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Predictors of the numbers of antenatal visits in Burkina Faso and cote d'ivoire : a cross sectional study

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ABSTRACT

Background: based on evidence, World Health Organization recommends a minimum of eight ANC contacts. This paper aimed to investigate the use of ANC services and identify the predictors of the number of ANC visits in Burkina Faso and Cote d'Ivoire.

Patient and Methods: Bivariate and multivariate analyses were performed in January 2019 on existing ANC data from a total of 1091 parturients. These data were collected during phase 1 of the Checklist Project implemented in both countries from October to December 2018. Associations between dependent and explanatory variables were explored in Stata 14 (p-value<0.05).

Results: More than half of mothers who commenced ANC did not attain up to 4 ANC visits. Most of the mothers received between 4 and 5 items of care. Over 80% of them received iron/folic acid supplementation, IPT, HIV testing and at least two doses of tetanus toxoid vaccine. The number of items or content of care received was found to be a strong predictor of the number of visits in both countries. High parity and a low education level were found to be negatively associated with the number of ANC visits in Cote d'Ivoire.

Conclusion: These findings might help healthcare programmers and policy makers to adopt appropriate policy and strategies to meet the new recommended ANC and make pregnancy a positive experience for women.

Keys words: antenatal care, predictors, eight or more ANC visits, 2016 WHO ANC guidelines

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RESUMÉ

Introduction : l'Organisation Mondiale de la Santé recommande un minimum de huit visites prénatales sur la base de données probantes. Cet article visait à évaluer l'utilisation des services de CPN et identifier les facteurs prédictifs du nombre de visites prénatales au Burkina Faso et en Côte d'Ivoire.

Patient et Méthodes : Des analyses bivariées et multivariées ont été réalisées en janvier 2019 sur des données existantes de CPNs d'un total de 1091 parturientes. Ces données étaient issues de la phase 1 du Projet Checklist mis en œuvre dans les deux pays d'octobre à décembre 2018. Les associations entre les variables dépendante et explicatives ont été explorées dans Stata 14 (p-value<0,05).

Résultats : Plus de la moitié des mères qui ont commencé la CPN n'ont pas atteint les 4 CPNs. La plupart des mères ont reçu entre 4 et 5 types soins prénatals. Plus de 80% d'entre elles ont reçu une supplémentation en fer/acide folique, un TPI, un test VIH et au moins deux doses d'anatoxine tétanique. Le nombre des soins reçus s'est avéré être un facteur prédictif important du nombre de visites dans les deux pays. La parité élevée et le faible niveau d'éducation étaient négativement associés au nombre de visites de CPN en Côte d'Ivoire.

Conclusion : Ces résultats pourraient aider les responsables des programmes de santé et les décideurs à adopter des stratégies appropriées pour la mise en œuvre des huit visites prénatales et faire de la grossesse une expérience positive pour les femmes.

Mots clés : soins prénatals, prédicteurs, huit visites prénatales, modèle OMS 2016 de soins prénatals

BACKGROUND

Healthcare decisions to reduce maternal and perinatal mortality and morbidity have led to the implementation of key interventions. Antenatal care provided by skilled healthcare professionals is one of these interventions that provides pregnant women an entry point to health system and an opportunity to monitor and preserve their well-being and that of their children (1). Prior to 2016, the World Health Organization (WHO) recommended a «focus antenatal care » (FANC) model of at least four ANC visits for pregnant women in the case of uncomplicated pregnancies, with the first visit occurring in the first trimester (i.e. the first 12 weeks of conception) (1,2). However, since 2016, WHO has recommended a new ANC model of attaining at least eight ANC visits, on the basis of recent evidence that indicates improvements in health outcomes and an increased likelihood when receiving effective maternal health interventions under the new ANC model compared to four focus ANC model (2,3).

In developing countries such as those in Sub-Saharan Africa (SSA) where the vast majority of maternal and perinatal death occur , ANC coverage remains an important indicator to assess the use of healthcare during pregnancy and to track progress to improve maternal and newborn health (4). Evidence from developing countries has showed three main challenges of ANC services: late booking, non-compliance with the recommended number of visits, and inadequate ANC services (5).

