Are women in Lomé getting their desired methods of contraception?
Understanding Provider Bias from Restrictions to Choice

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Abstract
Background: Despite continuing improvements in methods of contraception available, women face persistent barriers that continue to compromise reproductive autonomy and informed choice in contraception globally. Provider bias is one way in which access to contraception can be restricted within clinical encounters and has been established as common, based on provider reported restrictions imposed on contraceptive provision in different areas of sub-Saharan Africa. This analysis assessed the prevalence of provider restrictions in the provision of contraception and the potential impact on women's contraception method uptake in Lomé, Togo.
Methods: This sub-analysis used survey data from provider and client interviews collected to assess the impacts of the Agir pour la Planification Familiale (AgirPF) program in Togo. The relationships between provider restrictiveness and women's receipt of their desired method of contraception were modelled using mixed effects logistic regressions looking at all women and among subgroups hypothesized to be at potentially higher risk of bias (women who wanted long-acting reversible contraception and unmarried women).
Results: Around 84% of providers in this sample reported adhering to some type of restriction in contraceptive provision for the five contraceptive methods included in assessment (pill, male condom, injectable, IUD, and implant). Around 53% of providers reported restricting at least four of the five methods based on age, parity, partner consent, or marital status. Among all women, there were no significant associations between provider restrictiveness and women's receipt of their desired method. This relationship was similar among women who desired LARC methods. In adjusted models, marital status was a covariate significantly associated with desired method with married women more likely to receive their desired method than unmarried women (aOR 2.8 (95% CI 1.48-5.30); though in modelling among unmarried women, those who had non-restrictive providers were less likely to receive their desired method (aOR 0.25, 95% CI 0.006-1.06), the results were marginally significant at p=0.06.
Conclusions: Restrictions reported by providers in this study did not appear to influence contraceptive method received. Providers reports of high level of restrictions in this population is concerning and should be further explored, especially its effects on unmarried women. As family planning programs continue to focus on increasing uptake and utilization of contraception, the role of provider bias in shaping access to contraception needs to be better measured and provider bias needs to be addressed through approaches designed to support providers while facilitating unbiased contraceptive provision.

Introduction

Reproductive rights are fundamental human rights; women and adolescents have the right to access contraceptive information and services free from coercion, discrimination and violence and this is critical for achieving gender equality and ensuring that they can participate as full members of society (Ibañez et al, 2010). There are many contexts around the world where women face limited access to effective methods of contraception, but women in West Africa have both a high and sustained unmet need for modern contraception. Unsurprisingly, this unmet contraceptive need is coupled with a surge in population growth in the region (Bremner et al, 2010). While family planning policies have been implemented to address the rapid increase in population in West Africa, (Penney, 2017; AFP, 2017) the impacts of family planning programs seem to be limited by a variety of challenges related to infrastructure and socio-cultural context (Izugbara et al, 2010; Aransiola et al, 2014; Hindin et al, 2014).

Beyond broader challenges in implementing family planning programs, research has also been done to explore the barriers that women face in accessing contraception in West Africa. Economic access and/or physical access to clinic (geographic distance); method availability; women's education and ability to navigate contraceptive decision-making; influence of male partners, specifically partner desire for a large family and/or refusal to use contraception; concern about side effects, misinformation about contraception, and fear; and quality of and satisfaction with care have all been found to be determinants of unmet reproductive care needs in West Africa, playing a role in if and how women could access services (Ayanmore et al, 2015).

Issues related to quality and satisfaction with sexual and reproductive health care have been explored as a key issue in access with potential for feasible intervention, particularly related to retraining health care providers to deliver higher quality care. Provider bias in the provision of contraception, or the tendency of health care providers to deny access to a family planning method as a result of their own prejudices about the method not based in any clinical recommendation, is one way in which the quality of care in contraceptive services can be compromised.

Studies have shown significant provider bias in contraceptive provision in African contexts with providers applying restrictions in the contraceptives they provide to certain women, particularly unmarried and/or young women (Biddlecome et al, 2007; Esantsi et al, 2015). Biased provision of contraception limits women's ability to access a full range of contraceptive methods no matter their age, marital status, parity, or any other characteristic, potentially contributing to unplanned pregnancy rates and unmet reproductive health need, particularly for younger, unmarried women who may not receive desired, effective methods of contraception due to provider bias. Restriction of reproductive autonomy based on personal prejudice contributes to the challenges women face in accessing high quality contraceptive care.

This analysis will quantify the presence and effects of provider biases in contraceptive provision in Togo during the first year of implementing Agir pour la Planification Familiale (AgirPF) program of the U.S. Agency for International Development (USAID)/West Africa
and EngenderHealth (Agir pour la Planification Familiale, 2015). The AgirPF intervention was designed to improve access to and uptake of contraception by addressing supply-side barriers, including quality of clinic services, provider training, and the availability of mobile services and community-based distribution. This study examines: 1) the relationship between provider-reported restrictions in the provision of contraceptive methods and a client receiving her preferred method of contraception; and 2) the differences between clients who came into the clinic with a desired method of contraception and those who did not.

Methods

Data collection

Data used in this study were collected as part of operations research conducted in Lomé to assess the effectiveness of AgirPF. Data were collected from 50% of intervention and 50% of control facilities included in the AgirPF baseline data collection. A random sample of 50% was chosen as it would provide

sufficient power to assess differences in contraceptive use between intervention and control sites based on the average volume of patients at each clinic per day and the number of days data would be collected at each facility. Sites were selected using the Stata 13 command for random sample selection without replacement of half of the universe, resulting in 11 intervention and 5 nonintervention facilities in total. The 16 randomly selected sites from 6 different districts in the city and employed assessments intended to gauge the quality of health care services provided at the sites. Data collection was carried out between July and August 2016 in Lomé, Togo.

Provider exit interviews were carried out with 47 providers total, each randomly selected using a lottery system from all midlevel providers working in family planning service provision at that facility (maximum three per facility). The field teams also observed client-provider interactions during family planning consultation and conducted exit interviews for all clients that consented on the days the team was assessing that facility. A total of 1,096 facility family planning clients were asked to participate in the study and 1,089 clients participated. All clients were women of reproductive age and were generally women with uncomplicated medical histories.

For the purposes of this analysis, providers were restricted to those that only provided contraception and contraceptive counselling resulting in 45 eligible providers. Additionally, only clients who had complete demographic information recorded in their exit interview (age, marital status, parity, and education) and with information on the healthcare provider they were seen by were included in this analysis (n=968). For the regression analyses exploring the relationship between provider restrictiveness and women's receipt of their desired contraceptive method, only women who reported having a desired method of contraception were included (n=619). The data for the remaining 349 women were used for the exploratory, descriptive analysis of differences between them and the women who came in with a desired contraceptive method.

Variable definition

The primary exposure of interest for this analysis was **provider restrictiveness**, indicating the provider reported unnecessary restrictions in the provision of contraception based solely on client characteristics and not any medical necessity. Provider restrictiveness was defined in two ways for the purposes of this analysis:

1) **Restrictive vs. non-restrictive provider:** provider self-report of at least 1 medically unnecessary restriction imposed for any method of contraception (restrictive (0) versus non-restrictive (1)), and
2) **Provider restriction score:** a provider restriction score (range 0-5) assigned based on self-report of restrictions across contraceptive methods of interest.

