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RESEARCH ARTICLE

LEVEL OF UTILIZATION OF SKILLED DELIVERY SERVICE BY PREGNANT WOMEN AT THE HEALTH FACILITIES IN GHANA

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ABSTRACT

Background: About 99% of maternal mortality (MM) occurs in developing regions particularly Africa and Asia, during labor, birth and the 24 hours after birth. However, about 88% – 98% of these deaths are avoidable. World health organization (WHO) recommended that every pregnant woman must use Skilled Delivery Service (SDS) during labourreduce maternal and neonatal mortality. SDS are services provided to women during pregnancy, childbirth and immediately after child birth by accredited and competent health care providers. The purpose of this study was to assess the level of utilization of SDS by Pregnant Women at the health facilities in Central Region of Ghana. **Methods:** A descriptive cross-sectional design was used to conduct the study. A multi-stage sampling technique was used to sample 1100 pregnant women. Structured questionnaire was used to collect the data after pretesting was done and the collected data were analysed using frequencies and percentages. **Results:** The results showed that majority (80%)of the pregnant women had the intention to use SDS during labour. Among women who had given birth before, during their last delivery, about 69% used SDS at health facilities in Central Region of Ghana. **Conclusion:** In conclusion, Central Region is doing better than the national coverage of 56% but it is worth emphasizing that more need to be done to achieve the global target of the Sustainable Development Goals (SDG) 3.1 and 3.2. As a result, the governments through the Ghana Health Service (GHS) must implement strategic interventions that will motivate every pregnant woman in the country to use SDS.

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INTRODUCTION

The World Health Organization (WHO) indicated that the contribution of women in the welfare of families, communities and countries in terms of ensuring better health for every individual and the society as a whole cannot be underestimated (1). Women serve important roles for the improvement of the economy; such roles include caring for all the members of the family especially the sick and children. In terms of economic development, they farm, trade and provide the basic needs of their families. The health of pregnant women is of importance in all countries of the world (1). The major factors that account for maternal mortality (MM) and morbidity are pregnancy and childbirth associated complications (2). Some of the factors that cause maternal mortality are the dominance of haemorrhage, infections, hypertensive disorders, access to maternal health and skill delivery attendants.

This means that all pregnant women should have access to skilled attendants at birth and immediately after, and to timely referral for emergency care. Sub-Saharan Africa and South Asia—face massive deprivation in access to such care and the sheer scarcity of staff and the excessive costs of care to mothers are substantial barriers to progress (3). To achieve rapid coverage requires training, deployment, and retention of midwives, preferably in teams in small facilities (4). Financial barriers to care, such as user fees, must also be removed. Overcoming health system constraints to provide such interventions at scale is possible, but donors will need to increase financial contributions for maternal health in low-income countries to help overcome the resource gap. Maternal death results in greater financial loss to countries (2). In 2014, the United Nations International Children's Emergency Fund (UNICEF) reported that an amount of $15.5 billion is lost yearly from productivity because of maternal death (5).

Concerning complications associated with pregnancy and labour that could lead to death, WHO recorded that close to 300 million women in childbearing age suffer from various forms of such complications in Africa (1). Pregnancy-related complications such as prolonged labour, convulsions, retained placenta, premature rupture of membrane and malposition of the fetus account for 15% of the complications in developing countries (1). The SDG 3 seeks to ensure Good Health and Well-being of every individual globally (6). The targets for the SDG 3 are to ensure healthy lives for all at all ages by improving reproductive, maternal and child health; ending the epidemics of major communicable diseases; reducing non-communicable and environmental diseases; achieving universal health coverage; and ensuring access to safe, affordable and effective medicines and vaccines for all (6). The SDG 3.1., seeks to reduce the global MMR to less than 70 per 100,000 live births by 2030. The indicators are MMR and proportion of births attended by skilled health personnel (100%). The SDG 3.2., seeks to end preventable deaths of newborns and children under 5 years of age, with all countries aiming at reducing neonatal mortality (probability of dying during the first 28 days of life) to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births by 2030. The indicators are under-five mortality rate and neonatal mortality rate (6-7). We believe that the SDG 3will best be achieved by adoption of a core strategy of intrapartum care based on access, improved health centres and skilled birth attendant (SBA).

Developed countries achieved 99% coverage of SBA use, developing countries achieved slightly over 50% of births, which took place with the presence of skilled attendant (8). In Ghana, about 57% of births were delivered in health facilities in 2014 (9). In addition, coverage of supervised delivery which increased slightly from 55% in 2013 to 56% in 2015 (10) was not evenly distributed across all the 10 regions of Ghana. In the Central Region in particular, coverage of supervised delivery was 54% which was also below the national coverage of 56% (10).Health facility delivery was 52% which was below the national average of 56% and the global expected coverage of 100% by 2030 as proposed by the SDG 3 (10; 6). Level of SDS utilisation is the rate at which pregnant women use the available health services of SBAs either at health facilities or in their communities when the need arises within a specified period (monthly, quarterly, half year or annually) (11). Sometimes trend analysis are done to determine the level of use of SDS. The level of SDS use is usually determined through surveys (11). There are variations in the level of use of SDS between countries, districts, sub-districts and within communities (12). The level of use also varies based on the background characteristics of the pregnant women and their partners. Socio-cultural, physical and health service factors are other important determinants of the level of use of SDS.In the Central Regionmany women often left the hospital before they were well enough for discharge because they could not pay for the care they received.User charges add to the costs of transport and companion time, which can be substantial for those living far from facilities. The time spent looking for cash can also delay access to emergency life-saving care in facilities. Women are encouraged to plan for their deliveries, but the unpredictability of the outcomes and costs makes planning difficult. Indeed, the fear of anticipated cost can deter use of services. The huge inequalities between poor and rich people in access to skilled delivery care are therefore not surprising, and are greater than those for uptake of child health services or family planning.(3,9,10). The socioeconomic differences in maternal mortality can also be large with, for example, a six-fold difference between the richest and poorest quintiles in Central Region. Globally, skilled health workers attended about 78% of births (8). In developed countries, the level of births assisted by SBAs was estimated to be 99%; in upper middle –income countries it was estimated to be 95%; 64% in less developed countries and 47% in least developed countries (13; 8). In the Central Region in particular, coverage of supervised delivery was 54% and facility delivery was 51.7% which was below the national average of 57% and the global expected coverage of 90% by 2015 (14). About 47% of pregnant women at Mwingi District in Kenyaused SBA at health facilities (15). Meanwhile in a household survey conducted in South Sudan, the prevalence of SDS use was 45% (95% CI = 42.4 – 47.0) (16). Improvement in financial, skilled Health personnel and geographical access to good quality intrapartum care based in health centres is therefore important in any poverty eradication strategy, as well as ameans of reachingSDG 3 in derived communities such as the Central Region of Ghana.

