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Original Article

Covid-19 Vaccination Compliance Among Rural Farming Households in Kwara State: Characteristics and Drivers

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A B S T R A C T

The covid-19 Pandemic has contributed significantly to food crises in Sub-Saharan Africa, Nigeria inclusive. While vaccines have been successfully developed to ameliorate the impact of covid-19 infection, the level and drivers of compliance among farmers have not been adequately documented. This study examined the level of compliance as well as the drivers of compliance to covid-19 vaccination among farmers in Ilorin East Local Government Area of Kwara State, Nigeria. We conducted a farm survey among 120 households drawn through a 3-staged sampling technique. The cross-sectional data obtained were analyzed with descriptive statistics and a logistic regression model. The results of the data analysis show that 87.5 % of the farmers have been vaccinated. 62.5% of the farmers reported that their farming activities were affected adversely by the pandemic. 42.5% of the affected farmers claimed that the effect of covid on their farming activities actually manifested in form of pest infestation. The majority (77.5%) of the affected farmers reported that they recorded financial losses with 71.1% of them recording severe wastages in their farm produce due to delayed harvesting. Household size and years of schooling were the significant determinants of Covid-19 vaccination compliance in the study area. It was thus recommended that efforts should be geared towards educating the rural populace to achieve 100% vaccination for sound health and higher productivity among farmers.

Introduction

The ability of households to produce is either enhanced or diminished by health as a capital good (Schneider-Kamp, 2021). Due to the global goal of food security and the eradication of extreme poverty, issues regarding farmers' health and productivity have received a lot of attention in recent years (FAO, 2020). This goal has been seriously threatened by the COVID-19 pandemic. Before the pandemic, adverse effects of climate change, pests, and illnesses were affecting the food systems in underdeveloped countries in addition to inefficiencies (Shimeles et al., 2018; Pais, 2022; Nchanji and Lutomia, 2021).

The efficiency of the food systems is already being negatively impacted by the unprecedentedly quick and widespread spread of the coronavirus (Nchanji and Lutomia, 2021). The worldwide pandemic will have an impact on nutrition, food security, and access to food in a number of ways, according to FAO (2020). Countries have implemented containment measures with varying degrees of rigor in response to the deadly virus's spread (Anderson et al., 2020). Depending on how stringent they were, the regulations affected how food was produced, distributed, and consumed, which raised concerns about how they would affect the already severe issues with food security in developing nations (Nchanji et al., 2020).

An unparalleled global effort has been made since the discovery of the new coronavirus to stop and slow its transmission (WHO, 2020). In addition to preventative measures, a vaccine has been created. Despite these results, it has been difficult to persuade some people to get the vaccine. As one of the top countries with declining rates of vaccination against vaccine-preventable diseases, Nigeria is the focus of the difficulty of administering vaccination in Africa (Akanbi et al, 2015). This situation is of greater

concern among farming households in rural areas who might be miss informed, fearful and, lack trust in orthodox medical interventions (Albers *et al.*, 2022; Opel *et al*, 2015; O'leary *et al.*, 2015). As a result, this study was carried out to determine the level of compliance and to provide policy suggestions for increasing immunization in rural regions, which is the responsibility of agriculture.

Specifically, the study: analyzed the socioeconomic characteristics of farmers; examined the effect of covid-19 on farming activities; considered the level of covid 19 vaccination compliance among farmers in the study area, and identified the drivers of covid-19 vaccination compliance among farmers.

Materials and Methods
The Study Area
The study was conducted in Ilorin East Local Government Area (LGA) of Kwara State. This local government was purposively selected due to the presence of numerous farming communities in the LGA.
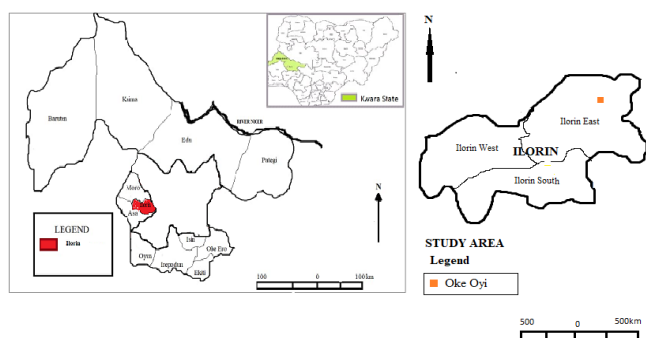

Figure 1. Map of study Area.
Source: Authors' design

Source of Data
Cross-sectional data were obtained through a semi-structured interview schedule conducted among 120 farming households in the study area. The instrument for data collection was a questionnaire deployed through the kobo toolbox app.

