

ORIGINAL RESEARCH ARTICLE

Effect of community health workers' visits on uptake of modern contraception among rural women of reproductive age in Nigeria

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Abstract

This paper assessed the effect of visits by Community Health Workers (CHW) in the prior 12 months on modern contraceptive use at the time of the survey using a national sample of women residing in rural communities in Nigeria. Cross-sectional data from 5072 rural women ages 15–49 years interviewed in the PMA2020 Survey in 6 states in Nigeria in 2018 were used. Descriptive analysis and generalized linear models were conducted in Stata 15.1 and average marginal effects calculated. Overall prevalence of modern contraceptive use was 14.8% (95% CI: 12.7%, 17.3%), varying from 2.1% in Kano to 22.7% in Nasarawa. Ten percent of women reported that they were visited by a community health worker in the 12-month period preceding the survey, ranging from 2.9% in Kano to 14.6% in Nasarawa. Women visited by a CHW had 50% higher odds of reporting modern contraceptive use, and these visits raised the probability of modern contraceptive use by an average of 6.4 percentage points overall. Local governments in rural Nigeria should invest in training, deploying and supervising CHWs in the provision of modern contraception through home visits to women who may otherwise have limited access to improve use. (*Afr J Reprod Health* 2020; 24[3]: 108-117).

Keywords: Community Health Workers (CHWs); Family Planning; Modern contraception; Rural Nigeria

Résumé

Cet article a évalué l'effet des visites des agents de santé communautaires (ASC) au cours des 12 mois précédents sur l'utilisation de la contraception moderne au moment de l'enquête en utilisant un échantillon national de femmes résidant dans les communautés rurales du Nigéria. Des données transversales de 5072 femmes rurales âgées de 15 à 49 ans interrogées dans le cadre de l'enquête PMA2020 dans 6 États du Nigéria en 2018 ont été utilisées. Une analyse descriptive et des modèles linéaires généralisés ont été réalisés dans Stata 15.1 et les effets marginaux moyens ont été calculés. La prévalence globale de l'utilisation de la contraception moderne était de 14,8% (IC à 95%: 12,7%, 17,3%), variant de 2,1% à Kano à 22,7% à Nasarawa. Dix pour cent des femmes ont déclaré avoir reçu la visite d'un agent de santé communautaire au cours des 12 mois précédant l'enquête, allant de 2,9% à Kano à 14,6% à Nasarawa. Les femmes visitées par un ASC avaient 50% plus de chances de déclarer une utilisation de contraceptifs modernes, et ces visites ont augmenté la probabilité d'utilisation de contraceptifs modernes de 6,4 points de pourcentage en moyenne. Les gouvernements locaux dans les zones rurales du Nigéria devraient investir dans la formation, le déploiement et la supervision des ASC dans la fourniture de contraceptifs modernes par le biais de visites à domicile aux femmes qui pourraient autrement avoir un accès limité pour améliorer l'utilisation. (*Afr J Reprod Health* 2020; 24[3]: 108-117).

Mots-clés: Agents de santé communautaire (ASC); Planification familiale; Contraception moderne; Nigéria rural

Introduction

Community or village-based health workers for family planning have in fact been engaged since the 1950s as a complement to facility based services, and continue to serve as a critical link between these communities and the primary health care system. Community Health Workers (CHWs) most often work in rural communities where their services are most effective¹⁻⁴. The roles of CHWs

help to address some of the concerns that have been raised regarding shortages of human resources for health, especially in low resource settings⁴⁻⁶. However, Lehmann and colleagues argue that the effectiveness of the roles of CHWs depends on having the right mechanisms in place and sustained political will, over the long term⁷. CHWs are uniquely positioned to offer family planning services to women where they live, thus helping to address the social barriers that prevent

some women from using effective methods^{8,9}. The roles of CHWs give them an opportunity to help to sustain and improve the continuum of care, as they are trained to provide low-cost maternal and child health interventions that are known to reduce morbidity and mortality and also improve care-seeking behavior^{10,11}.

