

# Child Birth Order, Birth Month, and History of Breasts Cancer Inspire Women's Healthcare Services Utilisation in Ghana

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## ABSTRACT

**Background:** Although utilisation of healthcare services is multidimensional in nature. Despite considerable investments in developing and maintaining an extensive network of public health facilities, the utilisation of health services is still far from satisfactory.

**Objective:** In line with this, the study set out to investigate how childbirth order, month of childbirth, and history of breast cancer inspire or hinder the utilisation of healthcare services among women in Ghana, with the aim of informing more tailored and effective health policy and outreach strategies.

**Methods:** Data for the study were extracted from the 2022 GDHS. Data were processed with SPSS version 27. Frequency distribution, Pearson's chi-squared test of independence and binary logistic regression were used to make meaning to the data. The frequency distribution was used to summarise participants' responses into proportions. The Pearson's chi-squared test of independence was used to test the three hypotheses postulated in the study to either accept or reject the three null hypotheses. However, the binary logistic regression was used to determine the influences the explanatory variables exert on women's healthcare services utilisation in Ghana.

**Results:** Breasts examined for cancer was significantly related to healthcare services utilisation. Child birth order was less significant related to healthcare services utilisation.

**Conclusion:** To improve healthcare utilisation among women, especially those with higher childbirth orders or giving birth during low-access periods, the study recommends that health policymakers should implement targeted outreach programs that will consider seasonal and familial contexts.

**Keywords:** Birth Order, Breasts Cancer History, Child Birth Month, Healthcare Services Utilisation, Women

IVs : Independent Variables

SPSS : Statistical Package for the Social Sciences

## Abbreviations

AIDS : Acquired immunodeficiency syndrome

DHS : Demographic and Health Survey

DV : Dependent Variable

ERC : Ethical Review Committee

GDHS : Ghana Demographic and Health Survey

GSS : Ghana Statistical Service

HIV : Human Immunodeficiency Virus

## Introduction

Across the globe, women are cornerstones of the family unit [1,2], primarily responsible for childcare, nutrition, and overall family well-being [3,4]. During their childbearing years, women face many health risks specific to pregnancy and childbirth. Any compromise in women's health during this period of their lives—or exposure to gender-based violence or discrimination might have a detrimental consequence for individual women, their families, communities, and the larger society [6-9].

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Being a man or a woman has a significant impact on health, as a result of both biological and gender-related differences [10,11]. The health of women and girls is of particular concern because, in many societies, they are disadvantaged by discrimination rooted in sociocultural factors. For example, women and girls face increased vulnerability to HIV/AIDS [12-15]. Some of the sociocultural factors that prevent women and girls to benefit from quality health services and attaining the best possible level of health include: unequal power relationships between men and women; social norms that decrease education and paid employment opportunities; an exclusive focus on women's reproductive roles; and potential or actual experience of physical, sexual and emotional violence [13,14]. While poverty is an important barrier to positive health outcomes for both men and women, poverty tends to yield a higher burden on women and girls' health due to, for example, feeding practices (malnutrition) and use of unsafe cooking fuels [13,14,16-18].

Women's healthcare service utilisation refers to how often and in what ways women access and use various healthcare services [19]. This includes services like antenatal care, delivery with a skilled birth attendant, and postnatal care. Factors influencing utilisation can be individual, such as age, education, and income, as well as contextual, like geographical location and access to healthcare facilities [20-22]. Barriers to utilisation can include financial constraints, lack of access to transportation, and cultural norms. The recognition of health problem can be perceived as the "need" for care [23-26]. However, apart from the recognition of health problem, access to health care depends greatly on the availability of high-quality providers in their communities as well as their own knowledge about maintaining their health through routine checkups, screenings, and provider counselling. Social determinants of health, structural racism, and experiences with health care providers shape health outcomes and health equity [23-26].

