

# Monitoring the socio-economic impacts of COVID-19 on Djiboutian households

Results from first round of survey (July 7-22, 2020)

September 2020

## INTRODUCTION



Djibouti had its first confirmed case of COVID-19 on 18 March 2020. As an early response, the Government suspended all in and out international passenger flights on March 18, 2020, closed schools and universities on March 23, and ordered a general lockdown starting from March 27, 2020. As of August 20, 2020, there were 5,374 confirmed cases of COVID-19 in Djibouti, with 59 reported deaths. Even though the total number of cases increased sharply in the last two weeks of May and early June, they declined considerably in July and August.

Effects of a spread of COVID-19 and government's containment measures are likely to affect household welfare through four broad channels: labor income, non-labor income, direct effects on consumption, and service disruptions. The labor income impacts could be both direct through loss of earnings due to illness or indirect through employment and wage shocks. Non-labor income impacts can be driven by changes in patterns of remittances and public transfers. Consumption could be directly impacted either through changes in prices of items having a significant share in household budget or increase in out of pocket costs of health care. Finally, service disruption can ultimately have severe welfare implications through school closures and saturation of health care systems.

## THE PHONE SURVEY



To understand the impact of COVID-19 and associated government measures, a phone survey was designed to capture how Djiboutians were affected and through which channels. The survey on the socio-economic impact of COVID-19 on households in Djibouti was carried out through telephone interviews between July 7-22, 2020 and was collected by The National Institute of Statistics of Djibouti (INSD). As a recently conducted representative household survey with telephone numbers was not available, we relied on social registry data collected by the Ministry of Social Affairs and Solidarity (MASS) to draw the sample to be interviewed in the phone survey. A random sub-sample was drawn from the list of households in the social registry data that reported telephone numbers. A sample of 1486 households was interviewed that were representative nationally, by poverty status<sup>1</sup> and by three domains of Balbala (489 households), rest of Djibouti city (508 households) and urban areas outside Djibouti city (489 households).

Both the population and household weights are designed to adjust for differences in selection probability due to either design or non-response<sup>2</sup>. In addition, further adjustments in sampling weights were made to ensure that indicators produced are representative of the country's population, by poverty status and by location. The sampling frame, the social registry of the Ministry of Social Affairs, over-represents the poor and has an incomplete coverage of the upper distribution of income. To correct for these biases, we rely on a post-calibration approach, using the household budget survey of 2017 (EDAM 2017) survey as the reference data source. This is because EDAM 2017 survey was representative of the country's population, poverty status and survey domains. However, EDAM 2017 survey is restricted to the first four consumption quintiles to ensure sufficient overlap of the universes covered by both surveys.<sup>3</sup> Thus, the results presented in this report are representative of the country's urban population except for the top 20 percent of the richest.

The response rate stood at 71.4 percent nationally. Slight differences were observed across location with districts 1, 2 and 3 of Djibouti city more likely to respond than other locations. This response rate is line with what has been experienced for phone surveys in other contexts. Respondents of the survey are individuals who were knowledgeable of the households' daily experience (Table 2.2). While most respondents were either the heads of the household or their spouses, in a few instances their adult children answered the survey. Around 43 percent of the respondents were female. The largest share of respondents is aged between 35 and 49 (44

<sup>1</sup> Poverty status variable in the social registry database is based on consumption per capita, which is imputed for each household by the Ministry of Social Affairs and Solidarity (MASS) based on observable characteristics and using the Proxy Means test formula using household budget survey of 2013.

<sup>2</sup> For more details on the sampling framework, please refer to the Annex.

<sup>3</sup> Restricting the reference data source to the first four quintile is somewhat arbitrary. But this is motivated by discussions with senior officials of the Djibouti Statistical Institute. The unavailability of variables that are not used for calibration but common to both datasets prevents us from running sensitivity analysis around the choice of this cutoff.

percent) followed by those aged below 35 years (28 percent). The economic activity and livelihoods of breadwinners were questioned in the survey. It is found that breadwinners were more likely to be males (72 percent) and were older, on average, than the respondents.<sup>4</sup>

**Table 2.1: Response rate by survey domain and poverty status**

Survey Domain	%	Freq.
Balbala	70.9	489
Rest of Djibouti City	72.9	508
Other urban centers	70.4	489
<b>All</b>	<b>71.4</b>	<b>1,486</b>

Source: Djibouti COVID-19 phone survey, 1<sup>st</sup> round.

**Table 2.2: Share of respondents and breadwinners by age and gender**

Age	Respondents			Breadwinners		
	Male	Female	All	Male	Female	All
<35	25.1	32.9	28.5	18.3	20.5	18.9
35-49	48.7	38.3	44.2	50.5	43.7	48.6
50-64	19.9	22.4	21.0	22.8	29.3	24.6
65 +	6.2	6.4	6.3	8.4	6.5	7.9

Source: Author's calculations based on Djibouti COVID-19 phone survey, 1st round.

KNOWLEDGE AND BEHAVIOR REGARDING THE COVID-19



Knowledge of the coronavirus disease is quasi-universal in Djibouti as almost everyone reported to be aware of it. In addition, nearly all households were aware of preventive measures to curb the spread of the disease (Table 3.1). The proportion of households that were aware of the preventive measures was above 99 percent for all measures, except curfew/ confinement. Curfew might well be something of the past for most households, as the country moved to pursue deconfinement starting in May. Regional variation in the extent to which households knew about the lockdown was negligible. In Balbala, where most of poor of Djibouti city live, awareness about each measure was high, while there were small differences by income group.

**Table 3.1: Percentage of households aware of preventive measures**

Measures	All	Balbala	Rest of Djibouti City	Other urban centers
Citizens advised to stay at home	99.8	100.0	99.6	100.0
Restricted travel within the country/area	99.8	100.0	99.6	100.0
Restricted international travel	99.6	100.0	98.9	100.0
Non-essential business closure	99.3	99.4	99.5	98.9
Closure of schools and universities	99.1	99.4	98.6	99.6
Curfew/confinement	98.0	97.3	98.3	98.8

Source: Authors' calculation based on Djibouti COVID-19 phone survey, 1<sup>st</sup> round.

