Quality of Care and Contraceptive Use in Urban Kenya

CONTEXT: Family planning is highly beneficial to women's overall health, particularly in developing countries. Yet, in much of Sub-Saharan Africa, contraceptive prevalence remains low and unmet need for family planning remains high. It is hypothesized that the poor quality of family planning service provision in many low-income settings is a barrier to contraceptive use, but this hypothesis has not been rigorously tested.

METHODS: Survey data from 3,990 women were used to investigate whether family planning service quality was associated with current modern contraceptive use in five cities in Kenya in 2010. In addition, audits of selected facilities and service provider interviews were conducted in 260 facilities, and exit interviews were conducted with family planning clients at 126 high-volume clinics. Individual- and facility-level data were linked according to the source of the woman's current method or other health service. Binomial regression was used to estimate adjusted prevalence ratios, and robust standard errors were used to account for clustering of observations within facilities.

RESULTS: Sixty-five percent of women reported currently using a modern contraceptive method. Provider's solicitation of clients' method preferences, assistance with method selection, provision of information on side effects and good treatment of clients were positively associated with current modern contraceptive use (prevalence ratios, 1.1 each); associations were often stronger among younger and less educated women.

CONCLUSION: Efforts to assist with method selection and to improve the content of contraceptive counseling and treatment of clients by providers have the potential to increase contraceptive use in urban Kenya.
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Family planning plays an important role in reproductive rights and the protection of maternal health, yet is underutilized in many parts of Sub-Saharan Africa. In the region, approximately 20% of married women currently use a modern method of contraception, and an average of one in four married women want to space or limit pregnancy, but are not using a modern method.[1] Family planning programs in developing countries have worked to increase the number of service delivery points and expand into remote areas;[2] however, to be effective, they must also address issues of service quality. Many family planning experts hypothesize that low-quality family planning services are a barrier to high contraceptive prevalence.[3–6]

Substantial increases in contraceptive use and corresponding declines in fertility have been consistently observed throughout the developing world, although such changes have been more limited in Sub-Saharan Africa than in other developing regions.[7] In Kenya, the prevalence of contraceptive use has increased since the 1970s: At that time, only 7% of married women of reproductive age used a family planning method, but that figure grew to nearly 40% by 1998.[8] At the same time, the total fertility rate (TFR) dropped, from more than eight children per woman in the early 1970s to approximately five by the late 1990s. Since then, however, progress has slowed: In 2013, Kenya's contraceptive prevalence among married women

was 46%, and the TFR was 4−5 children.[8,9]

Motivated by the hypothesis that improvements in service quality may facilitate greater contraceptive use, two prior large-scale, facility-level, quantitative studies have assessed the quality of family planning service delivery in health care facilities in Kenya. Kenya's first nationwide assessment of family planning quality, conducted in 1989 among 99 randomly selected public facilities, found several deficiencies in service quality, including restricted choice of methods, little information on management of side effects, failure on the part of providers to ascertain the client's reproductive goals and a dearth of mechanisms in place to ensure follow-up.[10] A subsequent study that focused on public facilities in Nairobi was conducted in 1993;[11] its results did not differ markedly from those of the national study.

Other studies have described the quality of family planning service delivery in Kenya, but have been unable to assess the relationship between quality of care and current contraceptive use.[10,12–17] Such an assessment typically requires both facility- and individual-level data, as well as the ability to link women to the facility where they reported receiving or are assumed to have received services. A few studies have taken this type of multilevel approach to assessing the relationship between family planning service quality and contraceptive prevalence or continuation, with

mixed results. Studies conducted in Peru, Egypt and Morocco in the late 1980s and early 1990s found little to no effect of quality on method use or continuation;[18–20] however, studies conducted between 1991 and 2003 in Tanzania, Egypt, the Philippines and Nepal found moderate to strong associations between service quality and use.[21–24] The conflicting results in these studies may be explained by variations in how quality was defined and measured. A 1988 study in Egypt that found no relationship between quality and continued method use measured quality solely through interviews with staff and defined quality by the number of trained personnel, number of available methods and presence of female doctors;[18] in contrast, a 2003 study in Egypt that found an association between the two measured quality with a variety of tools, including provider and client interviews and observations, and created a quality of care index.[23]

Studies that fail to find a notable link between quality and use may accurately reflect the absence of a strong relationship between the two. It is possible, however, that such null findings are a result of measurement error, as suggested by the wide variation in approaches to measuring and defining family planning service quality. It should also be noted that prior multilevel studies linked women to a facility based on their location. This linking strategy assumes that women seek services at health care facilities within the geographic cluster to which they have been assigned. Some believe this assumption should not be made and suggest, instead, that women participating in demographic surveys should be asked to report the facility where they seek services, so that correct exposure classification will be ensured.[25]

This study aimed to investigate the relationship between family planning service quality and current contraceptive use among women in urban Kenya; our ability to link women's contraceptive use to family planning service quality at the health care facility from which they report receiving care addresses an important research gap. This linking strategy is based on the hypothesis that the quality of family planning service delivery at the facility where a woman reports actually receiving services will affect her decision to use contraceptives—that is, that her direct experience at a facility is more important to whether she uses contraceptives than the quality of the facility closest to her or the average level of quality among facilities in her geographic area. Because urban populations in Africa are expected to double between 2000 and 2030,[26] a focus on urban women is timely. We hypothesize that women attending facilities with high quality services will be more likely than those attending facilities with poor quality services to be using modern contraceptives. It is also possible that the relationship between high-quality services and use of modern contraceptives will be stronger among some demographic subgroups, such as younger or less educated women, because they have fewer financial resources and less knowledge than other women to compensate for low-quality services.

