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Socio-Demographic Determinants of Antenatal Care among Pregnant Women in Ifo Local Government Area of Ogun State, Nigeria

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Abstract

This study examined socio-demographic factors that influenced antenatal care among pregnant women in Ifo local government area (LGA) in Ogun State of Nigeria. It helped to narrow the gap in contextual information that are crucial in evidence-based intervention to scale-up increased antenatal care utilization at the grassroots and communities in the country. It employed multistage sampling design to elicit health behavior information from 1350 pregnant women who participated in the study. The two dependent variables used to measure antenatal care were; the place where pregnant women delivered their first child, and the health personnel who attended to the women at the time of delivery. Results from multivariate logistic regression model showed that place of delivery of the last child of the study respondents was significantly influenced by respondent's occupation, number of living children, and the type of house they lived-in. The outcomes of this study suggest that the skill of the health personnel who assisted in the delivery of the first child was a more prominent measure of antenatal care because it had better fit model and more statistically significant socio-demographic predictors. The skill of health personnel who assisted with the delivery of the last child of the respondent had significant causal relationships with religion, polygamy (husband had other wife), education, occupation, number of living children, and spouse's occupation. Policy makers, program implementers, researchers, and other stakeholders who are desirous to upscale quality antenatal utilization and outcomes will find these study results informative as baseline for an effective and impactful program intervention towards achieving SDG 3 at the grassroots and communities in Ogun state and the entire country by year 2030.

Keywords: *Socio-Demographic; Antenatal Care; Pregnant Women; Place of Delivery; Skilled Assisted Delivery*

Introduction

Maternal and child health (MCH) care represents the most vulnerable segment of society, and women and children suffer disproportionately in terms of morbidity and mortality risk. In fact, child survival is a critical marker of a thriving society [1]. Improvements in MCH indicate a good measure of progress and disease control in a community. Furthermore, most maternal and childhood deaths are preventable with available healthcare interventions. Antenatal care (ANC) utilization has a significant role in reducing pregnancy-related

complications and maternal mortality. Meanwhile, maternal health greatly impacts human development, and it is a crucial part of general health and sustainable development goals, particularly goal 3. ANC helps women to prepare themselves for delivery and to understand pregnancy and childbirth-related complications.

Antenatal care is defined as an essential component of primary healthcare and is defined as every aspect of care, from screening to intensive life support provided to any woman while pregnant and up to delivery [2]. ANC timely identifies and mitigates pregnancy-related problems that can harm the mother and fetus [3] and ANC remains a safe motherhood intervention and essential for basic primary health care during pregnancy [4]. In addition, ANC visits allow providers to identify and manage infections as well as obstetric complications and to provide preventive injections, medications, and supplements to women. During ANC visits, women receive education about health behaviors during pregnancy, counseling on pregnancy danger signs, and information on family planning [5]. ANC is specialized care for pregnant women to prevent health problems or get an early detection, if any, in both fetus and mother [2,6,7].

Sub-Saharan Africa (SSA) is the only region with a very high maternal mortality ratio (MMR) for 2017, estimated at 542 maternal deaths per 100,000 live births, while the lifetime risk of maternal death was 1 in 37, compared with just 1 in 7800 in Australia and New Zealand [8] Sub-Saharan Africa and Southern Asia accounted for approximately 86% (254,000) of the estimated global maternal deaths in 2017, with SSA alone accounting for roughly 66% [8] Similarly, Adedokun and Uthman (2019) observed that in sub-Saharan Africa, where 66% of global maternal mortality occurred, only 56% of all births occur in a health facility [9] . Also, the total number of under-five deaths dropped to 5.3 million in 2018 from 12.5 million in 1990. SSA remains the region with the highest under-five mortality rate in the world. In 2021, SSA average under-five mortality rate was 74 deaths per 1,000 live births [10]. Besides, Noh., *et al.* (2019) study demonstrated that socioeconomic factors and health information sources are associated with women's use of ANC [11].

