

# Community-based provision of injectable contraceptives in Madagascar: ‘task shifting’ to expand access to injectable contraceptives

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**Accepted** 15 October 2010

**Introduction** Injectable contraceptives are now the most popular contraceptive methods in sub-Saharan Africa. Injectables have not been an option for African women lacking convenient access to health facilities, however, since very few family planning programmes permit community-based distribution (CBD) of injectables by non-medically trained workers. Committed to reducing unmet contraceptive need among remote, rural populations, the Ministry of Health and Family Planning (MOHFP) of Madagascar sought evidence regarding the safety, effectiveness and acceptability of CBD of injectables.

**Methods** The MOHFP joined implementing partners in training 61 experienced CBD agents from 13 communities in provision of injectables. Management mechanisms for injectables were added to the CBD programme’s pre-existing systems for record keeping, commodity management and supervision. After 7 months of service provision, an evaluation team reviewed service records and interviewed CBD workers and their supervisors and clients.

**Results** CBD workers demonstrated competence in injection technique, counselling and management of clients’ re-injection schedule. CBD of injectables appeared to increase contraceptive use, with 1662 women accepting injectables from a CBD worker. Of these, 41% were new family planning users. All CBD agents wished to continue providing this service, and most supervisors indicated the programme should continue. Nearly all clients interviewed said they intended to return to the CBD worker for re-injection and would recommend this service to a friend.

**Conclusions** This experience from Madagascar is among the first evidence from sub-Saharan Africa documenting the feasibility, effectiveness and acceptability of CBD services for injectable contraceptives. This evidence influenced national and global policy makers to recommend expansion of the practice. CBD of injectables is an example of effective task shifting of a clinical practice as a means of extending services to underserved populations without further burdening clinicians.

**Keywords** Community-based distribution, family planning, task shifting, Madagascar, DMPA

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## KEY MESSAGES

- With appropriate competency-based training and logistical support, non-medically trained health workers are capable of offering effective services for delivery of injectable contraceptives.
- Community-based distribution of injectable contraceptives by community health workers is an example of appropriate task shifting, whereby desired services are extended to previously underserved populations without further burdening clinical staff.

## Introduction

Leaders throughout sub-Saharan Africa are embracing the goal of increasing contraceptive prevalence as a means of improving health and supporting development. Motivated by the 2015 target date of the Millennium Development Goals, programme managers are seeking innovative, effective measures to expand access to contraceptive services among underserved populations (Haines *et al.* 2007; Prata 2009). Community-based distribution (CBD) of contraception by non-medically trained workers is one service delivery approach that extends services to traditionally underserved remote areas. CBD programmes in Africa have been delivering contraceptive methods—primarily condoms, spermicides and oral contraceptives—since the 1980s (Prata *et al.* 2005). Opportunity exists to heighten programme impact through the addition of injectable contraceptives like Depot Medroxyprogesterone Acetate (DMPA) to the method mix offered by CBD workers.

Permitting CBD workers to offer injectable contraceptives is a programmatic innovation worthy of consideration for several reasons (Prata *et al.* 2005). First, demand for the method is high. Worldwide 35 million women use injectables, and use has risen dramatically in the past 15 years in resource-poor settings (Stanback *et al.* 2010). Collectively, injectables are now the most popular modern method in sub-Saharan Africa (Lande and Richey 2006). For women lacking convenient, regular access to health facilities, DMPA has not been a viable contraceptive choice given that the method requires re-injection every 3 months. Meanwhile, experience outside Africa has established the safety, effectiveness and acceptability of the provision of injectable contraceptives by trained CBD workers; countries in Latin America and Asia have been utilizing this approach since the 1970s (Fernandez *et al.* 1997; Garza-Flores *et al.* 1998; Rai *et al.* 1999; McCarraher and Bailey 2000; Lande and Richey 2006). Experience with CBD of DMPA in sub-Saharan Africa has nonetheless been extremely limited, with few established national policies permitting the practice.