Adoption of preventive measures was overall high (Table 3.2). Frequent hand washing was the most practiced measure, with 96 percent of the households reporting doing so. Most households were also practicing social

<sup>4</sup> The observation unit differs from one theme to another. In the section on knowledge of preventive measures, respondents were asked questions about their own behavior and attitude. The sections on access, food security and household perception reflect the behavior of the entire household. The economic activity section reflects the situation of the respondent, other active members of the household and the evolution of the household enterprise if present.

distancing by maintaining enough physical distance (85 percent), avoiding gatherings (88 percent), and reducing travel (89 percent). Approximately, 83 percent of the households used masks or gloves, and around 46 percent of the households relied on buying more food to limit going out. This preventive measure might generate economic reverberation that could adversely impact welfare. For 74 percent of the households, the use of sanitizers was a means to protect against the disease.

The practice of preventive measures varied slightly by location. A fewer share of households in urban areas outside of the capital relied on the use of some preventive measures such as usage of masks/ gloves and not being able to send children to school. The fact that some children are reported to be in school most likely reflected recent implementation of measures to loosen the lockdown, where senior high school students could resume going to school.

Stark regional differences can be observed with respect to using sanitizer. While 82 and 73 percent of the households used sanitizer in Balbala and the rest of Djibouti City, respectively, only 64 percent of the households in other urban areas were using such items. Finally, a higher share of poor households (77 percent) report not being able to send their children to school as compared to non-poor households (67 percent) but no other significant differences were found among poor and non-poor households. It is worth pointing that respondents may be misreporting the adoption of preventative measures due to fear of breaking government's laws and recommendations.

**Table 3.2: Percentage of households practicing preventive measures in the last 7 days**

Preventive measure	All	Balbala	Rest of Djibouti City	Other urban centers
Wash hand frequently	96.0	95.8	96.8	95.2
Avoid unnecessary travel	89.3	85.3	92.1	91.1
Avoid gathering	88.4	84.9	91.0	89.5
Maintain sufficient distance	85.0	84.1	84.4	87.0
No handshake/greeting	83.8	83.7	85.3	81.9
Use of masks/gloves	83.3	88.1	84.6	74.6
Reduce the number of times you go to the market	77.4	79.0	80.2	71.0
Use of disinfectant	74.2	82.0	73.6	64.0
Stop sending children to school	68.8	72.6	71.2	60.1
Buy more food/other resources	46.7	47.8	50.1	40.2

Source: Authors' calculation based on Djibouti COVID-19 phone survey, 1<sup>st</sup> round.

## ECONOMIC ACTIVITIES AND LIVELIHOODS



Djibouti's economy depends heavily the tertiary sector (80.3 percent), with transportation and trade representing 25.6 and 20.2 percent of the GDP.<sup>5</sup> Construction, whose contribution to the GDP (4.3 percent) has been rising for the past few years, is another important economic activity in Djibouti. Because of the country's small endowment in arable land, agriculture only has a small contribution to the national economic output (around 0.9 percent). The informal sector is crucial to employment, as it occupies around 47 percent of those employed.<sup>6</sup> The outbreak of the coronavirus pandemic has greatly disrupted the national economy both in terms of output and economic activities. Airport, hotels and restaurant activities were put on near-standstill by the suspension of the international passenger flights while construction, general trade, transportation, and

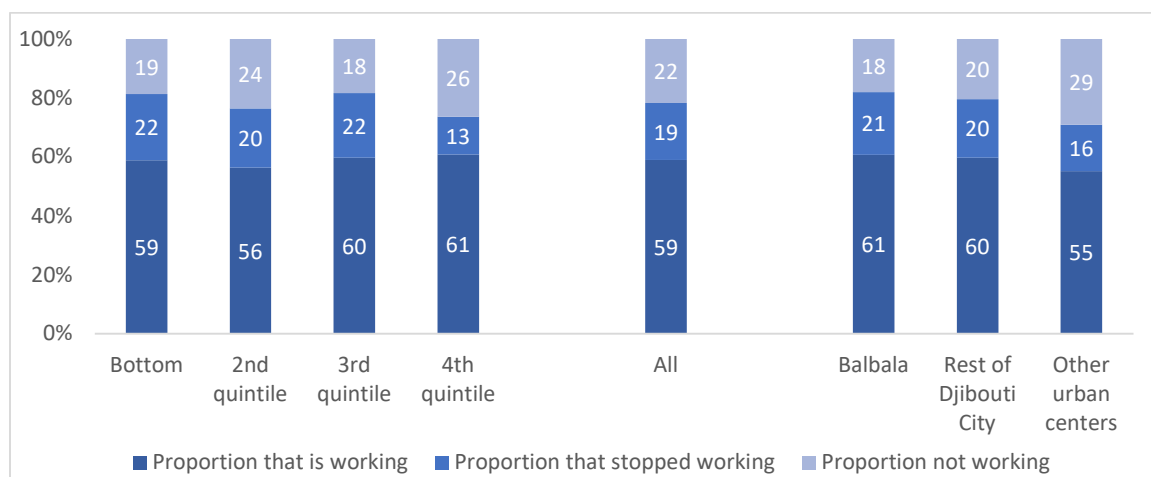
<sup>5</sup> Institut National de la Statistique de Djibouti (INSD), 2019.

<sup>6</sup> Lara Ibarra, Gabriel; Mendiratta, Vibhuti. 2019. Challenges to Inclusive Growth: A Poverty and Equity Assessment of Djibouti (English). Washington, D.C. : World Bank Group. <http://documents.worldbank.org/curated/en/825601576251871028/Challenges-to-Inclusive-Growth-A-Poverty-and-Equity-Assessment-of-Djibouti>.

services were particularly hit by the general lockdown. These disruptions are likely to have an impact on household’s well-being through the channel of employment.

It is found that approximately 59 percent of the breadwinners<sup>7</sup> worked in the week before the survey (Figure 4.1). About 19 percent of the breadwinners lost their job after the start of the pandemic and the remaining 22 percent did not work either before the pandemic or the week before the survey. Because the timing of the survey overlapped with the enforcement of policies to reopen the economy, it is possible that this number only gives a partial assessment of the short run impact of coronavirus on economic activities. Breadwinners from the top of the income distribution were less likely to lose their job than those from the bottom 3 quintiles; but there was no monotonic increase in the likelihood of working by income quintile. The percentage of breadwinners in the rest of Djibouti City (districts 1, 2 and 3 of Djibouti city) were more likely to work in the week before the survey than those in urban areas outside Djibouti city (55 percent).

Figure 4.1: Employment status of breadwinners (%)



Source: Authors’ calculation based on Djibouti COVID-19 phone survey, 1<sup>st</sup> round.

