# Cash or food transfer? Assessing the effectiveness of social safety nets for households during Covid-19 pandemic in Nigeria

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**Abstract**

In the midst of Covid-19 pandemic, many countries imposed economic and social lockdown to curtail the spread of the virus. These lockdowns bring extra-ordinary challenges for maintaining food security and livelihoods during the pandemic. In Nigeria, the federal government responded by offering food assistance and cash transfer to the most vulnerable households that were registered in the National Social Register (NSR). In the social protection literature, a significant policy debate have long revolves around the relative effectiveness of cash versus food transfer as a response tool against food insecurity in emergencies and crisis context. In this paper, we use household survey, conducted remotely through phone calls, to assess the preferences for and effectiveness of food and cash-based assistance in Nigeria. The analyses include modelling the reasons why beneficiaries prefer food or cash-based interventions. Our results show that majority of the recipients of social safety nets prefer cash transfer as against food assistance. In fact, more households prefer food-cash combination than only food assistance. Econometric analysis shows that households with more educated heads and those with access to Bank/ATM/POS services as well as mobile phone prefer cash as against foods transfer. On the other hands, richer households, those with older heads and larger number of dependents prefer food assistance. In terms of effectiveness, we found that cash transfer is more effective than food assistance leading to larger food consumption and dietary diversity on average. Our results also show that cash transfer appears to be more cost-effective for the recipients costing them only half of what it cost them to access food assistance.

**Keywords**: Cash transfer, Covid-19, effectiveness, food assistance, preference, Nigeria

## 1. Introduction

Coronavirus, or the disease it causes – Covid-19, originated from the Wuhan Province of China in December 2019. It began spreading rapidly in China and to other parts of the world through the movement of people in early 2020. The spread of COVID-19 affected economic activities in China, and in February, the Chinese economy came to a halt (Ozili, 2020). The outbreak was pronounced a pandemic by the World Health Organization (WHO) on 11 March, 2020. To dates, there have been confirmed cases in at least 213 countries, areas and territories (WHO, 2020). On 14 February, 2020, the first case of COVID-19 was reported in an African country – Egypt. To date, over 874,000 cases have been reported across African countries. Although the number of Covid-19 cases and fatalities might still appear comparatively lower in Africa than in other world regions, the pandemic have had disastrous socio-economic impact on the continent's economies (OECD, 2020). For, instance long before the first case was confirmed in Africa the indirect effects of COVID-19 on African countries were already manifesting, through links to trade with China which was going through health crisis as well as an economic shutdown. Since then, these indirect effects have broadened into other sectors – including tourism, and beyond China as COVID-19 affects the health and economies of Africa's other key trading and development partners (Ryder and Benefo, 2020).

The predicted negative impacts of Covid-19 on Africa's economy include an average decline in real Gross Domestic Product (GDP) growth from 3.1% in 2019 to -1.6% in 2020, (IMF, 2020), loss of between 9 to 18 million formal jobs (McKinsey & Co, 2020) and about $37- $79 billion loss in income (World Bank, 2020). Apart from this, it was also predicted that Africa will experience 15% and 23% decline in Foreign Direct Investment (FDI) and remittances inflows respectively (Ryder and Benefo, 2020). Because of the risks to the food supply and agricultural systems, Africa is expected to experience severe food crisis with a

2.6% to 7% decline in agricultural production (AUC, 2020), increased malnutrition and poverty (World Bank, 2020). Estimates by the World Bank showed that over 23 million extra people will fall into poverty compared to a no-Covid-19 scenario (World Bank, 2020). In similar way, International Food Policy Research Institute (IFPRI) estimate a 3% – representing around 10 million people, increase in poverty rate in sub-Saharan Africa (SSA) due to Covid-19 (IFPRI, 2020). In terms of trade, a report from the African Union Commission showed that imports and exports with major trade partners are expected to decline by at least 35% in 2020 compared to 2019 (AUC, 2020). The report noted that, China is a major exporter of commodities to African countries, and the economic contraction in China have had spill over consequences for African countries through the negative impact on African businesses that rely heavily on China for the supply of primary and intermediate raw materials. In terms of tourism, Africa in 2018 was the second-fastest growing region worldwide and the industry made up 8.5% of the continent's GDP and creating about 60 million jobs (Juergen, 2019). However, the sector has been greatly affected due to suspension of flights by airlines and disruption of activities leading to loss of jobs (IFPRI, 2020).

Countries worldwide including African countries responded to the negative impact of Covid-19 economic and social lockdown on the citizen as well as businesses by introducing different types of assistance and support policies (Ryder and Banefo, 2020). These supports can be categorized into three, namely, improved access to essential services, income protection and social safety nets (Ryder and Banefo, 2020). Figure 1 shows the number of countries implementing the different types of support in response to Covid-19 in Africa. In Nigeria, different social safety nets were put in place by national and state governments for vulnerable households during the lock down. However, two namely, food and cash transfer were the dominant ones. This is understandable given the challenges of the period: on the one

hands, the vulnerable need food to survive which they cannot go out to produce. On the other hands, they need money to buy foods, drugs and other essentials for survival.

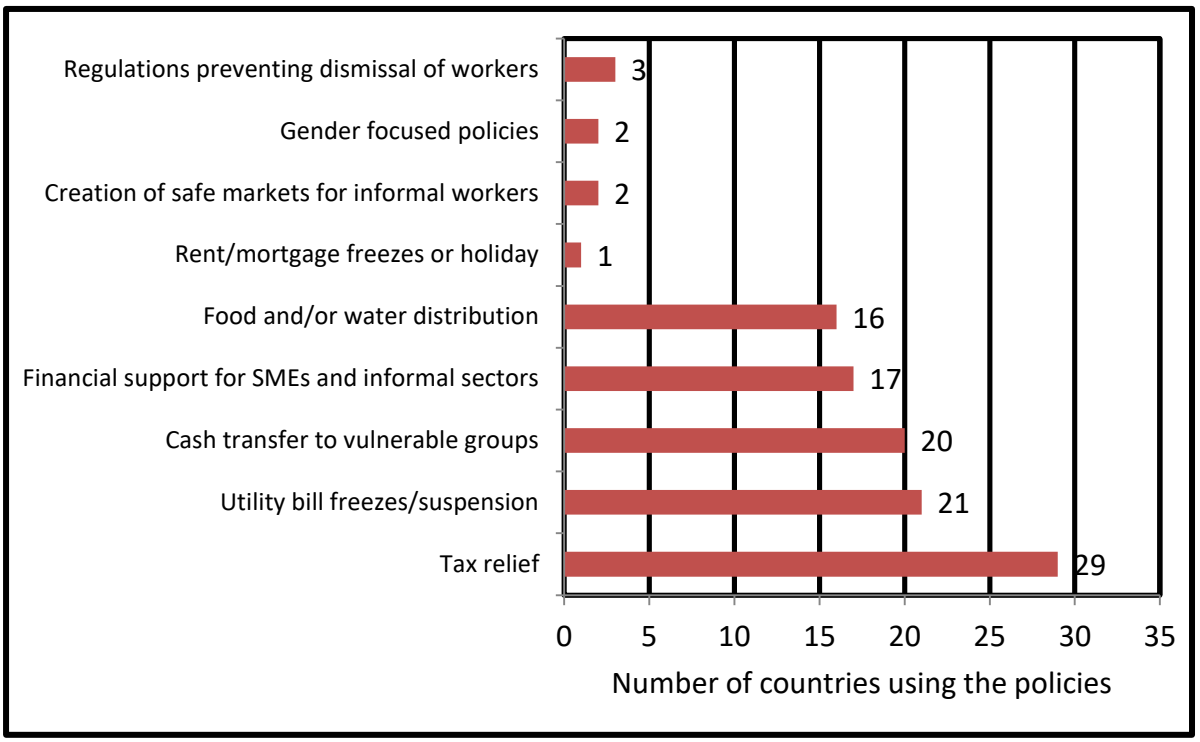

Figure 1: Policies and support tools adopted by African countries against Covid-19
Source: Ryder and Benefo (2020)