Interactions with CHWs and community health volunteers have been shown to improve use of modern contraceptives among women in rural settings in low and middle income countries, with contraceptive use being higher where the field worker lived within the community and paid several visits to women where they lived¹²⁻¹⁴. The success of community-based family planning outreach services has also been attributed to limited mobility of women, as seen in Bangladesh and Afghanistan, and the cultural expectation to defer to the opinions of husbands and kin, an act that has the potential to stymie a woman's pursuit of her reproductive preferences^{15,16}. In the Rural Expansion of Afghanistan's Community-based Healthcare (REACH) project, contraceptive use increased from 16% to 26% between baseline and endline over 2 years in 13 provinces served by both CHWs and clinics¹⁶. Research from Afghanistan revealed that the presence of a female CHW in the community was associated with increased contraceptive use, while the presence of a male CHW was not¹⁷. On the other hand, FP discussions with CHWs have been shown to be associated with use of modern contraception among men in Uganda¹⁸.

A systematic review of 54 eligible studies showed that 93% of them concurred that CHW FP programs increase the use of modern contraception. Of these studies, 26 compared CHWs to facility-based services, and in 77% of cases, reported that CHWs had a greater effect on contraceptive use than facility-based services alone¹⁹, suggesting that the personal touch during the visit of the CHW may be important.

A longitudinal study conducted in Bangladesh found that program exposure to family planning through household encounters with outreach workers were more important than client-initiated services received at fixed health facilities, even after a decade of outreach activity¹⁵. The authors of the Bangladeshi study posit that such

long-term outreach services can bring about ideational change as these female outreach workers (called family welfare assistants) create a social bond with women and concomitantly serve as confidants and role models. Moreover, this outreach initiative helps to address social, psychological and potential child-care costs when these serve as barriers to women seeking services to cater for their reproductive needs, especially where there is high demand for family planning¹⁵. Given many similarities in the contexts in which women live in Asia and Sub Saharan Africa, this community outreach initiated model, in addition to fixed facility services, is likely to have similar long term successes in rural parts of Sub Saharan Africa, if longitudinal studies were available to show this.

By simple reasoning, this means that ensuring these women have direct access to modern contraception can help to improve women's health. A small investment in training, equipping, posting, supervising and maintaining CHWs can generate health benefits at multiple levels. The cost for providing improved services for all women in need of modern methods was estimated to be \$26.90 per user per year in Africa in 2012, an amount that almost quadrupled the estimate for Asia²⁰. Another estimate in the same year suggested that CHWs can bring this cost down to \$6.36 per user per year²¹. The 2017 estimates to meet women's needs for both modern contraception and maternal and newborn care in Africa have been estimated at \$18 per person per year²².

The outreach services of CHWs are well known in different contexts, but the extent of their reach and length of their training varies widely²³. Competence and high levels of client satisfaction have been reported where CHWs are allowed to administer DMPA to women in studies from Bangladesh, Ethiopia, Madagascar, Mozambique, and Uganda²⁴⁻³⁰. Prata and colleagues argue that community-based distribution of contraception will continue to be effective for as long as they improve and broaden access to family planning for women, and lead to an increase in use³¹.

Existing research from various contexts provides consistent findings that show that the work of CHWs in rural settings is effective in

improving use of modern contraception. Less is known, however, about how contact with community health workers can help to improve modern contraceptive prevalence in rural settings in Nigeria where unmet need remains high, and contraceptive use remains low. This study will, in part, help to fill some of this gap in knowledge by assessing the association between report of a visit from a CHW in the 12 months preceding the survey and use of modern contraception among Nigerian women ages 15 – 49 years residing in rural settings in 6 states. Our hypothesis is that visits by CHWs will be independently associated with more modern contraceptive use among these women.

The Nigerian context

Nigeria, a country of over 160 million people, continues to have low modern contraceptive prevalence rates, despite the efforts and investments of donors and the government. The nationally representative Demographic and Health Surveys are conducted in Nigeria every 5 years, but show only very slight gains in modern contraceptive prevalence rates. The 2018 survey suggests only a 2% gain in modern contraceptive use among married women between 2008 and 2018, from 10% to 12%. However, disparities exist, with contraceptive use being more than twice as high in urban compared with rural settings in the 2018 survey (18.2% versus 7.8%)³².

