



RESEARCH ARTICLE

REVISED Over the counter: The potential for easing pharmacy provision of family planning in urban Senegal [version 3; peer review: 1 approved, 2 approved with reservations]

Previously titled: Over the counter: The potential for easing pharmacy provision of family planning in Senegal

Jill Peterson¹, Aurelie Brunie¹, Ibrahima Diop², Seynabou Diop³, John Stanback⁴, Dawn S. Chin-Quee⁴

¹FHI 360, Washington, DC, 20009, USA

²Agence pour la Promotion des Activités de Population-Sénégal (APAPS), Dakar, Senegal

³Marie Stopes International, Dakar, Senegal

⁴FHI 360, Durham, NC, 27701, USA

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Abstract

Background: This research assessed the potential for expanding access to family planning through private sector pharmacies in Senegal, by examining the quality of the services provided through private sector pharmacies, and pharmacy staff and client interest in private sector pharmacy-based family planning services.

Methods: This was a cross-sectional, descriptive study conducted in eight urban districts in and around Dakar and two urban districts outside of Dakar employing an audit of 225 pharmacies, a survey with 486 private sector pharmacy staff and a survey with 3,567 women exiting private sector pharmacies.

Results: Most (54%) pharmacies reported offering method-specific counseling to clients. Family planning commodities were available in all pharmacies, and 72% had a private space available to offer counseling. Three quarters (76%) did not have any counseling materials available.

49% of pharmacists and 47% of assistant pharmacists reported receiving training on family planning during their professional studies. Half had received counseling training. Few pharmacists met pre-determined criteria to be considered highly knowledgeable of the oral contraceptive pill (OCP) and injectable contraceptive provision (0.6% and 1.1%).

Overall, 60% of women surveyed were current family planning users and 11% procured their method through a private sector pharmacy.

Open Peer Review

Approval Status ? ? ✓

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1. **Katherine Tumlinson** , University of North Carolina at Chapel Hill, Chapel Hill, USA
University of North Carolina at Chapel Hill, Chapel Hill, USA
2. **Barbara O'Hanlon**, O'Hanlon Health Consulting, LLC, NW Washington, USA
3. **David K. Guilkey**, University of North Carolina at Chapel Hill, Chapel Hill, USA

Among non-users of family planning, and current users who did not obtain their method through a pharmacy, 47% said they would be interested in procuring a method through a private sector pharmacy.

Conclusions: There is both actual and latent demand for accessing family planning through Senegal's urban, private sector pharmacies. With proper training, pharmacy staff could better provide effective counseling and provision of OCPs and injectables, and lifting the requirement for a prescription could help support gains in contraceptive prevalence.

Keywords

Pharmacy, Contraception, Family Planning, Senegal

Any reports and responses or comments on the article can be found at the end of the article.

Corresponding author: Jill Peterson (jillpeterson@fhi360.org)

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REVISED Amendments from Version 2

Per the reviewer's comments, we revised this version by clarifying certain elements including the number of pharmacies selected, refused, and closed; the approach we used in assessing provider knowledge; price/cost interventions and available research; and rephrased the discussion and conclusions to be more nuanced. We have updated the title to: 'Over the counter: The potential for easing pharmacy provision of family planning in urban Senegal'. We have also provided specific responses to reviewer comments.

See referee reports

Introduction

Limited access to family planning services has been linked to the high rates of unmet need for contraception found in many African countries¹. Over the years, many countries have attempted to fill gaps in health services by capitalizing on private sector facilities, including privately run clinics, social franchising, and pharmacies². Research has shown drug shops, which typically do not employ a licensed pharmacist and are normally restricted to selling only over-the-counter medications, and private sector pharmacies to be a major source for contraceptives, particularly oral contraceptive pills (OCPs), emergency contraception, and condoms, especially for hard to reach women such as those who are younger or unmarried^{3–5}.

Hand in hand with increasing access through the private sector is task-sharing, in which lower level cadres of health providers are trained to provide certain health services that previously were the sole purview of a higher cadre⁶. Task sharing is a mechanism used in many countries to increase access to a variety of health services, including family planning. For example, community health workers in the public sector, and pharmacy and drug shop staff in the private sector, have all been trained in various countries to provide OCPs and injectable contraception—the two most popular forms of contraception in sub-Saharan Africa—without the need for a prescription written by a higher-level clinician, even when it is the first time the woman is using the method⁷.

In urban settings in particular, task-sharing of OCPs and injectables through private sector pharmacies is promising for improving access to family planning services. Thanks to the range of possible reasons for visiting pharmacies, the purpose of the visit can be disguised, providing a layer of confidentiality to women. In addition, research has shown that direct private sector pharmacy access to OCPs poses little risk to women; appropriately trained pharmacy staff are able to counsel for and provide the pill^{8,9}, and further research has shown that women can even self-screen for eligibility of OCPs with relative accuracy by self-administering a checklist^{10,11}. Sale and provision of injectable contraceptives in private sector pharmacies and drug shops is also common in the developing world, thanks to social marketing^{12,13}. Lastly, new packaging of injectable contraception designed to allow women to self-inject could eliminate the need for administration by a skilled professional for many, further increasing the impact pharmacies could have in improving access to contraception¹⁴.

At the same time, there are some possible concerns associated with over-the-counter provision of family planning services through pharmacies. Historically, low-income clients have been priced out of private facility services, although several programs are working to decrease financial barriers, including by increasing access to insurance and implementing savings products and voucher systems¹⁵. Screening for underlying health conditions is always desirable, but may not occur during a pharmacy visit. Similarly, private sector pharmacies may do little to provide re-supply reminders to clients buying methods such as OCPs and injectables. And, finally, private pharmacies may not counsel and refer women for methods they do not sell, since they are not usually integrated into the larger public health system, and since there is no economic incentive for them to do so.

To date, research focused on family service provision in pharmacy settings is limited and outdated. This research focused on Senegal seeks to address this gap. Senegalese pharmacies are ubiquitous in urban areas compared to health facilities. For example, Dakar counts 490 pharmacies but only 34 health facilities. Both public and private sector pharmacists are currently forbidden from dispensing OCPs and injectable contraception without a prescription, and pharmacists are not allowed to write prescriptions themselves. However, the Senegalese National Family Planning Action Plan for 2012–2015¹⁶ acknowledged the barriers imposed by a prescription requirement as a limitation to the regulatory framework of family planning and the expansion of family planning in Senegal. The removal of prescription barriers was also noted in Senegal's 2012 Program and Service Delivery commitment to Family Planning 2020 (FP 2020), and the updated National Strategic Framework for Family Planning 2016–2020¹⁷, calls for finalizing and validating the laws and regulations governing the pharmaceutical sector.

As an estimated 44% of Senegal's 14 million people live in an urban setting, and 38% of the total population living on less than \$1.90 per day, urban poverty is a concern^{18,19}. Given a total fertility rate of 5.0, a contraceptive prevalence rate (CPR) of 20.3%, and an unmet need for family planning at 25.6% overall, rising to nearly 30% for the lowest wealth quintile, increasing family planning access amongst the poorest women could help Senegal reach its commitment to FP 2020 with a CPR of 45% by 2020²⁰. Senegal sees the need and is clearly interested in updating their national policies regarding accessing family planning through pharmacies, and this research aims to provide evidence as they work to make final decisions.

This article reports on research conducted by FHI 360 under the Bill & Melinda Gates Foundation-funded Urban Reproductive Health Initiative (UHRI), led by IntraHealth International in Senegal, to assess the potential for expanding access to family planning through pharmacies. Specific objectives were to assess the quality of the services currently provided through pharmacies, and to examine pharmacy staff and client interest in pharmacy-based family planning services. This research aimed to provide evidence for a potential policy change that would help Senegal reach its family planning goals by expanding access through pharmacies.

Methods

This was a cross-sectional, descriptive study employing a pharmacy audit, a survey with pharmacy staff, and a survey with pharmacy clients.

