**Quality of antenatal care and associated factors in western Kenya: an assessment of service provision and experience dimensions**

**Draft Paper for PAA**

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**Abstract:**

Despite increasing attention on the contribution of poor quality care to maternal mortality, few studies have examined the levels and predictors of quality of antenatal care (ANC). In this paper we describe quality of ANC women received, including service provision and experience dimensions, as well as factors associated with each dimension in a rural county in Western Kenya. We use survey data from 1,031 women aged 15-49 who attended ANC at least once in their most recent pregnancy. ANC quality is measured by several questions related to receipt of recommended ANC services and communication and dignified care, which are summed to create service provision and experience of care indices. We find suboptimal ANC quality in both the service provision and experience dimensions. Controlling for other factors, the most disadvantaged and disempowered women receive the lowest quality ANC. ANC quality also differs by facility type with differences by dimension.

## I. Introduction

Maternal and neonatal mortality has remained high in low resource settings despite some progress. In 2015, about 303 000 women died from pregnancy-related causes and 2.7 million babies died during the first 28 days of life [1, 2]. About 2.6 million babies were also stillborn [3]. High quality antenatal care (ANC) can reduce maternal and neonatal morbidity and mortality and stillbirths through prevention, as well as early identification and management of pregnancy complications or pre-existing conditions [4]. High quality ANC can also influence women's health seeking behavior towards choosing skilled care at birth and helping them prepare to be able to access it [5–7]. While the specific recommendations for frequency of ANC has varied, the World Health Organization (WHO) has consistently recommended that all pregnant women receive some ANC during their pregnancy.

The most recent WHO recommendations *on antenatal care for a positive pregnancy experience*, updated in 2016, prioritizes person-centered care and overall well-being of the mother and baby. A key update in this document is the recommendation schedule of eight contacts, rather than four visits. Use of "contacts" rather than "visits" is said to imply an active connection between a pregnant woman and a health care provider. Clinical recommendations include blood pressure monitoring, urine testing, weight, and fetal monitoring at every visit, as well as Iron and Folic Acid supplementation and Tetanus Toxoid immunization at every visit, deworming after the first trimester, and at least three doses of Intermittent Preventative Treatment (IPT) or prophylaxis. Blood count screening for anemia is recommended at three of the eight contacts and HIV and tuberculosis screening recommended at first ANC contact in prevalent settings. One ultrasound scan is recommended before 24 weeks of gestation. The recommendations include broad as well as context specific guidance.

Kenya's National Guidelines for Quality Obstetrics and Perinatal Care that were in use at the time of this work were still based on the earlier WHO recommendations on Focused Antenatal Care (FANC), which recommended four comprehensive and targeted visits. The guidelines, however, urged providers to view each visit as if it were the only visit a woman may make. The content of each visit is similar to that recommended by WHO listed above. A comprehensive health promotion education, with a questions and answer session is also recommended during each visit. These guidelines also emphasize the importance of patient experience components such as communication, respect, and dignity. It states that *"Antenatal care should be simpler, safer, friendly and more accessible. Women are more likely to seek and return for services if they feel* ***cared for and respected*** *by their providers. This personalized approach requires health care providers to use excellent interpersonal skills* ***since listening to client's concerns is just as important as giving advice.*** *It respects clients' right to* ***dignity, privacy, confidentiality, full and accurate information****".*

Until recently, most prior research on maternal health care focused on use of services with research on ANC mostly on timing and frequency of ANC visits[8–11]. Increasing recognition of the role of poor-quality care to the poor maternal and neonatal outcomes has stimulated interest in assessing quality of maternal health service. However, most of the attention has focused on quality of care during childbirth.[12, 13]. Little research thus exists on quality of ANC, and the few studies on the topic have focused on the receipt of recommended ANC services [14–16]. This is despite a global movement advocating for measurement and interventions to improve respectful maternity care. A positive experience during both pregnancy and childbirth are key to person-centered care as highlighted in recent WHO recommendations [17–19]. Thus, studies examining ANC quality, including the experience dimensions, are critical to provide information on strengths and gaps in ANC quality for guiding interventions to improve the continuum of respectful maternity care.

The goal of this paper is to describe levels of quality of ANC, including both service provision and experience of care, in a rural county in western Kenya. Service provision here refers to receipt of recommended evidence-based services for antenatal care per WHO and Kenya guidelines. Experience of

care captures items related to effective communication, respect, dignity, and emotional support per the WHO framework for quality of maternal and newborn health [19]. These experience dimensions capture person-centered antenatal care (PCANC). We also examine factors associated with each dimension of quality of care to identify sources of disparities in quality of care.

## II. Methods

### A. Setting and Data collection

The data are from a survey conducted as part of a study on community perceptions of quality of maternity care in a rural county in western Kenya. The setting and data collection methods have been previously described [20, 21]. The survey was conducted in August and September 2016, with women aged 15-49 years who delivered in the nine weeks preceding the survey. A multistage sampling approach was used to select women from each sub-county. The interviews were conducted in English, Swahili, and Luo in private spaces in health facilities or in the homes of the respondents. About one thousand women (N=1,051) were interviewed, with response rate above 98%. Ethical approval for the study was provided by the institutions listed in the ethics statement, and all participants provided written informed consent after receiving information about the research. We use data from women who received antenatal care at least once during their most recent pregnancy (N=1,031).

### B. Measures

**Dependent variables (outcomes): measures of quality of ANC**

ANC quality is measured by several questions asked to women to assess different aspects of the content of ANC services they received and their nature of their interactions with providers, divided into measures of service provision and experience of care.

***Service provision:*** The service provision measures are nine items asking whether they received various services for screening and prevention listed in *Table 2*. The questions include whether they had their height, weight, and blood pressure measured, whether they had urine and blood tests, and whether they received tetanus injections, iron supplements, antihelminthes, and antimalarials. To examine associated factors, these nine items are summed to create a service provision index. These items have factor loadings of >.2 on one factor to support summing them in an index, and a reasonable Cronbach alpha of 0.5. Five of the questions have binary responses (No=0 and Yes=1), and 4 have responses on a four-point frequency scale (No never=0, Yes, a few times=1, and Yes, most of the time=2, and Yes, all the time=3). Thus, the summative score has a range of 0 to 17 ((5*1)+(4*3)). Don't know response options are recoded to missing before summing the responses. Ultrasound screening is examined separately as a binary variable because it does not load well with the rest of the items.

***Experience of care:*** The experience of care measures are also listed in *Table 2*. These questions capture mostly effective communication: told results after she has been weighed, her blood pressure taken, and after urine and blood tests; educated on pregnancy complications, what to do in the event of a complication, what to expect during the pregnancy, birth preparedness, diet, and breastfeeding; whether she understood the purpose of tests and medicines, if she was asked if she had questions, and if she felt able to ask questions. There are also three questions capturing dignity and respect as well as one question on cleanliness of the facility. These 18 items are summed to create an experience of care index to examine associated factors. They load together on one factor with loadings greater than 0.3 and have Cronbach alpha of 0.81. Six of the questions have binary responses (No=0 and Yes=1), and 12 have responses on a four-point frequency scale (No never=0, Yes, a few times=1, and Yes, most of the time=2, and Yes, all the time=3). Thus, the summative score has a range of 0 to 42 ((6*1) +(12*3)). Don't know response options are recoded to missing before summing the responses. Two items in *Table 1* (being asked for bribe and feeling they were discriminated against) are not included in the index because they loaded poorly with the rest of the items in the group.