The findings from the cross-sectional cluster survey at Makueni in Kenya indicated that the level of use of SDS among women was 40 % (18). Meanwhile, another study conducted at Makueni County in Kenya from alongitudinal cohort study indicated that the level of SDS use was 54% (17). Cross sectional analysis of the 2007 Bangladesh Demographic and Health Survey revealed that only 20% of women use SBA for their lastdelivery prior to the study (20). This confirms that the level of use of SDS in most countries in SSA is below the expected WHO standard of 90%. This could be attributed to low educational background of most of the pregnant women, lack of autonomy of the women in making decisions concerning health care seeking, inaccessibility of health care due to poor road networks and many more. The study therefore sought to determine the level of SDS use among pregnant women at health facilities in the Central Region of Ghana. The other sections of the work are the methods, results and discussions of the findings.

METHODS

Aim, design and setting of the study: The purpose of this study was to assess the level of utilisation of skilled delivery service (SDS) by Pregnant Women at the selected districts in Central Region of Ghana. The study was a descriptive cross-sectional survey that quantitatively explored the proportion of utilisation of SDS in the Central Region of Ghana. The study focuses on the antenatal clinics at districts in the Central Region of Ghana. The region shares borders on the east with the Greater Accra Region, on the north with Ashanti Region and on the north-east with Eastern Region. The region has 20 administrative districts with the historical city of Cape Coast as the capital. About 63% of the region is rural (21). The population was estimated at 2,413,050for the year 2013 with an annual growth rate of 3.1% (21) and a population density of about 215 inhabitants per square utilisation.

Population: The target population for the study was pregnant women of reproductive age (WRA), between 15-49 years who had delivered within the past three years prior to the study regardless of their birth outcome and those who had never

given birth and are pregnant for the first time, in the Central Region of Ghana.

Sampling Procedure: Formula by Krejcie and Morganwas used in calculating the sample size (21). Assuming 10% non-response rate, design effect of 2, (to compensate the clustering effect introduced as a result of using stratified sampling technique) the sample size was 1,100 pregnant women. Multi-stage cluster sampling was used to select the respondents for the study.The districts were grouped into two strata, urban and rural. The urban districts are districts with adequate social amenities including public hospital(s) and rural districts are districts with inadequate social amenities and without public hospital(s) (9). The purposive sampling method was used to select public health facilities that provide ANC services within the selected districts such as hospitals, poly clinics, health centers and CHPS compounds. Simple random sampling technique was used to select 10 districts out of the 20 districts. That is 6 districts with hospitals and 4 districts without hospitals. This was to make the sample representative of the 12 districts that had hospitals and 8 districts that did not have hospitals. The simple random sampling method was also used to select 2 health facilities that provide ANC services from each of the selected districts, one from urban and one from rural area. The simple random sampling method gave every facility a fair chance of being selected to help determine the utilisation of SDS at the selected health facilities to inform appropriate intervention. The proportionate stratified sampling method was used to select the respondents in proportion to the size of the population in their study area. The purposive and convenient sampling method was also used to select 1,000 women with their first pregnancy and those who had their last delivery within the past three years prior to the study.

Data Collection Instrument: Questionnaire for SDS utilisation scale of measure was used to collect the data from the respondents.The questionnaire was adapted from the safe motherhood questionnaire developed by maternal and neonatal health programme of JHPIEGO and Ghana Demographic and Health Survey (GDHS) (12). The questionnaire was developed in English and later translated into Fante to make more cultural relevant and comprehensive to the participants.This is because most of the people in the Central Region of Ghana are Fantes and the translation of the questionnaire also enhances content validity and gathers rich data. Each participant completed a set of standard demographic questionnaires designed for the presentsocio-demographic, antenatal services, physical factors, health service factors and level of satisfaction. The information collected centered on participants' age, religion, marital status, level of education of mother and husband, decision maker, ownership of NHIS, average monthly income and occupation.A pre-test or preliminary trial of the instrument was conducted at one health facility in the Western Region to ensure clarity of the questions and to correct confusion over some items of the instrument before the actual fieldwork. In addition, the questionnaire was piloted to establish the time needed to complete the survey and to screen the questions. The responses from the pregnant women were collated and used to determine the reliability of the instrument. The reliability of the items on the questionnaire were determined separately with the use of the Cronbach's alpha. The reliability of each of the three factors was established using Cronbach's alpha as a measure of internal consistency. The test has a reliability of .85 (F1 – internal), .88 (F2 – exaggerated), and .97 (F3 – mediator). The BPCS has been found to have excellent construct validity with a range of .85–.95. Based on the experience from the pretest, revision was made in the wording and translation of the questionnaire into Fante for better understanding by the respondents. Some of the items were then reworded for better understanding for the respondents without changing their meaning. After the pre-testing the 75 items were reduced to 74. This was because some of the items were ambiguous and some also did not address the study objectives directly. Some of the items were modified and the structuring of some questions were also improved to facilitate easy understanding by the participants. The Belief in Personal Control Scale (Berrenberg, 1987) was utilised to measure personal control. This instrument uses a 5-point Likert scale anchored on (1 = always true to 5 = never true). The BPCS is a 45-item instrument used to measure three dimensions of perceptions of personal control: general external control (ExtC), exaggerated internal control dimensions (ExagC), and God-mediated dimension (GM). ExtC assesses the extent to which an individual believes his or her outcomes are self-produced (internally) or produced by fate or others (externally), for instance ("I can make things happen easily"). ExagC dimension measures an extreme and unrealistic belief in personal control, for instance ("Getting what you want is a matter of knowing the right people"). The God-mediated dimension measures the belief that God can be solicited in the attainment of outcomes, for instance ("I can succeed with God's help"). This dimension allows for the important distinction to be made between individuals who believe that they have little or no control over their outcomes (externals) versus those who believe they control outcomes indirectly through God.

