The Financial Protection of National Health Insurance: Evidence From a Cross Section of State and Federal Workers in Akwa Ibom, Nigeria

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Research

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Acknowledgements

Not applicable

Availability of data and material

The data used in the analysis is freely available on request from the authors.

Authors' contribution

DF, JG and UI were involved in designing the study and analyzing the data. UI administered the collection of the data. DF, JG and UI were involved in writing the manuscript. All authors read and approved the manuscript.

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Competing interest

The authors declare that they have no competing interests.

Consent for publication

Not applicable

Ethics approval and consent to participate

Ethical approval to conduct this research was obtained from the Kemmy Business School Research Ethics Committee in the University of Limerick, Limerick, Ireland.

Abstract

Background: Public health insurance schemes can offer households financial protection against health care costs and help to resolve inequality in health care provision. The current study evaluates the impact of the Nigerian National Health Insurance Scheme (NHIS) in reducing financial hardship for a sample of Nigerian households working in the health and higher education sectors. The data allows us to examine the variation in the financial protection effects across different income groups and explore differences in standard of living by households with coverage and those without.

Methods: Data was gathered in Akwa Ibom state, Nigeria. A cluster sampling technique is used to compare participants and non-participants in the NHIS and within this, identify equivalent groups with regard to household characteristics such as education level, income and household composition. A regression approach examines variations in out-of-pocket expenditure (OOPE), catastrophic health expenditure (CHE) and number of household assets across the insured and uninsured groups controlling for cofounding factors.

Results: The likelihood of experiencing CHE for a household that is insured is estimated to be 76% lower than that of an insured household, even after controlling for our variety of observable characteristics. OOPEs are 126% lower in households with insurance compared to those without. Our results also point to the heterogeneous effect of insurance across income groups. The likelihood of experiencing CHE for a household in the lowest income quartile that is insured is 83% lower than that of an insured household in the same income group, but a similar figure of 70% those in the highest income group. We additionally find a significant difference in standard of living, as measured by household asset ownership across the insured and non-insured groups

Conclusions: There is a statistically and practically significant association between participation in the NHIS scheme and household financial protection. Interestingly, the financial protection effect of Nigeria's public health insurance scheme may be more concentrated in the lower end of the income distribution. This provides support to policy-makers seeking to design and extend equitable health-financing policies.

Keywords national health insurance scheme, Nigeria, financial protection, catastrophic health expenditure, household assets.

1   Introduction

2   Health insurance can play a critical role reducing inequality in health care and supporting economic

3   growth through stabilising household finances [1-3]. However, across many developing countries,

4   significant inequalities exist in access to health insurance, health care utilisation and health out-

5   comes [4]. In 2005, Nigeria launched the National Health Insurance Scheme (NHIS) to help pro-

6   mote access to quality healthcare and protect households against the financial effects of ill-health.

7   This was viewed as a first step towards universal health coverage (UHC), an important aspect of

8   the UN Sustainable Development Goals that emphasises the importance of providing affordable,

9   quality health services [5]. Nigeria is Africa's most populous and largest economy and prior to the

10   pandemic, it also had the highest out-of-pocket expenditure (OOPE) on healthcare in the African

11   Union, estimated at 77% of current health expenditure in 2017 [6]. Moreover, Catastrophic Health

12   Expenditure (CHE), defined as spending in excess of 40% of monthly non-food expenditure, was

13   experienced in twenty-seven percent of households in southeast Nigeria [7]. Such unforeseen ex-

14   penditures can eliminate savings, pushing households towards greater indebtedness and poverty

15   [8]. There is also evidence of unequal effects of healthcare spending as households in the lowest

16   income quintile in south-east Nigeria have a higher incidence of CHE relative to higher-income

17   households [9]. Furthermore, the continuing Covid-19 pandemic has revealed underlying inequal-

18   ities in access to health care, as it has had a greater impact on lower income groups [10]. Previous

19   studies in Africa and Mexico have evidenced the financial protective effect health insurance

20   schemes may have, particularly for lower income households [11-15]. In this context, we use data

21   on a sample of federal and state workers in Akwa Ibom, Nigeria to examine the relationship be-

22   tween enrolment in a national health insurance scheme and household health expenditures.

23   The Nigerian case provides a unique opportunity to examine the impacts of a national health in-

24   surance plan on household expenditures. Onoka et al. 2013 [16] point to the partial adoption of the

25   NHIS programme largely based on employment sector. Federal employees and their households

26   make up nearly the entirety of the five million participants in the NHIS [17]. However, the pro-

27   gramme has been unable to expand coverage beyond federal government employees as planned

28   [18-20]. Ozili 2020 [21] points to the low roll-out of the NHIS as evidence of the frailty in the

29   health care infrastructure in Nigeria that is exacerbating the impact of the Covid-19 pandemic. The

30   critical question about the level of financial protection provided by public health insurance has

31   recently been explored internationally by Erlangga et al. 2019 [22], however Nigeria's NHIS has

32   received scant attention, most likely due to data constraints. Ijeoma et al.'s 2019 [23] review paper

33   on the incidence and determinants of CHE in Nigeria, identifies significant variation in the inci-

34   dence of CHE in Nigeria across different studies. Aregbeshola and Khan 2018 [24] is to our

35   knowledge the only study that explores the relationship between health insurance coverage and

36   CHE in Nigeria. A significant negative relationship is found between participation in health insur-

37   ance and experiencing CHE. The study categorises households as non-participants in the NHIS if

38   they did not incur OOPE. This approach is likely to overstate the numbers with health insurance.