METHODS
Data
This study utilized data from the Measurement, Learning & Evaluation (MLE) Project, a six-year endeavor implemented by the Carolina Population Center to evaluate the Urban Reproductive Health Initiative. The Urban Reproductive Health Initiative is a five-year project funded in 2009 by the Bill and Melinda Gates Foundation to increase contraceptive prevalence in selected urban areas of Kenya, Nigeria, Senegal and Uttar Pradesh, India; Tupange, the country-level program in Kenya, is led by Jhpiego, an international health organization.

The MLE/Tupange study covered five urban areas in Kenya; it collected baseline data on individual women between September and November 2010, and on service delivery points between August and November 2011. For this multilevel analysis, we measured service quality at the facility level and the contraceptive use outcome at the individual level. Although service quality data were collected up to one year after outcome data, we do not believe that any meaningful changes in family planning service quality occurred between September 2010 and November 2011, as Tupange did not implement facility-level quality improvement activities until after all baseline data were collected.

•*Individuals.* To obtain a representative sample of women from each city, the MLE/Tupange study used a multistage sampling design in which government census enumeration areas served as primary sampling units. Within each selected unit, a random sample of 30 households was selected for interview, during which a list of usual household residents was obtained. All eligible women aged 15–49 on the list were asked to participate via an informed consent protocol. The response rate for the individual women's questionnaire was 85%; survey weights were used to account for nonresponse and differentials in selection probability.

Respondents were asked about their demographic characteristics, current contraceptive use and fertility desires. In addition, respondents answered questions about the source of their current contraceptive method, and about maternal and child health, vaccination and HIV services currently used; these data were used to link women in the individual-level survey to a facility where they had recently received health care services.

Of the 8,932 women who completed the questionnaire, we excluded 626 from our analysis because they reported being currently pregnant or unable to become pregnant (for reasons such as menopause or hysterectomy), and thus were not in need of contraception. Another 762 women were excluded because they reported wanting to become pregnant at the time of the interview. Last, we excluded 1,871 women because they reported not having received any type of health care service at a facility, and thus were not relevant to our examination of service quality. Overall, 5,673 women were eligible to be included in our analytic sample.

•*Facilities.* The MLE/Tupange study attempted to collect data from 286 public and private service delivery points,

including hospitals, health centers and clinics that offer family planning or maternal and child health services. The selected facilities included those in which the Tupange initiative planned to implement quality improvement activities, as well as those identified by women in the individual survey as locations where they sought family planning services. Of the 286 selected facilities, two were unable to participate because they lacked available staff and five refused; the overall participation rate was 98%. Nineteen participating facilities were excluded from our analysis because they did not provide family planning services; thus, our final sample size was 260. These facilities represent approximately 44% of all operational health care facilities with family planning provision in the five study cities. According to the Kenya Master Health Facility List, approximately 60% of all operational hospitals with family planning services were included, and more than half of the excluded facilities were smaller, private-sector facilities.[27]

Three types of facility-level data were collected: facility audits, provider interviews and client exit interviews. Facility audits consisted of an interview with a facility manager, who also provided access to client logs and commodity supplies; one audit was conducted at each of the 260 facilities. Audits collected data on training and experience profiles of staff, services provided, integration of available services, and the provision and availability of each of 12 types of family planning methods. They also checked for adequacy of storage and standard operating procedures, and the presence of such basic items as sterile equipment, electricity, running water, blood pressure cuffs, specula and private exam rooms.

Interviews were conducted with 1–4 service providers at 255 of the 260 participating facilities; for facilities with fewer than four providers, all were interviewed, and for facilities with five or more providers, four were chosen at random. A total of 692 providers were selected; seven did not complete an interview due to lack of available time or refusal, for a participation rate of 99%. Health care providers who gave informed consent were asked questions on such topics as preservice and in-service training, counseling procedures for family planning, integration of family planning with other health care services and quality assurance.

Client exit interviews were conducted with a convenience sample of 4,230 women visiting one of the 152 higher volume facilities for any health service.* Interviews were conducted at each facility for 1–5 days; between one and 44 interviews were conducted at each facility. Women were asked about the service or services they had received during their visit. Our analysis includes data from only the 1,316 clients of 126 facilities who reported their main reason for visiting was to initiate use of a contraceptive method or continue contraceptive use. These women were asked about the number of methods discussed by the provider, wait time, client satisfaction, perceived treatment and information given during the counseling session on topics including side effects, method use and when to return to the facility.

Measures

•*Dependent variable.* Current modern contraceptive use, our outcome of interest, was an individual-level measure based on women's baseline reports about which method or methods they or their partner were currently using. For this analysis, we defined modern methods as the condom, the pill, the injectable, the implant, the IUD, sterilization, emergency contraception, spermicides and the lactational amenorrhea method. A small number of participants (5% in the women's weighted sample) reported using a traditional method (the rhythm method, withdrawal or the standard days method) and were classified as not using a modern method.

