Measuring Family Planning Provider Bias: A Discrete Choice Experiment Among Burkinabé, Pakistani, and Tanzanian Providers

Authors

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Abstract

Unmet need for modern contraception remains high around the world, particularly for youth. While some of this unmet need is driven by limited health infrastructure and method mix availability, many adolescents who visit family planning providers still do not receive methods that fit their needs. This suggests that providers may be biased against youth, and that interventions to change provider behavior could help close this gap. However, youth are often also unmarried and nulliparous, which makes it difficult to know whether age or one of these other characteristics influences provider decisions. We use a discrete choice experiment in Burkina Faso, Pakistan and Tanzania to disentangle the effects of age on providers' decisions to provide contraception from the effects of other potential confounding factors. We find that, although young women may experience the most bias, age is not the main driver. Rather, marital status and parity seem to influence provider decisions to offer services or counsel on modern methods. These findings suggest that provider interventions that focus on client age are not enough, and that interventions that examine how parity and contraceptive options interact could be a promising avenue to improve access.

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Legend

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Introduction

Modern contraception plays a crucial role in allowing women to control the timing and number of their pregnancies. However, nearly 25% of women in poor countries who want to avoid pregnancy are not using a modern family planning method (J. Darroch et al., 2017). This problem is particularly prevalent among adolescent girls (aged 15-19), many of whom who may not want children at that time, and of whom over 60% have an unmet need for contraception (J. E. Darroch, Woog, Bankole, & Ashford, 2016). Of the estimated 38 million sexually active adolescents (15-19) in low- and middle- income countries who do not want a child in the next two years, 23 million (61%) have an unmet need for contraception (J. Darroch et al., 2017). This demographic group also has a low use of long acting reversible contraceptives (LARCs), methods well-suited to young women who want to delay childbearing and who want a method that does not require daily adherence. Among adolescent women in developing regions who use modern contraceptives, only five percent use IUDs and eight percent use implants (J. E. Darroch et al., 2016).

While some of the unmet need for family planning is driven by limited health infrastructure and a inadequate mix of methods to align with adolescents' fertility goals, many adolescents who do have access to family planning practitioners still do not obtain a modern contraception method or a method that best fits their needs (e.g. LARCs, which include injectables, intrauterine devices (IUDs) and implants) (MacQuarrie, 2014). This suggests that interventions to change the behavior of family planning providers have the potential to reduce the unmet need for contraception. However, in order to improve the quality of available family planning services, it is important to first understand the mechanisms that lead providers to avoid giving modern and long acting methods to adolescent girls.

Provider bias in family planning refers to the practice of favoring some methods and discouraging others without medical rationale, due to their own prejudices about the method or its delivery system, and is often targeted to a particular client subset (Bertrand, Hardee, Magnani, & Angle, 1995; Campbell, Sahin-Hodoglugil, & Potts, 2006). Biased provider behavior can reflect the social, cultural, and professional norms that shape their places of work, as well as misinformation about family planning options and population segments (Solo & Festin, 2019). Adolescent girls' disproportionate unmet need for contraception suggests that age could be a key component of providers' biases. Other characteristics of adolescent girls may drive low provision of modern methods to adolescent girls. For example, adolescents are more likely than adults to be unmarried and nulliparous. Therefore, it is difficult to disentangle the effect of age from the effect of marital status and parity. In order to design interventions to improve the quality of family planning visits for adolescents, including increased access to contraception, it is essential to understand which client characteristics influence provider bias. Prior literature has used a variety of approaches to measure bias in provider decision-making, but none have been able to isolate the role of individual client attributes (Alli, Maharaj, & Vawda, 2013; Chapman, Kaatz, & Carnes, 2013; Nalwadda, Mirembe, Tumwesigye, Byamugisha, & Faxelid, 2011; Yinger, Peterson, Avni, Gay, & Firestone, 2002).

In this study, we use a discrete choice experiment (DCE) conducted with 790 providers across three countries: Tanzania, Burkina Faso, and Pakistan. Our DCE approach presented client vignettes to providers that randomly vary levels of the following three attributes: client age, parity, and marital status. We then asked providers how they would counsel these hypothetical clients on

contraception options available to them. This methodology allows us to extend the previous literature and disentangle the effects of age on a provider's decision to provide contraception from the effects of marital status and parity, possible confounding factors associated with age.

We find that the provider bias experienced by young women is largely not a result of their age. We document that marital status and parity play an important role in a provider's decision to offer services or counsel on modern methods, while age of the client has only a limited influence on provider behavior. This suggests that interventions designed to improve the quality of family planning services and reduce provider bias should target provider attitudes towards unmarried and nulliparous women, in addition to attitudes around youth specifically.

We also find substantial variation across countries in both the level of bias and the client characteristics that influence provider behavior. Pakistani providers exhibit the most biased behaviors: they are several orders of magnitude more likely to report that they would deny services or deny a modern method, to believe all LARCs are inappropriate for young women, and to hesitate to provide counseling to nulliparous and unmarried women, and effect sizes are large. We expect that the professional and cultural norms in Pakistan around family planning counseling influences these findings. Biased behaviors among providers in Tanzania and Burkina Faso tend to be smaller in magnitude and are mostly driven by attitudes about parity. That providers across these three different contexts exhibit biased behaviors towards nulliparous women adds to the external validity of this finding and suggests that attitudes around parity could lead providers to withhold modern contraception methods in other geographies. Interventions to mitigate the effects of these attitudes on young women should be explored.

The rest of the paper is organized as follows: we first review the barriers adolescents face when seeking modern family planning methods, the current approaches used to measure provider bias, and how our research contributes to this body of literature. Then, we detail the discrete choice methodology and data used for this analysis. We follow with the results and conclude with a discussion of our findings and directions for future work.

Barriers to youth family planning access

Adolescents face many well-documented demand-side barriers to accessing contraceptives, which have been summarized in two literature reviews (Chandra-Mouli, McCarraher, Phillips, Williamson, & Hainsworth, 2014; Williamson, Parkes, Wight, Petticrew, & Hart, 2009). First, social pressure might prevent youth from seeking out and using modern family planning methods. For example, in many places, young women face pressure to conceive and have children soon after marriage (Bankole & Malarcher, 2010; Rivera, Cabral de Mello, Johnson, & Chandra-Mouli, 2001). Second, stigma surrounding contraception may prevent youth from seeking family planning services outside of marriage. Newton-Levinson et al. (2016) document this in a qualitative systematic review on barriers faced by adolescents in seeking family planning counseling. Finally, misconceptions about the short- and long-term consequences of contraceptives, including LARCs, may dampen demand for these methods. Qualitative work from Tanzania by Norris et al. (2011) revealed that many respondents were worried about adverse side effects such as infertility. To this end, our formative qualitative work in Tanzania, Burkina Faso, and Pakistan revealed a belief that hormonal methods damaged future fertility prospects, and that nulliparous women needed to "prove" their fertility, making long-acting hormonal methods undesirable.

Supply-side barriers also limit adolescents' ability to obtain modern methods of family planning, although these are less thoroughly documented in the literature. A review by Chandra-Mouli et al. (2014) describes that one obstacle that adolescents can face is health care worker refusal when seeking family planning methods. Health workers may refuse to provide family planning methods or counseling to clients because of their own beliefs about abstinence or the appropriateness of various methods. Several potential beliefs emerge from the literature and our own *ex ante* formative work. First, providers might believe that youth should not be sexually active and that distributing contraceptives condones or even promotes premature sexual activity (Rivera et al., 2001). Second, social norms around sexual activity of unmarried women in particular could dissuade providers from distributing contraception (Bankole & Malarcher, 2010). This could be because providers agree with the social norm, or because they are worried about sanctions for going against the norm. For example, our formative work with providers in Pakistan revealed fear of repercussions for providing services to women without a husband or mother-in-law present.[1] Finally, providers could hesitate to provide contraceptives to women who have not yet had children because of incorrect beliefs that long-acting methods are inappropriate for nulliparous women, or cultural and social norms around childbearing.

