



(RESEARCH ARTICLE)



Investigation of the relationship between health expenditure and profit level of farmers in Bayelsa State, Nigeria

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Abstract

Health expenditures on profit effect on farmers in Bayelsa State, Nigeria were examined. Purposive and random sampling procedures were used to select 216 respondents for the study. The average monthly health expenditure and net farm income per farmer were ₦664 and ₦17,995.31k respectively. The regression model showed that health expenditure had an inverse relationship with profit. Their total healthcare expenditure was significantly influenced by gender, age, household size, education, income, and cost of medical services. The result of the correlation analysis shows that there is a significant negative relationship between profit and health expenditure of farmers in the study area ($r=0.625$, $p<0.05$). It is recommended that more affordable health services should be provided as well as reduced transport costs; price ceilings for healthcare medical services should be introduced.

Keywords: Profit; Health; Expenditure; Farmers; Crop production

1. Introduction

Both communicable and non-communicable diseases have an impact on household finances, with households bearing disproportionate costs as a result of existing user fees and out-of-pocket expenses. It is critical to generate new data on the impact of health spending on the profitability of arable crop farmers in order to gain a better understanding. Previous research indicated that the disease burden is significant and growing (1, 2). Illness has continued to have a negative impact on agricultural production activities by reducing the labor supply on farms. It has also resulted in low farm income as more money is spent on the treatment of sick family members rather than using available resources to purchase farm inputs. As a result, poor health hurts farmers' savings as well as labour force productivity. Income growth, labour market participation, labour efficiency, and increased savings can all be influenced by improved health (3).

Actually, the burden of diseases poses a significant health risk to poor households (4). Because sick people are frequently unable to contribute to productivity growth, it reduces the earning potential of poor households. When a family member becomes ill, their ability to generate income is significantly reduced, and debts accumulate in addition to current assets being depleted. When other growth-determining factors are considered, the disease reduces the economy's per capita income to roughly half that of the non-affected economy, because the benefits of productivity growth accumulate over time (5).

The workforce is significantly reversed by a high disease load, which also reduces the output of individual farmers. This is in line with (6) observation that low turnover and absenteeism are produced by a high prevalence of illness in a

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workforce. The (7) claims that disease-related illnesses and deaths lower farm productivity and efficiency levels, especially due to labour losses and assets utilized to manage illnesses. In most cases, everything that changes the labour supply also changes the output. Less efforts have been made in Nigeria to correlate the cost of disease with agricultural productivity, with producers of arable crops suffering the brunt of the expense.

Prior statistics from Nigeria show that improved agricultural production is hampered by high medical treatment costs (8). Arable farmers struggle with a variety of problems, including transportation costs, the distance between healthcare facilities, and the lack of a healthcare practitioner to offer them assistance. One of these problems is a lack of medications in their medical facilities. As a result, they are now looking at more possibilities, which drives up the cost of healthcare. Both (9) and (10) used incidence-based cost of sickness analyses to highlight how the economic burden of typhoid fever affects societal treatment costs and productivity wage losses in their studies.

Health care costs were not taken into account in any of the earlier studies when determining the profitability of farmers of arable crops. This is the gap this study addressed. The purpose of this study is to ascertain the impact of health expenses on farmer profitability Bayelsa State, Nigeria. The specific goals are to:

- Estimate the cost of health services for farmers.
- Ascertain the impact of health expenses on farmers' profitability
- Investigate the factors that influence how much farmers spend on health services.

Hypothesis

HO: There is no significant relationship between profit and health expenditure of farmers.

