



Can Community Health Extension Workers (CHEWs) insert contraceptive implants at the same level of safety and quality as nurses and midwives?

Findings from a clinical study in Kaduna and Ondo states, Nigeria

Marie Stopes International/Glenna Gordon

Why should CHEWs provide implants?

An estimated 27% of married Nigerian women of reproductive age have an unmet need for family planning.¹ The Government of Nigeria aims to scale up access to modern contraceptives to a national contraceptive prevalence of 27% by the end of 2020.² Access to long-acting reversible contraceptives (LARCs) has increased over recent years, but is still limited in remote, rural, poorer areas, and nationally only 3.3% of women are using them.¹ Nurses and midwives trained to provide LARCs are concentrated in urban centres and the South of Nigeria. A 2015 national survey found only 7% of health service outlets in Nigeria had a LARC commodity or service available.³

Community Health Extension Workers (CHEWs) outnumber nurses by a ratio of 3:1⁴, and in 2014 the Federal Ministry of Health adopted the National Task Shifting/Sharing Policy, which authorises lower cadre health workers, including CHEWs, to provide contraceptive implants and intra-uterine contraceptive devices (IUCDs). As of 2017, all newly qualified CHEWs receive pre-service training on insertion and removal of implants and IUCDs.

The World Health Organization recommends close monitoring and evaluation of implant provision by auxiliary nurses (the equivalent of CHEWs) before they can fully endorse this cadre for implant provision globally.⁵



Findings at a glance

- Overall, moderate and severe adverse events were uncommon (4.3% by follow-up), and 70% of providers (nurses/midwives and CHEWs) achieved the highest quality score when observed.
- The most common adverse event was implant expulsion post-insertion, which was more frequent among clients of CHEWs. But expulsions decreased significantly with experience, in particular after receiving supportive supervision from Marie Stopes.
- Adverse events were higher and quality of provision was lower in Kaduna State than Ondo, although there was no significant difference between CHEWs and nurses/midwives in Kaduna State.
- Staff felt positive about task-sharing to CHEWs, and it was considered necessary to address staff shortages and growing demand.

Policy actions

- Ensure ongoing quality monitoring among CHEWs, including monitoring of expulsions at follow-up.
- Focus on quality in Kaduna to address identified weaknesses.
- Ensure women are counselled to avoid strenuous physical activity post-insertion.

How does CHEW training differ to nurses/midwives?

CHEWs undergo three years training approved by the Community Health Practitioners Board of Nigeria. In larger urban centres they work alongside nurses and doctors; in remote health centres they work alone or with another CHEW. Unlike nurses/midwives, CHEWs are required to work 30% of their time in the community and 70% in the health facilities.



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Nancy Kenah, is a CHEW trained by MSI

Task-sharing in context

In 2014, the Federal Ministry of Health adopted the National Task Shifting/Sharing Policy, which authorises lower cadre health workers, including CHEWs, to provide contraceptive implants and IUCDs. This policy change resulted from a growing body of evidence demonstrating the feasibility and acceptability of task-sharing implant and IUCD insertion from higher to lower cadre health workers. The primary aim of this strategy is to increase access to Contraceptive methods for people living in areas with a shortage of health workers. A pilot study was conducted in Northern Nigeria (Sokoto and Bauchi states) in 2015 among 166 CHEWs to test the feasibility of implant provision by this cadre.⁶ A second operational research study was conducted in 2015 in Kaduna and Cross River states, investigating the effects of task-sharing on method mix and observing quality of provision.⁷ Both studies demonstrated feasibility and acceptability, but neither evaluated safety outcomes of task-sharing or compared CHEWs with higher cadre health workers.

How did Marie Stopes International Organization Nigeria (MSION) support task-sharing to CHEWs?

