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## Factors influencing the early initiation of breastfeeding in public primary health care facilities in Northeast Nigeria: A mixed methods study

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Complete List of Authors:	Shobo, Olukolade; Society for Family Health Umar, Nasir; London School of Hygiene and Tropical Medicine Faculty of Infectious and Tropical Diseases, Disease Control Gana, Ahmed; Gombe State Primary Health Care Development Agency Longtoe, Peter; Society for Family Health Idogho, Omokhudu; Society for Family Health Anyanti, Jennifer; Society for Family Health
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## Factors influencing the early initiation of breastfeeding in public primary health care facilities in Northeast Nigeria: A mixed methods study

### Corresponding Author:

1. Olukolade George Shobo (Society for Family Health, 8 Port Harcourt Crescent, Area 11, Garki, Abuja. Email: [shoboolukolade@gmail.com](mailto:shoboolukolade@gmail.com))

### Coauthors:

2. Nasir Umar (London School of Hygiene and Tropical Medicine, London. Email: [nasir.umar@lshtm.ac.uk](mailto:nasir.umar@lshtm.ac.uk))
3. Gana Ahmed (Gombe State Primary Health Care Development Agency. Gombe State. Email: [ahmedgana567@yahoo.com](mailto:ahmedgana567@yahoo.com))
4. Longtoe Peter (Society for Family Health, 8 Port Harcourt Crescent, Area 11, Garki, Abuja. Email: [plongtoe.com](mailto:plongtoe.com))
5. Omokhudu Idogho (Society for Family Health, 8 Port Harcourt Crescent, Area 11, Garki, Abuja. Email: [oidogho@sfnigeria.org](mailto:oidogho@sfnigeria.org))
6. Jennifer Anyanti (Society for Family Health, 8 Port Harcourt Crescent, Area 11, Garki, Abuja. Email: [janyanti@sfnigeria.org](mailto:janyanti@sfnigeria.org))

### ABSTRACT

#### Introduction

The early initiation of breastfeeding is a high-impact intervention that gives newborns the best chance of survival. We assess the barriers and facilitators influencing the practice of early breastfeeding of newborns in public primary healthcare facilities (PHCs) in Northeast Nigeria, to influence health investment decisions in the region.

#### Method

We used a mixed methods approach, combining quantitative and qualitative study designs. We conducted case-observation of childbirths and interviewed mothers and birth attendants one hour after childbirth. The analysis for the quantitative arm was done with SPSS version 23. For the qualitative arm, we transcribed the audio files, coded the texts, and categorized them using thematic analysis.

#### Result

Thirty-nine percent of mothers did not breastfeed their newborns within one hour of birth in our study. Some themes that describe the barriers to early breastfeeding in public PHCs are: birth attendants' unwillingness or inability to accommodate mothers' safe traditional practices, ineffective rooming-in practices, and a lack of privacy and proper visiting-hour policy in public

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3 PHCs. Under one theme, we find that pregnant women denied safe traditional birth practices  
4 during delivery are five times more likely not to breastfeed newborns within the first hour of birth  
5 (RR=4.5, 95% CI=1.2-17.1) compared to pregnant women allowed these practices.  
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7

## 8 **Conclusion**

9  
10 Close to four of every 10 newborns in public PHCs in Northeast Nigeria do not breastfed in the  
11 first hour of birth. This doubles their risk of death in the first 28 days. Stakeholders must increase  
12 their focus on the breastfeeding practices in the public PHCs. This will improve the survival of  
13 newborns and impact of their investments.  
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## 18 **STRENGTHS AND LIMITATIONS OF THE STUDY**

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20
- 21 • We used a mixed methods study design to provide a richer understanding of the factors that  
22 affect newborn breastfeeding practice in public PHCs in resource poor settings.  
23
  - 24 • We used purposive sampling techniques, focusing on information-rich public PHCs. This  
25 improved the chances of observing a high number of childbirths, and identifying typical  
26 implementation issues associated with the study aim, during the study period.  
27
  - 28 • Our study findings are not causal  
29
  - 30 • The study findings do not generalize to secondary and tertiary health facilities.  
31
  - 32 • The study involved public PHCs in a resource poor setting and the findings have limited  
33 generalizability to PHCs located in places not similar to our study setting.  
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## 40 **INTRODUCTION**

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42 Every year about 77 million (50%) newborns do not get breastfed in the first hour of birth  
43 globally<sup>1</sup>. This leaves them vulnerable to diseases and death<sup>1-3</sup>. Newborn deaths continues to  
44 account for close to half of all under-5 mortalities across the world<sup>4</sup>. The early initiation of  
45 breastfeeding which means breastfeeding a newborn within one hour of birth<sup>5</sup>, is a high-impact  
46 intervention<sup>4,6,7</sup> that gives newborns the best chance of survival<sup>8</sup>. It also provides them long-term  
47 health benefits<sup>9,10</sup>. The Northeast region of Nigeria has one of the highest newborn mortalities in  
48 the world<sup>11-13</sup>. The early initiation of breastfeeding will reduce the risk of these newborn deaths  
49 by about a third<sup>14,15</sup>.  
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3 The practice of early breastfeeding of newborns differs between and within countries<sup>16,17</sup>. For  
4 instance, it ranges between 17% to 95% for countries in sub-Saharan Africa <sup>18,19</sup>. In Nigeria, only  
5 about 35% of newborns get breastfed within the first hour after birth <sup>20,21</sup>. In the Northeast region  
6 of the country, only about 40% of mothers commence the breastfeeding of newborns in the first  
7 hour after childbirth<sup>21</sup>. In Gombe State, the estimate is 49%<sup>22</sup>. In the rural areas of the country,  
8 mothers are more likely not to practice it at all<sup>20</sup>. The mothers' age, level of education, and  
9 socioeconomic status are factors that influence the pattern of early initiation of breastfeeding in  
10 the general population. Others are maternal and newborn health problems, childbirth method,  
11 family support, availability of supplements, and maternal preference<sup>21,23–25</sup>.

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19 To improve early breastfeeding and avert newborn deaths, one approach is for more births to  
20 occur in health facilities<sup>14,26–28</sup>. Having a birth in a health facility improves the chance that a  
21 newborn will breastfeed early<sup>21</sup>. Evidence however suggests that poor birthing practices occur in  
22 health facilities which can disrupt the early start of breastfeeding<sup>17,29–31</sup>. While international  
23 recommendations for improving breastfeeding practices in health facilities exist<sup>32</sup>, the problems  
24 faced by health facilities around the practice context specific<sup>33,34</sup>. Researches focusing on  
25 exploring and understanding these specific birthing practices in health facilities are now  
26 emerging<sup>18,29</sup>.

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33 The Northeast region of Nigeria is witnessing an increase in health investments by governments  
34 and non-governmental organizations<sup>35–38</sup>; aimed at reducing maternal and newborn deaths  
35 through improved access to quality childbirth and newborn care services in primary health care  
36 hospitals (PHCs)<sup>35,36</sup>. In Gombe State in Northeast Nigeria for instance, the government is  
37 implementing a Village Health Worker program that improves access to quality obstetric and  
38 newborn care services in public PHCs, through community-based demand generation activities.  
39 Primary health care facilities are better positioned to deliver high-impact newborn interventions  
40 in Nigeria. They make up 88% of health facilities in the country. In the Northeast, there are 5086  
41 public PHCs, and they make up 87% of the health facilities in the region<sup>39,40</sup>. Understanding the  
42 factors that influence the quality and uptake of life-saving newborn care services in these public  
43 PHCs is important for improving the effectiveness of the health investments in the region.

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52 In this study, we assess the barriers and facilitators influencing early breastfeeding of newborns  
53 in public PHCs in Northeast Nigeria. Most studies assessing breastfeeding practice in health  
54 facilities have used secondary data from demographic health surveys<sup>21,24,25,41</sup>. Recall bias and lack  
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of disaggregation between secondary and public health facilities limits the use of their findings<sup>42</sup>. A recent quantitative study in Bangladesh shows that about 43% of mothers in PHCs in the country do not breastfeed their newborns within one hour of birth. It did not assess the contextual implementation issues that influence the practice<sup>31</sup>. The literature around the practice in PHCs in Africa is also lacking. Our approach uses a broader study design that helps to develop a deeper understanding of early breastfeeding practices in public PHCs in Northeast Nigeria<sup>43,44</sup>. We believe our findings will contribute to the discussions about health investments and strategies for improving newborn care in the region, and settings similar to it.

## METHOD

### Study Design

We use a mixed methods approach for this study. Mixed methods combine quantitative and qualitative study designs to deepen how we understand a research phenomenon<sup>45,46</sup>. In this study, we use the approach to better understand the factors that influence the early initiation of breastfeeding in public PHCs<sup>45</sup>. We conducted the quantitative arm over four weeks in December 2017, and the qualitative arm over one week in November 2018.

### Study Setting

The study is set in Gombe State, located in the center of Northeast Nigeria on latitude 9°30' and 12°30'N, Longitude 8°5' and 11°45'E. It borders Borno, Yobe, Adamawa, Taraba, and Bauchi States. It has 11 Local Government Areas (LGAs) and 114 political wards<sup>47</sup>. There are 603 health facilities across the 11 LGAs in the State, 530 of which are public PHCs<sup>40</sup>. Of the 530 public PHCs in the State, 114 are designated as priority PHCs. The majority (34%) of staff in the PHCs have no medical training<sup>48</sup>. The picture of maternal and newborn health care in the state is comparable to other high mortality settings in sub-Saharan Africa<sup>48</sup>.

### PHC Selection

*Quantitative arm:* We selected 10 of the 114 priority PHCs using purposive sampling technique. The 10 had the most deliveries per day on the average, thus suited to provide rich information on our study objective. The budget for the study dictated the number of health facilities chosen.

*Qualitative arm:* We selected three of the 10 priority PHC in the quantitative arm of the study. The three had the most deliveries per day on the average. The intensity of the childbirths in the

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3 three PHCs and over the study period, will illuminate the barriers and facilitators of early initiation  
4 of breastfeeding in public PHCs in the region<sup>49</sup>.

### 5 6 7 **Subject Selection**

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9 We included all mothers who delivered in the selected PHCs and gave their consent to take part  
10 in the study in both arms of the study. For the qualitative arm: we also recruited all consenting  
11 healthcare providers who attended deliveries; and the mothers with a live birth for interviews.  
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### 14 15 **Instrument and data collection**

16  
17 *Quantitative arm:* Trained nurses and nurse-midwives completed the assessment tool. They  
18 observed and documented the time of events from when a pregnant woman in labor entered the  
19 health facility to when she leaves after childbirth or referral. During data collection, they only  
20 observed and did not take part or comment in the care offered to the pregnant woman. We only  
21 told them to intervene or offer help during a life-threatening situation to the mother and/or baby.  
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25 The health facility staff and pregnant women knew of the nurse and nurse-midwives but were  
26 unaware of what was being observed. Data on the cadre of the health worker, events during the  
27 first to third stage of labor, and newborn care activities in the first hour after birth were collected.  
28  
29 The nurses and nurse-midwives were available for 24hours in each of the health facilities  
30 throughout the study period on a shift schedule. They observed all deliveries.  
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33  
34 *Qualitative arm:* The data collection procedure for the qualitative arm is like that of the  
35 quantitative arm. The difference is that observation started for each pregnant woman during the  
36 second stage of labor and ended one hour after childbirth. The assessment tool used for  
37 observation is an extract from the tool used for the quantitative arm. A short interview of the  
38 health workers and the mothers occurred one hour after childbirth. We designed the interview  
39 questions to be straight to the point with a few follow-up questions around why breastfeeding  
40 started or did not. We kept the questions short keeping in mind the workload of the attending  
41 health worker and the fatigue of the mother because of labor.  
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### 50 **Analysis**

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52 *Quantitative arm:* We analyzed the data using SPSS version 23. We present nominal variables as  
53 percentages. We also determined associations and relative risks between initiation of  
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breastfeeding and predictor categorical variables using two-by-two contingency tables. To assess significant associations, we used Fisher's or Pearson's Chi-Squared test as appropriate

*Qualitative arm:* We transcribed the interviews from their audio files and analyzed the data with Saturate, an online qualitative software. Two people on the team analyzed a subset of the data and generated codes using a grounded theory approach. The two people then came together to review and agree on the codes generated and their meaning, eliminating less useful codes. We then analyzed the rest of the dataset using the agreed code-framework. We generated themes from the codes using an inductive approach. To analyze the respondent's profile, we used SPSS version 23.

### Patient and Public Involvement Statement

Resources for PPI was unavailable, so we could not involve patients. The development and dissemination of a policy brief of the study findings will involve patients.

## RESULT

### Respondents' Profile

Observation of 393 mothers occurred for the quantitative arm and 27 for the qualitative arm. We also interviewed all 27 mothers and 16 health workers one hour after childbirth under the qualitative arm. The childbirths were through spontaneous vaginal delivery.

Table 1. Respondents' profile

Study participant	Quantitative arm % n=393	Qualitative arms % n=27
<i>Age</i>		
<15	0	3
15 - 24	53	63
25 - 34	36	30
35+	11	4
<i>Gestational age in weeks</i>		
Mean	41 (SD=12)	38(SD=0.6)
Mode	38	38
Median	38	38
<i>Parity</i>		
Nulliparous	80	67



Multiparous		
<i>Attendant health worker during labor and delivery</i>		
nurse/midwife	4	0
junior community health extension worker	36	28
community health extension worker	18	15
environmental health assistant/technician/officer	28	19
hospital assistant	10	19
others (specify)	4	19
<i>Health attendant's sex</i>		
male	1	0
female	99	100
<i>Initiated breastfeeding within the first hour after birth</i>		
no	39	37
yes	61	63

Most (54%) of the women observed under the quantitative arm of the study were between 15 and 24 years old. Their mean gestational age was 41 weeks (SD=12). The commonest gestational age was 38 weeks. Only 4% of the women had a nurse or midwife attend to them during the second and third stage of labor. Junior Community Health Extension Workers (JCHEWs) attended the majority (36%) of the deliveries. Environmental health workers and hospital assistants attended close to two-fifths of the deliveries. Thirty-nine percent of the mothers did not breastfeed in the first hour after delivery.

Most (63%) of the women observed under the qualitative arm of the study were between 15 and 24 years old. Their mean gestational age was 38 weeks (SD=0.6). Junior Community Health Extension Workers attended the majority (28%) of the deliveries. Environmental health workers and hospital assistants attended close to two-fifths of the deliveries. Thirty-seven percent of the mothers did not breastfeed in the first hour after delivery (Table 1).