Design and selection procedures

We obtained a list of all private sector pharmacies (551) in all 10 URHI project districts. Eight of the project districts were in Dakar and two were urban districts outside of Dakar (Mbour and Kaolack). The study primary outcome was the proportion of private sector pharmacies that provide counseling for family planning methods as measured through self-reported pharmacy audits. We assumed that 65% of the pharmacies in our target districts would have received training on family planning counseling through one of two earlier projects funded for pharmacy training (the Health Services Improvement project, or RPS in French, and the Senegal Maternal, Newborn, and Child Health/Family Planning/ Malaria project). Thus, we determined that a sample size of 225 pharmacies would be needed to achieve a 95% confidence interval with five percent precision for the proportion of interest including a finite population correction. To be conservative we planned on sampling 250 pharmacies to allow for 10% refusal. A proportional random sample of pharmacies stratified by district was selected.

Pharmacy audit: Eligibility criteria for pharmacies included location within UHRI districts and willingness of the owner of the pharmacy to participate in the study. We attempted to speak with the most knowledgeable person present, or the one who had worked there the longest, but collective input was also allowed.

Pharmacy staff: In each selected pharmacy, we attempted to interview one pharmacist, one assistant pharmacist, and one counter staff or trainee. If no personnel from any one of the three positions were present the day of the interviews, that position was not included. When more than one was present for a given position, the one whose first name came first alphabetically was selected.

Clients: Eligible clients were women (aged 18–49, plus married women aged 15–17) exiting the selected pharmacies over a two-day period for each pharmacy. Initially, we conducted exit interviews with all women of reproductive age (as assessed by the survey takers) regardless of current family planning use in the first 50 pharmacies. Subsequently, after the first 50 we made the decision to cap the number of non-users of family planning interviewed at five per pharmacy to ensure data collectors had enough time to find and interview users of family planning. We interviewed all current users of family planning who consented, regardless of whether they sourced their method through the pharmacy or elsewhere.

Data collection

Prior to initiating the study in any pharmacy, the research staff reached out to pharmacy owners and explained the purpose of the research, emphasizing confidentiality and that there was no threat of penalty from the regulatory division of the Ministry of Health and Social Action, the *Direction de la Pharmacie et du*

Médicament (DPM), for any findings or responses and that responses would not be linked to particular pharmacies. Trained female data collectors conducted pharmacy audits, interviews with pharmacy staff, and client interviews between March and June 2015. Interviews with pharmacy staff, including for the audit, were conducted inside, whereas clients were intercepted and interviewed outside of the pharmacy so that pharmacy staff would not overhear their responses. Data collectors were required to have the equivalent of a technical degree (*Brevet de Fin d'Etudes Moyennes*) and to have previously participated in at least three household surveys, but they did not have clinical training.

Written informed consent was obtained from all participants prior to conducting each type of interview in French, Wolof, or other local languages. No compensation was provided. The study was approved by Senegal's national ethics committee (*Comité National d'Ethique pour la Recherche en Santé*; approval number, SEN14/25) and FHI 360's Protection of Human Subjects Committee (564606-1).

Analysis methods

Table 1 outlines the information gathered through each of the three questionnaires (questionnaires are available on Harvard Dataverse²¹). Data from each survey were analyzed descriptively using SPSS version 17.0. We constructed two separate composite indicators of pharmacy staff knowledge of OCPs and injectable contraception based on responses to the survey with pharmacy staff. Points were awarded as shown in tables (see Results section). While we did not strictly adhere to a theoretical quality of care framework such as Bruce-Jain²², questions were derived from tools such as the Quick Investigation of Quality²³, and the Situation Analysis, which are based on this framework²⁴. To simplify scoring and to avoid endless debate about the relative weights of the various questions, all questions were assumed to have equal importance. We considered staff who were able to provide correct responses to half or more of the questions (five or more out of eight points for OCPs and three or more out of six points for injectables) to be knowledgeable of each method. While this is a crude measure, we reasoned it was sufficient in the context of an exploratory study that aimed at providing initial insight into staff knowledge rather than precisely measuring competency.

Results

In total, we performed audits at 225 pharmacies, and interviewed 486 pharmacy personnel and 3,567 pharmacy clients. From the sample of 250 pharmacies drawn from our initial list, 20 refused to participate in the study and 11 were either permanently or temporarily closed, or in the process of being sold, four were outside of our study districts, and one was sampled twice. To meet our target size of 225, we randomly selected an additional 11 pharmacies (respecting the initial stratification by district). All 11 replacement pharmacies were open and consented to participate. Of the 486 pharmacy personnel interviewed, 182 were pharmacists, 94 were assistant pharmacists, 206 were counter staff, and 4 were interns. In total 56% of pharmacy staff respondents were men.

Table 1. Data collection methods and information gathered.

Data collection method	Information gathered
Audit/situation analysis	<ul style="list-style-type: none"> • Availability and conditions of family planning method provision, • Presence of support materials in-house, and • Availability of a private area (visual and/or auditory) to conduct counseling
Staff interview	<ul style="list-style-type: none"> • Knowledge and provision of family planning services, • Interest in providing family planning services, and • Receipt and/or desire for (additional) training in family planning service delivery
Client exit intercept interviews	<ul style="list-style-type: none"> • Client experiences with and demand for pharmacy-based family planning services

Client demographics

Of the total 3,567 clients interviewed, 390 (11%) were current family planning users who procured their method through a private sector pharmacy, 1,676 (47%) were current users of family planning who procured their method elsewhere, and 1,436 (40%) were non-users of family planning. The remaining 2% were using a method that did not need procuring, such as lactational amenorrhea, or were users of traditional methods. The average age of our respondents was 30.6 years. Our respondents were most commonly married (76%), living with their partner (83%) and had a previous pregnancy (79%). In total, 53% had one to two children, and the most common education level was primary (29%) (see [Table 2](#)).

Audit

Overall, 54% (95% CI: 48%–61%) of pharmacies reported offering counseling on at least one method of family planning method. On the day of the audit, 99% of pharmacies had at least one brand of OCP in stock; the most common was Securil (approximately 0.70 USD), stocked by 98%. Between 73 and 79% also reported they stocked at least one of the next three most commonly mentioned brands. In addition, over 99% of pharmacies indicated they had emergency contraceptive pills stock on the day of the audit, and just under 99% said they had condoms, while 83% of pharmacies said they had the injectable contraceptive Depo Provera.

Nearly three-quarters (72%) of pharmacies said they had a private space available to offer counseling in the pharmacy; however, 76% did not have any counseling materials available to assist pharmacy staff in counseling. Although available in only 10% of pharmacies, the most common materials were manuals and guides, with items such as flipcharts and counseling cards, available in fewer than 5% of pharmacies. Almost all pharmacies reported that OCPs (94%) and injectables (96%) required a prescription for purchase (see [Table 3](#)).

Survey with personnel

In total, 49% of pharmacists and 47% of assistant pharmacists reported receiving training on family planning during their professional studies. A third of pharmacists and 12% of assistants reported being trained after their professional studies (the questions were not asked of counter staff); of these, 53% and

50%, respectively, had received training on counseling for family planning. Among those with any training on family planning counseling, all had received training on counseling for use of OCPs and 82% on injectables. Nearly 90% of all pharmacists and assistant pharmacists, including those who had received training on family planning previously, expressed a desire for training on counseling for family planning, and 86% in how to offer methods.

[Table 4](#) outlines a series of questions asked to determine pharmacy staff knowledge of counseling issues related to OCPs. Scores ranged from 0–7 out of a possible 8 with an average of 1.6. Three staff (all pharmacists) (0.6%) were able to answer five or more questions correctly; 10% scored three points or more, and 44% scored two points or more. The average number of points earned on the OCP knowledge questions was slightly higher for those who reported receiving training of family planning during their professional studies (2.06) than those who did not report having received training (1.72).