In SSA where the use of ANC services remains poor, until now the vast majority of the countries have not shifted to eight contacts yet, and have their guidelines for antenatal care still based on the FANC. Besides, these countries are still struggling to improve the coverage of ANC4+ because more than half of women who commenced ANC did not attain up to 4 ANC visits (6).

They have been numerous studies of the determinants of ANC use in low– and middle–income countries(7–12). The education level of the mothers, that of their husband, the parity, the perceived quality of care, the level of autonomy of the women, the place of residence, etc are some of the factors identified as being able to affect the health seeking behaviour of women. Regarding West African countries, various studies have assessed factors affecting ANC utilisation including a good number of studies from Burkina Faso and Cote d'Ivoire(11,13–18). However, these studies mainly focused on timing ad frequency of ANC visits. Regarding our countries of interest, to our knowledge, very few studies especially in Cote d'Ivoire considered the content of ANC care when examining the factors associated with ANC visits. Besides, little is known about the predictors the

number of ANC visits especially as a comparative presentation across francophone West African countries.

In a context where these countries, like most developing countries, are led to adopt the new WHO ANC model, it is important to identify gap to develop strategies for a better implementation of this new model. This paper aimed to investigate the use of antenatal care and identify predictors of the number of ANC visits in Burkina Faso and Cote d'Ivoire across a set of explanatory variables. At the time of this work, Côte d'Ivoire guidelines were based on the WHO recommendations on Focused Antenatal Care Antenatal care models with a minimum of four ANC contacts while Burkina Faso was undertaking the revision of the national guideline to adopt the new model recommended by WHO.

METHOD

Study setting and design

The study setting, design and data collection methods have been described in detail previously (14). Briefly, in January 2019, we analysed existing data on antenatal care of parturient (*n* = 1091) from public health facilities respectively in the Central North health region in Burkina Faso and Agnéby Tiassa Mé health region in Cote d'Ivoire. Data was collected in the frame of Phase 1 of the Checklist Project conducted from October to December 2018. This project aimed to evaluate the adherence to Essential Birth Practices through a passive observation of healthcare providers during childbirth event using the WHO Safe Childbirth Checklist. Information on antenatal care were collected during mother's admission through an individual questionnaire and completed with the ANC register.

To calculate the sample simple we used the formula $n=z^2\ p\ (1-p)/d^2$, where n is the sample size, Z is the number of standard errors from the mean (for 95% confidence level, z=1.96), P is the proportion of pregnant women having received four antennal care visits, and d is the precision (5%).

The proportion of pregnant women having received four ANC visits in 2018 (40.7% in Côte d'Ivoire and 39.3% in Burkina Faso)(19,20). The other assumption during the sample size calculation was and 15% of non-responsiveness:

On the basis of the formula and 15% non-responsiveness, the minimum sample sizes needed for the survey were 427 and 422 for Côte d'Ivoire and Burkina Faso respectively. Finally, a total sample sizes of 580 and 511 were reached for Côte d'Ivoire and Burkina Faso respectively.

Variables

Dependant variable

In our study, the dependant variable was the number of ANC visits. The variable had a minimum value of zero and a maximum value of eight.

Explanatory variables

The Anderson model of health care seeking was used as a framework for the explanatory variables (15): (i) predisposing characteristics included demographic and obstetrical variables (mother's age at childbirth, marital status, parity, gravidity, history of stillbirth, history of abortion); socio-economic factors (mother education, mother occupation, husband education, husband occupation); (ii) Enabling factors like barriers to access (distance from home to the facility; interactions with health system (facility location, facility type, healthcare providers type, items of care received during ANC visit).

Concerning the variable « item of care received during ANC visit », it refers to the quality of care through the recommended essential components of ANC services during visits to health personnel that included measurement of weight and blood pressure, testing of urine and blood samples, having ultrasound, and counselling about danger sign of pregnancy complications.
In our study we only considered the components available in the database: testing of blood testing, testing of urine, iron/folic acid supplementation, tetanus toxid vaccine, intermittent preventive treatment of malaria (IPT), testing for HIV. We created a composite index of item of care received during ANC. The variable ranged from 0 to 6. A minimum value of zero indicating that the mother did not receive any item of care and a maximum value of six indicating that the women received all the six elements. Other recent studies have used a similar type of content index(10,16,17)

Statistical Analysis

Data were entered in Stata14. After database cleaning, 1091 observations were included in the analysis.