While the above characteristics may all contribute to the unmet contraception need among young women through the channel of biased provider decisions, , there is no scientific evidence

[1] The 2013 Reproductive and Healthcare Rights Act, a law applicable across Pakistan, acknowledges parental responsibility in educating their children about reproductive healthcare. It does not include any provisions for youth regarding their legal rights around contraceptive choice. This act creates an opportunity for interpretation that favors parental rights over their children's reproductive health decisions. See https://www.prb.org/youthfpscorecard/en/ for more discussion of this. Conversely, other laws in Pakistan - one prohibiting early and forced marriages and another ensuring that post-abortion care be available for women – could be an opportunity for providers to counsel youth on family planning options. See http://sindhlaws.gov.pk/setup/publications/PUB-13-000734.pdf, https://www.prb.org/youthfpscorecard/en/ for more information on these laws.

documenting the relative importance of each of these attributes in creating this supply-side barrier. This study is the first we are aware of to disentangle the individual effect of age, parity and marital status on a provider's decision to provide contraception to adolescent clients. Understanding what drives provider decision-making could lead to new types of interventions aimed at increasing contraceptive access and is an under-explored perspective, especially contrast to interventions aimed at changing community norms.

Measurement of provider bias

Provider bias is a multidimensional challenge which is difficult to measure and reduce. Existing research aimed at measuring provider bias has made some progress but has fallen short of isolating key drivers of biased behavior. We review three commonly used techniques in the literature to measure provider bias — client exit interviews, standardized patients, and provider surveys — and discuss the methodological challenges faced by each. The first two methods measure bias by eliciting patient perspectives about their experience receiving care, while the latter approach focuses on measuring provider attitudes and behaviors directly.

Client exit interviews

Exit interviews allow clients to comment on their quality of care and provider interactions after a clinical encounter. The first concern with this method is that client-reported quality of care measures are often unrelated to objective measures of quality. A secondary analysis of quality of care metrics in ten countries using Demographic and Health Survey data finds that adolescents receive lower quality care than older women do, but they are significantly more likely to report being satisfied with the care received (Moucheraud, Heuveline and Shah, 2019 working paper). A

second concern with exit interviews is that even if patients report their experiences accurately, exit interviews do not allow the researcher to disentangle the patient characteristics that contributed to poor quality care. This is because young women are not only young, but they are also often unmarried and nulliparous. This creates both causal inference and statistical problems. From a causal inference framework, one must adjust for the other characteristics of the client in order to isolate the effect of each characteristic. However, because characteristics are not randomly assigned, unobservable factors can lead to omitted variable bias. Moreover, in the analysis, the high degree of correlation between marital status, parity and age creates a multicollinearity issue if all these variables are included in the same regression.

Standardized patients

An increasingly commonly used method to evaluate client-physician interactions is an audit study. In the context of family planning visits, this involves having trained actors pose as women seeking family planning services (i.e. standardized patients). This method allows the researcher to isolate drivers of behaviors through random assignment of client characteristics and matched testers. The strength of audit studies is that they can provide both quantitative and rich qualitative data on client-physician interactions and quality of care. The three main limitations of this approach are ineffective matching of auditors to desired client profiles, standardized patient bias, and resource intensity. Effective matching means that the auditors are identical from the point of view to the provider except for the pre-determined random deviations in client characteristics (Heckman and Siegelman, 1993). While this concern can be limited through detailed scripts, extensive training, and post-hoc estimation adjustments, standardized patient heterogeneity has the potential to bias analyses. The same holds true for any bias that may be introduced as a result of standardized

patients being aware of their role and changing their behaviors accordingly. Finally, audit studies are often logistically challenging and resource intensive, particularly when there are many client profiles to test and researchers are interested in making inferences using quantitative analysis.

Provider surveys

Surveying providers about their care practices is a third approach for detecting bias in care settings. Provider surveys or questionnaires are used in the literature to measure knowledge about specific methods or services, including LARCs (Greenberg et al., 2013), IUDs (Chakraborty et al., 2015, Tyler et al., 2012), emergency contraception (Judge, Peterman & Keesbury, 2011), medical abortion (Patel et al., 2009), adolescent preferences for SHR services (Biddlecom et al., 2007), and contraception service provision generally (Dehlendorf, Levy, Ruskin & Steinauer, 2010; Hamid & Stephenson, 2006, Yinger, 2002). This is a useful approach to gather information about possible biases and provider knowledge, but this method is subject to reporting bias and other concerns common to all self-reported elicitation methods. Most importantly, provider surveys alone cannot be used to make causal claims about what influences behavior.

Discrete choice experiments

This study uses an alternative approach—a Discrete Choice Experiment (DCE)—which isolates the contribution of individual client characteristics on self-reported provider behavior. DCE methodology is a technique used to elicit individual preferences over alternatives in a choice set, which are described by certain attributes (Mangham, Hanson, McPake 2009; Bridges et al., 2011; Johnson et al., 2013; Hauber et al., 2016). This method's strength is that it can infer the value placed on each attribute and has been used widely in health care research. In LMIC contexts, DCE

has been used to measure health insurance preferences in Malawi (Abiiro et al 2014), job preferences of Indian health care workers (Rao et al 2013), and quality of care preferences in South Africa (Honda et al 2015), among others.

Methods

Our study is the first to our knowledge to apply the DCE methodology to understanding family planning counseling across diverse country contexts. We present providers with randomly assigned client profiles that include different attribute combinations. Then we ask them to make several decisions regarding family planning counseling. The attributes include cross randomized combinations of marital status, parity, and age. Cross-randomization of attribute levels has the unique advantage of parsing out the effect of different characteristics that are – in the real world - highly correlated. Our approach offers new insight into the relative importance of these characteristics.

Study sample and data sources

We enrolled 790 providers across Burkina Faso (n=302), Tanzania (n=288), and Pakistan (n=200). The clinics selected for the sample were chosen based on existing ties with implementing partner organization and are not nationally representative. Within targeted clinics, providers were randomly selected among those who had provided family planning counseling services in the last 12 months. The number of providers surveyed at each clinic was proportional to the total number of personnel at each clinic. In both Burkina Faso and Tanzania, all providers worked at medium-sized, urban public clinics that provided family planning services (average of four providers per clinic). All providers in Pakistan operated their own private clinic, where they were the only

provider. Clinics were selected from Hauts Bassins, Centre, and Cascades districts in Burkina Faso, Dar es Salaam, Tanzania, and Karachi, Pakistan. Table 1 provides a more detailed geographic breakdown of provider characteristics.

The study team collected data from providers using two instruments: a provider survey and a DCE. The provider survey recorded information on the providers' demographic characteristics and general attitudes and beliefs about young people, and details on the clinic environment where they practice, especially as they relate to youth and family planning services. The DCE complements the provider survey, in that it also elicits information about provider attitudes and beliefs towards youth and contraceptive access, but it does so in an indirect way, to encourage revelation of true beliefs and preferences. This is a particularly useful methodology for this analysis because it evaluates providers' willingness to trade off attributes of patients when making care decisions.

DCE experimental design

The DCE design was chosen for its ability to quantify the relative importance of patient age, marital status, and parity in provider decisions around family planning. In this study, which was done from the provider perspective, we conducted a balanced and orthogonal DCE with 18 total profiles. These profiles varied by three mutually exclusive attributes - age, marital status, and parity – which each had either two or three levels. Age had three levels: hypothetical clients could be 15, 20, or 25 years of age. These levels were chosen because they represent the range of ages that are considered "youth" by providers. Hypothetical clients could either be married or unmarried[2], and they could have 0, 1, or 2+ children. These levels of the parity attribute were

[2] In Pakistan, providers may have interpreted the unmarried category as widowed or divorced, rather than never married.

chosen because they encompass the range of parities that could lead to differential decision-making, while still being easy to interpret by respondents. We use full profiles in constructing the DCE tasks. In order to isolate the causal effect of each attribute level (e.g. the impact of being nulliparous compared to having 2+ children on provider behavior), we used randomization to ensure that 1) profiles types were balanced across our sample of providers and 2) within a given attribute the levels of that attribute are equally paired with other attribute levels.

We asked each provider to answer ten questions about three hypothetical client profiles, randomly selected from the total set of 18 client profiles with varying ages, marital statuses and parities. The DCE questions were repeated for each of the three randomly selected client profiles. This approach yields a maximum of thirty DCE tasks per respondent. In total, 790 providers completed the DCE, most of whom completed two or three client profiles, for a total of 1,784 observations.[3]

The outcomes of this study are constructed from the ten questions asked to providers in the DCE. We asked providers whether they would provide family planning counseling to one randomly selected hypothetical client. If they declined to counsel the client, the survey ended there. If they would choose to provide services to the client, they were asked about what types of methods would be appropriate to discuss with the client, whether they would deny a modern method to the client, and whether they would have any hesitations about providing family planning counseling on any particular methods. In this analysis, modern methods include pills, injectables, implants, and IUDs (WHO, 2018). LARCs include injectables, implants, and IUDs. All these methods are clinically

[3] 84 providers in Burkina Faso and 63 providers in Tanzania completed fewer than three profiles. This is because we omitted one category for marital status ("living with partner") from this analysis, as it was not asked in Pakistan.

appropriate for women in all the DCE scenarios, and the method selection should ideally only reflect a woman's personal preference and any clinical contraindications.

