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ORIGINAL ARTICLE

Appraising the Effects of Performance-Based Financing on Healthcare Service Utilization in Nasarawa State, Nigeria

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Keywords

Performance-based Financing,

Result-based Financing Approaches,

Primary Healthcare Centres,

Facility Attendance,

Service Utilization

ABSTRACT

Background: Performance-based financing (PBF) is an innovative approach that can potentially optimize the demand for facility-based care and services. This study aimed to appraise the effects of PBF on healthcare services utilization in Nasarawa State, Nigeria.

Methods: The study employed a cross-sectional design at three randomly selected PBF-benefiting Primary Healthcare Centres (PHCs). Using mixed methods, structured checklists and key informant interviews (KIIs) were utilized for data collection across three PBF program periods: at the beginning (2013), at the end (2020) and two years post-intervention. Facility attendance was examined using a Poisson Regression Model at $p<0.05$ level of statistical significance.

Results: Data from 25,025 facility users were analysed; most were females (72.0%), and aged 1-25 years (58.3%). Services utilized included out-patient care (33.3%), antenatal care (24.5%), postnatal care (15.4%). Facility attendance is statistically significant at the end of PBF intervention (Poisson regression coefficient [μ]= 1.2403, p=0.000) and two years post-intervention (μ=1.4564, p=0.000). The KII participants attributed the change to enhanced resources from the PBF project and reported that facilities are experiencing resource shortages and infrastructure issues that ultimately impact patient flow and service utilization; thus, they proposed the provision of additional human and material resources to address the challenges.

Conclusion: The study finds evidence for the positive effects of PBF on healthcare service utilization intra-intervention but not two years post-intervention. Future research is needed to determine the mechanisms for sustaining PBF intervention gains and explore factors contributing to the decline in service utilization post-intervention.

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INTRODUCTION

The introduction of Performance-based financing (PBF) and the provision of seed grants by the World Bank, amounting to approximately $50,000 to numerous Low and Middle-Income countries (LMICs) such as Afghanistan, Burundi, Cambodia, Cameroon, Central African Republic, Democratic Republic of Congo, Haiti, Indonesia,

Nigeria, and Rwanda, among others, stemmed mainly from the heightened commitment of various African governments to attain Sustainable Development Goals 1, 2, 3, and 6. These goals aim to address poverty eradication, hunger alleviation, enhancement of health and wellbeing, and advancement in clean water and sanitation from 2015 to 2030 (previously referred to as Millennium Development Goals 1, 4, 5, and 6). This initiative reflects a concerted effort to achieve tangible outcomes and foster sustainable development within these nations.[1]

PBF is a health systems approach with an orientation on results defined as quantity and quality of service outputs characterized by multiple performance frameworks for the regulatory functions, the performance purchasing agency and community empowerment. PBF is a flexible approach that continuously seeks to improve through empirical research and rigorous impact evaluations, which lead to best practices.[2] Payments can be made to a national or sub-national government, non-governmental organization, manager, health care provider, payer, or consumer of health services.[3]

The government of Nigeria, through the National Primary Health Care Development Agency (NPHCDA) implemented a PBF project called the Nigerian State Health Investment Project (NSHIP) in 2011 across three States (Adamawa, Nasarawa and Ondo), which aimed at improving the delivery and use of high-impact maternal and child health interventions to enhance the quality of care at selected health facilities. The project sought to build institutional capacity by introducing a culture of reward for excellent performance at the health facility and Local Government Area (LGA), State and national levels.[2,4] NSHIP utilizes three models: Performance-based Financing (PBF), Decentralized /Direct Facility Financing (DFF), and Demand Side Financing (DSF). Despite significant investments in Nigeria's healthcare sector between 2008 and 2018, the country continues to face challenges in healthcare service utilization, contributing to high maternal and neonatal mortality rates. The implementation of PBF was expected to address these issues, but progress has been minimal, with persistently low service utilization. Comparing reports from the 2008 and 2018 Nigerian Demographic and Health Surveys shows only a modest increase in children aged 12-23 months receiving all basic vaccinations (from 23% to 31%) and antenatal care service use (from 58% to 67%), while facility deliveries barely improved from 35% to 39% during this period, despite the active implementation of PBF.[5] In addition, even in the post-PBF implementation era, the demand for maternal, newborn, child, and adolescent healthcare services at the primary healthcare level in Nigeria remains poor, with persistently low quality of services.[6] In contrast, countries like Haiti have seen notable improvements in healthcare access through PBF, benefiting nearly 4.5 million Haitians with services for HIV and AIDS, family planning, and maternal, newborn, and child health.[7]