•*Independent variables.* Quality of service exposure classification was based on the Bruce-Jain framework, which consists of six elements: choice of methods, information given to user, provider competence, client-provider relations, continuity or follow-up mechanisms and appropriate constellation of services.[28] Choice of methods is defined as the physical availability of a satisfactory selection of methods, as well as by the provider's willingness to discuss multiple methods and ascertain client preferences.[11] Information given to clients refers to women's receipt of information from their provider to assist with their selection and proper use of a method, and with the management of side effects and warning signs of potential health problems related to the method.[29] A competent provider is one who demonstrates adequate technical competence and adherence to medical guidelines and protocols.[28] Client-provider relations are the personal or human aspect of service provision, such as respectful treatment and bidirectional communication.[4] Continuity or follow-up mechanisms refers to the presence of protocols, such as scheduling of future appointments or home visits, to encourage contraceptive continuity.[28] Finally, appropriate constellation of services is the integration of family planning into additional health services, such as child immunizations, postpartum care and HIV-related care, to ensure convenient access to services.[29] Each element of quality was measured using facility-level data; which specific questions were used from each survey instrument and information on the coding of these variables are included in the appendix (Appendix Table 1, page 77).

In regard to assessing the relationship between quality and contraceptive use, some researchers have suggested that achieving a high level of service quality may not be realistic in the absence of adequate service infrastructure.[30,31] RamaRao notes that program managers have cited deficiencies in the service infrastructure as a key barrier to providing good quality services.[32] Therefore, the term "quality" can be expanded to include not only the dynamics of the interaction between provider and client, but also

*Given the difficulty of accurately and precisely determining average client load in many of the participating facilities, experienced local field workers combined their own subjective measures of patient volume with reviews of client log books to determine those facilities where large numbers of women went for services. These facilities participated in client exit interviews, in addition to the facility audit and provider interviews.

TABLE 1. Percentage distribution of women aged 15–49 living in five Kenyan cities, by characteristic, Measurement, Learning & Evaluation (MLE) Project, 2010

Characteristic	Included in the analysis	Excluded from the analysis‡
ALL WOMEN	(N=3,246)	(N=2,399)
Age		
15–19	6	10
20–24	27	34
25–29	30	24
30–34	19	14
35–39	11	11
40–49	8	9
Education		
None	2	3
Incomplete primary	14	11
Complete primary	29	24
≥some secondary	55	63
Religion		
Catholic	24	26
Protestant/other Christian	67	66
Muslim/none/other	9	8
Currently married		
Yes	73	50
No	27	50
Parity		
0	10	30
1	31	29
2	27	19
3	16	11
≥4	16	11
Fertility intentions		
Wants a pregnancy later	50	60
Does not want a pregnancy	43	33
Not sure she can get pregnant	1	1
Other	1	1
Does not know	5	6
Wealth		
Poorest	18	16
Poor	22	18
Middle	22	21
Rich	20	20
Richest	18	25
City of residence		
Nairobi	70	82
Mombasa	18	13
Kisumu	7	3
Machakos	2	1
Kakamega	2	1
Slum residence		
Yes	24	17
No	76	83
Current contraceptive use		
Modern method	65	58
Traditional method	5	5
Nonuse	30	37
CONTRACEPTIVE USERS	(N=2,267)	(N=1,516)
Method type		
Female/male sterilization	2	2
Pill	22	23
IUD	5	4
Injectable	45	33
Male condom	9	24
Implant	8	2
Other modern method	3	4
Traditional method	7	8
Total	100	100

‡Excluded because they linked to a non-MLE facility. *Note:* Ns and percentages are weighted.

the degree to which facilities are prepared to offer services. For this reason, we included several variables related to facility infrastructure, such as whether the facility has basic items, family planning guidelines and quality assurance measures.

We also included measures of client satisfaction as a proxy for high quality services: overall satisfaction with services, satisfaction with amount of waiting time, satisfaction with the amount of information provided, the client's intention to use the facility again and client's statement that she would recommend the facility to others. Data on these measures came from client exit interviews, and thus describe only higher volume facilities.

All variables from the facility audit were coded as binary variables, except for the number of methods provided and not out of stock in the past year, which was coded as a continuous variable (ranges, 0–8). For variables from provider interviews, the proportion of providers at each clinic responding affirmatively to each item was calculated; we then dichotomized clinics by whether they were at or above the sample-wide proportion or below it for each indicator. Relevant quality-related variables from client exit interviews were averaged for each facility and then the average was multiplied by 4, to range from 0 to 4. This was done so that estimated prevalence ratios would reflect the change in contraceptive prevalence associated with a 25 percentage-point increase in that indicator. Client interview variables were entered into the model as continuous variables.

•*Covariates.* On the basis of our knowledge of their relationship with both quality of care and contraceptive use, we included the following variables as covariates: age, education, religion, marital status and wealth. These covariates were measured at the individual level using data from the women's questionnaires administered at baseline. In addition, we included a measure of slum residence. The 2009 census sampling frame was used to classify all primary sampling units as predominantly formal (nonslum) or informal (slum); households were classified as being located in a slum if built on land that the government had not al-

TABLE 2. Characteristics of selected health care facilities in five Kenyan cities, MLE/Tupange survey, 2011

Characteristic	%/mean (range)
PERCENTAGES	
Health care facilities	
Public	(N=87)
Hospitals	16
Other	84
Private	(N=173)
Hospitals	13
Other	87
Total	100
MEANS	
No. of providers interviewed per facility	3 (1–4)
No. of providers per facility overall	9 (1–267)
No. of family planning clients interviewed per facility	10 (1–44)

TABLE 3. Quality of care characteristics measured through audits of selected health care facilities in five Kenyan cities, interviews of providers in such facilities and exit interviews with contraceptive clients at higher volume facilities