In the results presented in the next section, we examine the following aspects of provider decision-making using the DCE approach described above:

- Declined counseling: Binary indicator for whether health care provider declined to provide counseling to client.
- Denied modern methods: Binary indicator for whether health care provider denied modern methods such as injectables, pills, or implants to client, or declined counseling.
- All LARCs inappropriate: Binary indicator for whether health care provider considered all of the following LARCs to be an inappropriate form of family planning method for this client, given her profile: IUDs, injectables, or implants. This counts providers who decline counseling as considering LARCs to be inappropriate for this client, given her profile.
- Any LARC inappropriate: Binary indicator for whether health care provider considered any of the following LARCs to be an inappropriate form of family planning method for this client, given her profile: IUDs, injectables, or implants. This counts providers who decline counseling as considering LARCs to be inappropriate.
- Injectable inappropriate: Binary indicator for whether health care provider considered injectables to be an inappropriate form of family planning method for this client, given her profile. This counts providers who decline counseling as considering injectables to be inappropriate for this client, given her profile.

- Hesitate modern method counseling: Binary indicator for whether health care provider would hesitate to counsel client on modern methods of family planning, given her profile, or declined counseling altogether. In the survey, this was phrased: `For this particular client, would you have any hesitations about counseling a modern method of FP (like injectables, pills, implants)?'

Statistical analysis

The causal effect of each client attribute on the probability of each binary outcome of interest is identified using the following logistic regression model:

$$Y_i = \text{expit}(\beta_1 age20_i + \beta_2 age15_i + \theta_1 unmarried_i + \alpha_1 one_{child\,i} + \alpha_2 no_{child\,i} + \epsilon_i)$$

Where Y_i is a binary indicator for whether the provider engages in one of the biased behaviors (declines counseling, denies modern methods, hesitates to counsel on modern methods, or believes IUD to not be appropriate) given randomly assigned client profile i. The β coefficients represent the impact of the client being 20 or 15 years old as opposed to 25 on provider behavior, the θ_1 represents the impact of the client being unmarried instead of married on provider behavior, and the αs represent the impact of having one or no children compared to two or more on provider behavior. We report marginal effects on the probability and statistical significance of younger ages relative to 25, unmarried relative to married, and having one or no children relative to two or more. While the randomized assignment of client profiles achieves attribute balance in expectation, we also control for potential imbalance by including all attribute levels in our regression model.

The standard errors are clustered at the provider level to control for within-respondent correlation and all analyses are conducted separately for each country. All analyses are conducted in STATA 14 (StataCorp, Texas, U.S.).

Summary statistics

Descriptive statistics on provider characteristics across countries can be found in Table 1. Seven hundred and ninety providers across Burkina Faso (n=302), Tanzania (n=288), and Pakistan (n=200) comprise our analysis sample. In Burkina Faso, 92% of providers surveyed are midwives or nurse midwives, in Tanzania 65% are nurses, and in Pakistan 47% are midwives or nurse midwives. In Pakistan, 44% of providers surveyed are doctors while in the other two countries, doctors make up less than 10% of the sample. Providers in Burkina Faso tend to be in the middle of their careers, while providers in Pakistan are either mid-career or older. Tanzania has the largest number of early-career providers, with 31% being under the age of 33. Almost all providers in Pakistan are Muslim, while in Tanzania and Burkina Faso between 25-31% are Muslim with the remainder identifying as Christian. Almost 90% of providers are married in Pakistan, and 70% of providers are married in Burkina Faso and Tanzania. Finally, most providers across all three countries have children. These cross-country differences in provider characteristics are important to keep in mind when interpreting the results of the provider survey and DCE.

Table 2 provides information on provider practices, attitudes and beliefs around providing youth counseling. These data are self-reported in the provider survey. Most providers across the three countries counsel 19-24-year-old youth several times per week, and over half of providers in Burkina Faso and Tanzania counsel 14-18-year-old youth several times a week (21% in Pakistan).

Provider beliefs clearly suggest a bias against unmarried women: most providers in Pakistan and Tanzania believe that married and unmarried women should not receive the same services, and Pakistani providers believe that unmarried clients require consent from parents. Eighty eight percent of providers in Pakistan and nearly half of providers and Tanzania and Burkina Faso reported that their religion considers it sinful for unmarried girls to use contraception. Most providers in our sample are not embarrassed to discuss sexuality with young clients, feel responsible to teach youth how to behave, enjoy working with youth, and are close to youth who have experienced post-pregnancy health complications. Providers in Pakistan have some of the most cautious beliefs, including that providing contraception increases promiscuity, and that young women require spousal or parental consent. Beliefs around parental consent in Pakistan may come from a conservative interpretation of the 2013 Reproductive and Healthcare Rights Act, which makes parents responsible for family planning education, but does not include any youth-specific provisions, policies, or bans around their rights around contraceptive choice. Community backlash was also an important fear and hence parental (mother-in-law) consent was considered as a protective factor for providers. Additionally, Pakistan's Zina Ordinance forbids nonmarital sex, so providers may fear legal repercussions for providing family planning methods to women they know to be unmarried. However, over half of providers in all three countries see deterring adolescent pregnancy as an important determinant of improved economic and labor force outcomes for young women. Finally, there is some evidence that beliefs about parity could lead to biased services, particularly among providers in Burkina Faso and Pakistan: most providers believe that young couples should have children as soon as possible after marriage and that an IUD is not an appropriate method for young women without children.

Outcome variable means are reported in Figure 1 for the pooled sample as well as by country. The pooled averages mask important country-level differences.[4] Half of providers in Pakistan declined counseling altogether compared to only 6% in Tanzania and less than 1% in Burkina Faso. Following a similar pattern, 3% of providers in Burkina Faso, 22% in Tanzania, and 53% in Pakistan denied counseling on modern methods. Half of Pakistani providers believed LARCs to be universally inappropriate for their hypothetical clients, while very few providers in Tanzania and Burkina Faso agreed. However, 50% of Tanzanian and 60% of Pakistani providers agreed that at least one LARC was inappropriate, while 15% of Burkinabe providers thought similarly. When looking specifically at the appropriateness of injectables, around half of Tanzanian and Pakistani providers found these to be inappropriate for their hypothetical clients. Finally, while only 7% of providers in Burkina Faso would hesitate to counsel the hypothetical client on modern methods of family planning, 61% of Tanzanian providers and 55% of Pakistani providers would. A full set of descriptive statistics on outcome variables by DCE scenario can be found in Appendix Table 1.

Results

Figures 2-7 graph the marginal effects on the probability of engaging in the behavior of interest of each age category, marital status, and parity level from Equation 1 (see Appendix Table 2 for full regression results reporting the marginal effects). Figure panels show marginal effects of each client attribute from Burkina Faso, Tanzania, and Pakistan, in that order. Results on the role of each client profile on all outcome variables are presented for each country in turn.

[4] Because of this, we conduct all analyses separately for each country.

Burkina Faso

We are not able to estimate the effect of client attributes on the provision of counseling, because all providers in Burkina Faso reported that they would provide counseling, independent of client profile.

As seen in Figure 3, Burkinabé providers are marginally (3 percentage points) more likely to deny modern methods to nulliparous women as compared with women who already have two children (95% CI: -0.6, 7.4; p=0.093), conditional on age and marital status. Neither marital status nor age are important factors in the denial of modern methods in Burkina Faso.

We find that Burkinabé providers are 22 percentage points more likely to think that at least one type of LARC is not appropriate for nulliparous women (Figure 5), regardless of age or marital status (95% CI: 14.4, 28.5; p<0.001). Looking at injectables more specifically, providers are 15 percentage points (95% CI: 9.2, 21.6; p<0.001) more likely to think that an injectable is not appropriate for women with no children compared with women who have at least 2 children, regardless of age or marital status (Figure 6). percentage points

Age and marital status are not significantly related to provider hesitation to provide counseling in Burkina Faso, while parity is only marginally significantly related (Figure 7).