39   Health insurance participation among their sample was 22.1%, far higher than the national estimate

40   of 5% [25]. Furthermore, Aregebeshola and Khan 2018 [24] examine the average effect of health

41   insurance on CHE, ignoring the possible heterogeneous effect across the income distribution. Fi-

42   nally, no study has examined the potential impact on household standards of living (due to reduced

43   medical expenditures) associated with health insurance coverage in Nigeria.

44   The current study uses a unique dataset of over five hundred federal (insured) and state (non-

45   insured) employees to evaluate the impact of the NHIS in reducing financial hardship for a sample

46   of Nigerian households working in the health and higher education sectors. The construction of

47   such a dataset allows us to examine differences in household OOP health spending and incidence

48   of CHE for households with NHIS coverage and those households without this coverage in a more

49   detailed manner than previously seen. The variation in these effects across different income groups

50   is also analysed. Finally, we examine the differences in the number of assets a household holds for

51   those with coverage and those without. The main contribution of this research is to explore the

52   benefits of expanding the NHIS programme to State employees as originally envisaged and help

53   inform broader health policy.

54   **Background**

55   The NHIS regulates, monitors, enforces quality control and administers the Social Health Insur-

56   ance (SHI) programmes operated by the federal government in Nigeria. We set out a short over-

57   view of key aspects of the NHIS here, while provide a comprehensive description of the NHIS and

58   its implementation can be found elsewhere [16, 25]. Federal government employees were man-

59   dated to enlist in the programme, while political and institutional factors inhibited adoption of the

60   programme at the state level [16, 25]. As a consequence, state employees remain largely outside

61   the scheme in all but three of the thirty-six states in Nigeria.[1]

62   The NHIS is comprised of three packages, the USSHIP, the RCSHIP and the FSSHIP with the

63   latter the focus of this study. The FSSHIP is directed towards employees in the public sector,

64   organised private sector (employers with more than 10 employees), the armed forces, the police,

65   para-military institutions, students in tertiary institutions and voluntary contributors. It is imple-

66   mented by NHIS-registered Health Maintenance Organisations (HMOs) and accredited Healthcare

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[1] The three states where State employees participate on the NHIS are Cross River (2007), Bauchi (2008) and Enugu (2010)

67 Providers (HCPs). The HMOs are publicly- or privately-owned limited liability companies respon-

68 sible for the collection of premiums from enrollees, payment for the services accessed by enrollees

69 and quality control of healthcare services offered by the accredited HCPs. The HMOs operate

70 within a competitive structure under a model of managed care, with the objective of enabling cost-

71 effective delivery of health care [26]. The HCPs are clinics, private and public hospitals at the

72 primary, secondary and tertiary levels that provide healthcare services to enrollees. The HCPs play

73 the role of gate-keepers as they are the first point of contact before referrals are made for secondary

74 or tertiary care [27].

75 Inclusion in the FSSHIP requires an annual premium equal to 15% of the annual basic salary of an

76 enrollee, with 5% of the contribution coming from the enrollee and 10% from the enrollee's em-

77 ployer. The premium can be paid in lump sum or in monthly instalments to cover health care

78 benefits as specified by the policy for the employee under the age of 65 years, a spouse and four

79 biological children below the age of 18 years.[2]

80 The benefits available on the FSSHIP are summarised in Table 1 and are subject to a waiting period

81 of five months after the payment of the first premium. The NHIS pays capitation for primary care

82 and fee-for-service upon referral through an accredited Health Management Organizations

83 (HMOs) to an accredited secondary or tertiary healthcare facility.

84 [INSERT TABLE 1 ABOUT HERE]

85 The rest of this paper is organized as follows. The next section explains the data sources and meth-

86 ods. The following section presents the results. The final section concludes with a discussion of

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[2] Where the number of children below age 18 is more than four, an additional payment is required.

87 the results, policy implications and lessons learned for other low and middle-income countries

88 currently undertaking similar health financing reforms.

89

90 **Methods**

91 **Study setting, sampling and empirical approach**

92 This study was conducted in Akwa Ibom, a state in southern Nigeria with an estimated population

93 of over 5.45 million. Akwa Ibom is rich in crude oil and has thirty-one local government areas

94 with Uyo as the state capital. Enrolment on the FSSHIP is compulsory for federal employees within

95 the state and unavailable to state employees. Similar to Nguyen et al. 2012 [28], we are not com-

96 paring households before and after insurance coverage, but instead we compare households with

97 and without insurance. The variation in NHIS coverage across federal and state employees in

98 Akwa Ibom provided an appropriate sample.

99 We undertake a cluster sampling technique to select the participants and obtain cross-sectional

100 data [28]. Purposive sampling is used to select four sample clusters, namely; employees from two

101 federal and two state institutions. We limit our sample to federal and state employees in health and

102 education institutions to best identify equivalent groups with regard to household characteristics

103 such as education level, income and household composition. The federal institutions were; the

104 University of Uyo and the University of Uyo Teaching Hospital with state employees were drawn

105 from, Akwa-Ibom State University and Etinan General Hospital. Twenty postgraduate students

106 from the University of Uyo conducted the interviews. The interviewers were provided with two

107 days of training on the data collection process and interviewing skills. Face-to-face surveys were

108 then undertaken with participants at their place of work.