Equipping CBD workers to deliver the most popular contraceptive method is a means of increasing contraceptive prevalence without adding excessive burden to the seriously strained health sector (Schneider *et al.* 2008). Such formal delegation of responsibility to health workers with shorter, focused training and fewer credentials—a practice known today as task shifting—is recognized as an effective strategy for increasing health sector outputs in the face of dire workforce shortages (WHO 2007). WHO recommends that countries introducing a task shifting innovation must include mechanisms to ensure that the new cadre of health worker maintains at least the same level of quality as the more highly trained professional. To achieve maximum benefits, task shifting should also serve as

a means to extend services and to move providers into communities where they are needed, thereby improving coverage and geographic equity of health services (WHO 2007; Zachariah *et al.* 2009).

Policy makers within the Ministry of Health and Family Planning (MOHFP) in Madagascar considered the potential advantages of task shifting of DMPA services to CBD workers as they updated the National Reproductive Health Norms and Procedures in 2006. Committed to reducing unmet need for family planning, estimated at 24% (INSTAT 2005), they included injectable contraceptives among the methods that could be administered by CBD workers. National programme managers were especially attracted to this innovation given the popularity of injectable contraceptives, used by 56% of the modern contraceptive users at the time of study launch (INSTAT 2005). Before national MOHFP programme managers would approve actual programmatic application, however, they wanted evidence that CBD of DMPA could be successfully integrated into existing CBD programmes in Madagascar. With support from the United States Agency for International Development (USAID), the MOHFP teamed with Family Health International to conduct operations research to determine whether the delegation of responsibility for provision of injectable contraceptives was indeed appropriate within the Madagascar context. Specifically, the study was designed to answer four main questions: (1) Were trained CBD workers able to provide DMPA services in accordance with quality standards? (2) To what extent did the mechanisms supporting service delivery function as intended? (3) Is CBD of DMPA services acceptable to CBD workers, their clients and supervisors? (4) How did the introduction of CBD of DMPA affect levels of contraceptive use?

## Intervention

The MOHFP chose two regions for the introduction of the CBD of DMPA intervention: Anosy and Alaotora Mangoro. Within Anosy, a region bordering the southeastern coast, six administrative units known as communes were selected. This region has been described as a high-need, underserved area where poverty is exceptionally high, basic knowledge about public health is low, contraceptive prevalence is low and access to health services is poor (Kleinau 2005). CBD services in Anosy were supported by the indigenous non-governmental organization (NGO) *Action Socio-sanitaire Organisation Secour (ASOS) Sud*. Another seven communes were selected from Alaotora Mangoro, a region in the central highlands located a few hours drive from the capital, Antananarivo. Two NGOs supported CBD services here: ASOS Moromanga and the

international NGO, Adventist Development and Relief Agency (ADRA). By working in two settings, we were able to assess the intervention in two different communities representing some of the diversity in Madagascar, in terms of geography, social and cultural norms, and programmatic support.

Health centre managers and supporting NGOs advised project staff on the selection of five high-performing CBD workers from each of the 13 communes to participate in programme training, assessed in terms of past success in attracting and retaining clients. Although no specific education level was required, all were literate. Females were strongly preferred. We worked with curriculum development specialists to adapt existing training materials to the Madagascar context. The project introduced several job aids, including a DMPA guide book on counselling and injection technique. In collaboration with the MOHFP, we adapted the eligibility checklist for safe provision of DMPA (Stang *et al.* 2000) to the Madagascar context. This tool prompts providers in posing questions first to safely rule out the possibility of pregnancy, for example by asking the client if she is currently menstruating or if she has been using another contraceptive. The checklist also presents questions to assess whether the client meets WHO medical eligibility criteria, for example by ruling out known or suspected breast cancer, jaundice, thrombosis, diabetes or clinician-diagnosed hypertension (WHO 2004). Finally, the research team adapted MOHFP reporting forms already used by the CBD programme, including client register, monthly activity report, stock monitoring form, individual client record form, finance accounting form and a referral form. Minor adjustments were made to accommodate record-keeping specific to injectable service delivery. The client register included a column, 'Observations', where problems related to injection procedures or side effects were to be recorded.

In November 2006, 62 CBD workers were trained in provision of DMPA. Also participating in the training were nurses and doctors who supervised CBD workers from their base at the health facility, as well as local NGO-deployed supervisors, known as *Techniciens Accompagnateurs*, or TAs. The 3-day training began with classroom instruction in basic reproductive physiology, the contraceptive methods available in Madagascar, and counselling to support informed reproductive decision making. These topics were a review for most CBD workers. Trainees were taught to screen clients using the eligibility checklist. They were given thorough instruction on safe injection technique; considerable attention was devoted to helping workers master the delicate skill of drawing the complete dose of drug into the single-use (auto-disable) syringe. Infection prevention, waste disposal and other essential aspects of DMPA provision were also integral to the training.