Data were analysed using univariate, bivariate and multivariate statistical methods. The statistical significance was tested by a *T-test* and analysis of variance (ANOVA). Kwallis test was performed when ANOVA was not applicable. Variables with significant association in the bivariate analysis

were fit in a generalized linear model (GLM) of Poisson regression with robust variance as the equidispersion was violated and the variance of the number of ANC visits was smaller than the mean (underdispersion) in both countries. Because the study finally included a varied numbers of observations per health facility, all the analyses were weighted for the clinic size. Significance was considered if p-value <0.05.

Ethical consideration

Ethical clearance was obtained from the national ethics review committees of Burkina Faso (reference number 2017-4-043) and Côte d'Ivoire (161-18/MSHP/CNE SVS-Kp). The study was also approved by the ethics review committee of the WHO (protocol ID ERC.0002951). Ethical guidelines were followed, and participants were recruited after obtaining a written informed consent. Data were collected, managed, and analyzed in a way to ensure the confidentiality of study participants.

RESULTS

Descriptive Analysis

Table 1 displays the distribution of the mothers according to their characteristics.

Participants' characteristics in Burkina Faso

Concerning socio-demographic variables, most of the mothers were farmer/housewife (92.76%), married (84.91%) and had no education (81.41%). Most of the mothers had a husband with no education (81.21%) and farmer (77.30%).

As regards the obstetrical variables, most of the mother had no history of abortion (92.56%) or stillbirth (90.22%). About 32.69% were primigravida and 41.29% had a gravidity that is equal to or greater than 4. At the time of childbirth, most of them (27.98%) were aged 20 to 24.

As for healthcare services variables, more than half (55.58%) of the mothers lived within 5km of the health facility, 74,36% went in a facility located in rural area for their ANC visits, 81.21% went to a PHCF to receive antenatal care. For more than half of the mothers' antenatal care was provided by a midwife (64.77%). About 61.64% received 5 items of care during ANC visits and only 3.52% received 6 items.

Participants' characteristics in Cote d'Ivoire

Most of the mothers were married (85.17%), farmer/housewife (71.21%) and more than half of them had no education (52.41%). Less than half of them (41.03%) had a farmer as husband and 53.79% had a husband with no education.

Regarding obstetrical variables, most of the mother had no history of abortion (85.52%) or stillbirth (89.31%). About 41.55 % had a gravidity 2 or 3 and 42.07% had parity 1 or 2. At the time of childbirth, most of them (26.90%) were aged 20 to 24.

As for healthcare services variables, most of the mothers lived within 5km of the health facility (86.90%). More than half (54.31%) received ANC in a facility located in went in rural area and 81.21% went to a PHCF to receive antenatal care. The vast majority (91.90%) of the mothers received ANC from a midwife. Less than half of them (44.68%) received 5 items of care during ANC visits and only 6.38% received 6 items.

Use of Antenatal care services by country (figure 1 and 2, table 1)

A statistically significant difference was observed between the two countries regarding the number of ANC visits (p=0.003).

In Burkina Faso, the number of antenatal visits during a pregnancy ranged from 1 to 7. The mean of the number of ANC visit was around 3.67±1.17 visits. Less than 1% of the mothers did not receive any ANC visits, just over 2% of the mothers made at least one ANC visit, and 33.46% had at least four ANC visits. Furthermore, 24. 26% of the mothers received more than four ANC visits but this was limited to seven ANC visits (***figure 1 and table 1***). As for the items of care received during ANC, in Burkina Faso, laboratory testing was around 80.23% for urine, 96.67% for HIV but very low for blood (6.26%). Regarding disease prevention and treatment, 98.04% of the mothers received IPT and iron/folic acid supplementation, 81.80% received at least two doses of tetanus toxoid vaccine.

In Cote d'Ivoire, the number of antenatal visits during a pregnancy ranged from 1 to 8. The mean of the number of ANC visit was around 3.46±1.42 visits. Very few mothers (2.24%) did not receive any ANC visits, around 97.76 % made at least one ANC visit, 30.34% had at least four ANC visits. Besides, 21.55% of the mothers received more than four ANC visits included one who received eight ANC visits.