The main objective of this paper is to assess the effectiveness of food versus cash-based assistance as a response tool for food insecurity in the context of the current Covid-19 pandemic in Nigeria. Using, households survey conducted through phone calls, the paper also analyses the reasons why vulnerable households prefer food or cash-based interventions. In the social protection literature, a significant policy debate have long revolves around the relative effectiveness of cash versus food assistance as a response tool against food insecurity in emergencies or crisis context. Therefore, this paper contributes to the literatures by assessing the relative impact and cost-effectiveness of food and cash-based assistance especially from the recipients perspectives in the context of current Covid-19 emergencies in Nigeria. The rest of the paper proceeds as follows. Section 2 discusses the socio-economic

impact and policies responses to Covid-19 by Nigeria. Section 3 discusses the literature on which the study is founded. Section 4 discuss the methodology adopted, section 5 discuss the result while section 6 concludes.

## 2. Socio-economic impact and policy responses to Covid-19 in Nigeria

Nigeria with a GDP per capita of $2,028 in 2018 and over 200 million people is a major regional actor on the Africa's continent (World Bank, 2020). The country confirmed its first case of Covid-19 in Lagos State on 27 February, 2020 and from that time; the number of infected people has been rising across the country reaching 44,890 and resulting in 927 deaths as at 6 August, 2020 (NCDC, 2020). On 18 March, 2020, the Federal government placed Lagos and Ogun states under lock down, schools were closed and large gathering of people were banned. Eight other states in Nigeria went on state declared lock down on the same day. Travels from 13 highly-infested countries were banned and Nigeria's visa-on-arrival policy suspended. On 20 March, 2020, Nigeria announced the closure of tertiary institutions, secondary and primary schools and the closure of three international airports, Enugu, Port Harcourt and Kano airports from 21 March. Lagos and Abuja airports were also closed two days later. On 30 March, 2020, government issued a guidelines outlining measures to curtail the effect of Covid-19 pandemic on economic and livelihoods and started enforcing social distancing rules by closing schools, organizations and businesses in the Federal Capital Territory (FCT), Lagos and Ogun States for an initial period of two weeks (PWC, 2020). Figure 2 shows the timeline of Covid-19 policy response in Nigeria.

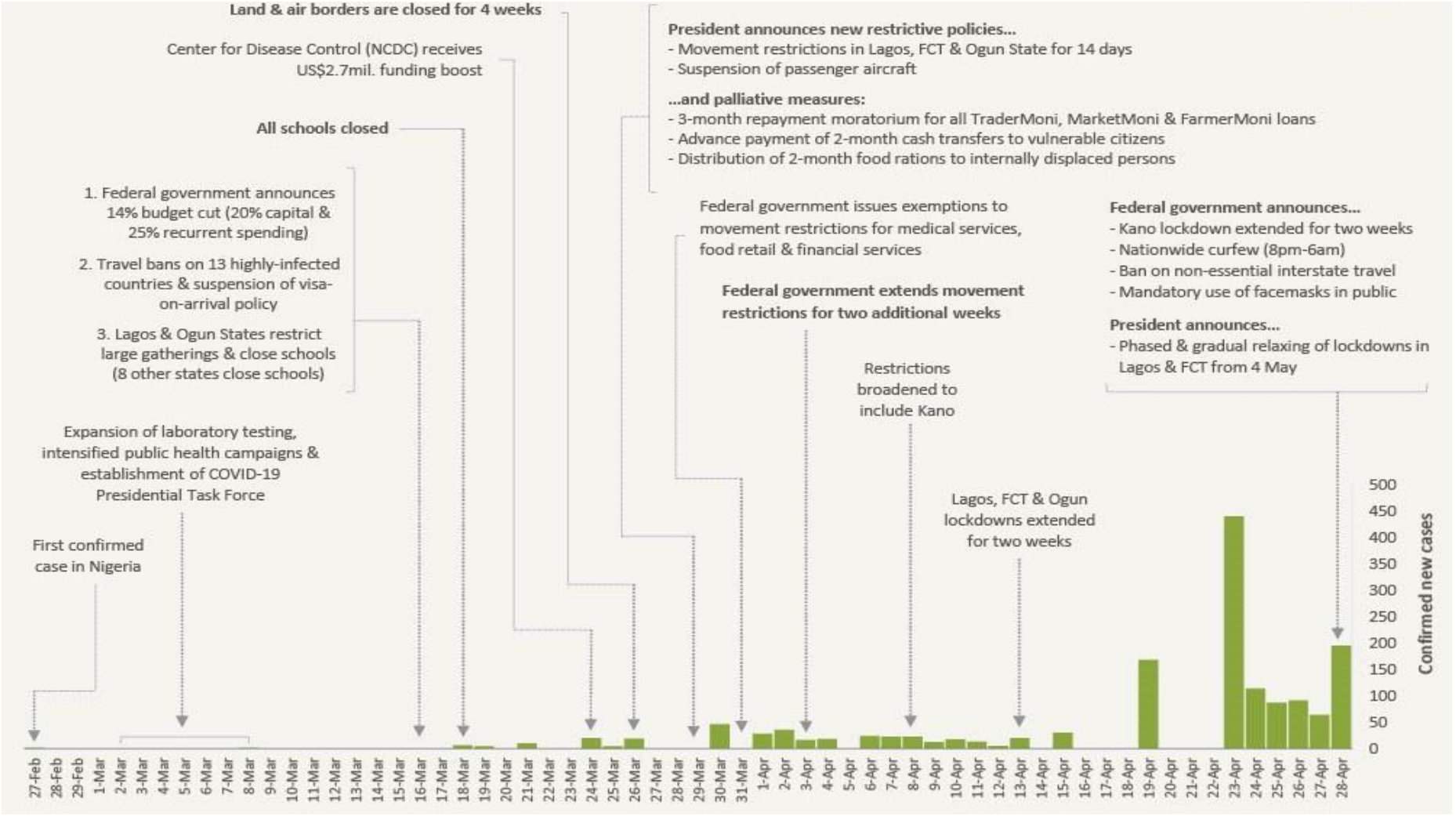


Figure 2: Timeline of important policy steps taken by the government of Nigeria
Source: Andam et. al, (2020)

## 2.1 Socio-economic impact of Covid-19 in Nigeria

Nigeria has been experiencing the direct impact of the pandemic. For instance, it was estimated that the pandemic will lead to average decline in Nigeria's Gross Domestic Product (GDP) growth of between -5% to -10% in 2020 and already about 38% decline in GDP has been reported during the first five weeks of the lock down with most of the losses occurring in the industrial and services sectors (Andam et. al, 2020). Figure 3 show the sources of estimated losses to GDP as a result of Covid-19 in in Nigeria. As forecasted, Nigeria is one of the most affected countries in Africa largely because of its dependence on oil revenue, large informal population and higher degree of involvement in international trade and tourism and FDI in particular (Ozili, 2020b). For instance, as a result of reduced energy utilization occasioned by worldwide lock down, the price of crude oil as at 18 March, 2020 had declined by 50% from nearly $60/barrel to $30/barrel (UNDP, 2020). Similarly, as people were no longer travelling this led to a sustained fall in the demand for aviation fuel and automobile fuel which affected Nigeria's net oil revenue, and eventually reduced Nigeria's foreign reserve (Ozili, 2020b). The reduced oil income made the government to immediately review downwards its 2020 national budget from ₦10.59 trillion to ₦9.09 trillion. The budget was initially planned with an oil price of $57 per barrel. The fall in oil price to $30 per barrel meant that the budget became obsolete and a new budget had to be prepared that was based on a low oil price (Ozili, 2020b).