Tanzania

Age has no effect on a provider's decision to decline counseling in Tanzania (Figure 2). Tanzanian providers are 3 percentage points (pp) more likely to deny counseling to unmarried women

compared to married women (95% CI: -0.2, 6.5; p=0.066). However, parity does not affect Tanzanian providers' decisions to provide counseling.

Nulliparous women in Tanzania are 21 percentage points more likely to be denied modern contraceptive methods (95% CI: 12.3, 29.4; p<0.001), conditional on age and marital status (Figure 3). Neither marital status nor age are important factors in the denial of modern methods in Tanzania.

We do not find any strong biases on age, marital status or parity in Tanzania for questions regarding LARC inappropriateness. In Figure 4, we see that Tanzanian providers are marginally more likely to think that *all* LARCs are inappropriate for unmarried women compared to married women, though this is not significant at the standard 5% level, and disappears in Figure 5 which rewords this question slightly. Looking at injectables specifically (Figure 6), we see that providers are 9 percentage points more likely to consider them to be inappropriate for women with at least two children compared to nulliparous women, conditional on age and marital status (Figure 5; 95% CI: -0.2, 0.01, p=0.079). This effect is not significant at the standard 5% level, but it is worth further investigation given that the direction is opposite that of our original hypothesis. We find no differential effects by marital status or age.

Age drives decision-making for whether Tanzanian providers would hesitate to counsel on modern methods (Figure 7). Compared to 25-year-old women, providers are 11 percentage points more likely to hesitate to provide counseling to 20-year-old women (95% CI: 1.2, 20; p=0.027) and 16 percentage points more likely to hesitate to provide counseling to 15-year-old women (95% CI:

6.2, 25.8; p=0.001). Marital status and parity are not significantly related to provider hesitation to provide counseling in Tanzania.

Pakistan

Pakistani providers do not decline counseling because of a client's age (Figure 2). However, providers are 55 percentage points more likely to decline counseling to unmarried women compared to married women (95% CI: 48, 62; p<0.001). Compared to clients with at least two children, Pakistani providers are 35 percentage points more likely to decline counseling to nulliparous women (95% CI: 27.2, 43; p<0.001).

Pakistani providers are 40 percentage points more likely to deny modern methods to nulliparous women, compared with women with at least two children (95% CI: 32.3, 48; p<0.001), seen in Figure 3. This is conditional on the client's age and marital status. In Pakistan, we also find that marital status influences the decision to deny modern methods: providers are 51 percentage points more likely to deny modern methods to unmarried women as compared to their married counterparts (95% CI: 43.7, 58.2; p<0.001). Age does not play a significant role in denying modern methods in Pakistan.

In Pakistan, providers are 55 percentage points more likely to consider all forms of LARCs to be inappropriate for unmarried women compared to married women (Figure 4), conditional on age and parity (95% CI: 47.5,61.8; p<0.001). They are also significantly more likely to consider all LARCs inappropriate for nulliparous women, compared to women who have at least two children. When asked whether any form of LARC is inappropriate, we see the same strong marital status

and parity gradients (Figure 5). Additionally, age becomes a significant determinant. Pakistani providers are 11 percentage points more likely to consider at least one form of LARC inappropriate for 15-year-old adolescents compared to 25 year old women (95% CI: 3.5, 17.5; p=0.003), conditional on marital status and parity. We see the same trends when we look specifically at injectables (Figure 6) – age, marital status and parity gradients are strong for Pakistani providers. However, looking at the magnitude of these effects, marital status and parity are the more significant drivers. percentage points .

In Figure 7 we display results for the outcome variable of whether the provider would hesitate to counsel on modern methods. This is the only other outcome for which age has an effect Pakistan, with providers expressing more hesitation for 15 year old women compared with 25-year old women, conditional on marital status and parity. Marital status and parity are again important in Pakistan, as they strongly predicted a provider's hesitation to provide counseling: providers are 35 percentage points more likely to hesitate for nulliparous women compared with women who have 2 or more children (95% CI: 26.5, 42.7; p<0.001) and 52 percentage points more likely to hesitate for unmarried women compared to their married counterparts (95% CI: 44.5, 58.6; p<0.001).

Discussion

Young women all over the world have unmet needs for modern contraception, and provider bias appears to contribute to this problem. However, this study calls into question the notion that providers are biased against youth *because of their age*. Rather, we document that marital status and parity drive providers' decisions to offer services or counsel on modern methods, while the

age of the client, conditional on marital status and parity, had limited influence on provider behavior.

We observed notable variation across countries in the characteristics that influence a provider's decision to provide contraception and in the size of the effect. Bias was most visible in Pakistan where providers were more likely to deny services, deny a modern method, to believe injectables to be inappropriate, and to hesitate to provide counseling to both nulliparous and unmarried women, relative to (parous and married women, respectively). The effect sizes were large, with Pakistani providers nearly four times as likely to decline counseling for unmarried relative to married women and more than twice as likely to decline counseling for nulliparous women relative to parous women. Bias was subtler in Tanzania and Burkina Faso and was mostly driven by attitudes towards nulliparous women; providers were more likely to deny modern methods (both) and to think injectables were inappropriate (Burkina Faso) for nulliparous women compared to parous women, although the effect sizes were more modest than what we observed in Pakistan. The fact that attitudes towards nulliparous women were a key driver of provider bias across three countries with very different settings adds to the external validity of this finding and suggests that such attitudes could be driving providers' biases elsewhere.

The unique contribution of our study lies in the experimental methodology. Our DCE approach presented randomly assigned client age, parity, and marital status profiles to providers, who were then asked a series of questions about how they would provide family planning counseling to these hypothetical clients. This methodology allows us build upon beyond previous literature on the associations of client attributes on provider behavior. Our DCE approach disentangles the effects

of age on a provider's decision to provide contraception from the effects of parity and marital status, two potential confounders.

The DCE findings can be put in context using the self-reported belief data in the provider survey, suggesting important differences across providers in terms of beliefs and attitudes towards youth counseling. Providers in all three countries counsel youth several times a week and report being close to youth who have experienced severe post-pregnancy problems. They report not being embarrassed by having conversations with young clients about family planning and feel a sense of responsibility to teach youth how to behave. However, provider beliefs around youth family planning differ substantially across contexts, which reflects both the heterogeneity among providers and the different social, cultural and professional norms in which they work.

We observe that Pakistani providers have the most traditional self-reported attitudes around contraceptive counseling, both based on client age and marital status. Most providers in our study report that family planning counseling should differ based on marital status, and most believe that young women should either have her spouse or mother consent to her contraceptive choices. Pakistani providers tend to think that women should have children soon after marriage, and that use of contraception increases promiscuity. As discussed earlier in the paper, the legal and social context in Pakistan is likely to heavily influence these self-reported measures, as well as the DCE outcomes. Additionally, there are many more doctors in our Pakistani sample than in Burkina Faso or Tanzania, where there are larger shares of nurses and nurse-midwives, which may contribute to the differences in behaviors.

In Burkina Faso and Tanzania, on the other hand, fewer providers report having strongly held traditional beliefs. Almost 90% of Burkinabé providers believe that contraceptive access should not depend on marital status, and most Tanzanian providers agree with this as well. Most providers surveyed in Burkina Faso and Tanzania believe that women do not need parental or spousal consent for decisions about family planning. Providers in both countries acknowledged the potential for improved employment opportunities if women avoided adolescent pregnancy. However, when asked whether contraceptives are appropriate for all ages, 66% of Tanzanian providers and only 29% of Burkinabé providers responded affirmatively. Neither group of providers in our sample reported religious beliefs or fear of increasing promiscuity as a reason for not providing family planning counseling to youth.

Our DCE has the unique ability to disentangle the contributions of different highly correlated client attributes (age, marital status, and parity). However, this approach also has limitations. Providers reported how they would act in a hypothetical situation, yet it is possible that their actual behavior would differ from what they reported. Without more information, it is difficult to know the direction of the bias. Social desirability bias could have pushed either more progressive or more conservative responses relative to actual behavior, depending on how providers perceived the enumeration team. The "know-do" gap between what providers know about proper guidelines and standards of care and how they behave has been documented elsewhere, and suggests a social desirability bias that would lead to reporting more progressive beliefs/behaviors (Mohanan et al., 2015). Contextualizing the DCE findings with the provider self-reported beliefs and behaviors is important, because these data hint at the vastly different professional, social and cultural norms that pervade the workplaces of these providers. This study does not examine these differences

directly but highlights possible avenues for future work and mechanisms through which providers may be making decisions.