2. Material and methods

The study was piloted in Bayelsa State Nigeria. It is located between 4°15'N, 5°23'S, and longitude 6°45'E and 5°22'W. It had a population of 1,703,358 and a land area of 21,110 square kilometers (11). Delta State borders it on the north, Rivers State on the east, and the Atlantic Ocean on the west and south. Farmers of arable crops made up the study's population. In order to choose the selected farmers, a multistage sampling process was adopted. The three agricultural zones of Bayelsa East, Bayelsa Central, and Bayelsa West were used as the basis for the initial stratification of the area because the majority of rural residents are farmers and poor health is a widespread problem. Second, three LGAs— Brass and Ogbia in Bayelsa East, Kolokuma/Opokuma and Southern Ijaw in Bayelsa Central, and Sagbama (Bayelsa west) were randomly chosen, representing 50% of the LGAs .In the third stage, 5% of farming communities were randomly chosen from each LGA, resulting in the choice of 22 farming communities. Fourthly, 10% of registered farmers were randomly selected using a lottery method from the list collected from Agricultural Development Programme (ADP). This gave a total of 264 respondents in the end, but only 216 structured questionnaires could be retrieved for the data analysis.

The study sought information on common illnesses, illnesses that affected any household member in the previous year, days missed from work due to illness, the types of health care services available cost on average monthly income on treatment, data on farm operations, and cost and returns (inputs-output). The data were subjected to statistical analysis with the application of descriptive statistics, regression model, and Pearson correlation coefficient. Cost and return analysis to achieve the objectives.

2.1. Specification model

2.1.1. Health expenditure and profitability

The simple regression model of the variable Y which is profitability was defined as follows;

$$Y = \beta_0 + \beta_1 X_1 + e \dots\dots\dots(1)$$

- Where: Y= profitability
 β_0 = Constant
 β_1 = Coefficient of the independent variable
 X_1 = health expenditure
 e = Error term

The regression model was further adopted for the determinants of profitability and healthcare expenditure. The model is explicitly stated as follows:

2.1.2. Socioeconomic factors influencing total healthcare expenditure

$$Y = b_0 + b_1GEN + b_2AGE + b_3HHS + b_4EDUCA + b_5FAEXP + b_6FASIZE + b_7INCOM + b_8COMES + e_i \dots\dots\dots(2)$$

where:

- Y = total health care expenditure (₦)
- GEN =Gender (Male=1, otherwise =0)
- AGE=Age (years)
- HHS =Household size (number of persons)
- EDUCA =Educational level (years)
- FAEXP= Farming experience (years)
- FASIZE =Farm size (ha)
- INCOM=Income (₦)
- COMES = Cost of medical services (₦)
- e_i = error term
- b₀ = intercept
- b₁-b₈= estimated coefficients

The research hypothesis was achieved with the Pearson moment correlation coefficient.

3. Results and Discussion

3.1. Socioeconomic characteristics of the farm operators

The result in Table 1 showed that majority (57.4%) of the respondents were female while very few males (42.6%), implying that crop production is more attractive to the female than the males. The modal age of the principal farm ranged from 31-40 years with 43.1% operators. The mean age was 42 years. The result implies that the average principal farm operators were in their prime production age and could still engage in rigorous crop cultivation activities. On marital status, 79.6% of the farmers were married, 15.7% single while 4.7% were either divorced or widowed. The mean household size was 7 people. The result indicate that 66.7% had large household size between 6 and 10 people. This is a potential source of labour for the farm business provided the household members are healthy. The result also shows that 8.3% had no formal education, 19.9% had primary education, 41.2% had secondary education and 30.6% had tertiary education. A total of 91.7% of the operators had some kind of education. This is an important finding, because education tends to make farmers more responsive and willing to adopt innovations, which will ultimately lead to increase in farm productivity. About 66.7% of the operators have between 11 and 20 years of experience. The mean year of farming experience was 12 years. This implies that the farmers had sufficient farming experience in crop production.

Table 1 Socioeconomic Characteristics of the Farm Operators

Variables	Frequency	Percentage	Mean
Gender			
Male	92	42.6	
Female	124	57.4	Female
Age			
21-30	16	7.4	
31-40	93	43.1	
41-50	65	30.1	42 years
Above 50	42	19.4	

Marital status			
Single	34	15.7	
Married	172	79.6	Married
Divorced	4	1.9	
Widowed	6	2.8	
Household size			
1-5	54	25.0	
6-10	144	66.7	7 people
11-15	16	7.4	
Above 15	2	0.9	
Educational level			
No formal education	18	8.3	
Primary education	43	19.9	
Secondary education	89	41.2	Secondary
Tertiary education	66	30.6	
Farming experience			
1-5	10	4.6	
6-10	62	28.7	
11-15	86	39.8	12 years
Above 15	58	26.9	

