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Abstract- Increasing urban growth is significantly transforming food landscape. However, consumption of a diverse diet is constrained by different factors owing to disparities in extent of access to nutritionally and safe food in most urban areas. This paper using cross-sectional data from 445 urban households in Nigeria, analyses the determinants of dietary diversity using the Berry Index and Quantile regression model. Income of household head, household size and level of urbanisation were important factors that influenced household's consumption of a diverse diet. However, the rate of influence varies in magnitude across quantiles. Results revealed heterogeneous level of dietary diversity across quantiles which suggests disparities in intake of wider varieties of food in urban settings. Suitable policy interventions are identified.

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I. Introduction

In recent times, consumers have shifted away from diets of varying nutritional qualities toward diets of edible oil and animal-source foods (Doan, 2014). This profound shifts in diets often less diversified in nutrients and lower in fiber, termed nutrition transition is responsible for the prevalence of non-communicable diseases and other diet-related diseases (Cockx, et al., 2017; Olawuyi and Adeoye, 2018). This trend is accentuated by growth in per capita income, population, economic development, changing socioeconomic status and rising urbanisation (Seto and Ramakutty, 2016; Zhou and Staatz, 2016). In Nigeria, these transitions have contributed to significant changes in food consumption pattern with urban households consistently shifting away from traditional foods to more animal based diets and processed foods (Liverpool-Tasie et al., 2016). More specifically, urbanization has been identified as a crucial determinant of dietary patterns and considered as one of the driving forces behind the nutrition transition (Cockx et al., 2017). As a result of rapid urban growth, most developing countries are now burdened with the triple burden of malnutrition which encompasses undernourishment, micronutrient deficiencies and over-nutrition (Olawuyi and Adeoye, 2018). Although, food insecurity still remains primarily a rural phenomenon, the rapidly expanding proportion of urban poor further posits a greater policy attention towards the urban food secure. A significant proportion of these urban population are micronutrient deficient, while some other subpopulations suffer from over-nutrition and obesity as a consequence of more sedentary lifestyles. There remains an unmet need to investigate urban differentials in household dietary pattern.

With the rise in income and urban population, having sufficient resources to afford a safe food in terms of food accessibility is the most important dimension of food security in urban areas as urban residents are net food buyers (Kuku-Shittu et al., 2013; Ruel et al., 2017). However, extent of access to these foods are threatened by changing socioeconomic status, income inequality and high food prices resulting to increased urban food insecurity (Omonona and Agoi, 2007; Babalola and Isitor, 2014). Also, varying social class as a result of rural-urban migration is expected to affect level of access to food owing to high rate of unemployment in the formal sector and seasonal variation at the informal. This often restrict amount of money expended on nutrient-rich foods in order to meet their basic food requirements, thus consumption of foods with low nutritional value which tend towards poor food utilisation. Decline in the ratio of food producers to food consumers and weakens rural-urban food linkages as urban population grows increases household's dependence on commercial food supplies compare to own production. This suggests inadequate access to food as opposed to inadequate food supply which has been identified as a critical challenge towards consumption of diverse diet. This trend is evident as low proportions of households in Nigeria have adequate access to food, coupled with the rise in triple burden of malnutrition (Akerele, 2015; International Food Policy Research Institute, (IFPRI), 2017).

Given that Nigeria is currently in the midst of an unprecedented wave of urbanisation with about 51.3 % of its population living in urban areas (United Nations, 2018), such trend will likely influence urban food consumption. This posits different challenges with respect to food demand and food systems. Poor understanding of dietary pattern within urban areas of Nigeria might hinder effective orientation and strategies towards food driven improvements especially for the urban poor. Therefore, empirical understanding of Nigerian urban food environment and changing dietary pattern is important to correctly predict urban dietary

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intake and develop the right policies towards making agriculture work for food and nutrition security.

