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Preventing, but Not Caring for, Adolescent Pregnancies? Disparities in the Quality of Reproductive Health Care in Sub-Saharan Africa

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Abstract

Purpose: There is concern that adolescents experience worse quality of health care than older women. We compare quality of reproductive health services (family planning and antenatal care) for adolescents (<20 years) versus adult women (25 years), in four sub-Saharan African countries.

Methods: In total, 2,342 family planning visits and 8,600 antenatal care visits were analyzed from Democratic Republic of the Congo, Malawi, Senegal, and Tanzania. Service Provision Assessment surveys include observation of care and client exit interviews. We compare visit content and care satisfaction for adolescents versus adult women aged 25. All models are multilevel, weighted to reflect survey design, and include client, provider, and facility covariates (pooled models also include survey fixed effects).

Results: Adolescents receive more overall family planning care activities compared to adult women (2.31 activities in adjusted generalized linear models, standard error [SE] 1.29, $p <$ .1), and 3.76 more discussion activities (e.g., counseling) on average (SE 1.94, $p <$ .1), but significantly fewer discussion activities during antenatal care (−3.10 activities, SE .97, $p <$ .01). However, adolescents' satisfaction with both care types was not significantly different than adult

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women. These relationships largely persist in country-stratified models, using different model specifications, and when comparing adolescents to women aged 20.

Conclusions: Adolescents' family planning visits are similar to, or even slightly more comprehensive than, adult women—but their antenatal visits include fewer recommended care components, with particular gaps for activities requiring provider-client dialog. This suggests opportunities for strengthening communication between providers and young women, and improving care across the reproductive health continuum.

Keywords

Adolescent reproductive health; Quality of care; Reproductive health disparities

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There have been major recent improvements in maternal and child health, yet a substantial effort is still needed to reach the ambitious Sustainable Development Goal targets and young women are a particularly high-priority group [1]. By addressing women's health through a life-course approach that includes adolescence, the global health community can better understand the unique challenges and opportunities faced by youth, and develop policies and programs to address these.

Use of family planning (FP) has contributed to recent declines in maternal mortality [2], and high-quality antenatal care (ANC) can improve neonatal and maternal outcomes [3]. However, there are many challenges, and adolescents in particular may be less likely to seek and use care [4], and may receive lower quality care [5], both of which may be critically important for improved reproductive and maternal health outcomes [6].

Global FP programs have increasingly worked to ensure access for adolescents, who were historically overlooked in the reproductive health agenda [7]. This includes a push toward "youth-friendly" FP services which may be associated with improved reproductive health outcomes for adolescents [8]. The World Health Organization (WHO) has additionally developed a package of "global standards" for improving the quality of all health services for adolescents [6]. However, little is known about the implementation and uptake of youth-friendly services for adolescents [9].

This analysis uses data from Service Provision Assessment (SPA) surveys to examine FP and antenatal service quality for adolescents in four sub-Saharan African countries from 2012 to 2018. These nationally representative surveys capture both directly observed clinical data as well as patient-reported perceptions of care. The research question is as follows: Do adolescents receive worse (or better) quality of family planning and antenatal care than adult women (age 25)? To our knowledge, this is the most comprehensive analysis to date about age inequalities in care in low- and middle-income countries, and is the first study to utilize standardized, nationally representative, multicountry clinical observation data to examine care quality and comprehensiveness for adolescents.

Methods

Data source

SPA surveys are administered by the Demographic and Health Survey program. The surveys collect data from public and private health facilities in study countries, and include information on facility and provider characteristics, as well as direct service observation and client exit interviews for women seeking ANC. This analysis uses SPA data from Democratic Republic of the Congo (DRC) (2017–2018) [10], Malawi (2013–2014) [11], Senegal (2012, 2014–2017) [12–16], and Tanzania (2014–2015) [17]. These data were selected as they represent the four countries with available, recent, and comparable SPA survey data on both FP and antenatal visits, and a sufficiently sized adolescent client sample for antenatal and/or FP visits. (DRC has a small adolescent FP sample [n = 1] so it is included for antenatal analyses only; analyses of the antenatal data without DRC were also conducted, and results are available upon request.) Detailed information about the SPA survey methodology, sampling strategy, recruitment of participants, and consent procedures can be found at https://dhsprogram.com/What-We-Do/Survey-Types/SPA.cfm (Appendix A).