In their interview, each provider reported on the restriction of 13 different contraceptive methods by minimum age, maximum age, minimum number of children (parity), partner consent, and marital status. Across all methods and all types of restrictions, if a provider did not report a single restriction they were a "Yes" (1) for being a "non-restrictive provider," resulting in our binary measure of provider restrictiveness.

Of the 13 different contraceptive methods asked about, 5 were of interest for this analysis: the combined oral contraceptive pill (the pill), injectable contraception, male condom, intrauterine device (IUD), and implant. For each of these methods, if a provider reported at least one restriction they were given a 1 for that method (e.g. a provider reported restricting IUDs to only provide them to married women, resulting in a 1 for IUD). The score for restriction of each method was summed to give a provider restriction score, ranging from 0 to 5 for each provider. Schwandt et al used a restriction scoring system in Nigeria, creating a provider bias score for each method (0-3) based on provider report of any restriction based on minimum age, minimum parity, and marital status then averaging across providers for each method and summing overall (2017). For this analysis we were interested in exploring the effects of restrictions reported across methods rather than only comparing prevalence of different restrictions within methods, so chose to modify their scoring approach to provide a score summarizing restriction across all contraceptive methods of interest and calling it a "restriction score"

rather than a "bias score" to clarify its content. The two provider restrictiveness indicators for each provider were attached to all clients seen by that providers. This resulted in a client dataset with each client having seen a healthcare provider with an indicator of having a **non-restrictive provider** and a **provider restriction score**.

The primary outcome of interest was **client receipt of desired contraceptive method**. In exit interviews, clients were asked "Did you come here today to obtain a specific contraceptive method?" "Which method did you want when you came here?," and "Which method did you receive or were you given a prescription or referral for?" Based on these responses the interviewer indicated "Did the client receive her method of choice?" "Yes" "No" or "Client had no preference at consultation." For all clients with a "Yes" or "No" response to this question (those who had a desired method before their consultation with the provider), a new dichotomous measure of client receipt of their desired contraceptive method was created. This measure indicated if a client received her method of choice (Yes, 1) or if she did not (No, 0). Covariates of interest were determined *a priori*; there were client age, marital status, parity, and education.

Additionally, based on the question "Which method did you want when you came?" a client's desired method of contraception was determined. The contraceptive method prescribed or provided to each client was also determined based on an additional question in the client exit interview, "Which contraceptive method(s) did you receive or were you given a prescription or referral for?" These questions were explored in association with the binary exposure (any restrictions) and the outcome indicator. Each client's desired method was also recoded into a binary variable to explore how the relationships between exposure and outcome might be different looking at women who desired long-acting reversible contraception (LARC) methods (IUD or implant). This resulted in an indicator of if a woman reported a LARC method as her chosen method prior to her consultation ("Yes", desired LARC = 1).

Data analysis:

All analyses were run in StataIC, version 15. Descriptive statistics explored the associations between all covariates and the binary exposure (any restriction), and then for the outcome (receipt of desired method). To account for the clustering by provider inherent in this data, a mixed effects logistic regression model was used. This model allowed us to determine the log odds of our outcome of interest (receipt of desired contraceptive method) modeled as a linear combination of provider restrictiveness and any covariates, accounting for the clustering of clients by providers (UCLA, 2019).

We ran separate mixed effects logistic regressions to examine the relationships between any provider restrictions (dichotomous) and provider restriction score (continuous), with the dichotomous outcome client receipt of desired method of contraception. We used combined data from intervention and control sites given that results from initial research analyses by study area were not statistically significantly different for the uptake of modern contraceptive methods overall. Age, parity, marital status, and education were included in our adjusted models.

There is a focus in improving the uptake of LARC methods in contexts with high fertility rates and low contraceptive use, such as Togo. As a result, we were interested in exploring outcomes for women who came into clinical encounters wanting LARC methods and created a model looking at only those women adjusting for age, parity, marital status, and education (n=132). Additionally, based on what has been found in past research regarding the importance of client marital status as activator of provider bias, an adjusted model was run restricted to unmarried women (n=92).

Ethical approvals

The study protocol was approved by USAID/WA. Ethical approval was provided by the Togolese Comité de Bioéthique pour la Recherche en Santé of the Togolese Ministry of Health and Social Protection (Avis N° 017/2016/CBRS du 30 juin 2016). Approval was also provided by the University of California, Berkeley Center for Protection of Human Subjects (CPHS #2016-04-8614). This sub-analysis of the previously collected data was exempted from review by the University of California, Berkeley Center for Protection of Human Subjects.

Results

All 45 providers were female, while most providers were over 25 years, had been at their facility at least a year, were midwives, and had received at least one in-service training in the past 6 months. All providers reported offering injectable contraception, and almost all offered the pill and male condoms. A smaller proportion, but still the majority, reported offering LARCs (IUD and implant). The majority of providers reported at least one restriction in the provision of contraception (84.4%) and over half reported restricting at least 4 of the 5 key contraceptive methods (restriction score = 4 or 5, 33.3 and 20.0%).

Table 2 provides a more detailed view of provider reported restrictions, showing a breakdown of type of restriction by contraceptive method. Age restrictions were the most commonly reported type of restriction, with the pill most frequently restricted for both minimum and maximum age. Injectable contraception had the highest reports of parity restrictions (33.3% of providers), and IUD and implant both had higher reports of partner consent (both 28.9%) and marital status restrictions (26.7 and 15.6%) than other methods.

Table 3 provides a summary of all clients (n=968) and compares those who had a desired method of contraception (n=619) to those who did not (n=349). The majority of clients were between 25 and 35, with an average age of 30 overall. Most were married, almost all women had two or more living children, with the majority having two or more. The majority of women also had at least a primary school education and over half had a secondary or higher education, indicating a fairly well-educated population. The vast majority of women wanted injectable contraception, followed by the implant and the pill. The majority of women left the clinic with injectable contraception (n=394, 40% of total sample, 65.6% of women who got any method).

The bulk of this analysis focused on the subgroup of women who reported having a desired method of contraception before their consultation with a provider. While this provides insight into whether self-reported provider restriction influenced if women were able to get their desired method of contraception, this is not be applicable to all women in this study. Generally, women were about the same age between the groups. Women who had desired method of contraception were married more often than women without a desired method (p=0.049). Everyone who received the pill (n=81) and condoms (n=2) came in with a desired contraceptive method. Similarly, almost all women who received injectable contraception (n=394) or an implant (n=82) came in wanting a contraceptive method. The vast majority of women who did not receive a method were those that did not have a desired method.