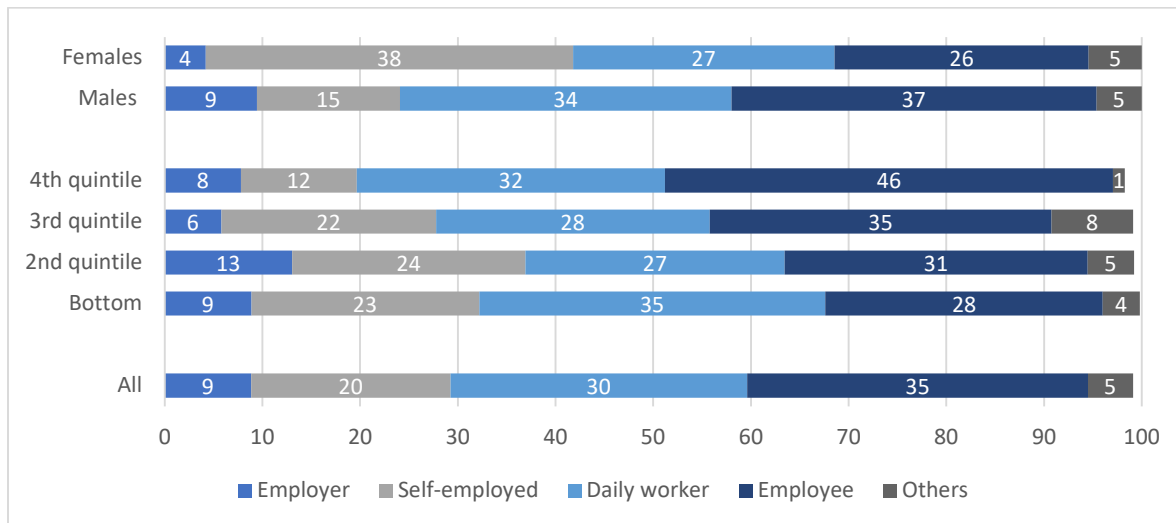
Note: Breadwinners are divided into three categories: 1) those working in the week before the survey, 2) those working before COVID-19 but stopped working in the week before the survey and 3) those that were neither working before COVID-19 nor in the week before the survey. It is important to understand the types and sector of employment of the breadwinners among those that worked in the week before the survey and those that worked before the pandemic. It is found that breadwinners work in a variety of capacities (Figure 4.2). They are mostly either employees receiving a regular income (35 percent) or workers an on-piece wage (30 percent). Approximately 20 percent of the breadwinners are self-employed and only nine percent are employers.

There are significant differences across poor and non-poor. A higher percentage of the poorest are engaged as daily workers, while a higher share of the richest quintile is found to be employees with a regular income. This is not a surprise given that 44 percent of the population is engaged in the public sector with an over-representation of the non-poor in this sector (Lara Ibarra, Gabriel; Mendiratta, Vibhuti.2019). It is, thus, more likely that COVID-19 and related measures will affect the poor more as they hold jobs in the informal sector with irregular income streams. In addition to poverty status, there are also some differences between male and female breadwinners with respect to their professional categories. Around 37 and 34 percent of male breadwinners are employees and employers respectively, compared with 26 and 27 among the female breadwinners, respectively. But daily workers represent a relatively larger share of female breadwinners than among their male counterparts. This suggests that female breadwinners are more likely to face higher uncertainty about their income stream than males.

<sup>7</sup> Breadwinner refers to main income earner of the household.

In terms of sector of employment, a third of the breadwinners work in the public sector, while about 20 percent work in private enterprises and another 22 percent work in their own or in a family enterprise. While 34 percent of non-poor work in the public sector, only 26 percent of the poor declare doing so.

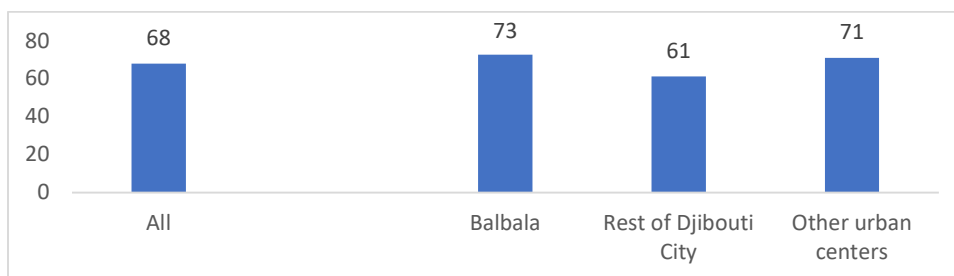
**Figure 4.2: Professional category of the breadwinners who were engaged in work either the week before the survey or before the pandemic (%)**



Source: Authors' calculation based on Djibouti COVID-19 phone survey, 1<sup>st</sup> round.

It is shown in Figure 4.1 that 59 percent of breadwinners worked in the week before the survey, while 22 percent had lost their jobs after the start of the pandemic. Among those who lost their jobs, the survey sought to investigate whether these individuals lost their work due to coronavirus. It is found that almost half of these individuals did not work even before the pandemic. For the other half who did work before the pandemic, a large majority (68 percent) identified coronavirus related reasons as the cause of their current economic inactivity (Figure 4.3). In addition to differences by poverty status, it is found that those from Balbala and urban areas outside of Djibouti city were more likely to lose their job due to coronavirus and related containment measures. The impact of COVID-19 on the ability to work varied by professional category of the breadwinner in a way that mirrored levels of vulnerability to deprivation. As expected, daily wage workers represent the highest share of those who lost jobs due to the pandemic, followed by self-employed breadwinners. Employers represented the category with the smallest fraction that stopped working because of COVID-19, followed by employees.

**Figure 4.3: Percentage of breadwinners that stopped working due to COVID-19, among those who lost their jobs**

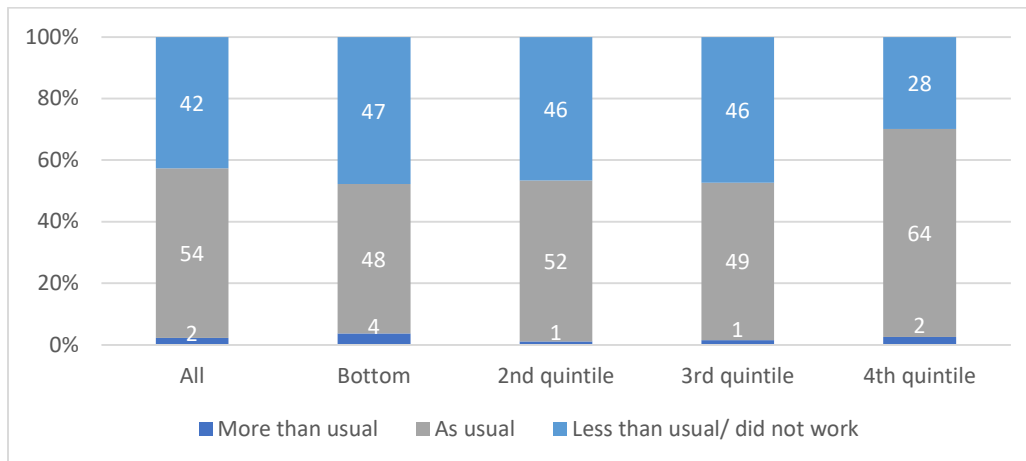


Source: Authors' calculation based on Djibouti COVID-19 phone survey, 1<sup>st</sup> round.