Although community health workers are a global concept, their roles differ by context and must be locally relevant and culturally appropriate to encourage community acceptance and ownership^{33,34}. Community Health Workers in Nigeria include community health officers (CHOs), community health extension workers (CHEWs) and junior community health extension workers (JCHEWs)³⁵, all of whom are employed in primary health care facilities. In addition, there are Community Resource Persons who generally work for non-governmental organizations, rather than the government, and include village health workers, community based distributors, and traditional birth attendants³⁵.

The shortage of family planning providers has been seen as one setback in the struggle to increase the modern contraceptive prevalence in

Nigeria. In an effort to expand access to family planning services provided by CHEWs, Nigeria passed a 2014 task-shifting and task-sharing policy. Thus, CHWs (CHOs and CHEWs) can now, in theory, provide all family planning methods except vasectomy and tubal ligation³⁶. The Evidence to Action project, working in Cross River and Kaduna states from April 2015 to June 2016 assessed the effects of implant provision by CHEWs on contraceptive uptake at health facilities in select Local Government Areas (LGAs) and found competency in implant counseling and insertion to be high in the intervention arm, compared with the control arm, but the scores had decreased by the end of the study. The researchers suggested ongoing supervision to address this. The study also revealed that clients of CHEWs were as satisfied with services as those who received care from other providers, such as nurses³⁷. Other studies conducted in northern Nigeria also found that CHWs can effectively provide implants³⁸ and injectables³⁹ under supervision. Despite the positive outcomes of these studies, the deployment of CHWs as a strategy to improve contraceptive prevalence in Nigeria appears to be limited in scope. Also limited is detailed information on the role CHWs may play in improving modern contraceptive method use among Nigerian women in rural settings where access to fixed facilities may be restricted due to distance and sociocultural factors.

This study assesses the association between exposure to family planning information through a visit by a CHW (independent of a visit to a health facility in the 12 months preceding the survey) and current use of modern contraception among Nigerian women ages 15 – 49 years residing in rural settings in 6 states. Our hypothesis is that visits by CHWs will be independently associated with more modern contraceptive use among women residing in rural communities in Nigeria.

Methods

This paper presents cross-sectional analysis of secondary data from the Performance Monitoring and Accountability 2020-Nigeria (PMA2020-NG) survey. The study area included rural communities

of 6 Nigerian states (Anambra, Kaduna, Kano, Nasarawa, Rivers, Taraba). The study population consisted of heads of households and women of reproductive age who resided in rural communities. Women had to reside in rural communities, be usual residents or have slept in the house the night before the survey to be eligible. Women who were pregnant or menopausal were excluded since they were not at risk of unintended pregnancy. Households where the household head refused to participate or where the interviewer was unable to obtain consent from a guardian to interview females 15-17 years of age were excluded. Similarly, households were excluded if there was a language barrier, as the survey was only available in English, Hausa, Yoruba, and Pidgin English.

PMA2020 is a mobile phone-assisted survey that consists of a random sample of 302 Enumeration Areas (EAs) across 7 Nigerian states (Anambra, Kaduna, Kano, Lagos, Nasarawa, Rivers, Taraba), drawn from the 2006 Housing and Population Census master sampling frame. A two-stage cluster sample was used to select households within selected EAs. Maps for the selected EAs were obtained from the National Population Commission to aid identification of the boundaries, followed by mapping and listing of all occupied residential structures and households in each EA. The goal was to list at least 200 households in each EA, and where this number was not attained, adjoining EAs were added to form an enumeration area cluster of approximately 200 households. Where listing was commenced in a given EA, this continued for the entire EA, even if this meant listing more than 200 households. After listing, a random sample of 35 households was selected per EA/EA cluster using a random number application. Thereafter, information on household composition and characteristics were collected from household heads and reproductive health-related information was obtained from eligible women of reproductive age using Open Data Kit (ODK) software on pre-programmed mobile phones. Household heads and eligible women were interviewed at home by enumerators resident in or near the selected EAs between April and May 2018. Data from the mobile surveys were uploaded to a cloud server onto the ODK

aggregate platform. Data quality checks were performed both during and after the data collection exercise by the data management team, and supervisors returned to re-interview 10% of eligible households with a brief survey as an additional way to monitor the quality of the data⁴⁰.