In conclusion, using DCE methodology that experimentally varies client attributes, we provide new insight into why providers might refrain from providing modern methods to young women. We find that that parity (and in some cases marital status), not only age, drives provider decisions. Interventions to address provider attitudes about how contraception and parity interact should be explored.

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Tables

Table 1. Provider-level Demographics

	Full Sample	***Burkina Faso***	***Tanzania***	***Pakistan***
Age				
Young provider (<33 years)	19.2%	18.3%	31.4%	8.5%
Midcareer provider (34-42 years)	47.1%	62.1%	37.7%	40.5%
Older provider (>42 years)	28.4%	19.6%	30.9%	35.0%
Provider type				
Doctor	17.3%	0.5%	7.4%	44.0%
Midwife or Nurse Midwife	53.2%	91.6%	18.5%	46.5%
Nurse	25.1%	6.2%	64.9%	7.0%
Religion				
Provider Muslim	51.5%	31.0%	24.5%	98.0%
Provider Christian	47.9%	68.2%	75.5%	1.0%
Marital status				
Provider married	75.4%	68.2%	70.0%	88.0%
Provider unmarried	24.6%	31.8%	30.0%	12.0%
Children				
Provider has children	87.1%	88.2%	83.2%	89.5%
Provider has no children	12.9%	11.8%	16.8%	10.5%
N	790	302	288	200

Note: Countries are significantly different from each other on all variables with $p<0.001$, except for provider parity ($p=0.004$)

Table 2. Provider beliefs and behaviors

	Full Sample	***Burkina Faso***	***Tanzania***	***Pakistan***
Provider Beliefs				
Close to youth with serious post-pregnancy health problem	80.9%	73.1%	80.2%	89.5%
Not embarrassed to discuss sexuality with young clients	68.3%	57.9%	80.1%	68.0%
Young people have modesty when talking about sex	25.5%	26.6%	34.9%	15.5%
Young people aged 15-24 do not take longer to counsel than older clients	34.8%	13.6%	43.2%	48.5%
Feels responsibility to teach youth how to behave	93.0%	97.9%	94.5%	86.0%
Young couples should not have children as soon as possible after marriage	36.3%	41.5%	54.3%	14.0%
Provider religion does not consider it sinful for unmarried girls to use contraception	43.6%	58.3%	60.5%	12.5%
Providing contraception does not increase promiscuity	54.8%	75.7%	66.1%	22.5%
Young married & unmarried clients should have same family planning	49.3%	88.0%	49.4%	9.5%
Unmarried clients do not require parental consent	60.1%	90.6%	71.4%	18.0%
Young married clients do not require spousal consent	54.0%	78.3%	54.5%	28.5%
Poor girl can get better job if she avoids adolescent pregnancy	67.5%	70.3%	83.1%	50.0%
Provider enjoys working with young clients	74.9%	64.7%	94.9%	66.5%
Sex is healthy part of life for youth	59.1%	69.0%	29.3%	77.0%
Contraceptive methods are appropriate for all ages	42.8%	29.3%	66.3%	34.5%
Provider behaviors				
Counsels youth (14-18) several times per week	44.7%	61.1%	52.0%	21.0%
Counsels youth (19-24) several times per week	81.0%	84.8%	69.5%	88.0%
IUD is an appropriate method for young women without children	37.1%	70.0%	27.3%	12.5%
N	790	302	288	200

Figure 1 Summary statistics of outcome variables

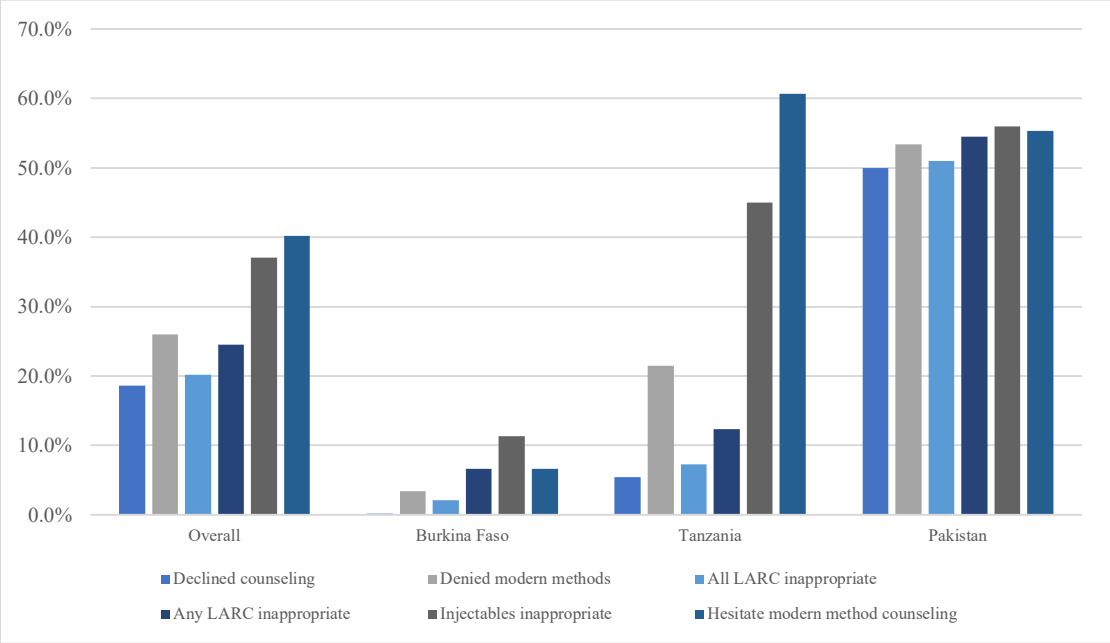
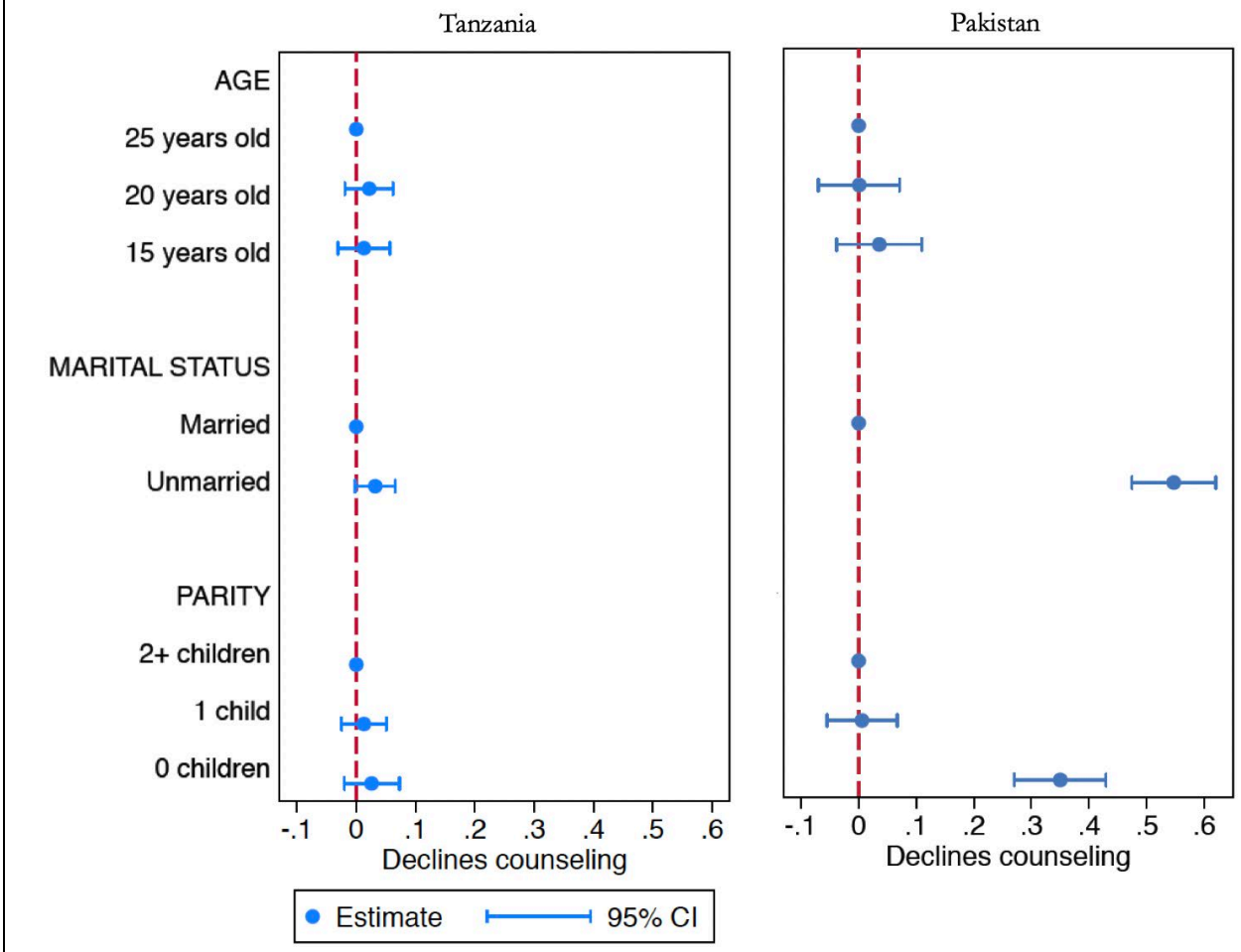
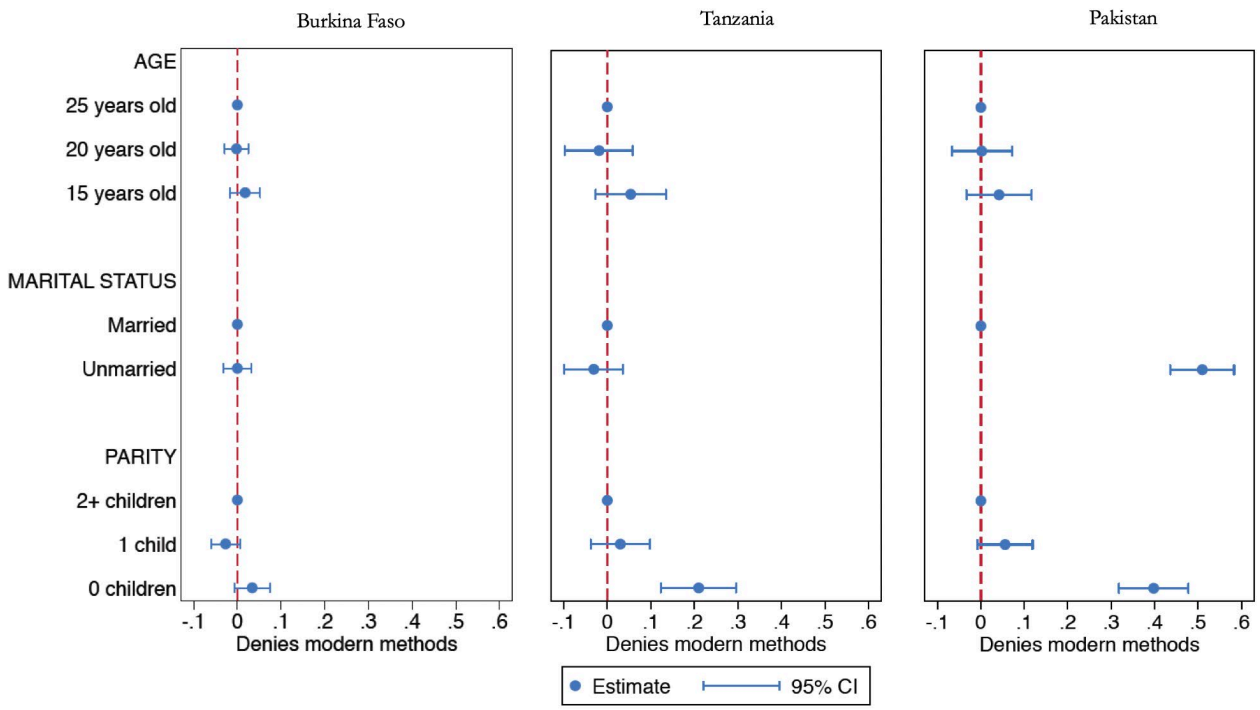