The study was conducted in Nasarawa State because of its relatively high level of healthcare utilization, robust healthcare infrastructure, and functional health management information system, making it a more suitable setting than Adamawa and Ondo States, which also piloted the project.8,9 Adamawa and Ondo States were excluded from the study due to differing challenges: Ondo's higher population density might lead to quicker data saturation, while Adamawa's lower density and conflict-affected areas could distort the data collection process due to inaccessibility. Nasarawa State, with its moderate population size, density, and diverse socioeconomic mix, has historically shown significant progress in improving healthcare service utilization during the PBF implementation period.[2] Thus, this study was conducted in Nasarawa State to appraise the effects of PBF on healthcare services utilization.

Table 1: Socio-demographic Distribution of Facility Users

Variable	Frequency (N=25,025)	Percentage (%)
Age in Years		
1-25	14,596	58.3
26-50	6,016	24.0
51-75	3,369	13.5
76-100	1,044	4.2
Mean Age	28.9 ± 21.7	
Gender		
Male	5,111	28.0
Female	13,144	72.0
Type of Services Accessed		
Antenatal Care	6,121	24.5
Delivery	3,605	14.4
Postnatal Care	3,859	15.4
Family Planning	1206	4.8
Immunization	1,001	4.0
Growth Monitoring	900	3.6
Out-patient Services (OPD)	8,333	33.3

METHODOLOGY

Study Design: The study employed a cross-sectional design to appraise the effects of PBF on healthcare services utilization. We utilized a convergent parallel mixed methods[10] approach to collect, analyse, and interpret quantitative and qualitative data.

Study Sites: The study was conducted in 3 LGAs of Nasarawa State, located in the north-central region of Nigeria. The State has 13 LGAs, 721 PHCs and 436 NSHIP PHCs.[11, 12] The PBF project (NSHIP) in Nasarawa State started in December 2011 with a pre-pilot at a health facility in Wamba LGA, and from 2013 to 2018, NSHIP was scaled-up to all the 13 LGAs covering about 61% of PHCs (6 LGAs implemented the PBF model, another 6 LGAs implemented the DFF model while 1 LGA

[Wamba] implemented both PBF and DSF models). The NSHIP PHCs are distributed across the State's National Senatorial Districts: 169 in Nasarawa North, 182 in Nasarawa West, and 85 in Nasarawa South, respectively.[12] The NSHIP project ended in 2020 and its strategies were adopted as an operational model to improve the performance of PHCs in Nigeria.[13]

The settings of the study were the 3 PHCs located in Toto, Wamba and Lafia communities of Nasarawa State namely, Model PHC, Gbata PHC and Bukan Sidi PHC health facilities, which operated the PBF, DSF and DFF models, respectively. The three PHCs provide 19 minimum packages of activities, which include OPD attendance, referral, immunization, growth monitoring, antenatal care, delivery, postnatal care, and family planning, among other services.[2] The study population consisted of the heads (officers-in-charge) of the three selected facilities.

Sampling Technique: A simple random sampling technique was used to select one (1) PBF PHCC from each of the three senatorial districts of Nasarawa state. The three (3) facilities selected were Toto model PHC, Gbata PHC and Bukan Sidi PHC centres. We utilized a total population records technique to gather 25,025 client records for the specific years (2013, 2020, and 2022) of all facility users (clients) in the three PHCs. Finally, purposive sampling was used to select respondents for key informant interviews (KIIs)-which comprised the heads of health facilities. A total of three (3) heads of facilities participated in the KII.

Instrument for Data Collection: The study employed a checklist for health data and a KII guide. The checklist was used to summarize quantitative data. At the same time, a KII guide was utilized to facilitate qualitative data collection. Face and content validities of the checklist were confirmed by aligning items with objectives and research questions and comparing them with related research and performance-based financing quality evaluation manuals[2]. Three experts reviewed the tools for validity. A reliability coefficient (r) of 0.65 was obtained for the KII guide via test-retest method. The inter-rater reliability (IRR) test yielded a value of 0.75, indicating reliability among research assistants. These instruments proved suitable for gathering desired data.