### **Knowledge of time to initiate breastfeeding**

The qualitative arm shows that health workers know when mothers should breastfeed newborns. They attributed their knowledge to on-the-job training sessions on newborn care had with visiting clinical-mentors. They believe their knowledge is sustained via peer-to-peer discussions while on the job and during staff meetings. One Junior Community Health Extension Worker (JCHEW) said:

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2  
3 *“breast feeding should commence immediately after birth ...we have clinical mentors that visit and*  
4 *remind us of these things. We also have staff meetings where we remind ourselves of these*  
5 *practices” (birth attendant 1)*  
6  
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8  
9 The word “immediately” is more used by junior health workers to describe when breastfeeding  
10 should start. The experienced health workers are more specific. breastfeeding should start. They  
11 also link the time breastfeeding should start with its benefits. The quote below is a typical  
12 response from a Senior CHEW when she was asked when breastfeeding should start.  
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16 *“It is very important because it helps the child to suck the yellowish nutrient in the breast milk. It*  
17 *boosts the child’s immunity. It also helps the mother’s uterus to shrink and close ...helping to stop*  
18 *bleeding. It should start by 30min to 1hour after delivery” (birth attendant 2).*  
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## 21 22 **Barriers to early breastfeeding**

### 23 24 ***Birth attendants’ unwillingness or inability to accommodate mothers’ safe traditional practices***

25  
26 The quantitative study shows that pregnant women denied safe traditional birth practices during  
27 the second and third stages of labor are five times more likely not to breastfeed within the first  
28 hour (RR=4.5, 95% CI=1.2-17.1) compared to pregnant women allowed these practices. Not being  
29 attended to by a skilled birth attendant (RR=1.2; 95% CI=0.9-1.5), experiencing delays in receiving  
30 care (RR=0.7, 95% CI=0.5-1.03), not having birth attendants communicate with the pregnant  
31 woman (RR=0.7; 95% CI=0.3-1.8), being attended to by a staff with poor attitude (RR=0.7; 95%  
32 CI=0.4-1.1), or not being allowed to give birth in a preferred position (RR=0.9; 95% CI=0.7-1.2) did  
33 not influence breastfeeding in the first hour after birth (Table 2).  
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41 Table 2: Association between early breastfeeding and predictor variables in the study

Variable	Response	Women who didn't initiate breastfeeding within 1hr after birth		
		% n=154	Relative risk 95% CI	p value
birth attendant had received training on newborn care	No	49	1.2 (0.9-1.5)	0.2
	Yes	51		
there were delays in providing care	No	90	0.7 (0.5-1.03)	0.2
	Yes	10		
Communication was easy and frequent between woman and birth attendant	No	2	0.7 (0.3-1.8)	0.5
	Yes	98		

Poor staff attitude	No	96	0.7 (0.4-1.1)	0.2
	Yes	4		
woman denied some safe traditional childbirth practices*	No	99	4.5 (1.2-17.1)	0.003***
	Yes	1		
birth attendant determined the birth position	No	41	1 (0.8-1.3)	1
	Yes	59		
woman was allowed to give birth in the position she preferred**	No	37	0.9 (0.7-1.2)	0.5
	Yes	63		
the labor room was clean and comfortable	No	18	0.98 (0.7-1.4)	0.9
	Yes	82		

\*n=154, \*\*n=150, \*\*\*Fishers  $X^2$

When mother's state of health after childbirth isn't an issue, a typical response given by some mothers for not breastfeeding in the first hour was the need to first wash the breast or have a bath to feel clean.

*"he (the baby) has to exercise patience until we get home (before he is breastfed). I can't breastfeed him before I take my bath" (mother 1)*

The quantitative study suggests that the mother's need to be clean may not be influenced by the cleanliness of the environment. Initiating breastfeeding is not related to the cleanliness and comfort provided by the delivery room. Mothers who had their babies when the labor room was clean and comfortable were just as likely not to initiate breastfeeding early as those who had their babies when the labor room wasn't (RR=0.98; 95% CI 0.7-1.4; p=0.9).

#### **Poor management of mothers' post-delivery state of health**

Post-delivery pains and fatigue are barriers to breastfeeding within the first hour after birth. Even when mothers show a good knowledge of when breastfeeding should start, some still express the need to regain strength and wellness first before they breastfeed the newborn.

*"breastfeeding should commence immediately after birth... I did not commence it because I was feeling after pains. The health worker said she will bring the baby to suck. I told her to allow me to have some relief" ZA (mother 2)*

The quantitative study shows that pregnant women not encouraged to consume fluids or food at least once during labor are twice as likely not to breastfeed within the first hour compared with

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2  
3 those encouraged to do so (RR=2.1; 95% CI=1.5-3; p=0.001). There is no evidence from the study  
4 that blood loss greater than 500mls during labor and delivery influence early breastfeeding (p=1).  
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### 7 **Manpower shortages**

8  
9 The qualitative study shows that shortage of health workers in PHCs introduces a delay in carrying  
10 out newborn care activities. Sometimes, health workers have to attend to other ill patients when  
11 there is no one else to assist. When we asked some health workers why a mother under their care  
12 did not breastfeed early, a typical response given was:  
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17 *““You see, if you have someone that will assist you, you will assign the person to carry the baby to*  
18 *the mother and initiate the breastfeeding, or weigh the child, or apply chlorhexidine to the baby’s*  
19 *cord or any other thing needed while you continue with the remaining work and management of*  
20 *others ...but most of the time you are on duty alone. It is because we have shortage of manpower*  
21 *here in this facility” (birth attendant 3)*  
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26 The manpower shortage also affects rooming-in in the PHCs. Placing the mother and newborn in  
27 the same room after delivery is rooming-in<sup>50</sup>. Sometimes, the health worker has to clean and  
28 make this room ready for the mother and newborn. When there is a shortage of staff, this delays  
29 the transfer of the mother and newborn to the rooming-in room, and affects early breastfeeding.  
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34 *“I wanted to transfer the mother and baby to the postnatal ward first before she commences*  
35 *breastfeeding. The room is not set. I have to clean and make the room so she is comfortable to*  
36 *commence breastfeeding” (birth attendant 4)*  
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### 40 **Ineffective rooming-in practices**

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42 When rooming-in happens, the quantitative study reveals that mothers who do not have skin-to  
43 skin contact with their newborns in the first hour after birth are twice as likely not to breastfeed  
44 early, compared to mothers who did (RR=2.3, 95% CI=1.8-2.8; p<0.001). While the qualitative  
45 study shows that delay in rooming-in also delays early breastfeeding, the quantitative study  
46 further reveals that just keeping the mother and newborn in the same room (rooming-in) without  
47 skin-to-skin contact has no influence on early breastfeeding (RR=2.6; 95% CI=2.3-2.9; p=0.059).  
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### 52 **Lack of privacy and proper visiting-hour policy in the PHCs**

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3 The PHCs have open rooming-in rooms that doesn't guarantee privacy. There are also no defined  
4 visiting hours in the PHCs. The qualitative arm of the study shows that male and female relatives  
5 visit the new mother in the hospital after childbirth. During the visit, the relatives pray for the  
6 newborn baby and congratulate the mother. Some relatives sit around after prayers for long.  
7  
8 When relatives come visiting, the mothers have to dress up to receive them and do not breastfeed  
9 during this time. The birth attendants also delay supporting the mother to breastfeed. One birth  
10 attendant suggested that addressing the issue puts them in bad light in the community.  
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15 *"you know, the people in the community have a unique character or attitude. The moment you try*  
16 *to talk to them about this kind of issue they feel you are molesting them or depriving them of*  
17 *coming close to their relatives. They do not know you are trying to ensure their relative (mother*  
18 *and baby) gets what is beneficial to them"* (birth attendant 5).  
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## 22 23 **Facilitators of early breastfeeding**

### 24 25 ***Health education during ANC and post-delivery period***

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27 From the qualitative study, we find that Antenatal Clinics (ANC) helps pregnant women to learn  
28 about breastfeeding newborns within one hour of birth. The knowledge they gain during these  
29 clinics influences their behavior after childbirth. Most mothers who practiced early breastfeeding  
30 said what they learned from ANC influenced their decision to do so. The typical response they  
31 gave is:  
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37 *"I used to give my children water (after childbirth). I did not know the importance of breastfeeding*  
38 *early. I used to think breast feeding could start at any time of the day (of birth). I started*  
39 *breastfeeding early because the health workers tell us (of the importance of starting breastfeeding*  
40 *immediately after birth) during ANC"* (mother 3)  
41  
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### 44 45 ***Encouraging and supporting mothers to start breastfeeding after childbirth***

46 From the qualitative study, we find that when the birth attendants encourage some reluctant  
47 mothers to breastfeed their newborns within one hour of childbirth; they do.  
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50 *"I was told (by the health worker) to give. Normally, I won't"* (mother 4)  
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3 The encouragement process takes the form of a negotiation between the birth attendant and the  
4 mother. We find that the information passed by the birth attendants to the mothers around the  
5 benefits of early breastfeeding, facilitate early breastfeeding in the PHCs.  
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9 *"I commenced breastfeeding early because of what the health worker said ...she explained how it*  
10 *is important to the health of my baby. That's why I commenced it" (mother 5)*  
11

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13 Sometimes, showing the mothers how to place and breastfeed the newborns also facilitates early  
14 breastfeeding after childbirth in these health facilities.  
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## 16 17 **DISCUSSION**

18  
19 In our study setting, we find that close to four out of every 10 newborns do not get breastfed  
20 within the first hour of birth. This doubles their risk of dying in the first 28 days of their lives<sup>10,15</sup>.  
21 Our estimate is four percentage points lower than what researcher observed in PHCs in Asia<sup>31</sup>. It  
22 is also higher than what others have estimated amongst mothers who had spontaneous vaginal  
23 deliveries (SVD) in some secondary health facilities; and lower than what others have estimated  
24 amongst mothers who had SVD in some tertiary health facilities, even in Nigeria<sup>31,51,52</sup>. The mixed  
25 results emphasize the influence of context on the early breastfeeding of newborns in different  
26 health facilities. It underscores the need for unique interventions to address the problem.  
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30 The northeast region of Nigeria has a shortage of skilled health workers. The Boko-Haram  
31 insurgency has made this worse<sup>53-55</sup>. It is also worsened by staff absenteeism in PHCs in the region.  
32 Only about 35% of employed staff in PHCs in Gombe are likely to be at work on any given day, for  
33 example<sup>22</sup>. Studies suggest that a shortage of manpower and a dominant population of unskilled  
34 health care workers affects the quality of newborn care in health facilities<sup>17,56-58</sup>. This is not overall  
35 consistent with our study findings. We find that unskilled health workers are dominant in our  
36 study setting. Also, we find that shortage of manpower is a barrier to early initiation of  
37 breastfeeding in the PHCs. We did not find that the skills of the birth attendants influenced the  
38 early breastfeeding of newborns. This may be because clinical mentors have trained the birth  
39 attendants in our study on newborn care. Educational interventions around support for the  
40 breastfeeding of newborns has been found to improve health workers' knowledge, attitude, and  
41 compliance with the practice<sup>59,60</sup>.  
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55 In our study, we find that the mothers denied safe traditional birth practices during deliveries  
56 were five times more likely not to breastfeed the newborns than the mothers not denied. This  
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3 supports the findings from other settings that shows that the unwillingness of birth attendants to  
4 accommodate safe traditional birth practices affects mothers' adoption of supportive care<sup>57,61,62</sup>.  
5 This may be because mothers perceive denial of such traditional practices as mistreatment or  
6 abuse<sup>57,63</sup>. The recent abuse of women affects their breastfeeding behavior<sup>64</sup>. Although in our  
7 study, we found no evidence to support this. Instead we find that birth attendants' attitude,  
8 rapport skills, and negligence during the delivery period doesn't affect early breastfeeding  
9 practice amongst mothers. The discrepancy in findings may be because the women in our study  
10 setting perceive or tolerate abuse differently than women in other settings<sup>65</sup>.  
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17 Washing of the breast with water after childbirth is a hygiene related practiced in parts of the  
18 world<sup>66</sup>. In our study, mothers express a strong need to wash the breast and/or have a bath before  
19 breastfeeding newborns. This makes the "need for a bath after childbirth" a major theme for why  
20 mothers delay breastfeeding newborns in our study setting. Some health workers also agree that  
21 mothers should wash their breasts first before breastfeeding newborns after childbirth<sup>18</sup>. Their  
22 inability to help the mothers to wash their breasts or have a bath before breastfeeding may be  
23 because there is no running water in the health facility. Only 38% of priority PHCs in Gombe have  
24 running water<sup>22</sup>. The need to wash the breast may be deeper than the need for hygiene,  
25 nonetheless. Washing of the breast or having a bath after childbirth before breastfeeding  
26 newborns has traditional and/or religious undertones in other parts of the world<sup>58,67</sup>.  
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35 The other barriers that influence early breastfeeding of newborn in PHCs that our study finds are  
36 the poor state of mothers' health, delay in skin to skin contact during rooming-in, and poor visiting  
37 hour policy in the PHC. These findings reinforces what other studies have reported<sup>5,21,24,33,41,52,58</sup>.  
38 We suggest however that the poor state of mothers' health is because of post-delivery fatigue in  
39 our study setting. The post-delivery fatigue may be because the mother is famished. The  
40 quantitative arm of our study shows that mothers not encouraged to take fluids or eat during the  
41 second and third stages of labor are more likely not to breastfeed early after childbirth. There is  
42 no evidence from our study that the fatigue may be due to blood loss. We also find that rooming-  
43 in is not enough and that skin to skin contact must be deliberate. Mothers that did not have skin  
44 to skin contact with their newborns while in the rooming-in room were more likely not to  
45 breastfeed than those who did in our study. Our study reemphasizes that the lack of restrictions  
46 on relatives visiting the mothers in the post-delivery period impedes breastfeeding<sup>68</sup>. This could  
47 be because the mothers don't feel comfortable breastfeeding in front of male relatives or visitors.  
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3 Helping mothers to breastfeed within an hour of birth is an international recommendation  
4 practiced by health care providers in most of the world<sup>32,69</sup>. We find that birth attendants in our  
5 study setting practice this and the strategy facilitates the early breastfeeding of newborns in  
6 public PHCs. This may be because there is an awareness of the recommendation<sup>70</sup>. Our study also  
7 reinforces findings from previous studies on the benefits of health education on the timely  
8 breastfeeding of newborns<sup>71,72</sup>. We find that health education received by mothers during ANC  
9 and the post-delivery period improves the practice of early initiation of breastfeeding in public  
10 PHCs, in our study setting

## 17 **CONCLUSION**

19 There is a 40% chance that babies born in public PHCs in Northeast Nigeria will not breastfed in  
20 the first hour of birth. This means they'll miss important nutrition that saves lives. The  
21 stakeholders in the region must increase their focus on the breastfeeding practices in the public  
22 PHCs. This will improve the survival of newborns and impact of their investments. Instituting  
23 policies that protect mothers' privacy; and finding innovative ways to accommodate and promote  
24 safe traditional practices in the intrapartum and postpartum period in PHCs will improve the early  
25 breastfeeding of newborns in these PHCs. The cadre of birth attendants does not matter once  
26 trained on newborn care, although manpower shortage is a problem. The birth attendants must  
27 be trained on effective rooming-in to further improve early breastfeeding of newborns in these  
28 public PHCs, however.

## 37 **LIST OF ABBREVIATIONS**

39 PHC (Primary Health Care hospital/facility), ANC (Antenatal Care) VHW (Village Health Workers)

## 42 **DECLARATIONS**

### 44 **Ethics approval and consent to participate**

46 The Gombe State Ministry of Health Ethics Committee granted ethical approval for the qualitative  
47 arm of the study (reference no: MOH/ADM/658/VOL.II/104). Mothers and birth attendants also  
48 gave their consent to take part in the study before the interviews. The IDEAS team at the London  
49 School of Hygiene and Tropical Medicine (LSHTM) got ethical approval for the quantitative arm of  
50 the study from LSHTM (reference 6088).

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2  
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6 by SFH.  
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### 13 **Data Availability**

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16 Data for the quantitative arm of the study is in a secured database at the London School of  
17 Hygiene and Tropical Medicine. Write to Nasir Umar through [nasir.umar@lshtm.ac.uk](mailto:nasir.umar@lshtm.ac.uk) to place a  
18 reasonable request for the anonymized version of it. Also, write to Shobo Olukolade, through  
19 [shoboolukolade@gmail.com](mailto:shoboolukolade@gmail.com) to ask for the anonymized transcripts of the qualitative data.  
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### 26 **Competing interest**

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28  
29 OGS and PL are consultants working for Society for Family Health (SFH), OI and JA are full-time  
30 staff of SFH. GA is the Former Executive Secretary of Gombe State Primary Health Care  
31 Development Agency. SFH's program in Northeast Nigeria seeks to improve MNCH outcomes in  
32 the general population.  
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### 39 **Author Contribution**

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42 OGS conceived of the study and developed the original draft of the manuscript. OGS analyzed the  
43 quantitative data. OGS and PL analyzed the qualitative data. NU, GA, JA, and OI reviewed, edited,  
44 and made significant contributions to the development of the final manuscript. All authors read  
45 and approved the final manuscript.  
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## Factors influencing the early initiation of breastfeeding in public primary health care facilities in Northeast Nigeria: A mixed methods study

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## Factors influencing the early initiation of breastfeeding in public primary health care facilities in Northeast Nigeria: A mixed methods study

### Corresponding Author:

1. Olukolade George Shobo (Society for Family Health, 8 Port Harcourt Crescent, Area 11, Garki, Abuja. Email: [shoboolukolade@gmail.com](mailto:shoboolukolade@gmail.com))

### Coauthors:

2. Nasir Umar (London School of Hygiene and Tropical Medicine, London. Email: [nasir.umar@lshtm.ac.uk](mailto:nasir.umar@lshtm.ac.uk))
3. Gana Ahmed (Gombe State Primary Health Care Development Agency. Gombe State. Email: [ahmedgana567@yahoo.com](mailto:ahmedgana567@yahoo.com))
4. Peter Longtoe (Society for Family Health, 8 Port Harcourt Crescent, Area 11, Garki, Abuja. Email: [plongtoe.com](mailto:plongtoe.com))
5. Omokhodu Idogho (Society for Family Health, 8 Port Harcourt Crescent, Area 11, Garki, Abuja. Email: [oidogho@sfnigeria.org](mailto:oidogho@sfnigeria.org))
6. Jennifer Anyanti (Society for Family Health, 8 Port Harcourt Crescent, Area 11, Garki, Abuja. Email: [janyanti@sfnigeria.org](mailto:janyanti@sfnigeria.org))

### ABSTRACT

#### Introduction

The early initiation of breastfeeding is a high-impact intervention that gives newborns a better chance of survival. We assess the barriers and facilitators influencing the practice of early breastfeeding of newborns in public primary healthcare facilities (PHCs) in Northeast Nigeria, to influence the planning of programs targeted at improving newborn care in the region.