In literature, several studies have examined the effect of various socioeconomics characteristics on dietary diversity (Doan 2014; Das 2014; Akerele and Odeniyi, 2015; Codjoe et al., 2016; Cordero-Ahiman et al., 2017). These studies found that both non-economic (e.g. age, household size, education) and economic factors (e.g income, prices) influenced household consumption of diverse diets. Most of the literature based on rural-urban dichotomy concluded that urban areas are better off compared to rural areas in dietary diversity (Alexandria and Pauna, 2014; Doan 2014; Alexandria and Kevorchian, 2015; Qineti et al., 2017). This general conclusion might run contrary when level of urbanisation is considered especially within urban areas. This is because urban areas noted as hub of economic activities with rapid urban growth as a result of rural-urban migration comprised varying social class (Ikwuyatum, 2016). It is expected that differences might likely occur in these areas. Although, some studies considered dietary diversity within urban areas, however, quantifying the extent of urbanisation was not incorporated (Frimpong, 2013; Das, 2014). This paper, however, differentiates itself in that it disaggregates urbanisation by urban indicators and computes their individual contributions to the construction of the urbanicity index which explains the urban effect among households. This approach in line with UN (2014) methodology of defining urban areas offers sound policy options as it considers urbanisation as a dynamic process. Estimating dietary pattern within urban areas are expected to differ due to variations in socioeconomic characteristics of household and changing level of urbanisation. With changes in urban lifestyle and subsequently the structure of food environment in Nigeria, it is necessary to incorporate urban effect into dietary diversity studies as diet-related diseases are on the increase in the face of rapid urbanisation.

Most studies which analysed the factors that influence household dietary pattern have primarily relied on mean estimation approaches such as Ordinary Least Squares (OLS), and two-stage-least square (2SLS) (Doan 2014; Cupak, et al., 2014; Akerele and Odeniyi, 2015; Codjoe et al., 2016; Qineti et al., 2017. Although the average effect might yield straightforward interpretations on dietary outcomes, they are restricted to only providing evidence of the impact of independent variables at the mean of the respective diversity measures. In this regard, the regression mean approach may not appropriate how covariates affect dietary diversity differently at different points of the conditional dietary distribution which is crucial for policy purposes. For instance, studies have shown that increase in income is associated with better dietary outcome (Akerele and Odeniyi, 2015; Doan, 2014), it would be expedient to know where increased income occur at the conditional distribution considering different social classes in urban areas. The interest, therefore, lies in describing the relationship at different points in the conditional distribution of diversity which tends to address the question of 'for whom does diversity matter?' Few studies however used quantile regression but the urbanisation effect especially in urban areas was not considered (Drescher and Goddard, 2011; Das, 2014). Reliable information on dietary pattern in urban areas of Nigeria is rather scarce. This might hinder effective orientation and strategies towards food driven improvements especially for the vulnerable. Therefore, the need for holistic approach to underpin the underlying nexus between related to dietary diversity, while capturing rising effect of urbanisation and dietary diversity.

The objective of this paper is to investigate the effect of urbanisation and other socioeconomic factors on household dietary pattern in urban areas of Nigeria. Quantile regression (QR) approach was employed as it maintains a modelling advantage over linear regression with non-normally distributed data. It is useful when dependent variable in this case dietary diversity is sensitive to small changes (i.e high variation) as suggested by Rizov et al. (2015). QR would help to identify population subgroups at the different tails of the diversity distribution (Drescher and Goddard, 2011). This may provide relevant information for economic and nutrition policy, where specific information about vulnerable sub-groups could generate targeted interventions. The rest of this paper is as follows. Section 2 explains the methodology and estimation parameters as well as the data used. Results and discussion is explained in section 3. The paper concludes with relevant policy recommendation in section 4.

II. Methodology

a) Data

The study used cross sectional data from two randomly selected states in Southwest Nigeria which are representative of areas with rapid urbanisation. The two states namely Ekiti and Oyo represented low and high urban population density areas (NPC, 2006). This representation was on the basis of their level of urbanisation, population, date of creation and other level of urban activities (Coker et al., 2008). A multi-stage sampling procedure was used to sampled 445 respondents. Information sourced included household socioeconomic and urban-related characteristics as well as food expenditure within a one-week period.

b) Dietary diversity model

It is established in literature that a consumer with a hierarchic preference function will add food items to his purchased set as income increases in an order