Table 4 provides a summary of clients comparing those who got their desired contraceptive method to those who did not, among women who reported a desired method of contraception prior to their consultation (n=619). Married women much more likely to receive their desired method of contraception compared to unmarried women (p=0.001). Women that wanted injectable contraception and the pill were more likely to receive their desired method of contraception, whereas women who wanted and IUD or implant were less likely to receive their desired method of contraception in comparison (p>0.001). Also of note, in this subgroup of women who all had a desired method of contraception prior to their clinical encounter, over 5% left without any contraceptive method.

Relationship between provider restrictiveness and women's receipt of their desired method of contraception

Results of a mixed effects logistic regression model showing the relationship between having a non-restrictive provider and client receipt of their desired contraceptive method are presented as in **Table 5**. Clients with non-restrictive providers had non-significantly lower odds of receiving their desired method of contraception compared to clients with providers reporting at least 1 restriction method, adjusting for women's education, parity, age, and marital status (OR: 0.62, 95% CI:0.26, 1.44).

While it was important to understand if there was a strong relationship between having a restrictive versus non-restrictive provider and women's receipt of their desired method, the majority of providers reported at least one restriction resulting in a relatively small number of clients with non-restrictive providers (n=140 women). To explore any differential effects for providers reporting

restriction of more methods of contraception and more types of restrictions across all methods, provider restriction score and the total number of restrictions reported by the provider were explored as alternative exposure variables. The results of modelling with provider restriction score are presented in **Table 6.** There was no significant association between provider restriction score and client's receipt of their desired method of contraception. This model adjusted for education, parity, age, and marital status and the association between provider restriction score and women's receipt of their desired method stay very close to the null (OR= 1.09, 95% CI: 0.91, 1.32).

Relationship between provider restrictiveness and women's receipt of their desired method of contraception within sub-groups of interest

Looking at only women who reported wanting a LARC method before their consultation (n=132) and adjusting for education, parity, age, and marital status, clients with non-restrictive providers had lower odds of receiving their desired method of contraception compared to those with restrictive providers, though this association is not significant (see **Table 5**; OR= 0.80, 95% CI: 0.22, 2.99). In this group there was also no significant association between any covariate and women's receipt of their desired method. Results of modeling for the relationship between provider bias score and women's receipt of their desired contraceptive method adjusted for covariates among women who desired LARCs are presented in **Table 6.** There was no significant association between exposure and outcome when controlling for education, parity, age and marital status and the overall OR stayed essentially the same as the unrestricted adjusted model (OR= 1.08, 95% CI: 0.81, 1.44).

Results of an adjusted model of the relationship between having a non-restrictive provider and receipt of desired method among unmarried women are also presented in **Table 5.** Adjusting for education, parity, and age, there was a significant negative association between having a non-restrictive provider and receipt of desired method among unmarried women (p=0.061), with unmarried women with non-restrictive providers less likely to receive their desired method than unmarried women with restrictive providers (OR=0.25, 95%CIL 0.06, 1.06). Results of a similar model with bias score as the exposure are presented in **Table 6**. Among unmarried women, higher provider bias score was significantly associated with higher odds of receiving their desired method of contraception (p=0.036), with a 41% increase in odds for each unit increase in bias score (OR= 1.41, 95%CI: 1.02, 1.95).

Discussion

This analysis builds on past research which has explored provider reported restrictions on contraception, the mix of contraceptive methods used by women, and the experiences of women of demographic backgrounds accessing contraception in a variety of contexts in sub-Saharan Africa and beyond. While the previous analyses provided insights into components of provider bias and contraceptive access, they did not elucidate the link between provider restrictions and women's access to their chosen methods of contraception. This link is key for understanding how provider bias can be enacted in clinical encounters and how it impacts women's ability to enact contraceptive choice. While the regression results of this analysis were mostly not significant, this approach to analyzing provider bias is an intuitive progression in this area of research and provides a model for future research. Additionally, the results provide some insights into how measurement can more effectively capture the steps on the pathway between reported restrictions and method outcomes and highlights some key areas for intervention to improve contraceptive provision in Togo and similar contexts that will be highlighted in this discussion.

High prevalence of provider reported restrictions:

There was a high prevalence of imposed restrictions reported by providers, and many reported restricting multiple contraceptive methods. Age restrictions were the most common type of restriction reported and the IUD and implant were the most restricted methods based on partner-related characteristics, including marital status. Compared to past research done by Sidze et al in Senegal, our

study sample also reported far more restrictions comparatively. In their sample of 637 providers at 269 health facilities, the highest proportion of provider reported minimum age restriction was on the pill in public hospitals (59.3%) and for marital status, the implant at public health centers (25.9%) (2014). In our sample, these maximum values were 66.7% restricting the pill for minimum age and 26.7% restricting the implant for marital status. In an analysis of contraceptive restriction by service providers in urban Nigeria with 1479 health facility providers, Schwandt et al found higher proportions of providers reporting restrictions with 86.9% restricting the pill for minimum age and 67.3% restricting the IUD for marital status (2017).

While our analysis was based on a much smaller sample of providers than previous studies, results seem within the expected range of restrictions reported in this region. From our results, it is clear that many providers reported unnecessary restrictions on contraceptive methods despite many having received training intended to promote high quality counselling. The high prevalence of restrictions, and presence of many providers restricting across multiple methods, highlights a need for additional intervention to address those restrictions and the factors, including technical skills and socio-cultural norms, that could be contributing to them.

Client population and contraceptive desires:

Most of the women in this sample were between 25 and 35 years old, married, and had at least 2 living children, resulting in a majority of the sample not being vulnerable to the restrictions reported by providers and therefore not vulnerable to bias. While most of women in the entire sample did not receive any contraceptive method, of those who received a method, the vast majority received injectable contraception while a smaller but notable number received the implant and the pill. It was previously determined that a similarly skewed method-mix in Malawi, with the majority of women receiving the contraceptive injection, was related to women's preference rather than lack of access or provider bias in Malawi and the same may be true in this context (Sullivan et al, 2006). This is supported by the fact that the majority of women reported injectable contraception as their desired method.

Of clients who reported wanting a specific contraceptive method, the majority wanted injectable contraception. Compared to the numbers who desired each contraceptive method, a similar number received each method, though more women left without a method following their consultation than reported not wanting one prior. To explore reasons women were not able to access their chosen methods, we looked at responses to an additional question in the client exit interview "Why do you think you did not get your chosen method?" (full results not presented for this secondary analysis). When looking at the reasons reported, the majority said they did not receive their chosen method because of physical or financial access barriers (too expensive, not available at the clinic, no provider to administer method, n=37) while others commonly reported provider related reasons (changed mind after listening to provider, preferred method was not appropriate, provider recommended another method, n=24). These reasons indicate that while there was potential provider intervention to discourage clients from using their desired method, appropriate or biased, there were also other supply-side barriers and access issues that kept women from accessing their desired methods. These issues with supply chain, stocking, cost, and provider training/staffing are important to note while Togo continues to develop sexual and reproductive health services as areas where continual improvement is needed to allow for unrestricted contraception choice.

