

Pandemic-Induced Income Shock and Household Coping Strategies in Imo State, Nigeria

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Abstract: This study examined the effects of the COVID-19 pandemic on household income and coping strategies in Imo State, Nigeria. Data were collected from 360 households drawn from both rural and urban communities using a structured questionnaire through a multistage sampling procedure. Descriptive statistics and a probit regression model were used to evaluate the data. Findings revealed that the mean age of the household heads was 42 years, with rural and urban averaging 40 and 44 years, respectively. Most respondents were married (83.9%), male-dominated (72.8%), with an average household size of 6 members, and an average monthly income of ₦59,223.61. The majority (77.2%) of the respondents identified the lockdown measure as the most significant proxy for the pandemic, noting the adverse effect on their income. The probit regression results confirmed the effect of the lockdown on household income. In addition, socioeconomic variables, such as gender, primary occupation and cooperative society membership, were revealed to influence household income during the pandemic. To cope with the income shock, households mainly relied on savings ($\bar{x}=0.93$) and obtaining credit/loans from relatives/friends ($\bar{x}=0.75$), which were attributed to income loss due to the lockdown measures implemented by the government to reduce the spread of the disease. This study recommends implementing effective policy measures to safeguard the household income and ensure the survival of income-earning activities in the event of future disruptions, such as a pandemic-induced lockdown.

Keywords: COVID-19, Pandemic, Coping Strategies, Income, Household, Nigeria.

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I. INTRODUCTION

The outbreak of the coronavirus (SARS-CoV-2) in early 2020 precipitated an unprecedented global health and economic crisis, subsequently designated as COVID-19 by the World Health Organization (WHO) (Onyeneke et al., 2022). The spread of the virus and its annihilating effects were lethal and were felt across the globe, causing immense human and economic loss. By 12th August, 2021, global records indicated over 205 million cases and over 4.3 million deaths due to the pandemic had been recorded worldwide (WHO, 2021). According to Ibukun and Adebayo (2021), the presence of the virus in Nigeria was first reported on the 27th of February 2020. Subsequently, the cases rose above 67,000 and about 1,200 deaths by the end of November 2020. To control the rapid spread of the virus, practically all governments worldwide, including the Nigerian government, implemented urgent and aggressive public health measures, including lockdowns (Ogunji et al., 2021). Within Nigeria, major cities, which

include Abuja, Lagos and Ogun, experienced a five-week lockdown, while several other states also implemented several others state imposed varying levels of social and economic movement restrictions. Complementary measures, which include a social distancing protocol, were also enforced in both public and private institutions to shut down mass gatherings while permitting only those rendering essential services. Though this policy response was effective in limiting the rapid spread of the virus, it came with some negative impacts on employment and income, and a significant downturn in business activities (Ibukun & Adebayo, 2021; Onyeneke et al., 2022).

The agricultural sector, one of Nigeria's most significant economic sectors, the largest employer of labour, and the main source of income and nutrition in rural areas, was particularly vulnerable to these disruptions. Farmers faced challenges in accessing their farms, selling their produce, and making it available to consumers as and when due (Mohamed et al.,

2021). Ilesanmi et al. (2021) argue that the pandemic precipitated significant labour shortages within the agricultural sector. Given the sector's heavy reliance on manual labour due to limited mechanization, movement restrictions and lockdown measures severely constrained access to farmlands for both farmers and hired labourers. This disruption reduced the available workforce, thereby diminishing cultivation activities and overall agricultural output. Additionally, the labour deficit led to post-harvest losses of highly perishable crops, such as okra, cucumber, and tomatoes, ultimately contributing to food supply shortages in the market. This event increased the cost of food items, hunger, and posed a threat to farmers' income, where about 83 million Nigerians live below the national poverty threshold (World Bank, 2020), and 5 million citizens were projected to be forced into the poverty trap due to the COVID-19 government-implemented measures (International Monetary Fund [IMF], 2020).

Beyond agriculture, the various restrictions and lockdowns seriously impacted practically all aspects of people's livelihoods (Woodhill 2022). Earnings of multinational companies and firms also dropped, forcing them to downsize their workforce. Evidence shows households experienced substantial loss in purchasing power, with rural non-farm and urban households being the most affected (Chikaire et al. 2022). In response to the income shocks induced by the anti-COVID-19 lockdown measures, which significantly reduced household earnings (Andam et al., 2020), the Federal Government of Nigeria implemented a range of intervention measures. Prominent among these were monthly conditional cash transfers of ₦20,000 over four months to approximately 3.6 million vulnerable households, the provision of ₦30,000 survival funds to micro, small, and medium enterprises (MSMEs), distribution of food palliatives to disadvantaged groups, and the introduction of a ₦2.3 trillion economic stimulus package (Human Rights Watch, 2020).