Amidst the pandemic, there was also serious pressure on Nigeria's currency as the Central Bank of Nigeria (CBN) announced the depreciation of the official rate of the Naira from ₦307 to ₦360 per dollar. This caused inflation rate to increase to 12.56% against the projected 11% rate for 2020 (UNDP, 2020).The inflation rate increase was significantly affected by a shortage in consumer goods due to the disruptions to imports and local food supply chains, particularly as Nigeria is a net importer of basic foodstuff (UNDP, 2020).

Covid-19 pandemic has also caused a plunged to the major market indices in the Nigeria's stock exchange, leading investors to pull out significant investments in to safe havens like US treasury bonds (Ozili, 2020b). For instance, stock market investors lost over ₦2.3 trillion ($5.9bn) barely three weeks after the first cases of coronavirus was confirmed and announced in Nigeria on January 28, 2020. The market capitalisation of listed equities, which was valued at ₦13.657 trillion ($35.2bn) on February 28, 2020 had depreciated by ₦2.349 trillion to ₦11.308 trillion ($29.1bn) on 23 March 2020. The All-share index closed at 21,700.98 from 26,216.46 representing 4,515.48 points or 20.8 per cent drop (Ozili, 2020b).

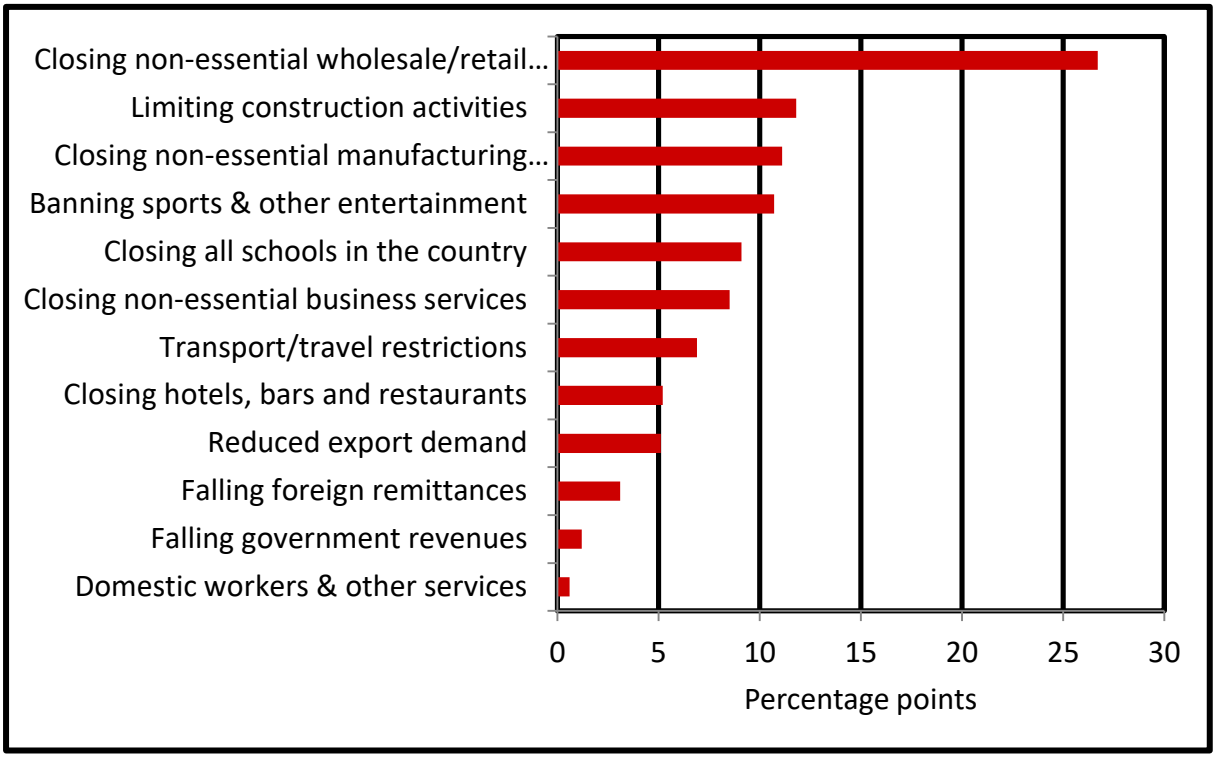


Figure 3: Estimated sources of loss to total GDP during Covid-19 lockdown in Nigeria
Source: Andam et al, 2020

Perhaps the most affected in Nigeria are those working in the informal sector and the vulnerable groups including people living in poverty, older persons, persons with disabilities, youth and women, homeless and jobless peoples, internally displaced people, refugees and migrants (Ozili, 2020a). In Nigeria, 50 to 70% of the economy is informal and those living on daily subsistence conditions. As a results of lockdown and social distancing measures,

including closure of businesses and stoppage of travels, millions of jobs are already lost in the informal sector while unemployment rate generally is expected to increase to more than 35% by the end of 2020 (UNDP, 2020). The Covid-19 related risks in Nigeria are expected to push additional 30.1 million people into poverty and lead to 18% decline in agriculture GDP (Andam, et. al, 2020). In the health sector, the pandemic has placed immense and unprecedented pressure on Nigeria's fragile and underinvested healthcare system. Estimates indicate that around 20% of COVID-19 cases require hospitalization and another 7.5% require intensive care (UNDP, 2020). However, there are inadequate manpower and equipment, including personal protective equipment (PPE), surgical masks, gloves, ventilators, bed spaces, laboratories, ambulances and drugs to adequately respond to this pandemic. According to the Nigeria Centre for Disease Control (NCDC), there are currently few testing and treatment centers designated for COVID-19 (UNDP, 2020). Also, there are insufficient isolation centers in many states and many have to result to using stadium and schools as isolation centers. Overall, the Covid-19 pandemic has overwhelmed the poor public health infrastructure in Nigeria (Ozili, 2020b).

### 2.2 Covid-19 policy responses in Nigeria

Two policy responses namely, fiscal and monetary, are worth discussing in the context of the Covid-19 pandemic in Nigeria. Notably, the policy responses are guided by Nigeria's pre-existing fiscal challenges which are compounded by the pandemic (PWC, 2020). For instance, the pre Covid-19 Nigeria fiscal environment is characterized by low tax compliance as well as very low tax to GDP rate (less than 6%), high debt services to revenue ratio, low oil production and declining oil prices (PWC, 2020). Table 1 outlines the fiscal and monetary policy response to Covid-19 outbreak in Nigeria.

