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Characterizing provider bias in contraceptive care in Tanzania and Burkina Faso: A mixed-methods study

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ABSTRACT

Provider bias based on age, marital status, and parity may be a barrier to quality contraceptive care. However, the extent to which bias leads to disparities in care quality is not well understood. In this mixed-methods study, we used four different data sources from the same facilities to assess the extent of bias and how much it affects contraceptive care. First, we surveyed providers in Tanzania and Burkina Faso (N = 295) to assess provider attitudes about young, unmarried, and nulliparous clients. Second, mystery clients anonymously visited providers for contraceptive care and we randomly assigned the reported age, marital status, and parity of each visit (N = 306). We used data from these visits to investigate contraceptive care disparities across 3 domains: information provision and counseling quality, contraceptive method provision, and perceived treatment. Third, we complemented mystery client data with client exit surveys (N = 31,023) and client in-depth interviews (N = 36). In surveys, providers reported biased attitudes against young, unmarried, and nulliparous clients seeking contraceptives. Similarly, we found disparities according to these characteristics in the reporting of contraceptive care quality; however, we found that each characteristic affected a different quality of care domain. Among mystery clients we found age-related disparities in the provision of methods; 16/17-year-old clients were 18 and 11 percentage points less likely to perceive they could take a contraceptive method relative to 24-year-old clients in Tanzania and Burkina Faso, respectively. Unmarried mystery clients perceived worse treatment from providers compared to married clients. Nulliparous mystery clients reported lower quality contraceptive counseling than their parous counterparts. These results suggest that clients of different characteristics likely experience bias across different elements of care. Improving care quality and reducing disparities will require attention to which elements of care are deficient for different types of clients.

1. Introduction

Access to contraceptive care allows individuals to achieve their reproductive goals by controlling whether and when they get pregnant. To access most contraceptive methods, people interact with a health care provider or the health care system (Rodriguez et al., 2014). High quality contraceptive care is person-centered and includes access to a range of contraceptive methods (Sudhinaraset et al., 2018). Person centered care is driven by clients' personal values, preferences, and needs, and recognizes clients' rights to fully informed decision-making, autonomy, dignity, privacy, and confidentiality (Rodriguez et al., 2014; Bruce, 1990). However, poor-quality contraceptive care is widespread, particularly in low- and middle-income countries (LMICs). In a recent study in eight LMICs, fewer than half of contraceptive users received high-quality services (Leslie et al., 2017). Low quality care can influence future care-seeking behavior. Individuals make decisions about whether and where to seek contraceptive services based on the quality of previously received contraceptive services (Speizer et al., 2022; Tumlinson et al., 2015a). Numerous qualitative studies have identified poor quality and negative provider treatment of contraceptive clients as a barrier to

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contraceptive use, particularly for adolescents, unmarried, and nulliparous clients (Bain et al., 2021). However, there is limited data quantifying the extent to which clients with these characteristics receive lower quality care than their older, married, or parous counterparts.

Provider bias toward specific types of clients has been identified as a driver of poor-quality care and a barrier to contraception access and use (Bain et al., 2021; Solo and Festin, 2019). In previous research, providers report limiting access to contraceptive care or to specific contraceptive methods for young, unmarried, and nulliparous women (Pleasants et al., 2019; Schwandt et al., 2017; Sidze et al., 2014; Dieci et al., 2021). Providers' attitudes about sex, gender, fertility, and families may be one source of client-related bias (Solo and Festin, 2019). For example, social norms about premarital sex may cause a provider to think contraceptive methods are inappropriate for unmarried clients (Starling et al., 2017). Providers may also hold beliefs and biases about which contraceptive methods best align with particular client characteristics (Solo and Festin, 2019; Starling et al., 2017; Burgess et al., 2007; Tyler et al., 2012). For instance, providers who believe that a specific method can cause infertility may be more likely to restrict access for nulliparous clients (Solo and Festin, 2019; Tumlinson et al., 2015b).

Although provider bias can affect provider behavior and, ultimately, quality of care, we have a limited understanding of the magnitude of this relationship and whether it leads to disparities in care. Limitations in methodologies hinder the generalizability and comparison of findings within and across settings. Provider bias has most often been assessed through measuring providers' attitudes and self-assessed behavior (Schwandt et al., 2017; Sidze et al., 2014; Tumlinson et al., 2015b; Calhoun et al., 2013; Sieverding et al., 2018), but there is less literature documenting how clients experience bias (Solo and Festin, 2019), particularly in the same facilities where provider attitudes have simultaneously been measured. Studies using data from exit surveys of contraceptive clients have shown inconsistent results: some have found no differences across client age groups (Speizer and Calhoun, 2020) while others have found that young clients report receiving better care than their older counterparts on some measures (Moucheraud et al., 2022).

Assessing the effect of client characteristics using exit surveys has several limitations. First, social desirability bias in exit surveys is well documented (Solo and Festin, 2019) and could be correlated with client characteristics. Second, client characteristics could be correlated with other factors that confound the estimated effect of each characteristic (e.g. younger clients could also be poorer). Third, clients that visit clinics are a select sample, and the young, unmarried, or nulliparous clients that come into the clinic might be systematically different from the people with these characteristics who avoid visiting the clinic. Several studies use mystery clients to overcome these issues, which are less prone to social desirability bias and allow for controlled variation in client characteristics. These studies have explored contraceptive care quality in a number of settings and found mixed results in terms of disparities in care (Sieverding et al., 2018; Mchome et al., 2015; Hazel et al., 2021; Chandra-Mouli et al., 2014; Shukla et al., 2020; Tumlinson et al., 2022). However, these studies compare only a small number of mystery client profiles (e.g. young, nulliparous, and unmarried mystery clients vs. older, married, and parous mystery clients) or have not been designed to evaluate age, marital status, and parity specifically, which does not allow for assessment of which individual characteristics are most important or how different characteristics affect different quality of care domains.

In this paper, we leverage provider- and client-level datasets to overcome limitations in past provider bias research. This is the first study to estimate the effect of client age, marital status, and parity on quality-of-care outcomes using randomized variation in these mystery client attributes. We first describe the extent to which providers hold biased attitudes against young clients, unmarried clients, and nulliparous clients using data from a provider survey. Then within the same facilities, we use mystery client visits with randomized client attributes to measure care quality and how this differs by age, marital status, and parity. In addition, we collect data from real clients at the same facilities via exit surveys and qualitative interviews, which we use to complement the mystery client data. Therefore, we are able to use multiple data sources from the same clinics to comprehensively understand provider bias and how bias impacts care quality.

