the government (Figure 5). The national (urban and rural) poverty line wages determined by Coneval, and the World Bank international poverty line wage for upper middle-income countries like Mexico, are also below the living wage of Yucatan. The estimate based on the international poverty line of US\$ 6.85 per day of the World Bank for upper-middle income countries is MXN 5,442 (PPP 2022 of 11.10) for Yucatan, while the one resulting from the rural poverty line in Mexico is MXN 6,891 (USD 336). The urban equivalent of the latter is MXN

9,659 (USD 470), higher but still well below the living wage (Figure 5). This result of our living wage being higher than these poverty line wages is consistent with the definition of decent salary, which should allow for a standard of living above poverty. The size of the gap, however, indicates that national poverty lines and minimum wage are set at levels that are too low for social policy purposes.

The estimated living wage for Yucatan is 1.4 times the average wage of manufacturing workers in Mexico (MXN 8,379 in the third quarter of 2022). Therefore, actual average wages are also lagging behind the living wage. However, the average wage in manufacturing might be affected by the low wages usually observed in small and informal manufacturing establishments across the country.

**Figure 5. Monthly wage ladder, Yucatan, Mexico (MXN of July 2022)**



Source: Conasami, World Bank, Coneval, ILOSTAT, and authors' calculation.

## 14. CONCLUSIONS

This report estimated the living wage for rural areas and small towns of Yucatan, Mexico, based on the Anker Methodology (Anker & Anker, 2017), which has already been used in over 50 living wage studies worldwide and yields internationally comparable estimates of living wages.

This study included extensive field research and data collection on local food prices, housing rental prices, health care costs, education costs, and transportation costs for a reference family of four people (2 adults and 2 children). It also utilized extensive secondary sources of information from household surveys and the population census for rural and urban households in Yucatan on household expenditures, employment patterns, and household size.

A family of four requires, as of July 2022, a monthly net income of MXN 17,296 (USD 842) to have a basic but decent life in the study municipalities. This figure translates into a take-home pay net living wage for full-time workers in these municipalities of MXN 10,174 (USD 496). Taking into account mandatory social security contributions and income taxes for a full-time worker at the net living wage, we estimate a gross living wage (aka living wage) of MXN 11,550 (USD 563) per month.

The estimated living wage for Yucatan is 1.4 times the average wage of manufacturing workers in Mexico by mid-2022. It is also about 1.4 times the average of rural and urban poverty line wage, and 2.2 times the minimum wage. This indicates that the wages actually paid on average do not exceed the poverty wage, and that the minimum wage is below the poverty line. The improvements to the minimum wage made since 2015, but particularly since 2018, which have consisted of increases well above inflation, have not allowed the minimum wage to recover the historical values observed in the 1970s, before the macroeconomic crises of the 1980s and 1990s. Currently, the living wage estimated in this study is a better guide than the minimum wage for setting wages that allow workers and their families to achieve a basic but decent standard of living.

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