Table 1: Fiscal and monetary policies responses to Covid-19 by the Nigerian government

| **A** | **Fiscal policy responses** |
|---|---|
| 1 | Contingency funds of NGN984 million ($2.7 million) were released to Nigeria's Centre for Disease Control and an additional NGN6.5 billion ($18 million) already disbursed. |
| 2 | Establishment of N500bn COVID-19 Crisis Intervention Fund which will be channelled to the upgrade of healthcare facilities at the national and state-level, as well as provide intervention for states. |
| 3 | Draw down on World Bank facility (US$82m) and additional financing from the REDISSE (US$100m) project to meet COVID-19 emergency needs by States/FCT. |
| 4 | US$150m to be withdrawn from the NSIA Stabilization Fund to support the June 2020 FAAC disbursement. |
| 5 | Benchmark oil price revised to US$30/b from $57/b and production to 1.7mbpd from 2.18mbpd. |
| 6 | Downwards adjustment of non-oil revenue projections, customs receipts and proceeds of privatisation exercises. Budget Office to revise 2020-2022 MTEF / FSP and amended Appropriation Act will provide for COVID-19 Crisis Intervention Fund. |
| 7 | Establishment of coalition against COVID-19 (CACOVID) that raised over $72 million |
| 8 | VAT exemption for expanded list of basic food items plus medical and pharmaceutical products. |
| 9 | Approval of employment of 774,000 Nigerians into the Special Public Works Programme to ameliorate the suffering caused by COVID-19 in the country. |
| 10 | Three-month repayment moratorium for all TraderMoni, MarketMoni and FarmerMoni loans with immediate effect. Similar moratorium was given to all Federal Government-funded loans issued by the Bank of Industry, Bank of Agriculture and the Nigerian Export Import Bank. |
| 11 | Conditional cash transfers for the next two months to be paid immediately to the most vulnerable at internally displaced persons camps. |
| 12 | Also, due to the reduction in global oil prices, the government reduced the petrol pump price from NGN145 per litre to NGN123.50 per litre on April 1, 2020. |
| 13 | Suspension of the proposed increase of electricity tariffs by the electricity distribution companies (Discos). |
| 14 | Waiver of import duty on medical equipment, medicines, protection equipment for the treatment of COVID-19. |
| **B** | **Monetary responses** |
| 1 | Reduction of interest rates on all applicable CBN interventions from 9% to 5% |
| 2 | Approval of $3.4 billion from IMF to tackle impact of the pandemic |
| 3 | Liquidity injection of N3.6 trillion stimulus package in the form of loans into the banking system |
| 4 | Nigeria Incentive-based Risk Sharing System for Agricultural Lending (NIRSAL) Microfinance bank, on behalf of the Central Bank of Nigeria (CBN), started the disbursement of N50 billion Targeted Credit Facility (TCF) to beneficiaries. |
| 5 | Provision of N100 billion to support the health sector, N2trillion to the manufacturing sector and N1.5 trillion to impacted industries in the real sector. |
| 6 | Suspension of the sale of foreign currency to members of the Association of Bureau De Change Operators of Nigeria |

Source: PWC (2020).

## 3. Literature review

While the current Covid-19 pandemic appears to be unprecedented – implying dearth of evidences, the review presented in this section is quite insightful for the current pandemic focussing on effectiveness of cash or food assistance for vulnerable populations in period of crisis. For instance, Gelan (2006) examine the relative effectiveness of cash and food aid using a general equilibrium approach for Ethiopia and find that cash transfer has larger positive effects on household welfare than food aid, which provides a disincentive to local food production. Staunton and Collins (2002) investigate the effectiveness of cash versus food transfers in rural Zimbabwe during periods of humanitarian crisis and food insecurity. They find that cash transfer has a bigger impact on the people than food aid. Kita (2014) assess the effectiveness of cash transfer as a tool in responding to food insecurity and general humanitarian crises in Malawi. The study finds that cash transfers, on a larger scale, offer more benefits than food assistance. In a series of studies conducted in Ethiopia, Afghanistan, Sri Lanka, Malawi and Zambia to examine cash-based responses in emergencies, Harvey (2007) finds that cash-based offers better impact in emergency situations than food-based assistance.

Gentilini (2016) in a review of literature, examine the long standing debate on the effectiveness of cash versus food transfer in the developing countries and finds that effectiveness depends on context, objectives and measurement, but implementing cash transfer is however, relatively cheaper compared to food transfers. Also, TNH (2007) suggests that cash transfer and not food should be given to people affected by a natural disaster because it helps them recover quickly from the disaster than food aid. Similarly, Jacobsen (2020) submitted that cash transfers are better and have larger impact than food aids among the Syrian refugees and those fleeing conflicts and famine. Additionally, Alam (2020) suggests that cash transfer as against food aid, is a superior and more cost-effective way to

meet the needs of the people during the current Covid-19 pandemic. This is because it makes the vulnerable recover more quickly. Jerving (2020) also submits that cash transfer is the most impactful form of social assistance that was used during Covid-19 lockdown in India. According to the author, it is easier and cost-effective to implement especially where there are existing social safety net infrastructures.

Another body of literature have argued that food-based assistance is more effective during humanitarian crisis. For instance, Hoddinott, Sandstrom and Upton (2013) examine the relative impact of cash versus food transfer in Niger republic using a randomized design. They find that food transfer has a larger and positive impact on households' food consumption and diet quality than cash transfer. Ahmed et al (2010) compare the efficacy of food and cash transfers in enhancing the food security and livelihoods of the ultra-poor in rural Bangladesh. The study finds that majority of the people and especially those in the poorest income class prefer food to cash transfer. Cunha (2014) in the analysis of the welfare impact of cash versus food transfers using Randomized Control Trial (RCT) in Mexico finds that food transfer was more effective and non-distorting to the local markets. Also, Schwab (2020) analyse the impact of food and cash transfers for the poor households in rural communities of Yemen between 2011 and 2012. The results show that food transfer produced larger impact than cash on the food security of the recipients.

Yet the third group of literature present mixed results on the effectiveness of cash versus food transfer. For instance, Hidrobo et al (2012) examine the impact and cost-effectiveness of cash, food or vouchers in northern Ecuador using randomized evaluation. They find that the three types significantly improve the quantity and quality of food consumed. However, differences emerge in the types of food consumed, with food transfers leading to significantly larger increases in calories consumed and vouchers leading to significantly larger increases in dietary diversity. It could be deduced from the literature that

whether cash or food transfer will be more effective will depend on a number of factors. For instance, Harvey (2007) showed that there is need to consider the context (whether natural disaster, wars, health emergencies, conflict, or recession), cost-effectiveness, security risks, market impacts, gender, corruption and diversion risks, anti-social usage, targeting, consumption/nutrition and skills and capacity to implement, when making decision to implement a social assistance response. This finding is also buttressed by Coate (1989) and Gentilini (2016) who concluded that the effectiveness of cash or food transfer depends on the context, objectives and design. Harvey (2007) is of the opinion that in war/complex emergency where markets are not seriously disrupted, cash transfers could be a better option. However, in situation of natural disaster and where markets are disrupted, food transfer will be more appropriate. Similarly, Kebele (2006) submitted that in Ethiopia, cash transfer seems better suited to areas with market-oriented infrastructure and institutions while food transfer is more suited to remote areas.

## 4. Methodology

### 4.1 Study context

As mentioned earlier, Covid-19 poses extra-ordinary and unprecedented challenges for Nigeria – both for controlling the disease and maintaining food security and livelihoods during the lock down. As part of its response, Nigerian federal government, state governments and non-governmental organizations (NGO) including faith-based groups provided social safety nets assistance including food and cash transfer for the vulnerable and poorest citizens. Data used for this study were collected from Kwara state in the north-central region of Nigeria. Kwara State confirmed its first case of the virus on 6 April, 2020 (KWSG, 2020b). Between 6 April 2020 and 19 August 2020, the state has recorded 906 confirmed cases with 23 deaths and 697 recoveries (KWSG, 2020b). The spread of the virus in the state could be attributed partly to its heterogeneous nature and location: it is the

gateway between the northern and southern regions, and it has a good mixture of the three major ethnic groups in Nigeria, so that transportation to and from the state is larger than for most states in Nigeria. The state has a total population of 3.1 million people with 45% engaged in the informal sector (KWSG, 2020a).