2. Conceptual framework

Provider bias may manifest as implicitly or explicitly held beliefs and attitudes toward certain clients, contraceptive methods, or a combination of the two. These attitudes and beliefs may (or may not) cause providers to treat different clients differently, for example denying services to some, offering less information, not taking into account client preferences during counseling, offering only a subset of contraceptive methods, or treating clients judgmentally or poorly (Solo and Festin, 2019; Starling et al., 2017; Mann et al., 2021). However, susceptibility to provider bias may vary by different elements of contraceptive care. For instance, a provider may offer the same information and method choices to all clients, while acting more disrespectfully toward certain clients. Conversely, providers may restrict some clients' access to certain methods, while treating all with equal respect. As such, we analyze provider attitudes and three distinct domains of quality of care: (1) information provision and counseling quality, (2) contraceptive method provision, and (3) perceived treatment (summarized in Fig. 1).

3. Study setting

This study was conducted in Tanzania and Burkina Faso. Thirty eight percent of women in Tanzania use contraception, higher than the 30% in Burkina Faso (World Population Dashboard [Internet]). Both countries share a similar fertility rate (~4.6), age at first sex for women (17.2 in Tanzania and 17.7 in Burkina Faso), and age at marriage for women (19.2 in Tanzania and 20 in Burkina Faso) (World Population Dashboard [Internet]; Ministry of Health and Community Development, 2016; The World Bank. World Bank Gender Data Portal). In both countries, premarital childbearing and premarital sexual activity is discouraged while having children after marriage is highly valued and tied to social status (Bazié et al., 2022; Schuler et al., 2011).

4. Methods

4.1. Data

We draw on data collected as part of the Beyond Bias study, a randomized controlled trial conducted between September 2020 and August 2021 to evaluate the effectiveness of an intervention that aimed to decrease contraceptive provider bias against young clients, regardless of their marital status or parity. This analysis uses only data collected among facilities enrolled in the control arm of the trial that were not exposed to the Beyond Bias intervention (See Wagner et al. for information about the intervention and evaluation (See Wagner et al.,

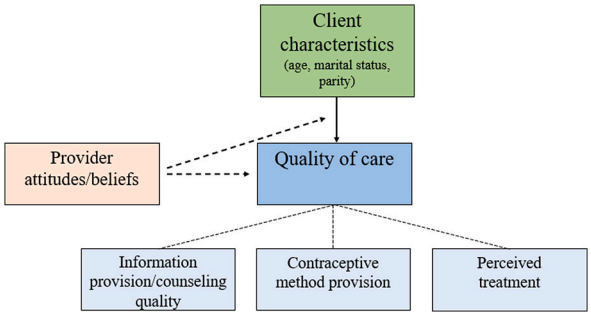

Fig. 1. Study conceptual model.

2023).). We include only control facilities to understand whether provider attitudes and disparities in care quality exist in the absence of an intervention addressing provider bias.

Data were collected from 76 public primary care facilities: 37 in Tanzania (in the urban and semi-urban areas of Dar es Salaam) and 39 in Burkina Faso (across Ouagadougou, Banfora, and Bobo districts, and including urban, semi-urban, and rural settings). In both countries, facilities were selected because they had existing relationships with Pathfinder International, a non-governmental organization that implemented the Beyond Bias intervention. Although Pakistan was part of the Beyond Bias project, we exclude Pakistan from this analysis because of data limitations. The RAND Human Subjects Protection Committee as well as national committees in each country approved this study.

4.1.1. Provider survey data

Providers were surveyed in August 2021. In Tanzania, we invited all providers at enrolled facilities to participate in the survey. In Burkina Faso, where the total number of providers was larger, we selected a sample proportional to the number of providers at each facility; however, we attempted to survey all providers in facilities with fewer than five providers. We achieved a response rate of 95% in Burkina Faso and 82% in Tanzania.

Provider surveys were conducted in-person by trained enumerators. The survey covered provider characteristics, professional training and experience, attitudes about contraceptive care for young, nulliparous, and unmarried women, self-reported behavior about contraceptive method dispensing, and clinic characteristics.

We surveyed 141 providers in Tanzania and 154 providers in Burkina Faso. Providers in both Tanzania and Burkina Faso were majority female, on average 40 years old, had been providing contraceptive care for over 5 years, were married, and had at least one child (Table 1). In Tanzania, providers were overwhelmingly nurses, midwives, or nurse/midwives (99%) who provided contraceptive care 3–5 days per week (84%) and in Burkina Faso, nurses, midwives, or nurse/midwives (97%) who provided contraceptive care 6–7 days per week (84%).

Table 1
Provider and client characteristics among all facilities, Tanzania and Burkina Faso.

	Tanzania	Burkina Faso
Facilities	37	39
Providers	N = 141	N = 154
Age (years)	39.3	40.9
Female	91.5%	81.8%
Experience as contraceptive provider		
≤5 years	32.1%	26.8%
>5 years	67.9%	73.2%
Married	79.9%	76.5%
Has child	90.7%	90.9%
Provider qualifications		
Doctor/Health officer	0.7%	2.6%
Nurses, Midwifes, Nurse-midwives	99.3%	97.4%
Days offer contraceptive services per week		
1-2	3.6%	2.0%
3-5	83.7%	14.3%
6-7	12.8%	83.8%
Facility client socioeconomic status reported by providers		
Well off/middle class	12.8%	6.5%
Poor or vulnerable	34.8%	30.5%
A mix	49.7%	57.8%
Don't know	2.8%	5.2%
Clients (client exit)	N = 12,658	N = 18,365
Age (mean)	27.3	27.3
Married	66.7%	77.6%
Parous	96.1%	91.4%
Secondary education or more	44.7%	32.2%
Average perceived SES[a] (mean)	2.8	3.0
Used contraception before (current or previous users)	75.2%	83.2%

[a] Clients were asked "Imagine six steps, where on the bottom, the first step, stand the poorest people, and on the highest step, the sixth, stand the rich".

4.1.2. Mystery clients

We trained enumerators to be mystery clients who assumed an age (16/17 or 24), marital status (unmarried and married), and parity (no children and one child). There was a profile representing every combination of these three attributes (8 total distinct profiles). Aside from these characteristics, mystery client characteristics were equivalent across profiles aside from characteristics generally coupled with age, marital status, and parity to make profiles believable (e.g., the 16/17-year-old unmarried profiles were students while other profiles were petty traders or street vendors). All mystery client profiles had never used contraception before and had at least some or completed secondary education depending on their age. Each clinic in the sample was randomly assigned 4 mystery client visits, stratifying on age, marital status, and parity – i.e., within each clinic, two visits were unmarried and two married, two visits were younger and two older, and two visits were nulliparous and two parous – which allows us to estimate the causal effect of each attribute on outcomes of interest without confounding from correlation with other client or clinic characteristics. The number of mystery client visits per facility was designed to minimize potential discovery of mystery clients. Mystery clients were also randomly assigned a method preference (implant or injectable) which they disclosed only if the provider asked their preference. Mystery clients underwent a rigorous seven-day training that emphasized memorizing the profiles and responses to common questions and paying attention to things that happen during the visit that needed to be recorded later in a survey (Wagner et al., 2023).