Concerning the prevention and treatment of disease more than 85% of the mothers received iron/folic acid supplementation, IPT and at least two doses of tetanus toxoid vaccine. As for laboratory testing, except for HIV (95%), less than 50% of mothers were tested for blood and urine.

Predictors of the number of ANC Visits

The bivariate analysis of the mean number of ANC visits is displayed in ***Table 1*** for both countries.

In Burkina Faso, the analysis showed that the distance from home to the facility and the number of items of care received during ANC visits have significant association with the number of ANC visits.

Mothers who lived within 5km of the health facility were more likely to have a higher mean of ANC visits than the others (p=0.002). The mean of ANC visits also increased with the number of items of care received during ANC (p<0.001).

In Côte d'Ivoire, analysis indicate that gravidity, parity, history of stillbirth, mother education, mother occupation, husband education, husband occupation and the number of items of care received during ANC visits have significant association with the number of ANC visits. A negative association of the mean of ANC visits with both gravidity (p=0.003) and parity (p<0.001) was found. The mean of ANC visits was found to be higher among the primigravida (3.69±1.46) compared to the mothers with gravidity four or more (3.21±1.43). As for parity, the mean of ANC visits was higher among mothers with parity zero (3.67±1.47) compared to mothers with parity six or more (2.89 ±1.37). Mothers with history of stillbirth were more likely to have a higher mean of ANC visits (p=0.007). Mother education as well as husband education showed significant positive association with the mean of ANC visits. For instance, the mothers with no education had a mean of ANC visits around 3.25±1.42 whereas those with a secondary and above level of education had a mean of 3.99±1.18 ANC visits. Mothers whose husbands or themselves were engaged in an activity other than agriculture were more likely to have higher mean of ANC visits. As regards the content of ANC care received, a significant positive association was found between the number of items care received during ANC visits and the mean of ANC visits (<0.001).

In Burkina Faso, the regression analysis identified the number of items of care received during ANC care as significant predictors of the number of ANC visits. A significant positive association with the number of ANC visits. Mothers who received 6 items of care had 2.864 times higher incidence risk ratio of having a higher number of ANC visits compared to mothers who received 2 or 3 items of care (IRR = 2.864, (95% CI :2.277, 3.602)).

In Côte d'Ivoire, mothers who had parity 3 to 5 (IRR = 0.841, (95% CI: 0.745, 0.949)) and 6 and more (IRR = 0.682, (95% CI: 0.540, 0.861)) were found to be less likely to receive ANC visits than mothers with parity 0. Education level of mother showed significant positive association with the number of ANC visits. Mothers with a secondary school and above level of education had 1.104 times higher incidence risk ratio of receiving ANC visits compared to mothers with no education and primary level of education (IRR = 1.104, (95% CI:1.010,1.208)). The number of items of care received during ANC also showed a significant positive association with the number of ANC visits. Mothers who received 6 items of care had 3.534 times higher incidence risk ratio of receiving ANC visits compared to mothers who received 2 items of care (IRR = 3.534, (95% CI : 2.409, 5.184)).

DISCUSSION

The antenatal period is an opportunity for reaching pregnant women with interventions that allow healthcare providers through regular visits to treat and prevent potential health problems that can occur during pregnancy and to promote healthy lifestyles that benefit both mother and child.

Use of antenatal care

Antenatal care coverage is globally an important indicator to assess maternal health. Our findings showed that more than 80% of the mothers had at least one ANC visit with a skilled health worker in both countries. These findings showed that efforts are made to ensure that every pregnant woman received at least one ANC visit. However, around 35% of the mothers in both countries achieved at least 4 ANC visits ; this results are consistent with others studies on SSA countries such as Ghana, Senegal, Cameroun where less than 50% of the women completed at least four or more ANC visits (12,18). The improvement of ANC4+ coverage remains a challenge in Burkina Faso and Cote d'Ivoire like in many others SSA countries especially in a view to adopt the 2016 WHO ANC model that suggests a minimum of eight ANC contacts, with the first contact taking place in the first trimester of gestation, followed by two and five contacts in the second and third trimesters, respectively (2). No mother in Burkina Faso and only one in Cote d'Ivoire met the recommended 8 ANC visits, however as the new ANC model is not effective in both countries, this result is understandable. The low ANC4 coverage and the poor performance in timely ANC initiation might be a limit to adopt and achieve the new ANC model. Even though Burkina Faso is undertaking the implementation of the new ANC model, other countries which encounter difficulties in the use of ANC service, such as Côte d'Ivoire, could hesitate to adopt the new model or worse, implement it only in areas that already have higher ANC coverage, thus further increasing equity gaps(25).