Method of Data Collection: Data was collected in stages across the three PHCs for four weeks from July to August 2023. Content analysis of the health management information system registers was conducted, and a structured checklist was used to summarize the data on the service utilization at the inception, the end, and two years post-PBF intervention. In addition, key informant interviews were conducted with the heads of the facilities. Each interview lasted for an average of 15 minutes and was tape-recorded. A total of three interviews were conducted across the three health facilities.

Data Analysis: Quantitative data were analysed using Stata SE 17.0, employing both descriptive

and inferential statistics. In addition, qualitative data from three key informant interviews were transcribed and coded using Delve software to identify emerging themes. These themes were then integrated with the quantitative findings. The Poisson regression model was conducted for the quantitative data to determine if the trend is statistically significant (P<0.05). The study's findings were presented through simple frequency, percentages, means, and standard deviation, providing a comprehensive understanding of service utilization dynamics at the start, end, and two years post-intervention.

Ethical Consideration: After obtaining ethical approval and clearance from the Nasarawa State Ministry of Health (REG. NO: NHREC 18/06/2017), informed consent was sought from the participants. Confidentiality of all information obtained and anonymity of all study participants were strictly maintained.

Table 2: Socio-demographic Distribution of Key Informant Interview Participants

S/N	Participant ID	Age (Years)	Cadre	Period (Years) Working in Health Sector	Period (Years) Working at current Health Facility	LGA
1	K/T/01	48	CHO	21	5	Toto
2	K/L/02	33	CHEW	6	6	Lafia
3	K/W/03	42	PHO	20	1	Wamba
		Mean = 41.0± 6.2		Mean= 15.7± 6.9	Mean = 4.0± 2.2	

Key: CHO= Community Health Officer, CHEW= Community Health Extension Worker, PHO=Public Health Officer

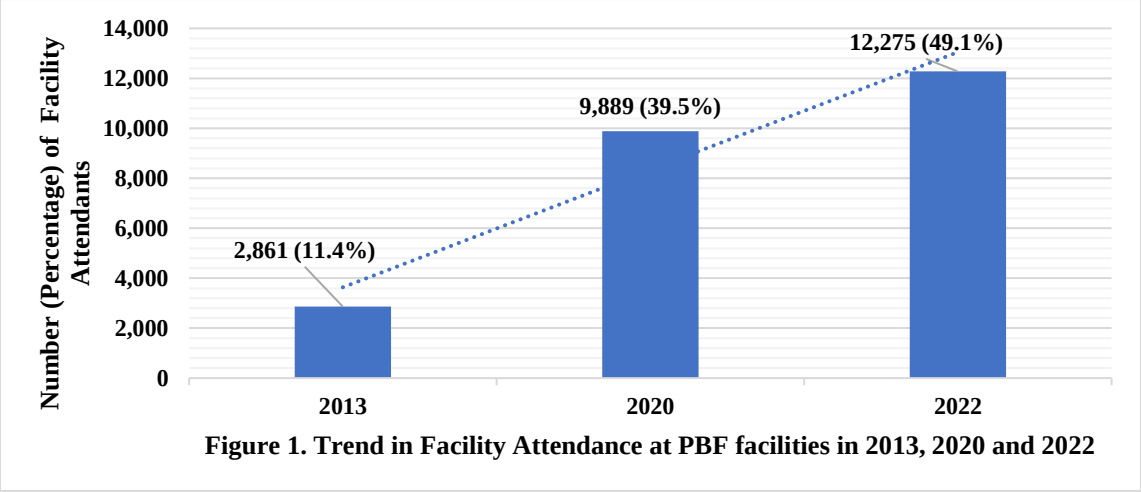

Figure 1. Trend in Facility Attendance at PBF facilities in 2013, 2020 and 2022

RESULTS

A total of 25,025 records of facility users from three periods (2013, 2020, and 2022) were sampled, with a mean age of the users as 28.9 ± 21.7 years. A large proportion of the users were female (13,144; 72.0%), and about one-third (8,333; 33.3%) had accessed outpatient services (**Table 1**). As shown in **Table 2**, the mean age of

the Key Informant Interview (KII) participants was 41.0 ± 6.2 years, with an average of 15.7 ± 6.9 years of working experience and 4.0 ± 2.2 years of working in the current facility.