Characteristic	%/mean (range)	Characteristic	%/mean (range)
FACILITY AUDITS	(N=260)	**Family planning integration**	
Choice of methods		With child health services	72.1
Mean no. of methods provided	7.3 (1–12)	With postnatal care services	70.2
Mean no. of methods provided and currently available	5.5 (0–8)	With HIV services	80.9
Mean no. of methods provided and not out of stock in previous year	3.8 (0–8)	CLIENT EXIT INTERVIEWS	(N=1,315)
Mix of methods provided‡	63.1	**Choice of methods**	
Mix of methods provided and currently available	55.8	Provider mentioned two or more family planning methods	46.7
Mix of methods provided and not out of stock in previous year	33.1	Provider asked about client's method of choice	56.7
		Information given to clients	
Family planning integration		Provider helped select a method§	40.7
With child health services	85.8	Provider explained how to use selected method§	65.9
With postnatal care services	78.1	Provider mentioned possible side effects of chosen method	57.6
With HIV services	90.0	Provider discussed what to do if method-related problems occurred	64.6
Facility infrastructure/readiness			
Private exam room	87.3	**Client-provider relations**	
Water	78.5	Provider asked about client's reproductive goals	34.8
Electricity	93.9	Provider treated client "very well"	33.4
Blood pressure cuff	95.4	Other facility staff treated client "very well"	21.3
Speculum	82.3	Provider asked if client had any questions	66.4
Family planning guidelines	51.5	Client felt comfortable asking questions during the visit	91.1
Quality assurance measures in place	38.9	Provider answered all of the client's questions	79.1
PROVIDER INTERVIEWS	(N=648)	**Follow-up mechanisms**	
Choice of methods		Provider informed client when to return for resupply	93.4
Discusses different methods with clients	80.9		
Asks client about their preferred method	47.5	**Client satisfaction**	
		Believed other clients could not see them	83.9
Information given to clients		Believed other clients could not hear them	93.8
Helps clients select a method	43.1	Believed provider would keep their information confidential	87.3
Explains how to use the selected method	52.6	Believed she received the right amount of information	91.0
Explains side effects of selected method	81.0	Felt waiting time was satisfactory	76.3
Discusses potential warning signs related to selected method	29.8	Felt satisfied overall with services	91.8
		Will use the facility again	98.9
Provider competence		Will recommend the facility to others	97.8
Received in-service training in family planning provision	50.0		
Client-provider relations			
Discusses reproductive goals with clients	44.0		

‡A mix of methods is defined as at least one long-acting or permanent method, one shorter-acting method and one barrier method. §Among 472 new and switching clients.

located for housing and as not being located in a slum if built on land allocated for housing.

Statistical Analysis

After exploring the facility audit instrument and the questionnaires for interviewing family planning providers and clients, we identified a total of 48 variables related to facility-level service quality, infrastructure or client satisfaction. We employed factor analysis and were able to reduce the number of quality-related exposure variables to 35. The following sets of variables were grouped together on the basis of an alpha greater than 0.70 and a Factor 1 Eigenvalue greater than 1.0, which suggests that the observed variables in each group have a similar pattern of response and are appropriately grouped for the purposes of data reduction: method choice, measured by facility audits (number of methods provided, mix of methods provided,* number of methods currently available and mix of methods currently available); method choice, measured by client interviews (provider gave information about different family planning methods and provider asked the client

about her method of choice); information given, measured by client interviews (provider explained how to use the method, provider talked about possible side effects and provider told client what to do if they have any problems); bidirectional communication, measured by client interviews (provider asked the client if she had any questions, client felt comfortable to ask questions during the visit and provider answered all of the client's questions); presence of basic items and private exam room, measured by facility audits (are certain items available on a functioning basis and is there a private examination room); and client satisfaction, measured by client interviews (client would use this facility again and would recommend it to others).

We estimated prevalence ratios using binomial regression. The model was stabilized by using the Poisson distribution for the residuals. Each of the 35 exposure variables was entered into a separate model with the same covariates. We accounted for clustering of observations within

*A mix of methods is defined as at least one long-acting or permanent method, one shorter-acting method and one barrier method.

TABLE 4. Adjusted prevalence ratios (and 95% confidence intervals) from multivariate binomial regression models examining associations between quality of care measures and current use of modern contraceptives among urban Kenyan women aged 15–49