109 To more closely evaluate the financial protection effect of NHIS participation, our survey was

110 focused on the sub-population where a household participant had experienced at least one episode

111 of illness (using a 4-week recall period). This approach is consistent with the previous literature

112 [24, 28, 29]. We additionally gather information on their NHIS participation status, medical care

113 utilization, expenditure on healthcare, food and other non-food expenditures, total income and

114 other household demographics[3]. In total 560 respondents participated in the survey. Of these,

115 twenty-two were incomplete leaving an estimable sample of 538, 273 state employees and 265

116 employed in federal institutions.

117

118 **Variables**

119 The outcome variables in this study are out-of-pocket expenditure (OOPE) and Catastrophic

120 Health Expenditure (CHE). OOPE is the total monthly outlays on healthcare costs, including con-

121 sultations, drugs, hospital costs, transportation to and from where treatment was received and other

122 cost directly related to the restoration, improvement, and maintenance of health [9]. CHE is meas-

123 ured using a threshold of 40% monthly non-food expenditure [30, 31]. Total household expendi-

124 ture by broad category was gathered and food expenditure was subtracted from this to obtain

125 household non-food expenditure. The independent variable of interest is whether a household, by

126 having a member employed in the federal or state sector, is enrolled or not enrolled on the NHIS.

127 Household characteristics used as covariates in the study are; employment sector, education level

128 of the household head as well as the location, income group, size and self-reported frequency of

129 health care utilization of the household. A description of these variables is included in Table 2.

130 [INSERT TABLE 2 ABOUT HERE]

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[3] Data was collected in 2018 and a dollar exchanged for three hundred and sixty naira (1 US dollar = 360 Naira)

131 Household standard of living was based on household ownership of a representative basket of ten

132 household assets. This approach is shown to be at least as reliable as conventionally measured

133 consumption expenditures and sometimes more so [32, 33]. The objective was to measure each

134 household's ownership of a basket of goods, in this way capturing the benefits that people re-

135 ceive from publicly provided goods.[4]

Empirical Approach

137 While a descriptive analysis of OOPE and CHE is presented in the next section, our data also al-

138 lows us to undertake a multivariate approach and examine these variations. In order to model the

139 relationship between our outcomes of interest and health insurance participation, we estimate

140 two standard linear regression models, such that:

$$LogOOPE_i = \alpha + \beta Insured_i + \gamma \boldsymbol{X}_i + \varepsilon_i \qquad [1]$$

$$CHE_i = \alpha + \beta Insured_i + \gamma \boldsymbol{X}_i + \varepsilon_i \qquad [2]$$

141 where $LogOOPE_i$ represents the log value of the out-of-pocket payments spending on healthcare

142 of household i in the past four weeks and $Insured_i$, our main independent variable of interest,

143 is a dummy variable indicating whether household i is covered by health insurance. $\boldsymbol{X}_i$ is a vector

144 of variables relating to the household's income, self-reported medical care utilisation, household

145 size, the employment sector, urban or rural location, age group of the head of household and head

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[4] The list of assets are as follows: Car, Motorcycle, Bicycle, Refrigerator, Television set, Air-Conditioner, Electric power generator, Gas cooker, Home theatre video/audio system, Private water supply system.

146   of household education level, while $\beta\ and\ \gamma$ are the parameters to be estimated and ε_i represents

147   the error term. Estimated standard errors are clustered by health insurance membership to allow

148   for intragroup correlation at this level[5]. Our second model, with CHE_i representing a dummy

149   variable indicating whether a household experienced catastrophic health expenditure in the past 4

150   weeks is also estimated as a linear regression with the same vector of covariates $\boldsymbol{X}_i$ and with

151   standard errors also clustered by health insurance membership.

152   In considering the relationship between household health expenditures and health insurance cov-

153   erage through working in the federal sector, selection bias may be an obvious issue. For example,

154   if households with higher medical needs or households located in more urban areas have a greater

155   likelihood of choosing to work in the federal sector and obtain private health insurance this could

156   give rise to a spurious relationship between the two variables of interest. Thus, our model controls

157   for a range of observable factors likely to be correlated with these health expenditures and having

158   private health insurance through working in the federal sector. Despite the specific design of the

159   survey, it is important to acknowledge that there may still be other unobserved individual-level

160   characteristics that may impact health expenditures, factors that could lead to omitted variable bias

161   if they are also correlated with health insurance participation.

162   **Results**

163   Table 3 presents the summary statistics of the variables by NHIS participation status. There are

164   significant differences in OOPE across the two groups with those uninsured spending more than

165   twice that of those insured in the reference period (the previous thirty days), standing at ₦69,438

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[5] The estimates were also run clustering at the employment sector level with no significant difference in results.

166 (~$191) versus ₦23,678 (~$69). The proportion of households that experienced CHE in the refer-

167 ence period is also significantly lower among the NHIS enrolees (3%), relative to the non-enrolees

168 (80%). This difference is suggestive of a large financial protective effect provided by NHIS enrol-

169 ment.

170 [INSERT TABLE 3 ABOUT HERE]

171 With regard to the composition of both groups, Table 3 shows that they are similar in terms of

172 education, income, age, household size with the main difference stemming from geographical lo-

173 cation and medical care utilization. Specifically, 46.15% of the uninsured households reside in

174 urban areas while 89.91% of insured households are concentrated in urban areas. Insured house-

175 holds in our sample use medical care more frequently than uninsured households, indicating that

176 enrolment on the NHIS induces some degree of moral hazard health [34,35].