#### Method

We used an explanatory mixed methods approach. We conducted case-observation of childbirths and newborn care for the quantitative arm, and interviewed mothers and birth attendants one hour after childbirth for the qualitative arm. The analysis for the quantitative arm was done with SPSS version 23. For the qualitative arm, we transcribed the audio files, coded the texts, and categorized them using thematic analysis.

#### Result

We observed 393 and 27 mothers for the quantitative and qualitative arms of the study respectively. The quantitative arm shows that 39% of mothers did not breastfeed their newborns within one hour of birth. The qualitative arm shows that 37% of mothers did not breastfeed within one hour of birth. Themes that describe the barriers to early breastfeeding in public PHCs are:

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3 birth attendants' unwillingness or inability to accommodate mothers' safe traditional practices,  
4 ineffective rooming-in practices, staff shortages, lack of privacy in the lying-in ward, and poor  
5 implementation of visiting-hour policy in public PHCs. The pregnant women denied safe  
6 traditional birth practices like chanting, praying, or reading religious books during delivery are five  
7 times more likely not to breastfeed newborns within the first hour of birth (RR=4.5, 95% CI=1.2-  
8 17.1) compared to pregnant women allowed these practices.  
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### 13 **Conclusion**

14  
15 Stakeholders must increase their focus on improving the breastfeeding practices in the public  
16 PHCs. Instituting policies that protect mothers' privacy; and finding innovative ways to  
17 accommodate and promote safe traditional practices in the intrapartum and postpartum period  
18 in PHCs will improve the early breastfeeding of newborns in these PHCs.  
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### 23 **STRENGTHS AND LIMITATIONS OF THE STUDY**

- 24 • We used a mixed methods study design to provide a richer understanding of the factors that  
25 affect newborn breastfeeding practice in public PHCs in resource poor settings.
  - 26 • We used purposive sampling techniques, focusing on information-rich public PHCs. This  
27 improved the chances of observing a high number of childbirths, and identifying typical  
28 implementation issues associated with the study aim, during the study period.
  - 29 • Our study findings are not causal.
  - 30 • The study findings may not generalize to secondary and tertiary health facilities, nor to PHCs  
31 located in places not similar to our study setting.
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### 43 **INTRODUCTION**

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45 Every year, about 77 million (50%) newborns do not get breastfed in the first hour of birth  
46 globally<sup>1</sup>. This leaves them vulnerable to diseases and death<sup>1-3</sup>. Newborn deaths continue to  
47 account for close to half of all under-5 mortalities across the world<sup>4</sup>. The early initiation of  
48 breastfeeding which means breastfeeding a newborn within one hour of birth<sup>5</sup>, is a high-impact  
49 intervention<sup>4,6,7</sup> that gives newborns a better chance of survival<sup>8</sup>. It also provides them long-term  
50 health benefits<sup>9,10</sup>. The Northeast region of Nigeria has one of the highest newborn mortalities in  
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3 the world<sup>11–13</sup>. The early initiation of breastfeeding will reduce the risk of these newborn deaths  
4 by about a third<sup>14,15</sup>.

6  
7 The practice of early breastfeeding of newborns differs between and within countries<sup>16,17</sup>. For  
8 instance, it ranges between 17% to 95% for countries in sub-Saharan Africa <sup>18,19</sup>. In Nigeria, only  
9 about 35% of newborns get breastfed within the first hour after birth <sup>20,21</sup>. In the Northeast region  
10 of the country, only about 40% of mothers commence the breastfeeding of newborns in the first  
11 hour after childbirth<sup>21</sup>. In Gombe State, the estimate is 49%<sup>22</sup>. In the rural areas of the country,  
12 mothers are more likely not to practice it at all<sup>20</sup>. The mothers' age, level of education, and  
13 socioeconomic status are factors that influence the pattern of early initiation of breastfeeding in  
14 the general population. Others are maternal and newborn health problems, childbirth method,  
15 family support, availability of supplements, and maternal preference<sup>21,23–25</sup>.

16  
17 To improve early breastfeeding and avert newborn deaths, one approach is for more births to  
18 occur in health facilities<sup>14,26–28</sup>. Having a birth in a health facility improves the chance that a  
19 newborn will breastfeed early<sup>21</sup>. Evidence however suggests that poor birthing practices occur in  
20 health facilities which can disrupt the early start of breastfeeding<sup>17,29–31</sup>. While international  
21 recommendations for improving breastfeeding practices in health facilities exist<sup>32</sup>, the problems  
22 faced by health facilities around the practice are context specific<sup>33,34</sup>, requiring unique responses.  
23 Researches focusing on exploring and understanding these specific birthing practices in health  
24 facilities are now emerging<sup>18,29</sup>.

25  
26 The Northeast region of Nigeria is witnessing an increase in health investments by governments  
27 and non-governmental organizations<sup>35–38</sup>; aimed at reducing maternal and newborn deaths  
28 through improved access to quality childbirth and newborn care services in primary health care  
29 hospitals (PHCs)<sup>35,36</sup>. In Gombe State in Northeast Nigeria for instance, the government is  
30 implementing a Village Health Worker program that improves access to quality obstetric and  
31 newborn care services in public PHCs, through community-based demand generation activities.  
32 Primary health care facilities are better positioned to deliver high-impact newborn interventions  
33 in Nigeria. They make up 88% of health facilities in the country. In the Northeast, there are 5,086  
34 public PHCs, and they make up 87% of the health facilities in the region<sup>39,40</sup>. Understanding the  
35 factors that influence the quality and uptake of life-saving newborn care services in these public  
36 PHCs is important for improving the effectiveness of the health investments in the region.

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3 In this study, we assess the barriers and facilitators influencing early breastfeeding of newborns  
4 in public PHCs in Northeast Nigeria. Most studies assessing breastfeeding practice in health  
5 facilities have used secondary data from demographic health surveys<sup>21,24,25,41</sup>. While maternal  
6 recall is valid and reliable in establishing the period of initiation of breastfeeding<sup>42</sup>, the DHS  
7 findings do not provide context concerning supply side factors that influenced the maternal  
8 behavior. A recent quantitative study in Bangladesh shows that about 43% of mothers in PHCs in  
9 the country do not breastfeed their newborns within one hour of birth. It did not assess the  
10 contextual implementation issues that influence the practice<sup>31</sup>. The literature around the  
11 contextual issues affecting the practice in PHCs in Africa is also lacking. Our approach uses a  
12 broader study design that helps to develop a deeper understanding of early breastfeeding  
13 practices in public PHCs in Northeast Nigeria<sup>43,44</sup>. We believe our findings will contribute to the  
14 discussions about health investments and strategies for improving newborn care in the region,  
15 and settings similar to it.  
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## 25 **METHOD**

### 26 **Study Design**

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28 We used an explanatory mixed methods approach for this study. Mixed methods study designs  
29 deepen how we understand a research phenomenon<sup>45,46</sup>. In the explanatory mixed method type,  
30 a first phase quantitative data collection and analysis is followed by the collection of qualitative  
31 data, to explain the quantitative result<sup>45</sup>. The mixed-method approach helps us better understand  
32 the factors that influence the early initiation of breastfeeding in public PHCs<sup>45</sup>. We conducted the  
33 quantitative arm over four weeks in December 2017, and the qualitative arm over one week in  
34 November 2018. Budget constraints delayed implementing the qualitative arm. We assume that  
35 the time difference between the study arms is not sufficient to change the practice around  
36 breastfeeding newborns in the study setting.  
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### 46 **Study Setting**

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48 We conducted the study in Gombe State, in the center of Northeast Nigeria on latitude 9° 30' and  
49 12° 30'N, Longitude 8° 5' and 11° 45'E. It borders Borno, Yobe, Adamawa, Taraba, and Bauchi  
50 State. It has 11 Local Government Areas (LGAs) and 114 political wards<sup>47</sup>. There are 603 health  
51 facilities across the 11 LGAs in the State, 530 of which are public PHCs<sup>40</sup>. Of the 530 public PHCs  
52 in the State, the government has designated 114 as priority PHCs. These 114 are Ward Health  
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Centers and provide basic emergency obstetric and newborn care services. Nurses, community health workers, community health extension workers (CHEWs), junior CHEWs, and environmental health officers are the main staff of PHCs in Nigeria<sup>48</sup>. Community Health Officer, a Public Health Nurse, three CHEWs, four Nurse/Midwives and one medical Assistant are the main staff of a Ward Health Center<sup>49</sup>.

Fifty percent of these priority PHCs have staff trained in providing basic emergency obstetric and newborn care services. About 36% of them have labor rooms and lying-in wards. None has a medical doctor, 4% have at least one nurse, and 19% have at least one midwife. Each PHC has an average of six health workers not categorized as skilled in attending labor and delivery. These include Community Health Extension Workers (CHEWs), environmental health technicians, hospital assistants (cleaners), and students. The majority (34%) of the staff in these PHCs have no medical training<sup>50</sup>. Fewer than half of pregnant women in the State access pregnancy care at least four times as recommended, and only about a third access facility based intra-partum care and/or skilled attendance at birth<sup>50</sup>. Cesarean sections are not conducted in PHCs in the study setting.

### **PHC Selection**

*Quantitative arm:* We selected 10 of the 114 priority PHCs using purposive sampling technique. The 10 had the most deliveries per day on the average in the six-month period prior to starting the study, thus suited to provide rich information on our study objective. They also had labor wards and lying-in wards. The budget for the study dictated the number of health facilities chosen.

*Qualitative arm:* We selected three of the 10 priority PHC in the quantitative arm of the study. The three had the most deliveries per day on the average. They also had labor wards and lying-in wards. The intensity of the childbirths in the three PHCs and over the study period, will illuminate the barriers and facilitators of early initiation of breastfeeding in public PHCs in the region<sup>51</sup>.

### **Subject Selection**

We included all mothers who delivered in the selected PHCs and gave their consent to take part in the study in both arms of the study. For the qualitative arm: we also recruited all consenting healthcare providers who attended deliveries; and the mothers with a live birth for interviews.

### **Instrument and data collection**



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3 *Quantitative arm:* We recruited and trained nurses and nurse-midwives who are not a part of the  
4 health facility staff to complete the assessment tool. They observed and documented the time of  
5 events from when a pregnant woman in labor entered the health facility to when she leaves after  
6 childbirth or referral. During data collection, they only observed and did not take part or comment  
7 in the care offered to the pregnant woman. We only told them to intervene or offer help during  
8 a life-threatening situation to the mother and/or baby. The data collectors used separate  
9 assessment tools in cases of twin deliveries.  
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15 The health facility staff and pregnant women knew of the nurse and nurse-midwives but were  
16 unaware of what aspect of care was being observed. Data on the cadre of the health worker,  
17 events during the first to third stage of labor, and newborn care activities in the first hour after  
18 birth were collected. The nurses and nurse-midwives were available for 24hours in each of the  
19 health facilities throughout the study period on a shift schedule. They observed all deliveries.  
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24 *Qualitative arm:* We also recruited and trained female nurses and midwives who are not part of  
25 the health facility staff to observe and complete the assessment tool under this arm of the study.  
26 Observation for each pregnant woman started during the second stage of labor and ended one  
27 hour after childbirth under this arm of the study. The data collector then interviewed the mother  
28 and attendant health worker, after the observation period. The assessment tool used for the  
29 observation is an extract from the tool used for the quantitative arm. For the mothers and birth  
30 attendants we asked questions around how they felt about the childbirth process and knowledge  
31 of when newborn babies should breastfeed during the interview. We also asked the mothers why  
32 they chose to or not to breastfeed their newborns within the hour depending on if they did or  
33 not. Also, we asked the attending healthcare workers why they think breastfeeding occurred or  
34 did not occur within the first hour for each newborn. We also asked the attending healthcare  
35 workers about the strategies they used to encourage mothers to breastfeed their newborns  
36 within the hour. The data collectors attended every birth in the health facilities and interviewed  
37 respondents who could not speak or understand English in Hausa. They interviewed the mother  
38 and attending healthcare worker separately. The mothers' interviews occurred at their bedside in  
39 the lying-in ward. The data collectors excused relatives or visitors in the lying-in room during  
40 interviews.  
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### 53 **Analysis**

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3 *Quantitative arm:* We analyzed the data using SPSS version 23. We present nominal variables as  
4 percentages. We also determined associations and relative risks between initiation of  
5 breastfeeding and predictor categorical variables using two-by-two contingency tables. To assess  
6 significant associations, we used Fisher's or Pearson's Chi-Squared test as appropriate  
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10 *Qualitative arm:* We transcribed the interviews from their audio files and analyzed the data with  
11 Saturate, an online qualitative software. Two people on the team analyzed a subset of the data  
12 and generated codes. The two people then came together to review and agree on the codes  
13 generated and their meaning, eliminating less useful codes. The two reviewers held regular face-  
14 to-face meetings to discuss their codes. We then analyzed the rest of the dataset using the agreed  
15 code-framework developed by the two. We generated themes from the codes using an inductive  
16 approach.  
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### 23 **Patient and Public Involvement Statement**

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25 Resources for patient and public involvement statement was unavailable, so we could not involve  
26 patients. The development and dissemination of a policy brief of the study findings will involve  
27 patients.  
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## 31 **RESULT**

### 32 **Respondents' Profile**

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34 All pregnant women recruited under the two arms of the study consented to be observed. Under  
35 the quantitative arm, we observed 393 pregnant women. Most (54%) were between 15 and 24  
36 years old with a median age of 23 years. A quarter were below the age of 20, half below the age  
37 of 23, and three quarters below the age of 30. The childbirths were through spontaneous vaginal  
38 delivery. Twin delivery occurred in only six (1.5%) cases. Also, 39% of the new mothers did not  
39 breastfeed their newborns in the first hour after delivery. Thirty-three health workers attended  
40 the deliveries under this arm of the study. The number of deliveries attended by each health  
41 worker ranged from one to thirty-seven, with an average of 12 (S.D: 10) deliveries each and a  
42 median of eight during the observation period. At least two health workers attended about 61%  
43 of the 393 deliveries. Also, Junior Community Health Extension Workers (JCHEWs) attended the  
44 majority (36%) of the 393 deliveries (Table 1).  
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55 Table 1. Pregnant women's profile  
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	Quantitative arm % n=393	Qualitative arms % n=27
<i>Age</i>		
<15	0	3
15 - 24	53	63
25 - 34	36	30
35+	11	4
<i>Gestational age in weeks</i>		
Mean	41 (SD=12)	38(SD=0.6)
Mode	38	38
Median	38	38
<i>Parity</i>		
Nulliparous (first pregnancy above 28wks gestational age (GA))	20	33
Multiparous (more than first pregnancy above 28wk GA)	80	67
<i>Initiated breastfeeding within the first hour after birth</i>		
no	39	37
yes	61	63
<i>Health worker who attended pregnant woman's labor and delivery</i>		
nurse/midwife	4	0
junior community health extension worker	36	28
community health extension worker	18	15
environmental health assistant/technician/officer	28	19
hospital assistant	10	19
nutritionists/dieticians/students	4	19
<i>Sex of health worker that attended pregnant woman's labor and delivery</i>		
male	1	0
female	99	100

Under the qualitative arm, 27 pregnant women were delivered of their babies by 16 health workers. The pregnant women consented to be observed and interviewed. The 16 health workers also consented to be interviewed after the observation. Most (63%) of the pregnant women were between 15 and 24 years old, with a median age of 22 years. A quarter were below 20 years of age and a quarter above 30 years of age. None had a twin delivery. Also, 37% of the mothers did not breastfeed the newborn within one hour of birth under this arm of the study. We also

interviewed all 27 mothers and 16 health workers one hour after childbirth. Of the 16 health care workers interviewed under the qualitative arm, most (63%) were hospital assistants. About a third (33%) were Community Health Extension Workers (CHEWS), 17% (2) were students, 6% (1) were nutritionist, and 6% (1) environmental health technician. Of the 27 deliveries under this arm of the study, in 44% of cases, the attending health care worker was assisted by another health worker (Table 1).