Despite increasing attention to the socio-economic impacts of the pandemic, much of the existing literature has focused on macroeconomic outcomes, with limited empirical evidence on household-level effects, particularly in specific regions such as Imo State. The gap remains important in the state, where Chikaire et al (2022) argued to have a substantial worrisome share of ill-being, poverty and deprivation. The economic impacts of this pandemic are expected to affect households disproportionately, based on their socioeconomic status and livelihood strategies. This study therefore analyze the socioeconomics effect of the COVID-19 pandemic on household income and coping strategies in Imo state, Nigeria.

II. MATERIALS AND METHODS

Imo State is situated within the rainforest belt of southeastern Nigeria. According to Obasi et al. (2022), the state covers a land area of approximately 5,430 square kilometres and has a population of 4,060,816, yielding a population density of about 725 persons per square kilometre. Geographically, it

lies between latitudes 5°45'N and 6°35'N and longitudes 6°35'E and 7°28'E (Anyiam, Igwe, & Henry-Ukoha). The state is bounded by Abia State to the east, the Niger River and Delta State to the west, Anambra State to the north, and Rivers State to the south (Chikaire et al.). The state is predominantly agrarian and comprises 27 Local Government Areas, which are grouped into three agricultural zones: Okigwe, Orlu, and Owerri (Obasi et al., 2022).

A multistage sampling procedure was used to select 360 respondents that cut across rural and urban communities. The primary data used for this study were obtained from the household head using a structured questionnaire. In the absence of the household head, an adult who was present during the pandemic served as the respondent. (Coates et al. 2017).

This study employed descriptive and inferential statistical analysis and analytical tools based on the objective stated earlier.

➤ *Descriptive Statistics and Probit Regression*

Descriptive statistics were employed to summarize the respondents' socioeconomic characteristics and to assess whether the COVID-19 pandemic affected household income sources within the study area. To achieve this, respondents were presented with multiple-response options to capture the ways in which the pandemic affected their income and/or sources of livelihood. Subsequently, a Probit regression model was applied to estimate the factors (household socioeconomic variables) that determine whether the respondents' income has been affected by the COVID-19 pandemic.

The Probit model, first introduced by Chester Bliss in 1934, was further advanced through an efficient maximum likelihood estimation procedure proposed by Ronald Fisher in 1935. It has since become a widely used approach for modelling binary and ordinal response variables through the application of a probit link function. Typically, the model is estimated using maximum likelihood techniques, where the probability of a binary outcome ($Y = 1$) is expressed as the cumulative distribution function of the standard normal distribution, denoted as $\Phi(z)$, evaluated at a linear predictor of the form $z = \beta_0 + \beta_1 X$. Thus, the probit regression model is expressed as.

$$\Pr(Y=1|X) = \Phi(\beta_0 + \beta_1 X) \quad \text{eqn. (1)}$$

where Φ = cumulative standard normal distribution function
 $z = \beta_0 + \beta_1 X$ is the z index of the probit regression

$$\Pr(Y=1|X) = \Phi(\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10}) + \mu \quad (2)$$

Where Y = Income; dichotomous response variable (1 =there is an effect and 0 = there is no effect)

X_1 = Household size (in numbers)

X_2 = Age of the respondent (year)

X₃ = Respondent primary occupation (dummy, 1=farming, 0=otherwise)

X₄ = Respondent marital status (dummy, 1=married, 0=otherwise)

X₅= Respondent income (₦)

X₆= Respondent educational status (dummy, 1=formal education, 0=otherwise)

X₇= Gender composition of the respondent (dummy, 1=male, 0=otherwise)

X₈= Household settlement (dummy,1=urban, 0 = rural)

X₉= Member of a cooperative society (dummy, 1= yes, 0 = no)

X₁₀= COVID-19 pandemic (lockdown)

β = regression coefficient explaining changes caused in Z by changes in the independent variables.

U=error term

III. RESULTS AND DISCUSSION

Socioeconomic characteristics of the respondents

The socioeconomic characteristics of the respondents are presented in Table 1.

