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EFFECT OF PLATEAU STATE CONTRIBUTORY HEALTHCARE SCHEME ON OUT-OF-POCKET EXPENDITURE AND CATASTROPHIC HEALTH SPENDING: A COMPARATIVE CROSS-SECTIONAL STUDY TOWARDS UNIVERSAL HEALTH COVERAGE IN NORTH-CENTRAL NIGERIA

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Abstract

Background: Nigeria's health financing is characterized by high out-of-pocket expenditure (OOPE) accounting for 71.5% of total health expenditure, undermining Universal Health Coverage. Plateau State Contributory Healthcare Management Agency (PLASCHEMA) established 2019 but impact unquantified. **Objective:** To evaluate impact of PLASCHEMA on OOPE, catastrophic health expenditure (CHE) and impoverishment. **Methods:** Comparative cross-sectional with quasi-experimental Propensity Score Matching (PSM). Conducted in Jos North, Jos South and Mangu LGAs Jan-June 2025. Multistage sampling of 420 households with illness in last 90 days: 210 actively enrolled in PLASCHEMA ≥ 12 months and 210 non-enrolled matched by income quintile. Data collected using WHO-adapted health expenditure questionnaire via KoboCollect. Primary outcomes: mean OOPE, CHE at 10% total expenditure and 25% non-food expenditure thresholds, impoverishment at \$2.15/day. Analysis with SPSS 28 and Stata 17 using t-test, chi-square, multivariate logistic regression and PSM for Average Treatment Effect on Treated (ATT). Results: Mean monthly income comparable: Enrolled ₦58,420 $\pm 12,300$ vs Non-enrolled ₦55,310 $\pm 11,800$ $p=0.34$. Mean OOPE significantly lower among enrolled: ₦4,850.60 $\pm 2,124.30$ vs ₦18,700.45 $\pm 6,412.80$ $p<0.001$. ATT showed reduction of ₦13,410 (95%CI: -15,200 to -11,620). CHE at 10% threshold 8.6% vs 31.4% adjusted OR 0.19 95%CI 0.10-0.35 $p<0.001$. CHE at 25% non-food threshold 3.8% vs 18.1% aOR 0.17 95%CI 0.07-0.39. Impoverishment 2.4% vs 14.3% aOR 0.14 95%CI 0.05-0.41. Residual OOPE among insured driven by non-formulary drugs 67.8%, diagnostic stock-outs 54.2%, informal payments 21.4%. Conclusion: PLASCHEMA provides significant financial risk protection reducing OOPE by 74% and CHE by over 70%. However residual OOPE persists due to supply-side gaps. Scale-up with supply-side reform needed. Keywords: Out-of-pocket; Catastrophic health expenditure; PLASCHEMA; Health insurance; Universal health coverage; Nigeria.

Keywords: Out-of-Pocket Expenditure, Catastrophic Health Expenditure, PLASCHEMA, Health Insurance, Universal Health Coverage, Financial Risk Protection, Impoverishment, Nigeria

1. INTRODUCTION

Financial risk protection central to UHC SDG 3.8.2. WHO recommends OOPE should not exceed 30%. Nigeria has 71.5% OOPE exposing 25 million to catastrophic spending annually. Plateau State population 4.7 million, 55.2% multidimensionally poor. PLASCHEMA established by Law No.5 2018, started 2019. Programs: formal sector 5% basic salary, informal ₦12,000 per annum per person, equity program for vulnerable funded via BHC PF. Benefit package includes outpatient, inpatient 21 days, maternal care, essential drugs. As of December 2024, 189,450 enrollees 4.1% coverage. No rigorous quasi-experimental study has evaluated PLASCHEMA impact. This study fills gap.

2. METHODS

Study Design: Comparative cross-sectional with PSM.

Study Setting: Jos North urban, Jos South semi-urban, Mangu rural.

Sample Size: Formula $n = (Z\alpha + Z\beta)^2 * (SD1^2 + SD2^2) / (M1 - M2)^2$. Using Ishaku et al 2023 mean OOPE insured ₦5,200 SD 2,500 non-insured ₦16,500 SD 6,000, power 90%, alpha 0.05, n=192 per group +10% attrition =210 per group =420 total.

Sampling: Three-stage: 1) purposive 3 LGAs 2) random 4 wards per LGA 3) systematic sampling of households from PHC register and community list matched by income quintile. For PSM matched on age, income, education, household size, chronic illness.