CBD workers progressed to a practicum of safe injection technique, first practicing on papaya fruit and then progressing to clients recruited from the hospital adjacent to the training site. To complete training successfully, the CBD workers had to pass a written test following training. They also had to complete six observed injections assessed by a supervisor/trainer using a competency-based checklist that included steps for counselling, screening, aspiration of the drug into the syringe, correct injection technique and infection control. Since there was insufficient opportunity for all trainees to practice

giving injections on actual clients during the formal group training, trainees returned to the health centre to which they were attached and served clients under the direct supervision of a clinician until they successfully administered the six injections needed for certification.

Successful trainees were awarded a certificate documenting completion of the training programme. To carry their supplies, they received a backpack with the MOHFP logo and the well-recognized logos of the participating NGOs. The programme gave each CBD worker an initial supply of 15 DMPA doses free of charge, along with cotton and alcohol. CBD workers were not paid a salary but were able to gain a modest profit of 150 ariary (approximately 7 US cents) from each dose sold to clients, comparable with that earned for provision of oral contraceptives. Following procedures established for the pre-existing CBD programme, workers were expected to travel monthly to their assigned health facility to submit a monthly activity report and obtain new supplies, including DMPA. The programme also provided each CBD worker with two hard-cardboard 'sharps' containers for safe disposal of syringes, which they were expected to turn into the health facility when filled. Prior to initiating injectables service provision, each CBD worker was formally re-introduced into his or her community, typically in a small ceremony officiated by the mayor. CBD workers then proceeded to offer injectable contraceptives along with pills, condoms and referrals for other methods, delivering services in clients' homes and out of their own homes as was customary for CBD services.

Both the clinician at the local health centre and the NGO-supported TA were charged with supervising the CBD workers. Supervisors were provided with checklists to monitor CBD workers' efforts and were responsible for verifying competency, ensuring that service records were being completed, and reinforcing key skills related to DMPA provision. CBD workers were instructed to notify the health centre or supervisor if any problems were encountered while serving as CBD workers.

## Methods

We conducted a single round of data collection approximately 7 months after intervention implementation to answer the four main study questions. Trained interviewers conducted structured interviews with all CBD workers who initiated service delivery following training, as well as their supervisors attached to the public sector health centre and the supporting NGO. They also interviewed five clients per CBD worker, selected in a manner to approximate a representative sample of DMPA acceptors. Specifically, having randomly chosen the 'starting point' in the list of names in the client register, the supervisor selected every *n*th client for a total of five that spanned the complete client list. Interviewers collected service statistics from CBD workers' registers to determine the number of DMPA acceptors, past contraceptive use of acceptors and the number who received re-injection. Finally, interviewers reviewed CBD workers' administrative records reflecting matters like inventory management and accounting.

Data from each of the sources described above were analysed descriptively using Stata 9. To assess the competency of CBD

workers to provide DMPA services safely and correctly, the research team created a composite score based on questions posed in the CBD worker interview. The questions reflected service delivery standards established by the MOHFP and taught during training. Items included correct use of the screening checklist, safe injection technique, accurate and complete counselling, and proper syringe disposal.

The research protocol was approved by the ethics committee of the Ministry of Health and Family Planning of Madagascar and the Protection of Human Subjects Committee of Family Health International.

## Results

### CBD worker profile: background, knowledge and competence

All 62 CBD workers successfully completed training, and all but one began delivering DMPA services. (One re-located with his family outside the study region.) All of the workers participated in interviews. Their profile is presented in Table 1 according to their supporting NGO and in aggregate. As intended by the programme, most were women who had completed at least primary schooling. CBD workers supported by both NGOs in Moramanga tended to have less previous experience as CBD workers than those supported by ASOS Sud. Even though CBD workers were expected to offer pills and condoms along with injectables, more than a quarter reported that DMPA was the only method they actually provided to clients. Most CBD workers were involved in other aspects of public health services, like social marketing of bed nets, malaria treatment and water purifiers.