Although utilisation of healthcare services is multidimensional in nature [27-29]. Despite considerable investments in developing and maintaining an extensive network of public health facilities, the utilisation of health services is still far from satisfactory [30-32]. Healthcare services utilisation demonstrates the type of health care services used by the population, and how often these services are used [31]. It is essential for planning and monitoring of healthcare services [31,33]. The Andersen healthcare utilisation model demonstrates that people's use of health services (including inpatient care, physician visits, dental care etc.) is a function of their predisposition to use services, factors which enable or impede use, and their need for care [34,35].

In Ghana, women's access to and utilisation of healthcare services remains a public health priority, particularly in the context of maternal health and preventive care [36-38]. Despite improvements in healthcare infrastructure and awareness campaigns, significant gaps persist in how and when women engage with health services [36,39]. Several studies in Ghana have explored how socio-demographic and reproductive factors—such as birth order, childbirth month, and history of breast cancer—impact women's healthcare service utilisation. While some factors have been well-documented, others remain underexplored, leading to discrepancies in healthcare access

and outcomes [40-45]. Among the studies are: Amo-Adjei and Anamaale [40] looked at how socio-demographic factors such as birth order affect the timing and frequency of antenatal care visits; Zegeye, Ahinkorah, Idriss-Wheeler and Yaya [41] explored seasonal (month-related) variation in the use of maternal healthcare services; Atuahene, Guure and Atuahene [42] studied the predictors of breast cancer screening, including education and employment status, and reports low screening rates; Addai [43] examined how reproductive factors link with maternal health service utilisation in rural Ghana; Ganle and Dery [44] analysed how socio-cultural barriers intersect with reproductive roles (e.g., birth order) and health service use; Aboagye et al. [45] also provided an updated national data on breast cancer screening and identifies disparities in screening uptake.

Per the aims of the studies above, it is clear that none has consistently examined socio-demographic and reproductive factors—especially birth order, birth month, and personal or family history of breast cancer—as an integrated determinants of healthcare behaviour. Therefore, without a clear understanding of these influences, public health interventions may fail to effectively target women who are most likely to underutilise essential health services. In line with this, the study set out to investigate how childbirth order, month of childbirth, and history of breast cancer inspire or hinder the utilisation of healthcare services among women in Ghana, with the aim of informing more tailored and effective health policy and outreach strategies.

Specifically, the study seeks to:

1. analyse if childbirth order inspires healthcare services utilisation among women in Ghana;
2. examine whether month of childbirth inspires healthcare services utilisation among women in Ghana; and
3. ascertain if history of breast cancer inspires healthcare services utilisation among women in Ghana.

The study further hypothesised that there is no statistically significant relationship between childbirth order, month of childbirth as well as history of breast cancer and healthcare services utilisation among women in Ghana.

## Methods

### Data Source

Data for the study were extracted from the 2022 GDHS. The Measure DHS Program made the data available through the link <https://dhsprogram.com/data>. The data extracted for the study revolved the following variables (child birth month, birth order number, breasts examined for cancer, and visited health facility last 12 months). The GDHS data were preferred because its nationally representative; focuses on child and maternal health and is designed to provide adequate data to monitor the population and health situation in Ghana [46].

## Measures

### Independent Variables

In the study, the independent variables (IVs) are child birth order, birth month, and history of breasts cancer. These variables were carefully chosen to ascertain how they interplay to influence women's healthcare services utilisation in Ghana. Further, the variables were chosen because the literature review indicated

that currently, there is a lack of integrated research in Ghana that examines the interrelationship between child birth order, birth month, history of breasts cancer, and women's healthcare services utilisation in Ghana [40-45].

### Dependent Variable

The dependent variable (DV) in the study is healthcare services utilisation. This variable was carefully chosen to test the influences of the IVs on it in order to ascertain the women that are underserved for a policy recommendation. This was based on self-reports from the individuals surveyed.

### Data Processing and Analysis

Data were processed with SPSS version 27 and analysed with frequency distribution, Pearson's chi-squared test of independence and binary logistic regression. The frequency distribution was used to summarise participants' responses into proportions. The Pearson's chi-squared test of independence was used to test the three hypotheses postulated in the study to either accept or reject the three null hypotheses. However, the binary logistic regression was used to determine the influences the explanatory variables exert on women's healthcare services utilisation in Ghana.