Mystery clients proceeded as normal clients through the care process, but at the end of the visit, they said they wanted time to think about the information and left without a method. Following each interaction, mystery clients reported whether they thought the provider suspected they were not real clients, and none did.

Within an hour of leaving the facility, supervisors administered debrief surveys to mystery clients. Surveys included questions about provider interactions including the counseling on contraceptive methods, perceived treatment, and whether they thought they could have received a method (any contraceptive method, an implant, and an injection) had they been a real client.

There were 148 and 158 mystery client visits in Tanzania and Burkina Faso respectively (Appendix Table 1).

4.1.3. Client exit surveys

Real clients who visited the clinic for contraceptive services were surveyed after their visit by young adult enumerators (aged 18–24), who spent 2–3 days per week at each facility for 12 consecutive months. Surveys covered client characteristics, services received, counseling on contraceptive methods, and the client's perception of how they were treated by the provider during the visit. Surveys were translated into Swahili and French, and for clients who spoke other languages, enumerators translated while administering the survey aloud. For this analysis, we excluded clients who stated they were not seeking a contraceptive method during their visit (3.8% of the sample) as the counseling and method dispensation outcomes are not relevant for this group.

We surveyed 12,658 clients in Tanzania and 18,365 clients in the client exit survey in Burkina Faso. Most clients surveyed were married, had at least one child, and had used a contraceptive method previously (Table 1). Six percent of clients in Tanzania and 11% of clients in Burkina Faso were under the age of 20.

4.1.4. Client in-depth interviews

We recruited young (under age 25) contraceptive clients for in-depth interviews at a subset of the 76 participating facilities. In total, we

conducted these interviews at 4 facilities in Burkina Faso and (due to lower client volumes) at 8 facilities in Tanzania aiming for geographic heterogeneity in our sample.

In Tanzania we interviewed new contraceptive users (n = 16). In Burkina Faso, we interviewed new and experienced contraceptive users (n = 20). We sampled across marital status and parity (Appendix Table 2). Interviewed clients in Tanzania were older, more often married, and more often nulliparous than the clients surveyed in the client exit survey of the same age range. In Burkina Faso, interviewed clients were more often younger and nulliparous while well-matched on marital status. Clients were interviewed in a private location either within or near the facility.

The client interview guides were semi-structured and aimed to capture the client's experience obtaining contraceptive care, including counseling provided, engagement of the client in decision-making, and how the provider addressed their age, marital status, and parity.

We piloted the qualitative interview guides prior to fielding. Interviews were conducted in local languages. Interviews were transcribed and translated to English by a professional transcriber and translator (not the interviewer).

4.2. Analysis

4.2.1. Quantitative Outcomes

4.2.1.1. Provider attitudes. To measure whether providers reported biased attitudes and beliefs, we evaluated agreement (or disagreement, depending on the statement phrasing) with a set of statements related to contraceptive care for young, unmarried, and nulliparous clients (e.g. "You would provide family planning services to a client even if you thought they were too young to use contraception"); those reporting a "neutral" attitude were grouped with more biased attitudes for each question as this indicated providers did not endorse the least biased attitude/belief. We also constructed three binary measures indicating whether providers self-reported not offering certain methods because a client was "too young", unmarried, or nulliparous, and examined which methods providers reported restricting to these groups.

4.2.1.2. Quality of care. We used the mystery client data and the client exit surveys to measure behavioral manifestations of provider bias. We defined outcomes in the domains of information provision and counseling quality, method dispensing, and perceived treatment. See Table 2 for definitions of each outcome within these domains that were measured both in the mystery client data and client exit data (unless otherwise noted). All items rely on client-reported survey items.

Mystery client data are our preferred source for these client outcomes for three reasons. First, the age, marital status, and parity of mystery clients were randomized and carefully stratified to isolate the effect of specific client characteristics. In contrast, real clients are a select sample and client characteristics could be correlated with unobserved variables affecting contraceptive care. Clients that avoid clinics might be the most likely to experience bias (Speizer et al., 2022). Second, mystery clients were trained to assess and report on outcomes that happened during the visit reducing recall bias and improving accuracy of outcome measurements. Third, mystery clients are less prone to social desirability bias than actual clients. However, mystery clients did not take a method due to ethical concerns. Only in the client exit data do clients actually receive contraceptive methods. We present client exit survey results in the Appendix (Tables 4, 8–13) as supplementary analyses for all outcomes.

4.2.2. Statistical analysis

For all client outcomes, we modeled the outcome adjusting for a set of client level covariates. Our linear regression models take the following form for the mystery client data (Equation (1)) and the client

Table 2
Outcome definitions.

Domain	Item	Definition and operationalization
Information provision and counseling quality	Counseled on a range of methods (binary)	Counseled on pills, implants, IUDs, and injections[c]
	Method information index (binary)	Adapted from the validated method-information index measure (Jain et al., 2019)[d] Informed of: • What to do in case of side effects/problems (client exit only) • Possible side effects/problems • Other methods of contraception aside from method received (client exit)/ More than one contraceptive method (mystery client) Assigned a zero if not all items were reported by the client.
	Essential questions index (continuous, range from 0 to 1)	Asked about: method preferences (1 point), birth spacing and limiting preferences (1 point), if the client had questions (1 point) (average)
	Encouraged any method (binary)[a]	The provider encouraged or recommended specific methods
	Discouraged any method (binary)[a]	The provider discouraged the client from using specific methods
Method dispensing[b]	Received a method (binary)	Received a method of contraception during their visit (exit survey); thought they could receive a method if they were a real client (mystery client)
	Received method of choice (binary)	Answered no to "After talking with the provider, is there a method that you would prefer more than the one that you received?" (exit survey); perceived they could have received the specific method they were assigned as a preference (implant or injection) (mystery client)
	Received specific methods (binary)	Received an implant, IUD (exit survey only), injection, or pill (exit survey only) during the visit. For mystery clients, perceived they could receive implants or injections.
Perceived Treatment	Not treated worse due to age/marital status/ parity (binary)[a]	Never felt like they were treated worse because of their age, marital status, and parity respectively
	Not treated differently based on sex life (binary)	Provider never made them feel uncomfortable because of their sex life
	Not judged nor scolded (binary)	Never felt judged or scolded by the provider
	Would recommend to friend (continuous, range 0.25–1)	Would recommend the clinic to a friend who needed a contraceptive method or advice (Not at all, somewhat, mostly, completely)[e]
	Perceived treatment index (continuous, range 1–4)	Average of 29 exit survey items, or 22 mystery client debrief survey items, that measured whether clients received respectful, non-judgmental, and engaging care

[a] Includes mystery client data only.
[b] If a client did not receive services, each of these outcomes was coded as zero.
[c] For exit survey data, we excluded methods that contradicted the client's stated preferences; and excluded clients who said they came to the facility to continue use of a method.
[d] For exit survey data, excluded clients who did not receive a method.