Characteristic	Full sample‡	Restricted sample§
FACILITY AUDITS		
Choice of methods		
Composite variable for method choice	0.98 (0.91–1.05)	1.06 (0.96–1.18)
No. of methods provided and not out of stock in previous year	1.01 (0.98–1.03)	1.02 (0.99–1.05)
Mix of methods provided and not out of stock in previous year	1.10 (0.98–1.23)†	1.15 (0.99–1.34)†
Family planning integration		
With child health services	1.09 (0.93–1.28)	1.09 (0.90–1.32)
With postpartum services	1.02 (0.87–1.19)	0.99 (0.84–1.17)
With HIV services	1.05 (0.90–1.23)	1.02 (0.85–1.22)
Facility infrastructure/readiness		
Composite variable for basic items	0.96 (0.89–1.05)	0.99 (0.89–1.10)
Family planning guidelines	0.96 (0.86–1.07)	0.92 (0.79–1.06)
Quality assurance measures in place	1.05 (0.95–1.17)	1.04 (0.92–1.18)
PROVIDER INTERVIEWS		
Choice of methods		
Discusses different methods with clients	1.02 (0.91–1.14)	1.07 (0.92–1.23)
Asks client about their preferred method	1.03 (0.93–1.14)	1.14 (1.02–1.28)*
Information given to clients		
Helps clients select a method	1.03 (0.92–1.15)	1.11 (0.96–1.29)
Explains how to use the selected method	1.05 (0.94–1.18)	1.10 (0.97–1.26)
Explains side effects of selected method	1.12 (1.01–1.23)*	1.08 (0.95–1.23)
Discusses potential warning signs related to selected method	1.06 (0.96–1.18)	1.09 (0.95–1.24)
Provider competence		
Received in-service training in family planning provision	0.95 (0.85–1.06)	0.98 (0.84–1.14)
Client-provider relations		
Discusses reproductive goals with clients	0.99 (0.88–1.11)	1.02 (0.87–1.19)
Family planning integration		
With child health services	1.00 (0.87–1.14)	1.15 (0.92–1.43)
With postnatal care services	0.97 (0.85–1.10)	1.05 (0.88–1.26)
With HIV services	1.01 (0.88–1.16)	1.05 (0.85–1.28)
CLIENT EXIT INTERVIEWS		
Choice of methods		
Composite variable for method choice	na	1.01 (0.93–1.11)
Information given to clients		
Provider helped select a method	na	1.06 (1.01–1.11)*
Composite variable for information	na	0.96 (0.86–1.08)
Client-provider relations		
Provider asked about client's reproductive goals	na	1.05 (0.97–1.14)
Provider treated client "very well"	na	1.10 (1.01–1.19)*
Other facility staff treated client "very well"	na	1.06 (0.95–1.18)
Composite variable for bidirectional communication	na	1.00 (0.89–1.11)
Follow-up mechanisms		
Provider informed client when to return for resupply	na	0.97 (0.87–1.07)
Client satisfaction		
Believed other clients could not see them	na	0.92 (0.85–1.00)†
Believed other clients could not hear them	na	0.88 (0.73–1.05)
Believed provider would keep their information confidential	na	1.09 (0.95–1.26)
Believed she received the right amount of information	na	0.98 (0.82–1.17)
Felt waiting time was satisfactory	na	0.97 (0.89–1.06)
Felt satisfied overall with services	na	0.96 (0.82–1.14)
Composite variable for satisfaction	na	1.17 (1.02–1.35)*

*p<.05. †p<.10. ‡Full weighted sample (N=2,949). §Sample restricted to observations linked to a higher volume facility where client exit interviews were conducted (N=1,887). *Notes:* na=not applicable. All models are adjusted for age, education, marital status, religion, wealth and slum residence.

facilities using robust standard errors. Our presentation of results includes one model of the full sample of women, and one of only those women who linked to a higher volume facility; this was done because client data were collected only at the higher volume facilities.

RESULTS
Descriptive Findings
•*Sample of women.* A total of 5,673 eligible and consenting women completed the individual women's questionnaire. Some 3,990 (approximately 70%) could be linked to a facility for which the MLE/Tupange study collected quality-related facility-level data at baseline in 2011; of those, 3,083 were linked to a higher volume facility from which client interview data were collected.

After weighting, the sample included 3,246 women. Fifty-seven percent were aged 20–29, and 55% had at least some secondary education (Table 1, page 72). Most women were Protestant, currently married and had had at least two live births. Seventy percent resided in Nairobi, and 24% resided in a slum. Two-thirds of women (65%) reported currently using a modern contraceptive method, 5% were using a traditional method and 30% reported nonuse. Of women practicing contraception, 45% were using the injectable, 22% were using the pill and 15% reported using a long-acting or permanent method (the IUD, the implant, or female or male sterilization).

To examine whether there were selection effects with respect to the users of facilities included in the baseline survey, we compared background characteristics and method use of women included in our analyses with those excluded because they linked to a facility not included in the MLE baseline facility-level survey. Fifty percent of excluded women were unmarried, and 30% had had no children; those figures were 27% and 10%, respectively, among included women. Among women practicing contraception, 24% of excluded women relied on male condoms, compared with 9% of included women.

•*Sample of facilities.* One-third of the health care facilities selected for the facility-level baseline survey were public facilities, and the majority (84%) of these public facilities were nonhospital facility types such as health centers and dispensaries (Table 2, page 72). A similar proportion of the private facilities (87%) were facilities such as clinics and maternity homes, which are smaller than hospitals. Overall, facilities employed an average of nine service providers, and an average of 10 clients were interviewed per higher volume facility.

•*Quality of care.* On average, facilities provided seven contraceptive methods (Table 3, page 73); however, fewer than six were available at the time of the facility audit, and only about four had not been out of stock at some point in the previous year. According to facility supervisors, integration of family planning with child health, postnatal or HIV-related services was fairly widespread (78–90% of facilities). Private exam rooms, running water, electricity and basic items often used in family planning provision

were each available at most facilities (79–95%); far fewer facilities could show written copies of national family planning guidelines on demand (52%) or describe any quality assurance measures that were in place (39%).

In interviews, most providers (81%) reported discussing multiple methods with their clients; fewer than half (48%) asked their clients their preferred method. Between 30% and 53% of providers helped clients select a method, explained how to use the method or discussed warning signs of potential method-related problems; however, 81% reported explaining possible side effects of the client's chosen method. Half of providers had received in-service training on the provision of family planning services—our proxy for technical capacity. Providers reported slightly lower levels of integration of family planning with other services than facility audits showed (70–81%).