### Knowledge of time to initiate breastfeeding

The qualitative arm shows that health workers know when mothers should breastfeed newborns. Ninety-two percent of them responded that breastfeeding should start between zero to sixty minutes (Table 2).

Table 2. Health workers' response to when breastfeeding should start.

Attending health care workers interviewed under qualitative arm	Frequency	Percent (n=16)
<b>Response to when breastfeeding should start</b>		
Immediately after delivery	9	54
<b>10 - 30 minutes after delivery</b>	2	13
<b>30 - 60 minutes after delivery</b>	1	8
<b>0 - 60 minutes after delivery</b>	3	17
<b>0 - 24 hours after delivery</b>	1	8

They attributed their knowledge to on-the-job training sessions on newborn care had with visiting clinical-mentors. They believe their knowledge is sustained via peer-to-peer discussions while on the job and during staff meetings. One Junior Community Health Extension Worker (JCHEW) said:

*“breast feeding should commence immediately after birth ...we have clinical mentors that visit and remind us of these things. We also have staff meetings where we remind ourselves of these practices” (birth attendant 1)*

The word “immediately” is more used by lower cadre health workers to describe when breastfeeding should start. The CHEWs are more specific about when breastfeeding should start. They also link the time breastfeeding should start with its benefits. The quote below is a typical response from a Senior CHEW when she was asked when breastfeeding should start.

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2  
3 "It is very important because it helps the child to suck the yellowish nutrient in the breast milk. It  
4 boosts the child's immunity. It also helps the mother's uterus to shrink and close ...helping to stop  
5 bleeding. It should start by 30min to 1hour after delivery" (birth attendant 2).  
6  
7

### 8 9 **Barriers to early breastfeeding**

#### 10 11 ***Birth attendants' unwillingness or inability to accommodate mothers' safe traditional practices***

12  
13 The quantitative study shows that pregnant women denied safe traditional birth practices such  
14 as praying or reading religious texts during the second and third stages of labor are five times  
15 more likely not to breastfeed within the first hour (RR=4.5, 95% CI=1.2-17.1) compared to  
16 pregnant women allowed these practices (Table 3).  
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21 Table 3: Association between early breastfeeding and predictor variables in the study

Variable	Response	Women who didn't initiate breastfeeding within 1hr after birth		
		% n=154	Relative risk 95% CI	p value
birth attendant had received training on newborn care	No	49	1.2 (0.9-1.5)	0.2
	Yes	51		
there were delays in providing care	No	90	0.7 (0.5-1.03)	0.2
	Yes	10		
Communication was easy and frequent between woman and birth attendant	No	2	0.7 (0.3-1.8)	0.5
	Yes	98		
Poor staff attitude	No	96	0.7 (0.4-1.1)	0.2
	Yes	4		
woman denied some safe traditional childbirth practices*	No	99	4.5 (1.2-17.1)	0.003***
	Yes	1		
birth attendant determined the birth position	No	41	1 (0.8-1.3)	1
	Yes	59		
woman was allowed to give birth in the position she preferred**	No	37	0.9 (0.7-1.2)	0.5
	Yes	63		
the labor room was clean and comfortable	No	18	0.98 (0.7-1.4)	0.9
	Yes	82		

51 \*n=154, \*\*n=150, \*\*\*Fishers X<sup>2</sup>

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3 When mother's state of health after childbirth isn't an issue, a typical response given by some  
4 mothers for not breastfeeding in the first hour was the need to first wash the breast or have a  
5 bath to feel clean.  
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8  
9 *"he (the baby) has to exercise patience until we get home (before he is breastfed). I can't*  
10 *breastfeed him before I take my bath"* (mother 1)  
11

12  
13 The quantitative study suggests that the mother's need to be clean may not be influenced by the  
14 cleanliness of the environment. Initiating breastfeeding is not related to the cleanliness and  
15 comfort provided by the delivery room. Mothers who had their babies when the labor room was  
16 clean and comfortable were just as likely not to initiate breastfeeding early as those who had their  
17 babies when the labor room was not (RR=0.98; 95% CI 0.7-1.4; p=0.9).  
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### 22 **Poor management of mothers' post-delivery state of health**

23  
24 Post-delivery pains and fatigue are barriers to breastfeeding within the first hour after birth. Even  
25 when mothers show a good knowledge of when breastfeeding should start, some still express the  
26 need to regain strength and wellness first before they breastfeed the newborn.  
27  
28  
29

30 *"breastfeeding should commence immediately after birth... I did not commence it because I was*  
31 *feeling after pains. The health worker said she will bring the baby to suck. I told her to allow me*  
32 *to have some relief"* ZA (mother 2)  
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36 The quantitative study shows that pregnant women not encouraged to consume fluids or food at  
37 least once during labor are twice as likely not to breastfeed within the first hour compared with  
38 those encouraged to do so (RR=2.1; 95% CI=1.5-3; p=0.001). There is no evidence from the study  
39 that blood loss greater than 500mls during labor and delivery influence early breastfeeding  
40 (RR=1.17; 95% CI=0.2-5.9; p=1).  
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### 45 **Human resource shortages**

46  
47 The qualitative study shows that shortage of health workers in PHCs introduces a delay in carrying  
48 out newborn care activities. Sometimes, health workers have to attend to other ill patients when  
49 there is no one else to assist. When we asked some health workers why a mother under their care  
50 did not breastfeed early, a typical response given was:  
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3 *““You see, if you have someone that will assist you, you will assign the person to carry the baby to*  
4 *the mother and initiate the breastfeeding, or weigh the child, or apply chlorhexidine to the baby’s*  
5 *cord or any other thing needed while you continue with the remaining work and management of*  
6 *others ...but most of the time you are on duty alone. It is because we have shortage of manpower*  
7 *here in this facility” (birth attendant 3)*

11 The human resource shortage also affects rooming-in in the PHCs. Placing the mother and  
12 newborn in the same room after delivery is rooming-in<sup>52</sup>. Sometimes, the health worker has to  
13 clean and make this room ready for the mother and newborn. When there is a shortage of staff,  
14 this delays the transfer of the mother and newborn to the rooming-in room, and affects early  
15 breastfeeding.

21 *“I wanted to transfer the mother and baby to the postnatal ward... before she commences*  
22 *breastfeeding (of the newborn). The (lying-in) room is not set (for use yet). I have to clean and*  
23 *make the room so she is comfortable to commence breastfeeding” (birth attendant 4)*

### 27 ***Ineffective rooming-in practices***

29 When rooming-in happens, the quantitative study reveals that mothers who do not have skin-to  
30 skin contact with their newborns in the first hour after birth are twice as likely not to breastfeed  
31 early, compared to mothers who did (RR=2.3, 95% CI=1.8-2.8; p<0.001). Just keeping the mother  
32 and newborn in the same room (rooming-in) without skin-to-skin contact has no influence on  
33 early breastfeeding (RR=2.6; 95% CI=2.3-2.9; p=0.059).

### 38 ***Lack of privacy and proper visiting-hour policy in the PHCs***

41 The PHCs have open rooming-in rooms that doesn’t guarantee privacy. There are also no defined  
42 visiting hours in the PHCs. The qualitative arm of the study shows that male and female relatives  
43 visit the new mother in the hospital after childbirth. During the visit, the relatives pray for the  
44 newborn baby and congratulate the mother. Some relatives sit around after prayers for long.  
45 When relatives come visiting, the mothers have to dress up to receive them and do not breastfeed  
46 during this time. The birth attendants also delay supporting the mother to breastfeed. One birth  
47 attendant suggested that addressing the issue puts them in bad light in the community.

53 *“you know, the people in the community have a unique character or attitude. The moment you try*  
54 *to talk to them about this kind of issue they feel you are molesting them or depriving them of*

1  
2  
3 *coming close to their relatives. They do not know you are trying to ensure their relative (mother*  
4 *and baby) gets what is beneficial to them” (birth attendant 5).*

## 7 **Facilitators of early breastfeeding**

### 9 ***Health education during ANC and post-delivery period***

11 From the qualitative study, we find that Antenatal Clinics (ANC) helps pregnant women to learn  
12 about breastfeeding newborns within one hour of birth. The knowledge they gain during these  
13 clinics influences their behavior after childbirth. Most mothers who practiced early breastfeeding  
14 said what they learned from ANC influenced their decision to do so. The typical response they  
15 gave is:  
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20  
21 *“I used to give my children water (after childbirth). I did not know the importance of breastfeeding*  
22 *early. I used to think breast feeding could start at any time of the day (of birth). I started*  
23 *breastfeeding early because the health workers tell us (of the importance of starting breastfeeding*  
24 *immediately after birth) during ANC” (mother 3)*

### 27 ***Encouraging and supporting mothers to start breastfeeding after childbirth***

28  
29 From the qualitative study, we find that when the birth attendants encourage some reluctant  
30 mothers to breastfeed their newborns within one hour of childbirth; they do.  
31  
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34  
35 *“I was told (by the health worker) to give (the baby breast to suck early enough). Normally, I won’t”*  
36 *(mother 4)*

37  
38 The encouragement process takes the form of a negotiation between the birth attendant and the  
39 mother. We find that the information passed by the birth attendants to the mothers around the  
40 benefits of early breastfeeding, facilitate early breastfeeding in the PHCs.  
41  
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44  
45 *“I commenced breastfeeding early because of what the health worker said ...she explained how it*  
46 *is important to the health of my baby. That’s why I commenced it” (mother 5)*

47  
48 Sometimes, showing the mothers how to place and breastfeed the newborns also facilitates early  
49 breastfeeding after childbirth in these health facilities.  
50  
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52  
53 *“I gently encourage them and tell them to give (breast milk) early... I put the baby on her laps and*  
54 *remove the breast, and demonstrate to her how to breastfeed” (birth attendant 6)*



## DISCUSSION

In our study setting, we find that close to four out of every 10 newborns do not get breastfed within the first hour of birth. This doubles their risk of dying in the first 28 days of their lives<sup>10,15</sup>. Our estimate is four percentage points lower than what researcher observed in PHCs in Asia<sup>31</sup>. It is also higher than what others have estimated amongst mothers who had spontaneous vaginal deliveries (SVD) in some secondary health facilities; and lower than what others have estimated amongst mothers who had SVD in some tertiary health facilities, even in Nigeria<sup>31,53,54</sup>. The mixed results emphasize the influence of context on the early breastfeeding of newborns in different health facilities. It underscores the need for unique interventions to address the problem.

The northeast region of Nigeria has a shortage of skilled health workers. The Boko-Haram insurgency has made this worse<sup>55-57</sup>. It is also worsened by staff absenteeism in PHCs in the region. Only about 35% of employed staff in PHCs in Gombe are likely to be at work on any given day, for example<sup>22</sup>. Studies suggest that a shortage of human resource and a dominant population of unskilled health care workers affects the quality of newborn care in health facilities<sup>17,58-60</sup>. This is not overall consistent with our study findings. We find that unskilled health workers are dominant in our study setting. Also, we find that human resource shortage is a barrier to early initiation of breastfeeding in the PHCs. We did not find that the skills of the birth attendants influenced the early breastfeeding of newborns. This may be because clinical mentors have trained the birth attendants in our study on newborn care. Educational interventions around support for the breastfeeding of newborns has been found to improve health workers' knowledge, attitude, and compliance with the practice<sup>61,62</sup>.

In our study, we find that the mothers denied safe traditional birth practices like praying, reciting religious texts, or reading religious books during deliveries were five times more likely not to breastfeed the newborns than the mothers not denied. This supports the findings from other settings that shows that the unwillingness of birth attendants to accommodate safe traditional birth practices affects mothers' adoption of supportive care<sup>59,63,64</sup>. This may be because mothers perceive denial of such traditional practices as mistreatment or abuse<sup>59,65</sup>. A study in Norway finds that the recent abuse of women by "both known and unknown" perpetrators affects their breastfeeding behavior<sup>66</sup>. Although in our study, we found no evidence to support this. Instead we find that birth attendants' attitude, rapport skills, and negligence during the delivery period doesn't affect early breastfeeding practice amongst mothers. The discrepancy in findings may be

1  
2  
3 because the women in our study setting perceive or tolerate abuse differently than women in  
4 other settings<sup>67</sup>.

6  
7 Washing of the breast with water after childbirth is a hygiene related practiced in parts of the  
8 world<sup>68</sup>. In our study, mothers express a strong need to wash the breast and/or have a bath before  
9 breastfeeding newborns. This makes the “need for a bath after childbirth” a major theme for why  
10 mothers delay breastfeeding newborns in our study setting. Some health workers also agree that  
11 mothers should wash their breasts first before breastfeeding newborns after childbirth<sup>18</sup>. Their  
12 inability to help the mothers to wash their breasts or have a bath before breastfeeding may be  
13 because there is no running water in the health facility. Only 38% of priority PHCs in Gombe have  
14 running water<sup>22</sup>. The need to wash the breast may be deeper than the need for hygiene,  
15 nonetheless. Washing of the breast or having a bath after childbirth before breastfeeding  
16 newborns has traditional and/or religious undertones in other parts of the world<sup>60,69</sup>.

24  
25 The other barriers that influence early breastfeeding of newborn in PHCs that our study finds are  
26 post-delivery pains and fatigue within the first hour after birth, delay in skin to skin contact during  
27 rooming-in, and poor visiting hour policy in the PHC. These findings reinforces what other studies  
28 have reported<sup>5,21,24,33,41,54,60</sup>. The post-delivery fatigue may be because the mother is famished.  
29 This may also be due to anemia, infections, thyroid disorders, mood disorders and  
30 cardiomyopathy<sup>70</sup> which our study does not assess. The quantitative arm of our study shows that  
31 mothers not encouraged to take fluids or eat during the second and third stages of labor are more  
32 likely not to breastfeed early after childbirth. There is no evidence from our study that the fatigue  
33 may be due to blood loss. We also find that rooming-in is not enough and that skin to skin contact  
34 must be deliberate. Mothers that did not have skin to skin contact with their newborns while in  
35 the rooming-in room were more likely not to breastfeed than those who did in our study. Our  
36 study reemphasizes that the lack of restrictions on relatives visiting the mothers in the post-  
37 delivery period impedes breastfeeding<sup>71</sup>. This could be because the mothers don't feel  
38 comfortable breastfeeding in front of male relatives or visitors.