[e] Mystery clients were asked if they would recommend the clinic to a 17-year old friend specifically.

exit data (Equation (2)):

$$Y_{if} = \beta_0 + \beta_1 Young_{if} + \beta_2 Unmarried_{if} + \beta_3 Nulliparous_{if} + \alpha_f + \epsilon_{if} \quad (1)$$

$$Y_{if} = \beta_0 + \beta_1 Young_{if} + \beta_2 Unmarried_{if} + \beta_3 Nulliparous_{if} + \beta_4 Age20-24_{if} + \beta_{5-6}\mathbf{X_{if}} + \alpha_f + \epsilon_{if} \quad (2)$$

Where Y_{if} is one of our respective outcomes for individual i (a real client in the exit survey or a mystery client visit) from facility f. *Young* indicates the client's age is 16 or 17 in equation (1) and less than 20 years in equation (2), and β_1 is the disparity in the outcome between younger and older clients, holding other characteristics fixed. *Unmarried* indicates the client is unmarried and β_2 is the conditional disparity in the outcome between unmarried and married clients. *Nulliparous* indicates the client has no children and β_3 is the conditional disparity in the outcome between nulliparous clients and parous clients, and α_f is a set of facility fixed effects, which controls for the possibility that different types of clients visit different facilities. In the client exit data, β_4 is the conditional disparity between clients who are 20–24 years old and clients who are 25 or older and **X** is a vector of client characteristics that includes an indicator of whether the client had secondary education or more and the client's perceived socioeconomic status. We did not include any covariates other than facility fixed effects in the mystery client models because mystery client attributes were randomly assigned to each visit with facility stratification.

One potential limitation of the above empirical strategy in the client exit data is that clients with different characteristics may favor different method features. For instance, young clients may have been more likely to want a long-lasting method than older clients based on how long they want to avoid pregnancy. To address this, we ran a sensitivity analysis controlling for client method feature preferences, which was recorded in the exit survey. Because these questions were not asked to clients who wanted to continue using a method they had used previously, we restricted this analysis to clients who had never used contraception before (20% of the sample). Additionally, this analysis was conducted only among clients who reported receiving services at the facility, as those who did not receive services were not asked about their method feature preferences. In addition to the covariates listed above, we controlled for whether the client wanted a long-lasting method, a method highly effective at preventing pregnancy, a method that was easy to stop, a method that made it easy to get pregnant in future, a method with few side effects, a method with no need to take a pill, or had no method feature preference. We also controlled for whether the client said they knew what method they wanted before talking to the provider (yes/no).

Analyses were conducted in Stata v15.

4.2.3. Qualitative: client in-depth interviews

We iteratively generated a codebook based on the interview guides, existing provider bias literature, and a review of the transcripts. Our team of three researchers double-coded 5 client interviews (including interviews with clients who visited treatment facilities which are excluded from this analysis) to reach consistency in how codes were applied. Thematic analysis was conducted through the development of analytic memos to understand whether clients felt like their care was influenced by their age, marital status, or parity (Ritchie and Lewis, 2003; Glaser, 1965). Coding was conducted in Dedoose software.

5. Results

We first present findings from our analysis of provider attitudes and beliefs and then present findings from our analysis of the disparities in mystery client and client exit survey data, first by age, then marital status, and finally parity. We find that providers reported biased attitudes against young, unmarried, and nulliparous clients seeking contraceptives. Among clients, we found disparities according to age, marital status, and parity in reported contraceptive care quality; however, we found that each characteristic affected a different quality of care domain. At a high level, young clients experienced a disparity in method provision compared to older clients, unmarried clients perceived worse treatment than married clients, and nulliparous clients received worse counseling and information provision that parous clients.

5.1. Providers

In this section, we present provider attitudes and beliefs and self-reported method restrictions.

5.1.1. Attitudes

Table 3 shows that a large portion of providers in both countries considered age, marital status, and parity to be key factors in appropriate contraceptive care provision. The pattern of agreement with these 14 statements suggested many providers believe that care for younger, unmarried, and nulliparous clients should be more restrictive than for their counterparts, with certain methods and sometimes contraception itself viewed as inappropriate. For example, only about half of providers in both countries believed hormonal methods were appropriate for women under 20; approxiamtely 40% usually counselled unmarried youth to practice abstinence; 34% in Tanzania and 15% in Burkina Faso believed (or responded neutrally) that married women without children should not be using contraception at all; many providers in both countries believed that providing contraceptives to young unmarried women may make them more promiscuous (37% in Tanzania and 16% in Burkina Faso agreed with or answered neutrally to this statement) or contribute to the spread of HIV (33% and 23% agreed with or answered neutrally to this statement); and a non-trivial portion of providers in both countries thought unmarried women should not be offered the same contraception options as married women.

Although we found biased attitudes in both countries, providers surveyed in Tanzania generally had more biased attitudes than providers in Burkina Faso. For example, only 64% of providers in Tanzania indicated they would provide contraceptives to a client if they felt she was too young to be using contraception, compared to 94% of providers in Burkina Faso. A larger portion of providers in Tanzania indicated a biased attitude in each of the 14 statements assessed.

5.1.2. Self-reported method restrictions

Many providers also said directly that they would not offer certain methods because a client was too young, unmarried, or nulliparous (Fig. 2). Self-reported method restrictions were most common by age followed by parity, and differences between these were statistically significant. Only fifty-five percent of providers in Tanzania and 49% of providers in Burkina Faso said they would offer all methods to a client if they thought the client was "too young". Most commonly, providers in Burkina Faso restricted access to permanent methods while Tanzanian providers most often restricted injections by age (Appendix Table 3). Over 80% of providers in both Tanzania and Burkina Faso reported they did not restrict any methods for unmarried clients. Around two-thirds of providers in Tanzania and Burkina Faso said they did not restrict access to any methods for nulliparous clients. In Tanzania, providers most often reported restricting injections for nulliparous women (26%) while in Burkina Faso permanent methods were most restricted (24%) (Appendix Table 3).