Figure 1 presents composite scores reflecting CBD workers' knowledge of correct injection technique, as indicated by correct responses to interview questions. (Possible scores range from 0 to 18.) Nearly 50% of all CBD workers scored the maximum 18 points, and another 46% received the next highest possible score of 16 points. No CBD worker scored below 14 points. Notably, scoring patterns of CBD workers supported by the three NGOs were similar, suggesting consistency of knowledge across sites. The items most commonly missed concerned telling clients about amenorrhoea as a possible side effect (67% correct) and understanding the permitted 'grace period' for clients who do not come precisely on the prescribed date for re-injection (84% correct). A question not included in the composite score asked providers whether a woman could receive her first injection on a day when she was not menstruating. Only 15% of workers correctly responded affirmatively, even though all CBD workers reported that they use the client screening checklist introduced by the project, which allows non-menstruating women to initiate DMPA if pregnancy can be ruled out based on other criteria.

Reflecting clients' perspectives on CBD worker performance, Table 2 indicates that nearly all interviewed clients reported no problem with injection procedures and were satisfied with the inter-personal rapport established by the CBD worker. Fewer clients reported that the CBD worker counselled on possible side effects, with just over a third recalling, unprompted, that the provider counselled on amenorrhoea as a possible side effect of DMPA, and even fewer recalling messages about

possible weight gain. Most clients gave the correct response, unprompted, regarding the duration of pregnancy prevention provided by a DMPA injection. A smaller majority correctly stated that the method offers no protection against sexually transmitted infection or AIDS. Almost all interviewed clients reported that the CBD worker asked them whether they were menstruating on the day they initially sought DMPA services. Of the interviewed clients who were using DMPA for the first time (rather than switching from clinic-based injections), 87% reported that they were menstruating on the day they received their first injection.

### Effect of CBD of injectables on contraceptive use

In total, 1662 clients received DMPA from the 61 CBD workers from January to June of 2007. Of the 13 communes participating in the study, each commune provided CBD of DMPA services to at least 50 clients (data not shown). Based on the profile of clients interviewed ( $n=303$ ), DMPA appealed to a diverse clientele, with ages ranging from 15 to 49. Nearly all interviewed clients had given birth, with their number of living children ranging from 1 to 11. The sample included those wishing to avoid future pregnancy (31%), those wanting to space births (63%) and those unsure about future pregnancy desires (6%).

According to CBD workers' registers, of the 1662 women who accepted DMPA from a CBD worker, 41% were new or re-starting contraceptive users. The rest were either switching from another method or from clinic-based DMPA use. Among the sub-sample of 303 clients who participated in interviews, 28% had never used family planning in their life. Nearly half had used DMPA previously and one-quarter had used another family planning method before but were using DMPA for the first time. From the CBD workers' registers ( $n=1662$ ), 924 clients were eligible to receive a second shot, meaning at least 12 weeks had passed since the initial shot administered by a CBD worker. Of these, 863, or 93%, received a second injection, with 96% of those returning to the CBD worker and a small fraction going to the health facility. Within the sample of 303 CBD clients interviewed, there were 199 eligible for a second injection. Of these, the vast majority received their second injection (96%), nearly all (98%) from a CBD worker.

Because geographic access to DMPA services is likely to influence uptake and sustained use, we asked interviewed clients about travel time between their homes and both the CBD worker's home and the nearest health facility. Average time to CBD worker's home was 27 minutes, versus 136 minutes to the closest health facility.

### Functioning of mechanisms supporting community-based provision of DMPA

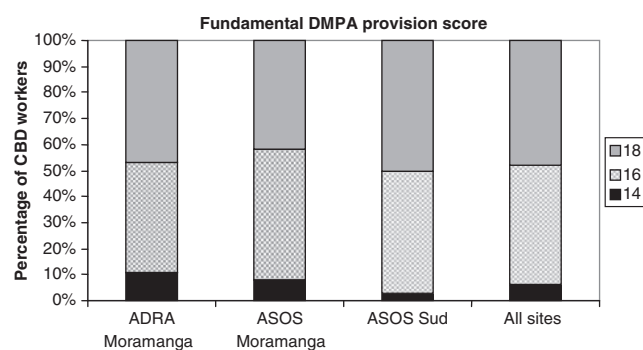
Interviews with CBD workers and their supervisors provided insight into the integrity of several intervention components implemented to support community-based provision of injectables. Asked about the duration of the training, three-quarters of the CBD workers responded that the course was too short, and the rest said it was just right. All 61 CBD workers reported that they felt the training left them fully prepared to carry out their duties. Of the 25 supervisors interviewed, 11 said CBD workers under their supervision were fully prepared when they