Box 1 presents contextual information on the sampled countries, all in sub-Saharan Africa [18–24]. Total fertility rates are similar in Malawi, Senegal, and Tanzania (approximately five children per woman), and higher in DRC (nearly 6.5 children per woman). In DRC, Malawi, and Tanzania, over 25% of adolescents have begun childbearing. Use of ANC is very common in all countries but only approximately half of women receive the 4 visits recommended by WHO before 2016 (when most of these surveys were conducted). In all four countries, use of modern FP among adolescents is much lower than among the full reproductive age population.

Variables

We use direct service observation data to assess whether evidence-based care components are delivered (see Appendix B for details of variable construction). We include care activities that all women (regardless of age or care history) should receive when they seek FP services or ANC. For FP visits, we include only women receiving injectable contraceptives as this is the predominant method used by adolescents in the dataset (in order to obtain sufficient sample size for analysis) and allowed for standardization in the care activities offered. We include all data about method-specific counseling and the clinical process itself (40 activities in total); this is scaled to 0–100 points, to summarize quality of care received; for example, what share of all possible FP visit care activities were received. This is calculated separately for clinical activities and discussion (counseling) activities, and the combined set. For ANC visits, we include those activities from the WHO recommended package of focused ANC activities from the period of these surveys (pre-2016) [25] that should be administered to all women during at least two ANC visits (since the SPA service observation may enroll women at any point during their antenatal sequence) (57 activities), and exclude those activities that were recommended for referral centers only. As above, a total (scaled 0–100) of activities is generated to create a summary measure of all care interactions for clinical activities, discussion activities, and the combined set.

We assess perceived quality of care based on exit interview questions: satisfaction with care received that day, and any reported complaint for that day's visit (wait time, ability to discuss problems, amount of explanation received, auditory and visual privacy, availability of medicines, timing [hours or days] of service availability, cleanliness, treatment by staff, and service costs).

Analysis

The analyses use multilevel models (visits are nested within providers, who are nested within facilities) to examine the outcome variables described above. Models are specified as general linear regression models (Gaussian distribution) for continuous outcomes (care activities), and a logistic regression model for binary outcomes (expressing any complaint with care). The main independent variable for all models is whether the client is an adolescent or an adult woman, and this is classified based on self-reported age (below 20 years, or 25 years and older). We exclude women aged 20–24 from this analysis to remove any effect that may be due to imprecision of age estimates (by the woman or by the healthcare provider). We test this through a robustness check that compares adolescents to women aged 20. We also check for a potential parity effect by a robustness check that restricts to first-time mothers.

All multivariable models include country and year fixed effects, client characteristics (self-reported previous pregnancy history, client self-reported education level [none, primary, or secondary/beyond]), provider characteristics (sex, education [years], cadre [doctor/other clinician, nurse, pharmacist/technician], clinical experience [years]), an indicator variable for whether this was the first encounter observed, whether they had recent work supervision, whether they had recent training (in FP and ANC, for respective models), urban/rural facility location, and facility service-specific readiness scores (ANC readiness for ANC models, and FP readiness for FP models) as defined by WHO Service Availability and Readiness Assessment guidelines [26]. Components of service readiness for ANC and FP include staff and training, equipment, diagnostics, medicines, and commodities (Appendix C provides a detailed list of tracer items that compose the ANC and FP service-specific readiness scores). Availability of indicators for each component was combined using a simple additive index to generate a summary score for each facility. In countries where SPA surveys use a stratified sampling strategy to obtain a nationally representative sample survey of health facilities, the model specification adjusts for stratification at the facility level. All analyses include scaled sample weights for survey year and country to reflect selection at the facility, provider, and client levels, per recent recommendations [27]. Weights were used and calculated at the survey (country-year) level. We report levels of significance up to $a = 0.1$ due to small sample sizes for some analyses. Analyses were conducted using Stata v14.2. We conducted a post hoc power analysis of the main outcomes of our multilevel model without survey weights. This analysis indicated sufficient power to detect a two-point difference in FP activities and insufficient power for estimated differences in ANC activities. As they do not account for survey design, however, these results should be interpreted with caution, and as lower limits of the weighted model's actual power.