A higher score of ExtC means more perceptions of internal control, higher scores of ExagC suggest exaggerated belief in personal control and higher GM scores indicate less belief in God as a mediator of control. The reliability of each of the three factors was established using Cronbach's alpha as a measure of internal consistency. The test has a reliability of .85 (F1 – internal), .88 (F2 – exaggerated), and .97 (F3 – mediator). The BPCS has been found to have excellent construct validity with a range of .85–.95 (Berrenberg, 1987).To ensure validity of the questionnaire, the researcher ensured that the items on the questionnaire represented the domain of interest. Again, the items on the instrument were reviewed by the supervisors, colleagues and other experts in SDS use for scrutiny, corrections, readability, clarity and comprehensiveness for face and content validity. To determine reliability of the instrument, the validated version of the questionnaire was pretested with 100 pregnant women who consented to the pretest at one hospital in the Western Region. The facility provides ANC services to pregnant women within the same age group as selected health facilities in the Central Region. The data collected for both pretesting and the actual study were subjected to Cronbach's Alpha coefficient to determine the reliability of the instrument. This helped to measure accuracy, trust worthiness and consistency and dependability of the instrument and the data collected. The Cronbach's Alpha for the pretest instrument was 0.905 for the pretest instrument with 75 items. In the case of the actual study, the 1100 questionnaires with 74 items on each questionnaire, the scale had good internal consistency with a Cronbach's Alpha coefficient of .921. This implies that the items on the questionnaire correlate to each other. Cronbach's Alpha is an index which is used to determine the reliability of the data collection instrument (23).

Data Collection Procedure and ethical issues: Ethical clearance for the study was sought from the University of Cape Coast Ethical Review Board and Ghana Health Service Ethics Review Committee. Approval for the study was sought from the Central Regional Health Directorate and permission was sought from the District Health Directors, Medical Superintendents, and the in-charges of the selected districts, health facilities and ANC clinics respectively. The Ethics committee of the university of cape coast and the Ghana health service did not specify parental or legal guardian consent for the study. The purpose of the study was explained to the clients. Six trained research assistants were used to facilitate the data collection. Written informed consent was sought from the study participants. The form for the consent to participate in the study was approved by the University of Cape Coast Ethical Review Board and Ghana Health Service Ethics Review Committee. Participants who could not read and/or write were asked to thumb print as approval for informed consent after the purpose of the study was explained and they were informed about their right to interrupt the interview at any time or opt out of the study without any fear of future prejudice. The questionnaires were distributed to those who consented to participate in the study and the instruments were taken right after completion. Respondents were assured of confidentiality.

All information obtained from the participants were kept confidentially. The names of respondents were not associated with responses provided to ensure their anonymity. Participants were informed about their freedom to skip some of the questions and exit from the study. The participants were informed about the duration (20 minutes) for answering the questionnaire. There were no risks associated with the study and there were no material or financial benefit to respondents. Participation in the study was entirely voluntary, and declining to enter the study, declining to answer a question, or terminating the interview did not have any negative consequence. Data collected was stored in locked file cabinets.

Data Processing and Analysis: After removing data from incomplete questionnaires, we evaluated the assumptions underlying parametric tests using SPSS.Descriptive and inferential statistics were used to analyse the data. The data collected were screened to ascertain the accuracy of the data, deal with missing data, and assess the effects of extreme values on the analysis. The dependent variable, utilisation of SDS, was dichotomous; implying that a pregnant woman in labour would use SDS or not. To determine the use of SDS among the pregnant women descriptive statistics was used to summarise and describe the data. The frequencies provided information about the number of participants who responded to each item. Consideration was given to the dichotomous (whether client will use SDS at health facility or not) data. Pie chart and cross tabulations were used to present the data.

RESULTS

The main aim of this study was to determine the level of SDS usage among pregnant womenin the Central Region of Ghana. The results for intended place of delivery for current pregnancy and place of delivery with previous pregnancy are presented in Figure 1 and 2, respectively. Figure 1 shows that 80% (n = 881) of the pregnant women had intentions to use SDS when in labour while 20% (n = 219) did not.

Concerning last place of delivery, 31% (n = 299) had home delivery and 69% (n = 677) delivered at a health facility as shown in figure 2. The finding implies that there has been an improvement of the use of SDS at health facilities from 69% during previous delivery of the women to 80% of women who are likely to use SDS with current pregnancy.To inform policy decision making, the proportion of women who intend to use SDS was also compared among selected districts in the Central Region, socio-demographic/economic characteristics and other predictors of SDS as indicated by the Anderson model. The results from the sub-district/group analysis showed that 64% of the study participants at Agona West (Nyakrom Health Center) indicated their intention to deliver in a recommended health facility. Among women with valid NHIS membership card, 80.8% showed their willingness to use SDS compared to those who do not hold valid NHIS membership card and the difference was found to be statistically significance (p = 0.025). Detailed distribution of proportion of SDS use among predictors (socio-demographic, antenatal services, physical factors, health service factors and level of satisfaction) could be found in Table 1-6.