### Results

To identify the proportion of women who use healthcare services in Ghana instigated data extraction on a single item (visited health facility last 12 months) used by the 2022 GDHS for analysis. After the analysis, the results revealed that 19920(57.5%) of women visited health facility in the last 12 months prior to the study while 14743(42.5%) did not.

To unravel the birth order number of children instigated data extraction on child birth order number for analysis. After the analysis, the results revealed that 29.9% of the children were

first born while 0.0% of the children were either 12<sup>th</sup> or 13<sup>th</sup> born (see Table 2).

**Table 1: Child Birth Order in Ghana**

Variable	Frequency	Percentage
Birth order number		
1	10356	29.9
2	7991	23.1
3	6040	17.4
4	4273	12.3
5	2743	7.9
6	1627	4.7
7	891	2.6
8	427	1.2
9	203	0.6
10	73	0.2
11	25	0.1
12	10	0.0
13	4	0.0
<b>Total</b>	<b>34663</b>	<b>100.0</b>

Source: GDHS (2022).

In Table 2, has outcome of Pearson's chi-square test of independence on child birth order number and women's healthcare services utilisation in Ghana. The analysis was necessary hence, it tested the hypothesis there is no statistically significant relationship between child birth order number and women's healthcare services utilisation in Ghana. Statistically significant relationship was found between child birth order number [ $\chi^2=109.771$ ,  $p<0.001$ ] and women's healthcare services utilisation in Ghana.

**Table 2: Relationship Between Child Birth Order and Women's Healthcare Services Utilisation In Ghana**

Variable	No (%)	Yes (%)	Total n (%)	$\chi^2$	P-value
Birth order number				109.771	<0.001
1	40.0	60.0	10356(100.0)		
2	41.1	58.9	7991(100.0)		
3	42.9	57.1	6040(100.0)		
4	44.2	55.8	4273(100.0)		
5	45.4	54.6	2743(100.0)		
6	46.7	53.3	1627(100.0)		
7	48.7	51.3	891(100.0)		
8	50.8	49.2	427(100.0)		
9	56.7	43.3	203(100.0)		
10	57.5	42.5	73(100.0)		
11	48.0	52.0	25(100.0)		
12	60.0	40.0	10(100.0)		
13	50.0	50.0	4(100.0)		

Note: Row percentages in parenthesis, Chi-square significant at (0.001), (0.05), (0.10)

No: did not use      Yes: use

Source: GDHS (2022).

Further analysis was conducted with binary logistic regression on child birth order number and women's healthcare services utilization in Ghana. This analysis was conducted to ascertain the effect of child birth order number on women's healthcare services utilization in Ghana. The results are presented in Table 3.

**Table 3: Binary Logistic Regression Results on Child Birth Order and Women's Healthcare Services Utilisation in Ghana**

Variable	B	Wald	Sig.	Exp(B)	95CI	
<b>Birth order number (1=1.0)</b>						
2	-0.043	1.973	0.160	0.958	0.903	1.017
3	-0.120	13.271	0.000	0.887	0.832	0.946
4	-0.169	21.133	0.000	0.845	0.786	0.908
5	-0.220	25.865	0.000	0.802	0.737	0.873
6	-0.269	25.277	0.000	0.764	0.688	0.848
7	-0.352	25.311	0.000	0.703	0.613	0.807
8	-0.436	19.488	0.000	0.646	0.533	0.785
9	-0.671	22.018	0.000	0.511	0.386	0.676
10	-0.707	8.859	0.003	0.493	0.309	0.785
11	-0.324	0.652	0.420	0.724	0.330	1.587
12	-0.809	1.570	0.210	0.445	0.126	1.579
13	-0.404	0.163	0.687	0.668	0.094	4.743
<b>Constant</b>	<b>0.404</b>	<b>405.040</b>	<b>0.000</b>	<b>1.497</b>		

Source: GDHS (2022). Significant at 0.05.