Methodological contributions to measuring bias and implications for addressing biases:

Analysis of this type of indicator measuring women's receipt of their chosen or desired method of contraception has not been previously explored in similar contexts, and never in conjunction with a measure of provider restrictiveness. A comparable study was carried out in East Java, Indonesia by Pariani et al exploring the effects of contraceptive choice for longer term continuation found that across all contraceptive methods 86.3% of women received their chosen method (1991). We found very similar results in this sample, with 87.6% of women receiving their desired method.

Our modelling of provider restrictiveness and women's receipt of their desired contraceptive method builds on the work done by Pirani et al and others in the field to explore different points on the

pathway between provider beliefs and client outcomes in the provision of contraception. Based on modelling, there is no evidence to suggest a significant association between a woman seeing a non-restrictive provider and receiving her desired method of contraception when considering all women in this sample. The weakness of the relationship between provider restrictiveness and women's receipt of their desired method of contraception could be due to the fact that the majority of women in this sample did not have characteristics that would make them vulnerable to provider bias. Further data collection efforts and analyses should focus on including young, unmarried, and low parity women and accounting for their experiences in contraceptive counseling, potentially over sampling this group or targeting intervention and data collection for them.

Despite the lack of overall association, based on odds ratios there was a stronger relationship between the binary exposure for provider restrictiveness (non-restrictive vs. restrictive provider) and women's receipt of desired method compared to provider restriction score, and there was a null association for total restrictions which was not presented for that reason. This seems to indicate that the effects of provider restrictions are stronger when you consider just the divide between providers who restrict access to contraception vs. those who do not, rather than taking into account any effects of continuous increasingly restriction across methods. This outcome is not counterintuitive, as based on current clinical recommendations and trainings providers should not be reporting imposing **any** restrictions in the provision of contraception. Accordingly, the difference in provider attitudes or beliefs about contraceptive provision may be most notable between those who do not believe any method should be restricted for any non-medical reason and those who see restrictions as appropriate and perhaps warranted for women of different backgrounds.

This outcome of our analysis indicates that efforts to address provider restrictions should likely focus on encouraging choice-based, completely unrestricted access rather than reducing restrictions. The use of a "method mix" informed-choice model for contraceptive counselling, where women are given a balanced presentation of all contraceptive methods rather than a single method, has been advocated in India and applied to other contexts globally. This model is supported by the WHO and could be applied to the context of this study (Baveja et al, 2000), though the potential for this improve on existing training models and change counselling approaches in implementation would need to be explored. Other researchers advocate for the development of close, trusting relationships between clients and providers to develop shared-decision making in contraceptive counseling for its potential to not only improve uptake but facilitate long term method continuation (Dehlendorf et al, 2014). While it is not clear which approach would most effectively shift existing provider beliefs in Togo and encourage women's unrestricted access to contraception, both approaches present models for more effective provision of contraception that could have benefits for women and population health long-term.

Reproductive autonomy and contraceptive outcomes:

While women's self-report of receiving their desired contraceptive method had some limitations as our outcome indicator (discussed below in limitations), it does provide the benefit of being closely aligned with client desire in contraception, potentially reducing the influence of provider coercion on their desired method. Reproductive coercion has been found to occur in a variety of ways in clinical encounters, sometimes by discouraging women from certain methods such LARCs by emphasizing or inflating adverse effects as discussed previously (Sieverding et al, 2018) but also by leading women towards LARC methods related to biases or incentivization of their provision. Research in the US has found IUDs are more commonly recommended to low SES women of color compared to low SES white women, indicating provider bias or discrimination (Dehlendorf et al, 2010). These findings are supported by qualitative findings exploring patient perception of provider counselling, which found that patients felt providers were recommending LARCs disproportionately to socially disadvantaged women (Higgins et al, 2016). In Sub-Saharan Africa LARC access is generally still limited by structural factors and programs have largely focused on promoting access and uptake rather than investigating any biases in provision of LARCs (see Ngo et al, 2017 and Cleland et al, 2017). But it should be noted in the process of improving access and potentially incentivizing LARC provision over other methods, as has been done in Chad and

the Democratic Republic of the Congo and suggested for other developing contexts (Rahmand et al, 2016), that reproductive coercion can include LARC promotion when client interests are compromised or subverted.

In the same 1991 study in Indonesia discussed previously, Pirani et al found that women's receipt of their chosen contraceptive method was highly associated with the likelihood of continuing their method for longer than 12 months. While the differences in discontinuation by method were not fully explored in their analysis to account for the endogeneity of discontinuation to method used, this overall difference seems to indicate a strong relationship between leaving a clinical encounter with the preferred contraceptive method and continuing use. In our analysis it is also notable that some women in this study left the clinic with a method other than the one they desired. Additionally, there were women who wanted a method and left without one, and likely women who did not report a desired method but hoped to leave with some form of contraception. While there are structural factors that likely limit access, the potential role of provider bias should be accounted for even if it was not detected in this analysis. Improving contraceptive counselling approaches through interventions that are framed as 'provider-aides' rather than programs that emphasize improving the quality of care (implying low existing quality and standards) has been highlighted in past recommendations for addressing provider bias (Starling et al, 2017) and provides a promising approach to reframing training to engage providers and effectively address biases. Additionally, carrying out continual supportive supervision with providers within a well-organized system with supportive supervisors has been advocated an effective and supportive approach to ongoing improvement in the quality of contraceptive services (Rowe et al, 2005; RAISE Initiative, 2012).

Importance of marital status for women in enacting contraceptive choice

Another notable outcome of this analysis was that marital status was the importance of marital status in the relationship between provider restrictiveness and women's receipt of their desired method. In our adjusted models looking only at married women, it is unclear why unmarried women with non-restrictive providers were less likely to receive their desired method than those with restrictive providers. But looking at simple proportions, 89.4% of married women received their desired method while only 77.2% of unmarried women did. It is also notable that marital status restrictions were the least commonly reported type of restriction across all methods, though the IUD and implant were the most commonly restricted methods based on marital status. It is possible that providers who were biased based on marital status were not reporting those restrictions across all methods and this weakened the relationship between restrictions and outcomes in our model.

Restriction and bias by marital status has been found in past research (Tumlinson et al 2015; Sidze et al, 2014; Schwandt et al, 2017; Sieverding et al, 2018), supporting our findings of the importance of marital status in this analysis. Marital status is a determinant of women's ability to enact contraceptive choice and should be a focus for in discussions of biases and accounted for in efforts to address them. The influence of marital status on contraceptive provision and the long-term implications of provider biases more broadly could be communicated clearly to providers to highlight the need for awareness of bias and the benefits of unbiased counselling comparatively.

The strong influence of norms of abstinence before marriage and resulting stigmatization of contraceptive use for unmarried people was noted by Starling et al based on a literature review and expert interviews with providers (2017). The importance of marital status in this analysis seems to support the view that value is placed on women's marital status by providers while they are accessing contraception, indicating barriers for unmarried women potentially related to the stigmatization of premarital sex. Interventions should address the more finite contributors to provider bias through improved training and counselling approaches, there is also a need to account for the role of social norms in shaping biases and consider how to address the influences of this broader context on provider biases and contraceptive provision.