48  
49 Helping mothers to breastfeed within an hour of birth is an international recommendation  
50 practiced by health care providers in most of the world<sup>32,72</sup>. We find that birth attendants in our  
51 study setting practice this and the strategy facilitates the early breastfeeding of newborns in  
52 public PHCs. This may be because there is an awareness of the recommendation<sup>73</sup>. Our study also  
53 reinforces findings from previous studies on the benefits of health education on the timely  
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3 breastfeeding of newborns<sup>74,75</sup>. In our study, we find that health education received by mothers  
4 during ANC and the post-delivery period improves the practice of early initiation of breastfeeding  
5 in public PHCs, in our study setting  
6  
7

## 8 9 **CONCLUSION**

10 Only about 60% of babies born in public PHCs in Northeast Nigeria get breastfed in the first hour  
11 of birth. This means the rest miss important nutrition that saves lives. The stakeholders in the  
12 region must increase their focus on improving the breastfeeding practices in public PHCs. This will  
13 improve the survival of newborns and impact of their investments. Instituting policies that protect  
14 mothers' privacy; and finding innovative ways to accommodate and promote safe traditional  
15 practices in the intrapartum and postpartum period in PHCs will improve the early breastfeeding  
16 of newborns in these PHCs. Birth attendants in PHCs must also be trained on effective rooming-  
17 in to further improve early breastfeeding of newborns in these public PHCs, however.  
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## 24 25 **LIST OF ABBREVIATIONS**

26  
27 PHC (Primary Health Care hospital/facility), ANC (Antenatal Care) VHW (Village Health Workers),  
28 CHEWs (Community Health Extension Workers).  
29  
30

## 31 32 **DECLARATIONS**

### 33 34 **Ethics approval and consent to participate**

35  
36 The Gombe State Ministry of Health Ethics Committee granted ethical approval for the qualitative  
37 arm of the study (reference no: MOH/ADM/658/VOL.II/104). Mothers and birth attendants also  
38 gave their consent to take part in the study before the interviews. The IDEAS team at the London  
39 School of Hygiene and Tropical Medicine (LSHTM) got ethical approval for the quantitative arm of  
40 the study from LSHTM (reference 6088).  
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44

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3 intervention is funded through donor grants received by SFH. The donor did not play a role in the  
4  
5 design of this evaluation.  
6  
7

### 8 **Data Availability**

9  
10  
11 Data for the quantitative arm of the study is in a secured database at the London School of  
12  
13 Hygiene and Tropical Medicine. Write to Nasir Umar through [nasir.umar@lshtm.ac.uk](mailto:nasir.umar@lshtm.ac.uk) to place a  
14  
15 reasonable request for the anonymized version of it. Also, write to Shobo Olukolade, through  
16  
17 [shoboolukolade@gmail.com](mailto:shoboolukolade@gmail.com) to ask for the anonymized transcripts of the qualitative data.  
18  
19  
20

### 21 **Competing interest**

22  
23  
24 OGS and PL are consultants working for Society for Family Health (SFH), OI and JA are full-time  
25  
26 staff of SFH. GA is the Former Executive Secretary of Gombe State Primary Health Care  
27  
28 Development Agency. SFH's program in Northeast Nigeria seeks to improve MNCH outcomes in  
29  
30 the general population.  
31  
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33

### 34 **Author Contribution**

35  
36  
37 OGS conceived of the study and developed the original draft of the manuscript. OGS analyzed the  
38  
39 quantitative data. OGS and PL analyzed the qualitative data. NU, GA, JA, and OI reviewed, edited,  
40  
41 and made significant contributions to the development of the final manuscript. All authors read  
42  
43 and approved the final manuscript.  
44  
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46

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# BMJ Open

## Factors influencing the early initiation of breastfeeding in public primary health care facilities in Northeast Nigeria: A mixed methods study

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3 1 Factors influencing the early initiation of breastfeeding in public primary health care  
4 2 facilities in Northeast Nigeria: A mixed methods study  
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6  
7 3 **Corresponding Author:**

- 8 4 1. Olukolade George Shobo (Society for Family Health, 8 Port Harcourt Crescent, Area 11, Garki, Abuja.  
9 5 Email: [shoboolukolade@gmail.com](mailto:shoboolukolade@gmail.com))

10  
11 6 **Coauthors:**

- 12  
13 7 2. Nasir Umar (London School of Hygiene and Tropical Medicine, London. Email: [nasir.umar@lshtm.ac.uk](mailto:nasir.umar@lshtm.ac.uk))  
14 8 3. Gana Ahmed (Gombe State Primary Health Care Development Agency. Gombe State. Email:  
15 9 [ahmedgana567@yahoo.com](mailto:ahmedgana567@yahoo.com))  
16  
17 10 4. Peter Longtoe (Society for Family Health, 8 Port Harcourt Crescent, Area 11, Garki, Abuja. Email:  
18 11 [plongtoe.com](mailto:plongtoe.com))  
19  
20 12 5. Omokhudu Idogho (Society for Family Health, 8 Port Harcourt Crescent, Area 11, Garki, Abuja. Email:  
21 13 [oidogho@sfnigeria.org](mailto:oidogho@sfnigeria.org))  
22 14 6. Jennifer Anyanti (Society for Family Health, 8 Port Harcourt Crescent, Area 11, Garki, Abuja. Email:  
23 15 [janyanti@sfnigeria.org](mailto:janyanti@sfnigeria.org))  
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25 16 **ABSTRACT**

26  
27 17 **Introduction**

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29  
30 18 The early initiation of breastfeeding is a high-impact intervention that gives newborns a better  
31 19 chance of survival. We assess the barriers and facilitators influencing the practice of early  
32 20 breastfeeding of newborns in public primary healthcare facilities (PHCs) in Northeast Nigeria, to  
33 21 influence the planning of programs targeted at improving newborn care in the region.  
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37 22 **Method**

38  
39 23 We used an explanatory mixed methods approach. We conducted case-observation of childbirths  
40 24 and newborn care for the quantitative arm, and interviewed mothers and birth attendants one  
41 25 hour after childbirth for the qualitative arm. The analysis for the quantitative arm was done with  
42 26 SPSS version 23. For the qualitative arm, we transcribed the audio files, coded the texts, and  
43 27 categorized them using thematic analysis.  
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48 28 **Result**

49  
50 29 We observed 393 and 27 mothers for the quantitative and qualitative arms of the study  
51 30 respectively. The quantitative arm shows that 39% of mothers did not breastfeed their newborns  
52 31 within one hour of birth. The qualitative arm shows that 37% of mothers did not breastfeed within  
53 32 one hour of birth. Themes that describe the barriers to early breastfeeding in public PHCs are:  
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3 1 birth attendants' unwillingness or inability to accommodate mothers' safe traditional practices,  
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5 2 ineffective rooming-in practices, staff shortages, lack of privacy in the lying-in ward, and poor  
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7 3 implementation of visiting-hour policy in public PHCs. The pregnant women denied safe  
8  
9 4 traditional birth practices like chanting, praying, or reading religious books during delivery are five  
10  
11 5 times more likely not to breastfeed newborns within the first hour of birth (RR=4.5, 95% CI=1.2-  
12  
13 6 17.1) compared to pregnant women allowed these practices.

## 14 7 **Conclusion**

15  
16 8 Stakeholders must increase their focus on improving the breastfeeding practices in the public  
17  
18 9 PHCs. Instituting policies that protect mothers' privacy; and finding innovative ways to  
19  
20 10 accommodate and promote safe traditional practices in the intrapartum and postpartum period  
21  
22 11 in PHCs will improve the early breastfeeding of newborns in these PHCs.

## 23 12 **STRENGTHS AND LIMITATIONS OF THE STUDY**

- 24  
25  
26 13 • We used a mixed methods study design to provide a richer understanding of the factors that  
27  
28 14 affect newborn breastfeeding practice in public PHCs in resource poor settings.
- 29  
30 15 • We used purposive sampling techniques, focusing on information-rich public PHCs. This  
31  
32 16 improved the chances of observing a high number of childbirths, and identifying typical  
33  
34 17 implementation issues associated with the study aim, during the study period.
- 35  
36 18 • Our study findings are not causal.
- 37  
38 19 • The study findings may not generalize to secondary and tertiary health facilities, nor to PHCs  
39  
40 20 located in places not similar to our study setting.

## 41 21 **INTRODUCTION**

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45 22 Every year, about 77 million (50%) newborns do not get breastfed in the first hour of birth  
46  
47 23 globally<sup>1</sup>. This leaves them vulnerable to diseases and death<sup>1-3</sup>. Newborn deaths continue to  
48  
49 24 account for close to half of all under-5 mortalities across the world<sup>4</sup>. The early initiation of  
50  
51 25 breastfeeding which means breastfeeding a newborn within one hour of birth<sup>5</sup>, is a high-impact  
52  
53 26 intervention<sup>4,6,7</sup> that gives newborns a better chance of survival<sup>8</sup>. It also provides them long-term  
54  
55 27 health benefits<sup>9,10</sup>. The Northeast region of Nigeria has one of the highest newborn mortalities in

1 the world<sup>11-13</sup>. The early initiation of breastfeeding can reduce the risk of these newborn deaths  
2 by about a third<sup>14,15</sup>.

3 The practice of early breastfeeding of newborns differs between and within countries<sup>16,17</sup>. For  
4 instance, it ranges between 17% to 95% for countries in sub-Saharan Africa <sup>18,19</sup>. In Nigeria, only  
5 about 35% of newborns get breastfed within the first hour after birth <sup>20,21</sup>. In the Northeast region  
6 of the country, only about 40% of mothers commence the breastfeeding of newborns in the first  
7 hour after childbirth<sup>21</sup>. In Gombe State, the estimate is 49%<sup>22</sup>. In the rural areas of the country,  
8 mothers are more likely not to practice it at all<sup>20</sup>. The mothers' age, level of education, and  
9 socioeconomic status are factors that influence the pattern of early initiation of breastfeeding in  
10 the general population. Others are maternal and newborn health problems, childbirth method,  
11 family support, availability of supplements, and maternal preference<sup>21,23-25</sup>.

12 To improve early breastfeeding and avert newborn deaths, one approach is for more births to  
13 occur in health facilities<sup>14,26-28</sup>. Having a birth in a health facility improves the chance that a  
14 newborn will breastfeed early<sup>21</sup>. Evidence however suggests that poor birthing practices occur in  
15 health facilities which can disrupt the early start of breastfeeding<sup>17,29-31</sup>. While international  
16 recommendations for improving breastfeeding practices in health facilities exist<sup>32</sup>, the problems  
17 faced by health facilities around the practice are context specific<sup>33,34</sup>, requiring unique responses.  
18 Researches focusing on exploring and understanding these specific birthing practices in health  
19 facilities are now emerging<sup>18,29</sup>.

20 The Northeast region of Nigeria is witnessing an increase in health investments by governments  
21 and non-governmental organizations<sup>35-38</sup>; aimed at reducing maternal and newborn deaths  
22 through improved access to quality childbirth and newborn care services in primary health care  
23 hospitals (PHCs)<sup>35,36</sup>. In Gombe State in Northeast Nigeria for instance, the government is  
24 implementing a Village Health Worker program that improves access to quality obstetric and  
25 newborn care services in public PHCs, through community-based demand generation activities.  
26 Primary health care facilities are better positioned to deliver high-impact newborn interventions  
27 in Nigeria. They make up 88% of health facilities in the country. In the Northeast, there are 5,086  
28 public PHCs, and they make up 87% of the health facilities in the region<sup>39,40</sup>. Understanding the  
29 factors that influence the quality and uptake of life-saving newborn care services in these public  
30 PHCs is important for improving the effectiveness of the health investments in the region.

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2  
3 1 In this study, we assess the barriers and facilitators influencing early breastfeeding of newborns  
4 2 in public PHCs in Northeast Nigeria. Most studies assessing breastfeeding practice in health  
5 3 facilities have used secondary data from demographic health surveys<sup>21,24,25,41</sup>. While maternal  
6 4 recall is valid and reliable in establishing the period of initiation of breastfeeding<sup>42</sup>, the DHS  
7 5 findings do not provide context concerning supply side factors that influenced the maternal  
8 6 behavior. A recent quantitative study in Bangladesh shows that about 43% of mothers in PHCs in  
9 7 the country do not breastfeed their newborns within one hour of birth. It did not assess the  
10 8 contextual implementation issues that influence the practice<sup>31</sup>. The literature around the  
11 9 contextual issues affecting the practice in PHCs in Africa is also lacking. Our approach uses a  
12 10 broader study design that helps to develop a deeper understanding of early breastfeeding  
13 11 practices in public PHCs in Northeast Nigeria<sup>43,44</sup>. We believe our findings will contribute to the  
14 12 discussions about health investments and strategies for improving newborn care in the region,  
15 13 and settings similar to it.

## 14 **METHOD**

### 15 **Study Design**

16 We used an explanatory mixed methods approach for this study. Mixed methods study designs  
17 18 deepen how we understand a research phenomenon<sup>45,46</sup>. In the explanatory mixed method type,  
19 19 a first phase quantitative data collection and analysis is followed by the collection of qualitative  
20 20 data, to explain the quantitative result<sup>45</sup>. The mixed-method approach helps us better understand  
21 21 the factors that influence the early initiation of breastfeeding in public PHCs<sup>45</sup>. We conducted the  
22 22 quantitative arm over four weeks in December 2017, and the qualitative arm over one week in  
23 23 November 2018. Budget constraints delayed implementing the qualitative arm. We assume that  
24 24 the time difference between the study arms is not sufficient to change the practice around  
25 25 breastfeeding newborns in the study setting.

### 25 **Study Setting**

26 We conducted the study in Gombe State, in the center of Northeast Nigeria on latitude 9° 30' and  
27 27 12° 30'N, Longitude 8° 5' and 11° 45'E. It borders Borno, Yobe, Adamawa, Taraba, and Bauchi  
28 28 State. It has 11 Local Government Areas (LGAs) and 114 political wards<sup>47</sup>. There are 603 health  
29 29 facilities across the 11 LGAs in the State, 530 of which are public PHCs<sup>40</sup>. Of the 530 public PHCs  
30 30 in the State, the government has designated 114 as priority PHCs. These 114 are Ward Health

Centers and provide basic emergency obstetric and newborn care services. Nurses, community health workers, community health extension workers (CHEWs), junior CHEWs, and environmental health officers are the main staff of PHCs in Nigeria<sup>48</sup>. Community Health Officer, a Public Health Nurse, three CHEWs, four Nurse/Midwives and one medical Assistant are the main staff of a Ward Health Center<sup>49</sup>.

Fifty percent of these priority PHCs have staff trained in providing basic emergency obstetric and newborn care services. About 36% of them have labor rooms and lying-in wards. None has a medical doctor, 4% have at least one nurse, and 19% have at least one midwife. Each PHC has an average of six health workers not categorized as skilled in attending labor and delivery. These include Community Health Extension Workers (CHEWs), environmental health technicians, hospital assistants (cleaners), and students. The majority (34%) of the staff in these PHCs have no medical training<sup>50</sup>. Fewer than half of pregnant women in the State access pregnancy care at least four times as recommended, and only about a third access facility based intra-partum care and/or skilled attendance at birth<sup>50</sup>. Cesarean sections are not conducted in PHCs in the study setting.

#### PHC Selection

*Quantitative arm:* We selected 10 of the 114 priority PHCs using purposive sampling technique. The 10 had the most deliveries per day on the average in the six-month period prior to starting the study, thus suited to provide rich information on our study objective. They also had labor wards and lying-in wards. The budget for the study dictated the number of health facilities chosen.

*Qualitative arm:* We selected three of the 10 priority PHC in the quantitative arm of the study. The three had the most deliveries per day on the average. They also had labor wards and lying-in wards. The intensity of the childbirths in the three PHCs and over the study period, will illuminate the barriers and facilitators of early initiation of breastfeeding in public PHCs in the region<sup>51</sup>.

#### Subject Selection

We included all mothers who delivered in the selected PHCs and gave their consent to take part in the study in both arms of the study. For the qualitative arm: we also recruited all consenting healthcare providers who attended deliveries; and the mothers with a live birth for interviews.

#### Instrument and data collection

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3 1 *Quantitative arm:* We recruited and trained nurses and nurse-midwives who are not a part of the  
4 2 health facility staff to complete the assessment tool. They observed and documented the time of  
5 3 events from when a pregnant woman in labor entered the health facility to when she leaves after  
6 4 childbirth or referral. During data collection, they only observed and did not take part or comment  
7 5 in the care offered to the pregnant woman. We only told them to intervene or offer help during  
8 6 a life-threatening situation to the mother and/or baby. The data collectors used separate  
9 7 assessment tools in cases of twin deliveries.

10 8 The health facility staff and pregnant women knew of the nurse and nurse-midwives but were  
11 9 unaware of what aspect of care was being observed. Data on the cadre of the health worker,  
12 10 events during the first to third stage of labor, and newborn care activities in the first hour after  
13 11 birth were collected. The nurses and nurse-midwives were available for 24hours in each of the  
14 12 health facilities throughout the study period on a shift schedule. They observed all deliveries.