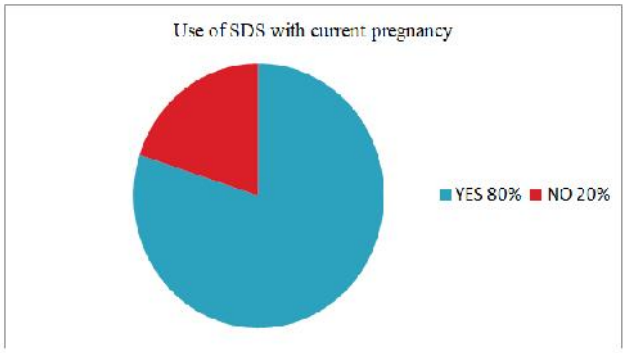

Figure 1. Level of SDS use with current pregnancy

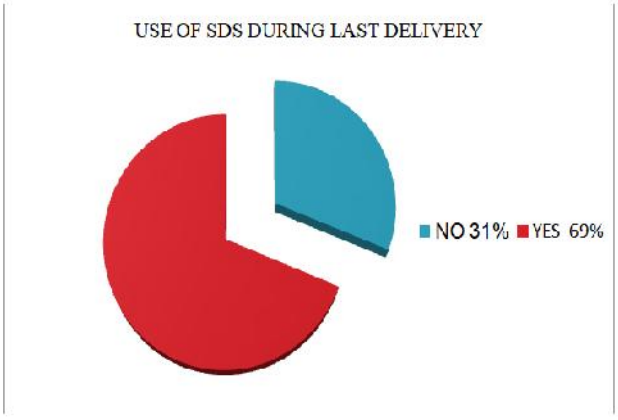

Figure 2. Level of SDS use during last delivery

DISCUSSION

The present study sought to explore the level of utilization of skilled delivery service (SDS) among Pregnant Women within selected districts in the Central Region of Ghana. The findings of the present study indicated that (80%) of the pregnant women of the sampled districts have the intension to use SDS during their current pregnancy. A possible explanation for this resultcould be due to the 58% increase in the functional CHPS zones available to pregnant women in Ghana (12).

Table 1. Proportion of SDS use among socio-demographiccharacteristics

Overall estimate of SDS use among pregnant women = 80.0% (95% CI: 75.4 – 84.1), N = 1100 women	Proportion of SDS use and the corresponding 95% CI stratified by indicators of the Anderson model	
Predictors of SDS use	Proportion of SDS use in % (point estimate)	95% CI of the proportion of SDS use (interval estimate)
Age in years		
<20	83.52	74.90 – 89.58
20-29	80.96	75.20 – 85.64
30-39	78.59	73.19 – 83.16
40-49	72.22	51.84 – 86.26
Religion*		
Christianity	81.58	77.28 – 85.22
Islamic	73.83	62.38 – 82.75
Marital status		
Never married	76.47	66.84 – 83.96
Married	80.97	75.41 – 85.52
Living together/cohabiting	78.54	72.61 – 83.48
Mothers level of education		
No formal	84.80	78.28 – 89.62
Basic	77.83	71.26 – 83.25
Secondary	83.23	74.09 – 89.61
Tertiary	81.48	73.59 – 87.42
Husband/partner's level of education		
No formal	79.23	72.31 – 84.78
Basic	78.28	71.50 – 83.82
Secondary	80.37	71.74 – 86.84
Tertiary	85.22	80.51 – 88.95
Decision taker on where mothers should seek healthcare*		
Husband/partner	83.08	78.05 – 87.15
Family member	66.18	50.07 – 79.24
Self	82.18	78.44 – 85.38
Husband/partner and self	79.89	74.35 – 84.49
Ownership of NHIS*		
Not valid NHIS	19.2	17.43 – 22.47
Valid NHIS	80.8	78.04 – 84.91
Average monthly income in cedis		
≤ 100	74.89	69.39 – 79.69
101-200	82.69	74.48 – 88.67
>200.00	75.73	61.88 – 85.71
Occupation		
Self employed	78.97	73.80 – 83.34
Civil servant	80.00	72.16 – 86.06
Unemployed	86.49	75.80 – 92.90

CI: Confidence interval for point estimate adjusted for standard error estimate by controlling for clustering at the district level. LR: Likelihood ratio.

Table 2. Proportion of SDS use and antenatal care experience

Overall estimate of SDS use = 80.0% (95% CI: 75.4 – 84.1), N = 1100 women	Proportion of SDS use and the corresponding 95% CI stratified by indicators of the Anderson model	
Predictors of SDS use	Proportion of SDS use in % (point estimate)	95% CI of the proportion of SDS use
Number of pregnancies		
One	26.00	15.34 – 40.53
Two	17.15	13.62 – 21.36
Three	16.08	12.84 – 19.94
Four or more	24.34	16.89 – 33.75
Age at last birth		
Less than one year	81.82	63.77 – 92.00
Exactly one year	79.59	72.94 – 84.94
Two years	80.28	75.17 – 84.54
Three years	82.11	74.79 – 87.65
Number of deliveries		
None	75.78	63.51 – 84.90
One	81.42	76.11 – 85.78
Two	83.80	78.84 – 87.78
Three	76.25	66.78 – 83.68
Four or more	77.04	65.15 – 85.76
Place of ANC attendance during last/previous pregnancy		
Private Health Facility	77.61	69.41 – 84.12
Public Health Facility	81.27	75.85 - 85.71
Number of ANC visits during last/previous pregnancy		
One	64.00	36.31 – 84.72
Two	73.08	55.64 – 85.45
Three	80.52	69.06 – 88.45
Four or more	81.95	78.32 – 85.09
Number of ANC visits with current pregnancy		
One	68.15	50.18 – 81.96
Two	82.94	76.85 – 87.68
Three	79.51	73.64 – 84.34
Four or more	82.59	78.41 – 86.10
Information received during ANC visits		
No	76.89	65.09 – 85.59
Yes	80.97	77.24 – 84.22

CI: confidence interval for point estimate adjusted for standard error estimate by controlling for clustering at the district level.