MSION supports the Federal Ministry of Health (FMOH) in strengthening the capacity of providers to deliver contraceptives, in particular long-acting reversible contraceptives. MSION supported the testing of task-sharing implant provision to CHEWs in the following ways:

- 1) **Advocacy** to communicate the value of task-sharing and garner support for the study with the Kaduna and Ondo States Ministries of Health (SMOH); the Nursing and Midwifery Council of Nigeria; and the Community Health Extension Practitioners Board.
- 2) **Selection and training of clinical supervisors** (experienced nurses/midwives) and providers (selected nurses/midwives and CHEWs). Selection was conducted jointly with SMOH, using pre-determined criteria. Supervisors were deployed at a ratio of 1:10 providers.
- 3) **Oversee training of providers** by supervisors on insertion and removal of Implanon and Jadelle implants for seven days (including lecture and practicum components). Training of trainers and provider training manuals were approved by the FMOH. Research training was conducted for providers by the MSION research team.
- 4) **Accreditation of providers** for insertion, if competency ascertained after observation of five successful insertions of each implant (Jadelle and Implanon) and for removal if two successful removals were observed. Accreditation took place between October 2015 and December 2016.
- 5) **Four levels of monitoring:** (i) **biweekly**, by clinical supervisors to monitor and manage adverse events; (ii) **monthly**, by MSION state clinical officer to assure clinical quality and collect data; (iii) **quarterly** by MSION and SMOH to assure data quality, and identify and address challenges; and (iv) **biannually**, supervision by MSI, MSION, SMOH and FMOH to assess implementation quality. Providers were supported with managing adverse events, completing tools and emergent issues.
- 6) **Demand generation** in and around local health facilities to raise awareness of FP methods available, including implants.



MSION training CHEWs and nurses/midwives for task-sharing pilot in Kaduna

What did the study aim to do, and how?

The study evaluated whether CHEWs can insert implants to the same quality standards as nurses/midwives. The study was conducted in **public health facilities in Kaduna and Ondo states** between September 2015 and December 2016.

The study used a quasi-experimental non-inferiority design to assess whether CHEWs were non-inferior to nurses/midwives in clinical adverse events (AE) and quality of care. Non-inferiority margins are a benchmark of acceptable difference between the two groups, and were determined based on outcome data from existing clinical studies and consensus of the investigation team on acceptable differences. When confidence intervals exceed the margin, non-inferiority is not proven. Client satisfaction was also compared but non-inferiority not assessed.

In total, 119 providers were selected from participating facilities* who had not previously been trained on implant insertion and removal. They comprised 30 nurses/midwives and 30 CHEWs from Ondo State, and 29 nurses/midwives and 30 CHEWs from Kaduna State. Clients were enrolled consecutively into the study if they requested implant insertion or removal.

We assessed the following outcomes:

Safety: Moderate and severe adverse events recorded **by providers themselves** in a structured questionnaire post-insertion (day 0)(n=7,691) and at a follow-up visit (in person or by phone) up to 75 days post-insertion (n=6,504).

Quality: Adherence to a quality checklist of 28 individual items – covering pre-insertion counselling, pre-insertion preparation, insertion technique, post-insertion procedures and counselling – measured by **direct observation of insertions by supervisors** (n=1,420). High quality was defined as a score of 28/28 on different aspects of care.

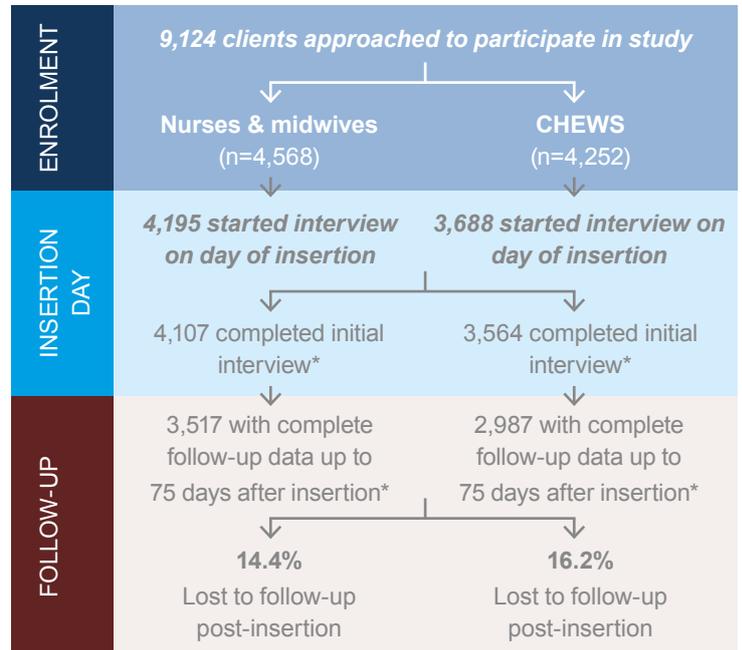
Satisfaction: Clients were considered highly satisfied if they rated 7 service aspects as good or very good during an **exit survey after insertion** (n=749). 16 in-depth interviews were also conducted with providers to investigate their feelings about task-sharing of implants to CHEWs.