The majority (78%) of respondents' knowledge adhered to the outdated protocol that a woman should initiate OCPs on the first day of her period, rather than current recommended practice, which allows women to start at any time during her cycle as long as she is reasonably sure she is not pregnant. While 59% of pharmacists and assistant pharmacists were able to name one or two common side effects, few (5.2%) were able to name five or more. While only 7% of respondents knew that a breastfeeding woman should wait twenty-four weeks/six months before initiating combined oral contraceptives, 18% knew that she could initiate progesterone-only pills either right away (current guidance), or after six weeks (previous guidance).

[Table 5](#) outlines the series of questions asked to determine pharmacy staff knowledge of counseling issues related to injectable contraception. Scores ranged from 0–4 out of a possible 4 with an average of 0.9. Six staff (four pharmacists, one assistant pharmacist, and one counter staff) (1.2%), answered three or more questions correctly; 16% scored two or more points. As with OCPs, the average score was slightly higher for staff who reported having received training on family planning while in school. Those who reported receiving training averaged 1.1 points, versus 0.99 for those not reporting having received training.

Table 2. Demographic information for clients interviewed (n=3,567).

Question	% (n)
Average age	30.6
Marital status	
Married	76 (2,718)
Single	18 (651)
Separated/Divorced	5 (175)
Widowed/Other	1 (21)
Of those with partner:	
Live with partner	83 (2,280)
Do not live with partner	17 (480)
Previous pregnancy	
Yes	79 (2,807)
No	21 (760)
Number of living children	
0	2 (49)
1–2	53 (1,493)
3–4	32 (898)
5–6	10 (290)
>6	3 (77)
Education level	
No formal schooling	22 (771)
Primary	29 (1,042)
Secondary 1	17 (608)
Secondary 2	12 (407)
Post-Secondary	16 (566)
Other	5 (159)

Table 3. Pharmacy characteristics (n=225).

Audit question	%
Private space available for counseling	72
Offering counseling on a specific method of family planning	54
At least one type of counseling material available (flipchart, poster, etc.)	24
Prescription required for oral contraceptive pills	94
Prescription required for injectable contraceptives	96

While nearly three-quarters (73%) of staff knew the duration of effectiveness to be three months per injection, few understood that women have a window from two weeks before to four weeks after her previous injection was set to expire to receive her reinjection. Whereas 21% of respondents could name three side effects associated with injectables, only 10% could name four. A total of 20% of respondents could name two reasons not to use injectables, but only 4% could name four or more reasons.

Survey with clients

In total 21% of the entire sample (3,567) had ever used the pharmacy to get a contraceptive. Of clients currently using a modern

family planning method, 31% used OCPs, 30% used injectables, 20% used implants and 10% used IUDs. A total of 70% of users obtained their methods through a public health facility, 19% from a private sector pharmacy and 10% from another source. Current users who procured their method through a private sector pharmacy received OCP (69%), condoms (21%), emergency contraceptive pills (5%) and injectables (3%).

Among the 390 current users who obtained a method from a pharmacy, 54 (14%) reported that they or their partner had received counseling at the pharmacy the last time they procured their method. Table 6 provides further information about that experience, including privacy and details of the counseling received. When asked, 52% of clients who had ever procured family planning through a pharmacy reported receiving a method without a prescription (390 of 741); 50% reported having bought OCPs and 2% injectables.

More clients reported having visual and auditory privacy for the counseling than what we found in our own audit—83% versus 72%. A majority reported having been treated with respect, and having had the opportunity to ask questions, whereas just over half reported that the staff explained how to use the method, asked them about contraindications to the method, and/or discussed side effects. Only 44% reported that the provided had talked to them about both advantages and disadvantages of the method.

Of potential users of the pharmacy for family planning, including current users procuring from a non-pharmacy source, users of traditional methods, and non-users of family planning who were interested in family planning (n=3,171), 47% said they would be interested in procuring a method through a pharmacy. Of those who were not interested in procuring through a pharmacy (n=1,008), 45% cited that they were dissatisfied with the quality of services through the pharmacy, and 12% reported high costs for their lack of interest. (Figure 1)

Of the potential users of family planning who were interested in receiving a method through the pharmacy (n=1,495), half or more would not be willing to pay for their method in the pharmacy (Figure 2). A total of 62% would, however, be willing to pay for counseling from pharmacy staff. The mean amount they would be willing to pay for counseling was 1679 CFA (approximately 3 USD) with a median and mode of 1000 CFA (approximately 2 USD).

Discussion

Findings on the current state of family planning service provision through private sector pharmacies in the UHRI project area are mixed, especially in light of information on prior programs offering training to pharmacies. Both OCPs and injectables were in good supply, and close to three-quarters of pharmacies had a private space where counseling could be performed. Results on client-provider interactions are promising, as clients who procured their method through pharmacies reported being treated with respect and having the opportunity to ask questions.

Table 4. Staff knowledge questions, OCPs (n=486).

Questions and responses	% (n)	
In general, at what time during the menstrual cycle do you recommend that the client begin using oral contraceptives?		
Anytime as long as the client is reasonably sure she is not pregnant.	3 (13)	1 point
At the beginning of her cycle	78 (381)	
All other responses (anytime during her menstrual cycle, don't know/no response)	19 (92)	
In general, after finishing a 21-day pack of pills, how many days should the client wait before starting the next pack of pills?		
7 days/one week	66 (322)	1 point
Other (Most common responses under "other: included "it depends," and "start immediately.")	16 (77)	
All other numerical responses	18 (87)	
In general, after finishing a 28-day pack of pills, how many days should the client wait before starting the next pack of pills?		
No wait/start immediately.	62 (302)	1 point
Other (The most common response under "other: was "I don't know.")	15 (73)	
All other numerical responses	23 (111)	
In general, how many weeks after giving birth should a breastfeeding woman wait before starting combined oral contraceptives?		
24 weeks/6 months	7 (32)	0.5 point
I don't know	40 (192)	
All other numerical responses	54 (262)	
In general, how many weeks after giving birth should a breastfeeding woman wait before starting progestin-only oral contraceptives?		
Six weeks or earlier	18 (86)	0.5 point
I don't know	49 (237)	
All other numerical responses	33 (163)	
What are the most common side effects of oral contraceptives?^a		
Five or more correct side effects	5 (25)	1 point
Four side effects listed	12 (57)	
Three side effects listed	24 (118)	
Two side effects listed	31 (151)	
One side effect listed	20 (99)	
Zero side effects listed	7 (36)	
Which drugs or type of drugs reduce the effectiveness of oral contraceptive pills?^b		
Two or more correct drugs listed	6 (29)	1 point
One correct drug listed	15 (74)	
Zero correct drugs listed	79 (383)	
What are the reasons not to use oral contraceptive pills?^c		
Five or more correct reasons listed	3 (12)	1 point
Four correct reasons listed	4 (17)	
Three correct reasons listed	13 (61)	
Two correct reasons listed	21 (104)	
One correct reason listed	26 (126)	
Zero correct reasons listed	34 (166)	
In what situations should you recommend a back-up method for oral contraceptives?^d		
Two or more correct situations listed	5 (23)	1 point
One situation listed	45 (219)	
Zero situations listed	50 (244)	

OCP, oral contraceptive pill

^a Correct responses include for headache, nausea, vomiting, vertigo, breast tenderness, spotting/breakthrough bleeding, weight gain.^b Correct responses include seizure medicine, antiretroviral (ART), tuberculosis medicine^c Correct responses include if client is pregnant, history of heart/circulation problems, breast cancer, severe liver disease, heavy smoker over 35 years old, breastfeeding first six months post-partum for combined OCPs, breastfeeding in first six weeks post-partum for Progestin-only OCPs, severe/complicated diabetes.^d Correct responses include if client forgets 3 or more pills, if she vomited soon after taking pill, if she starts the pill after the first 5 days of her menstrual cycle, if she forgets to take Progestin-only pill by more than 3 hours

Table 5. Staff knowledge questions, injectable contraceptives (n=484).