Content of ANC care

Indicators on use of antenatal care services provide no information on the content or quality of the services. Despite the broad consensus on what the content and quality should be, it is generally recognized that the antenatal care services currently provided in many parts of the world fail to meet the standards recommended by WHO(5). In our study the content of ANC care includes blood testing, urine testing, HIV status, IPT, iron/folic acid supplementation, tetanus toxoïd vaccine. In both countries, IPT, iron/folic acid supplementation, tetanus toxoïd vaccine, HIV testing and urine testing were each received by over 80% of the mothers whereas less than 20% and 10% of them did not realize blood testing respectively in Burkina Faso and Côte d'Ivoire. This findings are consistent with those of a study conducted in Bangladesh where the least received component was the blood

testing done by 43% of mothers (9). Furthermore, in average, mothers received between 4 and 5 items of care and less than 10 % of them received the six items in both countries. These findings highlighted inadequacy in the quality and the provision of antenatal care, certain ANC interventions were commonly received by pregnant woman and others were not. This inadequacy in the provision of ANC interventions and has been reported in other studies conducted in low and middle income countries such India, Zambia, Bangladesh (8,10,19,20). As the quality of care is important to make ANC visits an effective strategy, there is a need to effectively monitor and understand the provision of ANC interventions to identify gaps and elaborate strategies focus on the improvement of the quality of ANC care. If the quality of ANC is poor and women's experience of it is negative, the evidence shows that women will not attend ANC, irrespective of the number of recommended contacts in the ANC model(21).

Predictors of the number of ANC visits

Our analyses indicates that the number of items of care is a significant predictor of the number of ANC visits in both countries, which is in agreement with other studies findings conducted in other settings (22–24). The number of items of care received reflects the quality of care. These findings suggest that the improvement of the uptake of ANC necessitate to strengthen the quality of care. In Côte d'Ivoire, aside from the number of items received during ANC, the analyses showed that the likelihood of completing more ANC visits increased as mother education level rose. These results are consistent with other studies(10,23,25–27). Mothers having lower education level often have lower income, have less knowledge on ANC services and often face difficulties including intellectual and financial disadvantages, to get access these services(2). Sufficient knowledge on the necessity of ANC services and the complications occurring during pregnancy could increase the accessibility to ANC(28). On the other hand, mothers' parity showed a negative association with the number of ANC visits in Cote d'Ivoire. As the number of children increase, utilization of ANC services becomes less likely. Similar findings were reported by many recent studies carried out in different setting (10,23,29). Women with high parity have less desire to use ANC services and there are several pathways through which high parity might affect their health seeking behaviour, leading an underuse of ANC services. Mothers with high parity might believe that they do not need ANC interventions as they have experience with pregnancy and childbirth. Besides, structural barriers related to cost and time raised from higher child dependency ratio prevents seeking ANC services for higher parity women(23).

The differences between the two countries could be explained by a much more developed community approach to prenatal care in Burkina Faso(30).

Implication for 2016 WHO ANC Model implementation

At the time of the study, the ANC program in Burkina Faso and Côte d'Ivoire is still based on WHO's former guidelines of at least four ANC visits. Meeting the new WHO recommendation on antenatal care is going to be a real challenge for Burkina Faso and Cote d'Ivoire. Indeed more than half of the women who commenced ANC did not achieved ANC4. Moreover, while content of care has been identified as a strong predictor of the number of ANC visit in both countries, high parity and low education level also affect the use of antenatal care by women in Cote d'Ivoire.