In exit interviews, 47% of clients reported receiving information on multiple methods during their visit, and 57% reported being asked about their method of choice. Of clients initiating a contraceptive method or switching methods, 66% reported that their provider had explained proper method use, while fewer said that their provider had helped them select a method (41%). Among all clients, 58% were told about potential side effects and 65% about how to manage problems. Regarding the relationship between providers and clients, 35% of clients reported that their provider had asked about their reproductive goals and 33% said their provider had treated them "very well"; only 21% said that other facility staff had treated them "very well." Sixty-six percent of clients had been asked by their provider if they had any questions, 91% had felt comfortable asking questions and 79% had had all their questions answered by the provider. The vast majority of clients (93%) had been told when to return to the facility for method resupply. In terms of client satisfaction, more than eight out of 10 clients reported that they had had adequate privacy during their visit, their services would be kept confidential, they had received the right amount of information, and they were satisfied with services overall; fewer (76%), however, were satisfied with the waiting time. Clients nearly universally reported that they would use the same facility again and would recommend it to others.

Multivariate Analyses
In our first analytic model, which included facility audit and provider interview measures among the full weighted sample of facilities, only one variable was associated with use of a modern method: Clients of facilities at which providers reported explaining method side effects had an increased likelihood of contraceptive use (prevalence ratio, 1.1; Table 4, page 74). In addition, one aspect of method choice measured by the facility audit—providing a mix of methods that has not been out of stock in the previous year—was marginally significant (1.1).

Our second analytic model was restricted to higher volume facilities and included client interview measures, as well as facility audit and provider interview measures.

FIGURE 1. Relationship between client treatment and current contraceptive use among urban Kenyan women, by age-group
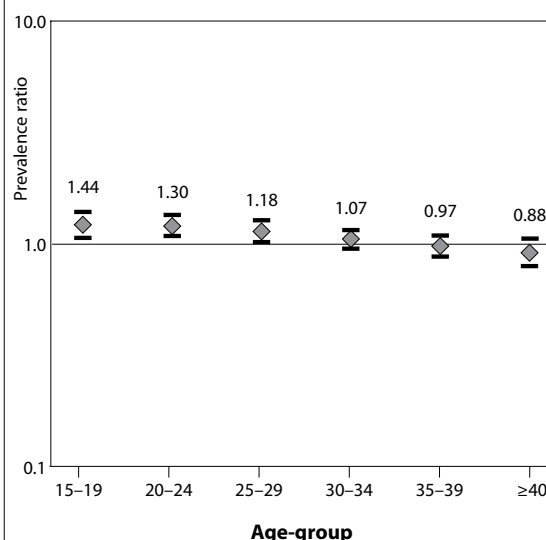
Notes: Client treatment measure by women's reports that their provider treated them "very well." Lines represent 95% confidence intervals.

In this model, facilities' having a consistently stocked mix of methods was marginally associated with clients' contraceptive use, and the magnitude of the relationship was slightly larger than in the unrestricted sample (prevalence ratio, 1.2). Method choice was associated with contraceptive use when measured by provider interviews: Women attending facilities at which providers reported asking clients about method preferences were significantly more likely than others to use contraceptives (1.1). Providers' discussion of method side effects—significant in the full sample—was not significant in the restricted sample.

Finally, three client interview measures were found to be positively associated with contraceptive use in our second analytic model. Women attending facilities at which clients reported receiving a provider's help with method selection had a 6% greater likelihood of contraceptive use for each 25 percentage-point increase in the indicator (prevalence ratio, 1.1). Women attending facilities at which clients reported their provider treating them "very well" were more likely than others to be using a contraceptive (1.1). And women attending facilities at which clients reported that they would use the facility again or recommend the facility had a greater likelihood of contraceptive use (1.2).

In general, the association between several aspects of service quality and contraceptive use was much stronger for younger women and those who were less educated. The relationship between contraceptive use and feeling well-treated by their provider was strongest among 15–19-year-olds (prevalence ratio, 1.4; Figure 1), but diminished with age so that it was no longer significant for women aged 35 or older. A similar modification was observed for some aspects of quality and education, where the magnitude of effect was strongest among the least educated women. For example, the strength of the relationship between provid-

ers' offering clients a choice of methods and contraceptive use was strongest among women with no education (1.3; not shown), and it diminished with increased educational attainment.

DISCUSSION

We found that several indicators of family planning service quality are positively associated with current contraceptive use, including providers inquiring about client's family planning preferences and assisting them with method selection, and having clients who feel that they were treated "very well." Surprisingly, provider competence, follow-up mechanisms and integrated services appear not to be associated with current contraceptive use. It is possible that our means of measuring these aspects do not sufficiently capture their true meaning. For example, just because a provider has received in-service training on family planning provision, there is no guarantee that they are more competent in service provision than their peers who have not received such training. In addition, giving clients verbal instructions on when to return for continued contraceptive supplies may not affect the future behavior of clients to the same extent as additional types of reminders such as appointment cards or follow-up phone calls, which may not be standard practice in many parts of Kenya. It may also be the case that facility managers and providers report higher levels of integrated services than actually exist in practice, in an attempt to exaggerate service quality;[6,33] such misreporting may attenuate an existing relationship. It is also possible that these aspects of quality have no association with current contraceptive use. Last, facility infrastructure and most aspects of client satisfaction—including privacy issues, the amount of information given, waiting time and overall satisfaction—were unrelated to contraceptive use.

Many of the prevalence ratios from our multivariate analyses were close to the null value (1.00); however, a prevalence ratio of 1.1 or 1.2, although modest as a ratio measure, equates to a 10% or 20% increase in modern contraceptive use, which is substantial. For example, contraceptive prevalence among our sample of urban Kenyan women not trying to become pregnant was 65%; a 20% increase would raise it to 78%.

Prior to this study, the most recent multiregion assessment of family planning service quality in Kenya using the Bruce-Jain framework took place in 1989 among public facilities and identified several areas of quality in need of improvement.[10] Because of methodological differences between our study and the earlier study, however, a direct comparison of our findings and those of the earlier study is not possible.