Questions and responses	% (n)	
In general, at what time during the menstrual cycle do you recommend that the client begin using Depo Provera?		
Anytime as long as the client is reasonably sure she is not pregnant.	5 (25)	1 point
No response/I don't know	48 (235)	
All other responses (anytime during her menstrual cycle, don't know/no response)	46 (224)	
For how long is Depo Provera effective?		
Three months/13 weeks	73 (305)	1 point
No response/I don't know	19 (93)	
All other numerical responses	18 (86)	
When should a woman return for a re-injection of Depo?		
From 2 weeks before up to 4 weeks after	1 (4)	1 point
Up to 2 weeks before	1.4 (7)	0.5 point
Up to 4 weeks after	1 (4)	0.5 point
On the exact date	64 (313)	
All other responses	32 (153)	
What are common side effects of Depo Provera? ^a		
Four or more correct side effects listed	10 (48)	1 point
Three correct side effects listed	21 (101)	
Two correct side effects listed	28% (137)	
One correct side effect listed	20 (99)	
Zero correct side effects listed	20 (99)	
What are the reasons not to use Depo Provera? ^b		
Four or more correct reasons listed	4 (19)	1 point
Three correct reasons listed	7 (35)	
Two correct reasons listed	20 (98)	
One correct reason listed	25 (119)	
Zero correct reasons listed	44 (214)	

^a Correct responses include prolonged/heavy/irregular bleeding, amenorrhea, headaches, mood changes, weight gain, dizziness, abdominal pain/boating, reduced sex drive.

^b Correct responses include if client is pregnant, breast cancer, very high blood pressure, severe liver disease, unexplained vaginal bleeding, breastfeeding in first 6 weeks postpartum, thrombosis/blood clots, rheumatic lupus disease.

Table 6. Clients' most recent counseling experience received at pharmacy (n=54).

Survey question	% (n)
Counseling conducted with auditory and visual privacy	83 (45)
Staff treated client/partner with respect	87 (47)
Staff explained how to use the method	52 (28)
Staff asked about health conditions that might impede use of contraception	52 (28)
Staff spoke to client/partner about side effects	52 (28)
Staff discussed both advantages and disadvantages of the method	44 (24)
Staff gave client/partner the opportunity to ask questions	89 (48)

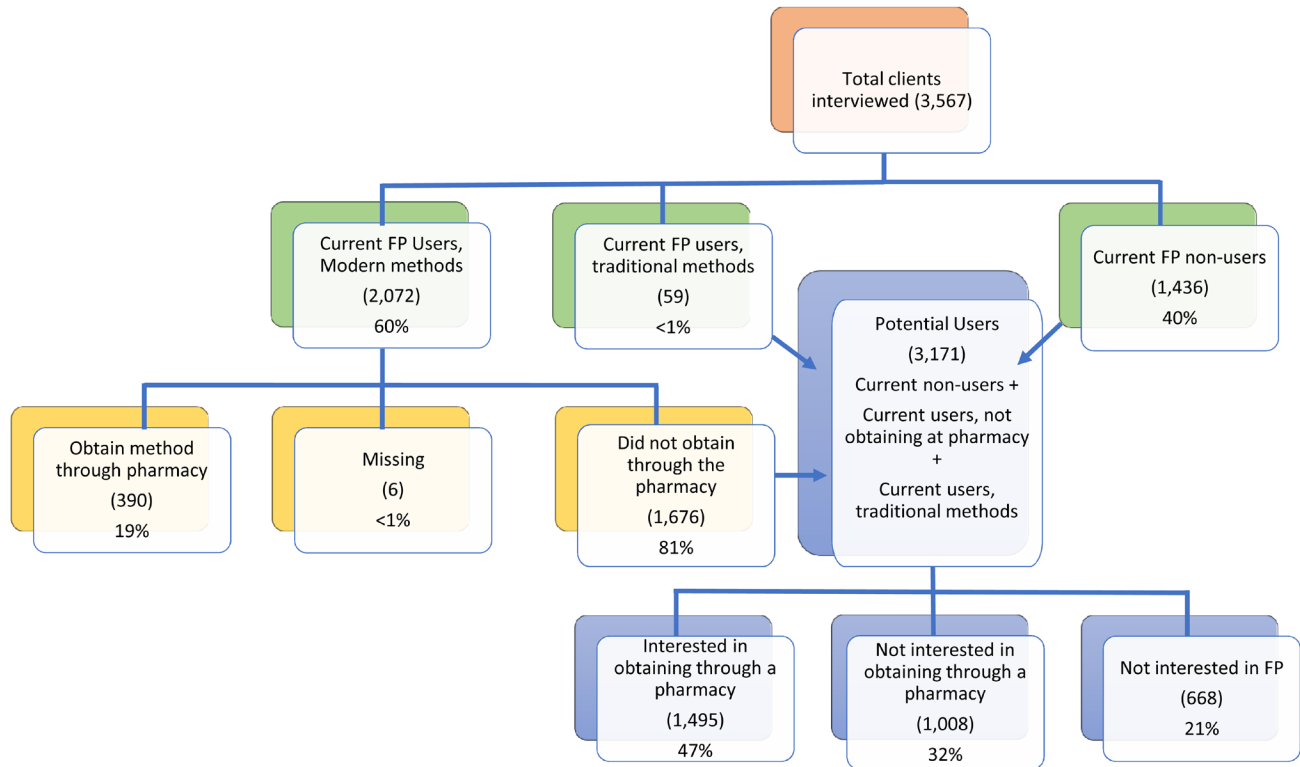


Figure 1. Client survey results flowchart.

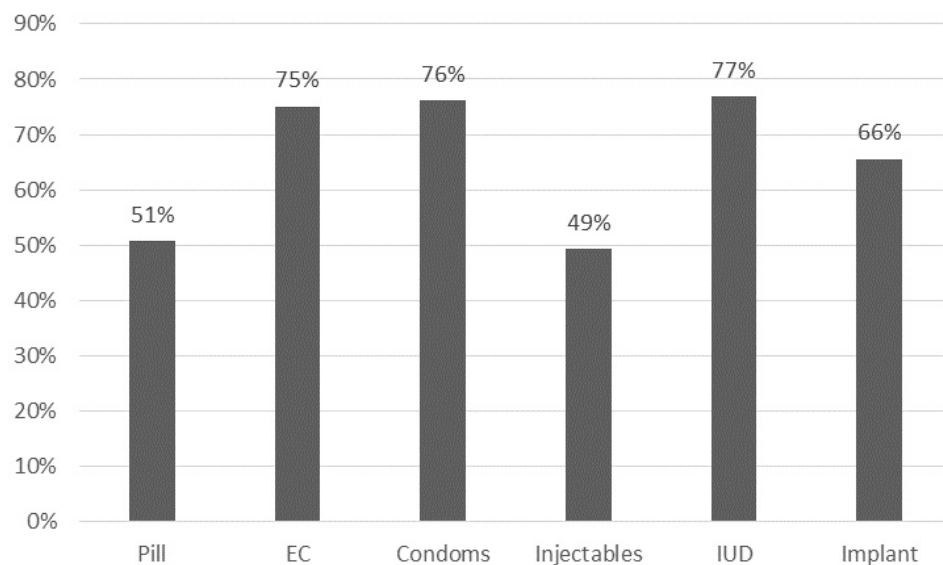


Figure 2. Percent of clients unwilling to pay for the given method at a pharmacy (n=1495).

At the same time, while a little over half of pharmacies indicated providing counseling in the pharmacy audit, only 14% of clients who procured their method through the pharmacy confirmed being counseled at their last visit, and few pharmacies had access to counseling materials such as posters, flip charts, or brochures. The limited family planning training provided to

pharmacists and assistant pharmacists was reflected in some knowledge gaps, particularly with regards to up-to-date and detailed information. Clients who were counseled were not systematically informed of how to use their method, advantages and disadvantages or possible side effects. More detailed training on family planning counseling as part of the pharmacy licensure

training program as well as opportunities for pharmacists and assistant pharmacists to refresh their skills through more broadly offered training could help address these challenges, especially given that providers in this study expressed interest in more training on methods and counseling. This expressed interest may be enough to overcome the “know-do” gap seen in other health fields²⁵. Others have also suggested creating linkages with and accountability to other FP providers to address the know-do gap²⁶.