Table 3. Proportion of SDS use and socio-cultural factors

Overall estimate of SDS use = 80.0% (95% CI: 75.4 – 84.1), N = 1100 women	Proportion of SDS use and the corresponding 95% CI stratified by indicators of the Anderson model	
Predictors of SDS use	Proportion of SDS use in % (point estimate)	95% CI of the proportion of SDS use
Money for transport and health care		
Disagree	76.82	68.59 -83.42
Agree	81.84	77.01 – 85.85
Cultural and religious beliefs and customs		
Disagree	78.08	72.17 – 83.03
Agree	82.44	78.15 – 86.05
Decision making power		
Disagree	77.90	72.56 – 82.45
Agree	82.22	76.79 – 86.61
Health facility in the community available		
Disagree	79.21	72.51 – 84.62
Agree	80.84	77.18 – 84.03
Distance		
Disagree	76.99	69.57 – 83.04
Agree	82.36	78.59 – 85.59
Road networks		
Disagree	76.40	69.99 – 81.80
Agree	83.57	79.20 – 87.17
Husband/partner/family member(s) influence		
Disagree	77.18	71.04 – 82.33
Agree	83.27	78.43 – 87.20
Need for closer attention from relative		
Disagree	76.58	69.41 – 82.49
Agree	83.45	80.67 – 85.90
Comfortable when delivered at home		
Disagree	80.25	73.96 – 85.33
Agree	79.79	75.05 – 83.83
Community and family support		
Disagree	79.57	74.72 – 83.69
Agree	80.62	74.28 – 85.70

CI: confidence interval for point estimate adjusted for standard error estimate by controlling for clustering at the district level.

Table 4. Proportion of SDS use and health service factors

Overall estimate of SDS use = 80.0% (95% CI: 75.4 – 84.1), N = 1100 women		Proportion of SDS use and the corresponding 95% CI stratified by indicators of the Anderson model	
Predictors of SDS use		Proportion of SDS use in % (point estimate)	95% CI of the proportion of SDS use
Attitude of staff			
Disagree		76.25	68.95 – 82.28
Agree		82.84	79.30 - 85.88
Service hours			
Disagree		79.60	74.58 – 83.84
Agree		80.67	75.40 – 85.04
Privacy			
Disagree		79.90	74.59 – 84.32
Agree		80.31	74.17 – 85.28
Communication			
Disagree		77.00	70.26 – 82.59
Agree		83.80	79.58 -87.29
Service cost in health facilities			
Disagree		79.07	73.13 – 83.98
Agree		81.54	76.19 – 85.91
Equipment, drugs and supplies			
Disagree		77.27	70.90 – 82.58
Agree		83.86	78.97 – 87.80
Demand for money and items (soap, pad, cot sheet etc.)*			
Disagree		77.01	70.53 – 82.43
Agree		84.88	80.81 – 88.22

CI: confidence interval for point estimate adjusted for standard error estimate by controlling for clustering at the district level.

CHPS zones are means of increasing accessibility of health services including SDS. Most of the CHPS zones now have SBAs who provide SDS to pregnant women and refer those with complications when necessary. The present study confirms assertion that the regions with the highest mortality burden sub-Saharan Africa and south Asia—face massive deprivation in access to health facility with qualified staff. The gains in the Central Region is clearly link to availability of health facility with skilled personnel (3). The findings are consistent with other studies which found that majority of the respondents used SDS during their last delivery (16; 24).

Improvement in general health seeking behaviour might have contributed to a larger proportion of women seeking assisted delivery (24).In a study conducted in Ghana that used decomposition statistical approach to explain the variation in the observed change in percentage of SBAs using two successive nationally representative household survey data (25) andanother study that used cross-sectional multi-stage cluster household survey (26) showed that 79% of women who had ever given birth in the year prior to the survey had the assistance of skilled attendants during delivery in the Upper East and Greater Accra regions of Ghana which is consistent

Table 5: Proportion of SDS use and client satisfaction

Overall estimate of SDS use = 80.0% (95% CI: 75.4 – 84.1), N = 1100 women	Proportion of SDS use and the corresponding 95% CI stratified by indicators of the Anderson model	
Predictors of SDS use	Proportion of SDS use in % (point estimate)	95% CI of the proportion of SDS use (interval estimate)
Place of last birth		
Home	70.83	62.33 – 78.09
Health facility	83.04	78.10 – 87.04
Attitude of staff during last delivery		
Negative	70.77	55.01 – 82.74
Positive	84.28	80.40 – 87.52
Level of satisfaction with the services provided		
Dissatisfied	60.00	39.86 – 77.25
Satisfied	85.92	82.92 – 88.47
Recommendation of last delivery place to family and friends		
No	63.24	43.28 – 79.50
Yes	84.98	81.53 – 87.88

CI: confidence interval for point estimate adjusted for standard error estimate by controlling for clustering at the district level.