177 While these descriptive statistics provide a useful summary of the differences in CHE and OOPE

178 between those with insurance and those without, our data also allows us to undertake a multivariate

179 approach and examine these variations in a more rigorous way. In Table 4 we present a set of linear

180 regression models estimated using ordinary least squares (OLS) as specified in equations 1 and 2.

181

182 [INSERT TABLE 4 ABOUT HERE]

183 The results show that the likelihood of experiencing CHE for an insured household is 76% lower

184 than that of an uninsured household, controlling for observable characteristics such as income and

185 medical care utilisation. From column two of Table 4 we see that OOPE is 126% lower in house-

186 holds with insurance compared to those without for our sample. Both of these results taken to-

187 gether, illustrate a large practical and statistical significant association between being within the

188 NHIS scheme and household financial protection.

189 While the results above help us understand the relationship of interest on average, they do not

190 address the fact that there may be heterogeneity in the impact of being in the NHIS scheme across

191 the income distribution. For example, it may be the case that being insured has a greater (or lesser)

192 impact on the probability incurring CHE for households at the bottom of the income distribution.

193 To consider this, we estimated a model containing an interaction term between NHIS coverage

194 and quartiles of household income. The average marginal effects of being insured for the four

195 income quartiles are presented in Table 5.

196

197   [INSERT TABLE 5 ABOUT HERE]

198 The results suggest that the effect of being insured is different for different income groups with the

199 likelihood of experiencing CHE for an insured household in the lowest income quartile is 83%

200 lower than that of an insured household in the same income group. In contrast, we find a differen-

201 tial of 70% for those in the highest income group. This indicates a pro-poor in the NHIS with the

202 reduced incidence of CHE more pronounced in the lower end of the income distribution.

203

204 While not the main focus of this study, the data facilitated a simple comparison of household ex-

205 penditures and indicators of standards of living across both groups. This may help shed some in-

206 sight into the alternative uses of income that insured households may avail of as a consequence of

207 reduced health expenditures. A comparison of overall household expenditure shows that insured

208 households on average spend more on education, food and rent and also save more during the

209 reference period (See Figure 1). Drawing on Filmer and Pritchett's 2001 [32] approach, households

210 were asked to indicate ownership of assets from a representative basket of ten items. Similar ap-

211 proaches to evaluating standard of living have been applied in the Nigerian context in the context

212 of the socioeconomic impact of remittances [36]. Quantifying household standard of living using

213 this approach has also been applied to examine the socioeconomic impact of health care utilisation

214 in Palestine and Tunisia respectively [37, 38]. From the descriptive data presented in Table 3, on

215 average, households with no insurance had a value of 4.76 in this index compared to 6.4 for those

216 with insurance. This suggests a significant difference in standard of living across the two groups

217 and similar to Hailemichael et al. 2019 [39], to better examine this relationship we also estimate

218 an ordered logit model with the same covariates used in models 1 and 2 above with absolute num-

219 ber of household assets as the dependent variable. The marginal effects of having NHIS coverage

220 on household asset ownership, based upon this ordered logit model are presented in Table 6. They

221 show that even with factors such as household income and urban/rural location controlled for,

222 households covered by the NHIS experienced a higher level of asset ownership relative to the

223 uncovered households.

224 [INSERT TABLE 6 ABOUT HERE]

225

226

Discussion and Conclusion

228 Our study is motivated by the stated financial protection objective of Nigeria's NHIS. The incom-

229 plete roll-out of the NHIS programme provides a valuable opportunity to evaluate the impact of

230 NHIS participation on OOPE and CHE, a topic rarely explored to date. We collect data on federal

231 (NHIS participants) and state (NHIS non-participants) employees in Akwa Ibom State in Nigeria

232 and model the relationship between health insurance participation and health care expenditures.

233 We discuss noteworthy findings.

234 First, the results from our sample suggest the NHIS has achieved positive outcomes by reducing

235 the incidence of CHE by 76% and the scale of OOPE by 126%. The results demonstrate the notable

236 protective effect of the NHIS, showing that the structure of the scheme provides a comprehensive

237 range of cover and minimises co-payments by participants. This is a more pronounced effect when

238 compared to Ghana (3% reduction in CHE) and Mexico (54% reduction in CHE) [12, 14]. The

239 high level of variation across countries may be attributed to several factors, for example; the level

240 of insurance cover (conditions covered, co-payments) as well as institutional factors (capacity,

241 range of medicines, indebtedness of insurance scheme). The evidence suggests, that participants

242 in the Nigerian NHIS are actively using their insurance cover when participating in the health care

243 system, showing that the NHIS is functioning well, albeit for a relatively small proportion of the

244 total population.

245 Second, one of the key objectives of public sector insurance schemes is to address existing ine-

246 qualities in health care. From our analysis, there was evidence of the heterogeneous effect of health

247 care insurance across income groups. The financial protection effect was stronger among the lower

248 quintile income groups. This has important implications for the extension of the NHIS to the wider

249 population. It is noteworthy that our data was gathered prior to the outbreak of Covid-19, so it is

250 not possible to examine the performance of insurance cover in a health care infrastructure that is

251 under increased strain. The NHIS in Nigeria does appear to be achieving its pro-poor objectives

252 with lower income households disproportionally benefiting from participation in the scheme and

253 the extent to which coverage is low in Nigeria, and this finding implies that extended coverage of

254 the scheme can reduce the poverty rate in the country. In essence, NHIS served as a safety net

255 mechanism by reducing the probability of an insured household foregoing the subsistence needs

256 for medical expenditure.