Pharmacy staff in our study were aware of the law requiring a prescription to purchase OCPs and injectables, but our results suggested that it was not always adhered to, especially for OCPs but more rarely for injectables. In addition to women already procuring their method through pharmacies, we found there was latent demand for accessing family planning through pharmacies. Although the study design does not support a demand forecast, there was substantial interest among women in our sample (about half of future potential users of pharmacy for family planning) to supply through pharmacies. While some women currently procuring through pharmacies were able to obtain their method despite the prescription requirement, most were OCP users and very few obtained injectables. Given that injectables are the most widely used method in Senegal, revising the prescription requirement would be important to consider in the context of informed method choice, along with strengthening of pharmacists’ competencies, to fulfill the potential of urban private sector pharmacies in meeting this latent demand.

Price also warrants attention as it appears to be an important consideration for women. Price structure across service delivery channels in Senegal could also be a challenge on the supply side given the for-profit nature of pharmacy-based service provision. The majority of women interviewed were unwilling to pay for their method, though most *were* willing to pay for counseling obtained through the pharmacy, which reflects the typical payment structure of public health facilities, where women pay a small fee for methods (approximately a tenth of what they pay at private pharmacies), and a separate fee for a family planning consultation (less than a dollar at public facilities). Women in our sample expressed a willingness to pay 2–3 USD for the counseling at a pharmacy. To reconcile affordability with incentivization of private sector providers, additional interventions may need to be considered in Senegal to expand the potential of private sector pharmacies to reach women of all income levels, including increasing access to insurance and implementing savings products and voucher systems. A systematic review of family planning voucher programs in low and middle income countries concluded that in terms of contraceptive use, most programs reported a significant increase with vouchers²⁷.

Our study had several limitations. The ten UHRI districts represent urban settings, and findings may not transfer to other contexts. Because the sampling of urban private sector pharmacy clients was capped for non-users of family planning, we oversampled current users of family planning who obtain services in the pharmacy setting. While our finding indicate there

is latent demand for services through pharmacies, results should not be interpreted as a precise estimate. We did not collect income information and can therefore not draw conclusions on pharmacies’ ability to improve access among the urban poor. Social desirability bias may have led to an inflated proportion of staff who reported requiring prescriptions. Other design options such as directly asking pharmacy staff about their practices or conducting a mystery client study were considered at the design stage, but met with opposition from ethics committees. Nevertheless, we attempted to address this shortcoming by triangulating pharmacy staff responses of knowledge of prescription requirements with client acknowledgement of having previously purchased a method without a prescription, creating a proxy for sales without a prescription. The scoring system for the knowledge index is crude and the passing score was based on the reasonable but subjective expectation that staff should be able to correctly answer half of the questions. Results on the proportion of knowledgeable staff should be interpreted cautiously, as this criterion may have been too stringent; however, this exercise allowed us to highlight important gaps in knowledge. Administering similar questions to facility-based staff could provide a useful comparison point in future research.

Conclusion

Given high rates of success with task-sharing in other environments, the availability of contraceptive commodities and private counseling space within most urban-Senegalese pharmacies, positive client-pharmacist interactions, and client interest in receiving family planning directly through pharmacies, Senegal’s private sector urban pharmacies provide an opportunity to expand family planning service provision in urban areas. Proper training, including the use of job aids, is important to address current deficiencies in the quantity and quality of services provided. Although women reported being able to circumvent prescription requirements, they may still impose barriers to women seeking services, especially in terms of the ability of women to get their preferred method. Many medical experts consider such requirements unnecessary, and in countries in Asia, Europe, Africa and South and Central America, OCPs are available without a doctor’s prescription.

Data availability

Replication data from this study are available on Harvard Dataverse: <https://doi.org/10.7910/DVN/UQ3NWN>²¹

Data are available under the terms of the [Creative Commons Zero “No rights reserved” data waiver](#) (CC0 1.0 Public domain dedication).

Grant information

This work is supported by the Bill and Melinda Gates Foundation [OPP1005927]. This funds the Urban Reproductive Health Initiative, of which this research is part of and was initiated by FHI 360 and led by IntraHealth International in Senegal.

The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

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Open Peer Review

Current Peer Review Status: ? ? ✓

Version 3

Reviewer Report 27 June 2019

<https://doi.org/10.21956/gatesopenres.14137.r27362>

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David K. Guilkey

Department of Economics, Carolina Population Center, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

This paper reports descriptive results from a facility audit at a sample of 225 pharmacies in urban areas of Senegal. In addition the authors did exit interviews with a large number of clients of those facilities. The goal was to determine the potential for expanding access to family planning services in urban Senegal through pharmacies.

The paper is well-written and the statistical methods are appropriate. I have a few comments that may improve the paper:

1. In 2011 and 2015, the Measurement, Learning, and Evaluation Project (also funded by the Gates Foundation) conducted surveys in a census to pharmacies as opposed to a sample in many of the same areas as this work. It may be useful to see how comparable the results of the facility audits are across the different surveys. See Cronin *et al.* (2018¹) and https://tciurbanhealth.org/wp-content/uploads/2017/10/senegal_note_technique_mle_etudefinal2016_0.pdf [French].
2. It is not clear whether or not methods in stock were based on an interview with staff at the pharmacy or whether or not the methods were actually seen in stock by the interviewer. There is sometimes a discrepancy between these two assessments.
3. A total of 3,567 clients were interviewed. What was the refusal rate and is there any information on the characteristics of the women who refused to be interviewed?
4. There were a few typos in paper that should be cleared up before the final draft.

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Text

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Statistical methods

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 2

Reviewer Report 22 January 2019

<https://doi.org/10.21956/gatesopenres.13970.r26809>

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Katherine Tumlinson

¹ Department of Maternal and Child Health, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

² Carolina Population Center, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

³ Department of Maternal and Child Health, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

⁴ Carolina Population Center, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

Overall: In my first review of this article, I noted that this is an interesting study that identifies some deficiencies in the quality and quantity of counseling provided to FP pharmacy clients while also suggesting some latent demand for procurement of FP through pharmacies, based on data collected at pharmacies in select urban areas of Senegal. I suggested several areas for improvement prior to publication in my first review and many of these were addressed. However, the following initial suggestions did not receive a response or need further clarification from the authors prior to acceptance for publication.

Methods:

1. **Initial comment:** The selection of districts could be presented with greater clarity. Did the URHI include only 10 districts for the country of Senegal and were all of the URHI districts in or near Dakar? If so, please make this clear. If not, how were the 10 districts in this analysis selected? Were the data for this study from the URHI endline survey in Senegal or were they part of a project piggybacking onto the Senegal URHI? **Comment following revision:** My interpretation of the revised version is that the data come from three cities (Dakar, Mbour, and Kaolack); could the authors just clarify why the other three URHI cities were excluded? Did these other cities not collect pharmacy-level data? Given data come entirely from urban areas, it would be helpful to insert the word “urban” in front of “Senegal” in the title. Could you also clarify when the data were collected (2014?)?

Results

1. **Initial comment:** The first two sentences of the results section are difficult to interpret. Please clarify: how many facilities were initially selected, how many facilities refused to participate, and how many facilities were found to be closed (and were they permanently closed?). As written, it appears that 236 facilities were initially selected ($236 - 18 - 18 + 25 = 225$), yet this is different from the number (250) presented in the methods section. **Comment following revision:** Still unclear how many pharmacies were temporarily closed or not found.
2. **Initial comment:** Tables 4 and 5 list a number of survey questions that were used to create a score for provider knowledge of OCP and injectable provision. Please describe the logic and strategy behind the construction of this point system. For example, why should knowledge of five or more side effects (table 4) receive a point and all other categories receive no points? Is knowledge of five or more side effects meaningfully different than knowledge of four? How did the authors decide where to draw cut points? Has this approach been used or validated in prior studies? As these data comprise more than half of the total results section, it is important to understand the reason and logic behind this approach. **Comment following revision:** I was unable to find where the authors addressed this in the article.