Fig 1 shows the study flow chart. In total, 14% of clients visiting nurses/midwives and 16% of clients visiting CHEWs were lost to follow-up between the two interview days.

*76 primary level and 17 secondary or tertiary level facilities were selected for the study based on the following criteria:

- no previous availability of implants;
- provided family planning services for at least 3 years;
- not running overlapping interventions;
- offering referral services, or within 20km of one.

Fig 1: Study Flow Chart



* % with non-missing outcome data. Outcomes up to 28 days were also assessed through sensitivity analyses.

Analysis

All data were weighted for clustering by provider. Outcome data were analysed using a Generalised Estimating Equations (GEE) model, using Wald tests to assess goodness of fit. Confounding variables assessed were previous insertion experience, state, facility type, facility location, other provider at facility, age, implant type, time travelled to clinic, number of living children, desire to limit further children, education, marital status, employment status, previous contraceptive use, and source of household drinking water. Interactions with state, implant type, and insertion experience were also assessed.

Non-inferiority of AEs was assessed by modelling odds ratios rather than risk differences due to rarity of events and the binary outcome. Non-inferiority margins were set at 0.5% for insertion AEs (aOR bound of 2.01), 1% for follow-up AEs (aOR bound of 2.02), and 10% for quality.

Sensitivity analyses were conducted to assess effects of missing data and inconsistent date reporting, but these did not alter conclusions reached.



Table 1: Moderate or severe adverse events (AEs) by cadre

MODERATE or SEVERE AEs [†]	Total	Nurse/ midwife	CHEW	Crude* OR	95% CI
Implant insertion	(n=7,691)	(n=4,107)	(n=3,584)		
% day 0	0.46	0.41	0.51	1.27	0.34–4.74
Bruising or haematoma	0.30	0.30	0.30	0.97	0.17–5.64
Bleeding around insertion area	0.24	0.18	0.31	1.69	0.43–6.61
Implant breaks	0.01	0.0	0.03	--	--
(Other) oedema	0.01	0.0	0.03	--	--
Implant insertion with follow-up	(n=6,504)	(n=3,517)	(n=2,987)		
% day 0	0.42	0.44	0.40	0.90	0.24–3.37
Bruising or haematoma	0.27	0.32	0.22	0.69	0.11–4.30
Bleeding around insertion area	0.21	0.19	0.23	1.23	0.32–4.69
Implant breaks	0.02	0.0	0.03	--	--
(Other) oedema	0.02	0.0	0.03	--	--
% at follow-up	4.0	1.8	6.3	3.57	1.69–7.56
Pain around insertion site	0.46	0.34	0.59	1.74	0.38–7.93
Bruising or haematoma	0.10	0.05	0.16	3.42	0.28–42.48
Post-insertion bleeding	0.07	0.03	0.11	3.95	0.34–45.42
Infection	0.22	0.09	0.36	3.85	0.74–19.79
Paraesthesia	0.15	0.09	0.20	2.24	0.43–11.78
Scarring	0.35	0.45	0.25	0.56	0.19–1.67
Expulsion	3.15	1.15	5.24	4.56	1.93–10.63
% combined (day 0 and follow-up)	4.27	2.08	6.58	3.17	1.52–6.60

*Crude odds are adjusted for clustering by provider.