Overall, content of care received during ANC is one of major driving force for meeting the 2016 WHO antenatal care guidelines for a positive pregnancy experience, showing that the major issue for ANC uptake is the quality of ANC provision. This findings are corroborated by those of qualitative evidence synthesis which showed that whether or not women continues ANC depends on their experience of ANC design and provision at the first visit. The capacity of healthcare providers to deliver high-quality, relationship-based ANC is likely to facilitate the uptake of ANC by women(31). In addition to strengthening the healthcare system by providing infrastructure, equipment, materials and skilled human resources, it is also crucial to achieve the eight recommended visits and ensure optimal ANC : to set up effective task shifting to reach women in rural or vulnerable communities. Numerous studies reported the potential of task shifting in ANC uptake(32,33,34), however, certain conditions must be met such as adequate training, support and incentives for sustainability.

Besides, implementation research can help the decision-makers to identify and design effective and scalable strategies such as behaviour communication change, sensitization of women with high parity and low level of education for instance. Other strategies that aim to make the women want to come back to receive ANC interventions, to make them understand the added value from a visit to another, to tackle dropout antenatal care should be implemented.

Study limitations

The study has some limitations. We carried the study in two selected regions and the findings may not be generalizable to each individual country. We could not address the confounding effects of other potential factors that may act as a barrier for using of ANC services. Some of these potential factors include timing of ANC 1 visits, cost of care, the desirability of pregnancy, and knowledge and attitudes towards ANC services.

CONCLUSION

Each country had its own pattern of the use of ANC services as well as the extent to which predictors influenced the number of visits. However, there are common patterns.

In both countries, the study highlighted drop-out antenatal care as well as poor compliance to ANC interventions. The number of items or content of ANC has been identified as a common factor of the two countries positively associated with the number of ANC visits. These findings might help healthcare programmers and policy makers to adopt appropriate policy, programs and strategies to meet the new recommended ANC and guarantee universal maternal healthcare coverage to tackle maternal and perinatal death in Sub-Saharan African countries.

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Conflict of interest

All authors declare that there is no conflict of interest

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Table 1: Percentage distribution of mothers and mean of ANC frequency for explanatory variables in Burkina Faso and Cote d'Ivoire

	Burkina Faso			Cote d'Ivoire		
Variables	**Number of women**	**Mean of ANC frequency**	**p value**	**Number of women**	**Mean of ANC frequency**	**p value**
Total	511	3.67±1.17		580	3.46±1.42	
Woman age at birth of child (years)			0.289			0.743
< 20	122(23.87%)	3.84±1.20		90(15.52%)	3.5±1.39	
20-24	143(27.98%)	3.62±1.10		156(26.90%)	3.47±1.47	
25-29	108(21.14%)	3.63±1.27		152(26.21%)	3.34±1.46	
30-34	87(17.03%)	3.52±1.09		100(17.24%)	3.59±1.22	
≥ 35	51(9.98%)	3.80±1.15		82(14.14%)	3.45±1.50	
Gravidity			0.679			0.003
1	158(30.92%)	3.72±1.21		119(20.92%)	3.69±1.46	
2-3	142(27.79%)	3.71±1.08		241(41.55%)	3.57±1.36	
≥ 4	211(41.29%)	3.62±1.19		220(37.93%)	3.21±1.43	
Parity			0.535			<0.001
0	165(32.29%)	3.74±1.21		139(23.97%)	3.67±1.47	
1-2	141(27.59%)	3.72±1.09		244(42.07%)	3.65±1.36	
3-5	152(29.75%)	3.56±1.21		159(27.41%)	3.12±1.38	
≥ 6	53(10.37%)	3.70±1.12		38(6.55%)	2.89±1.37	
History of stillbirth			0.87			0.007
Yes	50(9.78%)	3.70±1.28		62(10.69%)	3.87±1.55	