**Independent variables (predictors)**
Based on prior studies and theoretical rationale, we examined various factors that might affect the quality of ANC a woman receives, including: socioeconomic and demographic factors, women's health status, familiarity and extent of contact with the health system, and facility and provider characteristics. The demographic factors included are age, marital status, parity, tribe, and religion.

The key independent variables are the socioeconomic factors which capture a woman's personal status and empowerment and her status based on her household or partner. These included *Employment status*, type of *Occupation, Education, and Literacy*, which capture economic empowerment (access to and control over the means to make a living, and receiving the material benefits of this access), cognitive and psychological empowerment (includes knowledge about rights, self-esteem, and self-efficacy) [22–24]. We also included two composite measures of empowerment: *participation in household decision-making* and *attitudes towards domestic violence* (from questions in the DHS module on empowerment- see Appendix 1) to measure sociocultural empowerment (gender norms, including norms against gender-based violence) [25]. In addition we included experience of domestic violence, which may be associated with both empowerment and mistreatment [20, 26]. Other measures of socioeconomic status (SES) included are *Household wealth* (measured in quintiles, calculated from a wealth index based on 13 questions on household assets [27] and *Partner's education and occupation*. In addition, we included a variable on whether they or someone in their household works in a health facility, as this could influence the type of care they receive.

Variables to capture health status related factors that might affect the care women receive include whether they had complications in the index or prior pregnancy and their own assessment of the severity of the complications (whether they felt the complication was severe or not), as well as reason for seeking ANC (for a problem or checkup). For familiarity with and extent of contact with the health system, we included a variable on whether they had received ANC in prior pregnancy, whether they had previously delivered in a health facility, and the timing and frequency of antenatal care. For facility and provider characteristics, we included two variables on the type of facility the woman received care in and the type of provider. Because a woman could receive care from more than one type of facility and provider, these were recoded into the highest type of facility and provider (e.g., if they received care from a hospital and a health center, it is coded as hospital, and if they received care from a doctor and nurse, it is coded as a doctor). Finally, we controlled for the timing and setting of the interview, as this might affect their responses.

**C. Analysis**
We first run descriptive analysis to examine the characteristics of the sample and the distribution of all ANC quality related variables using means for continuous variables and proportions for categorical variables. Next, we assessed which of the ANC quality related variables could be grouped together to generate the ANC service provision and experience of care indices using exploratory factor analysis and and Chronbach's alpha for internal consistency. We then summed the selected indices to generate ANC service provision and experience of care scores, which we used as the outcome variables in bivariate and multivariate analysis.

Because the summative scores are approximately normally distributed, we used them as continuous variables and examined mean differences in scores by the various predictors, as well as unadjusted and adjusted ordinary least squares regressions. We used logistic regressions to examine the factors associated with receipt of an ultrasound. In addition, we dichotomized the service provision and experience of care scores around the median into low and high quality and examined them in logistic regressions for sensitivity analysis. For the multivariate analysis we first included the key independent variables and all the variables that were significantly associated with the outcome measures in the bivariate analysis, in the

multivariate models. We then conducted post estimation tests to assess model fit and checked for collinearity, and removed variables that did not improve the models or were highly correlated with other variables in the model.

## III. Results

### Descriptive

*Table 1* shows the characteristics of the sample. The average age is 25 years, and about 17% are less than 20 years old. Approximately 79% are married, with average parity of 3; 30% have 4 or more children. About 60% have only primary education or less and 76% are literate (can read and write very well). Less than a quarter (23%) are gainfully employed (work for which they are paid). About two-thirds started ANC in the second trimester and received more than four antenatal care visits, whereas only 16% have health insurance. *Table 2* shows the distribution of individual ANC quality measures for both service provision and experience of care.

***Service Provision:*** About 60% had their height measured during their ANC and 80% reported their weight was measured at every visit. While guidelines recommend blood pressure and urine test at every ANC visit, only 58% reported their blood pressure was taken at every visit, and only 14% reported a urine test at every visit. Almost all (97%) received a blood test at least once, with 20% receiving a blood test more than once. In terms of preventative interventions, about 87% received a tetanus injection, 89% received iron supplementation, 58% received deworming medicine, and 83% were given antimalarial drugs, all of which are recommend per Kenya and WHO ANC guidelines. Only 16% of the women received an ultrasound during antenatal care. The average service provision score is 10.9 (SD=2.4; range=1 to 16) out of 17, giving a percent 64%.

***Experience of care***: Women were not consistently told the results of their examinations or about pregnancy and delivery: about 71% reported were always told their results after weighing, 53% always told blood pressure results, 38% always told urine test results, and 56% always told blood test results. Similarly, only 47% were told about the signs of pregnancy complications, 57% told where to go in case of complications, and 44% told what to expect during pregnancy and delivery. Over three-quarters (77%) reported receiving birth preparedness education, 67% nutrition education, and 64% breastfeeding education. At least one third of women reported sub-optimal understanding of ANC procedures: about 66% understood the purposes of tests performed most or all of the time and 68% understood the purposes of medicines received most or all of the time. Less than two-thirds of women (61%) felt they were able to ask questions most or all the time, and only 50% were consistently (most or all the time) asked if she had any questions. Most women felt they were treated with respect most or all of the time (90%), and about 87% felt they were treated in a friendly manner most or all of the time. However, in terms of confidentiality, about 31% reported they could never discuss issues in private. Over half of the women (58%) felt the health facility was always clean. The majority of women were never asked to give a bribe (89%) and felt they were never treated differently because of any personal attribute (94%). These two measures were not included in the experience score index. The average experience score is 27.3 (SD=8.2; range=1 to 42) out of 42, giving a percent 65%.

### Bivariate

*Table 3* shows bivariate statistics for the association between the summative ANC quality measures and receipt of an ultrasound with various potential predictors. Significant differences exist in the ANC quality measures by sociodemographic factors as well as facility types. Not accounting for other factors, women who are older than 19 years and married women have, on average, higher experience of care scores than younger and unmarried women. Older women are also more likely to receive an ultrasound examination than younger women. Women with higher parity had lower service provision scores, including less likely

to get an ultrasound. Compared to Luo women, Kuria women had higher experience scores and slightly higher service provision scores, but had lower odds of receiving an ultrasound.

Women who are more empowered, from high SES households, have someone in their household working in a health facility, and have health insurance have, on average, higher experience of care scores compared to less empowered women, women from lower SES households, women who have no one in their household working in a health facility, and women who have no health insurance, respectively. The significance and direction of the associations between service provision and the empowerment and SES measures are similar. College educated and women from the wealthiest households have over eight times higher odds of receiving an ultrasound than women with less than primary education and those from the poorest households.