Table 1: Distribution of Respondents by Socioeconomic Characteristics

Variables	Rural	Urban	Pooled
Gender			
Male	145(80.6)	117 (65.0)	262(72.8)
Female	35(19.4)	63(35.0)	98(27.2)
Age			
16-30	39(21.7)	24 (13.3)	63(17.5)
31-45	57(31.7)	43(23.9)	99(27.5)
46-60	76(42.2)	104(57.8)	180(50.0)
61-75	8(4.4)	9(5.0)	18(5.0)
Mean	39.98	43.98	41.98
Marital status			
Single	24(13.3)	29 (16.1)	53(14.7)
Married	153(85.0)	149(82.8)	302(83.9)
Widowed	2(11.1)	1(0.6)	3(0.8)
Separated	1(0.6)	1(0.6)	2(0.6)
Educational status			
No formal education	13(7.2)	7(3.9)	20(5.5)
Primary Education	57(31.6)	26(14.4)	83(23.1)
Secondary Education	86(47.8)	83(46.1)	169(46.9)
Post-Secondary Education	24(13.3)	64(35.6)	88(24.4)
Household Size			
1-5	27(15.0)	49 (27.2)	76(21.1)
6-10	151(83.9)	125(69.5)	276(76.7)
11-15	2(1.1)	6(3.3)	8(2.2)
Mean	7	6	6
Major Occupation			
Civil Servant	26(14.4)	29(16.1)	55(15.3)
Farmer	117(65.0)	118(65.6)	235(65.3)
Trader	27(15.0)	25(13.9)	52(14.4)
Artisan	10(5.6)	8(4.4)	18(5.0)
Monthly income (₦)			
1000-30,000	15(8.3)	23(12.8)	38(10.6)
31,000-60,000	117(65.0)	100(55.6)	217(60.3)
61,000-90,000	33(18.3)	33(18.3)	66(18.3)
Above 90,000	15(8.3)	24(13.3)	39(10.8)
Means	₦57,602.80	₦60,844.66	₦59,223.61
Cooperative Membership			
Membership	89(49.4)	102(56.7)	191(53.1)
Non-membership	91(50.6)	78(43.3)	169(46.9)

Source: Estimated field survey for 2025. Figures in parentheses are percentages

The table above reveals that the majority (72.8%) of the households were male-headed. This was consistent across both rural and urban areas, with more male household heads in rural areas (80.6%) and in urban areas (65%). This result establishes a patriarchal dominance in this study area, and it is consistent with the findings of Onyeneke et al (2022). The implication is that even during the COVID-19 pandemic, when most household members were confined indoors and unable to procure food or other essential needs, men bore the primary responsibility for household provision, which in turn influenced food availability and consumption. The average age of household heads was 42 years, with rural and urban averages of 40 and 44 years, respectively, showing that the majority of household heads are in their productive stage, making them physically active enough to ensure food provision for their families (Mukaila et al., 2024). The pooled data reveal that the majority (83.9%) of respondents were married, and 94.5% of them had at least a secondary school education, revealing that the average household head in the study area possessed basic literacy skills. Notably, 35.6% of household heads in urban areas had a tertiary education, compared to just 13.3% in rural areas. This educational advantage in urban areas is likely to expand income opportunities because education significantly influences decision-making. This corroborates the findings of Xiong and Nui (as cited in Mukaila et al., 2024) that access to

adequate information and higher educational attainment positively affect household income. The average size of the households was 7 members, revealing a large household size that could complicate intra-household food distribution during periods of scarcity. This aligns with Balama et al. (2020), who noted that large households are more vulnerable to food insecurity. However, Mukaila et al. (2024) argued that in rural areas, larger households can be advantageous by providing sufficient family labour for farming and other related on-farm operations. Most household heads (65.3%) are engaged in agriculture, with farming or agribusiness serving as their primary occupation. This corroborates the findings of Obasi et al. (2022), who stated that farming is an occupation in the state. Pooled data reveal that approximately 60% of household heads earn between ₦31,000 and ₦60,000, with an average income of ₦ 59,223.61, which is below Nigeria’s ₦70,000 minimum wage. This low-income level limits households’ ability to adopt innovations, adapt to climate challenges, and achieve adequate farm yields, ultimately reducing their capacity to meet daily food needs and increasing the risk of food insecurity (Nwaiwu et al., 2013). About 53.1% of household heads were members of a cooperative society, whereas 45.9% were not. Membership rates varied slightly by location, with 49.4% and 56.6% of participants in rural and urban areas, respectively.