Limitations:

While this analysis built on past research to explore provider bias in a new way, it did have limitations. The indicators used for both exposures in this study provided opportunities for comparison with the existing body of literature, but they were also subject to social desirability bias that would lend providers to under-report their restrictions. It also not known whether some restrictions are more socially acceptable to report than others and therefore more widely reported. The exposure measures used also did not capture the method-level biases providers might be enacting, or the nuanced nature of bias as it happens within clinical encounters—a provider reporting restrictions did not mean that they were enacting them in clinical encounters. It is possible that clinical judgement takes over when providers are interacting with women in consultations, lending them to provide methods more widely than they reported they would. It is also possible that within clinical encounters women were able to negotiate for their desired contraceptive method even if their provider did not agree with their choice related to biases. It is also plausible that women with more social capital, likely married women and/or women of higher parity, were more able to negotiate with providers than those with less power. Further research should be done to explore how reported restrictions differ from those enacted within clinical encounters with women to further elucidate how this occurs and how it might differ by provider and client characteristics.

The challenges inherent in measuring biases as embodied beliefs has been acknowledged and is evidenced by the dearth of research clear representing provider bias and its enactment. Implicit association tests have been used to detect health care provider biases based on race in the US (Sabin et al, 2009; Sabin et al, 2008; Haider et al, 2015; Fitzgerald and Heart, 2017) but no research has been done specifically with contraceptive providers despite the work being done to assess provider biases in contraception in other ways and qualitative findings indicating the presence of "implicit" pressures in contraceptive provision that shape outcomes for women (Gomez and Wapman, 2017). Implicit association tests have the potential to effectively assess provider biases and could be administered to contraceptive providers to begin to more systematically assess their biases and create greater opportunities to effectively intervene.

It should also be noted that the outcome measure used, women's receipt of their chosen contraceptive method, is not a direct indicator of if there was bias in the interaction.
This measure is limited in multiple ways. First, women having a chosen method and the method that they chose if they had one is based in women's knowledge of available methods, including their conceptions and misconceptions. It should also be noted that all report of method desired was collected during client exit interviews, following their consultation. Additionally, the use of this outcome indicator means that our regression analyses were restricted to only women who had a desired contraceptive method, leaving women who did not have a desired method out of this entire component of the analysis. There were some differences between women who did and did not have a desired method, with married and higher parity women more likely to have a desired method. These differences highlight that this sub-analysis is likely not generalizable to the entire study sample and that this analysis may have excluded women with the least reproductive autonomy and contraceptive choice.

The scarcity of young, unmarried, and low parity women in this sample has implications for the generalizability and impact of the outcomes of this analysis. While the majority of this sample was older, married women with children that is not necessarily representative of the general population of women of reproductive age in Togo or of women in need of contraception. It is very likely that women coming to these clinics were those that wanted modern methods prior, so did not reflect the majority of women in Togo who do not use modern contraception. It is also notable that in this context of low contraceptive use, it is likely that the women in our sample were those that already had knowledge of modern contraception, creating a subsample of women with high knowledge and more established preferences than would likely be seen in the general population of Togo.

It is also notable that this was a sample of urban and peri-urban clinics in Togo. Past research has found overall higher proportions of providers in rural areas reporting restrictions compared to

urban areas (Speizer et al, 2000), Additional exploration of provider restrictions and method outcomes for women in a variety of contexts in Togo is an important component of developing a full picture of provider bias in contraceptive provision.

Conclusions

Our analysis does not present any definitive relationship between provider reported restrictions for women's ability to access their desired method of contraception for study sites but clarifies the needs that exist for further research and improvement in this area. It is clear that the majority of providers in this study were reporting restrictions in the provision of contraception, even if this analysis had notable methodological limitations that likely compromised our ability to draw any definitive conclusions about the relationship between our exposure and outcome variable. While these restrictions may not have influenced method outcomes for all women in this study, they are concerning and should be further explored and addressed with a particular focus on the effects of marital status on women's ability to access their desired methods of contraception. Integrating provider training and supportive supervision that assesses bias and method outcomes for women into site performance criteria would provide opportunities for quantifying and addressing provider biases. In contexts where improving contraceptive uptake is a priority for governments, eliminating provider bias should also be emphasized.

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Appendix 1: Figures and Tables

Figure 1: Relationship between provider reported restrictions in contraceptive provision and women's receipt of their desired method account for other influencing factors and context