Sampling Techniques
The samples for this study were drawn through a 3 staged sampling technique. Stage one involves the purposive selection of Ilorin East LGA. Stage two involves the random selection of 3 farming communities. The third stage involves the random selection of 40 households in each of the communities. A total of 120 households were sampled for the study.

Method of Data Analysis
Descriptive Analysis
Descriptive statistics including frequency counts, mean and percentage was be used to describe the socio-economic of the respondents as well as to analyze their covid 19 vaccination compliance status.

Binary Logit Regression Model
Logit binary regression model use maximum estimation method to fit binary or ordinary dependent variable. In this study the dependent variable is binary.

$$p0P(Y = \frac{1}{x_i} \dots \dots \dots \dots \dots x_k = f(x_{i \dots \dots} x_k).$$

Equation (I) can be written as a logistic distribution function;

$$P(Y = \frac{1}{x_i} \dots \dots \dots \dots \dots x_k = \frac{\exp(\beta_0 + \beta_i x_i + \cdots \beta_n x_n}{1 - \exp(\beta_0 + \beta_i x_i + \cdots \beta_n x_n}.$$

Equation (II) can also be written as,

$$logit P(Y = \frac{1}{x_i} \dots \dots \dots \dots \dots x_k = \beta_0 + \beta_i x_i + \cdots \beta_n x_n.$$

Where:
Y = vaccination status (yes = 1 and no = 0)
X_i = independent variables and Y = dependent variable
The independent variables are defined as follows:
X_i = Age (years)
X_2 = Gender (male=1, female=0)
X_3 = Marital status (Single = 0, married = 1, divorce = 2, widowed = 3)
X_4 = Household size
X_5 = Educational status(years)
X_6 = Proximity to health center
X_7 = Income (naira)
X_8 = Contact with extension agent (yes = 1, no = 0)

Results and Discussion
Table 1. Socioeconomic Characteristics.

Variables	Categories	Freq	Percent	Mean	S.D
Age	31-40	10	8.3		
	41-50	42	35		
	51-60	46	38.3	52.3	9.03
	61-70	20	16.7		
	>71	2	1.7		
Gender	Male	102	85	60	42
	Female	18	15		
Marital Status	Single	5	4.2	30	39.3
	Married	98	81.6		
	Divorce	7	5.8		
	Widow	10	8.1		
Household size	1-5	16	13.3		
	6-10	69	57.5	8.79	3.16
	>10	35	29.2		
Educational Status	Primary	78	65	5.67	3.90
	Secondary	34	28.3		
	Tertiary	8	6.7		
Membership of Co-operative Association	Yes	106	88.3	0.71	0.45
	No	14	11.7		
Access to Extension Visit	Yes	112	93.3	0.233	0.95
	No	8	6.7		
Number of Contact	0	8	6.7	4.86	8.35
	1	90	75		
	2	22	18.3		
Farm Income (₦)	21,000-30,000	14	11.7	45175	14673.2
	31,000-40,000	10	8.3		
	41,000-50,000	47	39.2		
	51,000-60,000	18	15		
	> 61,000	22	18.3		
Off farm income (₦)	11,000-20,000	61	50.8	24417	11090
	21,000-30,000	31	25.8		
	31,000-40,000	8	6.7		
	>41,000	20	16.7		

Source: Field Survey, 2022

According to the socioeconomic profile of the respondents, 85 percent of farmers are male and 15 percent are female. About 38 percent of farmers are over the age of 51, indicating that farming is primarily carried out by older people, particularly in Ilorin East, L.G.A. of Kwara State, Nigeria, where only 8.3 percent of farmers are over 30. According to additional socioeconomic data on table 1, 81.6 percent of respondents are married, 4.2 percent are single, 5.8 percent are divorced, and 8 percent are widowed.

According to the results, 57.5% of farmers live in households with a size between 6 and 10, 13.3% have a household with a size between 1 and 5, and 29.2% have a household with a size of 10 or more. The area's farmers have a fair literacy rate; over 65 percent have completed their primary school, 28.3 percent completed their secondary education, and 6.7 percent completed their university education. Additionally, 88.3 % of respondents identify as members of a cooperative society. Findings also indicate that 75% of respondents said they had contact with extension agents once a year, 18.3% said they have had contact twice a year, and 6.7% said they had no contact with extension agents at all.

According to the farm income, farming is the farmers' main source of income, but they also engage in non-agricultural activities that generate additional revenue for the respondents' households in the research area. Only 7.5% of farmers, according to the survey, make less than the minimum wage.

Table 2. Compliance of respondent to covid-19 vaccination.