15 13 *Qualitative arm:* We also recruited and trained female nurses and midwives who are not part of  
16 14 the health facility staff to observe and complete the assessment tool under this arm of the study.  
17 15 Observation for each pregnant woman started during the second stage of labor and ended one  
18 16 hour after childbirth under this arm of the study. The data collector then interviewed the mother  
19 17 and attendant health worker, after the observation period. The assessment tool used for the  
20 18 observation is an extract from the tool used for the quantitative arm. For the mothers and birth  
21 19 attendants we asked questions around how they felt about the childbirth process and knowledge  
22 20 of when newborn babies should breastfeed during the interview. We also asked the mothers why  
23 21 they chose to or not to breastfeed their newborns within the hour depending on if they did or  
24 22 not. Also, we asked the attending healthcare workers why they think breastfeeding occurred or  
25 23 did not occur within the first hour for each newborn. We also asked the attending healthcare  
26 24 workers about the strategies they used to encourage mothers to breastfeed their newborns  
27 25 within the hour. The data collectors attended every birth in the health facilities and interviewed  
28 26 respondents who could not speak or understand English in Hausa. They interviewed the mother  
29 27 and attending healthcare worker separately. The mothers' interviews occurred at their bedside in  
30 28 the lying-in ward. The data collectors excused relatives or visitors in the lying-in room during  
31 29 interviews.

### 30 **Analysis**

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3 1 *Quantitative arm:* We analyzed the data using SPSS version 23. We present nominal variables as  
4 percentages. We also determined associations and relative risks between initiation of  
5 2 breastfeeding and predictor categorical variables using two-by-two contingency tables. To assess  
6 3 significant associations, we used Fisher's or Pearson's Chi-Squared test as appropriate  
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10 5 *Qualitative arm:* We transcribed the interviews from their audio files and analyzed the data with  
11 Saturate, an online qualitative software. Two people on the team analyzed a subset of the data  
12 6 and generated codes. The two people then came together to review and agree on the codes  
13 7 generated and their meaning, eliminating less useful codes. The two reviewers held regular face-  
14 8 to-face meetings to discuss their codes. We then analyzed the rest of the dataset using the agreed  
15 9 code-framework developed by the two. We generated themes from the codes using an inductive  
16 10 approach.  
17 11

## 12 **Patient and Public Involvement Statement**

13 Resources for patient and public involvement statement was unavailable, so we could not involve  
14 14 patients. The development and dissemination of a policy brief of the study findings will involve  
15 15 patients.  
16 16

## 17 **RESULT**

### 18 **Respondents' Profile**

19 All pregnant women recruited under the two arms of the study consented to be observed. Under  
20 the quantitative arm, we observed 393 pregnant women. Most (54%) were between 15 and 24  
21 years old with a median age of 23 years. A quarter were below the age of 20, half below the age  
22 of 23, and three quarters below the age of 30. The childbirths were through spontaneous vaginal  
23 delivery. Twin delivery occurred in only six (1.5%) cases. Also, 39% (95% CI: 34%-44%) of the new  
24 mothers did not breastfeed their newborns in the first hour after delivery. Thirty-three health  
25 workers attended the deliveries under this arm of the study. The number of deliveries attended  
26 by each health worker ranged from one to thirty-seven, with an average of 12 (S.D: 10) deliveries  
27 each and a median of eight during the observation period. At least two health workers attended  
28 about 61% of the 393 deliveries. Also, Junior Community Health Extension Workers (JCHEWs)  
29 attended the majority (36%) of the 393 deliveries (Table 1).

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55 Table 1. Pregnant Women's Profile  
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	Quantitative arm % n=393	Qualitative arms % n=27
<i>Age</i>		
<15	0	3
15 - 24	53	63
25 - 34	36	30
35+	11	4
<i>Gestational age in weeks</i>		
Mean	41 (SD=12)	38(SD=0.6)
Mode	38	38
Median	38	38
<i>Parity</i>		
Nulliparous (first pregnancy above 28wks gestational age (GA))	20	33
Multiparous (more than first pregnancy above 28wk GA)	80	67
<i>Initiated breastfeeding within the first hour after birth</i>		
no	39	37
yes	61	63
<i>Health worker who attended pregnant woman's labor and delivery</i>		
nurse/midwife	4	0
junior community health extension worker	36	28
community health extension worker	18	15
environmental health assistant/technician/officer	28	19
hospital assistant	10	19
nutritionists/dieticians/students	4	19
<i>Sex of health worker that attended pregnant woman's labor and delivery</i>		
male	1	0
female	99	100

1

2 Under the qualitative arm, 27 pregnant women were delivered of their babies by 16 health  
3 workers. The pregnant women consented to be observed and interviewed. The 16 health workers  
4 also consented to be interviewed after the observation. Most (63%) of the pregnant women were  
5 between 15 and 24 years old, with a median age of 22 years. A quarter were below 20 years of  
6 age and a quarter above 30 years of age. None had a twin delivery. Also, 37% (95% CI: 19%-56%)  
7 of the mothers did not breastfeed the newborn within one hour of birth under this arm of the

1 study. We also interviewed all 27 mothers and 16 health workers one hour after childbirth. Of the  
 2 16 health care workers interviewed under the qualitative arm, most (63%) were hospital  
 3 assistants. About a third (33%) were Community Health Extension Workers (CHEWS), 17% (2)  
 4 were students, 6% (1) were nutritionist, and 6% (1) environmental health technician. Of the 27  
 5 deliveries under this arm of the study, in 44% of cases, the attending health care worker was  
 6 assisted by another health worker (Table 1).

### 7 **Knowledge of time to initiate breastfeeding**

8 The qualitative arm shows that health workers know when mothers should breastfeed newborns.  
 9 Ninety-two percent of them responded that breastfeeding should start between zero to sixty  
 10 minutes (Table 2).

11 Table 2. Health Workers' Response to When Breastfeeding Should Start.

Attending health care workers interviewed under qualitative arm	Frequency	Percent (n=16)
<b>Response to when breastfeeding should start</b>		
Immediately after delivery	9	54
<b>10 - 30 minutes after delivery</b>	2	13
<b>30 - 60 minutes after delivery</b>	1	8
<b>0 - 60 minutes after delivery</b>	3	17
<b>0 - 24 hours after delivery</b>	1	8

12  
 13 They attributed their knowledge to on-the-job training sessions on newborn care with visiting  
 14 clinical-mentors. They believe their knowledge is sustained via peer-to-peer discussions while on  
 15 the job and during staff meetings. One Junior Community Health Extension Worker (JCHEW) said:

16 *"breast feeding should commence immediately after birth ...we have clinical mentors that visit and*  
 17 *remind us of these things. We also have staff meetings where we remind ourselves of these*  
 18 *practices"* (birth attendant 1)

19 The word "immediately" is more used by lower cadre health workers to describe when  
 20 breastfeeding should start. The CHEWs are more specific about when breastfeeding should start.  
 21 They also link the time breastfeeding should start with its benefits. The quote below is a typical  
 22 response from a Senior CHEW when she was asked when breastfeeding should start.



1  
2  
3 1 "It is very important because it helps the child to suck the yellowish nutrient in the breast milk. It  
4 2 boosts the child's immunity. It also helps the mother's uterus to shrink and close ...helping to stop  
5 3 bleeding. It should start by 30min to 1hour after delivery" (birth attendant 2).

8  
9 4 **Barriers to early breastfeeding**

11 5 **Birth attendants' unwillingness or inability to accommodate mothers' safe traditional practices**

13 6 The quantitative study shows that pregnant women denied safe traditional birth practices such  
14 7 as praying or reading religious texts during the second and third stages of labor are five times  
15 8 more likely not to breastfeed within the first hour (RR=4.5, 95% CI=1.2-17.1) compared to  
16 9 pregnant women allowed these practices (Table 3).

20  
21 10 Table 3: Association Between Early Breastfeeding and Predictor Variables in the Study

Variable	Response	Women who didn't initiate breastfeeding within 1hr after birth		
		% n=154	Relative risk 95% CI	p value
Birth attendant had received training on newborn care	No	49	1.2 (0.9-1.5)	0.2
	Yes	51		
There were delays in providing care	No	90	0.7 (0.5-1.03)	0.2
	Yes	10		
Communication was easy and frequent between woman and birth attendant	No	2	0.7 (0.3-1.8)	0.5
	Yes	98		
Poor staff attitude	No	96	0.7 (0.4-1.1)	0.2
	Yes	4		
Woman denied some safe traditional childbirth practices*	No	99	4.5 (1.2-17.1)	0.003***
	Yes	1		
Birth attendant determined the birth position	No	41	1 (0.8-1.3)	>0.9
	Yes	59		
Woman was allowed to give birth in the position she preferred**	No	37	0.9 (0.7-1.2)	0.5
	Yes	63		
Woman encouraged to consume fluids/food at least once during labor	No	16	2.1 1.5-3.0	0.001
	Yes	84		
Mother and newborn kept in the same room after delivery (rooming-in)	No	2	2.6 2.3-2.9	0.059***
	Yes	98		
Mother had skin-to-skin contact with newborn in the	No	45	2.3	<0.001

first hour after birth	Yes	55	1.8-2.8	
Woman had blood loss greater than 500mls during labor and delivery	No	99	1.17 0.2-5.9	>0.9***
	Yes	1		
The labor room was clean and comfortable	No	18	0.98 (0.7-1.4)	0.9
	Yes	82		

\*n=154, \*\*n=150, \*\*\*Fishers  $\chi^2$

When mother's state of health after childbirth isn't an issue, a typical response given by some mothers for not breastfeeding in the first hour was the need to first wash the breast or have a bath to feel clean.

*"he (the baby) has to exercise patience until we get home (before he is breastfed). I can't breastfeed him before I take my bath" (mother 1)*

The quantitative study suggests that the mother's need to be clean may not be influenced by the cleanliness of the environment. Initiating breastfeeding is not related to the cleanliness and comfort provided by the delivery room. Mothers who had their babies when the labor room was clean and comfortable were just as likely not to initiate breastfeeding early as those who had their babies when the labor room was not (RR=0.98; 95% CI 0.7-1.4; p=0.9).

### **Poor management of mothers' post-delivery state of health**

Post-delivery pains and fatigue are barriers to breastfeeding within the first hour after birth. Even when mothers show a good knowledge of when breastfeeding should start, some still express the need to regain strength and wellness first before they breastfeed the newborn.

*"breastfeeding should commence immediately after birth... I did not commence it because I was feeling after pains. The health worker said she will bring the baby to suck. I told her to allow me to have some relief" ZA (mother 2)*

The quantitative study shows that pregnant women not encouraged to consume fluids or food at least once during labor are twice as likely not to breastfeed within the first hour compared with those encouraged to do so (RR=2.1; 95% CI=1.5-3; p=0.001). There is no evidence from the study that blood loss greater than 500mls during labor and delivery influence early breastfeeding (RR=1.17; 95% CI=0.2-5.9; p=1).

### **Human resource shortages**

1  
2  
3 1 The qualitative study shows that shortage of health workers in PHCs introduces a delay in carrying  
4  
5 2 out newborn care activities. Sometimes, health workers have to attend to other ill patients when  
6  
7 3 there is no one else to assist. When we asked some health workers why a mother under their care  
8  
9 4 did not breastfeed early, a typical response given was:

10  
11 5 *““You see, if you have someone that will assist you, you will assign the person to carry the baby to*  
12  
13 6 *the mother and initiate the breastfeeding, or weigh the child, or apply chlorhexidine to the baby’s*  
14  
15 7 *cord or any other thing needed while you continue with the remaining work and management of*  
16  
17 8 *others ...but most of the time you are on duty alone. It is because we have shortage of manpower*  
18  
19 9 *here in this facility” (birth attendant 3)*

20  
21 10 The human resource shortage also affects rooming-in in the PHCs. Placing the mother and  
22  
23 11 newborn in the same room after delivery is rooming-in<sup>52</sup>. Sometimes, the health worker has to  
24  
25 12 clean and make this room ready for the mother and newborn. When there is a shortage of staff,  
26  
27 13 this delays the transfer of the mother and newborn to the rooming-in room, and affects early  
28  
29 14 breastfeeding.

30  
31 15 *“I wanted to transfer the mother and baby to the postnatal ward... before she commences*  
32  
33 16 *breastfeeding (of the newborn). The (lying-in) room is not set (for use yet). I have to clean and*  
34  
35 17 *make the room so she is comfortable to commence breastfeeding” (birth attendant 4)*

### 36 37 18 ***Ineffective rooming-in practices***

38  
39 19 When rooming-in happens, the quantitative study reveals that mothers who do not have skin-to  
40  
41 20 skin contact with their newborns in the first hour after birth are twice as likely not to breastfeed  
42  
43 21 early, compared to mothers who did (RR=2.3, 95% CI=1.8-2.8; p<0.001). Just keeping the mother  
44  
45 22 and newborn in the same room (rooming-in) without skin-to-skin contact has no influence on  
46  
47 23 early breastfeeding (RR=2.6; 95% CI=2.3-2.9; p=0.059).

### 48 49 24 ***Lack of privacy and proper visiting-hour policy in the PHCs***

50  
51 25 The PHCs have open rooming-in rooms that doesn’t guarantee privacy. There are also no defined  
52  
53 26 visiting hours in the PHCs. The qualitative arm of the study shows that male and female relatives  
54  
55 27 visit the new mother in the hospital after childbirth. During the visit, the relatives pray for the  
56  
57 28 newborn baby and congratulate the mother. Some relatives sit around after prayers for long.  
58  
59 29 When relatives come visiting, the mothers have to dress up to receive them and do not breastfeed

1 during this time. The birth attendants also delay supporting the mother to breastfeed. One birth  
2 attendant suggested that addressing the issue puts them in bad light in the community.

3 *“you know, the people in the community have a unique character or attitude. The moment you try  
4 to talk to them about this kind of issue they feel you are molesting them or depriving them of  
5 coming close to their relatives. They do not know you are trying to ensure their relative (mother  
6 and baby) gets what is beneficial to them” (birth attendant 5).*

## 7 **Facilitators of early breastfeeding**

### 8 ***Health education during ANC and post-delivery period***

9 From the qualitative study, we find that Antenatal Clinics (ANC) helps pregnant women to learn  
10 about breastfeeding newborns within one hour of birth. The knowledge they gain during these  
11 clinics influences their behavior after childbirth. Most mothers who practiced early breastfeeding  
12 said what they learned from ANC influenced their decision to do so. The typical response they  
13 gave is:

14 *“I used to give my children water (after childbirth). I did not know the importance of breastfeeding  
15 early. I used to think breast feeding could start at any time of the day (of birth). I started  
16 breastfeeding early because the health workers tell us (of the importance of starting breastfeeding  
17 immediately after birth) during ANC” (mother 3)*

### 18 ***Encouraging and supporting mothers to start breastfeeding after childbirth***

19 From the qualitative study, we find that when the birth attendants encourage some reluctant  
20 mothers to breastfeed their newborns within one hour of childbirth; they do.

21 *“I was told (by the health worker) to give (the baby breast to suck early enough). Normally, I won’t”  
22 (mother 4)*

23 The encouragement process takes the form of a negotiation between the birth attendant and the  
24 mother. We find that the information passed by the birth attendants to the mothers around the  
25 benefits of early breastfeeding, facilitate early breastfeeding in the PHCs.

26 *“I commenced breastfeeding early because of what the health worker said ...she explained how it  
27 is important to the health of my baby. That’s why I commenced it” (mother 5)*

1  
2  
3 1 Sometimes, showing the mothers how to place and breastfeed the newborns also facilitates early  
4 2 breastfeeding after childbirth in these health facilities.

5  
6  
7 3 *"I gently encourage them and tell them to give (breast milk) early... I put the baby on her laps and*  
8 4 *remove the breast, and demonstrate to her how to breastfeed"* (birth attendant 6)

## 11 **DISCUSSION**

12  
13  
14 6 In our study setting, we find that close to four out of every 10 newborns do not get breastfed  
15 7 within the first hour of birth. This doubles their risk of dying in the first 28 days of their lives<sup>10,15</sup>.  
16 8 Our estimate is four percentage points lower than what researcher observed in PHCs in Asia<sup>31</sup>. It  
17 9 is also higher than estimates amongst mothers who had spontaneous vaginal deliveries (SVD) in  
18 10 some secondary health facilities; and lower than estimates amongst mothers who had SVD in  
19 11 some tertiary health facilities, even in Nigeria<sup>31,53,54</sup>. The mixed results emphasize the influence  
20 12 of context on the early breastfeeding of newborns in different health facilities. It underscores the  
21 13 need for unique interventions to address the problem.