Discussion

1. **Initial comment:** I would not agree that 72% is a “vast majority.” More than one in four pharmacies lacked a private space for counseling. I suggest just calling this a majority. **Comment after revision:** Not addressed.
2. **Initial comment:** In the first full paragraph on the left-hand side of page 9, the authors argue for increasing access to insurance, savings products, and voucher systems to help address price barrier in pharmacies. How feasible and realistic is this recommendation and would it serve to increase use of private facilities rather than pharmacies and drug-shops? **Comment following revision:** I was unable to find where the authors addressed this in the article.
3. **Initial comment:** The next sentence recommends addressing price sensitivities so that products are both profitable and affordable. Again, this begs the question, how feasible or

realistic is this recommendation? To better understand the feasibility, it would be helpful to have information on the price currently paid by pharmacy versus facility clients as well as an understanding of what is meant by “price sensitivities should be addressed.” **Comment following revision:** I was unable to find where the authors addressed this in the article.

4. **Initial comment:** I recommend the authors include results of any similar studies in other countries or regions to place their findings in the context of existing knowledge. I also suggest presenting results of any other studies that have implemented the recommendations made by the authors such as programs that aim to decrease financial barriers – have these been successful in similar settings? This might help us to determine the degree to which these recommendations are realistic and/or likely to result in increased access to FP. **Comment following revision:** I was confused by the authors’ statement that their “results are difficult to fully put into context” without more information... does this mean there are no prior studies with any similarities to this study? Further, they don’t address the comment about whether their suggested interventions (insurance, savings products, voucher schemes) have had success in Senegal or other LICs.

Conclusion

1. **Initial comment:** The final concluding paragraph states that training and job aides are all that are needed to allow pharmacist to offer OCPs and injectables. Again, I would be careful not to overstate the results. The data, as presented, don’t tell us whether increased training and job aids would translate into an increased percentage of providers who offer counseling. Several recent studies suggest large gaps between provider knowledge/training and actual practice and there is evidence of job aids not being widely distributed and used. I would encourage the authors to focus on the primary findings evident from the data:

1. Nearly half of pharmacies aren’t offering method-specific counseling
2. Providers also have low knowledge of correct provision of OCPs and injectables (assuming some of the scales are not overly stringent)
3. Many clients are not being told how to use their method, about health conditions and side effects, or the advantages/disadvantages (Table 6!)
4. The prescription requirement is a burden for some but more than half could procure a method without it
5. A large percent of women appear to have latent demand for accessing FP through pharmacies and we assume they are not doing so due to the prescription requirement – yet more than half circumvented this requirement
 1. Price and quality appear to be a deterrent for many women; how have programs in similar contexts worked to address price and quality concerns in the pharmacy setting?

Comment following revision: Regarding the decision about whether or not to emphasize that half of women could circumvent the prescription requirement, I’m happy to agree to disagree ~ although I would encourage the authors to acknowledge this. However, more importantly, the conclusion continues to contain claims that aren’t supported by these data or by other studies and there is no acknowledgement of the growing literature that indicates provider trainings are not enough (see Mohanan’s recent article on the Know-Do Gap). ***In sum, the authors are recommending that Senegal lift the prescription requirement without providing evidence-based suggestions for how to address highly prevalent and valid price and quality concerns.***

Also, please clarify, in the following statement in your author response sheet: “Given that half had, and we do not see resulting consequences on women’s health,...” were data on health outcomes for women receiving their method at the pharmacy analyzed and presented?

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 07 May 2019

Jill Peterson

Overall:

Thank you again for your careful review. Direct responses to your comments are here below, including clarification of where you can find our responses in the article.

Methods:

1. URHI included only 10 districts – the same as those in the present study. Under the section “Design and selection procedures,” we clarified that “We obtained a list of all private sector pharmacies (551) in ALL **10** URHI project districts.” Yes, we can add urban to the title. As stated under the *Data Collection* section, “Trained female data collectors conducted pharmacy audits, interviews with pharmacy staff, and client interviews between March and June 2015.”

Results:

1. We have revised the language in this section for clarification and specificity.
2. We added details regarding the approach and acknowledging its limitations (see both methods and limitations). All questions were assumed to be of equal importance and given equal weight, and the passing score is based on the reasonable, but subjective expectation that staff would be able to correctly respond to half of the questions. Results on the proportion of knowledgeable staff should be interpreted with caution

keeping this in mind, but the exercise was nonetheless useful in exposing knowledge gaps.

Discussion:

1. This was rephrased to “close to three-quarters.”
2. This paragraph has been edited and information about vouchers added.
3. The price difference between public and private facilities was added as a parenthetical in the same paragraph (*approximately a tenth of what they pay at private pharmacies.*) We have also added information on the cost of consultations at public facilities. It is a fine balance between making commodities affordable and competitive with the public facility rate and making it worth the effort for private pharmacies to stock them. It was those price sensitivities we suggested should be further studied when we added language on whether direct access to family planning through private sector pharmacies would bring in additional sales and profits to pharmacy owners. While on one hand the price may need to be less than the cost to the pharmacy of purchasing and stocking the items, the extra foot traffic may raise sales overall across the store. These are issues we were not able to explore within the time and budget of this study, but we agree that these issues should be further explored.
4. The comment about context was actually in reference to the subjective nature of the cutoff for the scoring system. This was rephrased. We have added some information on vouchers and re-written the paragraph.

Conclusion:

1. We have rephrased the discussion to be more nuanced. With regard to the prescription requirement, most women who were able to circumvent it were using COCs and few injectables, even though this is the most commonly used method in Senegal. We believe this may be important to consider in terms of method choice.

Competing Interests: No competing interests were disclosed.

Version 1

Reviewer Report 17 July 2018

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Barbara O'Hanlon

¹ O'Hanlon Health Consulting, LLC, NW Washington, DC, USA

² O'Hanlon Health Consulting, LLC, NW Washington, DC, USA

³ O'Hanlon Health Consulting, LLC, NW Washington, DC, USA

I would also like to thank researchers for the study. As a health policy expert working on integrating non-state provision of health services and systems with state (e.g. public) ones, I appreciate the growing research on private health sector potential contribution to key public health areas such as reproductive health and family planning. I believe this article on the Senegal experience in private pharmacy's potential role will be a good addition to this growing body of literature on the private health sector in developing countries.

Although my focus is primarily on harnessing and/or growing the private health sector to address public health objectives, it is difficult to truly understand a private sector role without understanding what is also happening at the same time in the public sector. Indeed, recent studies on consumer behavior indicate that most women do not go exclusively to one sector or the other but instead, "shop around for a better deal". For example, women often go to private providers for ANC visits because of convenience and price but deliver their babies in a public facility because it is free. Similarly, AIDS patients often are tested, diagnosed and initiated on ARVs in the public sector but switch to the private sector for long-term care.

Consequently, my main comment is I would like to know more about what is happening in the public sector before concluding that easing pharmacy provision will be an important strategy to address unmet need. Here are some areas to further pursue and/or clarify

- "Always, always, always" qualify what type (e.g. public vs. private and better yet if you can state public, not-for-profit and for-profit) of health facility as well as health cadres. When trying to understand if the private – or public sector as a matter of fact – is the strategic provider one needs to specify "who can do what". For example, you state that pharmacists are currently forbidden from dispensing. Does this mean **all** pharmacists? Public pharmacists? Or only private pharmacists? In practice we see that regulations on task shifting are liberal for public health cadres than for similar cadres in the private sector. Therefore, it is critical to always specify. Similarly, you stated that according to regulations that a woman "is obliged to visit a health facility to initiate either of these PF methods". Once again, can it be both types of facilities? Or just public? In South Africa only public doctors can diagnose and initiate AIDS. **So it is important to specify because it has implications on a woman's journey to receive FP methods.**
- You state prescriptions are required for OCPs but in practice women can obtain OCPs without a prescription at a private pharmacy. But few do: according to your data, 70% of women interviewed obtained their method in a public health facility (good you specified what type of facility!). **So, what is going on here?** Stock-outs in public facilities is the main reason women go directly to a private pharmacy but recent studies in Senegal demonstrate that stockouts in FP have almost disappeared due to IPM. Are women deciding to get their method in public facilities since that is where they get their prescription? Or is the price (consultation, method and opportunity cost) less than it would be in a private pharmacy? I would go back to the consumer data, if possible to understand why such an important number get their FP methods MOH facilities.
- Also, I would pursue further why non-users state they would go to a private pharmacy. Do they value convenience? Steady supply? Brand method? Cost? Also, it is hard to see if cost (notice not price) is a factor unless there is some data on the consumer's true cost to access FP in both public and private facility: some studies conclude that cost in the public sector (consultation fee and low price + transport cost and opportunity costs) can be equal if not

greater than the **price** of OCP in a private pharmacy. So yes women may consider price too high but we do not know the true cost for them to get this same method in public sector.