Covid-19 lockdown begin in the state on 10 April, 2020 for an initial period of two weeks with the exemption of vehicles carrying goods and services. Also, markets selling foods and medications were allowed to open every other day between 10 am and 2 pm (Premium Times, 2020). The lock down was extended in the state for another two weeks till 8 May, 2020 to curb the spread of the virus (The Nation, 2020). The extended lockdown posed a great challenge for meeting the food security of the people leading to hunger and deprivation. While the lockdown does not apply to those providing essential services, such as food distributors and retailers, including market stalls selling food and groceries, which the government has said can operate for four hours every 48 hours, it however, prevents many people working in the informal sectors from traveling to work or conducting their business. An increase in food prices as a result of the lockdown also means that many cannot stock up on necessities (Human Right Watch, 2020).

**4.2 Data**

On 1 April, 2020, the federal government through the Ministry of Humanitarian Affairs, Disaster Management and Social Development (FMHADMSD) started the distribution of food assistance and cash transfer to 2.6 million poorest and most vulnerable households spread across the 36 states and Federal Capital Territory that were registered in the National Social Register (Dixit, Ogundeji and Onwujekwe, 2020). In most cases and apart from places with serious security risks, the food aids (usually combination of grain and semolina) were distributed in a centralized location – usually local government office or village centers. Recipients of cash transfer who have bank account were credited while those

without bank account were paid physically at centralized locations. While the cash transfer amount to NGR 5,000 ($14), the value of food aid is slightly lower at NGR 4,200 ($12) per households at the local market value. To be able to measure the effectiveness of food versus cash transfer, we need sample comprising of beneficiaries that received cash transfer (as treatment) and foods transfer (as control). To do this, we selected eight local government areas randomly in Kwara State, from these eight local government areas, we use the list of households that received the federal government Covid-19 social assistance in Kwara State to select 112 households that received cash transfer and 112 households that received foods transfer. In total we sampled 224 households and collected their contact information for data collection.

Data collection was done with survey questionnaire, while the actual data were collected from the households remotely through phone calls. The questionnaire contains demographic, socio-economic, livelihood and contextual information of the households. It also includes data on preference, effectiveness and cost associated with collection of the food or cash transfer, the core objectives of the study. Apart from demographic and socio-economic data, we collected data on two important food security indicators, namely calorie intake and household dietary diversity, using the 24 hours food consumption recalls. Calorie intake is a measure of diet quantity and energy supply. It represents a good indication of overall household food security, so that household that does not meet the minimum calorie intake are regarded as food insecure (Smith et. al., 2006). Inadequate calorie supply has been found to be associated with malnutrition, low productivity and ill-health (Aromolaran, 2004).

Household calorie intake was estimated from food consumption data by asking the quantities of various foods consumed in the household for the last 24 hours before the survey. Calorie supplied was derived using locally available food composition table, but in few cases, where certain food items were not included in the local table, USDA (2005) table was used.

Resulting calorie were divided by the number of adult equivalence (AE) in the household, in order to obtain per capita daily calorie intake. Household dietary diversity was estimated from the food consumed in the household as the number of different foods or food groups consumed over the 24 hours reference period. Given the nature of the research, ethical permission were requested and granted and data were collected between 8 June, 2020 and 10 July, 2020. Data were analyzed using different analytical techniques suitable for the kind of data collected.

**4.3 Data analysis**

In order to examine the factors which determine the preference for social safety net in a quantitative manner, we estimated a logit regression model. Logistic regression uses a logistic function to model a binary dependent variable which has two possible values (0, 1). Logit regression measures the relationship between a binary dependent variable and one or more independent variables by estimating the probability of occurrence using the maximum likelihood estimation technique. In this study, we estimated two different logistic regression model representing food and cash transfer using the whole sample data. Several households and infrastructure variables were included as independent predictors of the preference for social safety nets. We also included per capita total household expenditure (as a proxy for income), access to bank/ATM/POS, mobile phone and social capital indicator.

To examine the effectiveness/impact of food and cash transfer, we used the Propensity Score Matching (PSM) approach. In the PSM estimation, households that received food transfer are the treatment and those that received cash are the control households. The outcome variables with which to measure the effectiveness of the social safety nets assistance are households' food consumption and dietary diversity. In recent year, PSM – a non-parametric technique, has been applied in different context to identify the impact of projects or programmes in many developing countries (Abebaw et al, 2010). The PSM is often

preferred because; one, it does not impose any assumption on the data thereby allowing for the estimation of heterogeneous treatment effects. Second, it tends to yield more reliable estimates as it uses only the matched sub-sample as against ordinary least square (OLS) regression that uses all observations in both the treatment and control groups (Abebaw et al, 2010). The PSM technique measures the impact of a treatment on the treated by comparing the mean of the outcome variables of interest in the treatment sample with those of the counterfactuals in the control sample.

Following Rosenbaum and Rubin (1983), we denote a dummy $D_i$ equals 1 to represent individual I belonging to the treatment household and 0 otherwise, $Y_{i1}$ and $Y_{i0}$ are the outcomes variables for unit i conditional on the presence and absence of treatment respectively. The treatment effect for individual i measures the difference between the relevant outcome indicator with the treatment and the relevant outcome indicator without the treatment. This is given by:

$$\Delta Y_i = E(Y_{i1}/D_i = 1) - E(Y_{i0}/D_i = 1) \quad (1)$$

While the post-treatment is observed, its value in the absence of treatment (i.e. the counterfactual) is not. In household surveys, it is impossible to observe these outcomes at the same time for same individual. In other words, the treatment indicator takes either 1 or 0 but not both. This is commonly known as a missing data problem in programme evaluation literature. Consequently, the components $E(Y_{i1}/D_i = 1)$ and $E(Y_{i0}/D_i = 0)$ are observable outcomes, whereas $E(Y_{i1}/D_i = 0)$ and $E(Y_{i0}/D_i = 1)$ are non-observable outcomes. By filling in the missing data on the counterfactual, propensity score matching provides a potential solution to the evaluation problem. The propensity score was introduced by Rosenbaum and Rubin (1983) and is defined as an algorithm that matches treated and non-participants on the basis of the conditional probability of participation, given the observable

characteristics. In other words, it aims to construct a comparison group with non-treated units that are comparable to treated units on the basis of observable characteristics.

More specifically, propensity score matching methods are based on the conditional independence assumption, which states that the outcome in the untreated state is independent of treatment participation conditional on a particular set of observable characteristics, denoted X (Rosenbaum and Rubin 1983). This assumption is equivalent to the absence of selection bias based on unobservable heterogeneity (Heckman et al, 1998) and can be expressed as:

$$(Y_{i0}, Y_{i1}) \perp D_i / X_i \quad (2)$$

It means that, given $X_i$, the outcomes of non-treated units can be used to approximate ith counterfactual outcome of treated units in the absence of treatment.

$$E(Y_{i0}/D_i = 1, X_i) = E(Y_{i0}/D_i = 0, X_i) \quad (3)$$

Rosenbaum and Rubin (1983) showed that it is possible to condition participation on the propensity score denoted *P(X)* rather than on observable characteristics *X*. The propensity score represents the probability of treatment conditional on a vector of observable characteristics and may be interpreted as the one dimensional summary of the set of observable variables.