Vaccination Status	Male frequency	(%)	Female frequency	(%)
Vaccinated	89	74.2	16	13.3
Not Vaccinated	12	10	3	2.5

Source: Field survey, 2022

According to Table 2 above, 74.16% and 13.33% of male and female farmers, respectively, have received the COVID-19 immunization. While 2.5% of women and 10% of men farmers lack vaccinations.

Effect of Covid 19 on farming Activities in the study Area
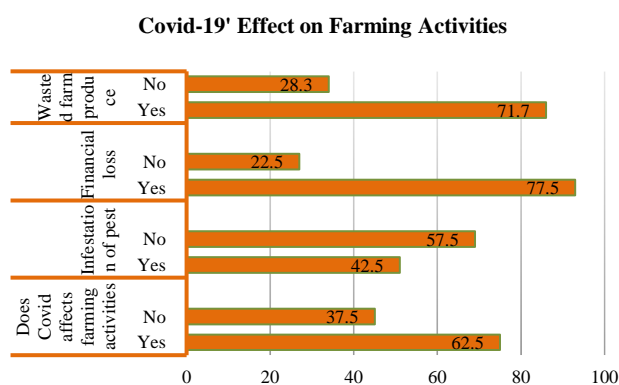

Covid-19' Effect on Farming Activities

Figure 2. Effect of Covid-19 on farming activities.

The responses of the respondents who were interviewed regarding how their farming activities are impacted by COVID-19 during the lockdown are shown in Figure 2. While the remaining 37.5 percent of farmers said they were not affected by COVID-19, 62.5 percent of farmers indicated

that COVID-19 had an impact on their farming activities. Considering that they were unable to spray their crop farms due to movement restrictions that impeded their access to agrochemicals to spray the farm, 42.5% of the affected farmers reported that the effect of COVID on their farming activities truly appeared in the form of pest infestation.

Majority (77.5%) of the affected farmers reported that they recorded financial losses due to the pandemic which consequently led to a lock down. This loss was mainly due to post harvest loss of their crops which they were unable to harvest at the right time. Some of these crops were lost to on-farm theft, cattle grazing and delayed harvesting. In particular, 71.7% of the affected farmers recorded wastages in their farm produce due to the afore mentioned issues.

Table 3. Drivers of Covid-19 vaccination compliance in the study area.

Variables	Coefficient	S.E.	p-value
Intercept	16.75558	9849.15	0.998643
Distance to nearest health center (km)	-0.05251	0.167615	0.754068
Monthly income (Naira)	4.61E-06	1.85E-05	0.802916
Age (yrs)	-0.02479	0.044139	0.574371
Gender	0.760992	0.831698	0.360199
Household size	0.508334**	0.276988	0.043900
Marital status	0.247983	0.563316	0.659778
Religion intensity	-8.35020	0.053343	0.166885
Education level (yrs)	0.408563**	2.608578	0.040000
Extension visits	-18.3023	8083.23	0.998193

Source: field survey, 2022

The factors that influence farmers in the research area's compliance with the covid-19 immunization are identified in this section. The respondent's immunization status in the research area is our dependent variable, and our independent factors are the respondent's age, household size, proximity to a health center, gender, educational attainment, income, level of religiosity, and interaction with extension agents. Education level and household size were the main influencers of compliance.

There is a statistically significant association between the level of education and compliance with COVID-19, as the table's level of education (years) has a p-value of 0.04 which is less than 0.05. According to the formal education coefficient (p-value of 4.096), vaccine compliance rises with education level. This finding is consistent with the findings of Raghupathi and Raghupathi, 2020, who found that adults with greater levels of education have longer lifespans and better health than their contemporaries with lower levels of education.

It can be also deduced from the table that household size has a p-value of 0.043 which is <0.05, this indicates that household size has a significant effect on covid-19 vaccination. Although this finding negates the report of Danish and Mohammad, 2014 who opined that households with fewer persons are more favourably disposed to acceptance of vaccination in Pakistan, it aligns with the findings of Bonsang and Pronkina, 2021. The latter duo reported that larger family sizes increase the probability of getting covid 19 vaccine.

Conclusion

The study has explored the compliance of farmers to covid-19 vaccination in Ilorin East, Kwara state. This study will help in future decision-making regarding the expansion of

immunization programs for farming households in rural Nigeria, as it has identified its drivers. The findings of the study are quite impressive with an 87.5 % level of compliance in the study area. Educational level and household size are the significant variables that contribute to vaccination intake in the study area. Extension and public vaccination agencies should gear efforts towards more sensitization to achieve 100% vaccination in the study area.

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