After processing the data, the logistic regression model was significant at  $-2\text{LogL} = 47167.881$ ; Nagelkerke  $R^2$  of 0.004;  $\chi^2 = 109.143$ ;  $p < 0.001$  with correct prediction rate of 57.6%. Significantly, the Model Summary which shows a Nagelkerke  $R^2$  of 0.004 suggests that the model explains 0.4% of variance in the likelihood of women's healthcare services utilisation in Ghana. With this percentage contribution to the entire model, the results confirmed the whole model significantly predict women's healthcare services utilisation in Ghana.

Table 3 revealed that women with third born children was statistically significant related to healthcare services utilisation at  $p < 0.001$ , (OR=0.887, 95%CI ([0.832-0.946])). This factor labels those women to have 0.9times less likely to use healthcare services compared with their counterparts with first born children (see Table 4). Further, women with fourth born children was statistically significant to healthcare services utilisation at  $p < 0.001$ , (OR=0.845, 95%CI ([0.786-0.908])). This variable tag those women to have 0.8times less likely to use healthcare services compared with their counterparts with first born children (see Table 3). Furthermore, women with fifth born children was statistically significant related to healthcare services utilisation at  $p < 0.001$ , (OR=0.802, 95%CI ([0.737-0.873])). This factor tags those women to have 0.8times less likely to use healthcare services compared with their counterparts with first born children (see Table 3). Additionally, women with sixth born children was statistically significant to healthcare services utilisation at  $p < 0.001$ , (OR=0.764, 95%CI ([0.688-0.848])). This variable tag those women to have 0.8times less likely to use healthcare services compared with their counterparts with first born children (see Table 3).

Added to above, women with seventh born children was statistically significant related to healthcare services utilisation

at  $p < 0.001$ , (OR=0.703, 95%CI ([0.613-0.807])). This factor labels those women to have 0.7times less likely to use healthcare services compared with their counterparts with first born children (see Table 3). Moreover, women with eighth born children was statistically significant to healthcare services utilisation at  $p < 0.001$ , (OR=0.646, 95%CI ([0.533-0.785])). This variable tag those women to have 0.6times less likely to use healthcare services compared with their counterparts with first born children (see Table 3).

Again, women with ninth born children was statistically significant related to healthcare services utilisation at  $p < 0.001$ , (OR=0.511, 95%CI ([0.386-0.676])). This factor labels those women to have 0.5times less likely to use healthcare services compared with their counterparts with first born children (see Table 3). Then, women with tenth born children was statistically significant to healthcare services utilisation at  $p < 0.001$ , (OR=0.493, 95%CI ([0.309-0.785])). This variable tag those women to have 0.5times less likely to use healthcare services compared with their counterparts with first born children (see Table 3). However, the rest of the birth order numbers were not significant which could be as a result of chance.

To analyse research objective one which is "to ascertain if child birth month influence women to utilise healthcare services in Ghana" triggered data extraction on child birth month for analysis. After the analysis, the results revealed that 9.2% of the children were either born on the month of April or May while 7.1% were born on the month of December (see Table 4).



**Table 4: Child Birth Month in Ghana**

Variable	Frequency	Percentage
Month of birth		
January	2599	7.5
February	2574	7.4
March	3000	8.7
April	3197	9.2
May	3193	9.2
June	3154	9.1
July	3155	9.1
August	2628	7.6
September	2963	8.5
October	3140	9.1
November	2600	7.5
December	2460	7.1
<b>Total</b>	<b>34663</b>	<b>100.0</b>

Source: GDHS (2022).

To unearth the proportion of women who have breasts cancer history instigated data extraction on a single item (breasts examined for cancer by health care provider) use by 2022 GDHS for analysis. After the analysis, the results revealed that 28948(83.5%) of women had not examined their breasts for cancer while 5715(16.5%) had examined their breasts for cancer. Table 5 has the outcome of Pearson's chi-square test of independence on history of breasts cancer and women's healthcare services utilisation in Ghana. This analysis was conducted to test the hypothesis there is no statistically significant relationship between breasts examined for cancer and women's healthcare services utilisation in Ghana. Statistically significant relationship was found between breasts examined for cancer [ $\chi^2=319.728$ ,  $p<0.001$ ] and women's healthcare services utilisation.