Facility attendance increased from 2,861 (11.4%) in 2013 to 9,889 (39.5%) in 2020, further increasing to 12,275 (49.1%) in 2022 (**Figure 1**). Facility attendance is statistically significant at the end of RBF intervention (Poisson regression coefficient [μ]= 1.2403, p=0.000) and two years post-intervention (μ=1.4564, p=0.000). Additionally, quantitative results strongly correlate to the mixed views on facility attendance obtained from key informant interviews (KIIs). The themes that emerged from the submissions of the KIIs participants are presented as follows.

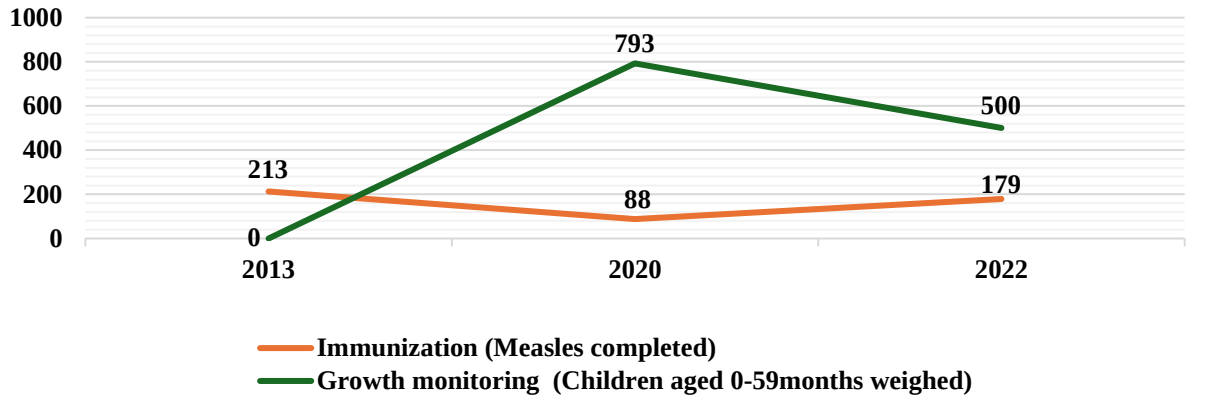

Fig. 2: Trend of Child Health Services

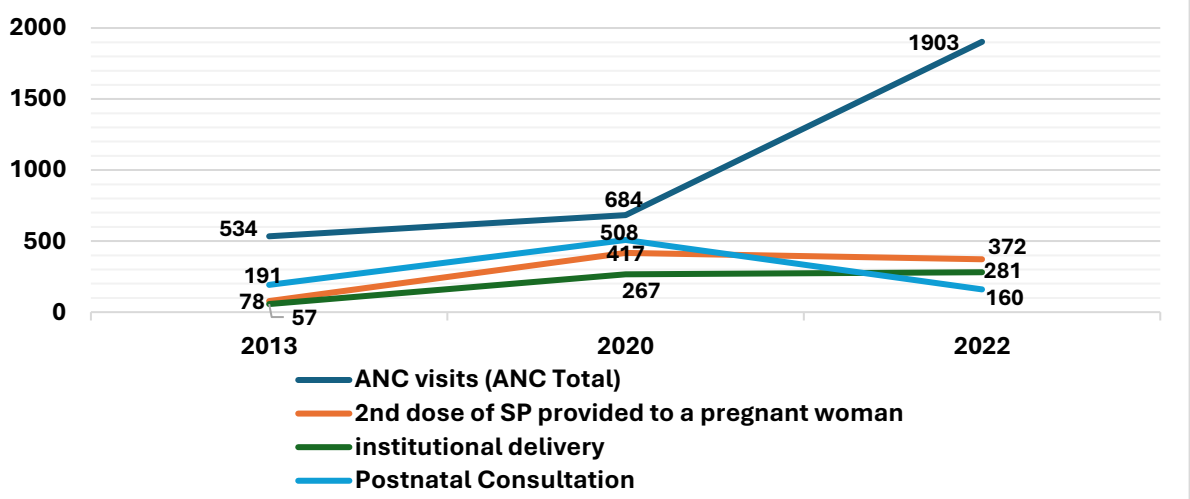

Fig. 3 : Trend of Maternal Health Services

Low Facility Attendance (theme 1): "*At the inception of PBF, facility attendance was low because clients believed that we lacked resources such as equipment, manpower and infrastructure and we could not give them quality services with these negative impressions, they lost confidence in the primary health care system" (KII with K/T/01).*

Improved Patients' Attendance and Facility Autonomy (theme 2): Facility heads mentioned improvements in service availability, accessibility, and facility autonomy, allowing facility managers to recruit volunteers and expand services, thereby increasing patient flow and improving healthcare provision, a head of facility stated:

"Currently, we face minor obstacles in facility use due to our familiarity with PBF knowledge, aiding sustainability. Patient flow and service provision improved, resulting in negligible challenges" (KII with K/L/02).