257 Third, our results indicate that insured households on average spend more on education, food and

258 rent and demonstrate a higher standard of living, proxied by ownership of household assets. Fur-

259 thermore, insured households save more during the reference period. Taken together these results

260 suggest a powerful effect of insurance on household expenditure and saving activity.

261 Our study has a number of limitations in the interpretation of the results. Firstly, the short recall

262 period of 30 days prior to the survey enables respondents to provide reliable payment responses

263 but may underestimate longer term effects. Secondly, we use a representative basket of ten assets

264 to create a proxy for the household's standard of living, however we applied a simple equal weight

265 to ownership of each asset. A more sophisticated approach would have required households to

266 additionally indicate the purchase price and current value for each asset under ownership. This

267 would have allowed the construction of a more precise measure of standard of living. Finally, our

268 survey was limited to federal and state employees in Akwa Ibom. Generalising our results to a

269 broader population and to states other than Akwa Ibom is thus made more difficult as the quality

270 and accessibility of health care institutions is likely to vary across the country. This in turn will

271 impact on the financial protection effect of the NHIS and the requirement for insureds to co-pay

272 to ensure faster access to the health care system.

273 Future studies can build on this research using national level datasets, where available, to better

274 understand the overall and distributional impacts on CHE and OOPE of Nigeria's NHIS at a na-

275 tional and regional level. A more in-depth exploration of the possible effects on household wealth

276 should also be considered. For example, extending our study to the three states (Cross River, Bau-

277 chi and Enugu) where state and federal employees both have NHIS coverage would provide an

278   important test on whether our results remain consistent in a broader implementation of the NHIS.

279   A phased roll-out of the NHIS to state employees in other areas, should similarly examine not just

280   its financial protection effect, but how it impacts on household savings and standard of living. If

281   our results are consistent, then the broader Nigerian economy will likely benefit from positive

282   outcomes not just in health, but in the levels of household saving and investment in education.

283   Finally, the possibility of an increase in the utilisation of healthcare that may be associated with

284   expansion in the pool of the insured should be considered to ensure the financial sustainability of

285   the programme.

286   In conclusion, our study provides evidence of the financial protection effect of national health

287   insurance in Nigeria. The findings of this study are encouraging for other developing countries

288   who are either developing or expanding their health insurance programmes.

References

1. Dupas P, Robinson T. Why Don't the Poor Save More? Evidence from Health Savings Experiments. American Economic Review. 2013; 103(4): 1138–1171.

2. Demirguc-Kunt A, Klapper L, Singer D. 2017. Financial Inclusion and Inclusive Growth : A Review of Recent Empirical Evidence. Policy Research Working Paper; No. 8040. World Bank. 2017.

3. Whitehead M, Dahlgren G, Evans T. Equity and health sector reforms: can low-income countries escape the medical poverty trap? Lancet. 2001;358: 833–6.

4. Gwatkin DR, Rutstein S, Johnson K, Suliman EA, Wagstaff A, Amouzou A. Socio-economic differences in health, nutrition, and population within developing countries: An Overview. Washington DC: World Bank; 2007.

5. Ukwaja K, Alobu I, Abimbola S, Hopewell P. Household catastrophic payments for tuberculosis care in Nigeria: incidence, determinants and policy implications for universal health coverage. Infectcious diseases of poverty. 2013; 2 (21).

6. World Health Organisation. Global Health Expenditure Database. 2020; accessed at https://apps.who.int/nha/database/country_profile/Index/en

7. Onwujekwe O, Uzochukwu B, Obikeze E, Okoronkwo I, Ochonma O, Onoka C, Madubuko G, Okoli C. Investigating determinants of out-of-pocket spending and strategies for coping with payments for healthcare in southeast Nigeria. BMC Health Services Research. 2010; (10) 67.

8. Van Doorslaer E, O'Donnell O, Rannan-Eliya R, Somanathan A, Adhikari S, Garg C, Harbianto D, Herrin A, Huq M, Ibragimova S, Karan A. 2006. Effect of payments for health care on poverty estimates in 11 countries in Asia: an analysis of household survey data. The Lancet. 2006; 368(9544): 1357-1364.

9. Onwujekwe O, Dike N, Chukwuka C, Uzochukwu B, Onyedum C, Onoka C, Ichoku H. Examining catastrophic costs and benefit incidence of subsidized antiretroviral treatment (ART) programme in south-east Nigeria. Health Policy. 2009; 90 (2-3): 223-229.

10.   Shadmi E, Chen Y, Dourado I, Faran-Perach I, Furler J, Hangoma P, Hanvoravongchai P, Obando C, Petrosyan V, Rao K, Ruano A, Shi L, de Souza L, Spitzer-Shohat S, Sturgiss E, Suphanchaimat R, Uribe M, Willens S. Health Equity and COVID-19: global perspectives. International Journal for Equity in Health. 2020; 19, 104.

11.   Ruiz F, Amaya L, Venegas S: Progressive segmented health insurance: Colombian health reform and access to health services. Health Economics. 2007. 16:3-18.

12.   Galárraga, O., Sosa-Rubí, S., Salinas-Rodríguez *et al*. Health insurance for the poor: impact on catastrophic and out-of-pocket health expenditures in Mexico. The European Journal of Health Economics. 2010; 11, 15.

13.   Nguyen, H.T., Rajkotia, Y. & Wang, H. The financial protection effect of Ghana National Health Insurance Scheme: evidence from a study in two rural districts. International Journal for Equity in Health. 2011; 10, 4.

