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**RESEARCH ARTICLE**

# Farmers Adaptive Capacities to Poverty-Related Diseases in Riverine Communities in Kogi State, Nigeria

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## ABSTRACT

Many of the diseases contributing to the disease burden in low-income countries are tightly linked to the debilitating conditions of poverty. At the global level, there are three primary poverty-related diseases (PRDs): acquired immunodeficiency syndrome, malaria, and tuberculosis. This study determining the farmers adaptive capacities to PRDs in Riverine communities in Kogi State, Nigeria. Primary data were collected from respondents; a multistage sampling technique was used to select respondents in Kogi State. Descriptive statistics and multivariate probit regression method were used to achieve objectives in the study areas. The findings reveal that the use of mosquito nets was common adaptation measure to reduce PRDs. It also shows that off-farm business and gender were positive and statistically significant at 5% and 10% level affects malaria, respectively. It was concluded that education, farming experience, off-farm income, access to credit, and sanitation of environment were the determinants of the adaptative capacities to PRDs by respondent in the study area. The study recommends that to reduce the effect of PRDs, there is need for policy makers to engage communities when taking decisions relating to their health.

**Key words:** Adaptive capacities, poverty related diseases, Adaptive, poverty and Diseases

## INTRODUCTION

Poverty is a major cause of diseases and a barrier to accessing health care when needed.[13] Poverty and diseases are closely tied with each factor aiding the other.[11] This relationship is financial, the poor cannot afford to purchase those things that are needed for good health, including sufficient quantities of quality food and health care. Diseases, in turn, are a major cause of poverty. This is partly due to the costs of seeking health care, which include not only out-of-pocket spending on care (such as consultations, tests, and medicine), but also transportation costs and any informal payments to health-care providers which can reduce farmer scares resource.[6] Poverty disease is a term sometimes used to collectively describe diseases, disabilities, and health conditions that are more prevalent among the poor than among wealthier people. In many cases, poverty is considered the leading risk factor or determinant for such diseases and in some cases, the diseases themselves are identified as barriers to economic development that would end poverty.[10]

At the global level, there are three primary poverty-related diseases (PRDs): acquired immunodeficiency syndrome (AIDS), malaria, and tuberculosis (TB). Developing countries account for 95% of the global AIDS prevalence, 98% of active TB infections, and 90% of malaria deaths occur in sub-Saharan Africa (Adjei *et al*., 2012). Diseases of poverty kill approximately 14 million people annually.[11] For example, malaria attacks an individual on average of four times in a year with an average of 10–14 days of incapacitation in Africa.[3] Nearly every minute,

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a child under 5 dies of malaria. Many of these deaths are preventable and treatable. In 2021, there were 247 million malaria cases globally that led to 619,000 deaths in total. Of these deaths, 77% were children under 5 years of age. This translates into a daily toll of over one thousand children under age 5. Malaria is an urgent public health priority. The disease and the costs of its treatment trap families in a cycle of illness, suffering, and poverty. Today, nearly half of the world's population, most of whom live in sub-Saharan Africa, are at risk for developing malaria and facing its economic challenges.[13] In 2022, an estimated US$16.4 billion was invested in malaria control and elimination efforts globally by Global Fund of all international financing for malaria programs.[13]

The diseases that primarily affect the poor serve to also deepen poverty and worsen conditions (Wiggins, 2019). Poverty also significantly reduces people's capabilities, making it more difficult to avoid PRDs.[11] Majority of the diseases and related mortalities in poor countries are preventable and treatable diseases for which, medicine and treatment regimens are readily available. Poverty is in many cases the single dominating factor in higher rates of prevalence of these diseases. Poor hygiene, ignorance in health-related education, non-availability of safe drinking water, inadequate nutrition, and indoor pollution are factors exacerbated by poverty (Wiggins, 2019).

PRDs are not only a health problem, it is also an economic problem. Diseases at the household level affect productivity of the people and their assets acquisition capacity. Households also frequently spend substantial share of their incomes and time on poverty diseases such as malaria prevention and treatment, as well as an effort to control mosquitoes.[2] The cost of prevention and treatment continue to consumes scarce households' resources. In addition, as some household members spend their productive time caring for those under disease attack, they themselves in turn seek rescue from the onslaught of the diseases.[3] Rural farmers unlike the fixed wage earners not only lose valuable working hours in treating the sickness but also lose income that would have been generated at this period. This poor health status thus directly affects the productive capacity of the households.