Note: The reasons that were considered as related to COVID-19 include closing of the enterprise, stop of activity and layoffs.

Those that were still working in the week before the survey observed a decline in the amount of time they were working. About 54 percent did not observe any effect on their workload, while 42 percent were working less or did not work at all. Stark differences are observed across income quintiles as 28 percent of the richest worked less as compared to about 47 percent among the bottom 3 quintiles.

**Figure 4.4: Workload of breadwinners who worked in the week before the survey (%)**

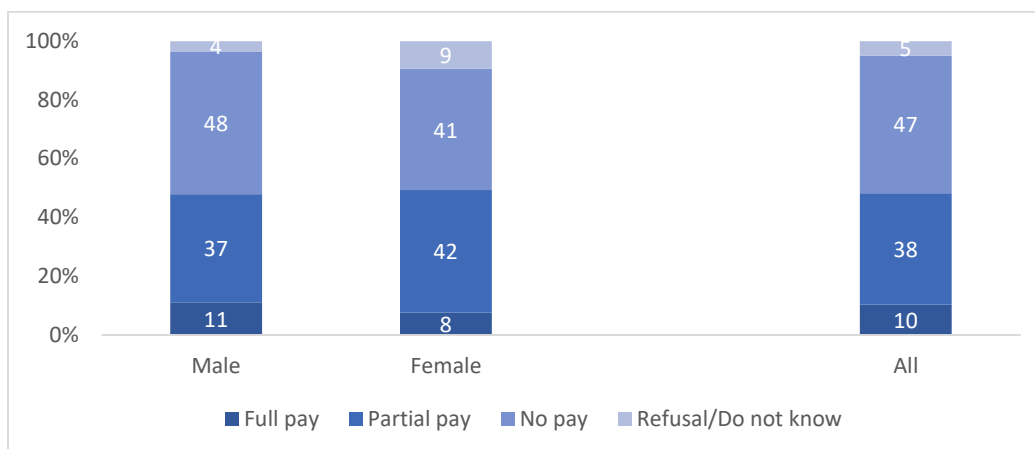


Source: Authors' calculation based on Djibouti COVID-19 phone survey, 1<sup>st</sup> round

Those working lesser than usual also observed a loss of income: about 45 and 36 percent received either no payment or partial wage, respectively while 9 percent could receive the full wage. There are gender differences in the impact of COVID-19 on labor income, with female breadwinner (41 percent) less likely to receive no payment than males (48 percent); while a relatively larger share among male breadwinners receives their full paycheck than female breadwinners. These findings give a glimpse of the level of precarity among the active population.

Households' most common sources of income included public assistance (26 percent), wages (20 percent), remittances (10 percent) and family business (8 percent). Remittances came from both domestic and international sources.

**Figure 4.5: Change in labor income among breadwinners who worked less (%)**



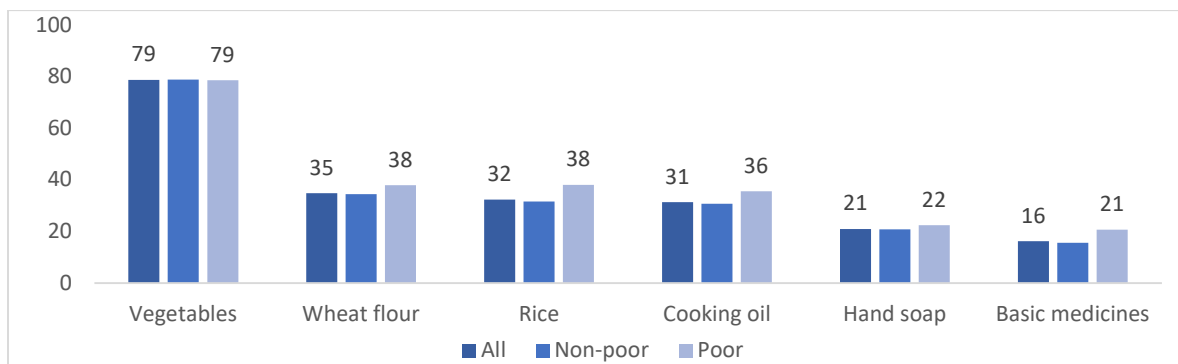
Source: Authors' calculation based on Djibouti COVID-19 phone survey, 1<sup>st</sup> round.

ACCESS TO BASIC GOODS



In Djibouti, food supply, being heavily dependent on imports, was reported to be affected by the households interviewed in this survey. Poor households experienced difficulty accessing basic goods to a slightly greater extent compared with non-poor households (Figure 5.1). A whopping 79 percent of the households report difficulty buying vegetables. While for 38 percent of poor households, wheat flour was unavailable, this was so for 34 percent among the non-poor. Hand soap and vegetables were items for which reported differences in availability by poverty status were the smallest. Some products such as rice and wheat were more likely to be unavailable in Balbala (38 and 40 percent respectively) than the rest of Djibouti city (31 and 32 percent respectively).