**Table 5: Relationship Between History of Breasts Cancer and Women's Healthcare Services Utilisation in Ghana.**

Variable	No (%)	Yes (%)	Total n (%)	$\chi^2$	P-value
Breasts examined for cancer				319.728	<0.001
No	44.6	55.4	28948(100.0)		
Yes	31.8	68.2	5715(100.0)		

Note: Row percentages in parenthesis, Chi-square significant at (0.001), (0.05), (0.10)

No: did not use Yes: use

Source: GDHS (2022).

Further analysis was conducted with binary logistic regression on breasts examined for cancer and women's healthcare services utilisation. This analysis was conducted to ascertain the influence breasts examined for cancer has on women's healthcare services utilisation. The results are presented in Table 6.

**Table 6: Binary Logistic Regression on History of Breasts Cancer and Women's Healthcare Services Utilisation**

Variable	B	Wald	Sig.	Exp(B)	95CI
Breasts examined for cancer (No=1.0)					
Yes	0.546	314.814	0.000	1.726	1.625 1.833
Constant	0.215	331.124	0.000	1.240	

Source: GDHS (2022).

After processing the data, the logistic regression model was significant at  $-2\text{LogL} = 46949.196$ ; Nagelkerke  $R^2$  of 0.013;  $\chi^2 = 327.828$ ;  $p<0.001$  with correct prediction rate of 57.6%. Significantly, the Model Summary which shows a Nagelkerke  $R^2$  of 0.013 suggests that the model explains 1.3% of variance in the likelihood of women's healthcare services utilisation in Ghana. With this percentage contribution to the entire model, the results confirmed the whole model significantly predict women's healthcare services utilisation in Ghana.

Table 6 revealed that breasts examined for cancer was statistically significant related to healthcare services utilisation at  $p<0.001$ , (OR=1.726, 95%CI ([1.625-1.833])). This factor labels those women to have 1.7times more likely to use healthcare services compared with their counterparts who had not examined their breasts for cancer (see Table 6).

## Discussion

This study aimed to investigate the influence of childbirth order, birth month, and history of breast cancer on women's healthcare services utilisation in Ghana. The findings revealed that breasts examined for cancer increased the likelihood of healthcare services utilisation. This outcome aligns with a previous study which found a statistically significant association between awareness of breasts cancer (BC) signs and symptoms and the use of BC screening services [47]. This finding suggests a greater awareness of their health needs and a proactive approach to preventative care, potentially leading to more frequent visits to healthcare professionals and a greater willingness to participate in other screenings or follow-up treatments [48]. The plausible explanation to this finding could be that these screenings serve as a form of proactive healthcare among the women which invariably empower them to be more health-conscious and engage with the healthcare system regularly [49,50].

The study found that child birth order tends to lead to lower odds of healthcare services utilisation among women in Ghana. This finding agrees with previous studies which found that women are 15% less likely to use maternal healthcare services at higher birth orders [51-53]. The authors further asserted that the odds for use of both the maternal health care services decreased with increasing birth order. On the contrary, the study disagrees with previous studies which found that first-born children are more likely to consume medical drugs and to utilise inpatient and outpatient medical services [54,55]. This finding suggests women with higher birth orders may not be more likely to use healthcare services during pregnancy or childbirth compared to women with lower birth orders [51,53]. The plausible

explanation to this finding could be that these women have an increased self-confidence from past experience which invariably led to less perceived need for professional help, and resource constraints due to caring for multiple children. Additionally, negative past experiences with healthcare facilities could also prevent women from seeking healthcare services [53].

The study found that relationship exists between history of breasts cancer and women's healthcare services utilisation. Therefore, the null hypothesis was ignored. A p-value of  $<0.001$  found is an indication of strong relation. This outcome corroborated with a previous study which found that a positive family breast cancer history was associated with an increased likelihood of being up-to-date for mammography screening [56]. The relationship explains that both the explanatory variable and the outcome variable are not independent of each other.