Illness is able to fuel the poverty situation of farmers in riverine communities of Kogi State Nigeria by inhibiting critical investment plans at the household level; productivity and income losses from diseases infection in this area are likely to linked with the growing poverty, among rural households. The gaps in knowledge of adaptive capacity to PRDs research are still in a rather primitive stage and many of the direct and indirect PRDs have not been fully identified or understood. Hence, although a lot is known about the science of diseases, there remain many uncertainties of its potential impact on adaptive capacity of farmers. Yet, this message has failed to penetrate public discussions on health policies. At the moment, few studies that have considered PRDs were at global perspective or regional aggregates. This research has narrowed it down to a State along Riverine communities of Kogi State in Nigeria for easy use by policy makers. Thus, this study is expected to add to the scanty knowledge in this area of research. In trying to find possible solutions to the farmers adaptive capacities to PRDs, the following research questions will be addressed in this study: What are the adaptive capacities to PRDs in the study areas?

## METHODOLOGY

The data were obtained through the administration of questionnaire to elicit information from the respondents, on the socioeconomic characteristics of the farmers such as age, marital status, gender, education, household size, farming experience, farmland size, the extent of awareness of poverty diseases, annual income, types of treatment used, and various adaptation measures to poverty diseases. The researcher was assisted by trained enumerators from the State's Agricultural Development Programme to carry out data collection.

### Methods of Data Analysis

Objectives were achieved using multivariate probit regression method to analyze the farmers adaptive capacity to PRDs. This is because of the binary nature of the dependent variable. The model is stated as follows: *n*

$$Y_i = \eta + \beta_i \sum = Z_i + e_i \quad (1)$$

*i=1*

$Y_i$ = Dependent variable

$Y_1$ = Malaria
$Y_2$ = HIV/AIDS
$Y_3$ = Tuberculosis
$\beta_i$ = Estimated as the parameters, while
$Z_i$ = Are the explanatory variables as presented in Table 1.

## RESULTS AND DISCUSSION

### Frequently of Use to Adaptation Strategies to PRDs

The result in Table 2 reveals that the use of mosquito nets was common adaptation measure to reduce poverty diseases with a mean score of 4.53, followed by sanitation of the environment and use of insecticides, with their means scores of 4.51 and 4.35, respectively. This implies that the majority of the respondents use mosquito nets as means of preventing malaria diseases in their areas. This finding is in line with the study of Gething (2014), who reported that the use of mosquito nets is one of the recommended measures to prevent malaria.

### Factors Influencing Adaptive Capacities to Poverty Diseases

The results of factors influencing adaptive capacities to poverty diseases from multivariate probit model are presented in Table 3. The result revealed that the Chi-square value was 33.0 which implies that the entire model was significant at $P < 0.01$ level probability. The result shows that off-farm business and gender were positive and statistically significant at $P < 0.05$ and $P < 0.10$ level affects malaria, respectively. Which show that malaria tends to increases by 0.419 and 0.466 implying malaria occurrence increases with increased in off-farm business and gender by 41.9% and 46.6% probability level, respectively. The finding agrees with[13] which reported that available evidence suggested that given equal exposure, adult men and women are equally vulnerable to malaria infection, except for pregnant women who are at greater risk of severe malaria in most endemic areas. The findings were also supported by Wiseman *et al.* (2013) who reported that malaria inhibits agricultural productivity such as ill-health or pre-mature death of farmers, which leads to decrease in farm output. This decrease in output may discourage respondents from solely depend on farming for their livelihood, therefore, engaged in off-farm businesses activities.

Furthermore, the result revealed that experience was statistically significant at $P < 0.01$ affects malaria. This indicated that malaria is likely to decrease by 0.022 implies that malaria occurrence decreases with an increased in experience by 2.2% probability level. This is in agreement with the findings of Alexander *et al.* (2018)[1] who revealed that people who have experienced cycles of malaria attacks will be able to tell the signs and symptoms of the disease and build strong adaptive capacities.

The result shows that types of accommodation, education, and sanitation of the environment were statistically significant at $P < 0.05$ and $P < 0.10$ level

**Table 1:** Explanatory variable influencing respondents, climate change adaptive capacity to poverty diseases

| Variable | Definition and measurement | Expected sign |
|---|---|---|
| Age | Age (years) | Positive |
| GED | Gender (male=1, female=0) | Neutral |
| MAR | Marital status (married=1, 0 otherwise) | Positive |
| TOA | Types of accommodation (modern=1, otherwise=0) | Positive |
| EDU | Education (years) | Positive |
| EXP | Experience (years) | Positive |
| ASD | Amount spent on drugs (Naira) | Negative |
| SOE | Sanitation of environment (yes=1, no=0) | Positive |
| OFF-FARM | Income obtained from off-farm business (Naira) | Positive |
| ACREDIT | Access to credit (Naira) | Positive |
| VTH | Visit to hospital (km) | Negative |