**Table 1** CBD worker profile, by supporting NGO and for total sample

CBD worker characteristics	ADRA Moramanga (n = 19)	ASOS Moramanga (n = 12)	ASOS Sud (n = 30)	Total (n = 61)*
<b>Gender (%)</b>				
Female	84	83	87	85
Male	16	17	13	15
<b>Age (years)</b>				
Median	40	38.5	38.5	39
Range	24–50	24–50	20–55	20–55
<b>Highest level of schooling (years)</b>				
Median	7	8	8	8
Range	4–10	4–13	3–11	3–13
<b>Time as CBD worker (months)</b>				
Median	7	7	21	12
Range	5–106	5–84	6–120	5–120
<b>CBD services provided (%)</b>				
Provide pills	63	50	87	72
Provide condoms	58	58	83	70
Health education	74	83	53	66
Sale of water purification	47	17	80	57
Mosquito nets	42	67	83	67
Malaria treatment kits	68	42	80	69
Maternal and child health	32	0	0	10
Nutrition	11	0	7	7
Other medication and treatments	5	17	0	5

\*One of the CBD workers trained by the programme did not initiate service delivery because he moved from the region soon after training.



**Figure 1** Percentage of CBD workers achieving indicated score, by supporting NGO and for total sample (possible scores range from 0 to 18)

emerged from training, 11 said somewhat prepared and 3 said not at all prepared.

All CBD workers received oversight from clinicians at the nearest health centre and from supervisors affiliated with the supporting NGOs. Interviews with 25 participating supervisors provided information on the status of supervisory mechanisms. All but one of the 11 NGO supervisors, versus 9 of 14 clinician supervisors, reported that they had had an opportunity since the training to directly observe a CBD worker providing services to a client. Although 96% of supervisors said that under ideal

circumstances supervisors and CBD workers should meet at least once a month, only 56% of supervisors reported actually being able to meet with their workers this frequently. Obstacles preventing supervisors from meeting with CBD workers included long distances to reach the CBD worker, other work responsibilities, lack of travel resources, weather and lack of supervisor compensation. These findings about supervisory constraints are corroborated by CBD workers. When asked 'Since you started providing Depo Provera, has anyone provided you support to help you with this new responsibility?', only 16% responded yes.

In examining procedures for maintaining commodity stocks, we found that on average CBD workers travelled to the health centre to obtain DMPA supplies 3.6 times during the 6-month study period. Most workers reported that they walked to the health centre (90%), and the mean travel time to the health centre was 162 minutes. Half the CBD workers reported that the trip to the health centre is impossible during part of the year, most commonly due to seasonal flooding that makes roads impassable. Seventeen of the 61 CBD workers (28%) reported that at least once they travelled to the health centre and were unable to obtain DMPA supplies. One-third of the supervisors interviewed suggested, unprompted, that a key way of improving CBD workers' commodity management is by ensuring a steady supply at the health centre.

CBD workers and supervisors alike reported challenges with record-keeping. Just over half the CBD workers reported that

**Table 2** Client perspectives on service quality, by supporting NGO and for total sample of interviewed clients

	ADRA Moramanga % (n = 95)	ASOS Moramanga % (n = 58)	ASOS Sud % (n = 150)	Total % (n = 303)
<b>Injection technique</b>				
Satisfied with way received injection	100	100	100	100
No problem with injection site	96	91	100	97
<b>Interpersonal rapport</b>				
CBD worker spoke in friendly way	97	98	97	97
Trusted CBD worker with private info	95	88	100	96
<b>Counselling content</b>				
CBD worker asked if menstruating	93	93	93	93
Was counselled on side effects	63	59	79	70
Amenorrhoea as possible side effect	26	26	48	37
Weight gain as possible side effect	4	2	17	11
Correctly recalled duration of pregnancy protection	86	86	89	88
Reported DMPA does not protect against STIs and AIDS	64	60	64	63

they found the forms difficult to complete. Of the 25 supervisors interviewed, 21 reported that they had to assist CBD workers in completing record-keeping tasks. The form presenting the most difficulties, according to both CBD workers and supervisors, was the one completed monthly by CBD workers and given to health centres in order to get new DMPA supplies.