Table 6. Proportion of SDS use at district level

Overall estimate of SDS use = 80.0% (95% CI: 75.4 – 84.1), N = 1100 women	Proportion of SDS use and the corresponding 95% CI stratified by indicators of the Anderson model	
District name	Proportion of SDS use in % (point estimate)	95% CI of the proportion of SDS use (interval estimate)
Awutu Senya East Dist.		
Kasoa Polyclinic	89.71	79.84 – 95.04
Ofaakor Health Center	76.92	46.50 – 92.75
Asikuma Odoben Brakwa		
Odoben Health Center	78.26	56.63 – 90.85
Asikuma Hosp	77.08	67.57 – 84.45
Agona West		
Agona Swedru Govt Hosp	64.58	54.48 - 73.53
Nyakrom Health Center	64.29	36.63 – 84.86
Awutu/ Senya West		
Awutu Bereku Health Center	89.41	80.81 – 94.42
Bontrase Health Center	84.62	53.37 – 96.35
Cape Coast Metro		
Ewim polyclinic	83.33	72.80 – 90.33
Metro hospital	87.50	60.21 – 97.00
Efutu Municipal		
Municipal hospital	78.00	64.31 – 87.46
Winneba Health Center	81.82	59.72 - 93.18
Ekumfi District		
Essueshyia Health Center	90.70	77.47 – 96.51
Otuam Health Center	78.95	54.67 – 92.10
Gomoa West District		
Nogochi Mem. Health Center	85.00	61.63 – 95.24
Apam Hospital	75.81	67.46 – 82.57
Mfantseman		
Saltpond Hospital	82.35	73.66 – 88.62
Biriwa Health Center	85.71	71.42 – 93.51
Twifo Hemang Lower Denkyira Dist.		
Jukwa Health Center	93.33	63.11 – 99.13
Twifo Hemang Health Center	81.58	65.84 – 91.05

CI: confidence interval for point estimate adjusted for standard error estimate by controlling for clustering at the district level.

with the findings of this study. A study conducted in some rural districts of Burkina Faso with similar socio-economic indices (income and education) to Central Region of Ghana reported that 72% of women delivered in health facilities (27). Since similar study designs were employed in both studies, the observed difference may arise as a result of different time periods of the study. Another possible explanation could be differences in culture and the type of settlement in these two countries. In Ghana majority being Christians, in Burkina Faso, majority are Muslims.

Based on the study conducted in Makueni at Kenya, it wasfound that 40% of mothers delivered new babies with the assistance of skilled attendants which contradicts the findings of this study (18). This difference in proportion could be attributed to different populations used in both studies. While Gitmu and colleagues recruited female respondents (15-49 years), who had children less than five years (0-59 months) at the time of the study (18), the present study also sampled women of reproductive age (15-49 years) who have delivered within the past three years prior to the study in the Central Region.

This implies that the last children of the women in the present study were younger than those of the mother in the study by Gitmu and colleagues. In addition, the findings contradictstudies conducted in Bangladesh andKenyawhich found that the level of SDS use were between 20% -54% (17-20). Factors that may account for the observed remarkable discrepancy in the level of SDS use among districts of these countries were religion, occupation and educational level of the pregnant women. Most of the women in these countries were Muslims, protestants, house wives, and unemployed as compared with the present study where most of the women are Christians and engaging in jobs which offer them more than two hundred Ghana cedis a month. A similar point estimate within the ranges of 30-36% was found in studies conducted at Bangladesh, Uganda and India through community based cross-sectional survey among 600-1,700 pregnant women who had ANC visit and delivered one year before the survey (28-30). Although the sample size differs remarkably from the current study, it is important to note that prevalence point estimate from different surveys is independent of sample size on condition that the sample size is representative of the target populations from which the samples were randomly drawn. The preceding explanations also apply to a similar conducted at West Shewa Zone, Oromia, and Ethiopia (30). The author reported thatthe probability of giving birth at health institutions among pregnant women attending ANC in estimated the proportion of women who intended to give birth in a health facility to be 69% (31). Weighted logistic regression analysis from a cross-sectional survey conducted in the Amansie West District of the Ashanti region in Ghana and some selected districts in Nigeria among women of reproductive age, however, reported low proportion of birth attended by skilled personnel (32-33). This difference in SDS use especially between districts in Ghana and Nigeria may be attributed to different time periods of the study, ethnic diversity and socioeconomic imbalance.

Many studies have found inverse relationship between MMR and the proportion of use of SDS among pregnant women and concluded that poor access and utilisation of SDS have undesirable impact on the achievement of the MDG 5 and SDG 3 (15-16;32-34).The SDG 3, set out by the United Nations General Assembly and the international communities, has been the gold standard for which the proportion of SDS use are compared. The SDG 3 has proposed that, by the year 2030, all women (100%) of child bearing age should deliver with the assistance of SBA and MMR will be reduced to less than 70 per 100,000 live birthsfrom 2016 to 2030 (6). Although this is a nationwide expected estimate, it may be prudent to compare regional estimates to the set target to critically assess how the Central Region is contributing to the national target of 100%. The results of this study, 80% intended coverage, showed that the Central Region is 20% point below the set target of 100% and several reasons may have accounted for the observed discrepancy which is the goal of this study. Thus, different population may have different attributes and characteristics and therefore different statistical estimates. Furthermore, data from post-intervention survey of a cluster-randomized community-controlled trial in Bangladesh estimated the proportion of women who had their last delivery by SBAs to be 30.6% (17). Several factors may account for the observed remarkable discrepancy in the level of SBA among districts of these countries especially when the Gross domestic product (GDP) of Bangladesh (developed country) have been estimated to be better over the years compared to Ghana (developing country) (37). A qualitative study conducted in the Eastern region of Ghana found that approximately 61% of pregnant women reported at least one previous health facility delivery which accounts for 8% -point difference from the previous SDS use by pregnant women in Central Region of Ghana (38). Although their study may not be representative of the target population due to its qualitative design, it is paramount to note the disparity and the reasons behind the disparity in future studies. The trend over the period showed significant improvement in the proportion of women intended to use SDS at facility in Central Region and this could be attributed to intense health education and other health interventions on assisted delivery in health facility. This has been a priority area for Ghana Health Service, Ministry of Health and other Government and non-Governmental organizations operating in the Central Region. The 20% of the pregnant women who have no intension to use SDS at health facilities are likely to deliver with the assistance of TBAs or family members at home. These practices are likely to result in maternal and child mortality, morbidity and disabilities.

Conclusion

In conclusion, Central Region (80%) is doing better than the current national coverage of 56% but it is worth emphasizing that more need to be done to achieve the global target of the SDG 3.1 and 3.2.