22  
23  
24 14 The northeast region of Nigeria has a shortage of skilled health workers. The Boko-Haram  
25 15 insurgency has made this worse<sup>55-57</sup>. It is also worsened by staff absenteeism in PHCs in the region.  
26 16 Only about 35% of employed staff in PHCs in Gombe are likely to be at work on any given day, for  
27 17 example<sup>22</sup>. Studies suggest that a shortage of human resource and a dominant population of  
28 18 unskilled health care workers affects the quality of newborn care in health facilities<sup>17,58-60</sup>. This is  
29 19 not overall consistent with our study findings. We find that unskilled health workers are dominant  
30 20 in our study setting. Also, we find that human resource shortage is a barrier to early initiation of  
31 21 breastfeeding in the PHCs. We did not find that the skills of the birth attendants influenced the  
32 22 early breastfeeding of newborns. This may be because clinical mentors have trained the birth  
33 23 attendants in our study on newborn care. Educational interventions around support for the  
34 24 breastfeeding of newborns has been found to improve health workers' knowledge, attitude, and  
35 25 compliance with the practice<sup>61,62</sup>.

36  
37  
38 26 In our study, we find that the mothers denied safe traditional birth practices like praying, reciting  
39 27 religious texts, or reading religious books during deliveries were five times more likely not to  
40 28 breastfeed the newborns than the mothers not denied. This supports the findings from other  
41 29 settings that shows that the unwillingness of birth attendants to accommodate safe traditional  
42 30 birth practices affects mothers' adoption of supportive care<sup>59,63,64</sup>. This may be because mothers

1 perceive denial of such traditional practices as mistreatment or abuse<sup>59,65</sup>. A study in Norway finds  
2 that the recent abuse of women by “both known and unknown” perpetrators affects their  
3 breastfeeding behavior<sup>66</sup>. Although in our study, we found no evidence to support this. Instead  
4 we find that birth attendants’ attitude, rapport skills, and negligence during the delivery period  
5 doesn’t affect early breastfeeding practice amongst mothers. The discrepancy in findings may be  
6 because the women in our study setting perceive or tolerate abuse differently than women in  
7 other settings<sup>67</sup>.

8 Washing of the breast with water after childbirth is a hygiene related practiced in parts of the  
9 world<sup>68</sup>. In our study, mothers express a strong need to wash the breast and/or have a bath before  
10 breastfeeding newborns. This makes the “need for a bath after childbirth” a major theme for why  
11 mothers delay breastfeeding newborns in our study setting. Some health workers also agree that  
12 mothers should wash their breasts first before breastfeeding newborns after childbirth<sup>18</sup>. Their  
13 inability to help the mothers to wash their breasts or have a bath before breastfeeding may be  
14 because there is no running water in the health facility. Only 38% of priority PHCs in Gombe have  
15 running water<sup>22</sup>. The need to wash the breast may be deeper than the need for hygiene,  
16 nonetheless. Washing of the breast or having a bath after childbirth before breastfeeding  
17 newborns has traditional and/or religious undertones in other parts of the world<sup>60,69</sup>.

18 The other barriers that influence early breastfeeding of newborn in PHCs that our study finds are  
19 post-delivery pains and fatigue within the first hour after birth, delay in skin to skin contact during  
20 rooming-in, and poor visiting hour policy in the PHC. These findings reinforces what other studies  
21 have reported<sup>5,21,24,33,41,54,60</sup>. The post-delivery fatigue may be because the mother is famished.  
22 This may also be due to anemia, infections, thyroid disorders, mood disorders and  
23 cardiomyopathy<sup>70</sup> which our study does not assess. The quantitative arm of our study shows that  
24 mothers not encouraged to take fluids or eat during the second and third stages of labor are more  
25 likely not to breastfeed early after childbirth. There is no evidence from our study that the fatigue  
26 may be due to blood loss. We also find that rooming-in is not enough and that skin to skin contact  
27 must be deliberate. Mothers that did not have skin to skin contact with their newborns while in  
28 the rooming-in room were more likely not to breastfeed than those who did in our study. Our  
29 study reemphasizes that the lack of restrictions on relatives visiting the mothers in the post-  
30 delivery period impedes breastfeeding<sup>71</sup>. This could be because the mothers don’t feel  
31 comfortable breastfeeding in front of male relatives or visitors.

1  
2  
3 1 Helping mothers to breastfeed within an hour of birth is an international recommendation  
4 2 practiced by health care providers in most of the world<sup>32,72</sup>. We find that birth attendants in our  
5 3 study setting practice this and the strategy facilitates the early breastfeeding of newborns in  
6 4 public PHCs. This may be because there is an awareness of the recommendation<sup>73</sup>. Our study also  
7 5 reinforces findings from previous studies on the benefits of health education on the timely  
8 6 breastfeeding of newborns<sup>74,75</sup>. In our study, we find that health education received by mothers  
9 7 during ANC and the post-delivery period improves the practice of early initiation of breastfeeding  
10 8 in public PHCs, in our study setting

## 9 **CONCLUSION**

10 Only about 60% of babies born in public PHCs in Northeast Nigeria get breastfed in the first hour  
11 11 of birth. This means the rest miss important nutrition that saves lives. The stakeholders in the  
12 12 region must increase their focus on improving the breastfeeding practices in public PHCs. This will  
13 13 improve the survival of newborns and impact of their investments. Instituting policies that protect  
14 14 mothers' privacy; and finding innovative ways to accommodate and promote safe traditional  
15 15 practices in the intrapartum and postpartum period in PHCs will improve the early breastfeeding  
16 16 of newborns in these PHCs. Birth attendants in PHCs must also be trained on effective rooming-  
17 17 in to further improve early breastfeeding of newborns in these public PHCs, however.

## 18 **LIST OF ABBREVIATIONS**

19 PHC (Primary Health Care hospital/facility), ANC (Antenatal Care) VHW (Village Health Workers),  
20 CHEWs (Community Health Extension Workers).

## 21 **DECLARATIONS**

### 22 **Ethics approval and consent to participate**

23 The Gombe State Ministry of Health Ethics Committee granted ethical approval for the qualitative  
24 24 arm of the study (reference no: MOH/ADM/658/VOL.II/104). Mothers and birth attendants also  
25 25 gave their consent to take part in the study before the interviews. The IDEAS team at the London  
26 26 School of Hygiene and Tropical Medicine (LSHTM) got ethical approval for the quantitative arm of  
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12  
13

#### 14 15 6 **Data Availability**

16  
17  
18 7 Data for the quantitative arm of the study is in a secured database at the London School of  
19  
20 8 Hygiene and Tropical Medicine. Write to Nasir Umar through [nasir.umar@lshtm.ac.uk](mailto:nasir.umar@lshtm.ac.uk) to place a  
21  
22 9 reasonable request for the anonymized version of it. Also, write to Shobo Olukolade, through  
23  
24 10 [shoboolukolade@gmail.com](mailto:shoboolukolade@gmail.com) to ask for the anonymized transcripts of the qualitative data.  
25  
26  
27

#### 28 11 **Competing interest**

29  
30  
31 12 OGS and PL are consultants working for Society for Family Health (SFH), OI and JA are full-time  
32  
33 13 staff of SFH. GA is the Former Executive Secretary of Gombe State Primary Health Care  
34  
35 14 Development Agency. SFH's program in Northeast Nigeria seeks to improve MNCH outcomes in  
36  
37 15 the general population.  
38  
39  
40

#### 41 16 **Author Contribution**

42  
43  
44 17 OGS conceived of the study and developed the original draft of the manuscript. OGS analyzed the  
45  
46 18 quantitative data. OGS and PL analyzed the qualitative data. NU, GA, JA, and OI reviewed, edited,  
47  
48 19 and made significant contributions to the development of the final manuscript. All authors read  
49  
50 20 and approved the final manuscript.  
51  
52  
53

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10  
11 5 quantitative arm of the study.  
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# BMJ Open

## Factors influencing the early initiation of breastfeeding in public primary health care facilities in Northeast Nigeria: A mixed methods study

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4 1 Factors influencing the early initiation of breastfeeding in public primary health care  
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7 3 **Corresponding Author:**

- 8  
9 4 1. Olukolade George Shobo (Society for Family Health, 8 Port Harcourt Crescent, Area 11, Garki, Abuja.  
10 5 Email: [shoboolukolade@gmail.com](mailto:shoboolukolade@gmail.com))

11  
12 6 **Coauthors:**

- 13  
14 7 2. Nasir Umar (London School of Hygiene and Tropical Medicine, London. Email: [nasir.umar@lshtm.ac.uk](mailto:nasir.umar@lshtm.ac.uk))  
15 8 3. Gana Ahmed (Gombe State Primary Health Care Development Agency. Gombe State. Email:  
16 9 [ahmedgana567@yahoo.com](mailto:ahmedgana567@yahoo.com))  
17 10 4. Peter Longtoe (Society for Family Health, 8 Port Harcourt Crescent, Area 11, Garki, Abuja. Email:  
18 11 [plongtoe.com](mailto:plongtoe.com))  
19 12 5. Omokhodu Idogho (Society for Family Health, 8 Port Harcourt Crescent, Area 11, Garki, Abuja. Email:  
20 13 [oidogho@sfnigeria.org](mailto:oidogho@sfnigeria.org))  
21 14 6. Jennifer Anyanti (Society for Family Health, 8 Port Harcourt Crescent, Area 11, Garki, Abuja. Email:  
22 15 [janyanti@sfnigeria.org](mailto:janyanti@sfnigeria.org))

23  
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25 16 **ABSTRACT**

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28 17 **Introduction**

29  
30 18 The early initiation of breastfeeding is a high-impact intervention that gives newborns a better  
31 19 chance of survival. We assess the barriers and facilitators influencing the practice of early  
32 20 breastfeeding of newborns in public primary healthcare facilities (PHCs) in Northeast Nigeria, to  
33 21 influence the planning of programs targeted at improving newborn care in the region.

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37 22 **Method**

38  
39 23 We used an explanatory mixed methods approach. We conducted case-observation of childbirths  
40 24 and newborn care for the quantitative arm, and interviewed mothers and birth attendants one  
41 25 hour after childbirth for the qualitative arm. The analysis for the quantitative arm was done with  
42 26 SPSS version 23. For the qualitative arm, we transcribed the audio files, coded the texts, and  
43 27 categorized them using thematic analysis.

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48 28 **Result**

49  
50 29 We observed 393 and 27 mothers for the quantitative and qualitative arms of the study  
51 30 respectively. The quantitative arm shows that 39% of mothers did not breastfeed their newborns  
52 31 within one hour of birth. The qualitative arm shows that 37% of mothers did not breastfeed within

## Page 2 of 26

1 one hour of birth. Themes that describe the barriers to early breastfeeding in public PHCs are:  
2 birth attendants' unwillingness or inability to accommodate mothers' safe traditional practices,  
3 ineffective rooming-in practices, staff shortages, lack of privacy in the lying-in ward, and poor  
4 implementation of visiting-hour policy in public PHCs. The pregnant women denied safe  
5 traditional birth practices like chanting, praying, or reading religious books during delivery are five  
6 times more likely not to breastfeed newborns within the first hour of birth (RR=4.5, 95% CI=1.2-  
7 17.1) compared to pregnant women allowed these practices.

## 8 **Conclusion**

9 Stakeholders must increase their focus on improving the breastfeeding practices in the public  
10 PHCs. Instituting policies that protect mothers' privacy; and finding innovative ways to  
11 accommodate and promote safe traditional practices in the intrapartum and postpartum period  
12 in PHCs will improve the early breastfeeding of newborns in these PHCs.

## 13 **STRENGTHS AND LIMITATIONS OF THE STUDY**

- 14 • We used a mixed methods study design
- 15 • Also, we used purposive sampling technique to select the public PHC, focusing on  
16 information-rich cases.
- 17 • Data collection included direct observation of mothers' newborn breastfeeding behavior in  
18 the first hour after childbirth
- 19 • We observed a high number of childbirths
- 20 • The sampling approach may limit the generalizability of the findings to places not similar to  
21 our study setting.

## 22 **INTRODUCTION**

23 Every year, about 77 million (50%) newborns do not get breastfed in the first hour of birth  
24 globally<sup>1</sup>. This leaves them vulnerable to diseases and death<sup>1-3</sup>. Newborn deaths continue to  
25 account for close to half of all under-5 mortalities across the world<sup>4</sup>. The early initiation of  
26 breastfeeding which means breastfeeding a newborn within one hour of birth<sup>5</sup>, is a high-impact  
27 intervention<sup>4,6,7</sup> that gives newborns a better chance of survival<sup>8</sup>. It also provides them long-term  
28 health benefits<sup>9,10</sup>. The Northeast region of Nigeria has one of the highest newborn mortalities in

1 the world<sup>11-13</sup>. The early initiation of breastfeeding can reduce the risk of these newborn deaths  
2 by about a third<sup>14,15</sup>.

3 The practice of early breastfeeding of newborns differs between and within countries<sup>16,17</sup>. For  
4 instance, it ranges between 17% to 95% for countries in sub-Saharan Africa <sup>18,19</sup>. In Nigeria, only  
5 about 35% of newborns get breastfed within the first hour after birth <sup>20,21</sup>. In the Northeast region  
6 of the country, only about 40% of mothers commence the breastfeeding of newborns in the first  
7 hour after childbirth<sup>21</sup>. In Gombe State, the estimate is 49%<sup>22</sup>. In the rural areas of the country,  
8 mothers are more likely not to practice it at all<sup>20</sup>. The mothers' age, level of education, and  
9 socioeconomic status are factors that influence the pattern of early initiation of breastfeeding in  
10 the general population. Others are maternal and newborn health problems, childbirth method,  
11 family support, availability of supplements, and maternal preference<sup>21,23-25</sup>.

12 To improve early breastfeeding and avert newborn deaths, one approach is for more births to  
13 occur in health facilities<sup>14,26-28</sup>. Having a birth in a health facility improves the chance that a  
14 newborn will breastfeed early<sup>21</sup>. Evidence however suggests that poor birthing practices occur in  
15 health facilities which can disrupt the early start of breastfeeding<sup>17,29-31</sup>. While international  
16 recommendations for improving breastfeeding practices in health facilities exist<sup>32</sup>, the problems  
17 faced by health facilities around the practice are context specific<sup>33,34</sup>, requiring unique responses.  
18 Researches focusing on exploring and understanding these specific birthing practices in health  
19 facilities are now emerging<sup>18,29</sup>.

20 The Northeast region of Nigeria is witnessing an increase in health investments by governments  
21 and non-governmental organizations<sup>35-38</sup>; aimed at reducing maternal and newborn deaths  
22 through improved access to quality childbirth and newborn care services in primary health care  
23 hospitals (PHCs)<sup>35,36</sup>. In Gombe State in Northeast Nigeria for instance, the government is  
24 implementing a Village Health Worker program that improves access to quality obstetric and  
25 newborn care services in public PHCs, through community-based demand generation activities.  
26 Primary health care facilities are better positioned to deliver high-impact newborn interventions  
27 in Nigeria. They make up 88% of health facilities in the country. In the Northeast, there are 5,086  
28 public PHCs, and they make up 87% of the health facilities in the region<sup>39,40</sup>. Understanding the  
29 factors that influence the quality and uptake of life-saving newborn care services in these public  
30 PHCs is important for improving the effectiveness of the health investments in the region.

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4 1 In this study, we assess the barriers and facilitators influencing early breastfeeding of newborns  
5 2 in public PHCs in Northeast Nigeria. Most studies assessing breastfeeding practice in health  
6 3 facilities have used secondary data from demographic health surveys<sup>21,24,25,41</sup>. While maternal  
7 4 recall is valid and reliable in establishing the period of initiation of breastfeeding<sup>42</sup>, the DHS  
8 5 findings do not provide context concerning supply side factors that influenced the maternal  
9 6 behavior. A recent quantitative study in Bangladesh shows that about 43% of mothers in PHCs in  
10 7 the country do not breastfeed their newborns within one hour of birth. It did not assess the  
11 8 contextual implementation issues that influence the practice<sup>31</sup>. The literature around the  
12 9 contextual issues affecting the practice in PHCs in Africa is also lacking. Our approach uses a  
13 10 broader study design that helps to develop a deeper understanding of early breastfeeding  
14 11 practices in public PHCs in Northeast Nigeria<sup>43,44</sup>. We believe our findings will contribute to the  
15 12 discussions about health investments and strategies for improving newborn care in the region,  
16 13 and settings similar to it.