14.   Aryeetey, G.C., Westeneng, J., Spaan, E. *et al.* Can health insurance protect against out-of-pocket and catastrophic expenditures and also support poverty reduction? Evidence from Ghana's National Health Insurance Scheme. International Journal for Equity in Health. 2016; 15, 116.

15.   van Hees, S.G.M., O'Fallon, T., Hofker, M. *et al.* Leaving no one behind? Social inclusion of health insurance in low- and middle-income countries: a systematic review. International Journal for Equity in Health. 2019; 18, 134.

16.   Onoka C, Onwujekwe O, Uzochukwu B and Ezumah, N. Promoting universal financial protection: constraints and enabling factors in scaling-up coverage with social health insurance in Nigeria. Health Research Policy and Systems. 2013; 11(1): 20.

17.   Dutta A, Hongoro C. Scaling Up National Health Insurance in Nigeria: Learning from Case Studies of India, Colombia, and Thailand. 2013. Washington, DC: Futures Group, Health Policy Project.

18.   Onoka C, Onwujekwe O, Uzochukwu B, Ezumah, N. Why are states not adopting the formal sector programme of the NHIS and what strategies can encourage adoption? 2012. Policy Brief. AHPSR.

19.   Odeyemi, I.A. Community-based health insurance programmes and the national health insurance scheme of Nigeria: challenges to uptake and integration. International Journal for Equity in Health. 2014; 13, 20.

20.   Savedoff W, Gottret P. Governing mandatory health insurance : learning from experience. Washington, DC: World Bank. 2008.

21.   Ozili P. COVID-19 in Africa: socio-economic impact, policy response and opportunities. International Journal of Sociology and Social Policy. 2020. (Ahead of Print)

22.   Erlangga D, Suhrcke M, Ali S, Bloor K. 2019. The impact of public health insurance on health care utilisation, financial protection and health status in low- and middle-income countries: A systematic review. PLoS ONE. 2019; 14(8): e0219731 10.1371/journal.pone.0219731

23.   Ijeoma O-A, Ifeyinwa C, Obumneme B, Chigozie J. 2019. A review of the incidence and determinants of catastrophic health expenditure in Nigeria: Implications for universal health coverage. The International Journal of Health Planning and Management. 2019; 34 (4): 1387-1404.

24.   Aregbeshola B, Khan S. Determinants of catastrophic health expenditure in Nigeria. European Journal of Health Economics. 2018: 19(4) 521-532.

25.   Onoka C, Hanson K, Hanefeld J. Towards universal coverage: a policy analysis of the development of the National Health Insurance Scheme in Nigeria. Health Policy and Planning. 2015; 30 (9): 1105-1117.

26.   Folland S, Goodman A, Stano M. The economics of health and health care. 2007 (Vol. 6). Upper Saddle River, NJ: Pearson Prentice Hall.

27.   Odeyemi I, Nixon J. Assessing equity in health care through the national health insurance schemes of Nigeria and Ghana: a review-based comparative analysis. International journal for equity in health. 2013; 12(1): 9.

28.   Nguyen K, Oanh T, Shuangge M, Duc C, Giang T, Ruger J. Impact of Health Insurance on Health Care Treatment and Cost in Vietnam: A Health Capability Approach to Financial Protection. American Journal of Public Health. 2012; 102(8): 1450–1461.

29.   Nghargbu R, Olaniyan O. Inequity in Maternal and Child Health Care Utilization in Nigeria. African Development Review. 2017; 29(4): 630-647.

30.   Xu K, Evans D, Kawabata K, Zeramdini R, Klavus J, Murray C. Household catastrophic health expenditure: a multicountry analysis. The Lancet, 2003; 362(9378): 111-117.

31.   Onwujekwe O, Hanson K, Uzochukwu B. Examining inequities in incidence of catastrophic health expenditures on different healthcare services and health facilities in Nigeria. PLoS One. 2012; 7(7); e40811.

32.   Filmer D, Pritchett L. Estimating wealth effects without expenditure data - or tears: An application to educational enrolments in states of India. Demography. 2001; 38 (1): 115–132

33.   Deaton, A. and M. Grosh, Consumption, in Designing Household Survey Questionnaires for Developing Countries: Lessons from 15 Years of the Living Standards Measurement Study, M. Grosh and P. Glewwe, Editors. 2000, The World Bank.: Washington, D. C.

34.   Aggarwal A. Impact evaluation of India's 'Yeshasvini' community-based health insurance programme. Health Economics. 2010; 19(S1): 5-35.

35.   Chankova S, Atim C, Hatt L. Ghana's national health insurance scheme. In Impact of Health Insurance in low-and middle-Income Countries. 2011. Edited by Escobar, M.L., Griffin, C.C. and Shaw, R.P. Brookings Institution Press.

36.   Odozi J, Awoyemi T, Omonona B. Household poverty and inequality: The implication of migrants' remittances in Nigeria. Journal of Economic Policy Reform. 2010; 13 (2): 191-199.

37.   Abu-Zaineh M, Mataria A, Moatti JP, Ventelou B. Measuring and decomposing socioeconomic inequality in healthcare delivery: A microsimulation approach with application to the Palestinian conflict-affected fragile setting. Social Science and Medicine. 2011; 72 (2): 133-141.

38.   Abu-Zaineh M, Romdhane HB, Ventelou B, Moatti JP, Chokri A, Appraising financial protection in health: the case of Tunisia. 2013; 13 (1): 73.93.