Prior multilevel studies examining the relationship between service quality and contraceptive use have produced mixed results;[18–24] some found a positive association between quality and use, as we did in this study.[21–24] Comparisons between our findings and prior research are challenging, however, given stark differences in study region, as well as in measurement and definition of quality. The only

previous multilevel study conducted in Sub-Saharan Africa (Tanzania) also found an association between the information provided to clients and current contraceptive use;[21] however, information was measured by the availability of educational and promotional material, rather than discussion of side effects, method selection or proper method use, making comparisons between the two studies problematic. In addition, the prevalence of current contraceptive use in the sample of women in the Tanzania study was 13%, whereas the prevalence within our sample of women in urban Kenya was 65%; therefore the same relative change in contraceptive prevalence will correspond to very different absolute differences within the two populations.

Our study identifies several aspects of family planning service quality that could be modified to increase contraceptive use within a country with high fertility and high unmet need, demonstrating the large public health importance of these results. In terms of quality improvements, increases in contraceptive prevalence may be most responsive to in-service and preservice training with an increased emphasis on the ability of providers to excel in client treatment, assist with method selection and impart critical information on the potential side effects of selected methods. Our results also suggest the need for more specific measures of providers' technical competence, as well as more innovative strategies for encouraging contraceptive continuation.

Strengths and Limitations

The MLE project is one of the first large-scale surveys to be able to link individual and facility-level data by individual woman rather than by cluster. This allows us to assess the relationship between service quality and contraceptive use without the restrictive assumption that all women in the sample attend the closest facility or the one preferred by the women in their primary sampling unit. To our knowledge, no other population-based study has been able to link individual women to their current health facility. In addition, the MLE project is the first large-scale survey to focus exclusively on urban populations in developing countries, which allows for an in-depth investigation of these rapidly growing populations. Last, this is one of only a handful of studies to consider all six aspects of quality, as well as facility infrastructure, and is the first comprehensive multiregion situation analysis conducted in Kenya since the early 1990s.

This study has some limitations that warrant discussion. Approximately 30% of the eligible women could not be linked to a facility at which the MLE project collected baseline facility-level data and, therefore, had to be excluded from the analysis; these exclusions suggest some bias in the MLE/Tupange study selection of facilities and caution should be used when generalizing results to unmarried and nulliparous women. Aggregated indicators at the facility level may not have represented the experience of an individual client, and provider performance may have varied from client to client. Some women who did not re-

port seeking family planning services were linked to a facility where they reported seeking other health care services, possibly leading to misclassification of their exposure status; however, integration of family planning and other services was widespread among the clinics. The assumption that a woman is affected by quality of care at a clinic she is known to have attended—even if she is not known to have received family planning services there—is stronger than the common assumption in similar studies that a woman is affected by quality of care at proximal facilities that she is not known to have visited. Providers may have given an inaccurate report of their service delivery behaviors in an effort to portray their performance in a positive light; similarly, client responses may have been influenced by a desire to please the interviewer or protect themselves from retribution from facility staff, or by a cultural reluctance to provide negative information. Given the large number of quality variables included, we would expect one or two spurious significant results at an alpha level of five percent. Last, for some women, data on exposure were collected up to a year after outcome data were collected; however, we do not expect that quality changed meaningfully during the period and, therefore, our results should not have been substantially biased.

CONCLUSIONS

The results of this analysis support the concept of promoting facility-level improvements in the delivery of contraceptive services, especially with respect to discussion of clients' method preferences, counseling on side effects, assistance with clients' method selection and client treatment. Encouraging positive and informative interactions

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APPENDIX TABLE 1. Measures of quality of care, by corresponding data collection instruments and coding schemes

Measure	Survey tool	Coding
Choice of methods		
Does this facility provide the following family planning methods?	Facility audit	Continuous (range 0–12)
Is the method currently available?	Facility audit	Continuous (range 0–8)
Has this facility had a stock-out of the method in the last one year?	Facility audit	Continuous (range 0–8)
Do you provide information about different methods?	Provider interview	Binary‡
Do you discuss the client's family planning preferences?	Provider interview	Binary‡
Did your provider provide information about different family planning methods?	Client exit interview	Continuous§
Did your provider ask about your method of choice?	Client exit interview	Continuous§
Information given to user		
Do you help a client select a suitable method?	Provider interview	Binary‡
Do you explain how to use the selected method?	Provider interview	Binary‡
Do you explain method-related side effects?	Provider interview	Binary‡
Do you explain specific medical reasons to return?	Provider interview	Binary‡
Did your provider help you select a method?	Client exit interview	Continuous§
Did your provider explain how to use the method?	Client exit interview	Continuous§
Did your provider talk about possible side effects?	Client exit interview	Continuous§
Did your provider tell you what to do if you have any problems?	Client exit interview	Continuous§
Provider competence		
Have you received any in-service training on providing methods of family planning?	Provider interview	Binary‡
Client-provider relations		
Do you identify reproductive goals of the client?	Provider interview	Binary‡
Did your provider ask your reproductive goal?	Client exit interview	Continuous§
During your visit, how were you treated by the provider?	Client exit interview	Continuous§
During your visit, how were you treated by the other staff?	Client exit interview	Continuous§
Did you feel comfortable asking questions during this visit?	Client exit interview	Continuous§
Did the provider ask you if you had any questions?	Client exit interview	Continuous§
Did the provider answer all of your questions?	Client exit interview	Continuous§
Continuity mechanism		
Did your provider tell you when to return for follow-up?	Client exit interview	Continuous‡
Appropriate constellation of services		
When a woman who has come in for child health services is also interested in receiving family planning counseling, does she always receive it on the same day?	Facility audit	Binary
When a woman who has come in for postpartum services is also interested in receiving family planning counseling, does she always receive it on the same day?	Facility audit	Binary
When a woman who has come in for HIV services is also interested in receiving family planning counseling, does she always receive it on the same day?	Facility audit	Binary
During child immunization/child growth monitoring, do you routinely provide information about family planning?	Provider interview	Binary‡
During postnatal care visits, do you routinely provide information about family planning?	Provider interview	Binary‡
While providing HIV-related services (HIV/AIDS management, PMTCT, VCT) to women and men, do you routinely provide information on family planning?	Provider interview	Binary‡