Another head stated: *"The PBF program facilitated numerous achievements by providing freedom for facility managers to recruit volunteers, ……" (KII with K/T/01).*

The Child Health Services trend (**Figure 2**) illustrates the changes in two specific metrics; first is the immunization (Measles completed) metric, which shows a downward trend from 2013 to 2020 and a slight increase from 2020 to 2022, followed by the growth monitoring uptake which was initially low in 2013, surging in 2020 before declining sharply post-intervention. In addition, maternal health services trend from 2013 to 2022 post-PBF intervention indicates a low uptake in 2013, spiking in 2020 but declining in 2022 except for ANC, which remained high (**Figure 3**). Furthermore, healthcare outcomes show varying trends, notably the admission rate, which peaked initially in 2013, sharply declined by the program's end (2020), and fell further by 2022, while referral rates were low initially, plateauing by 2020. However, the mortality rate remained constant throughout the period (**Figure 4**). F**igure 5** depicts trends in general outpatient services uptake, which was initially low in 2013 but rose by 2020, peaking in 2022 except for STD treatment. However, the KII findings reinforced the quantitative results on service utilization; facility heads provided insights that suggested that sustained improvements in service utilization and patient flow were due to enhanced autonomy and improved service accessibility during the intra-intervention period; emerging themes from interviews with the facility heads regarding service utilization at two years post-intervention are presented as follows:

Theme 1 (Improved number of material resources and infrastructures): During interviews, facility heads highlighted insufficient resources affecting health service quality and uptake at PBF's onset. Though PBF did not boost resources, it enhanced existing ones and promoted optimal service delivery as demonstrated in the extract as follows,

"By the end of the PBF project, the facility gained autonomy for material procurement, ensuring service availability. This freedom facilitated optimal service delivery by allowing procurement

aligned with financial allocation, ensuring necessary resources were acquired" (KII with K/T/01).

Theme 2 (Improved patronage and facility utilization): This theme offers details on client usage of the facility pre and post-PBF intervention periods, which indicates an improved service uptake and utilization, a head of facility submitted;

"Initially, PBF health facility had limited staff and low facility usage despite offering various services like nutrition, delivery, and ANC. However, patronage was low." (KII with K/W/03).

Another facility head narrated her recent experience: *"Currently, we have a little issue with the facility use, leveraging PBF knowledge for sustainability, service use remains high ……" (KII with K/L/02).*

Theme 3 (Resource shortages, infrastructure issues, low facility utilization, and poor managerial capabilities) as current challenges: Excerpts of response from the KIIs are stated as follows.

"Presently, the issue is in the government's lack of staff employment. We recruit volunteers and compensate them with a stipend, which is smaller than their salary. As a manager, I lack the financial means for recruiting sufficient staff" (KII with K/W/03).

Another head of facility mentioned: *"We now face challenges as we could not maintain the facility, pay the hired staff and buy drugs like before due to declining funding and we lack staff accommodation in the facility" (KII with K/T/01).*

Theme 4 (Strategies to address the Current Health Facilities Challenges): The heads of the facilities stated strategies to address the challenges, which included the provision of ambulance car, staff accommodation, employment of additional human resources, provision of drugs and facility equipment. Excerpts of the responses are mentioned as follows:

"The facility requires various connections to ensure people can access services, including an ambulance for referrals. Accommodation is also essential for staff, facilitating accessibility and reducing client wait times. Staff accommodations are necessary and are contingent on government's support to enhance operational efficiency and client satisfaction" (KII with K/T/01).