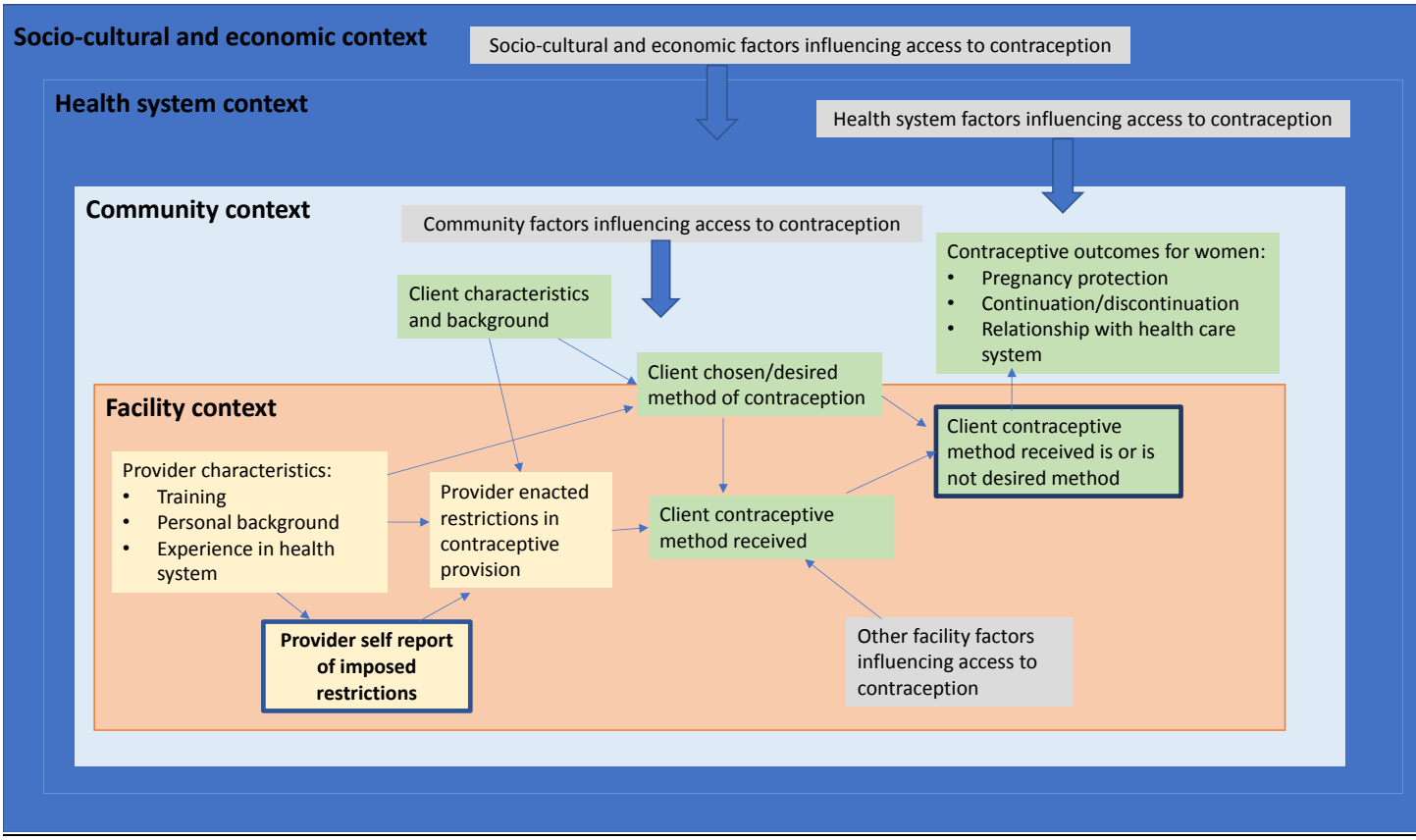

Figure 2: Exclusion criteria and final sample size—Providers

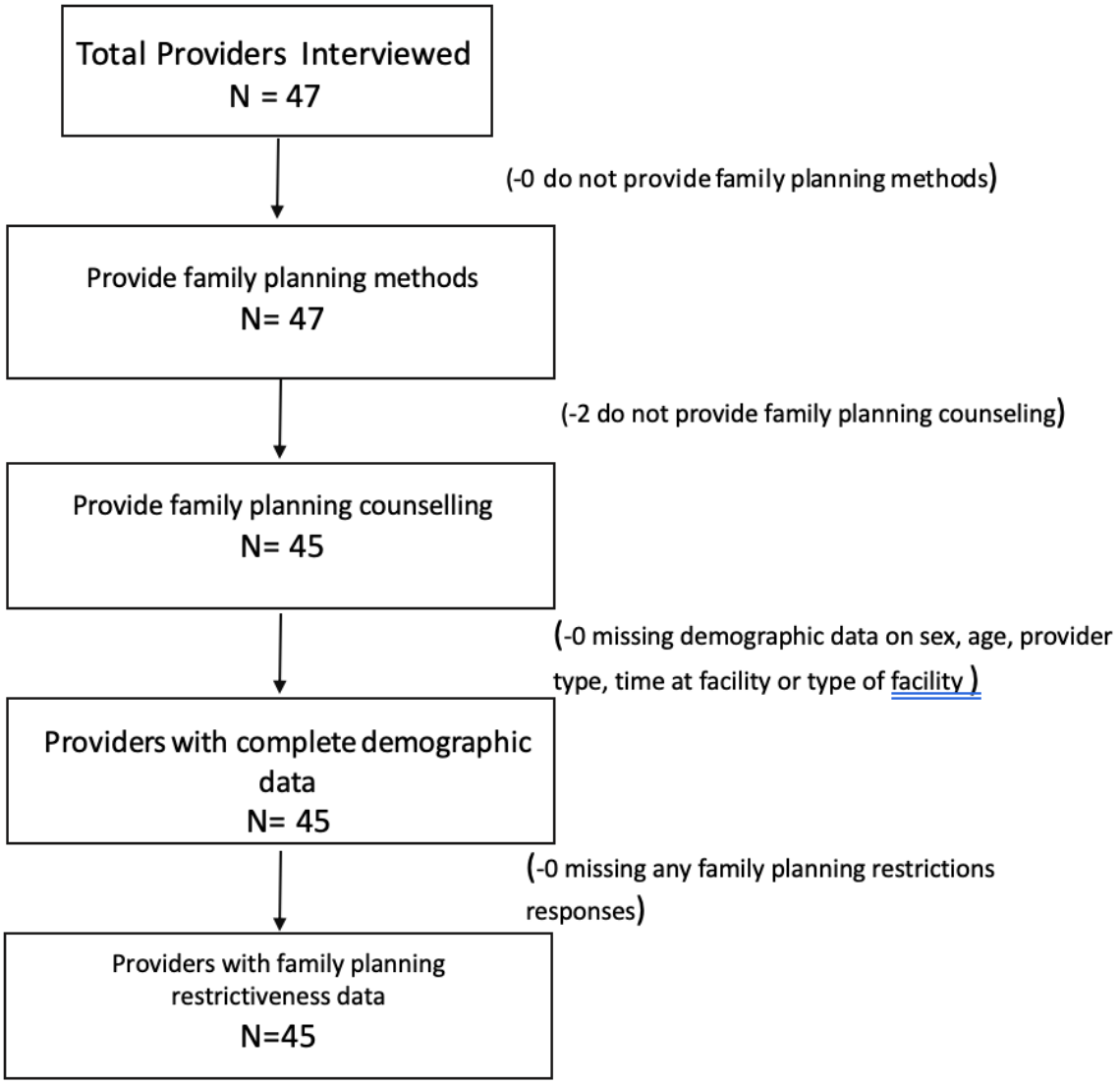

Figure 3: Exclusion criteria and final sample size—Clients

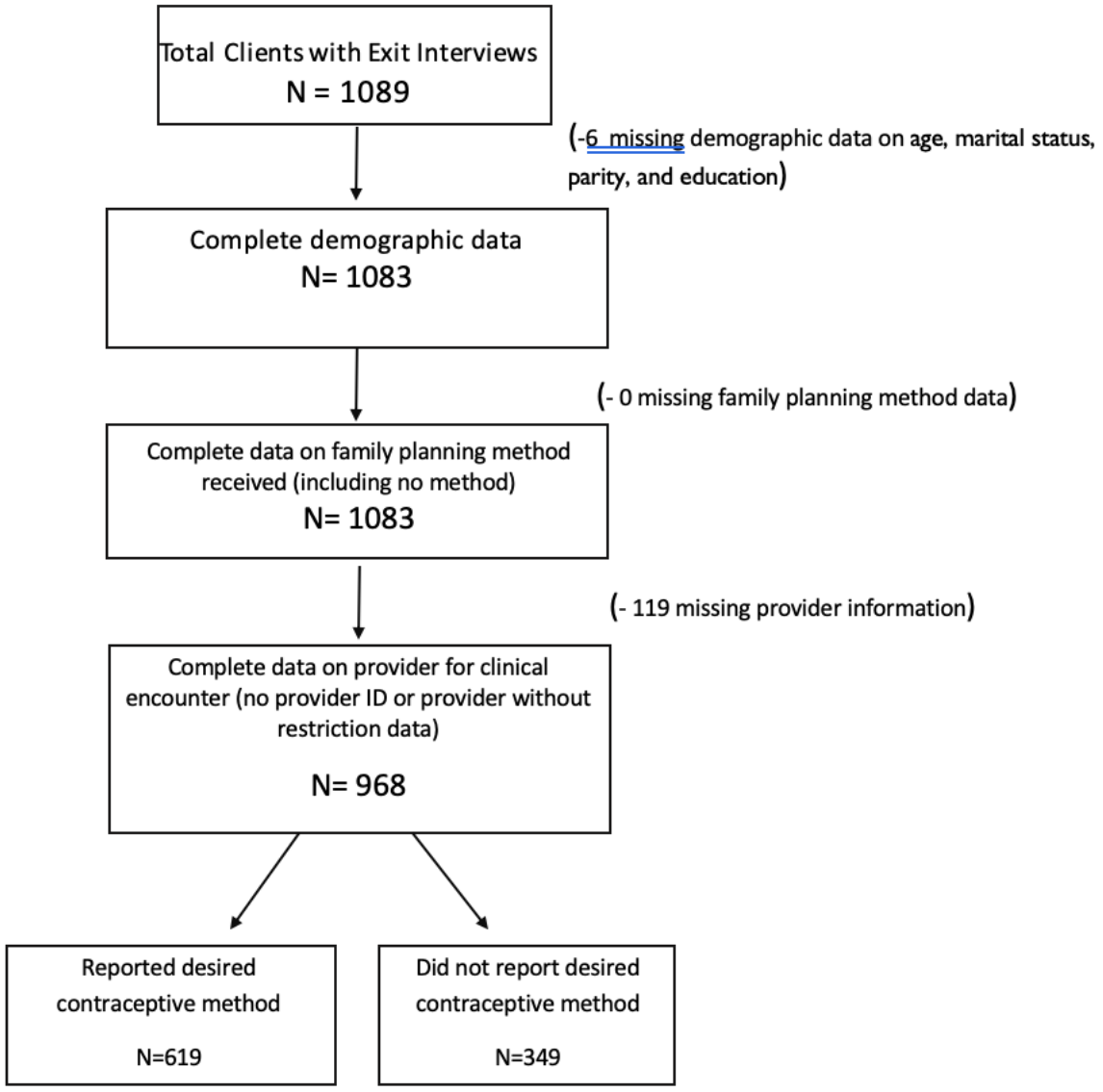

Table 1: Descriptive Statistics for Providers

Characteristic	All providers n= 45
Provider sex, n (%)	
Male	0 (--)
Female	45 (100)
Provider age (mean ± SD)	36.7 ± 7.6
Provider age (years), n (%)	
Less than 25	3 (6.7)
25-35	18 (40.0)
>35	24 (53.3)
Provider years at facility (mean ± SD)	4.9 ±3.9
Provider time at facility (years), n (%)	
Less than 1 year	13 (28.9)
1-3 years	12 (26.7)
4+ years	20 (44.4)
Provider staff type, n (%)	
Midwife	31 (68.9)
Nurse/Birth Attendant	14 (31.1)
Provider in-service training, n (%)	
No in-service training	19 (42.2)
1-3 in-service trainings	9 (8.9)
4 or more trainings	13 (28.9)
Months since last in-service training, n (%)*	
Less than 1 month	19 (42.2)
1-6 months	6 (23.1)
6 or more months	1 (28.9)
Providers offering method of contraception, n (%)	
Combined Oral Contraceptive Pill	44 (97.8)
Injectables	45 (100)
Male condom	44 (97.8)
IUD	37 (82.2)

Implant	40 (88.9)
Providers reporting any restrictions, n (%)	38 (84.4%)
Average total restrictions across all contraceptive methods (mean ± SD)	12.6±9.6
Provider restriction score, n (%)*	
0	8 (17.8)
1	5 (11.1)
2	3 (6.7)
3	5 (11.1)
4	15 (33.3)
5	9 (20.0)

*Provider restriction score: This variable is a measure of bias across contraceptive methods, with providers getting an additional point on this score for any report of a restriction for each contraceptive method. Score range: 0-5, for the 5 contraceptive methods included in this analysis

Table 2: Provider reported contraceptive restrictions by type of restriction for all contraceptive methods of interest

Characteristic	All providers n = 45
Minimum age restriction, n (%)*	**33 (73.3)[1]**
Combined Oral Contraceptive Pill	30 (66.7)
Injectables	28 (62.2)
Male condom	18 (40.0)
IUD	25 (55.6)
Implant	28 (62.2)
Maximum age restriction, n (%)	**33 (73.3)**
Combined Oral Contraceptive Pill	32 (71.1)
Injectables	28 (62.2)
Male condom	9 (20.0)
IUD	24 (53.3)
Implant	25 (55.6)
Any age restriction, n (%)	**34 (75.6)**