3.2. Monthly health expenditure of respondents

According to the findings in Table 2, the majority (40.7%) of respondents spend between ₦500 and ₦1000 per person per month on health expenses. This was followed by 38% of patients spending less than ₦500 per month on treatment, 12.5% spending between ₦1001 and ₦1500 per month, and only 8.8% spending more than ₦1500 per person per month on healthcare. Based on monthly health expenditure results, the average monthly per capita health expenditure of households was estimated to be ₦664. This could have a disastrous effect on their profit, which would have improved arable crop production.

Table 2 Monthly health expenditure of respondents

Monthly health expenditure	Frequency	Percentage	Mean (N)
Less than 500	82	38.0	
500-1000	88	40.7	
1001-1500	27	12.5	664
>1500	19	8.8	
Total	216	100.0	

3.3. Distribution of health expenses on illness types by respondents

The result as presented in Table 3 shows that the respondents spent 37.1% on malaria only. This was closely followed by a 16.5% cost of treatment for typhoid only. About 11.3% was spent on malaria and typhoid by the farmers out of the total cost of treatment amount of ₦143,370. The result further indicates that the net farm income of the farmer per month was ₦17,995.31k while the average health expenses of the farmer per month were ₦663.75k. Respondents' net

farm income for the farming season was ₦3,886,987. Profit was less than the Nigerian minimum wage, demonstrating that any amount spent on illness reduces profit. This demonstrates that an increase in health spending is associated with a 62.5% decrease in farmer profitability. This finding is consistent with (12) study on the impact of economic shocks on Nigerian households' healthcare expenditure, which discovered that the production frontier and profit margins are negatively affected.

Table 3 Distribution of health expenses on illness types by Respondents

Illness types	Amount spent (₦)	Percentage
Malaria only	53250	37.1
Diarrhea only	10420	7.3
Typhoid only	23640	16.5
Malaria and Diarrhea	13700	9.6
Malaria and Typhoid	16130	11.3
Typhoid and Diarrhea	9130	6.4
Malaria, Diarrhea and Typhoid	17100	11.9
Total health expenses	143370	
Net farm income	3,886,987	
Net farm income per farmer	17,995.31k	
Average health expenditure per farmer	663.75	
Total household income	9261600	

3.4. Health expenditure on Profitability of Respondents

The result exposed that there is a significant negative relationship between health expenditure and profitability of the farmers with a $\beta=0.625$, $t=11.717$, and a p -value <0.05 . This suggests that an increase in health expenditure is linked with a 62.5% reduction in the profitability of the farmers (Table 4).

Table 4 Regression Analysis on health expenditure on Profitability

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std.Error	Beta		
1	Constant	16860.708	3779.840		4.461	0.000
	Health expenditure	0.127	0.011	-0.625	11.717	0.000

a. Dependent Variable: Profitability

3.5. Socioeconomic factors influencing total healthcare expenditure

Table 5 depicts the regression analysis findings, which show that the double log functional form provided the best fit, based on R2 values, the number of significant variables, and compliance with a priori expectations. The R2 score of 0.6469 indicates that the independent variables account for 65 percent of the variation in healthcare spending. The F value of (47.41) was highly significant at the 1% level of probability, indicating a best-fit regression. Six of the eight independent variables (gender, age, household size, educational level, income, and medical services cost) were significantly different at the 5% level. The result of the double log regression analysis showed that the coefficient for gender was positively signed and significant at a 5% level of probability. Thus, a 1% rise in gender is predicted to result in a commensurate increase in health care costs. This is in line with the findings of (13), who found that the discrepancy in resource utilization leads to higher healthcare costs and reduced productivity, particularly for women who are less productive due to their lower socioeconomic level.

The age of the respondent was positively and significantly correlated with the cost of medical care at a 5% level of significance. Economic theory is congruent with this. Spending on healthcare increases with age, as evidenced by the

influence of socioeconomic factors on healthcare expenditures. In addition to being a factor of willingness to insure, it is a variable linked to high indirect risk susceptibility, which causes increased medical consumption. This suggests that when a farmer becomes older, more medical care is needed to keep them healthy, which raises treatment expenses. The results support what other people have found (14).