The analytic sample consisted of women ages 15-49 years who were at risk of unintended pregnancy and resided in rural communities in 6 Nigerian states at the time of the survey. In all, there were 5072 women in the analytic sample, representing 45.7% of the *de facto* sample of women who had complete interviews in the 7-state survey (See Figure 1).

The dependent variable was use of a modern contraceptive method, coded “1” if the woman reported current use, and “0” otherwise. The main independent variable was report of being visited by a CHW in the 12-month period preceding the survey. Univariate analysis and bivariate logistic regression were conducted.

The CHW’s visit represents a family planning program supply-side effort. The measure is based on “yes” responses to the question: “In the last 12 months, were you visited by a community health worker who talked to you about family planning?”. To control for the respondent’s demand for health care, the model includes the woman’s report of having visited a health facility, specifically that she said “yes” to the question, “In the last 12 months, have you visited a health facility or camp for care for yourself or your children?” and to “Did any staff member at the health facility speak to you about family planning methods?”. The latter can happen through group counseling when pregnant women attend for antenatal care or other maternal and reproductive health services. We assume here that this type of health visit, initiated by the woman, is qualitatively different than when contact is initiated by the community-based health worker.

Regression models were fitted using log link function and the poisson family distribution. The combined and state level regression models were adjusted for individual and household level variables. These included the woman’s age group (15-24, 25-30, 31-49 years); education level (no formal/primary, secondary/tertiary); marital status (currently married,

separated/divorced/widowed/never married); number of live births (0, 1-3, 4 or more); fertility desires (want more, want no more, don't know/no response/cannot get pregnant), and household wealth quintile. The wealth quintile was based on the national distribution of household assets and amenities, including construction materials, and main sanitation and water facilities, factor analyzed using the principal components method, to construct asset scores that were then distributed into quintiles. Average marginal effects of being visited by a CHW were estimated for the combined and state level models. The level of significance was set at $p < 0.05$. Data were weighted to account for the multi-stage sample design and robust standard errors were generated using the Taylor linearization method. All analyses were conducted using Stata/SE 15.1 (StataCorp. 2017. Stata Statistical Software: Release 15. College Station, TX: StataCorp LLC; URL: www.stata.com).

Results

The mean age of the 5072 women in the analytic sample was 28.4 ± 9.3 years. Response rates following female interviews were over 95% in all states. Prevalence of modern contraceptive use among rural women at risk of unintended pregnancy was 14.8% (95% CI: 12.7%, 17.3%). Prevalence ranged from 2.1% in the Kano state sample to 22.7% in Nasarawa state. One in ten (10.2%) of the respondents reported that they were visited by a CHW in the 12-month period preceding the survey, but this differed by state, varying from 2.9% in Kano state to 14.6% in Nasarawa state. Furthermore, 16.8% of women received FP information from a provider when they visited a health facility in the 12-month period preceding the survey, ranging from 9.8% of women in Taraba state to 22.4% in Kaduna state (Table 1).

Four-tenths (44.3%) of the respondents had at least secondary education, ranging from one in ten in Kano state (13.4%) to nine in ten in Anambra state (88.2%). Overall, 70.2% were currently married or living with a man, and this varied from 52.7% in Anambra state to 89.8% in Kaduna state. Regarding fertility desires, 66.7% of

women wanted more children (ranging from 62.1% in Taraba state to 69.2% in Rivers state), while 18.4% wanted no more (ranging from 12% in Kano state to 28% in Anambra state). Three in 10 (29.5%) women reported no births (from 15.7% in Kano state to 42.6% in Anambra state) while 36.3% had 4 or more birth events (26.4% in Rivers state to 53.5% in Kano state).

As seen in Table 2, in the combined sample of all 6 states, women who were visited by a CHW who spoke with them about FP had 50% higher odds of reporting contraceptive use compared with women who did not report such encounters (aOR=1.50, 95%CI=1.20-1.88, $p < .001$). Women who discussed FP with a provider in a health facility in the 12-month period preceding the survey had 50% higher odds of reporting use of modern contraception (aOR=1.50, 95%CI=1.24-1.82, $p < .001$). Both results are adjusted for individual and household level characteristics. Although the individual state-level analyses showed adjusted odds all greater than 1.0, the association between being visited by a CHW who spoke about FP and modern contraceptive use only reached statistical significance in Kano, Nasarawa and Taraba states. Similarly, the association between visiting a health facility where a woman spoke with a provider about FP and modern contraceptive use only reached statistical significance for Kaduna and Kano states.