Ethical review

The Demographic and Health Survey program makes SPA survey data available for research, and the University of California, Los Angeles Institutional Review Board classified this study as nonhuman subjects research and exempt from review.

Results

In total, 2,342 FP visits and 8,600 ANC visits were included (Table 1) in the analysis. Approximately 10.5% of the FP visits and 31.2% of the ANC visits were for women aged 19 or younger. More adolescents than adult women were new users of FP (31.4% and 16.6% for adolescents and adult women, respectively). Most women in the FP sample had previously been pregnant; in the antenatal sample, a large majority of women 25 years had been pregnant previously (95.1%), but this was most adolescents' first pregnancy (70.3%). Adolescent clients of both types had a slightly higher skewed distribution of educational attainment (<20% had no schooling vs. 25%–30% of women 25 years).

Most visits, both FP and antenatal, were conducted by female providers (particularly for adult women), and by nurses. Approximately three quarters of providers reported having received work supervision during the prior 6 months. Recent topic-specific training (on FP or ANC, respectively) was reported by approximately 66.5% of FP providers and just under half of ANC providers.

Among all women, clinical activities—during both FP and antenatal visits—were provided more often than discussion activities (Table 2). In multilevel multivariable models, compared to adult women, adolescents received borderline significantly higher percentage of overall care activities during FP visits (2.31, standard error [SE] 1.29, $p = .073$) and discussion activities (3.76, SE 1.94, $p = .053$). During ANC, adolescents received significantly fewer discussion activities than adult women (-3.10, SE 0.97, $p = .002$).

Overall, only approximately 43% of FP care activities and 33% of ANC activities were performed during these visits, and clinical activities were more common (63.9% during FP visits and 36.5% during ANC visits) than discussion activities (31.0% during FP and 29.1% during ANC visits) (Appendix Table A1). Certain care activities were more frequently performed than others: for example, providers were much more likely to talk with clients of any age about how to take injectable contraceptives (60.3%) and unlikely to talk about what to do if injection is not received ontime (13.7%); and were more likely to ask about pregnancy danger signs than provide newborn care recommendations (66.1% vs. 29.3%, respectively) (Appendix Table A1). Adolescents were more likely to receive nearly every aspect of FP care, and were less likely to receive nearly every aspect of ANC, than adult women. In adjusted odds ratios (aOR), counseling on whether to return to clinic if side effects appear or persist (aOR 7.65, SE 4.85, $p = .001$), confirming choice of injectable method with new client (aOR 13.24, SE 8.20, $p < .001$), asking about symptoms of sexually transmitted infections (aOR 3.70, SE 2.22, $p = .03$), and preparation of injection in clean location (aOR 6.57, SE 5.85, $p = .03$) were significantly more commonly provided to adolescents during FP visits. Counseling on delivery preparations (aOR 0.30, SE 0.14, $p = .01$) was significantly less likely to be provided to adolescents, while tetanus toxoid injection

was more likely for adolescents versus women 25 years (aOR 5.95, SE 3.32, p = .001) as was counseling or testing for HIV (aOR 5.95, SE 4.61, p = .02).

Echoing the pooled results, in each country, clinical care was more comprehensive than discussion activities (Appendix Table A2) but many of these relationships may not have attained statistical significance due to small sample sizes.

Despite these differences in quality of care received by adolescents, however, they did not differ significantly from older women in their estimated odds of reporting any complaints, or being highly satisfied with care (Table 3).

Robustness checks

When comparing adolescents to nonadolescents (i.e., women 20 years old), these relationships largely persisted but weakened and lost significance in many cases (Appendix Table A3). There was not a significant difference between adolescents' receipt of FP care activities than nonadolescent women (on average, an additional 1.23 activities overall [SE 1.02, p = .23], and an additional 2.17 discussion activities [SE 1.56, p = .16]), but adolescents did receive borderline significantly fewer antenatal overall care activities (−0.78 activities overall [SE 0.60, p = .19]) and significantly fewer discussion activities (−1.87 discussion activities [SE 0.77, p = .02]).