According to Oladosun., *et al.* (2021), socioeconomic and environmental factors associated with quality health care include the husband's occupation, the number of living children, the type of house the respondent lived in, the toilet facility, and the primary water supply source [12]. It has been observed that one of the factors affecting maternal health is the place of delivery, which invariably determines the status of ANC and post-natal care respectively [13]. According to Aung., *et al.* (2016), pregnant women with late initiation of ANC are more likely to attain poor outcomes of pregnancy [14]. Fasina., *et al.* (2020) revealed that background factors of the women such as age, region, residence, education, and wealth status have a significant association with neonatal mortality [15]. Some studies have reported that pregnant women receiving little or no ANC are more likely to have reduced or unfavorable pregnancy results [16,17]. Women from richest socio-economic position were more likely to demonstrate ANC4+ (at least four antenatal care visit a health facility) than those from low socioeconomic positions. In addition, women who had completed secondary and tertiary education were more likely to report ANC4+ than those without formal education [18]. In another context, Matthew., *et al.* (2015) reported that public spending significantly correlates with health outcomes in Nigeria [19]. Olonade., *et al.* (2019) study showed that apart from the medical-related causes of maternal mortality, certain sociocultural and socioeconomic factors influence the outcome of pregnancy, including a poor healthcare system [20].

Pregnancy and childbirth are often related to complications, and sometimes these complications become life-threatening [21]. Recently, the Ukachi (2019) study established that educational status, marital status, and age are the three key predictors of accessibility and utilization of maternal health information [22]. The usage of ANC services is associated with maternal and neonatal mortality [2,23,24]. The utilization of healthcare facilities was found to be high and encouraging among Nigerian women [15]. According to Jayaraman., *et al.* (2008), women from affluent families had a higher rate of ANC visits compared to women from low-income families [25]. Whereas women who reside in urban areas were more likely, to have at least four ANC visits than mothers from rural areas [26] Mother's education is reported as the most consistent and essential factor of maternal healthcare-seeking behavior [27]. Lack of access to antenatal care may likely be associated with high maternal or under-five mortality and morbidity. The availability and accessibility to health facilities and

utilization decreased child mortality and enhanced their survival chances [28]. Ogbo., *et al.* (2020) observed that reducing births assisted by unskilled birth attendants in Nigeria scaled-up maternal health efforts that target all women, especially those from low socioeconomic backgrounds, those who do not attend antenatal care, and those who reside in rural areas [29]. The risk of maternal mortality and morbidity, as well as neonatal deaths, can be reduced substantially through regular, and proper ANC check-up delivery under safe and hygienic conditions [3].

In Nigeria, according to NDHS 2018, a maternal mortality ratio of 576 deaths per 100,000 live births, infant mortality rate of 67 deaths per 1,000 live and under-5 mortality of 132 deaths per 1,000 live births (NPC, 2019) call for concern. The number of ANC visits during positions has a great impact on reducing complications and maternal mortality. World Health Organization's recommendations on ANC indicated a minimum of four trips to eight ANC contacts during pregnancy to improve pregnancy and perinatal outcomes [30]. In Nigeria, a home is a predominant place of delivery, leading to low or no access to ANC. However, according to NDHS 2018, while fifty-seven percent of women had at least four ANC visits, 39% of live births occurred in health facilities and a skilled provider assisted forty-three percent of births in Nigeria [5]. The above statistics are not encouraging and call for urgent policy action. So many factors mitigate the use of modern health care services such as residence, education, transportation, and cost of services (formal and informal), poverty, among others. Although several studies have been conducted to identify and understand reasons for reduced utilization of maternal healthcare services, particularly in rural areas [31,32] Studies, which examined predictors of ANC, are scarce. Despite several efforts to improve the utilization of maternal health care, universalization of antenatal care (ANC) remains a significant challenge in Nigeria, leading to a high incidence of maternal and child morbidity and mortality. Understanding these factors becomes crucial in policy formulation and implementing better maternal and child health (MCH) programs.