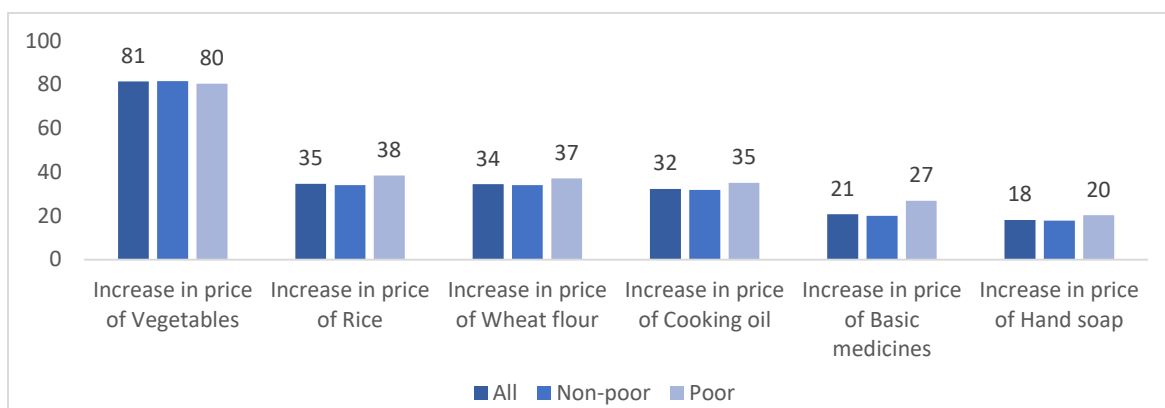
**Figure 5.1: Percentage of households that experienced difficulty accessing selected goods, by poverty status**



Source: Authors' calculation based on Djibouti COVID-19 phone survey, 1<sup>st</sup> round.

Price increases were felt among households of all categories of income; however, the poor were slightly disproportionately affected (Figure 5.2). For example, while 38 percent of the poor saw an increase in the price of rice, 34 percent of the non-poor reported this experience. The meaning of the changes in product prices might be different across income groups, depending on the relative shares of these changes in households' budgets. All this suggests that the most vulnerable might be bearing a larger burden of the price increases. The price increases were much more prevalent in Balbala and urban centers outside of Djibouti city than in the rest of Djibouti City (districts 1, 2 and 3) (Table 5.1). Not surprisingly, many households faced stress about their daily consumption. Around 26 percent of the households were confronted with a lack of food during the past 30 days, for one reason or another, with no noticeable differences across income groups.

**Figure 5.2: Percentage of households that reported an increase in price, by poverty status**



Source: Authors' calculation based on Djibouti COVID-19 phone survey, 1<sup>st</sup> round.



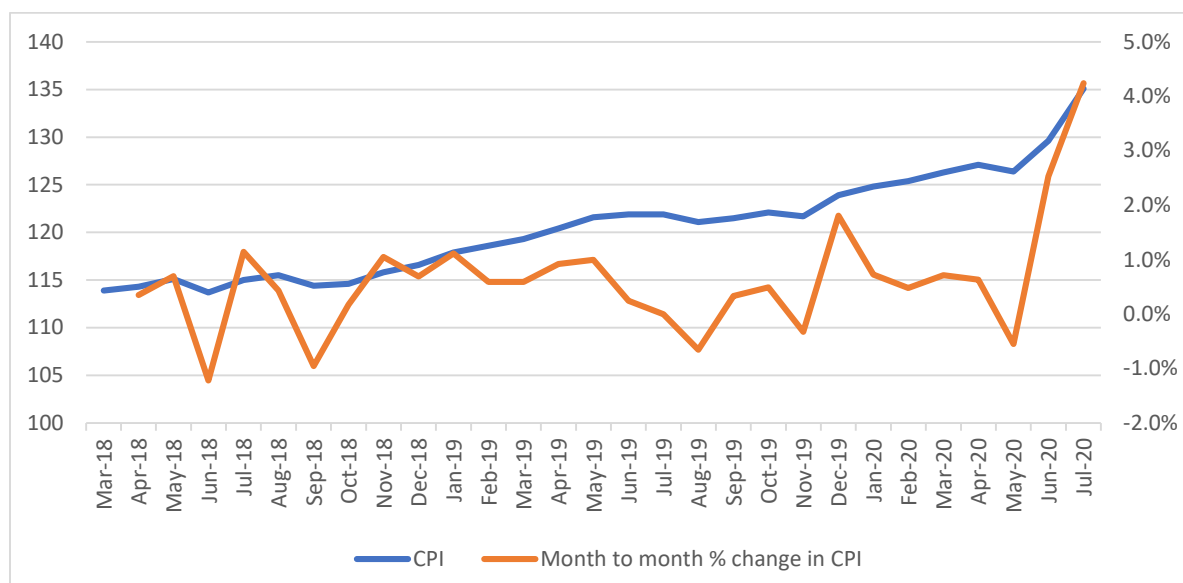
Table 5.1: Percentage of households that reported an increase in prices, by domain

Product	Balbala	Rest of Djibouti City	Other urban centers
Vegetables	85.4	73.0	87.2
Rice	37.6	23.4	45.5
Wheat flour	36.7	24.5	44.8
Cooking oil	34.4	23.4	41.0
Basic medicines	25.5	18.2	17.2
Hand soap	20.4	15.8	17.9

Source: Authors' calculation based on Djibouti COVID-19 phone survey, 1<sup>st</sup> round.

These findings beg contextualization in light of statistical briefs suggesting minimal impacts of COVID-19 and related lockdown measures on prices and product availability.<sup>8</sup> Figure 5.3 shows that the food consumer price index (CPI) has indeed seen a rise between May 2020 and July 2020. While, the period between June and August in both 2018 and 2019 saw slight spikes pointing to cyclical variations, it is uncontested that the spike in 2020 is much more prominent indicating that the pandemic may be playing a role. Nevertheless, the spike of the prices of vegetables and food items also be partly attributed to locust infections that ravaged East African countries. Further rounds of data collection would provide more evidence in this respect.

Figure 5.3: Consumer Price Index of food and non-alcoholic beverages in Djibouti



Source: CPI data from INSD website.

ACCESS TO EDUCATION AND HEALTHCARE



The lockdown measures and high demand for healthcare for confirmed cases of COVID-19 may have restricted the access of households to the health systems. About 17 percent of the households reported needing access to healthcare in the month before the survey. Among these households, approximately 37 percent were not able to access health facilities. A relatively larger share of households with a female breadwinner (40 percent) could not access healthcare compared with households where the breadwinner is a male (34 percent). Population in Balbala experienced, to a larger extent, difficulty accessing health services when they were in

<sup>8</sup> INSD, 2020.

need than in the rest of Djibouti City. The main reason cited by households for being unable to access healthcare related to not having enough money.

With strict implementation of lockdown measures, students were forced to stay home<sup>9</sup>. Most households have then responded by using a combination of internet technology and social media. Over 73 percent of households with school age children were relying on educational TV shows to meet educational goals among the youth. Television shows, a means to circumvent challenges posed by physical access to educational institutions, was more often reported in Djibouti (Balbala and rest of Djibouti City) than in other urban centers among households with children at the primary education level. No marked differences were observed between poor and non-poor in terms of access to healthcare or education.