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determined by prices (Theil and Finke, 1983; Jackson, 1984; Rizov, et al., 2015). Higher income allows additional goods to enter the consumption bundle, forming a systematic relationship between income and consumption diversity (Doan, 2014).This is premised on behaviour characterised by conditions which include; a very limited set of items purchased at low incomes; expansion of the set of items purchased as income increases; and a continuing growth in diversity at all income levels. As a result of this, it is apparent that consumer needs tend to quality rather than quantity as diversity changes. However, these features of behaviour can be included within the framework of maximization of a preference function. Following Jackson (1984) and Rizov, et al., (2015), u (q), a utility function, represents any vector of quantities q in some set of food commodity, N. This is given as:

$$u(q) = u(q_1, q_2, ..., q_n) \qquad (1)$$

subject to budget constraint,

$$\sum p_i q_i = Y \qquad (2)$$

while the non-negativity constraints hold for $qi \geq 0$; pi represents the price for the ith food commodity and Y is income. Satisfying the Kuhn-Tucker conditions yields;

$$\partial u / \partial q_i - \lambda p_i = 0 \qquad if i \epsilon S,\ q_i > 0 \qquad (3)$$

$$\partial u / \partial q_i - \lambda p_i < 0 \qquad if i \epsilon \bar{S},\ q_i = 0 \qquad (4)$$

where λ is the Lagrangian multiplier, S is the set of food commodities purchased, and $\bar{S}$ is the set of food commodities not purchased. With reference to the cardinality notation, total quantities in a food commodity set, is given as $|N| = |S| + |\bar{S}|$. However, solution to the above conditions leads to the Marshallian food demand function which is expressed as:

$$q_i = f(p, Y) \qquad (5)$$

where p is a vector of food prices and Y, the total income. However, the number of food commodities purchased in set S is also a function of food prices and income. For any urban household, let $sh = |S|$ denotes the number of different food commodities consumed by household *h*, from the purchased set which is also a measure of dietary diversity (D) at household level (Jackson, 1984; Stewart and Harris, 2005). Then $Dh = sh$ is a function of food prices and food expenditures, i.e.

$$Dh = sh = fh(ph, Yh) \qquad (6)$$

where Yh is total household disposable income and fh is household specific diet diversity function which accounts for the household characteristics and factors affecting dietary choices.

Dietary diversity has in recent years emerged as one of the widespread and valid indicators of food security outcomes (Carletto, et al., 2012; Jones et al., 2013). Dietary diversity index (DDI) reveals both the quantities eaten and the nutritional qualities of the various food groups (Hoddinott and Yohannes, 2002).However, diversification is commonly quantified with the Berry Index which has been widely used in economics literature (Drescher and Goddard, 2011; Akerele and Odeniyi, 2015; Cockx, et al., 2017; Ogundari, 2017). Therefore, this paper used theBerry index of diversification to construct dietary diversity index (DDI) which shows the extent to which food consumed by households are diversified. It is expressed as:

$$BI = 1 - \sum \omega_i^{\ 2} \qquad (7)$$

where ω_i is the budget share of the *ith* (disaggregate) food commodity consumed in the total food bundle. It attains a maximum value when consumption shares are equally distributed among food consumed which is related to increase in nutritional adequacy ((Liu, et al., 2014; Archer, 2018). The food measurement unit was household food expenditure on 12 different food groups in a one-week period. The food groups namely; cereals, vegetables, fruits, meat, egg, fish and other seafood, legumes, roots and tubers, milk and milk products, oils and fats and beverages was in line with the recommended FAO standard in calculating dietary diversity at household level (Swindale and Bilinsky, 2006; FAO, 2011).

According to Doan (2014), higher income allows additional goods to enter the consumption bundle, forming a systematic relationship between income and consumption diversity. Due to the continuing growth in diversity as income levels improves which could be linked with rising urbanisation (Seto and Ramakutty, 2016; Qineti, et al., 2017), this paper empirically examines the effect of urbanisation on household diet diversity. This was done by specifying an estimating equation where household diet diversity (D) is explained by extent of urbanisation, income, and other household sociodemographic characteristics using quantile regression. However, as household urban effect is not directly observable, this paper followed Zhou and Awokuse (2014), Jone-Smith et al.(2010) and Van de

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Poel et al. (2008) in estimating urban effect through urban functional characteristics, a measure identified by UN (2014) in defining urbanisation level within urban areas. The characteristics which include the housing condition; transportation; health facilities; educational facilities; market availability; communication infrastructure; economic indices were modified and operationalised to construct urbanicity index using the principal component analysis (PCA). The urbanicity index shows the degree to which a community has the features of urban environment. Constructing an index is inevitable as single and disaggregated measures of urban indicators are often highly correlated variables with possible risk of multicollinearity (Abdi and Williams, 2010). Therefore, principal component analysis is most suited, as a data reduction tool. The index generated from correlated variables are transformed to uncorrelated ones, while retaining principal components with maximum variance (Suryanarayana and Mistry, 2016). This model guarantees that the weights of each urban component are optimally chosen to maximize the explained variance in the underlying latentvariable, in this case urbanicity index. The components of the urbanicity index are expected to predict level of urbanisation differently, therefore avoiding the arbitrary selection of weights. The model is expressed as:

$$PC_1 = a_{11}X_1 + a_{12}X_2 + ... + a_{1p}X_p \quad (8)$$

where X_1, X_2..., X_p represents the urban indicators; a_{11} represents the weight for the X_1 principal component. The coefficient of the first principal component, $a_{11,}$ $a_{12,}$ a_{1p}, that maximises the variance of PC_1,therefore, represents the index. The urbanicity index further reveals the underlying factors and enhances ease of estimation and improves statistical efficiency (Abdi and Williams, 2010). To further explain the degree of urbanicity, the generated urbanicity index was classified into three categories namely: the low, middle and high urbanicity groups based on distribution of the data. The PCA result on urban indicators revealed that the first principal component (PC) which explains about 48%of the urbanicity level and offers some economic intuition was used in computing the urbanicity index. The average urbanicity index generated from the sum of square loadings of the first PC was 0.46. Based on this index, households were classified to show the extent of urbanisation from which about 40.6% of households belong to the middle urban category (MUC), while 34.9% and 24.5% were in the low urban category (LUC) and high urban category (HUC), respectively. This ranking into urban categories builds on a previous study by Allender, et al. (2010), which further explains the magnitude of disparities within urban areas at various stages of urbanisation.

c) Empirical model

This paper employed the quantile regressions, which estimate the effect of explanatory variables on the dependent variable at different points of the dependent variable's conditional distribution. Quantile regressions (QR) were initially introduced as a robust regression technique which allows for estimation where the typical assumption of normality of the error term might not be strictly satisfied (Koenker and Bassett, 1978). The method provides information about points in the distribution of the dependent variable other than the conditional mean (Eide and Showalter, 1998). The different quantiles may be interpreted as differences in the response of the dependent variable to changes in the regressors at various points in the conditional distribution of the dependent variable (Baum, 2013)

As specified by Koenker and Bassett (1978), QR can be expressed as:

$$Q\theta(Y/X) = X'\beta\theta \quad (9)$$

where *Y* denotes the dietary diversity index as a function of a set of independent variables, *X* within the θth quantile of the outcome variable *Y*. The special feature of the quantile regression approach is that the set of coefficients of the independent variables, $\beta\theta$ can differ across quantiles. However, the estimator$\beta\theta$ of the quantile regression is obtained by minimizing the objective function, given as:

$$Q(\beta\theta) = \sum \theta \,|\, y_i - x_i'\beta\theta \,|\, N_i : y_i \geq x_i'\beta + \sum (1-\theta) \,|\, y_i - x_i'\beta\theta \,|\, N_i : y_i < x_i'\beta \quad (10)$$

via Simplex method. Also, the model can be rewritten as follows:

$$q(Y_i) = \beta_q X_i + e_{qi} \quad (11)$$

where *q* is a specified quantile of dietary diversity(*Yi)* with median regression denoted as *q*= 0.5

$\beta q = (\beta_{q1}, \beta_{q2}, \dots \beta_{qj})$ is the vector of parameters to estimate, the coefficient of the vector will differ depending on the particular quantile being estimated.

$Xi = (X_{i1}, X_{i2}, \dots X_{ij})$ is the vector of household characteristics and urbanicity index. Summary and definitions of household characteristics and other explanatory variables are described Table 1. e_{qi} is a random disturbance.

Using Stata Qreg, a quantile regression at the 10th, 50th and 90th level with bootstrap standard errors on the estimated parameters with 100 replications were estimated (Drescher and Goddard, 2011).

III. Results and Discussion

Result of the mean household dietary diversity index using the Berry Index of diversification was 7.22, implying that, on average, about seven (7) different food groups were consumed by the households in the study area. This result agrees with previous findings from Akerele and Odeniyi (2015) and Codjoe et al. (2016). This suggests dietary diversity of urban households was moderate based on number of food consumed. The result of quantile regression analysis is presented in Table 2 revealed that the low pseudo R^2 squared obtained was quite typical with cross-sectional data, as observed by Das (2014). Also, the pseudo R^2, as a measure of goodness of fit with a range of 3% to 8% provides more information about diversity distribution for households in the lower quantiles than those at the higher quantiles. The result obtained from the raw and minimum sum of deviations were consistent, while the covariates were statistically different from zero, suggesting that each explanatory variable differs across the quantile of diversity distribution. Estimates obtained from different diversity distribution underscores the robustness of the model used compared to mean distribution (OLS). Some variables (household size, occupation, income and urbanicity group) were consistent across methods which suggests their relevance. From the OLS estimates, age, occupation, income of household heads positively influenced dietary diversity, while household size negatively influences it.