Objective of the Study

The objective of this study was to examine socio-demographic determinants of utilization of the maternal healthcare services among pregnant women in the study area.

Data and Method

This study focused on Ifo Local Government Area (LGA) of Ogun state, Nigeria. Ifo is the largest of the 20 LGAs in Ogun state with a current estimated population of about 962,850 [33]. The study was based on a cross-sectional survey using multi-stage sampling technique to elicit information from respondents present at selected health facilities in the LGA. At the first stage of sampling Ifo LGA was purposively selected from 20 LGAs in the state. The criteria used for the selection were, an LGA with a large population, high reported number of infant or child mortality, and nearness to the study team's location. In the second stage of sampling, 22 (75.9%) of the 29 health facilities listed in Ifo LGA were systematically selected using random numbers to establish a starting point for selecting the first health facility. The target population or unit of analysis for this study was pregnant women who attended antenatal care and had given birth to at least one child in the last three years preceding the survey. List of pregnant women who registered for antenatal care in the 22 health facilities selected was the primary sampling frame for this study. The health facility register was used as the sampling frame, and pregnant women who registered at the health facility were clustered based on their clinic days. All members of the target population who were present during the clinic days that coincided with the research team's visit were taken as a cluster and interviewed.

The data collection was implemented between May 1 and July 31, 2018. The study sample size was 1350 pregnant women who registered at the health facility for antenatal care at the time of survey. The data collection tool was validated by both a demographer and a health expert. Also, Cronbach Alpha test was conducted on the survey tool yielded 0.75, attesting to its reliability. Several questions in the women survey questionnaire were similar to those in the 2013 Nigeria Demographic and Health Survey (NDHS) women questionnaire. Information on diverse health issues were elicited from the pregnant women including; demographic characteristics, breastfeeding

practices, child mortality and survival issues, and reproductive health of the women. The survey questionnaire was administered by a team of experienced trained health workers to implement the fieldwork. Also, the health workers worked in the local communities and were fluent in spoken and written English, Yoruba language generally spoken in the southwest region of Nigeria, and the local dialect spoken in the communities where they did the fieldwork. environment.

The data collected were transformed and analyzed by SPSS Version 20. The data transformation was done according to standard recoding and categorization employed by Demographic and Health Survey (DHS) conducted in several countries of the world.

Results

Bivariate results

	Place of delivery of last child				Who assisted in delivery of last child			
Variables	**Home-TBA-others**	**PHC- hospital**	**Private clinic**	**P -value**	**TBA-relative-others**	**Nurses-mid wives**	**Doc-tors**	**P -value**
Age of respondent								
20-24	18.9%	22.2%	20.3%		24.0%	22.6%	18.0%	
25-30	39.5%	40.8%	40.8%		36.0%	41.1%	41.4%	
31-40	30.9%	27.9%	29.1%		29.0%	26.5%	31.8%	
41 and above	10.6%	9.1%	9.8%	.845	11.0%	9.9%	8.8%	.189
Age or respondent at delivery								
20 or less	9.4%	13.3%	11.9%		11.3%	12.9%	11.3%	
21-24	38.1%	34.3%	37.0%		43.3%	37.5%	31.1%	
25-29	35.7%	37.9%	35.7%		31.4%	34.4%	41.6%	
30 and above	16.8%	14.5%	15.4%	.536	13.9%	15.2%	16.0%	.035
Religion of respondent								
Traditional	10.1%	5.4%	4.8%		15.2%	3.9%	6.2%	
Islam	36.1%	33.5%	34.7%		39.9%	38.1%	28.2%	
Christianity	53.8%	61.1%	60.5%	.015	44.9%	58.0%	65.6%	.000
Marital status								
Single/divorced/separated/widowed	21.2%	14.5%	11.4%		27.0%	12.0%	15.2%	
Married	78.8%	85.5%	88.6%	.001	73.0%	88.0%	84.8%	.000
Husband had another wife								
Yes	29.5%	23.5%	18.0%		36.0%	21.1%	22.3%	
No	70.5%	76.5%	82.0%	.002	64.0%	78.9%	77.7%	.000
Education of respondent								
None-primary	21.8%	12.3%	13.3%		30.0%	12.5%	12.4%	