The average marginal effects were calculated for having had contact with a community health worker on modern contraceptive use and these were statistically significantly different from zero in Kano (0.024), Nasarawa (0.087) and Taraba (0.110) states, as shown in Figure 2. Similarly, Figure 2 also shows that average marginal effects for having visited a health facility, including the receipt of FP information on modern contraceptive use were statistically significant for Kaduna (0.076) and Kano (0.045) states. For both of these variables, average marginal effects were significantly different from zero for all states combined (0.064).

Discussion

Family planning-related contact with CHWs was associated with more modern contraceptive use in

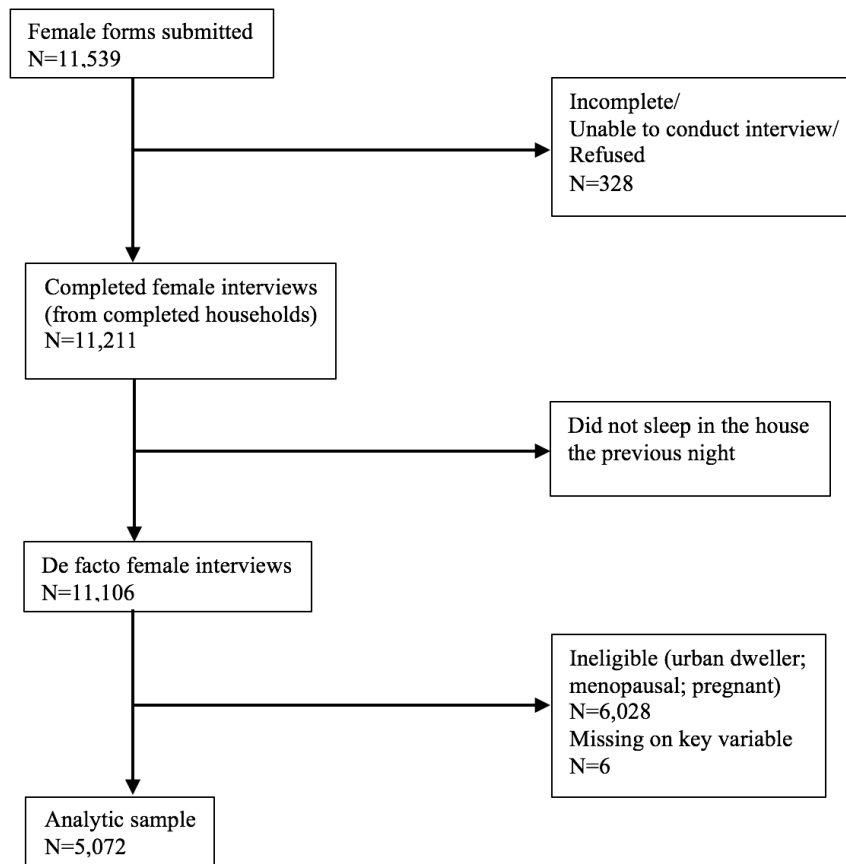


Figure 1: Flow chart showing selection of analytic sample

the combined sample of six states, but this did not always reach statistical significance when examined by state. In Kano, Nasarawa and Taraba states, visits by CHWs were associated with increased probability of modern contraceptive use, a finding in keeping with the results of other studies from sub-Saharan Africa and Asia^{12,16,38,39}. This relationship held true, even after adjusting for having visited a health facility where women received FP information in the 12-month period preceding the survey. This finding aligns with those from a longitudinal study from Bangladesh that showed that program exposure to family planning through household encounters with outreach workers were more important than client-initiated services received at fixed health facilities, even after a decade of outreach activity¹⁵.