Table 2. Households' Perception of the Proxy to the COVID-19 Pandemic

s/n	Indices Describing the COVID-19 Pandemic	Mean Score	Rank
1	a period of lockdown imposition	4.802	1 st
2	a period of social distancing	4.175	2 nd
3	a period of panic purchase	3.612	3 rd
4	a period of increase in food prices	3.447	4 th
5	a period of low income	3.387	5 th
6	a period of increased use of hand sanitizers	3.302	6 th
7	a period of increase in disease spread	3.225	7 th
8	a period of job loss	3.097	8 th
9	a period of market closure	3.058	9 th
10	a period of fear of being quarantined	2.980	10 th

Source: Estimated field survey 2025

Table 2 above revealed that lockdown imposition was adopted as the primary indicator of the COVID-19 pandemic period, consistent with the view of Itheme et al. (2020), who conceptualised the pandemic as a “lockdown period.” The findings further reveal that periods characterized by social distancing, panic buying, and rising food prices were ranked second, third, and fourth, with mean scores of 4.175, 3.617, and 3.447, respectively. This was followed by periods of reduced income (3.387), increased utilization of hand sanitizers (3.302), and a rise in the incidence of other diseases (3.225), which occupied the fifth, sixth, and seventh positions. Finally, job losses, market closures, and fears of quarantine were ranked eighth, ninth, and tenth, with mean scores of 3.097, 3.058, and 2.980, respectively.

Table 3: The Effect of the COVID-19 Pandemic on Household Income

Effect	Rural	Urban	Pooled (Rural and Urban)
Effect	141(78.3)	139(77.2)	280(77.8)
No Effect	38(21.7)	41(22.8)	80(22.2)
Total	180(100)	180(100)	360(100)

Source: Estimated field survey 2025. Figures in parentheses are in percentage (%)

The findings presented in Table 3 show that a substantial proportion of respondents acknowledged that their income was adversely affected by the COVID-19 pandemic. In both rural and urban settings, a similar pattern was observed, with 78.3% and 77.2% of respondents, respectively, reporting income disruptions attributable to the pandemic. This trend is further corroborated by the pooled data, which reveals that approximately 78% of the sampled households experienced a decline or disruption in income during the period under review.

Table 4. Regression Analysis of the Effect of COVID-19 on Household Income and Socioeconomic Characteristics that Affected Households' Income During the Pandemic

Explanatory variables	Coefficients	Standard Error	T- Value	Significant
COVID-19 (Lockdown)	0.0382**	0.0200	1.91	0.044
Household settlement	-0.0990	0.1752	-0.56	0.571
Gender	0.3307*	0.1879	1.76	0.063
Age	-0.0079	0.0069	-1.15	0.248
Marital status	-0.2476	0.2054	-1.21	0.227
Level of education	-0.0909	0.1034	-0.88	0.378
Household Size	0.0296	0.0452	0.66	0.657
Primary occupation	0.1176*	0.0623	1.89	0.056
Average Income	-4.38e-06	3.55e-06	-1.23	0.218
Member of a Cooperative society	-0.1875**	0.1001	1.90	0.049
Constant	1.7420	1.0228	1.70	0.008
Number of Observations	360			
LR Chi2(12)	11.47			
Pr>Chi2	0.034			
Pseudo R2	32.18			

Source: Estimated field survey 2025. Note: ** and * are significant at 5% and 10% respectively

Table 4 reveals the outcomes of the Probit regression analysis examining the impact of lockdown measures on household income, as well as the socioeconomic factors influencing income changes during the pandemic. The results indicate a pseudo R-squared value of 0.3218 (32.18%), suggesting a moderate explanatory power of the model. The Chi-square statistic (11.47) and log-likelihood value (-159.6445) further confirm the overall statistical significance and adequacy of the model fit. Collectively, these indicators demonstrate that the model is appropriate for explaining variations in household income associated with the COVID-19 pandemic and related socioeconomic determinants within the study area. The Chi-square probability value of 0.034 indicates statistical significance at the 5% level ($p < 0.05$).