We also explored age differences among first-time mothers seeking ANC. Among first-time mothers, adolescents received fewer care activities than older women (both women 25+ and women 20+); first-time adolescent mothers received fewer discussion activities (−3.38, SE 1.61, p = .04), but there was no significant difference in overall or clinical activities (−2.26, SE 1.85, p = .2; and −1.24, SE 2.33, p = .6, respectively) (Appendix Table A4). Unfortunately, an analogous assessment of first-time FP users was not possible due to small sample size. We also reestimated the main effects without scaled sample weights and the results were overall very similar in terms of magnitude, direction, and significance, to our main findings.

Discussion

Two main themes emerge from these findings. First, provision of high-quality FP and ANC is uncommon in the sampled countries. Second, compared to adult women (age 25 years) adolescents receive more care activities during FP visits, but fewer care activities during antenatal visits, and these differences are strongest for communication-dense (discussion, counseling) activities.

Although several studies have evaluated the quality of FP provision using SPA data, few studies have evaluated quality of care components across all service observation indicators [28,29]. We find that women received, on average, only 42.5% of evidence-based FP care activities during a visit, and only 33.1% of ANC activities. Clinical activities were much more common than discussion activities during both types of visits, and certain discussions were particularly unlikely to occur such as counseling on potential side effects from injectable contraceptives, and counseling on postpartum issues during ANC.

Quality of care is a nuanced and multifaceted concept with both technical and interpersonal components. We find particular gaps in interpersonal care quality, that is, discussion and counseling activities, which mirrors the broader literature. A study from Tanzania similarly identified certain clinical activities (e.g., blood pressure measurement, assessing for anemia) as more prevalent during antenatal visits than communication-based activities like health education and history-taking [30], and a multicountry study of antenatal visits found that women were more likely to report having had their blood pressure taken and having been given iron prophylaxis versus provided information on complications [31]. Evidence from Senegal evaluating quality of FP services for women similarly found inadequate levels of counseling for several contraceptive methods (pills, injectables, implants, and intrauterine device) [28]. These results indicate important gaps in the provision of high-quality reproductive health care across several countries in sub-Saharan Africa. Strengthening counseling and communication skills may be an important focus for programs in the region that seek to improve women's health outcomes. (It should however be noted that this study was unable to assess the quality of this interpersonal communication e.g., the tone or exact content of counseling.)

Provider bias, and differential treatment in the healthcare system, is a topic of critical need for further investigation [9], and these results underscore the importance of considering care received across the whole reproductive health continuum. Although these results suggest that adolescents receive lower quality ANC than adult women, the opposite is observed during FP visits: adolescents receive as many care components as adult women, and significantly more discussion and counseling, than women over age 25. These findings were generally consistent across countries and survey years, which highlight the importance of considering age-based care quality disparities during policy and program discussions at both national and global levels. These findings add to a nascent literature about bias in care provision from low- and middle-income countries, and offer a contrasting viewpoint to the majority of existing evidence that suggests worse care for adolescents, including studies of FP services in Nigeria [32], and provider reports of disapproving attitudes toward adolescent sexual activity (including contraceptive use) in Ethiopia [33], Kenya and Zambia [34], and South Africa [35]. In contrast, and in line with our findings, a study from Malawi found that quality of FP services was higher for adolescents (aged 13–19 years) compared to older women [36]. Additionally, we found that nulliparous adolescents received particularly poor ANC compared to nulliparous adult women, suggesting that first-time adolescent mothers may be a group in need of further study and care improvement.

It is possible that these results are picking up the effects of global initiatives to ensure youth-friendly FP services, and that the lack of better ANC for adolescent mothers reflects relative inattention to this topic. There may be unintended consequences of emphasizing FP for youth, including a risk of stigmatizing young motherhood. All four countries included in this analysis have specific policies and programs to strengthen youth-friendly FP services (including the National Multisectoral Strategic Plan for Family Planning [37] and the National Strategic Plan for the Health and Wellbeing of Adolescents [38] in the DRC; the National Youth-Friendly Health Services Strategy [39] and the National Youth Policy [40] in Malawi; the National Family Planning Action Plan [41] in Senegal; and the National Family Planning Guidelines and Standards [42] and the National Policy of

Youth Development [43] in Tanzania) but there has been relatively little emphasis on safe pregnancy and childbirth for young mothers in these countries. In fact in all four countries, key development indicators focus on reducing adolescents' number of pregnancies, and increasing their use of FP, potentially risking further stigmatization of young mothers. More research is needed, including longitudinal studies to assess trends and qualitative methods to interrogate possible hypotheses. If global policies to promote adolescent FP behaviors are affecting provision of obstetric care for young mothers, more nuanced messaging and programming may be needed.