It is expressed as: $P(X_t) = \Pr\{D_i = 1/X_t\}$ (4)

The estimation of the counterfactual is:

$$E[Y_{i0}/D_i = 1, P(X_i)] = E[Y_{i0}/D_i = 0, P(X_i)] \quad (5)$$

Finally, the average treatment effect for individual i is measured by:

$$\Delta Y_i = E[Y_{i1}/D_i = 1, P(X_i)] - E[Y_{i0}/D_i = 0, P(X_i)] \quad (6)$$

The first step of the PSM is to estimate the propensity score that an individual had been included in the treatment group. Common practice uses the predicted probabilities of being in the treatment group or in the non-treatment group derived from dichotomous logit or probit models using covariates X. Once propensity scores are estimated, a matching estimator

is selected that describes how comparison units relate to treated units. According to Dehejia and Wahba (2002), "matching on the propensity score is essentially a weighting scheme, which determines what weights are placed on comparison units when computing the estimated treatment effect". The average treatment effect may be expressed as follows:

$$\Delta\bar{Y} = \frac{1}{T}\sum_{i=1}^{T}\left[Y_{i1} - \sum_{j=1}^{C} W(i,j)Y_{ij0}\right] \quad (7)$$

Where $Y_{i1}$ is the post-treatment outcome of treated unit i, $Y_{ij0}$ is the outcome of the $j^{th}$ non-treated unit matched to the $i^{th}$ treated unit. T is the total number of treated units, C is the total number of non-treated units and *W (i, j)* is a positive valued weight function. There are different matching techniques that have been suggested in the literature for matching treatment and control households having similar propensity scores to compute the average treatment effect on the treated (ATT). The commonly employed methods include radius, nearest neighbour and kernel techniques.

## 5. Results

### 5.1 Characteristics of survey households

The demographic and socio-economic characteristics of the survey households are shown in table 2. Among the recipients of government social assistance programmes, majority have primary school education and less and close to one-quarter have no visible employment. Majority are farmers and self-employed artisans. About half are 51 years of age and above. Over 80% have no bank account or access to Automated Teller Machine (ATM) card and point of sale (POS) services. This is significant as these are necessary for ease of cash delivery especially for rural dwellers. The low access to banking services explain why recipients have to travel long distance to point where cash transfers are being disbursed, usually local government or district headquarters, with significant transaction costs for the recipients.

Table 2: Characteristics of survey households (n=224)

| Characteristics | Frequency | Percentage |
|---|---|---|
| **Gender of household head** | | |
| Male | 143 | 63.8 |
| Female | 81 | 36.2 |
| **Age group** | | |
| ≤ 30 | 9 | 4.0 |
| 31 – 40 | 27 | 12.1 |
| 41 – 50 | 85 | 37.9 |
| 51 – 60 | 101 | 45.1 |
| > 60 | 2 | 0.89 |
| **Education level of household head** | | |
| No formal education | 64 | 28.6 |
| Primary school education | 128 | 57.1 |
| Secondary school education | 29 | 12.9 |
| Above secondary education | 3 | 1.34 |
| **Marital status of respondent** | | |
| Single | 15 | 6.69 |
| Married | 53 | 23.7 |
| Divorced | 34 | 15.2 |
| Separated | 17 | 7.59 |
| Widowed | 105 | 46.8 |
| **Household size** | | |
| 1 – 5 | 198 | 88.4 |
| 6 – 10 | 22 | 9.82 |
| > 10 | 4 | 1.78 |
| **Primary occupation of household head** | | |
| No visible occupation | 47 | 21.0 |
| Farming | 84 | 37.5 |
| Self-employed/Artisan | 68 | 30.3 |
| Business/petty trading | 25 | 11.2 |
| **Membership of any social network/group** | | |
| Yes | 86 | 38.4 |
| No | 138 | 61.6 |
| **Number of dependents** | | |
| ≤ 2 | 121 | 54.0 |
| 3 – 5 | 87 | 38.8 |
| > 5 | 16 | 7.14 |
| **Access to Bank/ATM/POS services** | | |
| Yes | 42 | 18.8 |
| No | 182 | 81.2 |
| **Access to mobile phone/telecommunication services** | | |
| Yes | 198 | 88.4 |
| No | 26 | 11.6 |

Source: Own survey, 2020

### 5.2 Preferences of vulnerable households for the forms of social assistance

Our survey was conducted immediately after relaxation of the lockdown rules when households had received some kinds of assistance, which are either food or cash transfer, the survey asked the sample households what they would have preferred among only food, only cash, or a combination of food and cash as a form of assistance to tackle food insecurity during the current Covid-19 pandemic. Figure 4 shows the preference patterns of vulnerable households. Majority of the households express preference for cash transfer. One-quarter express preference for food assistance and close to one-third prefers a combination of food and cash transfers. The result is in line with other studies that have shown that majority of vulnerable households in crisis prefer cash than food transfer (e.g. Kita, 2014; Gelan, 2006).

This finding has implication for implementation of future social assistance programmes. Often, social safety nets assistance is implemented without conducting an initial need assessment of the preference of potential beneficiaries and this reduces the effectiveness of such intervention. According to Harvey (2007) and Gentilini (2016), needs and market assessments are two key issues that affect the effectiveness of social assistance programme and which should not be ignored and no wonder Gentilini (2007) submitted that beneficiary preferences for cash or food are context-specific and hence difficult to generalize. The survey further asked for the reasons for the expressed preferences and majority of the households submitted that their preference is dictated by conveniences and what their households' current needs are (Figure 5).