Table 3
Provider attitudes about contraceptive services for young, unmarried, and/or nulliparous clients.

	Age	Marital status	Parity	Tanzania (N = 141)	Burkina Faso (N = 154)
Agree or strongly agree …					
Hormonal methods are safe for youth's growing bodies (under 20)	X			44.0%	53.2%
You would provide family planning services to a client even if you thought they were too young to use contraception	X			63.8%	94.2%
Young married clients and young unmarried clients should have the same family planning options		X		67.4%	89.0%
You feel comfortable providing contraception to a married client who has not yet had a child		X	X	80.9%	89.0%
Disagree or strongly disagree …					
You usually counsel unmarried clients under age 20 to practice abstinence	X			39.7%	59.7%
Young women without children should not use any product that might cause a delay in fertility once stopped	X		X	42.6%	44.8%
Young married clients do not require the consent of the husband before family planning is provided	X	X		58.2%	76.0%
Providing contraceptives for unmarried young women may make them more promiscuous	X	X		63.1%	83.8%
Providing young unmarried clients with a method of family planning makes you worry about the spread of HIV	X	X		67.4%	76.6%
Contraceptives are more appropriate for women at least 20 years old	X			69.5%	81.8%
It is important for women who have not yet been pregnant to first prove their fertility before using some family planning methods			X	49.6%	83.1%
Married women who do not have any children should not be using contraception		X	X	66.0%	85.1%
Unmarried youth clients do not require consent from their parents before family planning is provided	X	X		83.0%	93.5%
Contraceptives are more appropriate for married women than unmarried women		X		83.7%	95.5%

Table shows the percentage of providers in agreement or disagreement which each statement.
X denotes that the statement refers to the specified characteristic (age, marital status, and parity).

Table 4
Average client outcomes among mystery clients in Tanzania and Burkina Faso.

	Tanzania (N = 148)	*Burkina Faso (N = 158)*
Information provision/counseling		
Counseled on range of methods	72.3%	69.9%
Essential questions index (range: 0–1)	0.592	0.346
Method information index	72.3%	58.9%
No method encouraged	34.3%	70.3%
No method discouraged	36.4%	86.2%
Method dispensing		
Could have received a method	75.0%	60.8%
Could have received method of choice	45.3%	52.0%
Could have received implant	64.2%	49.3%
Could have received injectable	21.6%	48.3%
Perceived treatment		
Perceived treatment index (range: 1.5–3.9)	2.87	2.97
Would recommend	0.639	0.691
Not judged or scolded	81.8%	87.8%
Did not feel uncomfortable because of sex life	78.4%	96.2%
Not treated worse due to age	95.3%	93.0%
Not treated worse due to marital status	93.9%	97.5%
Not treated worse due to parity	83.7%	98.1%

Notes: Cells represent the mean outcome among mystery clients in each country.

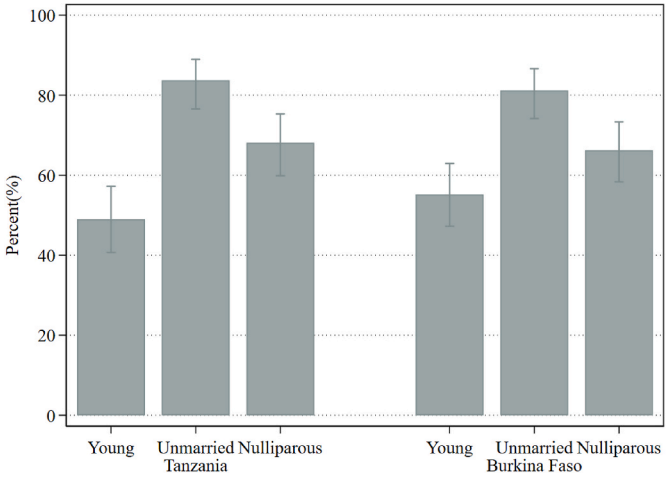

Fig. 2. Proportion of providers that self-report offering all contraceptive methods by client type (from provider self-report in provider survey)
Providers were asked "Are there any methods that you would not offer to a client because she is too young [unmarried/nulliparous]? Bars represent the percentage who answered "no" in each country by characteristic. 95% confidence intervals were calculated using logit-transformed confidence intervals. Tanzania, N = 141. In Burkina Faso, N = 154.

5.2. Client outcomes

5.2.1. Outcomes across the sample

Table 4 shows the average outcomes in each quality domain across mystery clients. In both countries, the majority of mystery clients were counseled on a range of contraceptive methods (72% in Tanzania and 70% in Burkina Faso). Counseling more often entailed recommending or discouraging use of specific methods in Tanzania than in Burkina Faso while Burkinabe mystery clients less often were asked essential questions and received less information about methods. In Tanzania, mystery clients reported that providers encouraged use of implants and discouraged use of injectables most commonly (Appendix Table 14), discouraging injections primarily due to side effects (data not shown). Only around half of mystery clients in both countries thought they would be able to receive their method of choice (45% in Tanzania; 52%

in Burkina Faso). In Tanzania, this was driven primarily by a lower proportion of clients reporting they would have been able to receive an injection if they were a real client compared to implants. In Burkina Faso, half of clients thought they could take either method. Receipt of the client's method of choice was much higher in client exit data (87% in Tanzania and 92% in Burkina Faso; Appendix Table 4).

5.2.2. Disparities in client outcomes

5.2.2.1. Age

5.2.2.1.1. Quantitative findings. In both countries, we found a pattern of age-based disparities in method provision among mystery clients, with negative coefficients on every outcome assessed in this domain (middle panel of Fig. 3). In Tanzania, younger mystery clients were significantly less likely to think they would be able to receive a method ($\beta = -0.18$, 95% CI: -0.31, -0.04, $p < 0.05$; Fig. 3). Younger mystery clients in Tanzania were also 7 to 11 percentage points less likely to think they would receive an injection and their method of choice, but these results were not statistically significant. In Burkina Faso, younger mystery clients were significantly less likely to think they could receive implants ($\beta = -0.15$, 95% CI: -0.30, 0.01, $p < 0.1$) or injections ($\beta = -0.19$, 95% CI: -0.36, -0.03, $p < 0.05$). Age effects for receiving a method of choice and any method in Burkina Faso were also negative and of an important magnitude among mystery clients (~11-13 percentage points), but not statistically significant. See Appendix Table 5 for all mystery client results.

In Burkina Faso, there was a pattern of worse perceived treatment among younger mystery clients, but no results were statistically significant, and this pattern was not present in Tanzania (top panel of Fig. 3). We did not find clear patterns of age-based disparities in counseling or information provision in either country for mystery clients.