Some limitations to this analysis should be noted. First, measurement of care components was necessarily different between FP and ANC visits, so the analysis stratified by care type. Second, the operationalization of "care quality," which used WHO guidelines for ANC and the available SPA variables for both service types, does not encompass all possible care activities, and in particular includes only coarse measures to capture discussion activities. Important aspects of informed choice and woman-centered care are not included, for example. Future research might seek to explore nuances in quality within and across countries, and service types. Third, there were relatively small numbers of adolescents in this sample particularly at FP visits. In settings where women commonly begin childbearing early, adolescents may be hesitant to seek FP care [44]. Underutilization of FP services by young women should continue to be investigated in future research, including how anticipated or experienced poor care quality may deter utilization. Fourth, this analysis compared adolescents to adult women and did not attempt to quantify per-age effects. It is possible that there are specific ages at which women experience larger care quality differences, but our sample size did not allow such an exploration. Future analyses should interrogate subgroups (if by-age analyses are not possible), such as examining care for very young adolescents. This is also important as other factors intersect with age subgroups, for example, if nulliparous women in their forties receive low-quality FP counseling due to provider expectations about childbearing patterns and preferences. Fifth, there is the possibility of measurement bias. For example, although the use of direct observation is a strength of this analysis as we do not rely on self-reported care activities, it may introduce bias if providers change their behavior when an observer is present; and, self-reported care satisfaction is a challenging construct to measure and quantify as noted above [45]. Finally, it is impossible to rule out the potential role of omitted or unobserved variables in this relationship. This is particularly worth noting since not every important factor that might affect this relationship was included in the SPA data; for example, marital status is not included in the data, and may contribute to the associations seen here if adolescents are less likely to be married and if unmarried women are likely to receive worse care. It is possible that younger women who seek reproductive health services are different in unobserved or unmeasured ways from those who do not.

Conclusions

These are the most comprehensive findings to date about directly observed reproductive healthcare quality for adolescents, and they provide a unique contribution by focusing on the experience of adolescents compared to adult women over age 25. Although adolescent fertility is on the decline, childbearing during adolescence remains very common, and

these results indicate that adolescents may receive similar (or better) FP care, but worse quality of ANC, relative to older women. As the global community works to improve the health of adolescents, including birth outcomes, attention to the full reproductive, maternal, newborn, and child health continuum should be prioritized. In particular, interventions to strengthen provider-patient communication, for example, via incentives or further education and training, may be especially valuable for this population. Further research is needed on the acceptability, impact, and cost-effectiveness of such supply-side interventions for improving quality of care for adolescents and, in particular, adolescent mothers.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Box 1:

Contextual information on the sampled countries

	DRC	Malawi	Senegal	Tanzania
Overview				
Income classification (24)	Low	Low	Lower-middle	Low
Population size (25)	81.3 million	18.1 million	15.4 million	56.3 million
GDP per capita, PPP (26)	$932	$1,311	$3,783	$3,227
Poverty headcount ratio at national poverty line (26)	63.9% (2012)	51.5% (2016)	46.7% (2011)	26.4% (2018)
Fertility				
Crude birth rate (per 1000 live births) (25)	44.0 (2019)	37.9 (2019)	37.7 (2019)	38.9 (2019)
Total fertility rate (per woman) (25)	6.4 (2019)	4.9 (2019)	5.0 (2019)	5.2 (2019)
Age-specific fertility rate among adolescents aged 15–19 years (per 1000 women aged 15–19) (25)	129.3 (2019)	144.2 (2019)	83.6 (2019)	123.2 (2019)
Mean age at childbearing (25)	29.6 (2019)	28.3 (2019)	30.2 (2019)	29.0
Proportion of adolescents (15–19 years) who have begun childbearing (27–30)	27.2% (2013–14)	29.0% (2015–16)	16.1% (2015)	26.7% (2015–16)
Median age at first birth among women aged 25–49 years (27–30)	19.9 (2013–14)	19.0 (2015–16)	21.1 (2015)	19.7 (2015–16)
Family planning (FP)				
Current contraceptive prevalence among women aged 15–49 years (27–30)	19.3% (2013–14)	46.0% (2015–16)	16.9% (2015)	32.4% (2015–16)
Current contraceptive prevalence among adolescents aged 15–19 (27–30)	11.5% (2013–14)	15.4% (2015–16)	2.5% (2015)	10.4% (2015–16)
Unmet need for FP among adolescents 15–19 years (27–30)	30.8% (2013–14)	22.2% (2015–16)	25.2% (2015)	22.1% (2015–16)
Antenatal care (ANC)				
Any ANC from skilled provider (previous 5 years) (27–30)	88.4% (2013–14)	94.8% (2015–16)	94.9% (2015)	98.0% (2015–16)
4+ ANC visit (previous 5 years) (27–30)	48.0% (2013–14)	56.0% (2015–16)	46.6% (2015)	50.7% (2015–16)

	DRC	Malawi	Senegal	Tanzania
Dataset information				
Years of SPA data	2017–18	2013–14	2012, 2014–2017[1]	2014–15
Family planning sample size	n/a (excluded from all FP analyses)	n=97 adolescents n=590 adult women	n=88 adolescents n=867 adult women	n= 60 adolescents n=640 adult women
ANC sample size	n=907 adolescents n=2196 adult women	n=428 adolescents n=902 adult women	n=311 adolescents n=1097 adult women	n=664 adolescents n=2095 adult women

[1] Senegal 2014 & 2016 included ANC data; Senegal 2012, 2015 & 2017 included FP data

IMPLICATIONS AND CONTRIBUTION

This multicountry assessment of differential quality of reproductive health care finds that adolescents receive similar-quality family planning services as adult women (age 25), but less comprehensive antenatal care, particularly counseling/discussion-based activities. Quality of care is generally low yet reported satisfaction is high.

Table 1

Characteristics of the pooled (all-country) study samples

	Family planning sample (n = 2,342)		ANC sample (n = 8,600)	
	Adolescents (<20 years)	Adult women (≥25 years)	Adolescents (<20 years)	Adult women (≥25 years)
	n = 245	n = 2,097	n = 2,310	n = 9,877
Client characteristics, n (weighted %)				
First ANC visit for this pregnancy: Yes (vs. no)	N/A		1,110 (52.1%)	2,810 (46.2%)
New FP user: Yes (vs. no)	68 (31.4%)	159 (6.6%)	N/A	N/A
Ever previously pregnant: Yes (vs. no) Education	215 (84.7%)	1,974 (91.4%)	680 (29.7%)	5,827 (95.1%)
None	56(17.7%)	676 (32.2%)	418 (16.5%)	1,554 (27.8%)
Primary	133 (62.4%)	1,053 (51.7%)	1,179 (49.3%)	2,693 (44.4%)
Secondary and above	56 (19.9%)	368 (19.9%)	713 (34.2%)	2,043 (27.7%)
Provider characteristics, n (weighted %)				
Provider sex: Female (vs. male)	185 (74.7%)	1,720 (85.5%)	1,737 (72.7%)	4,979 (76.6%)
Provider cadre				
Nurse	225 (92.5%)	1,918 (91.8%)	2,058 (94.6%)	5,434 (92.1%)
Doctor, other clinician	3 (0.3%)	71 (1.4%)	169 (4.1%)	673 (5.8%)
Pharmacist/technician/other	17 (7.3%)	108 (6.7%)	83 (1.3%)	183 (2.1%)
Years of schooling, mean (SE)	14.36 (0.3)	14.27 (0.20)	13.3 (0.13)	13.8 (0.13)
Years of clinical practice, mean (SE)	10.02 (1.4)	11.04(0.69)	11.0 (0.6)	10.7 (0.5)
Work supervision: Yes [a] (vs. no)	181 (76.9%)	1,553 (70.1%)	1,748 (76.3%)	4,658 (77.4%)
Recent training (in family planning or ANC, respectively): Yes [b] (vs. no)	177 (66.5%)	1,576 (65.7%)	1,051 (42.1%)	3,082 (44.3%)
First observation in dataset: Yes (vs. no)	60 (23.1%)	738 (49.6%)	593 (32.3%)	1,779 (27.7%)
Facility characteristics, n (weighted %)				
Facility location: Rural (vs. urban)	159 (64.4%)	1,244(57.0%)	1,686 (78.6%)	3,849 (70.7%)
Facility service readiness (for FP or ANC care), [c] mean (SE)	5.32 (.13)	5.57 (.08)	4.7 (0.09)	4.9 (0.07)