39.   Hailemichael Y, Hanlon C, Tirfessa K, Docrat S, Alem A, Medhin G, Lund C, Chisholm D, Fekadu

A, Hailemariam D. Catastrophic health expenditure and impoverishment in households of persons with

depression: a cross-sectional, comparative study in rural Ethiopia. BMC Public Health 2019; (9) 490.

Tables and Figures

Table 1. Household Benefits package and exclusions of FSSHIP

Benefits	Exclusions
In-patient care including admission in standard ward not exceeding 15 days per year	Antiretroviral drugs
Maternity care for up to four live births	Care for terminal illnesses such as cancer and AIDS
Preventive care including immunization	Chronic health problems such as diabetes
Eye examination and care	Renal dialysis and hypertension
Prostheses	Provision of spectacle and contact lenses
Dental care	
Prescribed drugs and diagnostics test covered by the national drugs list and diagnostics test list	
Out-patient care such as consultation	

Source: NHIS (2012)

Table 2. Variable Description

Variable	Description
Household Enrolled in FSSHIP	Household is covered by the FSSHIP plan within the Nigerian National Health Insurance Scheme
Out of pocket payment (OOP) on medical use	The amount of household income spent in the last month on medical services (Naira)
Catastrophic health expenditure (CHE)	Defined as spending greater than 40% of total household income in the past month on medical services.
Household size	The number of individuals living in the household
Location	Respondent's household is located in an urban or rural area
Employment sector	Household member of employed by the health or higher education section
Education level	Highest level of education of the head of household
Medical care utilisation	Self-reported Likert scale of medical service use within the household in the past month, scaled from one to five with five the highest level of usage.
Household Income Quartile	The income quartile in which the household resides
Age Group	Age group of the head of household
Standard of living index	Number of household assets from the following list of ten: Car, Motorcycle, Bicycle, Refrigerator, Television set, Air-Conditioner, Electric power generator, Gas cooker, Home theatre video/audio system, Private water supply system.

Table 3. Descriptive statistics of variables by NHIS participation status

Variable	NHIS participation status	
	Not enrolled (N=273)	Enrolled (N=265)
OOP medical payment (Naira)	69,438	23,678
Incurred CHE	80.22%	3.39%
Household size	4.75	4.92
Location		
Rural	53.85%	10.19%
Urban	46.15%	89.91%
Employment sector		
Health	50.55%	47.55%
Higher Education	49.45%	52.45%
Education level		
Completed secondary education only	19.05%	14.34%
Completed tertiary education	80.95%	85.66%
Medical care utilisation		
Frequent	30.04%	10.19%
Very frequent	54.95%	69.43%
Extremely frequent	15.02%	20.38%
Income group		
Lowest quartile	26.01%	24.15%
2nd Lowest quartile	27.11%	24.91%
2nd Highest quartile	23.81%	25.28%
Highest quartile	23.08%	25.66%
Age group		
<=34	16.48%	11.70%
>34 & <= 44	39.93%	39.62%

>44 & <=54	34.07%	35.85%
>54	9.52%	12.83%
Household assets index (median in bracket)	4.76 (5)	6.41 (6)

Table 4. Multivariate analysis of CHE and OOP

| Variable	Dependent Variable	
	(1) Catastrophic health expenditure	(2) Out-of-pocket health expenditures in past 30 days
Insured	-0.76 (0.03)**	-1.26 (0.07)**
Household size	0.02 (0.03)	0.09 (0.01)
Location (base = urban)		
Rural	0.04 (0.07)	0.09 (0.15)
Employment sector (base = health)		
Higher Education	-0.01 (0.04)	-0.04 (0.04)
Education level (base = *Completed secondary education only*)		
Completed tertiary education	0.11 (0.06)	-0.51 (0.25)
Medical care utilization (base = *Frequent*)		
Very frequent	0.06 (0.02)	0.03 (0.07)
Extremely frequent	0.04 (0.03)	0.04 (0.08)
Income group (base = lowest quartile)		
2nd Lowest quartile	0.01 (0.01)	0.48 (0.28)**
2nd Highest quartile	0.02 (0.01)	0.78 (0.11)*
Highest quartile	0.05 (0.05)	1.19 (0.05)**
Age group (base = *<=34*)		
>34 & <= 44	-0.08 (0.00)**	-0.10 (0.25)
>44 & <=54	-0.09 (0.03)	-0.01 (0.07)
>54	-0.02 (0.1)	0.18 (0.09)
Constant	0.66 (0.7) *	10.38 (0.1) ***

Notes: Standard errors clustered by insured/uninsured are in parentheses. *** denotes statistically significant at 1%,
** denotes statistically significant at 5%, and * denotes statistically significant at 10%.

Table 5: Estimated Marginal Effect of health insurance by Income Group

Income Group	dy/dx	SE
Lowest quartile	-0.83**	(0.04)
2nd Lowest quartile	-0.76**	(0.04)
2nd Highest quartile	-0.75**	(0.03)
Highest quartile	0.70**	(0.02)

Notes: Standard errors clustered by insured/uninsured are in parentheses. *** denotes statistically significant at 1%, ** denotes statistically significant at 5%, and * denotes statistically significant at 10%.