Client exit survey findings in Burkina Faso supported the finding from the mystery clients that perceived treatment was worse for younger clients and younger clients were less likely to receive injections (Appendix Fig. 1). However, there were no other clear patterns of younger women receiving worse care than older women. In fact, younger clients received more comprehensive counseling than older clients in both countries and young clients in Tanzania were more likely to have received any method and received their method of choice than older clients. Young clients in both countries were more likely to have received implants while older clients in both countries were more likely to have received injections, pills, and IUDs. In Burkina Faso, contrary to the mystery client data, all clients in the client exit data were equally likely to receive any method and their method of choice.

Accounting for method feature preferences among new contraceptive users, young clients were still more likely to have received implants in both countries (difference of 15 percentage points in Tanzania and 10 percentage points in Burkina Faso) and less likely to have received injectables (difference of 4 percentage points in Tanzania and 7 in Burkina Faso) (Appendix Table 11).

5.2.2.1.2. Client in-depth interview findings. In qualitative interviews with clients, few clients reported age factored into their counseling. In Burkina Faso, all clients reported they were asked their age but did not feel like the provider treated them differently because of it. A few clients reported that the provider tried to make them feel more comfortable by normalizing contraceptive use among young women and students in particular. In Tanzania, most clients felt like the provider did not treat them differently because of their age and many emphasized they believed the provider would serve contraceptive clients well regardless of their age. One client said:

> "He serves me well … Unlike other hospitals, they work in teamwork to welcome patients. No matter what age, they are all the same. They welcome you and serve you. They listen to you and they give you whatever service you need." (20yo, married, parous, Tanzania)

Some clients thought that younger clients might be treated more "carefully" than older clients, emphasizing how providers made them feel like they were urging young clients (and students) to use contraception. One client said: "No she didn't condemn me [because of her age], she told me the truth that you have done yourself justice by coming here, so as to protect yourself totally, not sitting there and getting pregnant. …" Speaking about serving younger clients, this client goes on to say:

> "[the younger client] is the one that is meant to be served more than even me, because she is 15 years or 16, she is a student. She is meant to be served with that protection, she must be given even some more because many girls now are spoilt with teenage pregnancies that shouldn't be like so." (22yo, unmarried, parous, Tanzania)

Only one client in Tanzania thought that younger clients may be "questioned" by the provider about why they need contraception (23yo, unmarried, parous).

5.2.2.2. Marital status

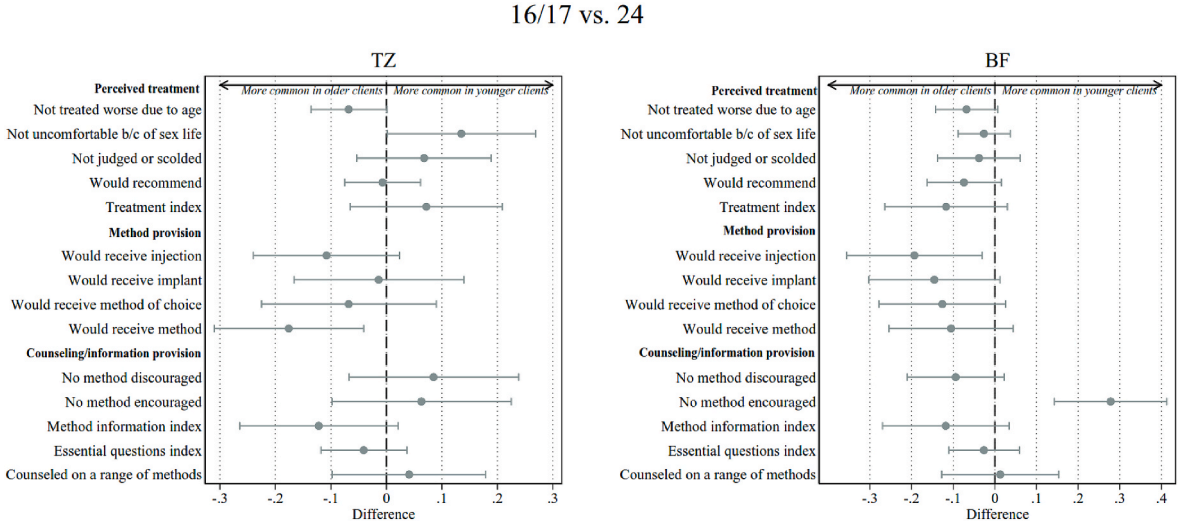

Fig. 3. Age-related disparities in contraceptive care quality among mystery clients
Figures show differences and 95% confidence intervals between younger and older clients for each given outcome. Differences estimated using regressions controlling for marital status and parity with facility fixed effects. In Tanzania, N = 148. In Burkina Faso, N = 158.

5.2.2.2.1. Quantitative findings. In both countries, unmarried mystery clients reported worse perceived treatment compared to married mystery clients (Fig. 4). The perceived treatment index was lower by 0.23 (95% CI: −0.36, −0.09, $p < 0.01$) and 0.18 (95% CI: −0.33, −0.03, $p < 0.05$) among unmarried mystery clients compared to married clients in Tanzania and Burkina Faso, respectively. The client exit survey also documented worse perceived treatment among unmarried clients (Appendix Fig. 2). A higher proportion of unmarried mystery clients were made to feel uncomfortable because of their sex lives compared to married clients in Tanzania (by 14 percentage points, 95% CI: .-27, −0.001, $p < 0.05$) (Appendix Table 6 & Fig. 4). There were no clear patterns of marital status disparities in the domains of information provision and counseling or in method provision (Fig. 4). Client exit data had conflicting results with married clients faring worse on some outcomes in these domains and better on others (Appendix Fig. 2). And while client exit data showed no differences in receipt of any method or the method of choice by marital status, small differences emerged in the dispensation of specific methods by marital status primarily in Burkina Faso where unmarried clients were less likely to receive pills but more likely to receive injections and implants.

5.2.2.2.2. Client in-depth interview findings. In qualitative interviews, there were few instances of clients describing how their marital status influenced their counseling or treatment from the provider. There was one example in Tanzania of a provider explicitly telling a client that IUDs were for married women saying: "She told me about the IUD, when you insert the IUD, you are meant to stay with you husband only, not today by surprise to whoever ….because the IUD is inserted in a place that where you and your husband ….if you will be using it with everyone, it can get lost and then it becomes dangerous and it will give you side-effects" (20yo, married, parous, Tanzania). In Burkina Faso, there were almost no instances in which a client mentioned that they perceived their marital status influenced their counseling.