Secondary	41.3%	40.5%	36.4%		36.0%	40.7%	39.9%	
Post sec-professional	37.0%	47.2%	50.3%	.000	34.0%	46.8%	47.8%	.000
Respondent occupation								
Not working	17.6%	13.8%	11.4%		20.8%	11.1%	15.2%	
Self-employed	72.2%	71.8%	75.2%		64.7%	75.3%	73.3%	
Civil-servant	10.2%	14.4%	13.4%	.165	14.5%	13.6%	11.6%	.019
Number of living children								
1 or 2	36.1%	49.7%	58.5%		36.0%	57.5%	42.3%	
3 or 4	37.2%	38.0%	31.3%		30.5%	33.9%	41.0%	
5 or more	26.6%	12.3%	10.1%	.000	33.5%	8.6%	16.7%	.000
Spouse education								
None-primary	16.9%	9.6%	8.5%		18.0%	9.9%	10.3%	
Secondary	41.8%	39.2%	39.9%		47.0%	41.6%	35.8%	
Post sec-professional	41.3%	51.2%	51.6%	.001	35.0%	48.5%	53.9%	.000
Spouse occupation								
Not working	9.4%	9.7%	3.8%		8.7%	7.0%	9.8%	
Self-employed	76.2%	74.2%	76.2%		67.6%	77.0%	76.5%	
Civil-servant	14.4%	16.1%	20.0%	.040	23.7%	16.0%	13.7%	.028
Type of house living in								
Mud-grass-hut	11.2%	7.2%	3.8%		11.5%	2.4%	11.6%	
One room	36.1%	24.9%	25.9%		32.5%	28.2%	26.2%	
Room and parlor	29.2%	32.5%	38.3%		31.5%	38.5%	27.2%	
Two-three-bedroom flat	19.8%	31.3%	27.2%		21.0%	27.6%	29.4%	
Detached house-mansion	3.7%	4.2%	4.7%	.000	3.5%	3.2%	5.6%	.000

Table 1: *Place of delivery at last birth and person who assisted with the delivery by socio-demographic factors.*

The statistics in table 1 shows the relationship between two antenatal care variables; place of delivery of last child, and who assisted in delivery of last child by socio-demographic factors which are the independent variables. Chi-Square statistical technique was used to test the association between the dependent and independent variables at .1, .05, .01, and .001 levels. In table 1, religion of respondent (p-value = .015), marital status (p-value = .001), husband had another wife (p-value = .002), education of respondent (p-value = .000), number of living children (p-value = .000), spouse education (p-value = .001), spouse occupation (p-value = .040), and type of house living in (p-value = .000) had significant relationship with place of delivery of last child. Table 1 also shows that age of respondent at delivery (p-value = .035), religion of respondent (p-value = .000), marital status (p-value = .000), husband had another wife (p-value = .000), education of respondent (p-value = .000), respondent occupation (p-value = .019), number of living children (p-value = .000), spouse occupation (p-value = .028), and type of house living in (p-value = .000) had a significant association with who assisted in delivery of last child.