FIGURE 2 Provider declines to provide family planning counseling to client



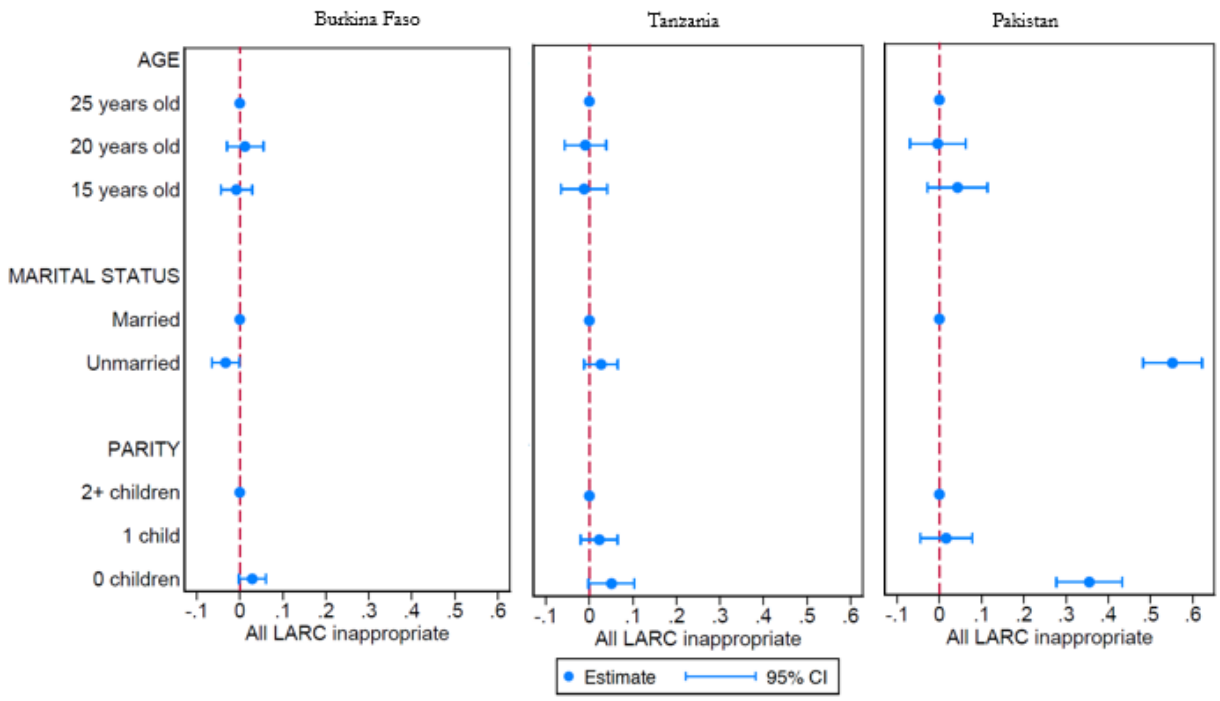
Notes: (1) Burkina Faso is not included because all providers in Burkina Faso reported that they would provide counseling, independent of client profile. (2) Marginal effect sizes and 95% confidence intervals obtained from country-specific binary logistic regression of outcome on age, marital status, and parity. Reference group for age is 25 years, for marital status is married, and for parity is 2+ children. Standard errors are clustered at the provider level.