Without a better understanding of the interface between public and private supply as well as consumer preference, your conclusion that “Senegal pharmacies are well-positioned to meet the country’s increasing desire for modern contraception”. First, urban market – which the study only focused on – is very different than rural ones. Moreover, there are few private providers in rural and remote areas compared to urban and peri-urban ones. Second, the study did not explore private sector perspective on expanding FP methods are part of their product portfolio. I find your proposed “strategies” harness private pharmacies a bit simplistic. From a public health perspective, supplying them IEC materials as well as offering training to improve their counseling skills will help. But without more data on private pharmacy incentives (e.g. more foot traffic, spin-off sales in ancillary treatment areas like. Child health, higher margin on brand FP methods, etc.) you may not be able to “attract” sufficient number of private pharmacies to take the time (and money) to invest in improving counseling skills to offer clients among a crowded product portfolio. Research has demonstrated that in addition to training, other incentives are needed to attract private pharmacies: look at FP voucher programs where they receive donated FP products, can charge a “fair” dispensing fee to recuperate the cost of stocking the FP method, and in some cases, free marketing and community promotion).

Is the work clearly and accurately presented and does it cite the current literature?

Partly. The author needs to go back to other studies on private pharmacy success stories to better understand under which context (e.g. policy, public supply, consumer preference, financing) a private pharmacy can address unmet need. Also, the author should look at the incentives to attract private pharmacies to deliver FP methods.

Is the study design appropriate and is the work technically sound?

Yes, but it would be great if they could go back to the consumer data to get more information on consumer preference between public and private supply. Also, it would have been optimal if the research had also included some questions (directed to pharmacy owner / manager) to better understand their market conditions to get at the issue of incentives.

Are sufficient details of the methods and analysis provided to allow replication by others?

Partly, but I would have expanded the questions to include more questions on consumer preferences, private provider perspective. I would also add a summary of the public supply to understand how the private supply is different and therefore could be a complimentary strategy to the public one to increase access to FP methods. Finally, if the budget permitted I would add some elements of cost and price comparison between the two sectors.

If applicable, is the statistical analysis and its interpretation appropriate?

Yes, for the data they collected. I would like to see if they could “squeeze” a bit more on consumer preference, cost/price and private provider perspective.

Are the conclusions drawn adequately supported by the results?

Partly. I think the conclusions are a bit over stated and recommendations a bit too simplistic.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Partly

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Health policy and planning, health policy and regulatory analysis, health advocacy, health financing, private health sector, public-private dialogue, private sector assessments, health markets

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 07 Dec 2018

Jill Peterson

Thank you for your thoughtful and excellent comments. We have addressed nearly all of them. In a few cases we were unable to make changes because of data limitations.

1. We have clarified terminology to "private-sector pharmacies," as appropriate.
2. Given prescription requirements at the time of our study, women would have had to go to a facility to get a prescription for a method, and methods are provided for low or no cost through public facility pharmacies. While we did not conduct interviews at public facility pharmacies, as it was outside the scope of our research, we can assume these are main reasons women obtain family planning through public facilities. As discussed in our results, women who do not seek family planning at the pharmacy cited quality concerns as well as cost concerns. Future research could include more questions about why women go through the various options.
3. We agree that more research could be done on incentives for private sector pharmacies to provide low-cost family planning methods. We regret not including questions on private provider perspectives and consumer preferences.
4. We have clarified language in the conclusion with regards to the influence of

pharmacies in the urban setting, as opposed to nationwide.

Competing Interests: No competing interests.

Reviewer Report 10 July 2018

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Katherine Tumlinson 

¹ Department of Maternal and Child Health, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

² Carolina Population Center, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

³ Department of Maternal and Child Health, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

⁴ Carolina Population Center, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

⁵ Department of Maternal and Child Health, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

⁶ Carolina Population Center, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

Overall: This is an interesting study presenting descriptive results of pharmacy audits and interviews with pharmacy staff and exiting pharmacy clients in Dakar, Senegal. Results of this study indicate there is room for improvement in terms of (some aspects of) the quality and quantity of counseling provided to FP pharmacy clients and that there is latent demand among women in Dakar for procurement of FP through pharmacies. The authors suggest this latent demand could be fulfilled by addressing concerns about price, quality, and by removing laws that restrict OTC provision. However, results also suggest that laws requiring a prescription before obtaining a contraceptive method from a pharmacy are not universally enforced – more than half of participants were able to procure FP without a prescription. As such, it's difficult to determine from the information provided which barriers are most significant and critical to address. Additionally, the authors do not clearly describe how they define and measure the quality of services and, in several places, it is difficult to determine the number or percent of women falling into key categories. Further, the discussion section includes statements that contradict or overstate the information provided in the results section. Additional minor suggestions are described below. I encourage the authors to revise their manuscript in response to the feedback below and thank them for their contribution.

Introduction:

1. Please briefly define or describe “drug shops” and how they differ from pharmacies.
2. Pharmacies are described as “plentiful” in urban/peri-urban areas, in contrast to health

facilities; it would be helpful to have further description or statistical information on the prevalence/accessibility of pharmacies compared to health facilities.

3. The sentence that begins (paragraph three), "Moreover, when compared with the alternative of pregnancy..." doesn't fit well with the rest of the paragraph which describes the benefit of pharmacies offering OCPs and injectables. I would recommend pulling out this sentence and creating a separate paragraph which transparently describes and addresses some of the possible downsides or concerns regarding OTC provision of FP through pharmacies.
4. Per my comment above, please provide at a short paragraph that describes some of the possible downsides or existing concerns regarding drug shop/pharmacy OTC provision of FP.

Methods:

1. The selection of districts could be presented with greater clarity. Did the URHI include only 10 districts for the country of Senegal and were all of the URHI districts in or near Dakar? If so, please make this clear. If not, how were the 10 districts in this analysis selected? Were the data for this study from the URHI endline survey in Senegal or were they part of a project piggybacking onto the Senegal URHI?
 - Assuming all included districts/pharmacies are in or near Dakar, please discuss how this impacts generalizability of results in the limitations section.
2. It is not clear how specific pharmacies within each district were selected for inclusion. For example, within each district, were the pharmacies selected at random? Please describe.
3. Under the pharmacy staff paragraph, line 5, please delete the word "not" in front of present. I believe the sentence should read: "If none of the three were present the day of the interviews, that position was not included."
4. One of the key objectives of the study (as stated in the abstract and in the middle of the right-hand column of page 3) is to assess the quality of the services provided through pharmacies; yet the authors do not provide a definition of quality or describe how quality is measured in this study. This should be included. There are many different ways to define and measure quality and many possible aspects of quality that could be included. The authors need to unpack how and why they chose the specific indicators presented in the descriptive analysis (and how and why other indicators are excluded from this analysis) and tie this justification to an existing framework such as Bruce, Donabedian, or other framework.