Additionally, compared to women who had never experienced domestic violence, women who had experienced domestic violence had lower experience and service provision scores and had lower odds of getting an ultrasound. Also, women who had a severe pregnancy complication and first presented for ANC because of a problem had lower experience scores than those who had no severe pregnancy complication and first presented for ANC for checkup. Women who had any complication, however, had lower service provision scores with lower odds of receiving an ultrasound.

Women who started ANC in the first trimester, received ANC four or more times, and solely from private facilities have higher experience scores than those who started ANC after the first trimester, received ANC less than four times, and from government facilities. Similarly, women who started ANC in the first trimester and who received ANC four or more times had higher service provision scores. Service provision scores, however, did not differ between government hospitals and private facilities, but was lower for health centers. Additionally, compared to women who received ANC services in hospitals, women who received ANC in health centers had lower odds of receiving an ultrasound, while those who received ANC solely in a private facility had higher odds of receiving an ultrasound. Finally, women who were interviewed in their communities and after a week of delivery had lower experience and service provision scores those interviewed in health facilities and within a week of delivery.

**Multivariate**

The multivariate models presented in *Table 4* shows that, net of other factors, women in the 20 to 29 age group still have higher experience and those older than 30 years have higher service provision scores than those younger than 20 years. Both age groups are also over two times more likely to have done an ultrasound test than the younger women. Women with four or more children have lower service provision scores than the primiparous women. Net of other factors, Kuria women still had higher experience scores and slightly higher service provision scores, but had lower odds of receiving an ultrasound than Luo women.

Net of other factors, women who are literate, employed, and participate in household decisions also still have higher experiences scores, but only employment is significant for higher service provision, and those with higher participation in household decision making are more likely to get an ultrasound. Household wealth and partner's education are significantly associated with getting an ultrasound, with women from the wealthiest households and those with college educated husbands having about two times higher odds of receiving an ultrasound than women from the poorest households and whose husbands have less than primary education.

Controlling for other factors, women who had experienced domestic violence still had lower experience and service provision scores than women who had never experienced domestic violence.

Women who started ANC in the third trimester had lower experience and service provision scores, and those who received ANC four or more times received slightly higher service provision scores. Timing and frequency of ANC is not significantly associated with odds of getting an ultrasound. Additionally, compared to women who received ANC in hospitals, women who received ANC in health centers had higher experience scores but lower odds of receiving an ultrasound, while those who received ANC solely in a private facility had higher experience scores, but no difference in service provision scores or the odds of getting an ultrasound. The effect of location of the interview persists after controlling for other factors.

**Discussion**

This is one of the few to studies examine both service provision and experience dimensions of quality of ANC. We find that ANC quality is suboptimal in terms of providing recommended ANC services as well as ensuring women have a good experience. While many women receive basic ANC services such as blood pressure monitoring and urine test at least once during pregnancy, many are not receiving these consistently at every visit as recommended. The situation is even more dire for more advanced essential services such as ultrasounds, which less than one out of every five women in our sample received.

Although there is increased attention to mistreatment and poor person-centered in facilities globally, most of this work has focused on the intrapartum. In this paper we also draw attention to poor person-centered antenatal care (PCANC), which can affect women's adherence to treatment recommendations and deter them from returning to a facility to give birth [28–30]. The major gap in PCANC, which has been shown in other work for maternity care, is in the domain of communication [31]: women are not given sufficient information during antenatal care about their care, hence do not understand the purpose of examinations and medicines, but are not able to ask clarifying questions. In addition, although the majority of women felt respected by their health care providers, that 1 in 10 women did not feel respected means there is room for improvement. We did not include survey questions on extreme forms of poor person-centered care such as verbal and physical abuse. But prior qualitative work in this setting suggests that verbal and physical abuse occurs during antenatal care [32].

As in many areas of health care, the most disadvantaged and disempowered women receive the lowest quality ANC relating to both service provision and experience of care. The potential reasons why more empowered women and women from wealthier are more likely to receive high quality antenatal care and person-centered care is described in detail elsewhere [14, 20, 31]. These reasons include being able to access care in facilities that offer higher quality care, being able to pay for higher quality care, and having the knowledge and ability to advocate for higher quality care. Studies in Kenya have shown that poor women tend to live in areas where quality of care is poorer [16]. In this paper, we also find that the SES and empowerment differences are more marked for the experience of care dimensions than for the provision of ANC services. This is potentially because the services included in the service provision index are basic services that are offered free of charge to most clients, thus requiring less knowledge or ability to advocate for them. The exception is in getting an ultrasound where SES measured by household wealth and partner's education is a significant predictor. This finding is not surprising given the limited availability of ultrasounds in many government facilities in the setting, which requires that women perform utltrasounds at private facilities where they have to pay before getting the service. Tribal differences in ANC quality might be due to biases against or in favor of certain tribes resulting in them receiving less services and being treated differently. We believe implicit bias plays an important role in quality of care differentials in this setting not just by tribe, but also based on SES and age, and thus account for some of those disparities too.

The findings also suggest that certain high-risk women may not be getting key recommended services. For example, younger women (15 to 19 years) are less likely to get an ultrasound, in addition to being less likely have good PCANC. Given that this age group have high risk of complications, poor quality care may be playing a big role in their outcomes as complications may not be identified early or at all. In

addition, perceptions of poor person-centered care may deter them from starting ANC early and attending frequently, further delaying identifications of complications, and they may be less likely to deliver in a health facility where complications can be managed. Poor ANC quality in this group thus has detrimental consequences. Another high-risk group that was less likely to consistently receive the basic antenatal service was women with 4 or more children. This might be due to less attention to these women because of their prior childbirth experience, which could lead to adverse consequences for them if they receive less screening and preventative services. Other factors that account for differences in ANC quality are the timing and frequency of ANC. Both timing and frequency of ANC are important for the number of services one receives, but not for whether or not a woman gets an ultrasound. However, only timing is associated with experience of care, with women who received ANC in the third trimester reporting poorer experiences. This might be due to insufficient time for counselling and mistreatment from providers when women present for ANC late in the pregnancy, which we found in our qualitative work [32].

In addition, the types of facility one receives care affects the quality of care they receive based on different dimensions. In general, there was no difference in service provision scores by facility. However, women who received ANC at least once from a government hospital had lower experience scores, but had higher odds of getting an ultrasound. On the other hand, those who received care in a health center, had higher experience scores, but had lower odds of getting an ultrasound. Women who received care in only a private facility also had higher experience scores, but had similar odds of getting an ultrasound as those who were seen in the government hospital. The finding of higher experience scores in health centers and private facilities is consistent with prior studies on women's experiences for antenatal and delivery care and for family planning services [14, 31, 33, 34]. However, it raises the question of where the 'best' care for women might be during antenatal care[20]. Most women, particularly poor women, do not have the option of receiving care in private facilities. While they may receive more essential services in the higher-level facilities, which have more staffing and clinical infrastructure, they also stand the risk of being mistreated in these facilities. Women should not have to choose between receipt of essential services and good person-centered care. Thus, there is a need for targeted PCMC interventions in higher-level facilities, as well as equipping the lower level facilities to be able to provide the essential antenatal services.