This suggests that CHWs can help women who may not otherwise have access (due to social norms, distance, cost of transportation, etc.) to brick and mortar health facilities to receive counseling, commodities and referral, as necessary, where they live^{27,31}. The interpersonal interaction may help to address doubts and concerns, myths and misconceptions on the part of the woman, thus increasing the likelihood of her initiation of a method, as well as continued use of modern methods. Furthermore, contact with CHWs may help to reduce the fear of real or perceived social sanctions associated with seeking family planning services by making it possible to have private conversations with a health worker. Even though the Community Health Practitioners Registration Board of Nigeria is the statutory

Table 1: Characteristics of Rural Nigerian Women in Sample

Variables	All States N=5072	Anambra N=547	Kaduna N=1513	Kano N=843	Nasarawa N=1073	Rivers N=482	Taraba N=614
Visited by CHW in 12-month period preceding survey							
No	89.8	85.9	87.6	97.1	85.4	90.1	91.7
Yes	10.2	14.1	12.4	2.9	14.6	9.9	8.3
Visited a health facility in 12-month period preceding survey + spoken to about FP							
No	83.2	84.2	77.6	85.1	78.0	84.2	90.2
Yes	16.8	15.8	22.4	14.9	22.0	15.8	9.8
Fertility desires							
Want more children	66.7	63.5	69.0	67.7	68.8	69.2	62.1
Want no more children	18.4	28.0	12.4	12.0	21.8	22.8	17.5
Don't know/No response/Cannot get pregnant	14.8	8.5	18.5	20.4	9.4	8.0	20.5
Age group (years)							
15-24	38.7	35.4	43.8	35.1	41.4	34.5	38.6
25-30	23.7	19.7	22.2	24.5	25.9	21.7	24.3
31-49	37.6	44.9	34.0	40.3	32.6	43.8	37.0
Highest level of school attended							
No formal/Primary	55.7	11.8	78.4	86.6	47.4	18.3	65.5
Secondary/Tertiary	44.3	88.2	21.6	13.4	52.6	81.7	34.5
Marital status							
Currently married/living with man	70.2	52.7	89.8	86.2	60.2	58.8	69.5
Not currently living with man	29.8	47.3	10.2	13.8	39.8	41.2	30.5
Wealth quintile							
Lowest quintile	21.3	18.1	22.1	20.1	21.0	21.2	20.2
Lower quintile	18.6	19.1	20.5	20.3	17.0	17.3	20.9
Middle quintile	19.5	20.2	21.7	19.0	19.6	17.5	18.7
Higher quintile	19.2	20.2	20.4	18.6	16.0	17.0	20.8
Highest quintile	21.5	22.5	15.3	22.1	26.4	27.0	19.5
Number of live births							
None	29.5	42.6	19.6	15.7	35.2	39.0	29.4
1-3 births	34.2	29.0	41.2	30.8	34.9	34.7	33.1
4+ births	36.3	28.5	39.2	53.5	29.9	26.4	37.6
Modern contraceptive use							
No	85.2	83.9	88.1	97.9	77.3	80.3	85.8
Yes	14.8	16.1	11.9	2.1	22.7	19.7	14.2

Table 2: Generalized Linear Models Showing Association between Visit by a Community Health Worker and Modern Contraceptive Use and 95% CIs among Women in Rural Areas of Six Nigerian States

	All 6 States	Anambra	Kaduna	Kano	Nasarawa	Rivers	Taraba
CHW visit in preceding 12 months	1.50 (1.20, 1.88)***	1.04 (0.64, 1.71)	1.13 (0.71, 1.79)	6.31 (1.96, 20.28)**	1.46 (1.07, 1.99)*	1.08 (0.60, 1.95)	1.99 (1.16, 3.39)*
Visit to facility in preceding 12 months + spoken to about FP	1.50 (1.24, 1.82)***	1.29 (0.83, 2.02)	1.83 (1.24, 2.70)**	9.11 (3.00, 27.64)***	1.08 (0.81, 1.44)	1.51 (0.96, 2.38)	1.04 (0.58, 1.86)

Models adjusted for age group (15-24, 25-30, 31-49); educational level (no formal/primary, secondary/tertiary); marital status (currently married, separated/divorced/widowed/never married); birth events (0, 1-3, 4+); wealth quintile; fertility desires (want more, want no more, don't know/no response/cannot get pregnant)