**Table 5.2 Access to healthcare and education**

	All	Balbala	Rest of Djibouti City	Other urban centers	Non-poor	Poor
Proportion reporting not having access to healthcare when in need	37.2	46.2	33.0	NR	37.6	34.7
Proportion that watched Educational TV programs (Students aged 6-10)	73.5	86.0	75.0	45.3	73.4	73.8
Proportion that watched Educational TV programs (Students aged 11-18)	82.2	85.6	84.8	73.9	82.9	78.9

Source: Authors' calculation based on Djibouti COVID-19 phone survey, 1st round.

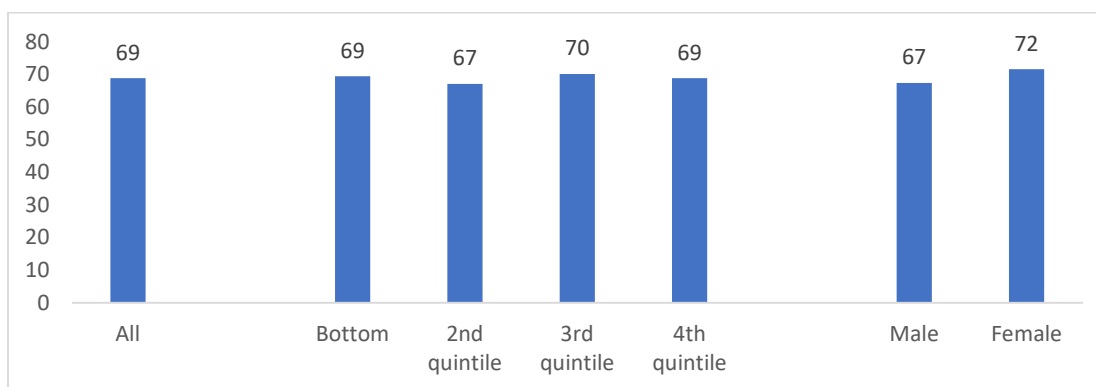
Notes: NR refers to not reported due to low sample size (<50 observations).

**SAFETY NETS**



COVID-19 pandemic has induced a situation in Djibouti wherein many are households struggling to make ends meet. Around 69 percent of the households did not have enough resources to sustain their livelihood for a month following the survey (Figure 6.1). This proportion varied little across income quintiles. It is worrisome to see that resilience is low across income groups. Households with female breadwinners (72 percent) were slightly more likely to face such stress than those with male breadwinners (67 percent). It seems that households had come to depend on their day-to-day economic activities to sustain their livelihoods, in a context where households savings were low. The current health crisis would not only exacerbate deprivation among the poor, but there is also a risk that some others may fall into poverty.

**Figure 6.1: Percentage of households without enough resources to sustain livelihood for next month**

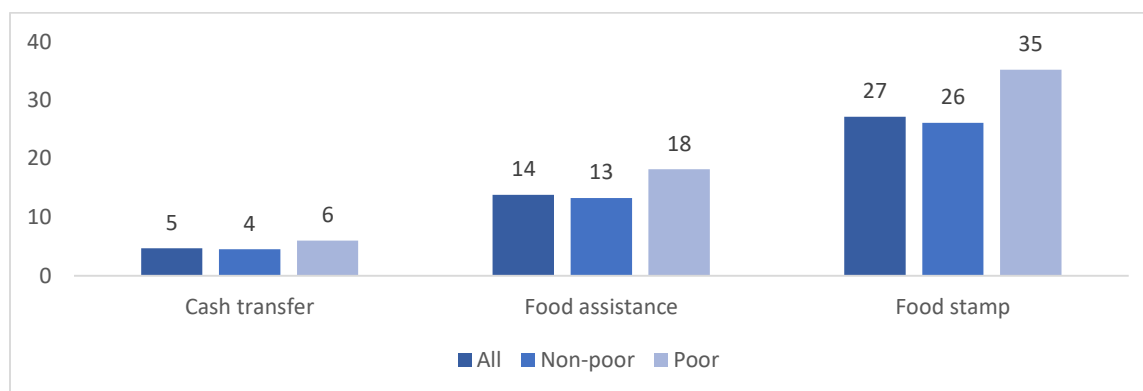


Source: Authors' calculation based on Djibouti COVID-19 phone survey, 1<sup>st</sup> round.

<sup>9</sup> About 37 percent and 39 percent of all interviewed households reported having 6-10 year old and 11-18 year old children respectively that were going to school before the coronavirus pandemic.

Considering the dire economic prospects facing households, the availability of safety nets would critically shape their welfare in the short term. The phone survey collected information about four kinds of assistance that households may be receiving: food assistance, food stamp, cash transfer and others. Around five percent of the households had benefited from cash transfer, while 14 percent had received food assistance (Figure 6.2). Food stamp was the most common relief package, reaching 27 percent of the households. This kind of assistance was mostly provided by the government (96 percent) and so was food assistance (91 percent). However, cash assistance came either from the government (50 percent) or family members (50 percent). NGO’s also turned out to be important players in helping households to mitigate the adverse socioeconomic impacts of the coronavirus pandemic. Finally, it is also found that less than 1 percent of households received all 3 types of assistance, while 35 percent of the households received at least one type of assistance and 8 percent of the households received both food stamps and food assistance.

**Figure 6.2: Percentage of households that received assistance**



Source: Authors’ calculation based on Djibouti COVID-19 phone survey, 1<sup>st</sup> round.

Households benefited from cash transfers differently depending on place of residence and poverty status. While around 6.7 and 4.2 percent received such transfers, respectively, in Balbala and the rest of Djibouti ville, only 2.4 were recipients of this transfer in other urban centers. Other kinds of assistance also displayed variation by location—34 percent of Balbala residents received food stamps versus 27 percent in rest of Djibouti city and 17 percent in urban areas outside Djibouti city. There is indication that assistance is being allocated to the right beneficiaries, as households from the bottom quintile are more likely to receive any kind of assistance than those from the richer quintiles. There is a relatively larger share of households with female breadwinners that received either cash transfer or food assistance. While cash transfer could come from the government, friends, or NGO’s, households with female breadwinners tend to benefit from public cash transfer than those with male breadwinners (4 vs. 1 percent). The fact that even non-poor households received assistance is in line with the targeting mechanism employed on the ground. The food vouchers were targeted to not only reach poor households but also the non-poor who held jobs in the informal sector and lost them due to the pandemic.