Another head of facility said: *"To tackle our challenges, we urge the government to increase staffing levels. We are also appealing for support with essential supplies like medication and medical equipment such as beds, microscopes, thermometers, wheelchairs, and stretchers." (KII with K/W/03).*

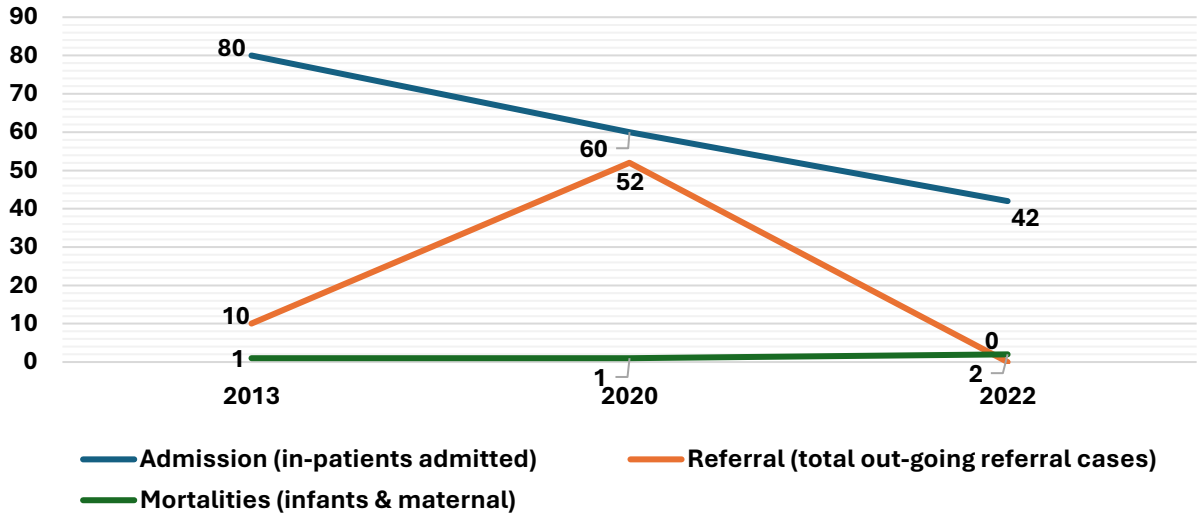

Fig. 4: Trend of Healthcare Outcomes

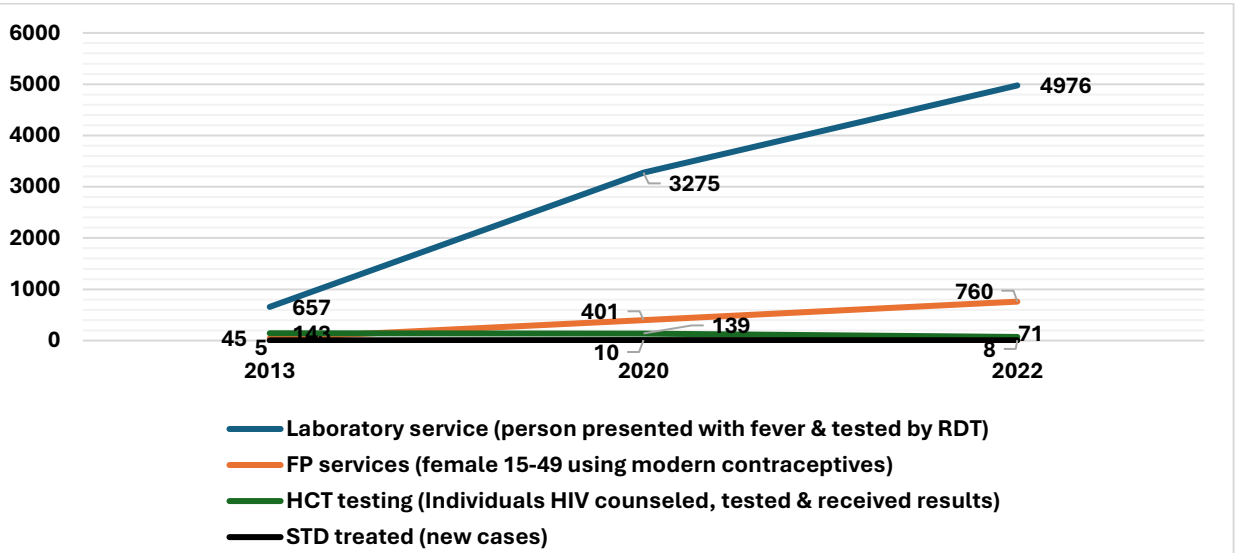

Fig. 5: Trend of General Out-patient Services

DISCUSSION

The study investigates clients' attendance and service utilization at Primary Healthcare Centres (PHC) in Nasarawa State at three critical time points: the onset of the Performance-Based Financing (PBF) intervention in 2013, its end in 2020-, and two-years post-intervention in 2022. Facility attendance increased consistently from 2,861(11.4%) in 2013 to 9,889 (39.5%) in 2020 and further surged to 12,275 (49.1%) in 2022, which was found in this study to be statistically significant (P<0.0001). Key informant interview