Data Collection: KoboCollect. OOPE disaggregated into drugs, lab, consultation, admission, transport. Household expenditure via consumption module. Pretested in Barkin Ladi n=20 Cronbach 0.82.

Analysis: SPSS 28 Stata 17. t-test, chi-square, logistic regression, PSM nearest neighbour caliper 0.2. Sensitivity analysis.

Ethics: Approval Plateau State Ministry of Health Ethics Committee Ref: MOH/MIS/202/VOL I/XX. Written informed consent.

3. RESULTS

Baseline: After PSM balanced SMD <0.1. Age 42.3 vs 41.8 years p=0.61. Male head 68.1% vs 70.5%. Tertiary education 34.3% vs 28.6% p=0.21.

OOPE: Table 1. Drug 43.3% of OOPE among enrolled vs 47.6% non-enrolled. Significant difference p<0.001 Cohen d=2.90.

Table 1: Mean OOPE (Naira)

Drugs: 2,100 vs 8,900 p<0.001

Lab: 850 vs 3,200 p<0.001

Consultation: 200 vs 2,500 p<0.001

Admission: 950 vs 2,800 p<0.001

Transport: 750 vs 1,300 p<0.01

Total: 4,850.6 ±2,124.3 vs 18,700.4 ±6,412.8 p<0.001

CHE and Impoverishment: Table 2.

Table 2: Catastrophic and Impoverishing Expenditure

CHE 10% threshold: Enrolled 8.6% 18/210, Non-enrolled 31.4% 66/210, Adjusted OR 0.19 95%CI 0.10-0.35 p<0.001

CHE 25% non-food: 3.8% vs 18.1% aOR 0.17 95%CI 0.07-0.39 p<0.001

Impoverishment: 2.4% vs 14.3% aOR 0.14 95%CI 0.05-0.41 p<0.001

Residual OOPE: Among 210 enrolled, 142 67.6% still paid OOPE mean ₦2,450. Reasons: non-formulary drug 67.8%, stock-out 54.2%, lab not covered 41.5%, informal payment 21.4%. Stock-out aOR 4.21 2.34-7.58, rural residence aOR 2.81 1.54-5.13.

PSM: ATT -₦13,410 95%CI -15,200 to -11,620 t=-12.45 p<0.001. Rosenbaum bounds gamma 2.0 still significant.

4. DISCUSSION

First PSM evidence PLASCHEMA reduces OOPE 74% larger than Lagos 58% and Kwara 45% due to lower co-payment. Residual CHE 8.6% among insured indicates effective coverage gap. WHO says insurance alone insufficient without supply. Drug stock-out systemic due to delayed capitation 3 months delay and poor supply chain. NCD drugs not in formulary causing residual payment. Policy Implications: 1) Increase coverage from 4.1% to >50% via mandatory market associations and telecom tax for equity fund 2) Strengthen supply chain via Drug Revolving Fund and e-pharmacy tracking 3) Benefit reform include hypertension/diabetes drugs 4) Equity fund Plateau receives ₦180m BHC PF annually vs need ₦1.2bn 5) Shift from passive capitation to performance-based. Strengths: First PSM study, urban/rural representation, WHO standard tool, robust analysis. Limitations: cross-sectional, 90-day recall bias, limited to 3 LGAs, exchange rate fluctuation. Future research: longitudinal cohort, qualitative trust study, cost-effectiveness. 5. CONCLUSION

PLASCHEMA effective but not sufficient. Scale-up with supply-side reform needed to achieve UHC by 2030.

DECLARATIONS

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PLAGIARISM AND AI CHECK DECLARATION FOR Q1 PUBLICATION

1. Originality: Original work of Shirkuk Nentok Bako, not published elsewhere.
2. Plagiarism Check: Turnitin Similarity Index 8.7% - PASSED. Q1 journals require <15%. All sources cited Vancouver style. No plagiarism.
3. AI Use Declaration: No generative AI used for data, results, analysis. Meta AI used only for language editing and formatting as allowed by COPE, ICMJE, and journal policies. Author takes full responsibility.
4. Data Integrity: Data collected Jan-June 2025 Plateau State, verifiable.

5. Ethical Compliance: Declaration of Helsinki, ethics approval obtained.

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