FIGURE 3 Provider denies modern family planning methods to client



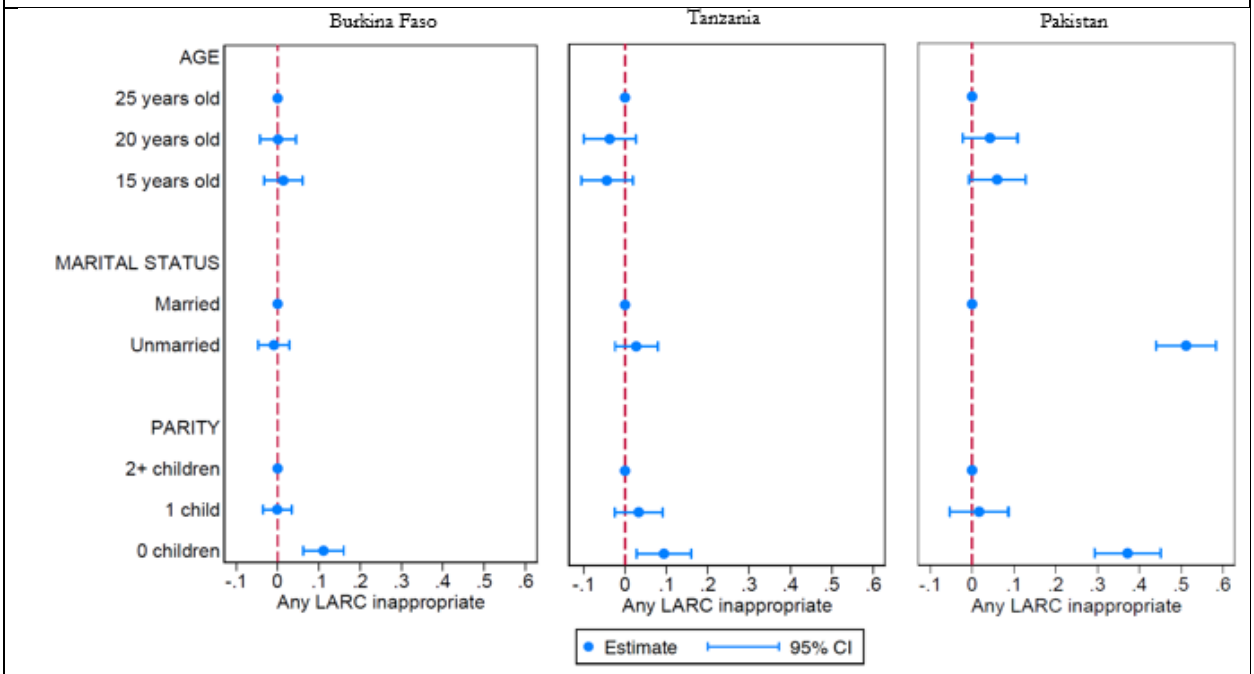
Notes: Marginal effect sizes and 95% confidence intervals obtained from country-specific binary logistic regression of outcome on age, marital status, and parity. Reference category for age is 25 years, for marital status is married, and for parity is 2+ children. Standard errors are clustered at the provider level.

FIGURE 4 Provider thinks all long acting reversible contraceptives are inappropriate for this client



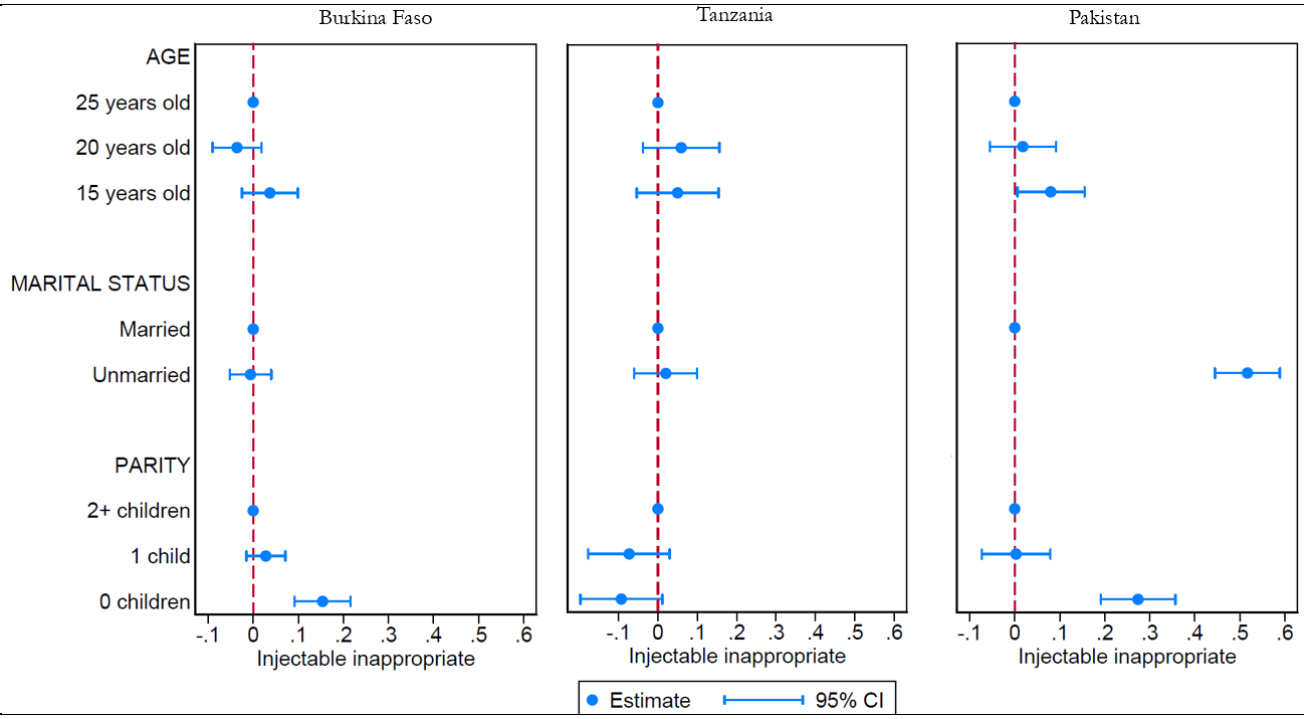
Notes: (1) In Burkina Faso, the model cannot be estimated for the case of "1 child" because no providers indicated they think that all LARCs are inappropriate for this profile. Overall, only 16 Burkinabe providers responded affirmatively to this question, for any client profile. (2) Marginal effect sizes and 95% confidence intervals obtained from country-specific binary logistic regression of outcome on age, marital status, and parity. Reference category for age is 25 years, for marital status is married, and for parity is 2+ children. Standard errors are clustered at the provider level.

FIGURE 5 Provider thinks any long acting reversible contraceptive is inappropriate for this client



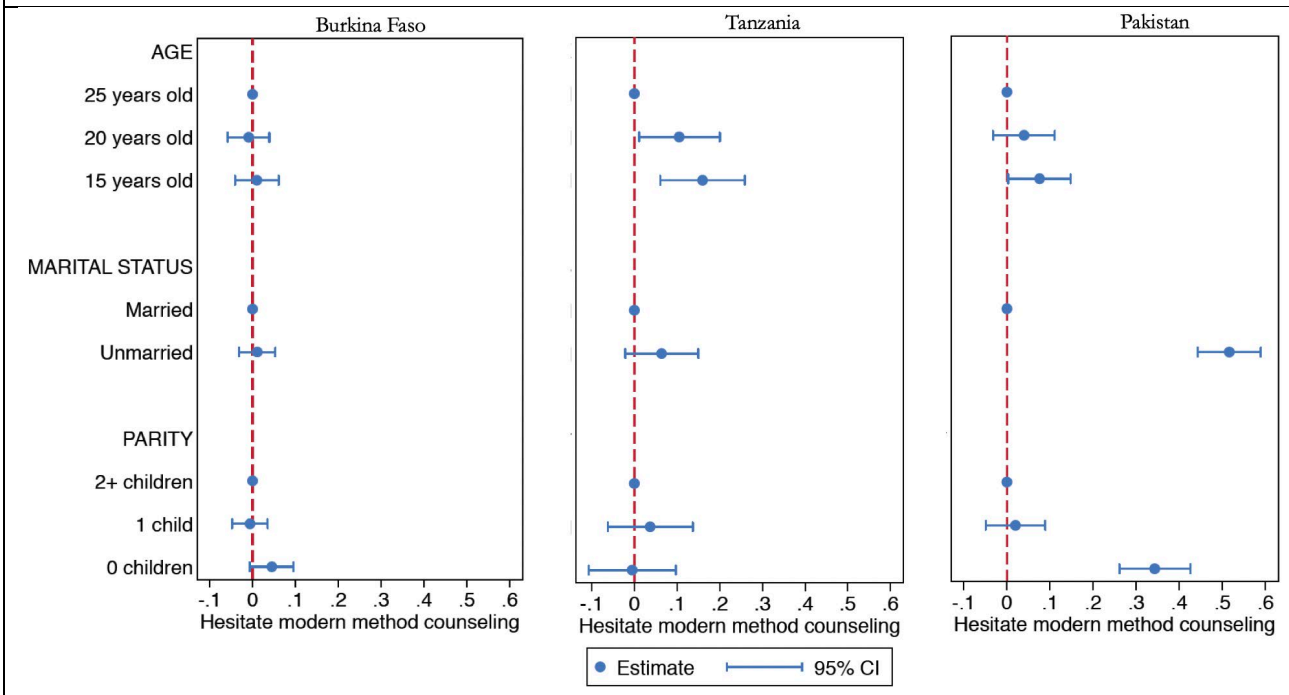
Notes: Marginal effect sizes and 95% confidence intervals obtained from country-specific binary logistic regression of outcome on age, marital status, and parity. Reference category for age is 25 years, for marital status is married, and for parity is 2+ children. Standard errors are clustered at the provider level.