Table 6: Estimated Marginal Effect of health insurance coverage on asset ownership

No. of Assets	dy/dx	SE
1	0.00	(0.00)
2	-0.19***	(0.02)
3	-0.16***	(0.02)
4	-0.04**	(0.02)
5	0.05***	(0.02)
6	0.09***	(0.02)
7	0.25***	(0.01)
8	0.01	(0.01)

*Notes: All estimates are based on ordered logit regression with number of household assets as the dependent variable. Standard errors clustered by insured/uninsured are in parentheses. *** denotes statistically significant at 1%, ** denotes statistically significant at 5%, and * denotes statistically significant at 10%.*

Figure 1. Comparison of Household Expenditure Among Insured and Uninsured Households in Akwa Ibom State, Nigeria.
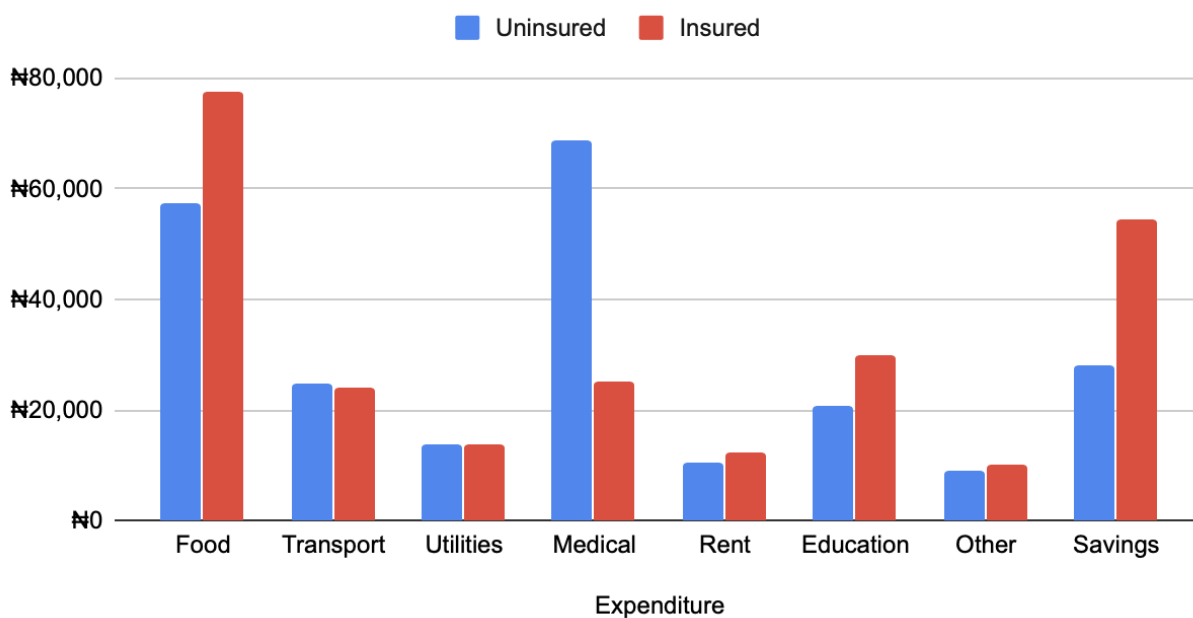
Figures

Figure 1. Comparison of Household Expenditure Among Insured and Uninsured Households in Akwa Ibom State, Nigeria.
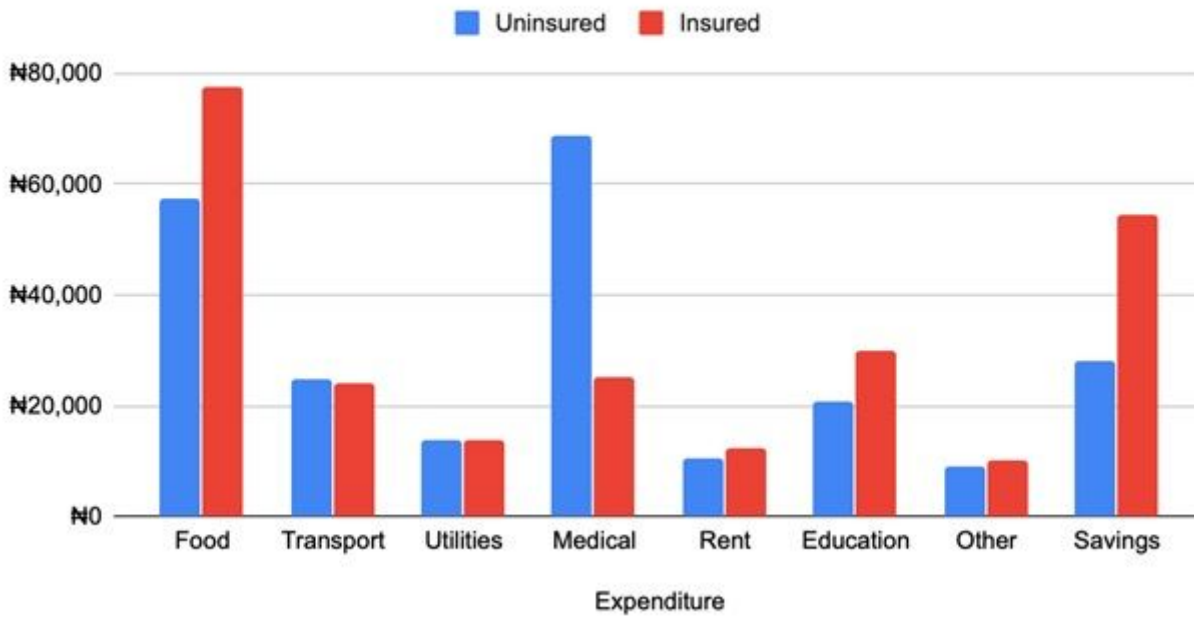

Figure 1

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