5.2.2.3. Parity

5.2.2.3.1. Quantitative findings. Nulliparous mystery clients reported significantly worse counseling and information provision in Burkina Faso compared to parous clients (Fig. 5). This pattern existed for the point estimates in Tanzania, but estimates were not statistically significant. In both countries, nulliparous mystery clients were 12–14 percentage points less likely to be counseled on the full range of methods ($p < 0.1$ in Tanzania $p < 0.05$ in Burkina Faso). In Tanzania, nulliparous mystery clients were more often encouraged to take an implant and discouraged to use injectables than their parous counterparts (Appendix Table 14).There were no consistent parity disparities in method provision or perceived treatment in either data source; however, we did find some differences for a subset of outcomes. In Tanzania, nulliparous mystery clients were less likely to think they would have been able to receive an injection ($\beta = -0.16$, 95% CI: −0.29, −0.03, $p < 0.05$) while in Burkina Faso, nulliparous mystery clients were less likely to have thought they could receive any method ($\beta = -0.13$, 95% CI: −0.28, 0.02, $p < 0.1$) (Appendix Table 7). Client exit data suggested that nulliparous clients in Tanzania were more likely to receive pills and less likely to receive implants than their parous counterparts (Appendix Fig. 3). Results for implants and pills held among new users of contraception considering method feature preferences (Appendix Table 13). We could not draw consistent conclusions about perceived treatment by parity as results differed by country and data source. Nulliparous mystery clients reported better treatment in Tanzania while the opposite was true in Burkina Faso. We found no differences, however, by parity in the treatment index in the client exit data.

5.2.2.3.2. Client in-depth interview findings. In qualitative interviews with clients, few clients in Tanzania or Burkina Faso felt like they were treated differently because of their parity or reported the provider mentioned their parity in counseling; however, there were several examples of parity influencing counseling. A few clients in Tanzania recounted how the provider talked about injections in particular, discouraging their use given injections being too "strong" for use in nulliparous clients (22yo, married, nulliparous, Tanzania). In Burkina Faso, one client reported the provider told them after taking injections that they might not get pregnant after getting married (19yo, unmarried, parous, Burkina Faso).

In Burkina Faso there were some examples of how parity influenced the care a client received; a few clients perceived that if they were married and did not have children they might have been treated differently given expectations married women have children. One client reported how a provider told her a specific method (not specified which) could only be used by unmarried clients (presumably who did not have children) or married clients who already had 1-2 children. In Tanzania, one client reported the provider acted "astonished" that she wanted contraception due to the fact she was married and did not have any children (22yo, married, nulliparous, Tanzania).

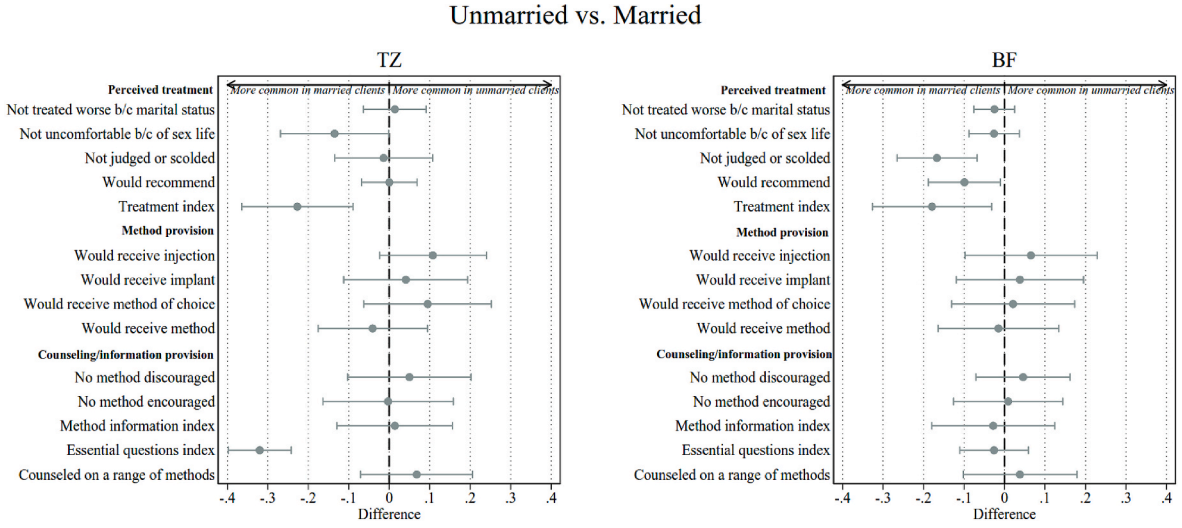

Fig. 4. Marital status-related disparities in contraceptive care quality among mystery clients
Figures show differences and 95% confidence intervals between unmarried and married clients for each given outcome. Differences estimated using regressions controlling for age and parity with facility fixed effects. In Tanzania, N = 148. In Burkina Faso, N = 158.

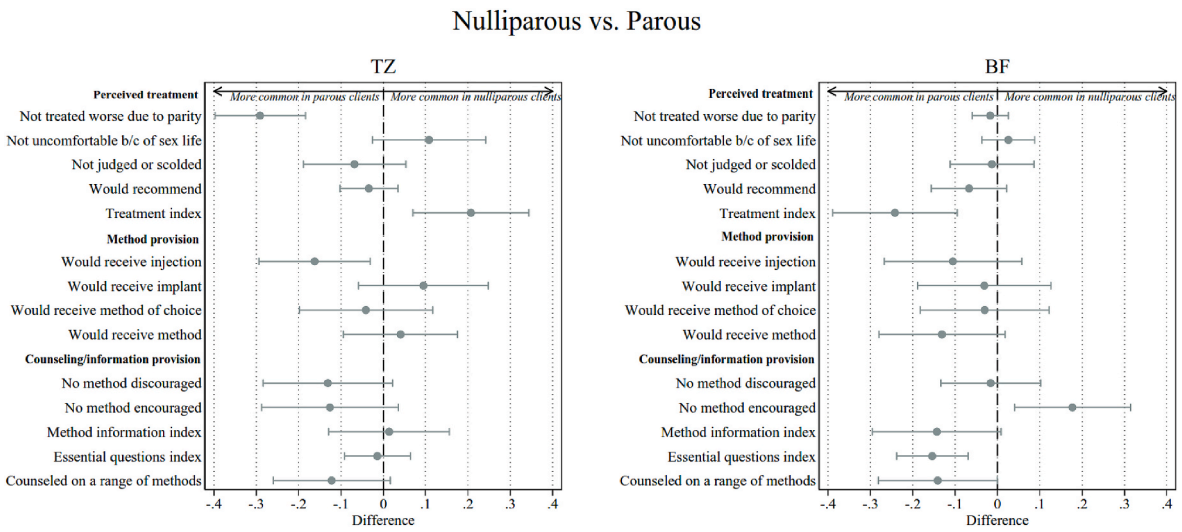

Fig. 5. Parity-related disparities in contraceptive care among mystery clients
Figures show differences and 95% confidence intervals between nulliparous and parous clients for each given outcome. Differences estimated using regressions controlling for marital status and age and facility fixed effects. In Tanzania, N = 148. In Burkina Faso, N = 158.