Various reasons, ranging from structural factors to provider attitudes, account for the suboptimal ANC quality. Providers will be unable to take weight and blood pressure measurements or to do blood and urine tests if they do not have working scales and blood pressure monitors or functional laboratories, reagents and supplies needed for these tests. Similarly, they will be unable to give medications they do not have in stock. Thus, availability of necessary equipment, supplies, and medicines are key to providing good quality ANC. These reasons are much more relevant for service provision than experience of care, although the frustration and stress of providing care without all the necessary tools could also manifest in providers' interactions with women. Lack of provider knowledge of service provision guidelines and their knowledge and willingness to provide person-centered care is also a potential reason for poor quality. It is notable in the distribution of the individual measures shown in Table 2 that women were far more likely to be given various services than to be given information and listened to. One reason is that in ANC clinics where one provider may be trying to attend to several women, it is faster to do tests and dispense medication than spending time explaining to women and answering their questions. Thus, poor communication may be because of time constraints or workflow. The implication of this is that women might not be adhering to treatments and recommendations for further tests because they do not understand why these are necessary. Providers therefore need to be able to prioritize effective communication even in busy health facilities.

**Limitations**

This study has potential limitations. Firstly, the measures of ANC quality are based on self-report. Recall bias is thus a potential limitation as women may not accurately remember whether or not they received a service. In creating the summative scores, we coded don't know/remember responses as missing. But it is likely that women who said they can't remember did not receive it, and if they don't know, they likely weren't told about it. Thus, we may have excluded women who received the poorest quality ANC thus overestimating the actual levels of ANC quality. Social desirability bias is also potentially a limitation if women responded in a way that will please providers. This is likely a problem among women who were interviewed in a health facility and closer to the time of birth, as shown by the higher service provision and experience scores for women who were interviewed in a health facility and within a week of birth compared to women who were interviewed at home and after a week of birth. These are consistent with findings on women's experiences during childbirth [20, 21, 35]. In addition, we are unable to account for structural factors that affect quality of care. Finally, the results are not generalizable to all of Kenya, as data was collected in a specific county using a multistage approach which included convenience samples within randomly selected health units. Despite these limitations, this study makes valuable contributions to existing research on ANC quality in Kenya and other low-resource settings.

**Conclusions**

We find that quality of ANC is suboptimal in both domains of service provision and experience of care. Much work is thus needed to improve quality of ANC in Kenya. This study adds to growing evidence that quality is a key driver of the persistently high maternal and neonatal mortality in low resource settings, as well as in some high resource settings. While it is still important to get women to health facilities, much more is needed to ensure it is worth going to the health facility. Quality of ANC needs to be considered along the growing efforts to improve quality of delivery care. More efforts are needed to ensure that women consistently receive services required to prevent, identify and manage complications. Ultrasounds need to be made more readily available and affordable so that it is accessible to even the most disadvantaged women who may require it most. In addition, momentum for improving person-centered maternity care through respectful maternity care movement should also be spread to ANC to ensure women are receiving person-centered care along the pregnancy childbirth continuum. As countries such as Kenya update their national guidelines for maternity care to align with WHO standards, they must consider the person-centered care components of communication, respect, and dignity and ensure training to capacitate providers to put these skills into practice with all women in all types of facilities. In addition, disparities in quality of antenatal care based on demographic and social status, as well as by type of facility, need to be addressed in order to achieve the "no woman left behind" sustainable development goal. Further research could examine the barriers and facilitators providers face in providing high quality ANC in order to provide further recommendations for addressing the suboptimal quality and disparities found in this study.

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**Table 1: Sample distribution**

| | No. | % |
|---|---|---|
| ***Total*** | 1,031 | 100 |
| **Age** | | |
| 15 to 19 years | 177 | 17.2 |
| 20 to 29 years | 599 | 58.1 |
| 30 to 48 years | 255 | 24.7 |
| **Current marital status*** | | |
| Single | 154 | 15 |
| Partnered/Cohabiting | 4 | 0.4 |
| Married | 811 | 78.7 |
| Widowed | 48 | 4.7 |
| Divorced/Separated | 13 | 1.3 |
| **Number of births*** | | |
| 1 | 320 | 31.2 |
| 2 | 207 | 20.2 |
| 3 | 191 | 18.6 |
| 4 or more | 309 | 30.1 |
| **Highest education** | | |
| No school/Primary | 623 | 60.4 |
| Post-primary/vocational/Secondary | 292 | 28.3 |
| College or above | 116 | 11.3 |
| **Literacy: reading and write very well** | | |
| No | 244 | 23.7 |
| Yes | 787 | 76.3 |
| **Employed with income** | | |
| No | 792 | 76.8 |
| Yes | 239 | 23.2 |
| **Self or household member work in health facility** | | |
| No | 967 | 93.8 |
| Yes | 64 | 6.2 |
| **Household wealth quintile*** | | |
| Poorest | 247 | 24.2 |
| Poorer | 231 | 22.6 |
| Middle | 159 | 15.6 |
| Richer | 188 | 18.4 |
| Richest | 197 | 19.3 |
| **Household wealth quintile** | | |
| Poorest/Poorer | 478 | 46.8 |
| Middle | 159 | 15.6 |
| Richer/Richest | 385 | 37.7 |
| **Current occupation** | | |

| | | |
|---|---|---|
| Agricultural labor | 170 | 16.5 |
| Casual labor | 63 | 6.1 |
| Salaried worker | 97 | 9.4 |
| Self-employed in petty trade | 189 | 18.3 |
| Self-employed small scale industry | 29 | 2.8 |
| Unemployed/homemaker | 470 | 45.6 |
| Other | 13 | 1.3 |
| **Partner's occupation*** | | |
| Agricultural labor | 213 | 20.7 |
| Casual labor | 185 | 18 |
| Salaried worker | 157 | 15.3 |
| Self-employed in petty trade | 144 | 14 |
| Self-employed small scale industry | 85 | 8.3 |
| Unemployed/homemaker | 25 | 2.4 |
| Other | 4 | 0.4 |
| No Partner | 215 | 20.9 |
| **Partner's education*** | | |
| No school/Primary | 397 | 39.3 |
| Post-primary/vocational/Secondary | 250 | 24.8 |
| College or above | 147 | 14.6 |
| No Partner | 215 | 21.3 |
| **Has health insurance*** | | |
| No | 866 | 84.2 |
| Yes | 162 | 15.8 |
| **Tribe*** | | |
| Luo | 696 | 67.6 |
| Kuria | 239 | 23.2 |
| Other | 95 | 9.2 |
| **Religious affiliation** | | |
| Catholic | 271 | 26.3 |
| Protestant/Pentecostal | 233 | 22.6 |
| Seventh Day Adventist | 299 | 29 |
| Other Christian | 208 | 20.2 |
| Muslim/other religion | 20 | 1.9 |
| **Attitude towards domestic violence** | | |
| Tolerant | 490 | 47.5 |
| Intolerant | 541 | 52.5 |
| **Participation in household decisions** | | |
| Low participation | 531 | 51.5 |
| High participation | 500 | 48.5 |
| **Experienced domestic violence** | | |
| No | 488 | 47.3 |
| Yes | 543 | 52.7 |
| **Had any pregnancy complications** | | |