**Table 2:** Frequently used adaptation strategies measure to poverty-related diseases

| Strategies | Weighted sum | Weighted mean |
|---|---|---|
| Use of mosquito's net | 1587 | 4.53 |
| Sanitation of environment | 1530 | 4.51 |
| Use of insecticides | 1253 | 4.35 |
| Preventive drugs | 1231 | 3.57 |
| Use of herbs | 1135 | 3.50 |
| Visit healthcare | 855 | 3.20 |
| Relocation | 746 | 2.42 |
| Spiritual head | 742 | 2.11 |
| Change source of water | 565 | 2.10 |

Source: Computation from field survey, 2020

**Table 3:** Estimate of factors influencing adaptive capacities to poverty diseases (pooled)

| Variables | Parameters | Malaria | HIV/AIDS | TB |
|---|---|---|---|---|
| Constant | $\delta_1$ | 0.5650 (0.557) | −1.1537** (0.616) | −1.9064*** (0.570) |
| Age (years) | $\delta_2$ | −0.0009 (0.008) | −0.0007 (0.010) | 0.0119 (0.009) |
| Gender | $\delta_3$ | 0.4654* (0.260) | 0.1636 (0.246) | −0.0669 (0.281) |
| Marital status | $\delta_4$ | −0.01575 (0.114) | −0.1048 (0.137) | 0.5181 (0.126) |
| Types of accommodation | $\delta_5$ | 0.1276 (0.177) | −0.4993** (0.204) | −0.3334 (0.229) |
| Education (years) | $\delta_6$ | −0.0185 (0.018) | −0.0263* (0.014) | −0.0295* (0.016) |
| Experience (years) | $\delta_7$ | −0.0220*** (0.075) | −0.0133 (0.008) | −0.0043 (0.010) |
| Amount spent on drugs (Naira) | $\delta_8$ | 0.0749 (0.167) | 0.1716 (0.191) | −0.2329 (0.237) |
| Sanitation of environment | $\delta_9$ | −0.1244 (0.169) | −0.3134* (0.179) | 0.1176 (0.223) |
| Off-farm business (Naira) | $\delta_{10}$ | 0.4185** (0.183) | 0.0987 (0.207) | 0.3294 (0.251) |
| Access to credit (Naira) | $\delta_{11}$ | 0.02388 (0.233) | 0.0804 (0.271) | 0.7739*** (0.256) |
| Visit to spiritual head (km) | $\delta_{12}$ | −0.1804 (0.175) | −0.2885 (0.211) | −0.3090 (0.252) |
| Model Chi-square | $\delta_{13}$ | 33.000 | | |
| Probability>Chi-square | $\delta_{14}$ | 0.0001 | | |

*10% level of significance, **5% level of significance, ***1% level of significance. SE in parentheses are in parenthesis. Source: Field survey, 2020. SE: Standard error, AIDS: Acquired immunodeficiency syndrome, TB: Tuberculosis

affects HIV/AIDS. This show that HIV/AIDS tends to increase by 0.499, 0.313, and 0.080 implying HIV/AIDS occurrence decreases with increased in types of accommodation, education, and sanitation of environment by 49.9%, 31.3%, and 8.0% level of probability, respectively. The finding agrees with the report of[13] which affirmed that HIV/AIDS education is a common and well-proven intervention strategy for providing information on adaptive capacities to HIV/AIDS in communities, especially the young people.

Furthermore, the result revealed that education was statistically significant at $P < 0.10$ affects TB. This indicated that TB is likely to decrease by 0.029 implies that TB occurrence will decrease with increase in education by 2.9% level of probability. This finding agrees with[7] who affirmed that malaria infection is an important cause of school absenteeism among African children, which may affect their school performance.

Access to credit was positively and statistically significant at $P < 0.01$ affecting TB. This indicates that TB will likely increase by 0.774. This implies that TB will increase with increased access to credit with 77.4% level of probability. According to the WHO (2018)[13] which reported that in 2017, an estimated 1 million children became ill with TB and 230 000 children died due to fact that most people in rural areas are poor and lack funds to purchased curative and preventive drugs.

## CONCLUSION

Based on the empirical evidence emanating from this study, it was concluded that education, farming experience, off-farm income, access to credit, and sanitation of the environment were the determinants of the adaptative capacities to PRDs by respondents in the study area. It was recommended that farmers should be educated on the causes of poverty-related diseases.

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