Multivariate results

	Place of delivery of last child Model 1		Who assisted in the delivery of last child Model 2	
Variables	**OR (95% C.I)**	**Sig**	**OR (95% C.I)**	**Sig**
Age of respondent				
20-24	1.00		1.00	
25-30	0.72 (0.46, 1.14)	.163	1.04 (0.61, 1.78)	.877
31-40	0.74 (0.45, 1.21)	.229	0.97 (0.54, 1.74)	.915
41 and above	0.77 (0.4, 1.49)	.431	1.05 (0.48, 2.3)	.898
Age or respondent at delivery				
20 or less	1.00		1.00	
21-24	0.62 (0.36, 1.08)	.090	0.7 (0.37, 1.36)	.293
25-29	0.72 (0.4, 1.29)	.269	0.87 (0.43, 1.76)	.701
30 and above	0.64 (0.32, 1.27)	.202	1.55 (0.63, 3.81)	.338
Religion of respondent				
Traditional	1.00		1.00	
Islam	1.15 (0.63, 2.13)	.646	1.69 (0.89, 3.21)	.111
Christianity	1.16 (0.63, 2.14)	.639	2.23 (1.16, 4.3)	.016
Marital status				
Single-divorced-separated-widowed	1.00		1.00	
Married	0.87 (0.55, 1.35)	.526	1.56 (0.96, 2.55)	.075
Husband had another wife				
Yes	1.00		1.00	
No	1.15 (0.78, 1.69)	.495	1.95 (1.23, 3.08)	.005
Education of respondent				
None-primary	1.00		1.00	
Secondary	1.14 (0.72, 1.81)	.569	1.97 (1.14, 3.4)	.015
Post sec-professional	1.25 (0.72, 2.18)	.434	1.53 (0.79, 2.97)	.206
Respondent occupation				
Not working	1.00		1.00	
Self-employed	1.62 (1.02, 2.57)	.040	1.92 (1.11, 3.35)	.021
Civil-servant	1.69 (0.86, 3.33)	.130	2.41 (1.07, 5.4)	.033
Number of living children				
1 or 2	1.00		1.00	
3 or 4	0.6 (0.42, 0.87)	.007	1.03 (0.64, 1.66)	.894
5 or more	0.29 (0.19, 0.45)	.000	0.28 (0.17, 0.46)	.000
Spouse education				
None-primary	1.00		1.00	

Secondary	1.21 (0.73, 1.98)	.462	0.77 (0.42, 1.42)	.408
Post sec-professional	1.23 (0.69, 2.18)	.489	1.06 (0.52, 2.18)	.873
Spouse occupation				
Not working	1.00		1.00	
Self-employed	0.77 (0.42, 1.41)	.395	0.55 (0.26, 1.18)	.124
Civil-servant	0.71 (0.34, 1.47)	.355	0.24 (0.1, 0.58)	.002
Type of house living in				
Mud-grass-hut	1.00		1.00	
One room	1.28 (0.73, 2.25)	.392	1.13 (0.57, 2.26)	.720
Room and parlor	1.79 (1, 3.21)	.049	0.85 (0.42, 1.72)	.655
Two/three-bedroom flat	2.47 (1.3, 4.71)	.006	1.28 (0.59, 2.8)	.534
Detached house-mansion	1.35 (0.5, 3.6)	.554	0.95 (0.28, 3.22)	.935
Note: Level of Significance; *p ≤ .05, **p ≤ .01, ***p ≤.001. **Model 1**: dependent variable: Place of delivery of last child (home/TBA/others vs. PHC/hospital/ private clinic) Chi-square = 68.722, -2 Log likelihood = 968.182[a], Nagelkerke R Square = .109 **Model 2:** Dependent variable: who assisted in the delivery of last child (TBA/relatives/others vs. nurses/midwives/doctor) Chi-square = 101.444, -2 Log likelihood = 699.178[a], Nagelkerke R Square = .183				

Table 2: *Showing logistics regression of place of delivery of last child, and person who assisted in the delivery by socio-demographic predictors.*

Table 2 shows the logistic regression on the antenatal care variables by socio-demographic factors as predictors. The two dependent variables on antenatal care were dichotomized as (1) place of delivery of last child (home/TBA/others vs. PHC/hospital/private clinic) which can be conceptualized as informal vs. formal. And, 2) person who assisted in the delivery of last child (TBA/relatives/others vs. nurses/midwives/doctor) conceptualized as unskilled vs. skilled. Model 2 which measured antenatal care using personnel who assisted with delivery compared to model 1 on type of place of delivery was best fitted of the two models based on higher percentage of variance explained (Nagelkerke R^2 18% vs. 11%), lower -2 log likelihood (699.178 vs. 968.2), and higher Chi-square (101.44 vs. 68.72).