The quantile regression results (table 2) suggest some significantdifferences across different points in the conditional distribution. The result at the lower end of the distribution (10th quantile) showed that income of household head and being in middle urban category positively influenced consumption of diversified diets at 10% and 5% levels of significance, respectively. This suggests that dietary diversity at the lower end of the conditional distribution would improve by an increase in income. This implies that household consumption of nutrient-based foods improves as household heads engaged in income-generating activities which means more financial flow. The finding is consistent with those of Liu et al. (2013) and Qineti et al. (2017). Also, findings showed that households at the middle urbanicity group tends to have higher dietary diversity compared to those of low urbanicity group. This could be attributed to diverse economic opportunities, urban lifestyles and changing socioeconomic status which tends to improve financial access to food, coupled with extent of access to urban facilities. However, household size negatively influenced consumption of diverse diets at 1% significant level. This suggests that an increase in household size increases money expended on food, which limits their access to nutrient-rich food. This may be basically due to the fact that it may be more expensive to have food diversity within very large household size as compared to small household size. This result contradicted the findings of Woldehanna and Behrman (2013) and Ecker et al. (2013) that larger household size had increased food diversity but match thosefound by Gaiha et al. (2013) and Rizov et al. (2015).

With respect to the median diversity quantile (50th quantile), it was observed that income of household head, membership of social group and being in middle urban category positively influenced diversified diets at 10% level of significance. Income of household head was also an important factor, however, at a lesser rate relative to lower diversity quantile. Also household size negatively influenced dietary pattern at 1% significant level which was contrary to Drescher and Goddard (2011). At the highest diversity quantile (90th quantile), household head'seducation, occupation, employment status significantly and positively influenced diversified diets at 1%, coupled with asset ownership and being in high urban category at 10% and 5% significant levels, respectively. However, sex of household head and membership of social group negatively influenced consumption of diverse diets at 5% significant level.

Better educated household head had the ability to process consumer dietary knowledge in food consumption which improves household's knowledge regarding health and nutrition. This finding corroborates those of Adamowiczand Swait, (2012),Liu et al. (2013) and Rizov et al.(2015). Contrary to expectation, the effect of formal education with the exception of highest quantile had insignificant effect on dietary gains across various regressions. This finding further explains the distributional effect of education on dietary diversity as against generalising its effect in urban areas as reported by some studies (Doan, 2014; Ahmed and Naptali, 2014). This suggests higher literacy level among urban households might not translate to more dietary gain. Therefore, greater awareness on nutritional education is equally important in ensuring consumption of wider food variety which is associated with improved dietary outcomes. Likewise, households in high urban category had better diverse diets relative to other urban category. This could be as a result of increased food distribution through access to larger varieties of food and expansion of food choices, as noted by Akerele and Odeniyi (2015) and Ogundari (2017).

Another notable result was the strength of the urbanicity variable in both the ordinary least squares (OLS) regression and in the quantile regression. The 0.031 estimate for middle urbanicity group in the lower quantile distribution implies that an increase in extent of urbanisation within urban areas would lead to a 0.031point gain in dietary outcome. Similar interpretation was observed in the OLS estimate (0.013) except that the gain was at the mean. The parameter estimates for middle urbanicity category are statistically significant in all cases except for the 90th quantile at high urban category. This suggests that growing relationship between rising urbanisation and diversity within urban diets might not translate directly into constant level of nutritional gains among urban consumers due to changing socioeconomic status, access to infrastructural facilities and varying social class. The findings with respect to the urban effect revealed that household dietary diversity is location-sensitive as suggested by Das (2014) and Seto and Ramankutty (2016).Also, the rate at which income influenced dietary diversity was higher (33%) at lower quantile compared to the other quantiles. This suggest policy strategies to improve financial capabilities will help households have access to wider varieties of foods and increase diverse diets. Across regression methods, household size had a negative relationship with consumption of diversified diets which was more pronounced especially at the lower end of the quantile (14%). This suggest enlightenment programmes on birth control/family planning would help improve dietary diversity across subpopulations in urban areas especially among urban poor with dwindling economic means.