| | | |
|---|---|---|
| No | 559 | 54.2 |
| Yes | 472 | 45.8 |
| **Had severe pregnancy complications** | | |
| No | 709 | 68.8 |
| Yes | 322 | 31.2 |
| **Had complications in prior pregnancy** | | |
| No | 894 | 86.7 |
| Yes | 137 | 13.3 |
| **Received ANC in prior pregnancy** | | |
| No | 339 | 32.9 |
| Yes | 692 | 67.1 |
| **Prior facility delivery** | | |
| No | 398 | 38.6 |
| Yes | 633 | 61.4 |
| **Highest ANC facility** | | |
| Gov't Hospital | 354 | 34.3 |
| Gov't HC/Disp | 571 | 55.4 |
| Mission/Private facility | 106 | 10.3 |
| **Highest ANC Provider type** | | |
| Nurse/Midwife | 905 | 87.8 |
| Doctor/Clinical officer | 115 | 11.2 |
| Non-skilled attendant | 11 | 1.1 |
| **Reason for first ANC*** | | |
| Because of a problem | 112 | 10.9 |
| Just for a checkup | 909 | 88.3 |
| Can't Remember | 9 | 0.9 |
| **Timing of first antenatal visit** | | |
| First trimester | 300 | 29.1 |
| Second trimester | 634 | 61.5 |
| Third Trimester | 97 | 9.4 |
| **Number of antenatal visits*** | | |
| Less than 4 | 368 | 35.8 |
| 4 or 5 | 547 | 53.3 |
| 6 plus | 112 | 10.9 |
| **Pregnancy anxiety** | | |
| No, never | 634 | 61.5 |
| Yes, a few times | 215 | 20.9 |
| Yes, most of the time | 104 | 10.1 |
| Yes, all the time | 63 | 6.1 |
| Don’t Know Or Can’t Remember | 11 | 1.1 |
| Refused | 4 | 0.4 |
| **Knowledge of pregnancy complications** | | |
| Low knowledge (lists 0-2 complications) | 305 | 29.6 |
| Moderate knowledge (lists 3-4 complications) | 439 | 42.6 |

| | | |
|---|---|---|
| High knowledge (lists >=5 complications) | 287 | 27.8 |
| **Place of interview** | | |
| Health facility | 421 | 40.8 |
| In the community/a home | 610 | 59.2 |
| **Postpartum length** | | |
| less than 1 week | 81 | 7.9 |
| 1 week or more | 950 | 92.1 |
| **Postpartum length** | | |
| less than 5weeks | 493 | 47.8 |
| 5 weeks or more | 538 | 52.2 |

*=total n < 1,031

**Table 2: Distribution of ANC quality variables**

| *Service provision* | No. | % |
|---|---|---|
| **Height measured** | | |
| No | 406 | 39.4 |
| Yes | 616 | 59.7 |
| Don't know or can't remember | 9 | 0.9 |
| **Weighed** | | |
| No, Never | 22 | 2.1 |
| Yes, A Few Times | 93 | 9 |
| Yes, Most Of The Time | 86 | 8.3 |
| Yes, All The Time | 828 | 80.3 |
| Don't know or can't remember | 2 | 0.2 |
| **Blood pressure taken** | | |
| No, Never | 99 | 9.6 |
| Yes, A Few Times | 207 | 20.1 |
| Yes, Most Of The Time | 122 | 11.8 |
| Yes, All The Time | 594 | 57.6 |
| Don't know or can't remember | 9 | 0.9 |
| **Did urine test** | | |
| No, Never | 223 | 21.6 |
| Yes, A Few Times | 632 | 61.3 |
| Yes, Most Of The Time | 31 | 3 |
| Yes, All The Time | 139 | 13.5 |
| Don't know or can't remember | 6 | 0.6 |
| **Did a blood test** | | |
| No | 35 | 3.4 |
| Yes | 789 | 76.5 |
| Yes, More than once | 207 | 20.1 |
| **Received a tetanus injection** | | |
| No | 130 | 12.6 |
| Yes | 892 | 86.5 |
| Don't know or can't remember | 9 | 0.9 |
| **Iron supplementation** | | |
| No | 98 | 9.5 |
| Yes | 915 | 88.7 |
| Don't know or can't remember | 18 | 1.7 |
| **Antihelminthes** | | |
| No | 379 | 36.8 |
| Yes | 598 | 58 |
| Don't know or can't remember | 54 | 5.2 |
| **Antimalarials*** | | |
| No | 162 | 15.7 |
| Yes | 849 | 82.4 |

| | | |
|---|---|---|
| Don't know or can't remember | 19 | 1.8 |
| **Ultrasound*** | | |
| No | 862 | 83.7 |
| Yes | 167 | 16.2 |
| Don't know or can't remember | 1 | 0.1 |
| ***Experience of care*** | | |
| **Told the results after weighing*** | | |
| No, Never | 103 | 10.2 |
| Yes, A Few Times | 82 | 8.2 |
| Yes, Most Of The Time | 104 | 10.3 |
| Yes, All The Time | 711 | 70.7 |
| Don't know or can't remember | 6 | 0.6 |
| **Told results after blood pressure measurements*** | | |
| No, Never | 187 | 20.3 |
| Yes, A Few Times | 134 | 14.5 |
| Yes, Most Of The Time | 90 | 9.8 |
| Yes, All The Time | 493 | 53.4 |
| Don't know or can't remember | 19 | 2.1 |
| **Told results after urine test*** | | |
| No, Never | 115 | 14.4 |
| Yes, A Few Times | 329 | 41.1 |
| Yes, Most Of The Time | 46 | 5.7 |
| Yes, All The Time | 303 | 37.8 |
| Don't know or can't remember | 8 | 1 |
| **Told results after blood test*** | | |
| No, Never | 62 | 6.2 |
| Yes, A Few Times | 304 | 30.5 |
| Yes, Most Of The Time | 62 | 6.2 |
| Yes, All The Time | 554 | 55.6 |
| Don't know or can't remember | 14 | 1.4 |
| **Told about the signs of pregnancy complications*** | | |
| No | 537 | 52.2 |
| Yes | 485 | 47.1 |
| Don't know or can't remember | 7 | 0.7 |
| **Told where to go in case of complications*** | | |
| No | 445 | 43.2 |
| Yes | 582 | 56.5 |
| Don't know or can't remember | 3 | 0.3 |
| **Told what to expect during pregnancy and delivery** | | |
| No | 566 | 54.9 |
| Yes | 458 | 44.4 |
| Don't know or can't remember | 7 | 0.7 |
| **Birth preparedness education*** | | |
| No | 233 | 22.6 |