Model 1 shows that the odds that the place of delivery of last child was a primary health center, hospital or private clinic was high for respondents who were self-employed (OR = 1.62; CI = 1.02, 2.57) compared to those who were not working. The odds that the place of delivery of last child was a primary health center, hospital or private clinic was low for respondents who had 3 or 4 living children (OR = 0.6; CI = 0.42, 0.87), and 5 or more living children (OR = 0.29; CI = 0.19, 0.45) compared to respondents who had just 1 or 2. The odds that the place of delivery of last child was a primary health center, hospital or private clinic was high for respondents living in a room and parlor apartment (OR = 1.79; CI = 1.0, 3.21), and two-three bedroom flat apartment (OR = 2.47; CI = 1.3, 4.71) compared to respondents living in a mud/grass/hut.

In Model 2, the odds that nurses, midwives or doctors assisted during the birth of last child was high for respondents that are Christians (OR = 2.23; CI = 1.16, 4.3) compared to the reference category. The odds that nurses, midwives or doctors assisted during the birth of last child was high for respondent that were married (OR = 1.56; CI = 0.96, 2.55) compared to respondents that were either single, divorced, separated or widowed. The odds that nurses, midwives or doctors assisted during the birth of last child was high for respondents whose husband had no other wife (OR = 1.95; CI = 1.23, 3.08) compared to respondents whose husband had another wife.

The odds that nurses, midwives or doctors assisted during the birth of last child was high for respondent that had a secondary education (OR = 1.97; CI = 1.14, 3.4) compared to respondents that had no education or just primary education. The odds that nurses, midwives or doctors assisted during the birth of last child was high for respondents who were self-employed (OR = 1.92; CI = 1.11, 3.35), and respondents that were civil servants (OR = 2.41; CI = 1.07, 5.4) compared to respondents that were not working. The odds that nurses, midwives or doctors assisted during the birth of last child was low for respondent that had 5 or more number of living children (OR = 0.28; CI = 0.17, 0.46) compared to respondents that had just 1 or 2 living children. The odds that nurses, midwives or doctors assisted during the birth of last child was low for respondents whose spouse was a civil-servant (OR = 0.24; CI = 0.1, 0.58) compared to the reference category.

Discussion

This paper examined the socio-demographic factors influencing antenatal care utilization in selected health facilities in Ifo LGA in Ogun state of Nigeria [33]. This is aimed at providing policy makers and programmers with information that will enable targeted intervention to improve antenatal use, and thus contribute to reducing infant and child mortality at grassroots in the state [1,10]. Place of delivery and the person who attended to the delivery are crucial in saving lives at the early stages of life [8]. General review of the results suggests that the dependent variable, health personnel who assisted in delivery is likely more important in explaining delivery outcomes and quality of care [12], compared to the place where delivery was done going by (i) the fact that it had better fitted regression model with higher explained variance, and (ii) it had more statistically significant socio-demographic factors of the two models specified. The critical role of skilled personnel in antenatal care outcomes is well supported in the literature [6].

A key highlight of this study is whether a pregnant woman will choose formal (PHC/hospital/private clinic) vs. informal (home/TBA/others) place for delivery and this health decision can be influenced by respondent's occupation, the number of children that she has already, and the type of house she is living in with her household which to some extent depicts socioeconomic status [15,17]. These independent variables are all indicative of obstructions to access better health facilities that the formal facilities represent [18]. Thus, policy and program intervention that aim at reducing these obstructions to better health facilities are likely to increase their use by more women in the locality [2,14]. The interventions that will be more efficient and impactful will have to respond to the characteristics and differences between pregnant women who are self-employed in comparison to those who are not working. The intervention will have to consider the nuances between those women who have few children compared to those who have many, and take adequate steps to ameliorate the issues surrounding type of house lived by these women and their choice of place of delivery. Another key finding of this study that is supported by the literature is the importance and crucial role of skilled health personnel in attendance during delivery [7]. Results from this study corroborate those of other study that socio-demographic variables such as religion, polygamy, education, occupation, family size, and spouse's occupation have significant relationship to the caliber of health personnel who attends to pregnant women during delivery which have grieve consequences for the survival of mother and child [15].