It emerged that relationship exists between child birth order and women's healthcare services utilisation in Ghana due to this, the null hypothesis was not confirmed. This outcome was consistent with a previous study which found that birth order was significantly associated with maternal health seeking behaviour of women, especially antenatal care and delivery service [52]. This suggests that both variables depend on each other.

The study found that only 16.5% of the women had their breasts examined for cancer. This outcome agrees with previous studies by Apaw, Mnyanga, Asiedu and Teye [57]; Okyere, Ayebeng and Dickson [58]; Anaba et al. [59]; Wuur, Duodu and Tarkang [60] all in Ghana which found that only 16.5%; 18.39%; 18.4%; 51.9% respectively of women 15-49 years had their breasts examined by a healthcare provider. This outcome implies that these proportion of women have a higher level of awareness and action towards early detection of breast cancer. Further, it could also indicate that these proportion of women prioritise their health and understand the importance of regular screenings [61,62]. However, the 83.5% of the women who had not examined their breasts for cancer is an indication that a potential gap exists in breast cancer screening practices and that there is a need to increase awareness and education about breast cancer screening [63,64]. This finding is in line with previous studies which found that majority of women had never practiced any form of breast cancer screening [65,66].

The study found that 29.9% of the children were first born. This was consistent with a previous study which found that the birth order distribution was as follows: 29.9% firstborn, 26.7% second, 16.2% third, 10.1% fourth and 17.0% with fifth or later birth order [67]. The authors further postulated that most studies suggest that first-born children are more likely to be immunised than children with later birth orders. This outcome implies that the child is the eldest in their family and that considered as the third parent of the family [68,69].

The study found that 9.2% of the children were either born in the month of April or May. This finding corroborated with Darrow et al.'s [70] study which found that the overall seasonal pattern of birth was characterised by a peak in August-September and troughs in April-May and November-January. However, 7.1% were born in the month of December. This suggests a specific percentage of individuals are born in December [71-73].

## Conclusion

The investigation of influence of childbirth order, month of childbirth, and history of breast cancer on healthcare services utilisation among women in Ghana reveals that these factors significantly affect when and how women seek medical attention. Higher birth order often correlates with reduced healthcare visit, possibly due to increased caregiving responsibilities or desensitisation to maternal health needs. Seasonal trends tied to the month of childbirth may reflect sociocultural practises or economic cycles that either facilitate or hinder access to services. A history of breast cancer consistently increases healthcare utilisation, indicating heightened health awareness and perceived need. Therefore, to improve healthcare utilisation among women, especially those with higher childbirth orders or giving birth during low-access periods, the study recommends that health policymakers should implement targeted outreach programs that will consider seasonal and familial contexts. Additionally, integrating breast cancer awareness and screening into maternal health services can leverage existing contact points to encourage ongoing healthcare engagement. Tailored interventions—such as mobile clinics during underutilised months or support programs for multiparous women—can enhance equity in healthcare access and outcomes.

## Limitations of the Study

The current study, while valuable, has limitations. Hence, the 2022 GDHS datasets were used. This 2022 GDHS survey was conducted cross-sectionally therefore, it cannot establish causal relationships between variables. Again, it also relies on self-reported data, which can be subjected to recall or social desirability bias. Additionally, while the survey provides national estimates, regional disparities may not be captured with the same precision, and the data may not be representative of all sub-groups within the Ghanaian population. Hence, the results should be interpreted with caution.

## Ethics Approval and Consent to Participate

The GDHS Program obtained ethical approval from both The Ghana Health Service's Ethics Review Committee (ERC) and The ICF The Institutional Review Board (IRB) for ethical review. This dual approval process assure that the survey adheres to ethical guidelines and protects the rights of participants.

## Consent for publication: Not Applicable

## Availability of Data and Materials

The datasets used is the 2022 GDHS data. Therefore, it is publicly available online at <https://dhsprogram.com/data>. This is Measure DHS Initiative or Program.

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## Author's Contributions

Anthony Edward Boakye is the sole author of the Manuscript

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