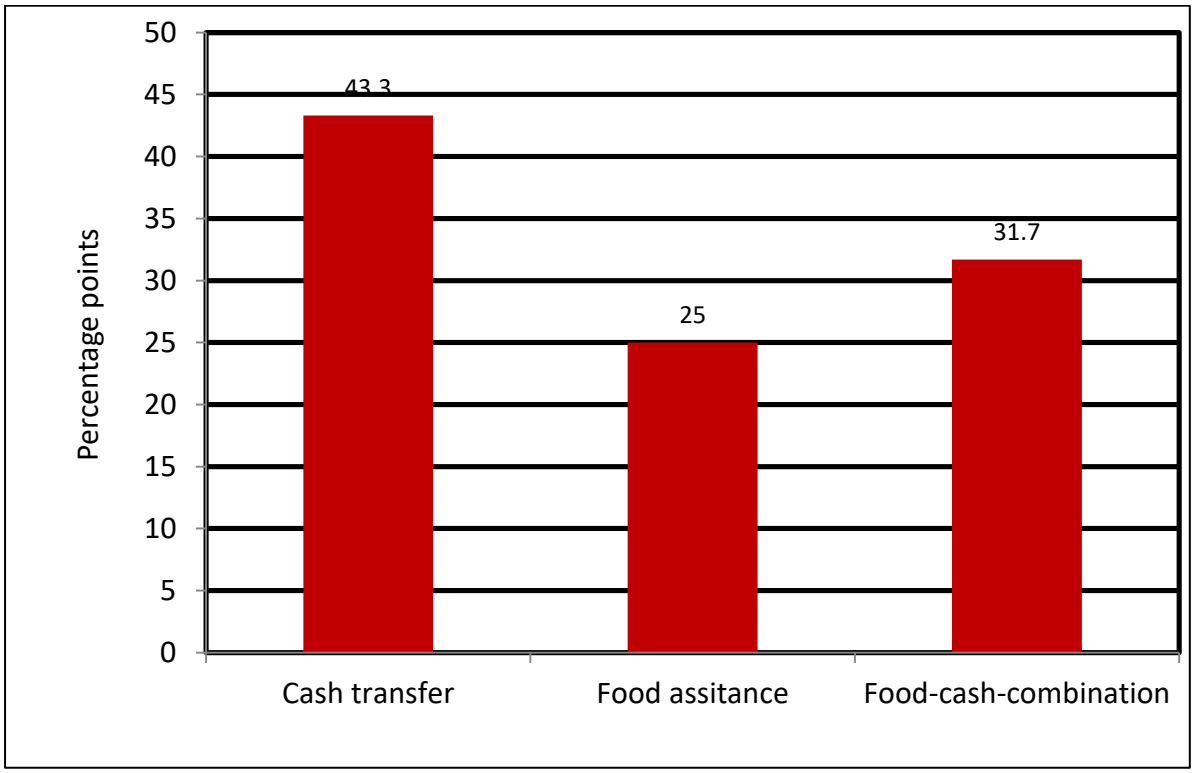

Figure 4: Preferences of households for the forms of social assistance

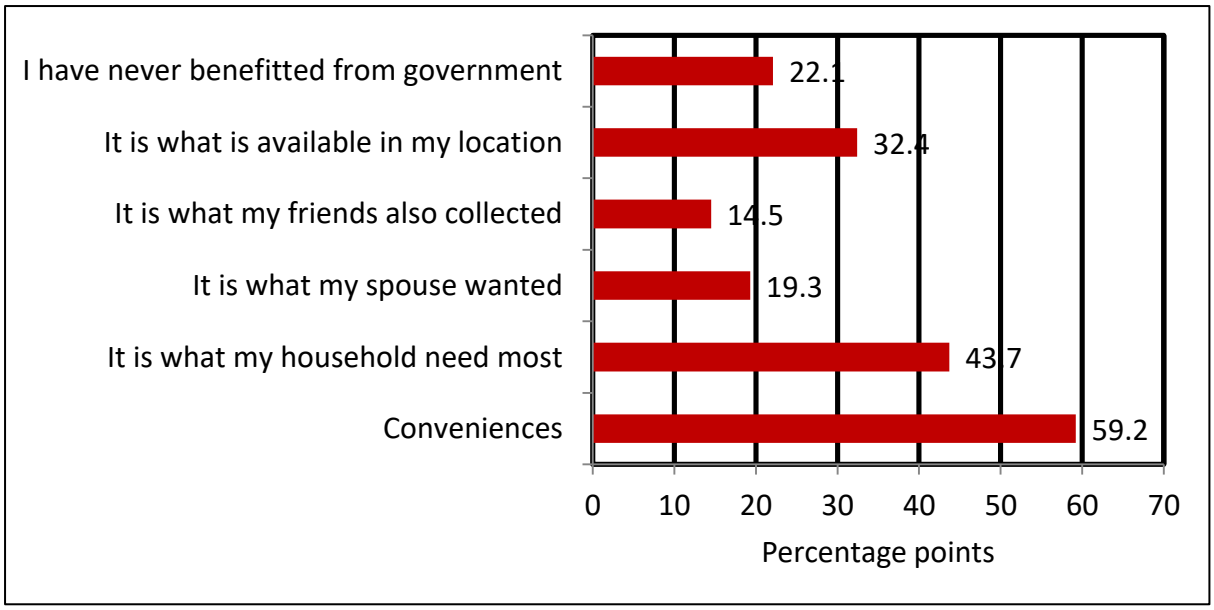

Figure 5: Qualitative assessment of reasons for households' preference for the forms of social assistance (multiple responses)

### 5.3 Determinants of households' preference for the forms of social assistance

Logit regression estimation was conducted to assess, through quantitative analysis, the factors which determine vulnerable households' preference for the forms of social assistance between foods or cash transfer in the context of the current Covid-19 pandemic. The results of the estimation are shown in table 3 below. Nine independent variables were included in each of the regression including, gender, age, education of household's head; number of dependents, household's size, income, membership of social groups and access to Bank/ATM/POS and mobile phone. Since our focus in this study is the factors that determine the preference of household for foods and cash transfer, we reported regression coefficients and not marginal probabilities. The results show that households with more educated heads and those with access to Bank/ATM/POS services as well as mobile phone are more likely to prefer cash as against foods transfer. On the other hands, those with older heads and larger number of dependents prefer food assistance. Although most of the beneficiaries are poor, those in the upper income class are more likely to prefer food transfer.

### 5.4 Effectiveness of the forms of social assistance

To measure and compare the effectiveness of food versus cash transfer in meeting the food security needs of vulnerable households during the Covid-19 crisis, we employed PSM technique. This is considered appropriate because we collected only one round of data and the households were not randomly assigned to the social safety net programme. In practice, to assess the impact of a social safety net requires that beneficiaries or households who receive the treatment are compared to those who do not received benefits from the programme or control group (Ahmed et al, 2010). In this study, we used households that received cash transfer as the treatment and those that received food as the control households. The outcome variables used to measure and compare the effectiveness of the social safety nets assistance

are households' food consumption in per capita calorie intake and households' dietary diversity index. Indicators that measure dietary diversity can provide insightful information on the quality of consumption patterns, in addition to its quantity (Gentilini, 2016).

Table 3: Logit estimates of determinants of preference for foods or cash transfer

| | Cash transfer | Food assistance |
|---|---|---|
| Gender of head (male = 1) | -0.015 | -0.043 |
| | (-1.04) | (-1.22) |
| Age of head (years) | 0.117 | 0.019*** |
| | (0.98) | (3.86) |
| Years of schooling (years) | 0.201** | 0.144 |
| | (2.27) | (1.43) |
| Income (Naira) | 0.051 | 0.053** |
| | (1.11) | (2.55) |
| Household size (AE) | -0.283 | -0.191 |
| | (-0.65) | (-1.17) |
| Number of dependents (number) | 0.170 | 0.029* |
| | (1.31) | (1.82) |
| Membership of social group (yes = 1) | -0.056 | -0.035 |
| | (-1.08) | (-1.19) |
| Access to Bank/ATM/POS services (yes = 1) | 0.352*** | 0.008 |
| | (3.15) | (0.68) |
| Access to mobile phone (yes = 1) | 0.068** | 0.046 |
| | (2.19) | (1.08) |
| Constant | 0.627** | 0.733** |
| | (2.53) | (2.06) |
| Pseudo $R^2$ | 0.025 | 0.049 |
| LR $\chi^2$ value | 42.78 | 38.54 |
| Log-likelihood | -278.4 | -198.2 |
| N | 224 | 224 |

Source: Own survey, 2020. AE is adult equivalent. *, **, *** indicate the coefficients are statistically significant at 10%, 5%, and 1% level, respectively. *Z*-values are shown in parenthesis below the coefficients.

As mentioned earlier, the first step of implementing PSM estimation is to estimate a probit regression which equals one if the households receive a social assistance and zero otherwise. In this study, we estimated two separate probit estimations; one for cash transfer treatment group with households that received food transfer serving as control and the other with food transfer treatment group with households that received cash transfer serving as the control. The control variables (regressors) in the probit estimation include households' and

demographic variables as well as factors that affect the outcomes. Having estimated the probit regressions, we used the result to calculate the propensity scores and perform matching on the basis of the scores.

We used the kernel matching estimator and the mean number of blocks was five, which ensures that the mean propensity score is not different for treatment and control in each block. The balancing property is satisfied using this matching estimator. We imposed the common support option and this resulted in the exclusion of two households from the control sample that has no match, resulting in 110 matched households. The impact measured by average treatment effect on the treated (ATT) was estimated with the Stata's PSMATCH command based on the matched sample. The standard errors were calculated by bootstrapping using 100 replications for each estimate. The results of the impact of social assistance are shown in Table 4. The results indicate that, cash transfer has a significantly larger impact on food consumption than food transfer. It increases food consumption by about 295 kilocalories per capita on average. In similar manner, cash transfer increases household dietary diversity by 1.43 count on average when compared to food transfer.

Table 4: Propensity score matching impact estimates of the social assistance

| Outcome variables | Treatment (Cash transfer) | Control (Food transfer) | Difference | *t*-statistic |
|---|---|---|---|---|
| Per capita daily calorie intake | 2311.4 | 2016.8 | 294.6*** | 3.92 |
| Household dietary diversity index | 6.32 | 4.89 | 1.43*** | 4.11 |

Note: *** indicate that the mean difference between the treatment and control is significant at 1% level. *T*-statistics are calculated based on bootstrapped standard errors.