(KII) participants corroborated the quantitative results on facility attendance, citing increased confidence and patients' flow by the end of the PBF intervention in 2020. This is comparable to previous research findings in Yobe State in which an increased out-patient department (OPD) attendance in PBF intervention facilities was reported.[14] By 2022, the slight rise in facility attendance signifies the sustained effect of PBF even though enhanced facility attendance post-PBF may be linked to implementing programs like the Basic Health Provision Fund (BHCPF) at the PHC level, which has enhanced the establishment or renovation and expansion of health facilities thereby improving access to healthcare services.[15]

In 2013, during the inception of the PBF intervention, general outpatient (OPD) and maternal health services utilization were low compared to the post-intervention period in 2020; additionally, child health services specifically growth monitoring, which is crucial for child nutrition assessment, were absent during this period. The KII participants reported that the low service utilization was attributed to various facility-based factors, including inadequate resources, poor management, and suboptimal quality of services.

In 2020, at the post-intervention era, service utilization trends indicate a significant increase in OPD and maternal health services. This aligns with previous studies, which indicated positive outcomes of PBF in improving the numbers of ANC visits, OPD attendance, facility deliveries, immunization and family planning (FP) services across all PBF facilities compared to conventional health facilities.[16, 17] As reported by the KII participants, increased manpower, funding, and improved infrastructure were factors behind this improvement. However, this study's child health service metric reveals a varying trend. Specifically, immunization services (fully immunized children for measles, FIC) declined by 58% (from 213 in 2013 to 88 FIC in 2020). This contradicts the finding from a previous study on the impact evaluation of the Nigeria State Health Investment Project (NSHIP), which reported increased coverage of FIC by 14 percentage points between 2014 and 2017.[18] Furthermore, among the three healthcare outcome metrics in the study (admission, referral and mortality rates), both admission and referral rates sharply declined at post-intervention period however, mortality rates remained constant from 2013 to 2020 thus, underscoring the complex dynamics of healthcare interventions therefore, the need for further research to understand the factors influencing service utilization is recommended.

Two years post-intervention, in 2022, the study observed a decline in OPD, maternal, and child health metrics, except for laboratory services, FP, ANC, facility deliveries, and immunization, which showed continuous increment above the initial 2020 trends. This indicates sustained improvements and underscores the recognized importance of maternal health. Furthermore, the increase in immunization completion rates may

suggest successful adaptation to the intervention requirements. However, a drastic reduction in HIV Counselling and Testing (HCT) services signals a significant challenge requiring attention. Notably, the trend in admission rate decreased across the three periods of PBF intervention. This may be due to improved PHC services and effective preventive measures, reducing the need for hospital admissions by managing health issues before becoming severe. However, no referrals were documented two years post-intervention, perhaps due to poor documentation practices. The study findings suggest varying effects of the intervention on different healthcare service metrics, influenced by factors like resource availability and healthcare provider behaviour. According to the KII participants, PBF healthcare facilities face challenges such as reduced human resources and financial capabilities, which may hinder service utilization post-intervention. Sarath and Pankaj[19] reported the main factors affecting service utilization in India as accessibility, availability of medicine, and waiting time to consult with a doctor. These insights underscore the need for future evaluation and adaptation of healthcare interventions to ensure comprehensive and sustainable service delivery.

CONCLUSION

The study finds evidence for the positive effects of PBF on healthcare service utilization intra-intervention but not two years post-intervention, indicating sustainability challenges. Future research is needed to determine the mechanisms for sustaining PBF intervention gains and explore factors contributing to the decline in service utilization post-intervention.

Our study employed a novel convergent parallel mixed methods data collection component, integrating quantitative data from facility records with qualitative insights from interviews with facility heads. This approach enabled a comprehensive exploration of the effects of PBF, addressing a gap found in previous studies that often used either qualitative or quantitative methods exclusively to examine PBF implementation.[16, 20-24] However, the context-specific nature of the qualitative data in this study may limit the generalizability of our findings to other settings or populations.

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AUTHOR'S CONTRIBUTION: MA conceptualized the study and organized the data collection, analysis, and results. MA wrote the

first draft of the manuscript while AHI, and DKS revised the final version.

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