Combined Oral Contraceptive Pill	34 (75.6)
Injectables	34 (75.6)
Male condom	34 (75.6)
IUD	34 (75.6)
Implant	34 (75.6)
Minimum parity restriction, n (%)	**23 (51.1)**
Combined Oral Contraceptive Pill	3 (6.7)
Injectables	15 (33.3)
Male condom	1 (2.2)
Emergency contraception	12 (26.7)
IUD	14 (31.1)
Implant	11 (24.4)
Partner consent restriction, n (%)	**21 (46.7)**
Combined Oral Contraceptive Pill	9 (20.0)
Injectables	8 (17.8)
Male condom	2 (4.4)
IUD	13 (28.9)
Implant	13 (28.9)

Marital status restriction, n (%)	**19 (42.2)**
Combined Oral Contraceptive Pill	3 (6.7)
Injectables	4 (8.9)
Male condom	1 (2.2)
IUD	12 (26.7)
Implant	7 (15.6)
Any restriction, n (%)	**38 (84.4)**
Combined Oral Contraceptive Pill	34 (75.6)
Injectables	32 (71.1)
Male condom	18 (40.0)
IUD	31 (68.9)
Implant	31 (68.9)

*percent calculated based on n providers that provide the specific method
1: overall value for all contraceptive methods, row percent only included for methods of interest for this analysis and do not average to overall percent as it includes additional providers reporting restrictions for other methods

Table 3: Client characteristics associated with reporting a preferred method of contraception prior to consultation

Characteristic		All Clients n=968	Clients reporting no method preference n=349	Clients reporting a preferred contraceptive method n=619	test statistic (p-value)
Client age (mean ± SD)		30.0 ± 6.6	30.1± 6.6	30.0 ± 6.5	t= 0.30 (0.76)
Age (years), n (%)					
	<25	191	68 (35.6)	123 (64.4)	χ^2 =0.814
	25-35	547	194 (35.5)	353 (64.5)	
	>35	230	87 (37.8)	143 (62.2)	
Marital status, n (%)					
	Married (monogamous and polygamous)	807	280 (34.7)	527 (65.3)	**χ^2 = 0.049**
	Not currently married	161	69 (42.9)	92 (57.1)	
Parity, n (%)					
	Less than 2 children	242	99 (40.9)	143 (59.1)	**χ^2 = 0.069**
	2+ children	726	250 (34.4)	476 (65.6)	
Education level, n (%)					
	No education	146	47 (32.2)	99 (67.8)	χ^2 = 0.258
	Primary education	312	111 (35.6)	201 (64.4)	
	Secondary education	421	151 (35.9)	270 (64.1)	
	Higher education	49	40 (44.9)	49 (55.1)	
Contraceptive method mix, n (%)					
	Combined Oral Contraceptive Pill	81	0 (--)	81 (100)	**χ^2 >0.001**