**Table 6.3: Percentage of households receiving each type of assistance, by location and gender of breadwinner**

Assistance	Balbala	Rest of Djibouti City	Other urban centers	Male breadwinner	Female breadwinner
Cash transfer	6.7	4.2	2.4	3.2	7.0
Food assistance	13.9	14.2	13.4	13.3	15.3
Food stamp	34.6	26.8	17.3	28.3	27.3

Source: Authors’ calculation based on Djibouti COVID-19 phone survey, 1st round.

## CONCLUSION



While Djibouti was affected by the COVID-19 pandemic as early as mid-March 2020, the government implemented a set of measures to limit the effects on the health of the population as well as to not strain the healthcare system. These measures have hit the economy and particularly some economic sectors, thereby affecting the well-being of Djiboutian households. This phone survey carried out in July 2020 aims to assess the socio-economic impacts of COVID-19 and government's containment measures on Djiboutian households, through various channels such as job loss, availability and price changes of basic food items and ability to access healthcare and education.

Nearly the entire population is aware of the existence of the virus and of the measures introduced by the Government to stem its spread in the country. Moreover, preventive measures have been widely adopted among the population, with some slight variation according to location. Containment measures have had a clear impact on economic activities. About 59 percent of the breadwinners worked in the week before the survey, 22 percent of them lost their job after the start of the pandemic related measures in March and the remaining 19 percent did not work before the pandemic or the week before the survey. A large majority of these individuals who stopped working after March claimed to have lost their work due to coronavirus related reasons. A little less than half of those that were still working in the week before the survey observed a decline in the amount of time they were working with stark differences across income quintiles as 28 percent of the richest worked less as compared to about 47 percent among the bottom 3 quintiles. Those working lesser than usual also observed a loss of income as about 81 percent received either no payment or a partial wage. Gender differences were also observed in this respect.

Along with job loss, reduction in workload and a decline in income, higher prices and difficulties in accessing goods and services were experienced by the entire population, more so among poor households. While INSD collects prices of basic food and non-food items on a monthly basis, it would be equally important and timely, from a policy perspective, to track availability of these basic items. Access to health care among those that needed it (17 percent of households) has also been restricted, particularly in Balbala where most of poor of Djibouti city live. Finally, about 36 percent of the households received aid in the form of either cash transfer, food assistance or food stamps. About 35 and 27 percent of poor and non-poor households received food stamps respectively. This is in line with the targeting mechanism employed as many non-poor engaged in the informal sector and lost their jobs due to COVID-19 were also in need of assistance.

In view of these multiple socio-economic impacts and the low resilience of Djiboutian households from all income categories, assistance of all types is strongly needed to mitigate the effects of this pandemic in the short run. This pandemic is likely to have long lasting consequences and expose those who are vulnerable even more. In the medium run, thus, there is an even stronger case to make growth more inclusive in Djibouti.

### Box 1. Sampling strategy

The sampling strategy of this survey aims to provide point estimates of key indicators with sufficient precision for the following three domains: (1) Balbala, (2) remainder of Djibouti-city and (3) other urban centers. Clearly, it will result in a survey that will only be representative of urban areas in the Djibouti. This will help to estimate precisely detectable policy relevant changes nationally and within each domain.

Data from the national social registry, restricted to urban households having at least one phone number and interviewed after July 1, 2017 (to increase the response rates), serves as the sampling frame for this survey. The social registry is an official database of households in Djibouti that may benefit from public transfers and be particular targets of poverty alleviation efforts. This data has been collected since 2014 and consists of about 70,000 households, with majority of the fieldwork conducted from 2017 onwards. Despite the fact that this database over-represents the poor, it provides us with an up-to-date sampling frame. The social registry collects a wealth of socioeconomic characteristics of households along with working phone numbers of household heads or spouses of household heads. The use of biometric information to record household level data negates the possibility of having duplicate entries.

The sample of this phone survey consists of households drawn randomly from the sampling frame stratified by survey domain and poverty status. To compute the sample size in each domain, the approach of a power analysis is used, whereby minimal sample sizes to estimate detectable changes in key indicators are calculated, using standard formula.<sup>10</sup> Specifically, a sample of 1,570 households is found sufficient to help estimate a detectable increase/decrease of 10 percentage points at the standard two-sided five percent level with a power  $\beta=80$  percent for an indicator whose prevalence is 50 percent. Table A1 presents the breakdown of the sample by survey domain. This sample size has been inflated to account for likely non-responses, which are expected to be at most 25 percent based on the World Bank's experience in similar contexts in Nigeria.<sup>11</sup> Within each domain, the sample size is equally divided between poor and non-poor.

**Table A1: Sample breakdown by survey domain**

Survey domain	Distribution of urban population across locations from EDAM 2017	Sample size by domain (# households)
Balbala	54.1%	523
Rest of Djibouti Ville	35.5%	523
Other urban areas	10.4%	523
<b>Total</b>	<b>100.0%</b>	<b>1,570</b>

### Box 2. Sampling weights

The sample design of the high frequency COVID-19 phone survey is a one-stage probability sample selected from the unique social registry restricted to urban households and stratified along two dimensions: the survey domain (three categories) and the poverty status (binary). This yields six independent strata. Within each stratum, households are selected with the same ex-ante probability; but this differs across strata. Initially, 1,590 households are drawn; but given a non-response rate averaging 30 percent, because either nobody picked up the calls (12.7 percent) or the phone numbers were disconnected (14.9 percent), a replacement sample of 750 households was selected. However, 589 of these replacement households have been contacted to reach the overall goal of 1,486 complete interviews.

Both the population and household weights are designed to adjust for differences in selection probability due to either design or non-response. Each weight is a combination of a design weight and a post-stratification weight, accounting from non-responses. In addition, further adjustments in sampling weights were made to ensure that indicators produced are representative of the country's urban population, by poverty status and by location. The sampling frame of the social registry of the Ministry of Social Affairs over-represents the poor and has an incomplete coverage of the upper distribution of income. To correct for these biases, we rely on a

<sup>10</sup> See: Sampling Design for Telephone Surveys of the Economic Implications of COVID-19.