‡For each quality indicator from the provider interview, the proportion of providers at each facility responding affirmatively was calculated, and clinics were then dichotomized as having a proportion of positive provider responses at or above versus below the sample-wide proportion for that indicator. §For each quality measure from the client interview, the proportion of clients at each facility responding affirmatively was calculated and multiplied by 4, for a range of 0–4, so that estimated prevalence ratios reflect the change in contraceptive prevalence associated with a 25% increase in that measure. *Notes*: PMTCT=prevention of mother-to-child transmission. VCT=voluntary counseling and testing.

between providers and clients has the potential to increase contraceptive use in this region of high unmet need.

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RESUMEN

Contexto: *La planificación familiar es altamente benéfica para la salud general de las mujeres, particularmente en los países en desarrollo. Sin embargo, en gran parte de África subsahariana, la prevalencia del uso de anticonceptivos sigue siendo baja y la necesidad insatisfecha de planificación familiar sigue siendo alta. Se plantea entonces la hipótesis de que la provisión de servicios de planificación familiar de baja calidad en muchos entornos de bajos ingresos es una barrera para el uso de anticonceptivos; sin embargo, esta hipótesis no ha sido probada rigurosamente.*

Métodos: *Se utilizaron datos de 3,990 mujeres para investigar si en el año 2010 la calidad de los servicios de planificación familiar estuvo asociada con el uso actual de anticonceptivos modernos en cinco ciudades en Kenia. Adicionalmente, se realizaron auditorías en instituciones selectas y entrevistas a proveedores de servicios en 260 instituciones de salud, y se condujeron entrevistas de salida con usuarias de planificación familiar en 126 clínicas de alto volumen. Los datos individuales y a nivel de las instituciones de salud se vincularon según la fuente del método que usaban en ese momento las mujeres u otro servicio de salud recibido. Se usó regresión binomial para estimar las razones de prevalencia ajustadas y se usaron errores estándar robustos para tomar en cuenta la conglomeración de las observaciones dentro de las instituciones de salud.*

Resultados: *Sesenta y cinco por ciento de las mujeres reportaron estar usando un método anticonceptivo moderno. La pregunta de los proveedores de servicios a las usuarias sobre sus preferencias de método, la ayuda para la selección del método, la provisión de información sobre efectos secundarios y el trato adecuado brindado a las usuarias se asociaron positivamente con el uso actual de anticonceptivos modernos (razones de prevalencia, 1.1 cada una); las asociaciones fueron frecuentemente más fuertes entre mujeres más jóvenes y con menor escolaridad.*

Conclusión: *Los esfuerzos para ayudar a la selección de método y majorar el contenido de la consejería sobre anticoncepción, así como el trato de las usuarias por parte de los proveedores tiene el potencial de aumentar el uso de anticonceptivos en zonas urbanas de Kenia.*

RÉSUMÉ

Contexte: *La planification familiale bénéficie grandement à la santé générale des femmes, en particulier dans les pays en développement. En Afrique subsaharienne pourtant, la prévalence contraceptive demeure souvent faible et le besoin non satisfait de planification familiale, élevé. L'hypothèse est que la faible qualité de la prestation de services de planification familiale dans de nombreux contextes à faible revenu fait obstacle à la pratique contraceptive. Cette hypothèse n'a cependant pas été rigoureusement testée.*

Méthodes: *Les données d'enquête obtenues de 3 990 femmes ont servi à rechercher s'il existe une association entre la qualité des services de planification familiale et la pratique contraceptive moderne dans cinq villes du Kenya en 2010. De plus, des contrôles d'établissement et des entretiens avec des prestataires ont été effectués dans 260 structures, de même que des interviews de clientes de la planification familiale à la sortie de 126 cliniques à grande fréquentation. Les données de niveau individuel et d'établissement ont été liées en fonction de la source de la méthode courante de la femme ou autre service de santé. Les rapports de prévalence corrigés ont été estimés par régression binomiale, avec de robustes erreurs types pour rendre compte du regroupement des observations au sein des établissements.*

Résultats: *Soixante-cinq pour cent des femmes ont déclaré pratiquer une méthode contraceptive moderne au moment de l'étude. La demande par le prestataire des préférences de méthode des clientes, l'aide à la sélection d'une méthode, l'apport d'information sur les effets secondaires et le traitement aimable des clientes apparaissent positivement associés à la pratique contraceptive moderne courante (rapport de prévalence de 1,1 chacun). Les associations sont souvent plus fortes parmi les femmes plus jeunes et moins instruites.*

Conclusion: *Les efforts visant à aider au choix d'une méthode contraceptive et à améliorer le contenu du conseil en contraception et le traitement des clientes par les prestataires ont le potentiel d'accroître la pratique contraceptive au Kenya urbain.*

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