6. Discussion

Biased attitudes and beliefs among contraceptive providers are well documented, and this is thought to be an important barrier to high quality contraceptive care for young, unmarried, and nulliparous clients. However, the extent to which contraceptive clients with these characteristics experience disparities in care is not well understood. This study is the first to use randomly assigned client attributes to assess the causal effect of age, marital status, and parity on quality-of-care outcomes. We find that each of these characteristics affects provider behavior along different quality of care domains; young women experience a disparity in method provision compared to older women, unmarried women perceive worse treatment than married women, and nulliparous women receive worse counseling that parous women. Our results provide important insights for efforts to improve contraceptive care for young, unmarried, and nulliparous clients, suggesting that interventions need to be crafted separately for clients with each of these characteristics. However, most disparities we document are small, implying that interventions may have a limited ceiling for effectiveness and may need to be paired with broader interventions to address causes of poor-quality care.

Provider bias is a complex, nuanced phenomenon. We show that bias may appear in some client outcomes for some client characteristics, but not others. For instance, while unmarried clients perceived worse treatment from providers in terms of their interpersonal interaction, unmarried clients reported receiving similar information and received similar methods as their married counterparts. Nulliparous clients received more limited counseling than their parous counterparts, which may be because of strong underlying beliefs about how contraceptive methods influence fertility and/or the strong emphasis on childbearing in these contexts (Solo and Festin, 2019; Sieverding et al., 2018). A growing body of literature shows how providers restrict autonomy and contraceptive choice for clients through counseling practices across settings (Senderowicz, 2019; Senderowicz et al., 2021). Encouragingly, the Beyond Bias intervention narrowed the disparity between nulliparous and parous clients in terms of counseling quality and information provision (Wagner et al., 2023).

Providers most often reported restricting certain methods by age, and among mystery clients we found the most consistent age-related disparities in provision of methods. Underlying provider attitudes may help explain the mystery client findings—provider attitudes suggest that while not in the majority, a large proportion of providers report counseling young clients to practice abstinence, find hormones to be potentially unsuitable for younger clients, and believe that providing contraceptives may increase a client's promiscuity. These results echo existing literature pointing to providers holding disapproving attitudes toward adolescent sexual activity (Tilahun et al., 2012; Warenius et al., 2006). However, the exit survey data present a different story. Younger clients in Tanzania were more likely to receive a method, and have it be their method of choice; in Burkina Faso we found no difference in receipt of any method or the method of choice by age in exit surveys. It may be that the difference between the mystery client and client exit results stem from selection that happens on the part of clients– wherein only the young clients who are the least likely to experience biased care are those that choose to seek care. There is evidence that clients avoid seeking care from clinics when they expect to be the target of provider bias (Speizer et al., 2022).

It may be that the intersection of age, marital status, and parity are what drives disparities in care. However, we were underpowered to investigate intersectional effects due to insufficient mystery client sample and rarity of certain client profiles in the exit survey data Our qualitative data suggest married nulliparous clients who are subject to strong social norms about fertility may perceive pressure from the provider (and society) to have children before using contraception (Schuler et al., 2011). Unmarried young clients, who may be more likely to be students and therefore on a different life trajectory, may receive different care from providers than married young clients. Providers may consider contraceptive use to be most important for young students because they are in school and have a "future" ahead of them. Future work should further investigate how intersections of identities influence disparities in contraceptive care.

We did find evidence that providers favored certain methods for younger clients, namely implants, and disfavored injections for younger and nulliparous clients. While we cannot completely disentangle the extent to which client preferences influenced method dispensation, these findings are supported by results from the provider survey which showed that providers were more likely to restrict injections by age and parity (particularly in Tanzania) and from the mystery client data in which mystery clients were more often encouraged to take up implants and discouraged from using injections (particularly in Tanzania). Mystery client data in Tanzania, however, suggests this is widespread among all clients so it is unclear the extent to which this is a bias about clients or about methods, or both. The bias away from injections is supported by other literature that suggests providers may restrict injections by age

and parity due to potential impacts on fertility (Solo and Festin, 2019; Dieci et al., 2021; Tuoane et al., 2004). However, other literature suggests that the ease of administration may cause providers to have bias towards injections (Solo and Festin, 2019). Future work should examine this potential method bias given the growing body of literature on programmatic preferences for long-acting methods and the potential for non-person-centered care and coercion this engenders (Senderowicz et al., 2021).

While this study drew on multiple sets of data and uses a design that allows us to isolate the effects of age, marital status, and parity, it is not without limitations. First, we do not capture certain factors in the exit survey that may cause poor quality care including a client's ethnicity, religion, or student status (Solo and Festin, 2019). Second, we rely on mystery clients' perceptions they would have received a contraceptive method, since they did not actually take a method. It is possible that mystery client perceptions do not correspond to actual method provision. Third, we cannot control for all factors in the client exit data that influence method dispensation to a client. Clients differ in the extent to which they want a provider to be involved in helping them decide which method is best and the type of information and perceptions they have about different contraceptive methods (Dehlendorf et al., 2013). Fourth, measurement of receiving a method of choice is difficult. Whether a client receives their method of choice may be based on the information provided in the visit, which may or may not be complete, unbiased, or without interference. Finally, study facilities participated in programs to improve quality of care, including for young people, which may make them different than other facilities in the country more broadly.

7. Conclusion

Our results suggest provider bias exists, and this leads to disparities in method provision for young clients, perceived treatment for unmarried clients, and counseling and information provision for nulliparous clients. These results highlight the need for interventions that focus on reducing disparities and potential discrimination by these characteristics in contraceptive care. Attention is needed to ensure that clients have full, free, and informed choice in their contraceptive care and are treated with respect.

CRediT authorship contribution statement

Alexandra Wollum: Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization. **Corrina Moucheraud:** Writing – review & editing, Methodology, Formal analysis, Conceptualization. **Jessica D Gipson:** Writing – review & editing, Supervision. **Willa Friedman:** Writing – review & editing, Conceptualization. **Manisha Shah:** Writing – review & editing, Conceptualization. **Zachary Wagner:** Writing – review & editing, Supervision, Resources, Project administration, Methodology, Conceptualization.

Declaration of competing interest

The authors have no competing interests to declare.

Data availability

The data are publicaly available online at Harvard Dataverse.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.socscimed.2024.116826.

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