| | | |
|---|---|---|
| Yes | 793 | 77 |
| Don't know or can't remember | 4 | 0.4 |
| **Nutrition education** | | |
| No | 329 | 31.9 |
| Yes | 691 | 67 |
| Don't know or can't remember | 11 | 1.1 |
| **Breastfeeding education*** | | |
| No | 365 | 35.4 |
| Yes | 655 | 63.6 |
| Don't know or can't remember | 10 | 1 |
| **Understood purpose of tests performed** | | |
| No, Never | 170 | 16.5 |
| Yes, A Few Times | 178 | 17.3 |
| Yes, Most Of The Time | 234 | 22.7 |
| Yes, All The Time | 442 | 42.9 |
| Don't know or can't remember | 7 | 0.7 |
| **Understood purpose of medicines received** | | |
| No, Never | 154 | 14.9 |
| Yes, A Few Times | 167 | 16.2 |
| Yes, Most Of The Time | 240 | 23.3 |
| Yes, All The Time | 462 | 44.8 |
| Don't know or can't remember | 8 | 0.8 |
| **Felt able to ask any questions*** | | |
| No, Never | 178 | 17.3 |
| Yes, A Few Times | 216 | 21 |
| Yes, Most Of The Time | 195 | 19 |
| Yes, All The Time | 434 | 42.2 |
| Don't know or can't remember | 6 | 0.6 |
| **Asked if she had any questions*** | | |
| No, Never | 306 | 29.7 |
| Yes, A Few Times | 206 | 20 |
| Yes, Most Of The Time | 153 | 14.9 |
| Yes, All The Time | 358 | 34.8 |
| Don't know or can't remember | 7 | 0.7 |
| **Felt treated with respect** | | |
| No, Never | 15 | 1.5 |
| Yes, A Few Times | 82 | 8 |
| Yes, Most Of The Time | 230 | 22.3 |
| Yes, All The Time | 699 | 67.8 |
| Don't know or can't remember | 5 | 0.5 |
| **Treated in friendly manner*** | | |
| No, Never | 25 | 2.4 |
| Yes, A Few Times | 109 | 10.6 |
| Yes, Most Of The Time | 247 | 24 |

| | | |
|---|---|---|
| Yes, All The Time | 646 | 62.7 |
| Don't know or can't remember | 3 | 0.3 |
| **Could discuss issues in private** | | |
| No, Never | 316 | 30.6 |
| Yes, A Few Times | 134 | 13 |
| Yes, Most Of The Time | 139 | 13.5 |
| Yes, All The Time | 438 | 42.5 |
| Don't know or can't remember | 4 | 0.4 |
| **Felt the health facility was clean** | | |
| No, Never | 64 | 6.2 |
| Yes, A Few Times | 126 | 12.2 |
| Yes, Most Of The Time | 231 | 22.4 |
| Yes, All The Time | 599 | 58.1 |
| Don't know or can't remember | 11 | 1.1 |
| **Asked to give bribes*** | | |
| No, Never | 912 | 88.5 |
| Yes, A Few Times | 64 | 6.2 |
| Yes, Most Of The Time | 29 | 2.8 |
| Yes, All The Time | 24 | 2.3 |
| Don't know or can't remember | 1 | 0.1 |
| **Felt treated differently because of any personal attribute** | | |
| No, Never | 965 | 93.7 |
| Yes, A Few Times | 36 | 3.5 |
| Yes, Most Of The Time | 10 | 1 |
| Yes, All The Time | 16 | 1.6 |
| Don't know or can't remember | 3 | 0.3 |
| | | |
| Total | 1,031.00 | 100 |