<sup>11</sup> Capitalizing on the World Bank LSMS-ISA Program for High-Frequency Phone Surveys on COVID-19.

post-calibration approach, using the household budget survey of 2017 (EDAM 2017) survey as the reference data source. This is because EDAM 2017 survey was representative of the country’s population, poverty status and survey domains. However, EDAM 2017 survey is restricted to the first four consumption quintiles to ensure sufficient overlap of the universes covered by both surveys.<sup>12</sup>

The design of the post-stratification calibration weight seeks to provide estimates that lie within the boundaries of known population values (at the household level). It extends the design weight that already accounts for non-response. Calibration is based on age distribution by gender of household heads and on poverty distribution across survey domains. While the survey domain is constructed identically in the two datasets, poverty is defined differently. Poverty status in the social registry data is based on consumption data which is imputed for each household by the Ministry of Social Affairs and Solidarity (MASS) based on observable characteristics and using the Proxy Means test formula from the household budget survey of 2013 (EDAM 2013). The poverty status in EDAM 2017, on the other hand, is based on consumption data collected as part of the survey.

Given this difference in the way that poverty is calculated, it is important to understand the overlap in indicators<sup>13</sup> highly correlated with consumption and which are part of the PMT formula in the two datasets (EDAM 2017 and social registry), for both poor and non-poor. Table A2 compares the percentage of households having access to services and living in dwelling with certain characteristics in both databases. It is evident that the indicators are similar across the two databases. While households from social registry data live in poorer conditions than households from EDAM 2017, the differences are not stark, and we can proceed with the use of EDAM 2017 for the design of sampling weights with some degree of confidence.

**Table A2: Dwelling characteristics and access to services**

	Social Registry			EDAM 2017		
	Poor	Non-poor	All	Poor	Non-poor	All
% households with access to electricity	20	62	53	16	72	60
% households with access to water	77	93	89	71	95	90
% households with access to sanitation	35	51	48	22	49	44
% households using clean fuel for cooking	6	8	7	9	23	20
% households that are proprietors of dwelling	63	57	58	60	72	69
% households in a solid dwelling	59	81	77	53	93	85
% households that have a solid roof material	70	83	80	48	84	76
% households that have a solid floor material	25	66	57	33	77	68
% of individuals have been/ are in school	52	57	55	37	59	54

Source: EDAM4-IS 2017 and Social Registry data (2017 -2019).

Note: Access to electricity is defined as the use of electricity as the main source of lighting. Access to water is defined as the availability of water in the household in the form of running water (Office National de l’Eau et de l’Assainissement [ONEAD] indoor connection), direct connection from a borehole, and ONEAD outdoor connection by pipe. Access to sanitation is defined as access to WC with flush, latrine with slab, but not shared with other households. Clean fuel for cooking refers to use of electricity or gas for cooking. Solid dwelling includes ordinary dwelling, apartment in a building, simple villa and duplex villa. Solid roof material includes sheet metal, concrete, tile. Solid floor material includes cement and floor tile.

The data used to compute the post-stratification calibration weights are presented in Table A3 below. The algorithms achieve perfect convergence, replicating exactly the target proportions. The diagnostics plot (Figure A1) indicates that calibration weights and scaling factors of the design weights lie within reasonable bounds. Specifically, the graph uncovers no outliers, though a sparse repartition of the weights is observed around the upper end of their distribution.

<sup>12</sup> Restricting the reference data source to the first four quintile is somewhat arbitrary. But this is motivated by discussions with senior officials of the National Institute of Statistics of Djibouti. The unavailability of variables that are not used for calibration but common to both datasets prevents us from running sensitivity analysis around the choice of this cutoff.

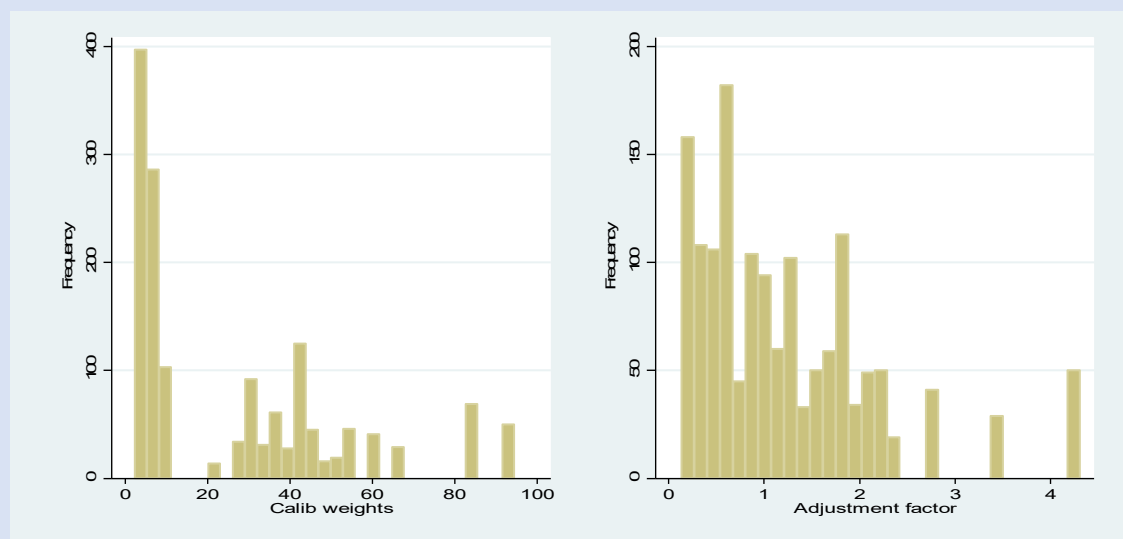
<sup>13</sup> Please note that there are other indicators of interest at the individual but due to lack of access to social registry, we were unable to compute them.

**Table A3: Control totals from most recent Djibouti Population (2020), Calibration weights**

Characteristics	Categories	Percentage (Col.)	Total Households (Weighted frequencies from EDAM 2017)
<b>Male, Total</b>			<b>29,309</b>
	<35	9.11	3,589
	35-49	37.63	14,826
	50-64	19.91	7,844
	65+	7.74	3,049
<b>Female, Total</b>			<b>10,090</b>
	<35	2.82	1,111
	35-49	9.10	3,585
	50-64	9.06	3,570
	65+	4.63	1,824
<b>Non-poor, Total</b>			<b>34,833</b>
	Balbala	31.79	12,525
	Other urban areas	22.93	9,034
	Rest Djibouti	33.69	13,274
<b>Poor, total</b>			<b>4,566</b>
	Balbala	5.16	2,033
	Other urban areas	3.07	1,210
	Rest Djibouti	3.36	1,324

Source: Authors' derivations based on EDAM, 2017 and Phone survey, 2020.

**Figure A1: Calibration diagnostics plot**



Source: Authors' derivations based on EDAM, 2017 and Phone survey, 2020.