Strategic vision: Thegovernment through the GHS must implement strategic interventions that will motivate every pregnant woman in the country to use SDS to reduce maternal and child mortality, morbidity and disability. To achieve the SDG 3 target of 100% by 2030, it will be prudent for the government through the GHS to establish more CHPS zones to increase accessibility of SDS by pregnant women in Central Region and the country at large.Birth preparedness plan and the importance of health facility delivery must be emphasised at ANC by service providers. The policy on community-based emergency transport system for maternal health must be revisited by government and strengthened to facilitate easy transportation of all pregnant women during emergency, mostly for those in rural areas.

Human resources: SBAs must be equipped with the needed knowledge and skills to provide house-to-house SDS and identify at risk women for timely referral and intervention as some of the pregnant women still prefer to deliver at home. Healthcare providers must intensify the education about the importance of SDS use mostly at health facilities through the social media. Community health nurses must be motivated to intensify their home visits to encourage pregnant women to deliver at health facilities. Heath care providers must be trained to provide maternal friendly services to encourage all pregnant women to deliver at health facilities. Husbands must be encouraged to accompany their partners to ANC to learn about the health of their pregnant women and that of their unborn babies to support the women to use SDS when in labour. This will motivate the husbands to support and accompany their partners to deliver at health facilities.

Financial resources: The government, donors and all stakeholders must be informed by the MOH/GHS about the need for all women to use SDS and the need to reduce maternal and child mortality.

Adequate financial support must be provided to support the SDS service provision to increase utilization by all pregnant women.

Tracking progress: MOH/GHS must ensure effective monitoring and supervision at the health facilities to ensure quality SDS provision to encourage all pregnant women to deliver at health facilities as expected by the SDGs.

List of abbreviations: ANC: Antenatal care; CHPS: community-based health planning and services; CI: Confidence interval; GDP: **Gross domestic product** ;GHS: Ghana health service; GDHS: Ghana Demographic and Health Survey; GSS: Ghana statistical service; MDG: millennium development goal; MOH: Ministry of Health;MMR: Maternal mortality ratio; NHIS: national health insurance scheme; OR: Odd ratio; SBA: skilled birth attendant;SDG: sustainable development goal; SDS: Skilled Delivery service;TBA: traditional birth attendant; UN: united nations;UNICEF: United Nations International Children's Emergency Fund; WHO: World healthorganization.

Declarations

Ethics approval and consent to participate: Ethical clearance for the study was sought from the University of Cape Coast Ethical Review Board and Ghana Health Service Ethics Review Committee. Approval for the study was sought from the Central Regional Health Directorate and permission was sought from the District Health Directors, Medical Superintendents, and the in-charges of the selected districts, health facilities and ANC clinics respectively. The Ethics committee of the university of cape coast and the Ghana health service did not specify parental or legal guardian consent for the study.

Consent for publication: Not applicable

Availability of data and material: The datasets generated during and/or analysed during the current study are not publicly available due to ethical reasons but are available from the corresponding author on reasonable request.

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Authors' contributions

CA was responsible for the conception, design, data collection, data analysis, interpretation, and write-up and in the preparation of the draft manuscript. PKO was involved in the design, writeupand revision of the paper. All authors read the final manuscript.

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REFERENCES

1. World Health Organisation:*Classifying health workers*. Geneva: WHO.2010.
2. Baral YR, Lyons K, Skinner JVTE: Determinants of skilled birth attendants for delivery in Nepal. *Kathmandu Univ Med*(2010), *8*(31): 325–32.
3. Ronsmans C, Graham WJ: Maternal mortality: who, when, where and when. Lancet 2006; published online Sept 28. DOI:10.1016/ S0140-6736(06)69380-X
4. Koblinsky M, Matthews Z, Hussein J, et al. Going to scale with professional skilled care. Lancet 2006; published online Sept 28. DOI:10.1016/S0140-6736(06)69382-3.
5. United Nations Children's Fund (UNICEF), World Health Organisation (WHO), World Bank, United Nations: Levels & Trends in Child Mortality, Report 2014 Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation, Latin America and the Caribbean.(2014). New York: Author.
6. United Nations: Sustainable Development knowledge platform. International Council for Science and International Social Council. New York, United Nations.2015. New York: Author.
7. Loewe M,Rippin N:*The Sustainable Development Goals of the Post-2015 Agenda: Comments on the OWG and SDSN Proposals*. 2015. Available at SSRN: https://ssrn.com/abstract=2567302.
8. World Health Organisation, UNICEF: Trends in maternal mortality: 1990 to 2013: estimates by WHO, UNICEF, UNFPA, The World Bank and the United Nations Population Division: executive summary.2014. Geneva: Author.
9. Ghana Health Service (GHS). (2015). *Holistic assessment of the health sector programmeme of work 2014Ghana.*Accra: Ministry of Health.
10. Ghana Statistical Service (GSS):*Ghana Health Service: Family Health Division 2015 annual report*. 2016. Accra: Ministry of Health.
11. World Health Organisation:*World Health statistics*. 2015. Geneva: Author
12. Ghana Statistical Service (GSS), Ghana Health Service (GHS), & ICF International:*Ghana Demographic and Health Survey 2014: Key indicators report.*2015. Maryland: Authors.
13. Kunst A, Houweling T: A global picture of poor–rich differences in the utilisation of delivery care; In: De Brouwere V, Van Lerberghe W (Eds) Safe

Motherhood Strategies: A Review of the Evidence. *Stud Health Serv Organ Policy 2001, 17*, 297–315.