***p<0.001, **p<0.01; *p<0.05

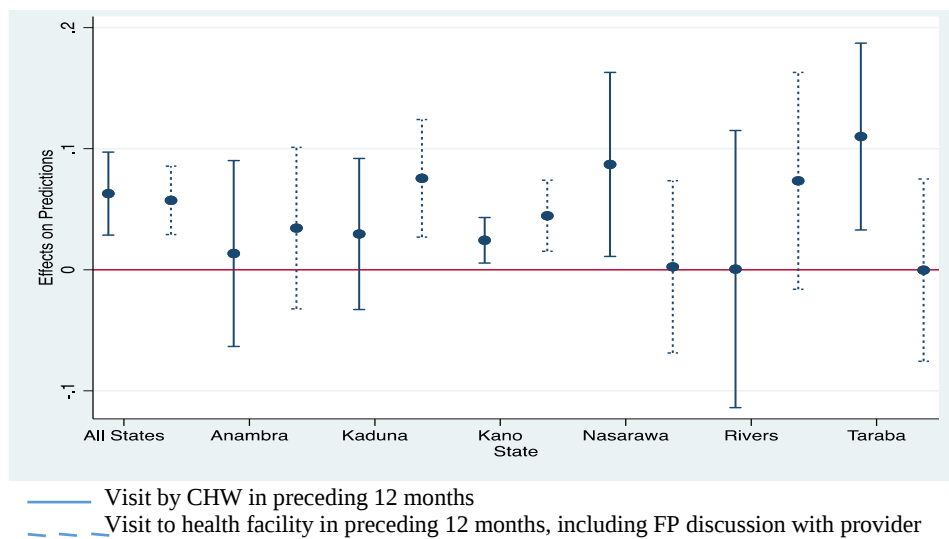


Figure 2: Average Marginal Effects of FP Discussion with CHW or Health Facility Provider and 95% CI

regulatory board in charge of both training and maintaining the standards of practice of CHWs¹¹, given Nigeria's three-tier system of governance, it is possible that one explanation for the differences in state-level findings is that some local governments have been able to provide an enabling environment to strengthen the performance of their CHWs, and support their ability to reach women in rural communities, while others have not been as successful.

The study is not without limitations. As a cross-sectional design, its empirical ability to establish association temporally between CHW contact exposure and contraceptive adoption is constrained, due to the fact that both pieces of information were obtained in the same survey. The PMA2020 surveys also do not presently explore the quality of CHW interactions with the woman visited. Women's reports of counseling, services and methods received and perceived advantages and disadvantages of community-level access may be informative in the future of the parameters along which the CHW program in Nigeria can expand or be strengthened.

These findings, though not trivial, also cannot be generalized beyond women who reside in rural areas in these 6 Nigerian states. Nonetheless, the state policy environment has an important role to play in the deployment of CHWs, and this may explain in part why findings differ by state. Furthermore, where women's mobility may

be limited, especially in rural areas of northern Nigeria (Taraba, Nasarawa, Kano, Kaduna), home visits by CHWs give women important additional options regarding access to family planning counseling and services.

Ethics Approval

Ethical approval for PMA2020 was from the National Health Research Ethics Committee (NHREC), with approval number NHREC/01/01/2007-02/01/2018C. Administrative approval to conduct the research was obtained from the State Ministry of Health of the respective states.

Conclusion

Visits by CHWs to women of reproductive age residing in rural communities that included discussions on family planning were associated with increased probability of modern contraceptive use in the combined 6 state sample, as well as in Kano, Nasarawa, and Taraba states. This result was independent of the finding that visiting a health facility where a woman discussed family planning with a provider was associated with increased probability of modern contraceptive use in the combined 6 state sample, as well as in Kaduna and Kano states. Programs and policies that aim to increase use of modern contraception in rural communities of Nigeria should invest not only in ensuring availability of services within

health facilities, but also in training and deploying CHWs into communities, especially where barriers to service access are substantial.

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Contribution of Authors

Funmilola OlaOlorun (FO) and Amy Tsui (AT) both conceived and designed the study; FO supervised data collection, analysed the data, and prepared the first draft of the manuscript. FO and AT both approved the final version of the manuscript.

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