Household size was linked to healthcare spending in a positive and significant way. If all other factors remain constant, a 1% increase in household size will result in a 0.979% rise in overall healthcare spending. The result of household size indicates that the number of dependents a farmer has; the cost of medical services pushed up. Severe health problems by a member of the family will skyrocket the out-of-pocket expenses of the farmer. The high rate of ill health by a household member of working age could be a menace to effective production resulting in cases of farm workforce shortages in other to rehabilitate the farmer, medical facilities have to be visited and thus will increase the total health care expenditure because large and healthy families become enhancement for better-quality production; easing labour bottlenecks. This finding corroborates (15) study on food insecurity and its drivers among farmers in Nigeria.

Concerning the relationship between education and health care expenses, A literate farmer probably receiving higher income and is well-to-do may make more effective use of modern medical facilities and other traditional therapies that would likely increase their expenditures. At the 1% level of probability, educational level was found to be significant and positively associated with overall healthcare spending. This means that when a household's educational level rises, overall healthcare costs will rise by 1.04 percent. This result agrees with (16).

The variable cost of medical services (COMES) was negatively significant at a 5% level of likelihood. The results revealed a negative link between the cost of medical services and farmer out-of-pocket spending, maybe because more expensive services are demanded less, but also because medical services are not sought for the larger part by consumer choice, but by sheer necessity. This revealed that a unit upsurge in COMES, out-of-pocket health outflow reduces by 0.11% on average. Farming entails a lot of dangers and uncertainties; therefore, farmers must have been in the farming business for a long time to be knowledgeable enough to handle all of the complexities of agriculture since sometimes treatment costs are involved (17).

Income was also positive and very significant at a 1% level of probability. As a result, a 1% increase in income results in a 0.74 percent increase in total healthcare spending. It was widely believed that the increase in income would be accompanied by an increase in spending. The positive impact of income could be because more income improves the possibility of purchasing health insurance (17), which could lead to higher healthcare spending.

Table 5 Socioeconomic factors influencing total health care expenditure

Variables	Coefficient	Standard error	t-value
Gender	0.03374	0.013876	2.43**
Age	0.3828711	0.1749789	2.19**
Household size	0.9792555	0.0730887	13.40***
Education level	1.039764	0.1823172	5.70***
Farming experience	0.0550664	0.0696397	0.79
Farm size	-0.0599657	0.076605	-0.78
Income	0.7418014	0.1051275	7.06***
Medical services cost	-0.1075236	0.0505461	-2.13**
Constant	6.52058	1.511113	4.32***
R2	0.6469		
F-ratio	47.41		

*** Significant at 0.01 level of significance, ** significant at 0.05 level

3.6. Hypothesis

The result of the correlation analysis in Table 6 showed that there is a strong negative relationship between profit and health expenditure of farmers in the study area ($r=0.625$) at a 5 percent level. The findings shows that there was

significant relationship between expenditure incurred on treatment and profitability of the arable crop farmers. The reason might be advanced by the fact that the resultant effects of high health expenditure will lead to a decrease in the earning capacity of the farmers. This suggests that quick policy interventions reduce the out-of-pocket expenditure of the farmers and become necessary to increase agricultural output in the study area.

Table 6 Estimation of relationship between profit and health expenditure of farmers

Variables	Profit	Health expenditure
Profit	1.000	0.625
Health expenditure	0.625	1.000

4. Conclusion

The study showed that the profit of arable crop farming was negatively affected by sickness. The study has established malaria, diarrhea, and typhoid the widespread diseases prevalent in the area. The result revealed that the amount spent by a household per month was ₦664. The cost of treatment was found to be relatively high which negatively affected productivity and profitability. Policy issues need to be addressed urgently to curb the menace of ill health by the crop farmers to increase food production by way of subsidizing treatment costs to enable maximize profit. Furthermore, price ceilings for healthcare medical services should be introduced. Healthcare services should be established in the study area to cushion the effect of transportation costs.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest.

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