#### Satisfaction with community-based DMPA services

CBD workers expressed enthusiasm about the intervention, with all reporting that they would like to continue DMPA provision. The most commonly cited positive aspects of the job were learning a new skill (89%), being able to serve more clients (46%) and being able to serve clients better (38%). Despite overall satisfaction, CBD workers noted obstacles to service delivery. Just over a third (36%) mentioned, unprompted, that they were constrained by missing supplies. These included medical supplies, like cotton and alcohol, and non-medical equipment, like umbrellas. About a quarter of the workers (28%) reported that long travel times to reach clients' homes and the health centre posed difficulties. CBD workers offered suggestions about additional supports that would help them continue providing DMPA. About 40% said they would like to receive greater compensation, and about half said they would like to receive bicycles.

Most interviewed clients reported positive experiences with community-based provision of DMPA. Nearly all (96%) reported that they were very much satisfied with DMPA as a family planning method, and 60% reported having no side effects. The most commonly mentioned side effects were bleeding problems, followed by amenorrhoea. Nearly all interviewed clients indicated that they planned to continue using DMPA and receiving re-injection from the CBD worker. Most clients (92%) reported that they would recommend to a friend that she obtain DMPA services from the CBD worker who had served her. Most of the women in this study reported that their husbands or partners knew of and approved of their use of DMPA. These reports of client enthusiasm are corroborated by

the CBD workers, with 82% saying it was easy to attract DMPA clients.

## Discussion

Results from this study add to the global body of evidence supporting CBD of injectable contraceptives. CBD workers maintained quality standards as they offered this new service. Sustained competency was revealed through both CBD workers' knowledge scores measured 7 months after training and reports from supervisors and satisfied clients. The study also showed that the intervention has the potential to reduce unmet need for contraception. This was indicated by the relative ease with which the newly trained CBD workers attracted clients for DMPA services, the high re-injection rate and the large proportion of clients who were new family planning users.

While there is strong indication of high quality CBD worker performance, two issues deserve attention. First, reports from both the CBD workers and the clients suggest inadequate attention to counselling on possible side effects. The finding that amenorrhoea was the side effect most frequently reported by interviewed clients, yet was a commonly overlooked topic by CBD workers, underscored the importance of reinforcing counselling in future trainings, including refresher training held for the original 61 CBD workers. A second area needing attention pertains to CBD workers' use of the checklist to rule out pregnancy in non-menstruating women. Findings suggest that the CBD workers and their clinical supervisors were wedded to the tradition of requiring women to be menstruating on the day they initiate DMPA, without attempting to rule out pregnancy by other criteria. This unnecessary medical barrier to contraception, noted in other countries as well, can be rectified through advocacy with health system leadership coupled with training reinforcement, clarification of performance expectations, and supervisory support for clinicians and CBD workers alike (Stanback *et al.* 1999; Stanback *et al.* 2005).

The study revealed some challenges associated with implementing CBD of DMPA that may be relevant as the intervention

is expanded to new sites. First, it is important to ensure appropriate class size during training to allow sufficient supervised practice of injection technique with actual clients who volunteer to be served by trainees. The fact that CBD workers had to return to health centres to complete supervised injections before becoming certified might explain the number of supervisors reporting that CBD workers were 'somewhat' qualified following training and the majority of CBD workers saying the course was too short. Second, challenges associated with providing routine supervision may be overcome by assigning greater supervisory responsibilities to technical staff appointed by NGOs who often live closer to CBD workers than clinicians do, generally in the same community. In Madagascar, NGO-affiliated supervisors had more resources to support visits, such as motorcycles; they also tended to have more time since they were free of clinical responsibilities. Third, CBD workers and supervisors indicated that record-keeping presented difficulties. Reporting should be streamlined to ensure that CBD workers are capable of completing the forms accurately, are sufficiently motivated to keep good records and are not over-burdened with administrative tasks. Finally, ensuring consistent supplies of DMPA commodities should be a foremost priority to keep CBD workers motivated and to maintain service integrity. Over half of the CBD workers reported that travel to the health centre is impossible during certain times of the year, due to seasonal rains or other obstacles. Related difficulties in obtaining commodities could potentially be mitigated by supplying additional stocks prior to seasonal rains.