Includes data from Malawi, Senegal, and Tanzania, and for ANC models, Democratic Republic of the Congo.

ANC = antenatal care; FP = family planning; SE = standard error.

[a] Defined as whether provider received supervision within past 6 months.

[b] Defined as whether received family planning (FP) training, or antenatal/prenatal care (ANC/PNC) training, within past 3 years.

[c] Readiness per World Health Organization Service Readiness and Availability Assessment guidelines.

Table 2

Multilevel generalized linear regression model: receipt of care for family planning or antenatal care (pooled all-country models)

	Family planning (n = 2,342)			ANC (n = 8,600)		
	All care activities	Discussion activities	Clinical activities	All care activities	Discussion activities	Clinical activities
Average number of activities (all ages) (SE)	42.50 (0.94)	31.00(1.13)	63.85 (1.09)	33.10 (0.71)	29.07 (0.96)	36.47 (0.72)
GLM coefficient (SE), adolescents versus adult women	2.31† (1.29)	3.76† (1.94)	0.07 (0.89)	−1.00 (1.10)	−3.10**(0.97)	0.76 (1.42)

Includes data from Malawi, Senegal, and Tanzania, and, for ANC models, Democratic Republic of the Congo.

Multilevel generalized linear model: client (Level 1); provider (Level 2); facility (Level 3), with sample weights at all levels.

Covariates: client characteristics (education level [categorical], first pregnancy [yes/no; only for ANC models] or ever pregnant [yes/no, only for FP models], first visit for this pregnancy [yes/no: only for ANC models]); facility characteristics (location [urban/rural], readiness score [ANC readiness for ANC models, FP readiness for FP models]); and provider characteristics (sex, type/cadre, years of education, years of experience, first SPA observation, recent supervision received, recently trained on ANC for ANC models, or FP for FP models). All models also include survey (country and year) fixed effects.

ANC = antenatal care; FP = family planning; GLM = generalized linear model; SE = standard error.

† $p < .1$

* $p < .05$

** $p < .01$

*** $p < .001$.

Table 3

Multilevel logistic regression model: odds of reporting any complaint after family planning or antenatal care visits for adolescents versus adult women (pooled, allcountry sample)

	Family planning (n = 2,342)		ANC (n = 8,600)	
	Any complaint, aOR (SE)	Very satisfied, aOR (SE)	Any complaint, aOR (SE)	Very satisfied, aOR (SE)
Adolescents (<20 years) versus adult women (25 years)	0.44 (0.22)	1.19(0.75)	0.67 (0.21)	1.41 (0.69)

Includes data from Malawi, Senegal, and Tanzania, and, for ANC models, Democratic Republic of the Congo.

Multilevel logistic regression model: client (Level 1); provider (Level 2); facility (Level 3), with sample weights at all levels.

Covariates: first pregnancy (yes/no; only for ANC models) or ever pregnant (yes/no, only for FP models), client education (none, primary, secondary, or beyond), provider sex, provider education (years), provider qualification (doctor/other clinician, nurse, pharmacist/technician), provider years of clinical practice, first clinical observation, work supervision, recent training (in family planning and ANC, for respective models), facility location, and survey country and year fixed effects. ANC = antenatal care; aOR = adjusted odds ratio; FP = family planning; SE = standard error.

†
$p < .1$

*
$p < .05$

**
$p < .01$

***
$p < .001$.