### 5.5 Cost of accessing social assistance for the beneficiaries

In the social protection literature, the debate on the effectiveness of cash versus food transfer as forms of social safety nets is often hinged on their impact and cost effectiveness from the stand point of the aid agencies or government (Harvey, 2007). While this has clear policy implications, it neglects the cost for the beneficiaries of the social assistance. In this

study, we measure cost effectiveness from the perspectives of the beneficiaries. In other words, at what cost do the recipients obtained the transfer? Is cash more cost-effective for recipients than food transfer? We estimated the transaction cost to the recipients of the transfer in terms of transportation cost to the point of collection and opportunity cost of time spent both in moving to the point of collection and waiting time to collect the transfer. The transaction cost is then compared to the value of the social safety nets. In case of households that received food transfer, the transaction cost is compared to the monetary value of the food ration received. Figure 6 shows that it is more cost-expensive to access food assistance than cash transfer: average transaction costs account for about 25% of the value of transfer for recipients of food transfer and 13% for recipients of cash transfer. The cost of accessing cash transfer could have been much lower if they were paid directly to beneficiaries' bank account, but because about 81% did not have bank account (Table 2) and have to be physically present at the venue of payment. Design of social assistance programme must take into cognizance the cost-effective ways of delivering the assistance to guarantee maximum benefit not only from the perspectives of the government or aid agencies but also from the recipients standpoint (Harvey, 2007).

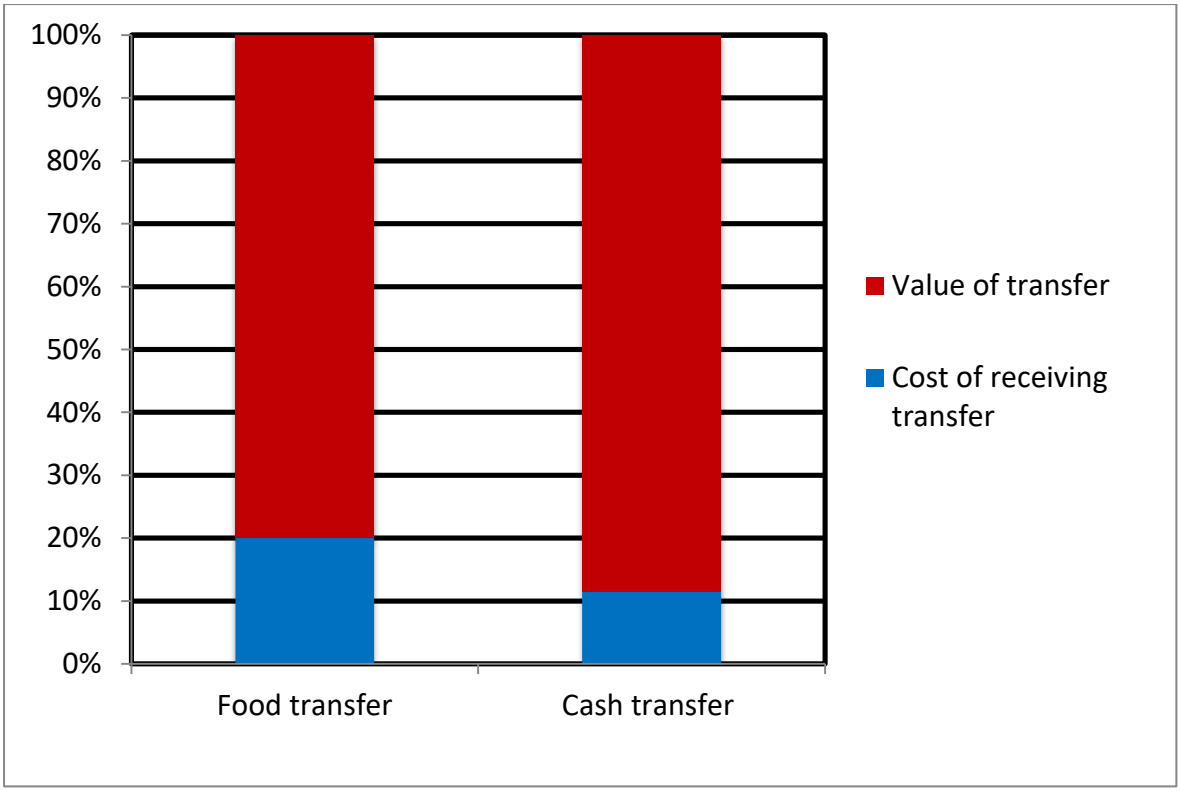


Figure 6: Cost of accessing transfer as percentage of value of transfer

## 6. Conclusion

Covid-19 poses extra-ordinary and unprecedented challenges for developing countries – both for controlling the disease and maintaining food security and livelihoods during the pandemic. Economic and social lockdown were imposed in most countries to curtail the spread of the virus. These lockdown bring severe negative impacts on the economies and the people. Many countries worldwide including African countries responded to the negative impact of Covid-19 lockdown on the citizen as well as businesses by introducing different kind of assistance and support policies. In Nigeria, food assistance and cash transfer, among other assistances, were given to the most vulnerable households as palliatives during the lockdown. In the social protection literature, a significant policy debate have long revolves around the relative effectiveness of cash versus food assistance as a response tool against food insecurity in emergencies or crisis context. In this paper, we used households survey

data collected remotely through phone calls, to analyze the preference for and effectiveness of food and cash-based assistance in the context of the current Covid-19 pandemic.

Our results show that majority of the recipients of social safety nets prefer cash transfer as against food assistance. In fact, more households prefer food-cash combination than food assistance only. Conveniences and households pressing needs are the reason for choosing either food or cash transfer. Results of the econometric analysis revealed that households with more educated heads and those with access to Bank/ATM/POS services as well as mobile phone prefer cash as against foods transfer. On the other hands, richer households, those with older heads and larger number of dependents prefer food assistance. On the effectiveness of social assistance programme, the PSM analysis results indicate that cash transfer is more effective leading to more food consumption of about 295 kilocalories per capita per day on average. Similarly, cash transfer increase households' dietary diversity index by 1.4 more than food transfer on average. In terms of cost effectiveness, our results show that cash transfer appears to be more cost-effective for the recipients costing them only half of what it cost them to access food assistance.

The results of this study have important implications for policy. First, vulnerable households seem to prefer cash as against foods or cash-food combination in emergencies situation. Therefore, in designing social protection programme for emergencies situation, consideration should be given to provision of cash transfer, especially when market infrastructure are functional. Households seems to prefer buying what their pressing needs are as long as they have access to market rather than being constraint to consuming what they were given as food assistance. Similarly, it was shown that it cost less for households – in terms of transaction costs, to access cash than foods transfer. The design of future programme should take into consideration cost-effectiveness of social assistance from the beneficiaries' perspectives. Cost-effectiveness assessment often focused only on how much it cost

government or aid agencies to deliver assistance to vulnerable households but neglecting the cost to the recipients of such assistance. Therefore, in addition to market accessibility and needs assessment studies, beneficiaries' cost analysis should be conducted and taking into consideration when planning social safety nets programme.

Second, the results of this study revealed that infrastructure especially, financial and digital infrastructure are important for the success of social safety nets programme. Households with access to banking and mobile phone services are better positioned to reap the full benefits of the social assistance. For instance, apart from security risks, it might be cheaper and more economical for households with access to these infrastructures to access the social safety nets. Apart from this, it would serve as avenue to improve financial inclusion among the poorest segment of the society. Again, this is an area that has not received sufficient attention in terms of research in the social protection literature. Overall, we found that the value of social safety nets assistance for tackling food insecurity during Covid-19 is grossly inadequate and in most cases is not the preference of the beneficiaries. Designing social safety nets programme for economic and health emergencies situation – as Covid-19 period, requires not only larger and regular transfer but also complementary market and preference analysis of the context.

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