IV. Conclusion

This paper investigates factors that influences urban household dietary pattern in Nigeria. From the empirical findings, this paper puts forward urban differential in factors that influenced dietary diversity distribution. Across methods of estimation, income, urbanisation level and household size were consistent variables. Specifically, the quantile regression results suggest that there may be differential in dietary effects at different points in the diversity distribution. These provide better information on how variables can be integrated into policy options that will help to improve household welfare since dietary quality measure is an outcome of food security. Thus, intervention strategy for better dietary outcome should revolve around policy propositions targeting different urban subpopulations as evident from the urbanicity grouping. Also, integration of agrifood systems and infrastructural facilities would strengthened rural-urban food linkages for effective food access to value added products which drives urban consumption. This will enhance agricultural productivity and food security.

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Table 1: Household socioeconomic characteristics used for the analysis

Explanatory variables	Variable meaning	Type of measure
Sex	Household is male headed or otherwise (female headed)	Dummy (male=1, otherwise=0)
Age	Age of household head in years	Discrete , number of years
Household size	Number of persons in the household	Discrete, measured by number
Membership in social organization	Household head being in a social group (professional, cooperative societies, religious, non-governmental organization) or not	Dummy (member=1, otherwise=0)
Educational status	Household head level of education being formal (primary, secondary and tertiary) or otherwise (non-formal)	Dummy (formal=1, otherwise=0)
Engaged in employment activities	Household head engagement in one form of income generating activities or not	Dummy (engaged=1, otherwise=0)
Average monthly income	Income earned by household head monthly	Continuous, measured in Naira
Occupational status	Occupational type of household head is in formal sector (government worker, private organizations) or otherwise (traders, farmers, artisans)	Dummy (formal sector=1, otherwise=0)
Household asset	Ownership of household assets	Asset index
Urbanicity index	Measure extent of urbanisation	Continuous, an index

Table 2: Parameter estimates of the determinants of household dietary diversity

	Quantiles			OLS
	0.1	0.5	0.9	
Sex (male=1)	0.0017 (0.0125)	0.0059 (0.0061)	-0.0094** (0.0041)	-0.0029 (0.0051)
Age (in years)	0.0048 (0.0061)	0.0025 (0.0029)	0.0002 (0.0020)	0.0050** (0.0024)
Age squared	-0.1336 (0.1953)	-0.0783 (0.0950)	-0.0182 (0.0645)	-0.1562** (0.0788)
Education (1= formal)	0.0150 (0.0161)	0.0026 (0.0078)	0.0182*** (0.0053)	0.0034 (0.0065)
Household size (number)	-0.0143*** (0.0044)	-0.0053*** (0.0022)	-0.0009 (0.0015)	-0.0064*** (0.0017)
Occupation (1= formal)	-0.0006 (0.0145)	0.0010 (0.0071)	0.0202*** (0.0048)	0.0100* (0.0058)
Employment status (1=employed)	0.0343 (0.0223)	-0.0125 (0.0109)	0.0208*** (0.0074)	-0.0066 (0.0090)
Urbanicity category (base=low)				
Medium	0.0305** (0.0131)	0.0108* (0.0064)	-0.0007 (0.0043)	0.0127** (0.0053)
High	0.0155 (0.0153)	-0.0061 (0.0074)	0.0108** (0.0050)	0.0038 (0.0062)
Asset index	-0.0012 (0.0025)	-0.0014 (0.0012)	0.0014* (0.0008)	-0.0007 (0.0010)
Membership of social group (1=yes)	0.0082 (0.0135)	0.0083* (0.0048)	-0.0101** (0.0045)	0.0043 (0.0054)
Household Income (Naira)	0.0330* (0.0191)	0.0139* (0.0093)	0.0077 (0.0063)	0.0211*** (0.0077)
Constant	0.4556*** (0.3068)	0.7101*** (0.1492)	0.8011*** (0.1013)	0.7193*** (0.1238)
Pseudo R^2	0.0817	0.0352	0.0301	
Raw sum of deviations	8.8638	15.9445	5.8976	
Minimum sum of deviations	8.0914	15.4070	5.4523	
Adjusted R^2	0.0826			
F test	3.17***			

Source: Output from quantile regression analysis. Figures in parentheses are standard error.

*Statistical significance: ***1%, ** 5%, *10%*