The study methods present limitations that warrant mention. Foremost, in assessing quality during post-intervention data collection, it was not logistically feasible to observe CBD workers directly as they counselled clients and administered injections. However, data from other sources—namely, observed performance during the practical component of training, assessment of provider knowledge, and reports from supervisors and clients—make a sufficiently convincing case for the competence of each community health worker trained by the project. A second limitation is the absence of a validated approach for assessing service quality. Lacking an alternative documented method, we relied on the expert knowledge of a clinical trainer to create the composite scoring approach, and the expert judgment of MOHFP programme officials (as well as that of the investigators) to interpret the results.

Another limitation is that it was not possible to measure changes in population-level contraceptive prevalence that could be attributed to the intervention, since population-based surveys were beyond the means of this study. We therefore had to rely on CBD workers' register data and clients' self-reports about initiating family planning use to draw conclusions about intervention effect on contraceptive use. Next, the sample of interviewed clients was not random. Although we attempted to reduce bias through a systematic approach to selecting clients, the most disenfranchised clients may have refused to participate. Finally, this study did not assess the cost of community health worker provision of DMPA. Future investigations should consider both the marginal cost and benefits of adding the service to existing community health worker family planning programmes, as well as more global questions regarding the affordability and sustainability of alternative mechanisms for

extending family planning services to remote, resource-poor areas. Despite these limitations, we are confident in the validity of the positive findings, particularly since results from different sources were mutually reinforcing.

The study results are consistent with other evidence indicating that provision of injectable contraception is a responsibility that can be effectively shared with non-medical workers, with the standard provisos for effective task shifting. Specifically, CBD workers must be selected and trained for the task, and feasible supervisory mechanisms should be adopted in order to monitor service quality and provide necessary technical support. Potential hazards associated with task shifting should also be averted. Most notably, attention should be focused on determining a fair reward, such as a standard modest service delivery fee, for CBD workers who assume this added responsibility in order to maintain motivation and avoid exploitation (Philips *et al.* 2008; Zachariah *et al.* 2009). Future research should focus on factors supporting effective scale-up and sustainability of the intervention, issues that were beyond the scope of this study. It is likely that the eventual advent of the much anticipated sub-cutaneous formulation of DMPA, Depo SubQ 104 in Uniject<sup>®</sup>, will obviate certain training needs (like drawing the drug into the syringe), thereby making training duration and learning curves shorter and more efficient.

The experience in Madagascar is important given the scant programmatic experience in CBD of injectables that has been documented in sub-Saharan Africa and the few countries that permit the practice. As of this writing, only Madagascar and Malawi have policies permitting provision of injectables by non-medically trained community health workers. Ethiopia, Kenya and Uganda have piloted implementation with Ministry of Health support in the absence of official policies. Prior to this study, the literature included only one investigation from Uganda that compared services delivered by nurses and CBD workers (Stanback *et al.* 2007).

National policy makers in Madagascar found our study's results to be sufficiently convincing to recommend that the DMPA intervention be continued and extended to other sites with high-functioning CBD programmes. At the global level, the study results were included in the body of evidence reviewed by programmatic experts participating in a 2009 WHO-convened technical consultation to inform future policy on the provision of progestin-only injectable contraceptives. Participants reached the conclusion that, 'Sufficient evidence exists for national policies to support the introduction, continuation, and scale-up of community-based provision of progestin-only injectable contraceptives, especially DMPA' (WHO *et al.* 2009). The CBD model tested in Madagascar may be transferable to other settings in sub-Saharan Africa with similar needs, including high unmet need for contraception, strong preference for injectable contraceptives, large segments of the population with poor access to health facilities, and a strained health work force.

## Funding

Funding for this project was provided by the United States Agency for International Development through The Contraceptive and Reproductive Health Technologies Research

and Utilization (CRTU) Cooperative Agreement No. GPO-A-00-05-00022-00.