FIGURE 6 Provider thinks that injectables are inappropriate for this client



Notes: Marginal effect sizes and 95% confidence intervals obtained from country-specific binary logistic regression of outcome on age, marital status, and parity. Reference category for age is 25 years, for marital status is married, and for parity is 2+ children. Standard errors are clustered at the provider level.

FIGURE 7 Provider would hesitate to provide counseling on modern methods to this client



Notes: Marginal effect sizes and 95% confidence intervals obtained from country-specific binary logistic regression of outcome on age, marital status, and parity. Reference category for age is 25 years, for marital status is married, and for parity is 2+ children. Standard errors are clustered at the provider level.

Appendix Table 1. Summary Statistics of Outcome Variables

	(1) *Declines counseling*	(2) *Denies modern method*	(3) *All LARCs inappropriate*	(4) *Any LARC inappropriate*	(5) *Injectables inappropriate*	(6) *Hesitate modern method counseling*
Pooled						
Overall	18.6%	26.0%	19.2%	41.4%	37.1%	40.2%
15 years old	19.3%	28.3%	19.7%	44.6%	40.2%	43.5%
20 years old	17.0%	22.9%	17.5%	38.8%	34.8%	39.2%
25 years old	19.5%	26.7%	20.3%	41.0%	36.2%	38.0%
Married	8.0%	17.0%	8.8%	31.7%	26.8%	28.7%
Unmarried	28.3%	34.1%	28.6%	50.3%	46.4%	50.7%
Nulliparous	26.9%	39.2%	27.9%	51.8%	45.0%	47.9%
1 child	14.3%	19.5%	14.5%	35.4%	31.8%	36.3%
2+ children	13.7%	17.7%	14.2%	36.0%	33.5%	35.6%
Burkina Faso						
Overall	0.2%	3.4%	1.5%	14.9%	11.3%	6.6%
15 years old	0.5%	4.3%	1.4%	19.3%	15.5%	7.7%
20 years old	0.0%	2.8%	0.9%	11.3%	7.5%	5.6%
25 years old	0.0%	3.0%	2.0%	14.2%	11.2%	6.6%
Married	0.0%	3.5%	1.9%	15.4%	11.5%	6.1%
Unmarried	0.3%	3.3%	1.0%	14.4%	11.1%	7.2%
Nulliparous	0.4%	6.2%	2.7%	27.4%	20.4%	9.7%
1 child	0.0%	0.5%	0.0%	9.6%	7.6%	4.6%
2+ children	0.0%	3.1%	1.5%	5.7%	4.6%	5.2%
Tanzania						
Overall	5.5%	21.5%	5.8%	50.4%	45.0%	60.7%
15 years old	5.6%	26.1%	5.6%	51.1%	46.7%	67.8%
20 years old	6.3%	18.3%	6.8%	49.7%	47.1%	62.3%
25 years old	4.6%	20.4%	5.1%	50.5%	41.3%	52.6%
Married	3.9%	23.9%	4.3%	49.4%	43.9%	57.6%
Unmarried	6.7%	19.6%	7.1%	51.3%	45.8%	63.1%
Nulliparous	6.6%	34.5%	7.1%	49.7%	41.1%	58.9%
1 child	5.5%	15.8%	6.0%	48.1%	43.2%	62.8%
2+ children	4.3%	13.4%	4.3%	53.5%	50.8%	60.4%
Pakistan						
Overall	50.0%	53.3%	50.0%	60.2%	56.0%	55.3%
15 years old	52.6%	56.3%	52.6%	65.6%	60.9%	59.4%
20 years old	46.6%	49.7%	46.6%	58.6%	52.9%	53.4%
25 years old	50.7%	53.9%	50.7%	56.7%	54.4%	53.5%
Married	20.4%	25.7%	20.4%	33.8%	28.2%	27.5%
Unmarried	76.6%	78.2%	76.6%	83.9%	81.0%	80.4%
Nulliparous	74.1%	78.8%	74.1%	79.7%	75.0%	78.3%
1 child	36.7%	41.7%	36.7%	49.2%	45.2%	43.2%
2+ children	37.0%	37.0%	37.0%	49.7%	46.0%	42.3%

Appendix Table 2. Marginal Effect Sizes from DCE Analysis

	Declines counseling 1			Denies modern methods			All LARC inappropriate 1			Any LARC inappropriate			Injectables inappropriate			Hesitates modern method counseling		
	TZ	PK	BF	TZ	PK	BF	TZ	PK	BF	TZ	PK	BF	TZ	PK	BF	TZ	PK	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(12)	(13)	(14)	
Reference: 25 years old																		
20 years old	0.021	0.000	-0.002	-0.019	0.000	-0.015	0.021	0.000	-0.029	-0.006	0.052	-0.036	0.059	0.018	-0.009	0.106 **	0.037	
	(0.020)	(0.035)	(0.014)	(0.039)	(0.034)	(0.017)	(0.021)	(0.035)	(0.030)	(0.049)	(0.034)	(0.027)	(0.050)	(0.038)	(0.025)	(0.048)	(0.035)	
15 years old	0.012	0.036	0.017	0.054	0.042	-0.008	0.007	0.036	0.044	0.003	0.105 ***	0.037	0.050	0.080 **	0.010	0.160 ***	0.076 **	
	(0.022)	(0.037)	(0.018)	(0.041)	(0.037)	(0.019)	(0.023)	(0.037)	(0.034)	(0.053)	(0.036)	(0.032)	(0.053)	(0.038)	(0.026)	(0.050)	(0.036)	
Reference: 2+ children																		
1 child	0.012	0.006	-0.027	0.029	0.057 *		0.017	0.006	0.038	-0.053	0.008	0.028	-0.073	0.003	-0.006	0.037	0.021	
	(0.019)	(0.031)	(0.017)	(0.035)	(0.032)		(0.020)	(0.031)	(0.025)	(0.054)	(0.040)	(0.022)	(0.053)	(0.039)	(0.021)	(0.050)	(0.035)	
0 children	0.026	0.351 ***	0.034 *	0.208 ***	0.401 ***	0.011	0.031	0.351 ***	0.215 ***	-0.036	0.289 ***	0.154 ***	-0.093 *	0.274 ***	0.045 *	-0.005	0.346 ***	
	(0.024)	(0.040)	(0.020)	(0.044)	(0.040)	(0.014)	(0.024)	(0.040)	(0.036)	(0.054)	(0.042)	(0.032)	(0.053)	(0.042)	(0.026)	(0.052)	(0.041)	
Reference: married																		
Unmarried	0.031 *	0.547 ***	0.000	-0.031	0.509 ***	-0.014	0.031 *	0.547 ***	-0.012	0.017	0.489 ***	-0.006	0.020	0.517 ***	0.011	0.064	0.515 ***	
	(0.017)	(0.036)	(0.017)	(0.034)	(0.037)	(0.014)	(0.017)	(0.036)	(0.026)	(0.041)	(0.036)	(0.024)	(0.041)	(0.037)	(0.021)	(0.043)	(0.036)	
Overall mean	0.05	0.50	0.03	0.22	0.53	0.02	0.06	0.50	0.15	0.50	0.60	0.11	0.45	0.56	0.07	0.61	0.55	
Observations	567	600	617	567	600	420	567	600	617	567	600	617	567	600	617	567	600	

Marginal effects from logistic regression of each client attribute level relative to reference group on binary outcome of interest, conditional on other client attributes. (Equation 1)

1 Burkina Faso model could not be estimated due to perfect prediction. In "declines counseling" age, marital status, and parity are perfectly predictive. In "all LARC inappropriate" parity of 1 is perfectly predictive.

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1