Notes: *=total n < 1,031

**Table 3: Bivariate regressions of Antenatal care quality measures on various predictors, PQCC 2016/2017**

| | *Experience score* | | | *Service provision score* | | | *Ultrasound* | | |
|---|---|---|---|---|---|---|---|---|---|
| **Age** | coeff | [95% CI] | | coeff | [95% CI] | | OR | [95% CI] | |
| 15 to 19 years | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| 20 to 29 years | 1.98** | [0.55 | 3.41] | 0.18 | [-0.25 | 0.61] | 2.40** | [1.34 | 4.32] |
| 30 to 48 years | 1.80* | [0.17 | 3.43] | -0.11 | [-0.60 | 0.38] | 2.84** | [1.51 | 5.31] |
| **Marital status** | | | | | | | | | |
| Single | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Partnered/Cohabiting | -2.88 | [-11.0 | 5.27] | -1.59 | [-3.98 | 0.80] | 1.38 | [0.14 | 13.7] |
| Married | 2.70*** | [1.21 | 4.19] | -0.17 | [-0.61 | 0.27] | 0.77 | [0.49 | 1.20] |
| Widowed | 1.01 | [-1.82 | 3.84] | -0.33 | [-1.15 | 0.50] | 0.59 | [0.23 | 1.52] |
| Divorced/Separated | 2.7 | [-2.13 | 7.54] | 0.18 | [-1.30 | 1.66] | 0.75 | [0.16 | 3.57] |
| **Number of births** | | | | | | | | | |
| 1 | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| 2 | 0.05 | [-1.46 | 1.56] | -0.085 | [-0.52 | 0.35] | 1.4 | [0.91 | 2.14] |
| 3 | 0.16 | [-1.38 | 1.69] | -0.52* | [-0.97 | -0.069] | 0.53* | [0.31 | 0.91] |
| 4 or more | -0.65 | [-2.01 | 0.70] | -1.08*** | [-1.47 | -0.68] | 0.67 | [0.43 | 1.04] |
| **Tribe** | | | | | | | | | |
| Luo | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Kuria | 3.96*** | [2.71 | 5.20] | 0.59** | [0.22 | 0.96] | 0.28*** | [0.16 | 0.49] |
| Other | 1.2 | [-0.61 | 3.01] | -0.2 | [-0.75 | 0.35] | 1.05 | [0.62 | 1.80] |
| **Religious affiliation** | | | | | | | | | |
| Catholic | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Protestant/Pentecostal | 0.77 | [-0.75 | 2.28] | -0.16 | [-0.60 | 0.28] | 0.58* | [0.36 | 0.93] |
| Seventh Day Adventist | 0.55 | [-0.87 | 1.98] | -0.11 | [-0.52 | 0.30] | 0.99 | [0.66 | 1.48] |
| Other Christian | -0.46 | [-1.99 | 1.06] | -0.58* | [-1.04 | -0.13] | 0.31*** | [0.17 | 0.57] |
| Muslim/other religion | -2.48 | [-6.42 | 1.45] | -1.21 | [-2.42 | 0.0026] | 0.2 | [0.026 | 1.51] |
| **Education** | | | | | | | | | |
| No school/Primary | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Post-primary/vocational/Secondary | 2.15*** | [0.96 | 3.34] | 0.66*** | [0.32 | 1.01] | 2.03*** | [1.35 | 3.04] |
| College or above | 1.79* | [0.11 | 3.47] | 1.17*** | [0.69 | 1.66] | 9.22*** | [5.87 | 14.5] |
| **Literacy: reading and write very well** | 2.28*** | [1.05 | 3.51] | 0.72*** | [0.35 | 1.08] | 2.57*** | [1.57 | 4.19] |
| **Employed** | 3.66*** | [2.44 | 4.88] | 0.86*** | [0.50 | 1.22] | 2.14*** | [1.50 | 3.06] |
| **Household wealth quintile** | | | | | | | | | |
| Poorest | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Poorer | 0.35 | [-1.20 | 1.90] | -0.24 | [-0.70 | 0.23] | 1.08 | [0.55 | 2.13] |
| Middle | 0.9 | [-0.81 | 2.61] | 0.34 | [-0.17 | 0.84] | 1.74 | [0.88 | 3.43] |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Richer | 1.47 | [-0.18 | 3.11] | 0.61* | [0.13 | 1.09] | 2.91*** | [1.59 | 5.33] |
| Richest | 1.98* | [0.37 | 3.60] | 0.72** | [0.25 | 1.19] | 8.16*** | [4.67 | 14.3] |
| **Household wealth quintile** | | | | | | | | | |
| Poorest/Poorer | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Middle | 0.73 | [-0.80 | 2.26] | 0.45 | [-0.000034 | 0.90] | 1.67 | [0.93 | 3.01] |
| Richer/Richest | 1.56** | [0.40 | 2.72] | 0.78*** | [0.44 | 1.12] | 5.03*** | [3.35 | 7.53] |
| **Current occupation** | | | | | | | | | |
| Agricultural labor | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Casual labor | -0.71 | [-3.18 | 1.77] | 0.45 | [-0.29 | 1.19] | 1.86 | [0.76 | 4.53] |
| Salaried worker | 3.16** | [1.02 | 5.30] | 0.79* | [0.17 | 1.42] | 8.51*** | [4.32 | 16.8] |
| Self-employed in petty trade | 3.07*** | [1.28 | 4.85] | 0.53 | [-0.00080 | 1.05] | 2.10* | [1.07 | 4.12] |
| Self-employed small scale industry | 1.18 | [-2.17 | 4.53] | 0.28 | [-0.72 | 1.28] | 3.55* | [1.29 | 9.75] |
| Unemployed/homemaker | 0.58 | [-0.94 | 2.10] | 0.19 | [-0.26 | 0.64] | 1.7 | [0.93 | 3.13] |
| Other | 1.31 | [-3.92 | 6.54] | -0.017 | [-1.72 | 1.69] | 3.34 | [0.82 | 13.6] |
| **Partner's education** | | | | | | | | | |
| No school/Primary | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Post-primary/vocational/Secondary | 1.1 | [-0.26 | 2.46] | 0.3 | [-0.093 | 0.70] | 1.74* | [1.05 | 2.89] |
| College or above | 2.22** | [0.64 | 3.81] | 1.25*** | [0.79 | 1.72] | 7.59*** | [4.67 | 12.3] |
| No Partner | -1.54* | [-2.96 | -0.12] | 0.44* | [0.025 | 0.85] | 2.36*** | [1.43 | 3.89] |
| **Partner's occupation** | | | | | | | | | |
| Agricultural labor | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Casual labor | -1.68 | [-3.36 | 0.0057] | 0.15 | [-0.36 | 0.65] | 1.32 | [0.68 | 2.53] |
| Salaried worker | 1.29 | [-0.45 | 3.03] | 0.91*** | [0.38 | 1.43] | 4.77*** | [2.68 | 8.51] |
| Self-employed in petty trade | 1.69 | [-0.11 | 3.49] | 0.51 | [-0.029 | 1.04] | 1.01 | [0.48 | 2.12] |
| Self-employed small-scale industry | -0.74 | [-2.90 | 1.41] | 0.6 | [-0.041 | 1.24] | 2.19* | [1.05 | 4.54] |
| Unemployed/homemaker | -0.62 | [-4.21 | 2.98] | 0.17 | [-0.91 | 1.25] | 7.29*** | [2.85 | 18.6] |
| Other | -4.75 | [-12.8 | 3.31] | 0.45 | [-1.92 | 2.83] | 1 | [1 | 1] |
| No Partner | -2.23** | [-3.86 | -0.60] | 0.48* | [0.0028 | 0.97] | 2.19** | [1.22 | 3.94] |
| **Self or household member work in health facility** | 2.95** | [0.74 | 5.17] | 0.72* | [0.073 | 1.36] | 1.97* | [1.10 | 3.51] |
| **Has health insurance** | 3.08*** | [1.66 | 4.50] | 0.86*** | [0.44 | 1.29] | 3.45*** | [2.36 | 5.05] |
| **High Participation in household decisions** | 1.30* | [0.25 | 2.35] | -0.011 | [-0.32 | 0.30] | 2.68*** | [1.88 | 3.81] |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Intolerant Attitude towards domestic violence** | 1.59** | [0.54 | 2.64] | 0.86*** | [0.55 | 1.17] | 2.89*** | [2.00 | 4.18] |
| **Experienced domestic violence** | -2.48*** | [-3.53 | -1.44] | -1.12*** | [-1.42 | -0.82] | 0.55*** | [0.39 | 0.77] |
| **Had any pregnancy complications** | 0.84 | [-0.22 | 1.90] | -0.40* | [-0.71 | -0.092] | 0.65* | [0.46 | 0.92] |
| **Had severe pregnancy complications** | 1.45* | [0.31 | 2.59] | -0.27 | [-0.61 | 0.061] | 0.73 | [0.50 | 1.06] |
| **Had complications in prior pregnancy** | -0.53 | [-2.08 | 1.03] | -0.51* | [-0.98 | -0.047] | 0.93 | [0.56 | 1.52] |
| **Received ANC in prior pregnancy** | -0.011 | [-1.13 | 1.11] | -0.51** | [-0.84 | -0.19] | 0.9 | [0.64 | 1.28] |
| **Prior facility delivery** | 0.63 | [-0.45 | 1.71] | -0.25 | [-0.57 | 0.073] | 1.04 | [0.74 | 1.47] |
| **Reason for first ANC** | | | | | | | | | |
| Because of a problem | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Just for a checkup | 1.69* | [0.033 | 3.34] | 0.077 | [-0.43 | 0.59] | 0.77 | [0.47 | 1.27] |
| Can't Remember | -4.45 | [-10.0 | 1.13] | 0.25 | [-1.48 | 1.99] | 0.51 | [0.061 | 4.31] |
| | | | | | | | | | |
| **Timing of first antenatal visit** | | | | | | | | | |
| First trimester | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Second trimester | -0.48 | [-1.66 | 0.70] | -0.032 | [-0.38 | 0.31] | 0.87 | [0.60 | 1.25] |
| Third Trimester | -3.31** | [-5.31 | -1.31] | -1.36*** | [-1.94 | -0.78] | 0.64 | [0.33 | 1.26] |
| | | | | | | | | | |
| **Number of antenatal visits** | | | | | | | | | |
| Less than 4 | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| 4 or 5 | 1.50** | [0.37 | 2.64] | 0.70*** | [0.36 | 1.03] | 1.57* | [1.07 | 2.29] |
| 6 plus | 2.34* | [0.53 | 4.15] | 1.24*** | [0.72 | 1.77] | 1.75 | [1.00 | 3.06] |
| **Highest ANC facility** | | | | | | | | | |
| Gov't Hospital | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Gov't HC/Disp | 0.68 | [-0.46 | 1.81] | -0.52** | [-0.86 | -0.19] | 0.28*** | [0.19 | 0.41] |
| Mission/Private facility | 3.48*** | [1.60 | 5.36] | 0.5 | [-0.045 | 1.05] | 1.62* | [1.01 | 2.59] |
| | | | | | | | | | |
| **Highest ANC Provider type** | | | | | | | | | |
| Nurse/Midwife | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Doctor/Clinical officer | 1.37 | [-0.27 | 3.02] | -0.16 | [-0.66 | 0.34] | 0.69 | [0.38 | 1.24] |
| Non-skilled attendant | 2.75 | [-2.66 | 8.15] | -0.051 | [-1.48 | 1.38] | 1.11 | [0.24 | 5.17] |
| **Place of interview** | | | | | | | | | |
| Health facility | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| In the community/a home | -2.19*** | [-3.25 | -1.13] | -0.58*** | [-0.90 | -0.26] | 0.92 | [0.65 | 1.28] |
| **Postpartum length: 1 week or more** | -2.97** | [-4.92 | -1.03] | -0.88** | [-1.45 | -0.31] | 1.12 | [0.59 | 2.12] |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Postpartum length: 5 weeks or more** | -1.05* | [-2.11 | -0.0021] | -0.36* | [-0.67 | -0.045] | 1.09 | [0.78 | 1.51] |
| *Observations range* | *935 to 942* | | | *917* | | | *916* | *1029* | *1028* |
| *95% confidence intervals in brackets* | | | | | | | | | |
| ** p<0.05* | *** p<0.01* | **** p<0.001* | | *** p<0.01* | **** p<0.001* | | *** p<0.01* | **** p<0.001* | |