14. World Health Organisation:*World Health Assembly closes*. Geneva: World Health Organisation. Accessed Sept 25, 2014 from http://www.who.int/mediacentre/news/releases/2014/WHA-20140524/en/.2014. Geneva: Author.
15. Nzioki JM, Onyango RO, Ombaka JH: Perceived socio-cultural and economic factors influencing maternal and child health: Qualitative insights from Mwingi District, Kenya. *Annals of Community Health*2015, *3*(1), 13-22.
16. Mugo NS, Agho KE, Zwi AB, Dibley MJ: Factors associated with different types of birth attendants for home deliveries: an analysis of the cross-sectional 2010 South Sudan household survey. *Global Health Action* 2016. Matern Child Health J. 2016, *20(6), 1266–79.*
17. Islam N, Islam MT, Yoshimura Y: Practices and determinants of delivery by skilled birth attendants in Bangladesh. *Reproductive Health*2014, *11*(1), 86. https://doi.org/10.1186/1742-4755-11-86.
18. Gitimu A, Herr C, Oruko H, Karijo E, Gichuki R, Ofware P, ... Nyagero J: Determinants of use of skilled birth attendant at delivery in Makueni, Kenya: A cross sectional study. *BMC Pregnancy and Childbirth*2015, *15*(1), 9. doi: 10.1186/s12884-015-0442-2.
19. Kimani H, Farquhar C, Wanzala P, Ng'ang'a Z:Determinants of delivery by skilled birth attendants among pregnant women in Makueni County, Kenya. *Public Health Research*2015, *5*(1), 1-6.
20. Bashar S, Dahlblom K, Stenlund H:*Determinants of the use of skilled birth attendants at delivery by pregnant women in Bangladesh.* Unpublished masters dissertation, Department of Public Health and Clinical Medicine, Epidemiology and Global Health, Umeå International School of Public Health, Umeå University, Sweden.2012.
21. Ghana Statistical Service (GSS), *Ghana Health Service (GHS), and ICF Macro: Ghana Demographic and Health Survey 2008. 2009.* Maryland: Authors.
22. Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607-610.
23. Tavakol M, Dennick R: Making sense of Cronbach's alpha. *International journal of Medical Education*2011, *2*, 53-55.
24. Bosomprah S, Aryeetey GC, Nonvignon J, Adanu RM: A decomposition analysis of change in skilled birth attendants, 2003 to 2008, Ghana demographic and health surveys. *BMC Pregnancy and Childbirth*2014, *14*(1), 415.doi: 10.1186/s12884-014-0415-x.
25. Esena RK,Sappor MM: Factors associated with the utilization of skilled delivery services in the Ga East Municipality of Ghana Part 2: Barriers to skilled delivery. *International Journal of Scientific & Technology Research*2013, *2*(8), 195-207.
26. Sakeah E, Doctor HV, McCloskey L, Bernstein J, Yeboah-Antwi K, Mills S: Using the community-based health planning and services programme to promote skilled delivery in rural Ghana: Socio-demographic factors that influence women utilization of skilled attendants at birth in Northern Ghana. *BMC Public Health*2014, *14*(1), 344. *https://www.ncbi.nlm.nih.gov/pubmed/24721385.*
27. De Allegri M, Ridde V, Louis VR, Sarker M, Tiendrebéogo J, Yé M, . . . Jahn A: Determinants of utilisation of maternal care services after the reduction of user fees: A case study from rural Burkina Faso. *Health Policy*2011, *99*(3), 210-218.
28. Anwar I, Sami M, Akhtar N, Chowdhury M, Salma U, Rahman M, Koblinsky M: Inequity in maternal health-care services: Evidence from home-based skilled-birth-attendant programmemes in Bangladesh. *Bulletin of the World Health Organisation*2008, *86*(4), 252-259.
29. Kabakyenga JK, Östergren PO, Turyakira E, Pettersson KO: Influence of birth preparedness, decision-making on location of birth and assistance by skilled birth attendants among women in south-western Uganda. *PLoS One*2012, *7*(4), e35747.
30. Nair M, Ariana P, Webster P: What influences the decision to undergo institutional delivery by skilled birth attendants? A cohort study in rural Andhra Pradesh, India. *Rural Remote Health*2012, *12*(4), 2311-2311.
31. Dida N, Birhanu Z, Gerbaba M, Tilahun D, Morankar S: Modeling the probability of giving birth at health institutions among pregnant women attending antenatal care in West Shewa Zone, Oromia, Ethiopia: A cross sectional study. *African health sciences*2014, *14*(2), 288-298.
32. Idris SH, Gwarzo UMD, Shehu AU: Determinants of place of delivery among women in a semi-urban settlement in Zaria, northern Nigeria. *Annals of African Medicine*2006, *5*(2), 68-72.
33. Nakua EK, Sevugu JT, Dzomeku VM, Otupiri E, Lipkovich HR, Owusu-Dabo E: Home birth without skilled attendants despite millennium villages project intervention in Ghana: Insight from a survey of women's perceptions of skilled obstetric care. *BMC pregnancy and childbirth*2015, *15*(1), 243. *gov/pubmed/26446145*
34. Wang W, Alva S, Wang S, Fort A: Levels and trends in the use of maternal health services in developing countries. DHS Comparative Reports N0 26. Calverton, Maryland, USA: ICF Macro. 85.2011.
35. Zere E, Tumusiime P, Walker O, Kirigia J, Mwikisa C, Mbeeli T: Inequities in utilization of maternal health interventions in Namibia: Implications for progress towards MDG 5 targets. *International Journal for Equity in Health*2010, *9*(1), 16. doi: 10.1186/1475-9276-9-16.

36. Lewis G: Maternal mortality in the developing world: Why do mothers really die? *Obstetric Medicine*2008, *1*(1), 2-6.
37. Maddison A: A comparison of levels of GDP per capita in developed and developing countries, 1700–1980. *Journal of Economic History*1983, *43*(01), 27-41.
38. Crissman HP, Engmann CE, Adanu RM, Nimako D, Crespo K, Moyer CA: Shifting norms: pregnant women's perspectives on skilled birth attendance and facility–based delivery in rural Ghana. *African journal of reproductive health*2013, *17*(1), 15-26.

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