Based on this study findings, policy makers and program will need to specifically target and harmonize the differences between pregnant women based on their socio-demographic characteristics in order to increase the number who use skilled health personnel during delivery. The intervention to scaleup use of skilled professionals during delivery will have to be evidenced-based building on the findings of this study which should be used as a baseline for providing specific details on the variations between pregnant women who

were Christian vs. those who were traditionalist; those whose husband had another wife compared to those who were in a monogamous relationship; those who had at least secondary school education compared to their counterpart who had no education.

Other significant variations that need to be teased out for tailored intervention are pregnant women who were civil servants compared to their counterparts who were not working; those who had small family size vs. those who had large family size; and the role of civil servant husbands compared to those whose husbands had no work. Interventions customized based on these variations in women's socio-demographic characteristics will go a long way to increase use of skilled health professionals during delivery and thus, avert infant and child death, and preservation of their mothers towards contributing to achieving SDG 3 in the country by 2030 [6,15].

Conclusion

With few years remaining to review the scorecard on each country's SDGs achievements, it is important to zero-in more on impediments to achieving the goals and respective targets at the grass roots and communities in most countries especially those of the developing countries. Examining socio-demographic factors influencing antenatal care at the community level is a surer way to bridging the gaps in antenatal utilization between (i) rural-urban differentials in facilities and (ii) differences in the socio-demographic characteristics of the pregnant women who are the end-users thus, serving as a double barrel approach to catalyze upscale in use towards achieving SDG 3 by year 2030. The role of all key players such as policy makers, program implementers, community mobilisers, and the end-user are vital in this regard.

Appendixes

Appendix 1: Collinearity Diagnostics of socio-demographic predictors of the place of delivery of respondent's last child

	1	2	3	4	5	6	7	8	9	10	11	Sig	Tolerance	VIF	Eigenvalue	Condition index
1	.13	.02	.01	.00	.01	.03	.00	.29	.02	.00	.02	.451	.817	1.224	.214	7.218
2	.24	.13	.00	.00	.01	.00	.00	.51	.00	.00	.00	.358	.829	1.207	.139	8.955
3	.00	.01	.08	.03	.06	.08	.01	.06	.04	.01	.26	.694	.865	1.156	.100	10.543
4	.00	.09	.04	.01	.01	.12	.11	.02	.06	.06	.31	.639	.902	1.109	.081	11.717
5	.51	.62	.00	.00	.00	.01	.01	.00	.07	.00	.02	.439	.791	1.264	.074	12.278
6	.03	.00	.08	.00	.06	.06	.23	.00	.02	.08	.36	.514	.588	1.700	.067	12.883
7	.01	.05	.60	.10	.23	.03	.08	.00	.06	.01	.01	.128	.820	1.219	.042	16.251
8	.00	.01	.01	.34	.05	.03	.16	.00	.00	.55	.00	.000	.937	1.068	.037	17.480
9	.03	.02	.05	.00	.14	.60	.00	.00	.70	.00	.00	.458	.597	1.674	.036	17.682
10	.01	.00	.00	.26	.41	.05	.38	.00	.03	.21	.00	.354	.825	1.212	.033	18.293
11	.03	.04	.14	.25	.02	.00	.02	.11	.00	.08	.00	.006	.817	1.224	.010	32.670

Note: Adjusted R Square = .056 Std. Error of the Estimate = .43766; Dependent Variable: place of delivery of last child; 1 = age of respondent, 2 = age of respondent at delivery, 3 = religion of respondent, 4 = marital status, 5 = husband had another wife, 6 = education of respondent, 7 = respondent occupation, 8 = number of living children 9 = spouse education, 10 = spouse occupation 11 = type of house living in