## Acknowledgements

The study investigators are grateful to the many partners who contributed to this project's success. Most notably these include (Ministry of Health and Family Planning) Dr Bako Nirina Rakotoelina and Dr Perline Rahantanirina; (Population Services International) Douglas Call, Iarimalanto Rabary, Rinah Randriamanandray, Andry Rabemanatsoa, Hasinara Rasoloharimahefa, Hery Ramangalahy, and Nadia Razakamandimby; (Chemonics) Volkan Cakir and Philippe Lemay, and Nirina Ranaivoson.

## References

- Fernandez VH, Montufar E, Ottolenghi E, Enge KI. 1997. Injectable contraceptive service delivery provided by volunteer community promoters. Unpublished paper. The Population Council.
- Garza-Flores J, Moraks del Olmo A, Fuziwara JL *et al.* 1998. Introduction of cyclofem once-a-month injectable contraceptive in Mexico. *Contraception* **58**: 7–12.
- Haines AD, Sanders D, Lehmann U *et al.* 2007. Achieving child survival goals: potential contribution of community health workers. *The Lancet* **369**: 2121–31.
- INSTAT (Institut National de la Statistique) [Madagascar], ORC Macro. 2005. Enquête Démographique et de Santé, Madagascar 2003–2004: Rapport de synthèse. Calverton, MD: INSTAT and ORC Macro.
- Lande R, Richey C. 2006. Expanding services for injectables. *Population Reports*, series K, no. 6. Baltimore, MD: Center for Communication Programs, Johns Hopkins Bloomberg School of Public Health.
- McCarragher D, Bailey P. 2000. Bolivia: Depo-Provera provision by community-based distribution workers and other CIES staff in El Alto. Unpublished paper. Family Health International.
- Philips M, Zachariah R, Venis S. 2008. Task shifting for antiretroviral treatment delivery in sub-Saharan Africa: not a panacea. *The Lancet* **371**: 682–4.
- Prata N. 2009. Making family planning accessible in resource-poor settings. *Philosophical Transactions of the Royal Society B: Biological Sciences* **364**: 3093–9.
- Prata NF, Vahidnia F, Potts M, Dries-Daffner I. 2005. Revisiting community-based distribution programs: are they still needed? *Contraception* **72**: 402–7.
- Rai C, Thapa S, Bhattarai L. 1999. Conditions in rural Nepal for which depot-medroxyprogesterone acetate initiation is not recommended: implications for community-based service delivery. *Contraception* **60**: 31–7.
- Schneider H, Hlophe H, van Rensburg D. 2008. Community health workers and the response to HIV/AIDS in South Africa: tensions and prospects. *Health Policy Planning* **23**: 179–87.
- Stanback J, Diabate F, Dieng T *et al.* 2005. Ruling out pregnancy among family planning clients: the impact of a checklist in three countries. *Studies in Family Planning* **36**: 311–5.
- Stanback J, Mbonye AK, Bekiita M. 2007. Contraceptive injections by community health workers in Uganda: a nonrandomized community trial. *Bulletin of the World Health Organization* **85**: 768–73.
- Stanback J, Qureshi Z, Sekadde-Kigondo C *et al.* 1999. Checklist for ruling out pregnancy among family-planning clients in primary care. *The Lancet* **354**: 566.
- Stanback J, Spieler J, Shah I *et al.* 2010. Community-based health workers can safely and effectively administer injectable contraceptives: conclusions from a technical consultation. *Contraception* **81**: 181–4.
- Stang AP, Schwingl P, Rivera R. 2000. New contraceptive eligibility checklists for provision of combined oral contraceptives and depot-medroxyprogesterone acetate in community-based programmes. *Bulletin of the World Health Organization* **78**: 1015–23.
- WHO. 2004. *Medical Eligibility Criteria for Contraceptive Use*. Geneva: World Health Organization.
- WHO. 2007. Task shifting to tackle health worker shortage. WHO/HSS/2007.03. Geneva: World Health Organization.
- WHO, USAID, Family Health International. 2009. Community-based health workers can safely and effectively administer injectable contraceptives: conclusions from a technical consultation. Research Triangle Park, NC: Family Health International.
- Zachariah R, Ford N, Philips M *et al.* 2009. Task shifting in HIV/AIDS: opportunities, challenges and proposed actions for sub-Saharan Africa. *Transactions of the Royal Society of Tropical Medicine and Hygiene* **103**: 549–58.