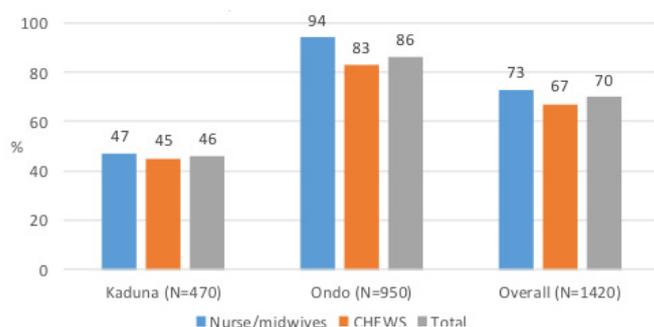
† None of the following AEs were reported: anaphylactic reaction, implant breaks, palpitations.

Table 2: Adjusted analysis of moderate or severe adverse events (AEs)

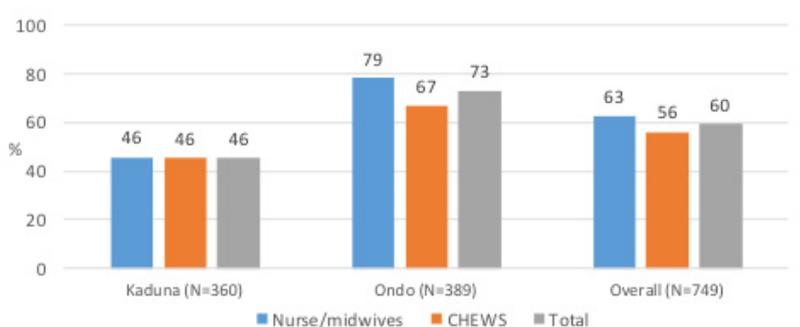
		Adjusted odds of moderate/severe AE				
		N	AEs	Odds ratio	95% CI	P-value
Day of insertion ^{††}	Nurse/midwives	4054	19	1.00	--	--
	CHEWs	3518	21	0.92	0.38 – 2.23	0.848
Day of insertion & at follow-up combined [§]	Nurse/midwives	3517	76	1.00	--	--
	CHEWs	2987	179	2.32	1.22 – 4.41	0.010

†† Adjusted for clustering by provider as well as for implant type, previous insertion experience, unemployed status.

§ Adjusted for clustering by provider as well as for previous insertion experience & other provider at facility.

Fig 2: Clients with *high quality* implant insertions, by provider and state*

* Adjusted for clustering by provider

Fig 3: Clients *highly satisfied*, by provider and state*

* Adjusted for clustering by provider

Results

Safety

AEs on the day of insertion were rare (0.46%), and there was no significant difference between CHEWs (0.51%) and nurses/midwives (0.41%), but after adjustment non-inferiority was still not demonstrated (aOR 0.92, 95%CI 0.38-2.23) since the margin of aOR 2.01 was exceeded.

By Day 14, 4.3% of women had experienced a moderate or severe AE, most commonly implant expulsion (3.2%). CHEW clients were more likely to experience a moderate/severe AE than nurse/midwife clients (6.7% vs. 2.1%; OR 3.17, 95% CI 1.52–6.60). After adjustment, CHEW clients remained more likely to experience moderate/severe AEs (aOR=2.32, 95% CI 1.22–4.41) (Table 2). The upper 95% CI bound exceeds the non-inferiority margin of aOR 2.02, so **we cannot conclude that CHEWs are non-inferior to nurses/midwives.**

CHEWs in Ondo performed better than CHEWs in Kaduna, but we still did not observe non-inferiority there after adjustment (aOR 0.72, 95%CI 0.19-2.72).

Rates of AEs decreased with insertion experience ($p < 0.001$) and elevated expulsion levels were observed among a few poor performers. After monitoring and additional supportive supervision were provided by MSION, the rate of expulsions was significantly lower (see Fig 4).