Injectables	394	13 (3.3)	381 (96.7)
Male condom	2	0 (--)	2 (100)
IUD	33	4 (12.1)	29 (87.9)
Implant	82	1 (1.2)	81 (98.8)
Other method*	7	1 (14.3)	6 (85.7)
Did not receive method	369	330 (89.4)	6 (10.6)

:includes EC

Table 4: Client characteristics associated with receiving their desired method of contraception, out of clients with a desired method prior to visit

Characteristic	All Clients n=619	Clients Not Given Desired Method n=77	Clients Given Desired Method n=542	test statistic (p-value)
Client age (mean ± SD)	30.0 ± 6.5	28.7± 6.3	30.1 ± 6.5	t= 1.81 (0.07)
Age (years), n (%)				
<25	123	20 (16.3)	103 (83.7)	χ^2 =0.274
25-35	353	43 (12.2)	310 (87.8)	
>35	143	14 (9.8)	129 (90.2)	
Marital status, n (%)				
Married (monogamous and polygamous)	527	56 (10.6)	471 (89.4)	**χ^2 = 0.001**
Not currently married	92	21 (22.8)	71 (77.2)	
Parity, n (%)				
Less than 2 children	14	3 (21.4)	11 (78.6)	χ^2 = 0.220
2+ children	129	20 (15.5)	109 (84.5)	
Education level, n (%)				
No education	99	13 (13.1)	86 (86.9)	χ^2 = 0.595
Primary education	201	23 (11.4)	178 (88.6)	
Secondary education	270	32 (11.9)	238 (88.2)	
Higher education	49	9 (18.4)	40 (81.6)	
Contraceptive methods desired, n (%)				
Combined Oral Contraceptive Pill	81	8 (9.9)	71 (90.1)	**χ^2 <0.001**
Injectables	381	15 (3.9)	366 (96.1)	
Male condom	2	0 (--)	2 (100)	
IUD	29	3 (10.3)	26 (89.7)	
Implant	81	9 (11.1)	72 (88.8)	
Other method**	6	3 (50.0)	3 (50.0)	
Did not want method	10	3 (30.0)	7 (70.0)	
Contraceptive methods provided, n (%)				
Combined Oral Contraceptive Pill	76	5 (6.6)	71 (93.4)	**χ^2 <0.001**
Injectables	397	34 (8.6)	363 (91.4)	
Male condom	2	0 (--)	2 (100)	
IUD	43	17 (39.5)	26 (60.5)	

Implant	89	18 (20.2)	71 (79.8)
Other method*	2	0 (--)	2 (100)
Did not receive method	39	39 (100)	0 (--)

*: includes EC

Table 5: Mixed effects logistic regression model, associations between receipt of desired method and having a non-restrictive provider with selected covariates and restricted to women who desired LARCs and unmarried women

	Model 1: Dichotomous exposure and Client receipt of desired contraceptive method OR (95% CI)		
	Adjusted	**Adjusted among women who desired LARC**	**Adjusted among unmarried women**
Restrictive provider			
Restrictive (ref)	1.00 (ref)	1.00 (ref)	1.00 (ref)
Non-restrictive	0.62 (0.26, 1.44) p=0.270	0.80 (0.22, 3.00) p=0.745	0.25 (0.06, 1.06)* p=0.061
Education			
No education (ref)	1.00 (ref)	1.00 (ref)	1.00 (ref)
Primary education	1.21 (0.57, 2.59) p=0.623	0.66 (0.15, 2.82) p=0.575	0.92 (0.15, 5.70) p=0.931
Secondary education	1.30 (0.63,2.71) p=0.481	0.70 (0.17, 2.90) p=0.625	0.50 (0.09, 2.83) p=0.436
Higher education	0.80 (0.28,2.25) p=0.666	0.73 (0.10, 5.54) p=0.764	0.21 (0.02, 2.37) p=0.208
Parity			
>2 living children	1.00 (ref)	1.00 (ref)	1.00 (ref)
2 or more	1.07 (0.54, 2.13) p=0.847	1.75 (0.43, 7.12) p=0.434	1.43 (0.43, 4.76) p=0.558
Age			
<25 (ref)	1.00 (ref)	1.00 (ref)	1.00 (ref)
25-35	1.20 (0.62, 2.32) p=0.593	0.74 (0.23, 2.34) p=0.611	0.90 (0.25, 3.22) p=0.871
>35	1.53 (0.65, 3.60) p=0.325	0.77 (0.18, 3.31) p=0.727	0.81 (0.13, 5.05) p=0.821
Marital status			
Unmarried (ref)	1.00 (ref)	1.00 (ref)	-------
Married	2.80 (1.48,5.30)*** p=0.001	1.70 (0.52, 5.59) p=0.382	

*significant below 0.10
**significant below 0.05
*** significant below 0.005

Table 7: Mixed effects logistic regression model, associations between receipt of desired method and provider restriction scores with selected covariates and restricted to women who desired LARCs and unmarried women

	Model 2: Continuous exposure and Client receipt of desired contraceptive method Coefficient (95% CI)		
	Adjusted	**Adjusted among women who desired LARC**	**Adjusted among unmarried women**
Provider restriction score			
0 (ref)	1.00 (ref)	1.00 (ref)	1.00 (ref)
Continuous score	1.09 (0.91, 1.32) p=0.346	1.08 (0.81, 1.44) p=0.620	1.41 (1.02, 1.95)** p=0.036
Education			
No education (ref)	1.00 (ref)	1.00 (ref)	1.00 (ref)
Primary education	1.21 (0.57, 2.59) p=0.622	0.66 (0.16, 2.84) p=0.581	0.75 (0.12, 4.65) p=0.759
Secondary education	1.28 (0.62, 2.68) p=0.500	0.71 (0.17, 2.92) p=0.632	0.37 (0.06, 2.19) p=0.274
Higher education	0.79 (0.28, 2.23) p=0.658	0.75 (0.10, 5.63) p=0.776	0.14 (0.012, 1.71) p=0.125
Parity			
>2 living children	1.00 (ref)	1.00 (ref)	1.00 (ref)
2 or more	1.08 (0.54, 2.16) p=0.821	1.74 (0.43, 7.08) p=0.440	1.52 (0.45, 5.07) p=0.497
Age			
<25 (ref)	1.00 (ref)	1.00 (ref)	1.00 (ref)
25-35	1.19 (0.62, 2.31) p=0.610	0.73 (0.23, 2.31) p=0.596	0.79 (0.22, 2.87) p=0.718
>35	1.52 (0.65, 3.56) p=0.338	0.77 (0.18, 3.32) p=0.732	0.632 (0.10, 3.98) p=0.625
Marital status (all)	1.00 (ref)	1.00 (ref)	
Unmarried (ref)			----------
Married	2.73 (1.45, 5.13)*** p=0.002	1.69 (0.52, 5.49) p=0.382	

*significant below 0.10
**significant below 0.05
*** significant below 0.005