The results reveal that the COVID-19 pandemic ($p < 0.10$), gender ($p < 0.05$), primary occupation ($p < 0.10$), and membership in cooperative societies ($p < 0.05$) were statistically significant determinants of household income effects during the period under review. Specifically, the COVID-19 lockdown variable ($p < 0.10$) and gender ($p < 0.05$) exhibited a negative and significant relationship with income outcomes, while primary occupation ($p < 0.10$) and cooperative society membership ($p < 0.05$) also showed significant associations with income shock during the crisis period. The results further indicate a positive relationship between the duration of the COVID-19 lockdown and income disruption, implying that the probability of income being adversely affected increased as the crisis persisted. This suggests that households' regular income streams were negatively impacted

by both the pandemic period and the restrictive measures implemented to contain its spread. This observation is consistent with the findings of Kansime et al., who reported that COVID-19 lockdown measures triggered significant income shocks across household livelihood activities.

Further findings indicate that gender had a positive and statistically significant effect on household income shock, implying that male-headed households were more susceptible to income disruptions during the COVID-19 lockdown period. This finding aligns with the explanation provided by Kansime et al. (2021), who argue that a considerable proportion of male respondents engage in multiple income-generating activities, thereby exposing them to compounded income losses during the pandemic. Similarly, Belard et al. (2020) observed that the labour market consequences of the COVID-19 lockdown disproportionately affected men relative to women.

The findings indicate that cooperative society membership exhibited a negative relationship with income shock, suggesting that the likelihood of experiencing income disruptions during the COVID-19 lockdown decreased as more household heads participated in cooperative associations. This implies that affiliation with cooperative structures, such as credit and thrift societies, may serve as a buffer against the adverse income effects associated with the pandemic.

Finally, the results show a significant negative relationship between primary occupation and the probability of experiencing pandemic-related income shocks. This suggests

that households engaged in relatively better-paying primary occupations were less vulnerable to income disruptions arising from the lockdown and were better positioned to mitigate the

financial risks associated with the pandemic compared to lower-income households.

Table 5. Coping Strategies Adopted to Cushion the COVID-19 Lockdown Effect on Household Income

s/n	Coping Strategy	Rural (%)	Urban (%)	Pooled (%)	Mean score
1	Relied on savings	168(93.3)	166(92.2)	334(92.7)	0.93
2	Obtained credit/loan	135(75.0)	138(76.7)	273(75.8)	0.75
3	Unconditional aid from relatives/friends	93(51.7)	91(50.5)	184(53.1)	0.52
4	Distress sale of household assets/livestock	95(52.7)	89(49.4)	184(51.1)	0.51
5	Send household members to live elsewhere	64(35.5)	77(42.7)	141(39.2)	0.39

Source: Estimated field survey 2025. Figures in parentheses are in percentage (%)

Table 5 presents respondents' coping mechanisms adopted to mitigate the adverse income effects of the COVID-19 crisis within the study area. The mean scores indicate that reliance on personal savings was the most commonly adopted strategy among households in both rural (93.3%) and urban (92.2%) areas, with a mean score of 0.93. This finding is consistent with Kansime et al., who identified savings as one of the primary coping mechanisms during the pandemic period.

Households also resorted to accessing credit facilities or loans to cushion the income shock, as reflected in a mean score of 0.75. This was followed by seeking unconditional assistance from relatives and friends, with a mean score of 0.52. Distress sales of assets ranked last but one of the least adopted strategies (mean score = 0.51), corroborating the finding of Onunka et al. (2018) that households typically avoid asset liquidation due to its long-term implications for food security and livelihood stability.

The least adopted coping strategy among both rural and urban households was the relocation of household members to live and consume food elsewhere, reflecting its low acceptability as a response to COVID-19-induced income shocks.

IV. CONCLUSION

This research paper used primary data obtained during the pandemic to analyze the effect of the COVID-19 pandemic on the incomes of urban as well as rural households. Based on the empirical evidence emanating from the descriptive and inferential statistics employed, this study concludes that there is a significant effect on household income during the COVID-19 pandemic, with variations observed across the two study areas. In response, households employed a range of coping strategies, including relying on savings, obtaining credit/loan, Unconditional aid from relatives/friends, Distress sale of household assets/livestock and sending household members to live elsewhere. The most common approach during the COVID-19 pandemic was reliance on savings as a means of managing the income shock. This coping strategy is, however, susceptible to depleting quite quickly, particularly for low-income households, in the event of a long-lasting pandemic and

government-imposed lockdown measures. The study recommends implementing effective policy measures to safeguard the household income and ensure the survival of income-earning activities in the event of future disruptions, such as a pandemic-induced lockdown.

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