	Place of delivery of last child Model 1		Who assisted in the delivery of last child Model 2	
Variables	**OR (95% C.I)**	**Sig**	**OR (95% C.I)**	**Sig**
Age of respondent				
20-24	1.00		1.00	
25-30	0.72 (0.46, 1.14)	.163	1.04 (0.61, 1.78)	.877
31-40	0.74 (0.45, 1.21)	.229	0.97 (0.54, 1.74)	.915
41 and above	0.77 (0.4, 1.49)	.431	1.05 (0.48, 2.3)	.898
Age or respondent at delivery				
20 or less	1.00		1.00	
21-24	0.62 (0.36, 1.08)	.090	0.7 (0.37, 1.36)	.293
25-29	0.72 (0.4, 1.29)	.269	0.87 (0.43, 1.76)	.701
30 and above	0.64 (0.32, 1.27)	.202	1.55 (0.63, 3.81)	.338
Religion of respondent				
Traditional	1.00		1.00	
Islam	1.15 (0.63, 2.13)	.646	1.69 (0.89, 3.21)	.111
Christianity	1.16 (0.63, 2.14)	.639	2.23 (1.16, 4.3)	.016
Marital status				
Single-divorced-separated-widowed	1.00		1.00	
Married	0.87 (0.55, 1.35)	.526	1.56 (0.96, 2.55)	.075
Husband had another wife				
Yes	1.00		1.00	
No	1.15 (0.78, 1.69)	.495	1.95 (1.23, 3.08)	.005
Education of respondent				
None-primary	1.00		1.00	
Secondary	1.14 (0.72, 1.81)	.569	1.97 (1.14, 3.4)	.015
Post sec-professional	1.25 (0.72, 2.18)	.434	1.53 (0.79, 2.97)	.206
Respondent occupation				
Not working	1.00		1.00	
Self-employed	1.62 (1.02, 2.57)	.040	1.92 (1.11, 3.35)	.021
Civil-servant	1.69 (0.86, 3.33)	.130	2.41 (1.07, 5.4)	.033
Number of living children				
1 or 2	1.00		1.00	
3 or 4	0.6 (0.42, 0.87)	.007	1.03 (0.64, 1.66)	.894
5 or more	0.29 (0.19, 0.45)	.000	0.28 (0.17, 0.46)	.000
Spouse education				
None-primary	1.00		1.00	
Secondary	1.21 (0.73, 1.98)	.462	0.77 (0.42, 1.42)	.408
Post sec-professional	1.23 (0.69, 2.18)	.489	1.06 (0.52, 2.18)	.873

Spouse occupation				
Not working	1.00		1.00	
Self-employed	0.77 (0.42, 1.41)	.395	0.55 (0.26, 1.18)	.124
Civil-servant	0.71 (0.34, 1.47)	.355	0.24 (0.1, 0.58)	.002
Type of house living in				
Mud-grass-hut	1.00		1.00	
One room	1.28 (0.73, 2.25)	.392	1.13 (0.57, 2.26)	.720
Room and parlor	1.79 (1, 3.21)	.049	0.85 (0.42, 1.72)	.655
Two/three-bedroom flat	2.47 (1.3, 4.71)	.006	1.28 (0.59, 2.8)	.534
Detached house-mansion	1.35 (0.5, 3.6)	.554	0.95 (0.28, 3.22)	.935
Note: Level of Significance; *p ≤ .05, **p ≤ .01, ***p ≤.001. **Model 1**: dependent variable: Place of delivery of last child (home/TBA/others vs. PHC/hospital/private clinic) Chi-square = 68.722, -2 Log likelihood = 968.182[a], Nagelkerke R Square = .109 **Model 2:** Dependent variable: who assisted in the delivery of last child (TBA/relatives/others vs. nurses/midwives/doctor) Chi-square = 101.444, -2 Log likelihood = 699.178[a], Nagelkerke R Square = .183				

Table 2: *Showing logistics regression of place of delivery of last child, and person who assisted in the delivery by socio-demographic predictors.*

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