Quality

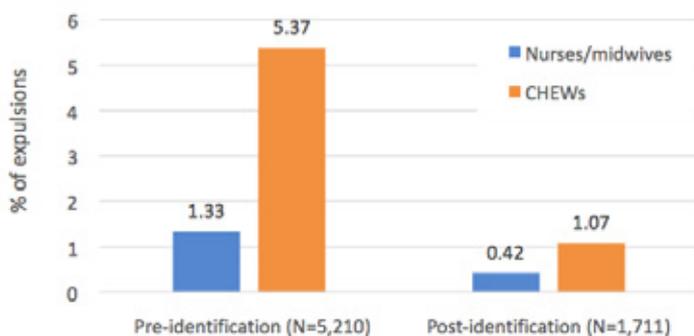
70% of providers delivered high quality insertions, scoring 28/28 in quality assessments (67% of CHEWs and 73% of nurses/midwives). Providers in Ondo were more likely to deliver high quality insertions than in Kaduna (89% vs. 46% (Fig 2)). After adjusting for state and previous insertion experience, the proportion of high quality insertions for CHEWs was 4.8% lower than for nurses/midwives (95% CI -15.1% – 5.6%). The 95% CI lower bound is below the non-inferiority margin of -10% so **we cannot conclude that insertion quality for CHEWs is non-inferior to nurses/midwives.**

Satisfaction

60% of clients were highly satisfied with their implant insertion, with a slightly higher proportion among nurse/midwife clients compared with CHEW clients (65% vs. 57%). Clients in Ondo were more satisfied than those in Kaduna (Fig 3). After adjusting for state, other provider at facility and urban/rural location, there was no evidence of a difference in the proportion of highly satisfied CHEW clients vs nurse/midwife clients (-4.3%, 95%CI: -0.198-0.111; $p=0.582$). We did not assess non-inferiority for satisfaction. Almost all clients said they would recommend the service to a friend.

Providers interviewed valued the role of task-shifting in increasing capacity, but suggested the need for more communication on CHEW training and cadre responsibilities.

Fig 4: % with implant expulsions, before and after post-monitoring training



Implant removal-related adverse events

355 women presented for a removal, and associated adverse events were recorded on the day of procedure and at follow-up. 16.2% experienced a moderate or severe AE at the time of removal, the most common events were: partial removal (5.1%); palpitations from anaesthetic (6.2%); and implant breaks during removal (2.7%). At follow-up, only seven AEs were reported, most commonly scarring (3 (0.6%)). Removal related AEs were higher among CHEWs than nurses (25% vs. 10%), but the small sample size means we cannot draw conclusions from this comparison.

Qualitative findings:

“CHEWs are more [numerous] than the nurses. [The] School of Health Technology admits more students than the nurses. So in that way there is no way the nurses can cover the 18 local governments without the CHEWs.” (Nurse, Ondo State)

“[Task-shifting] will improve [the situation] tremendously since we have the interest of our people at heart and we have more CHEWs than nurses and midwives, so that these ones will be able to work in some of our facilities that are in the interior areas that don't have nurses and midwives...” (CHEW, Ondo State)

Discussion & conclusions

CHEWs are a critical provider cadre who can support the national scale-up of implant provision in Nigeria. MSION worked in partnership with the FMOH to train and supervise provision of implants by CHEWs. The national roll-out of this initiative can help make long-acting reversible contraception accessible to women in remote and rural areas, where diffusion of nurses/midwives still remains insufficient to meet growing demand.

The low levels of moderate and severe adverse events on insertion day among CHEWs was encouraging, but this study found elevated clinical events by Day 14, in particular expulsions, in the first days or weeks after accreditation. The observed expulsion rate of 3% is far higher than 'normal' expulsion levels reported elsewhere (0–0.6%). Close monitoring allowed MSION to provide

additional training and supervision, and competency and expulsion rates improved significantly.

Quality of care and satisfaction were high overall, but quality of CHEWs was also not non-inferior to nurses/midwives, and was notably lower in Kaduna than in Ondo State.

While this was one of the largest clinical studies of implant provision conducted in the context of service provision in a remote low-income setting, findings should also be interpreted with some caution: AE data were collected by the providers themselves and data quality was compromised; different observers were used in different states; analysis was underpowered due to multiple levels of clustering; and some quality indicators were subjective.



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Discussions with the community helped generate demand for implant services

Recommendations:

- CHEWs and nurses/midwives require ongoing monitoring and supervision post-training in order to insert and remove implants safely.
- Clients should be adequately counselled to avoid strenuous physical activity following insertion.
- More focused attention on training and quality of service provision in Kaduna State is recommended.
- Adequate monitoring requires sensitive follow-up of clients post-insertion to assure quality and contraceptive coverage.

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