**Multivariate regressions of Antenatal care quality measures on various predictors, PQCC 2016/2017**

| | *Experience score* | | | *Service provision score* | | | *Received an ultrasound* | | |
|---|---|---|---|---|---|---|---|---|---|
| | coeff | 95% CI | | coeff | 95% CI | | OR | 95% CI | |
| **Age** | | | | | | | | | |
| 15 to 19 years | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| 20 to 29 years | 1.72* | [0.088 | 3.35] | 0.47 | [-0.0069 | 0.96] | 2.17* | [1.06 | 4.45] |
| 30 to 48 years | 1.78 | [-0.35 | 3.91] | 0.67* | [0.034 | 1.30] | 2.92* | [1.21 | 7.04] |
| **Currently married** | 2.94 | [-4.57 | 10.5] | 1.39 | [-0.81 | 3.59] | 0.55 | [0.043 | 6.91] |
| **Number of births** | | | | | | | | | |
| 1 | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| 2 | -0.84 | [-2.45 | 0.77] | -0.015 | [-0.49 | 0.46] | 1.26 | [0.72 | 2.22] |
| 3 | -0.67 | [-2.41 | 1.08] | -0.36 | [-0.88 | 0.16] | 0.52 | [0.26 | 1.03] |
| 4 or more | -0.88 | [-2.74 | 0.99] | -0.71* | [-1.26 | -0.16] | 0.86 | [0.43 | 1.72] |
| **Tribe** | | | | | | | | | |
| Luo | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Kuria | 4.97*** | [3.70 | 6.25] | 0.89*** | [0.52 | 1.27] | 0.37** | [0.20 | 0.69] |
| Other | 1.57 | [-0.16 | 3.31] | -0.068 | [-0.59 | 0.45] | 1.3 | [0.70 | 2.41] |
| **Literate** | 1.52* | [0.26 | 2.79] | 0.22 | [-0.16 | 0.60] | 1.35 | [0.76 | 2.38] |
| **Employed** | 2.73*** | [1.46 | 4.00] | 0.56** | [0.19 | 0.93] | 1.01 | [0.64 | 1.59] |
| **Participation in household decisions** | 1.24* | [0.14 | 2.34] | -0.16 | [-0.49 | 0.17] | 1.77* | [1.14 | 2.75] |
| **Household wealth** | | | | | | | | | |
| Poorest/poorer | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Middle | 0.99 | [-0.49 | 2.47] | 0.27 | [-0.17 | 0.71] | 1.03 | [0.53 | 2.02] |
| Richer/richest | 0.7 | [-0.64 | 2.04] | 0.13 | [-0.27 | 0.53] | 2.00** | [1.20 | 3.33] |
| **Partner's education** | | | | | | | | | |
| No school/Primary | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Post-primary/vocational/Secondary | 0.16 | [-1.21 | 1.52] | -0.062 | [-0.47 | 0.35] | 0.92 | [0.52 | 1.64] |
| College or above | -0.46 | [-2.27 | 1.36] | 0.39 | [-0.15 | 0.93] | 2.40** | [1.29 | 4.46] |
| No Partner | 1.42 | [-6.20 | 9.03] | 1.53 | [-0.71 | 3.76] | 0.94 | [0.072 | 12.4] |
| **Experienced domestic violence** | -2.42*** | [-3.51 | -1.33] | -0.83*** | [-1.15 | -0.51] | 0.91 | [0.60 | 1.36] |
| **Had severe pregnancy complications** | 0.91 | [-0.19 | 2.02] | -0.24 | [-0.56 | 0.088] | 1.19 | [0.77 | 1.85] |
| **Timing of first antenatal visit** | | | | | | | | | |
| First trimester | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Second trimester | -0.17 | [-1.32 | 0.98] | 0.16 | [-0.19 | 0.50] | 1.18 | [0.76 | 1.81] |
| Third Trimester | -2.21* | [-4.28 | -0.15] | -0.75* | [-1.36 | -0.13] | 0.82 | [0.35 | 1.93] |
| **Four plus antenatal visits** | 0.34 | [-0.81 | 1.49] | 0.38* | [0.033 | 0.72] | 1.1 | [0.70 | 1.74] |
| **Highest ANC facility** | | | | | | | | | |
| Gov't Hospital | 0 | [0 | 0] | 0 | [0 | 0] | 1 | [1 | 1] |
| Gov't HC/Disp | 1.99*** | [0.84 | 3.14] | -0.085 | [-0.43 | 0.25] | 0.33*** | [0.21 | 0.52] |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Mission/Private facility | 3.28*** | [1.48 | 5.09] | 0.48 | [-0.050 | 1.01] | 1.31 | [0.76 | 2.24] |
| **Interviews in the community** | -2.41*** | [-3.44 | -1.38] | -0.55*** | [-0.86 | -0.24] | 1.08 | [0.73 | 1.61] |
| Constant | 20.9*** | [13.1 | 28.6] | 9.38*** | [7.11 | 11.7] | 0.08 | [0.0056 | 1.16] |
| N | 909 | | | 882 | | | 993 | | |
| R-squared | 0.179 | | | 0.172 | | | | | |

95% confidence intervals in brackets * p<0.05 ** p<0.01 *** p<0.001