Results

1. The first two sentences of the results section are difficult to interpret. Please clarify: how many facilities were initially selected, how many facilities refused to participate, and how many facilities were found to be closed (and were they permanently closed?). As written, it appears that 236 facilities were initially selected ($236 - 18 - 18 + 25 = 225$), yet this is different from the number (250) presented in the methods section.
2. Tables 4 and 5 list a number of survey questions that were used to create a score for provider knowledge of OCP and injectable provision. Please describe the logic and strategy behind the construction of this point system. For example, why should knowledge of five or more side effects (table 4) receive a point and all other categories receive no points? Is knowledge of five or more side effects meaningfully different than knowledge of four? How did the authors decide where to draw cut points? Has this approach been used or validated in prior studies? As these data comprise more than half of the total results section, it is important to understand the reason and logic behind this approach.
3. Is the total sample 3,567 (first sentence of section entitled 'Survey with clients') or 3,569 as listed in abstract and title of Table 2?

4. Page 7, right column, second paragraph begins: "Among the 390 current users who obtained a method from a pharmacy..." However, in the abstract we're told that 60% of the sample of 3,569 women use FP and 11% *of these* obtained their method from a pharmacy: $(3,569 \times .6) \times .11 = @235$ women, not 390. Please explain why these two numbers are different. If the total of number of women who are current users who obtained a method from a pharmacy is 11% of the total sample, please correct the abstract by removing the phrase "of these."
5. The last two paragraphs are difficult to interpret as the various numbers presented don't sum to the expected result. Please provide a flow chart or graphic to visually display which participants were contraceptive users versus non-users and the latent demand among non-users. As currently written, it's difficult to understand (for example, see above point regarding 235 vs 390). In trying to understand the latent demand, I read that there are 3,074 women who are non-users or users who did not get their method from a pharmacy (which would imply there are 493 women who are current users who did get their method from a pharmacy?). It states that 47% of these 3,074 are interested in procuring through a pharmacy. This would cause me to conclude that 53% of these 3,074 are not interested in procuring through a pharmacy. Yet, 53% of 3,074 is 1,629 and the authors tell us that the actual number is 1,008. Please review all numbers, make corrections as appropriate, and provide a visual (or more detailed description) to help the readers understand the behavior and preferences of the sample of women.
6. Regarding the presentation of results on quality of services, Tables 4 and 5 relate primarily to the provider's technical competence which is one aspect of quality, but there are many other components of quality for which the authors appear to have data but don't describe or discuss. For example, Table 6 presents results that tie to additional aspects of quality such as respectful treatment and provision of information; yet Table 6 is barely mentioned in the results section – just one sentence directing readers to look at Table 6. Quality is also barely mentioned in the discussion section. Notably, 34% of those not interested in procuring FP services through a pharmacy cited poor quality as the reason – and presumably they are not talking about components of technical competence such as those listed in tables 4 and 5 since that is difficult for a client to assess. Hence, I would suggest the data presented in Table 6 deserve more unpacking.

Discussion

1. The first sentence states that pharmacies largely adhere to the law requiring a prescription to purchase OCPs and injectables yet the results of the client interviews indicate that more than half of clients who have ever obtained a method from a pharmacy did not have a prescription. How do the authors explain this contradiction between the first sentence of the discussion section and the actual results of their study? As transparently acknowledged in the limitations section, it is possible that the pharmacy staff may have been reluctant to report they were breaking the law by not requiring a prescription and therefore the data from the exiting clients may be more accurate than the data from providers on this point.
2. I would not agree that 72% is a "vast majority." More than one in four pharmacies lacked a private space for counseling. I suggest just calling this a majority.
3. Pharmacies are described as an "important point of supply" although just 11 percent of current users report getting their method from a pharmacy and only 22% report ever using pharmacies for FP supply. Some may agree that these percentages warrant calling pharmacies an important point of supply and others may disagree, but I would urge the authors to be careful not to overstate the results of their study.
4. For the phrase "including new or re-starting users" – I don't recall seeing this nuance

- presented in the results. If this nuance is important, please present these data.
5. In the first full paragraph on the left-hand side of page 9, the authors argue for increasing access to insurance, savings products, and voucher systems to help address price barrier in pharmacies. How feasible and realistic is this recommendation and would it serve to increase use of private facilities rather than pharmacies and drug-shops?
 6. The next sentence recommends addressing price sensitivities so that products are both profitable and affordable. Again, this begs the question, how feasible or realistic is this recommendation? To better understand the feasibility, it would be helpful to have information on the price currently paid by pharmacy versus facility clients as well as an understanding of what is meant by "price sensitivities should be addressed."
 7. I recommend the authors include results of any similar studies in other countries or regions to place their findings in the context of existing knowledge. I also suggest presenting results of any other studies that have implemented the recommendations made by the authors such as programs that aim to decrease financial barriers – have these been successful in similar settings? This might help us to determine the degree to which these recommendations are realistic and/or likely to result in increased access to FP.
 8. Please mention the limited geographic scope (just Dakar, correct?) as a potential limitation.

Conclusion

1. The authors conclude that pharmacies are well-positioned to meet demand for FP in Senegal, but my understanding is that this study was conducted only in Dakar. Please clarify the abstract and methods section if this understanding is incorrect. Otherwise clarify in the conclusion that the generalizable population is Dakar and not Senegal: I believe more than 80% of the country's population live outside of Dakar.
2. The final concluding paragraph states that training and job aides are all that are needed to allow pharmacist to offer OCPs and injectables. Again, I would be careful not to overstate the results. The data, as presented, don't tell us whether increased training and job aids would translate into an increased percentage of providers who offer counseling. Several recent studies suggest large gaps between provider knowledge/training and actual practice and there is evidence of job aids not being widely distributed and used. I would encourage the authors to focus on the primary findings evident from the data:
 - Nearly half of pharmacies aren't offering method-specific counseling
 - Providers also have low knowledge of correct provision of OCPs and injectables (assuming some of the scales are not overly stringent)
 - Many clients are not being told how to use their method, about health conditions and side effects, or the advantages/disadvantages (Table 6!)
 - The prescription requirement is a burden for some but more than half could procure a method without it
 - A large percent of women appear to have latent demand for accessing FP through pharmacies and we assume they are not doing so due to the prescription requirement – yet more than half circumvented this requirement
 - Price and quality appear to be a deterrent for many women; how have programs in similar contexts worked to address price and quality concerns in the pharmacy setting?

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 07 Dec 2018

Jill Peterson

Thank you also for your review and your valuable comments. We have addressed nearly all comments in the revised draft. We have noted the changes below and made a few further comments of our own.

Introduction: All comments addressed.

Methods:

1. District information clarified. This study was not part of the URHI endline survey; it was conducted independently.
2. Language around selection clarified.
3. Language clarified.
4. Language added to better describe quality.

Results:

1. Language clarified and corrected.
2. Logic and strategy behind provider scoring added.
3. The total sample should be 3,567.
4. "Of these" deleted.
5. Flow chart added and language clarified within the text.

6. More information on quality and specifically, on Table 6, added.

Discussion:

1. We agree that this was confusing to read. We clarified in the first sentence that most providers are “aware of” prescription requirements.
2. Suggestion taken.
3. Language edited so as not to overstate.
4. Language edited.
5. 6) and 7) The questions around price barriers are good ones. Our suggestion is that incentives such as vouchers be used in private sector pharmacies. We did add language around current prices in private sector pharmacies versus public facilities, and clarified where we see a need for further research in this area. Unfortunately, relevant research in Senegal or similar countries is limited, but we hope it will be explored in the future.
1. Language clarified to note that the research was done in 8 districts of Dakar as well as two urban areas outside of Dakar.

Conclusion:

1. The research was done in 8 districts of Dakar as well as two urban areas outside of Dakar.
2. We have edited the language in our conclusion based on your suggestions, but we stand by the overall conclusion that the prescription requirement be lifted. The glass is nearly half full and conversely, half empty. While approximately half of women could circumvent the prescription requirement, half had not. Given that half had, and we do not see resulting consequences on women’s health, we believe private sector pharmacies can provide this service, and in fact many already are. As such, private sector pharmacies should be allowed to do so without fear of punishment for breaking the law.

Competing Interests: No competing interests.