No	461(90.22%)	3.67±1.17		518(89.31%)	3.40±1.40	
History of abortion			0.531			0.124
Yes	38(7.44%)	3.79±1.36		84(14.48%)	3.24±1.41	
No	473(92.56%)	3.66±1.15		496(85.52%)	3.49±1.42	
Marital status			0.924			0.126
Married	485(84.91%)	3.67±1.183.		494(85.17%)	3.42±1.41	
Single/divorced/ widow	26(15.09%)	3.65±1.08		86(14.83%)	3.67±1.45	
Mother's education			0.718			<0.001
None	416(81.41%)	3.66±1.16		304(52.41%)	3.25±1.42	
Primary school	56(10.96%)	3.68±1.28		178(30.69%)	3.51±1.46	
Secondary school and above	39(7.63%)	3.82±1.07		98(16.90%)	3.99±1.18	
Mother's occupation			0.997			0.002
Farmer/Housewife	474(92.76%)	3.67±1.17		413(71.21%)	3.35±1.43	
Others	37(7.24%)	3.67±1.16		167(28.79%)	3.72±1.35	
husband's education			0.078			<0.001
None	415(81.21%)	3.62±1.16		312(53.79%)	3.25±1.34	
Primary school	62(12.13%)	3.93±1.20		103(17.76%)	3.41±1.54	
Secondary school and above	34(6.65%)	3.88±1.15		165(28.45%)	3.88±1.41	
Husband's occupation			0.216			<0.001
Farmer	395(77.30%)	3.64±1.18		342(41.03%)	3.26±1.33	
Others	116(22.70%)	3.79±1.12		238(58.97%)	3.73±1.49	

Distance from home to the facilty			0.002			0.555
< 5km	284(55.58%)	3.81±1.11		504(86.90%)	3.47±1.40	
5-9km	142(27.79%)	3.62±1.21		48(8.28%)	3.25±1.46	
≥10km	85(16.63%)	3.32±1.20		28(4.83%)	3.53±1.66	
Faciliy type			0.449			0.133
Primary Healthcare facility	415(81.21%)	3.69±1.17		473(81.55%)	3.41±1.39	
Referral Hospital	96(18.79%)	3.59±1.16		107(18.45%)	3.64±1.53	
Facility localisation			0.832			0.748
Urban	131(25.64%)	3.65±1.24		265(45.69%)	3.48±1.49	
Rural	380(74.36%)	3.68±1.14		315(54.31%)	3.44±1.36	
Health workers qualifications			0.669			0.076
Midwives	331(64.77%)	3.65±1.10		533(91.90%)	3.48±1.43	
Nurses	55(10.76%)	3.73±1.06		47(8.10%)	3.46±1.42	
Auxiliary staff	125(24.46%)	3.72±1.36		–	–	
Number items of care received during ANC visits			<0.001			<0.001
2	-	-		6(1.03%)	1±0.63	
3	18(3.52%)	2.82±1.18		52(8.97%)	2.71±1.38	
4	160(31.32%)	3.43±1.32		227(39.14%)	3.49±1.33	
5	315(61.64%)	3.83±1.02		258(44.48%)	3.53±1.44	
6	18(3.52%)	4.11±1.08		37(6.38%)	4.19±1.15	

Table 2: Predictors of the number of ANC visits in Côte d'Ivoire

Factors	Risk Ratio (IRR)	p value	95% CI of IRR	
			Upper	Lower
Parity				
0 (ref)	1			
1-2	0.935	0.200	0.834	1.036
3-5	0.841	0.005	0.745	0.949
≥ 6	0.682	0.001	0.540	0.861
Mother's education				
None (ref)	1			
Primary school	1.090	0.057	0.997	1.191
Secondary school and above	1.104	0.030	1.010	1.208
Items of care received during ANC visits				
2	1			
3	2.686	0.000	1.838	3.924
4	3.059	0.000	2.123	4.410
5	3.051	0.000	2.119	4.395
6	3.534	0.000	2.409	5.184

Table 3: Predictors of the number of ANC visits in Burkina Faso

Factors	Risk Ratio (IRR)	p value	95% CI of IRR	
			Upper	Lower
Items of care received during ANC visits				
2 (ref)	1			
3	1.203	0.119	0.953	1.520
4	1.334	0.013	1.064	1.672
5	1.398	0.025	1.044	1.873
6	2.864	0.000	2.277	3.602

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Mother's education				
None (ref)	1			
Primary school	1.090	0.057	0.997	1.191
Secondary school and above	1.104	0.030	1.010	1.208
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