## 14 **METHOD**

### 15 **Study Design**

16 We used an explanatory mixed methods approach for this study. Mixed methods study designs  
17 18 deepen how we understand a research phenomenon<sup>45,46</sup>. In the explanatory mixed method type,  
19 20 a first phase quantitative data collection and analysis is followed by the collection of qualitative  
21 21 data, to explain the quantitative result<sup>45</sup>. The mixed-method approach helps us better understand  
22 22 the factors that influence the early initiation of breastfeeding in public PHCs<sup>45</sup>. We conducted the  
23 23 quantitative arm over four weeks in December 2017, and the qualitative arm over one week in  
24 24 November 2018. Budget constraints delayed implementing the qualitative arm. We assume that  
25 25 the time difference between the study arms is not sufficient to change the practice around  
26 26 breastfeeding newborns in the study setting.

### 25 **Study Setting**

26 We conducted the study in Gombe State, in the center of Northeast Nigeria on latitude 9° 30' and  
27 27 12° 30'N, Longitude 8° 5' and 11° 45'E. It borders Borno, Yobe, Adamawa, Taraba, and Bauchi  
28 28 State. It has 11 Local Government Areas (LGAs) and 114 political wards<sup>47</sup>. There are 603 health  
29 29 facilities across the 11 LGAs in the State, 530 of which are public PHCs<sup>40</sup>. Of the 530 public PHCs  
30 30 in the State, the government has designated 114 as priority PHCs. These 114 are Ward Health

Centers and provide basic emergency obstetric and newborn care services. Nurses, community health workers, community health extension workers (CHEWs), junior CHEWs, and environmental health officers are the main staff of PHCs in Nigeria<sup>48</sup>. Community Health Officer, a Public Health Nurse, three CHEWs, four Nurse/Midwives and one medical Assistant are the main staff of a Ward Health Center<sup>49</sup>.

Fifty percent of these priority PHCs have staff trained in providing basic emergency obstetric and newborn care services. About 36% of them have labor rooms and lying-in wards. None has a medical doctor, 4% have at least one nurse, and 19% have at least one midwife. Each PHC has an average of six health workers not categorized as skilled in attending labor and delivery. These include Community Health Extension Workers (CHEWs), environmental health technicians, hospital assistants (cleaners), and students. The majority (34%) of the staff in these PHCs have no medical training<sup>50</sup>. Fewer than half of pregnant women in the State access pregnancy care at least four times as recommended, and only about a third access facility based intra-partum care and/or skilled attendance at birth<sup>50</sup>. Cesarean sections are not conducted in PHCs in the study setting.

#### PHC Selection

*Quantitative arm:* We selected 10 of the 114 priority PHCs using purposive sampling technique. The 10 had the most deliveries per day on the average in the six-month period prior to starting the study, thus suited to provide rich information on our study objective. They also had labor wards and lying-in wards. The budget for the study dictated the number of health facilities chosen.

*Qualitative arm:* We selected three of the 10 priority PHC in the quantitative arm of the study. The three had the most deliveries per day on the average. They also had labor wards and lying-in wards. The intensity of the childbirths in the three PHCs and over the study period, will illuminate the barriers and facilitators of early initiation of breastfeeding in public PHCs in the region<sup>51</sup>.

#### Subject Selection

We included all mothers who delivered in the selected PHCs and gave their consent to take part in the study in both arms of the study. For the qualitative arm: we also recruited all consenting healthcare providers who attended deliveries; and the mothers with a live birth for interviews.

#### Instrument and data collection



## Page 6 of 26

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4 1 *Quantitative arm:* We recruited and trained nurses and nurse-midwives who are not a part of the  
5 2 health facility staff to complete the assessment tool. They observed and documented the time of  
6 3 events from when a pregnant woman in labor entered the health facility to when she leaves after  
7 4 childbirth or referral. During data collection, they only observed and did not take part or comment  
8 5 in the care offered to the pregnant woman. We only told them to intervene or offer help during  
9 6 a life-threatening situation to the mother and/or baby. The data collectors used separate  
10 7 assessment tools in cases of twin deliveries.

11 8 The health facility staff and pregnant women knew of the nurse and nurse-midwives but were  
12 9 unaware of what aspect of care was being observed. Data on the cadre of the health worker,  
13 10 events during the first to third stage of labor, and newborn care activities in the first hour after  
14 11 birth were collected. The nurses and nurse-midwives were available for 24hours in each of the  
15 12 health facilities throughout the study period on a shift schedule. They observed all deliveries.

16 13 *Qualitative arm:* We also recruited and trained female nurses and midwives who are not part of  
17 14 the health facility staff to observe and complete the assessment tool under this arm of the study.  
18 15 Observation for each pregnant woman started during the second stage of labor and ended one  
19 16 hour after childbirth under this arm of the study. The data collector then interviewed the mother  
20 17 and attendant health worker, after the observation period. The assessment tool used for the  
21 18 observation is an extract from the tool used for the quantitative arm. For the mothers and birth  
22 19 attendants we asked questions around how they felt about the childbirth process and knowledge  
23 20 of when newborn babies should breastfeed during the interview. We also asked the mothers why  
24 21 they chose to or not to breastfeed their newborns within the hour depending on if they did or  
25 22 not. Also, we asked the attending healthcare workers why they think breastfeeding occurred or  
26 23 did not occur within the first hour for each newborn. We also asked the attending healthcare  
27 24 workers about the strategies they used to encourage mothers to breastfeed their newborns  
28 25 within the hour. The data collectors attended every birth in the health facilities and interviewed  
29 26 respondents who could not speak or understand English in Hausa. They interviewed the mother  
30 27 and attending healthcare worker separately. The mothers' interviews occurred at their bedside in  
31 28 the lying-in ward. The data collectors excused relatives or visitors in the lying-in room during  
32 29 interviews.

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54 30 **Analysis**  
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1 *Quantitative arm:* We analyzed the data using SPSS version 23. We present nominal variables as  
2 percentages. We also determined associations and relative risks between initiation of  
3 breastfeeding and predictor categorical variables using two-by-two contingency tables. To assess  
4 significant associations, we used Fisher's or Pearson's Chi-Squared test as appropriate

5 *Qualitative arm:* We transcribed the interviews from their audio files and analyzed the data with  
6 Saturate, an online qualitative software. Two people on the team analyzed a subset of the data  
7 and generated codes. The two people then came together to review and agree on the codes  
8 generated and their meaning, eliminating less useful codes. The two reviewers held regular face-  
9 to-face meetings to discuss their codes. We then analyzed the rest of the dataset using the agreed  
10 code-framework developed by the two. We generated themes from the codes using an inductive  
11 approach.

## 12 **Patient and Public Involvement Statement**

13 Resources for patient and public involvement statement was unavailable, so we could not involve  
14 patients. The development and dissemination of a policy brief of the study findings will involve  
15 patients.

## 16 **RESULT**

### 17 **Respondents' Profile**

18 All pregnant women recruited under the two arms of the study consented to be observed. Under  
19 the quantitative arm, we observed 393 pregnant women. Most (54%) were between 15 and 24  
20 years old with a median age of 23 years. A quarter were below the age of 20, half below the age  
21 of 23, and three quarters below the age of 30. The childbirths were through spontaneous vaginal  
22 delivery. Twin delivery occurred in only six (1.5%) cases. Also, 39% (95% CI: 34%-44%) of the new  
23 mothers did not breastfeed their newborns in the first hour after delivery. Thirty-three health  
24 workers attended the deliveries under this arm of the study. The number of deliveries attended  
25 by each health worker ranged from one to thirty-seven, with an average of 12 (S.D: 10) deliveries  
26 each and a median of eight during the observation period. At least two health workers attended  
27 about 61% of the 393 deliveries. Also, Junior Community Health Extension Workers (JCHEWs)  
28 attended the majority (36%) of the 393 deliveries (Table 1).

29 Table 1. Pregnant Women's Profile

	Quantitative arm % n=393	Qualitative arms % n=27
<i>Age</i>		
<15	0	3
15 - 24	53	63
25 - 34	36	30
35+	11	4
<i>Gestational age in weeks</i>		
Mean	41 (SD=12)	38(SD=0.6)
Mode	38	38
Median	38	38
<i>Parity</i>		
Nulliparous (first pregnancy above 28wks gestational age (GA))	20	33
Multiparous (more than first pregnancy above 28wk GA)	80	67
<i>Initiated breastfeeding within the first hour after birth</i>		
no	39	37
yes	61	63
<i>Health worker who attended pregnant woman's labor and delivery</i>		
nurse/midwife	4	0
junior community health extension worker	36	28
community health extension worker	18	15
environmental health assistant/technician/officer	28	19
hospital assistant	10	19
nutritionists/dieticians/students	4	19
<i>Sex of health worker that attended pregnant woman's labor and delivery</i>		
male	1	0
female	99	100

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2 Under the qualitative arm, 27 pregnant women were delivered of their babies by 16 health  
3 workers. The pregnant women consented to be observed and interviewed. The 16 health workers  
4 also consented to be interviewed after the observation. Most (63%) of the pregnant women were  
5 between 15 and 24 years old, with a median age of 22 years. A quarter were below 20 years of  
6 age and a quarter above 30 years of age. None had a twin delivery. Also, 37% (95% CI: 19%-56%)  
7 of the mothers did not breastfeed the newborn within one hour of birth under this arm of the

1 study. We also interviewed all 27 mothers and 16 health workers one hour after childbirth. Of the  
 2 16 health care workers interviewed under the qualitative arm, most (63%) were hospital  
 3 assistants. About a third (33%) were Community Health Extension Workers (CHEWS), 17% (2)  
 4 were students, 6% (1) were nutritionist, and 6% (1) environmental health technician. Of the 27  
 5 deliveries under this arm of the study, in 44% of cases, the attending health care worker was  
 6 assisted by another health worker (Table 1).

### 7 **Knowledge of time to initiate breastfeeding**

8 The qualitative arm shows that health workers know when mothers should breastfeed newborns.  
 9 Ninety-two percent of them responded that breastfeeding should start between zero to sixty  
 10 minutes (Table 2).

11 Table 2. Health Workers' Response to When Breastfeeding Should Start.

Attending health care workers interviewed under qualitative arm	Frequency	Percent (n=16)
<b>Response to when breastfeeding should start</b>		
Immediately after delivery	9	54
<b>10 - 30 minutes after delivery</b>	2	13
<b>30 - 60 minutes after delivery</b>	1	8
<b>0 - 60 minutes after delivery</b>	3	17
<b>0 - 24 hours after delivery</b>	1	8

12  
 13 They attributed their knowledge to on-the-job training sessions on newborn care with visiting  
 14 clinical-mentors. They believe their knowledge is sustained via peer-to-peer discussions while on  
 15 the job and during staff meetings. One Junior Community Health Extension Worker (JCHEW) said:

16 *"breast feeding should commence immediately after birth ...we have clinical mentors that visit and*  
 17 *remind us of these things. We also have staff meetings where we remind ourselves of these*  
 18 *practices"* (birth attendant 1)

19 The word "immediately" is more used by lower cadre health workers to describe when  
 20 breastfeeding should start. The CHEWs are more specific about when breastfeeding should start.  
 21 They also link the time breastfeeding should start with its benefits. The quote below is a typical  
 22 response from a Senior CHEW when she was asked when breastfeeding should start.

## Page 10 of 26

1 “It is very important because it helps the child to suck the yellowish nutrient in the breast milk. It  
2 boosts the child’s immunity. It also helps the mother’s uterus to shrink and close ...helping to stop  
3 bleeding. It should start by 30min to 1hour after delivery” (birth attendant 2).

#### 4 Barriers to early breastfeeding

##### 5 **Birth attendants’ unwillingness or inability to accommodate mothers’ safe traditional practices**

6 The quantitative study shows that pregnant women denied safe traditional birth practices such  
7 as praying or reading religious texts during the second and third stages of labor are five times  
8 more likely not to breastfeed within the first hour (RR=4.5, 95% CI=1.2-17.1) compared to  
9 pregnant women allowed these practices (Table 3).

10 Table 3: Association Between Early Breastfeeding and Predictor Variables in the Study

Variable	Response	Women who didn't initiate breastfeeding within 1hr after birth		
		% n=154	Relative risk 95% CI	p value
Birth attendant had received training on newborn care	No	49	1.2 (0.9-1.5)	0.2
	Yes	51		
There were delays in providing care	No	90	0.7 (0.5-1.03)	0.2
	Yes	10		
Communication was easy and frequent between woman and birth attendant	No	2	0.7 (0.3-1.8)	0.5
	Yes	98		
Poor staff attitude	No	96	0.7 (0.4-1.1)	0.2
	Yes	4		
Woman denied some safe traditional childbirth practices*	No	99	4.5 (1.2-17.1)	0.003***
	Yes	1		
Birth attendant determined the birth position	No	41	1 (0.8-1.3)	>0.9
	Yes	59		
Woman was allowed to give birth in the position she preferred**	No	37	0.9 (0.7-1.2)	0.5
	Yes	63		
Woman encouraged to consume fluids/food at least once during labor	No	16	2.1 1.5-3.0	0.001
	Yes	84		
Mother and newborn kept in the same room after delivery (rooming-in)	No	2	2.6 2.3-2.9	0.059***
	Yes	98		
Mother had skin-to-skin contact with newborn in the	No	45	2.3	<0.001

first hour after birth	Yes	55	1.8-2.8	
Woman had blood loss greater than 500mls during labor and delivery	No	99	1.17 0.2-5.9	>0.9***
	Yes	1		
The labor room was clean and comfortable	No	18	0.98 (0.7-1.4)	0.9
	Yes	82		

\*n=154, \*\*n=150, \*\*\*Fishers  $\chi^2$

When mother's state of health after childbirth isn't an issue, a typical response given by some mothers for not breastfeeding in the first hour was the need to first wash the breast or have a bath to feel clean.

*"he (the baby) has to exercise patience until we get home (before he is breastfed). I can't breastfeed him before I take my bath" (mother 1)*

The quantitative study suggests that the mother's need to be clean may not be influenced by the cleanliness of the environment. Initiating breastfeeding is not related to the cleanliness and comfort provided by the delivery room. Mothers who had their babies when the labor room was clean and comfortable were just as likely not to initiate breastfeeding early as those who had their babies when the labor room was not (RR=0.98; 95% CI 0.7-1.4; p=0.9).

### **Poor management of mothers' post-delivery state of health**

Post-delivery pains and fatigue are barriers to breastfeeding within the first hour after birth. Even when mothers show a good knowledge of when breastfeeding should start, some still express the need to regain strength and wellness first before they breastfeed the newborn.

*"breastfeeding should commence immediately after birth... I did not commence it because I was feeling after pains. The health worker said she will bring the baby to suck. I told her to allow me to have some relief" ZA (mother 2)*

The quantitative study shows that pregnant women not encouraged to consume fluids or food at least once during labor are twice as likely not to breastfeed within the first hour compared with those encouraged to do so (RR=2.1; 95% CI=1.5-3; p=0.001). There is no evidence from the study that blood loss greater than 500mls during labor and delivery influence early breastfeeding (RR=1.17; 95% CI=0.2-5.9; p=1).

### **Human resource shortages**

1 The qualitative study shows that shortage of health workers in PHCs introduces a delay in carrying  
2 out newborn care activities. Sometimes, health workers have to attend to other ill patients when  
3 there is no one else to assist. When we asked some health workers why a mother under their care  
4 did not breastfeed early, a typical response given was:

5 *““You see, if you have someone that will assist you, you will assign the person to carry the baby to  
6 the mother and initiate the breastfeeding, or weigh the child, or apply chlorhexidine to the baby’s  
7 cord or any other thing needed while you continue with the remaining work and management of  
8 others ...but most of the time you are on duty alone. It is because we have shortage of manpower  
9 here in this facility” (birth attendant 3)*

10 The human resource shortage also affects rooming-in in the PHCs. Placing the mother and  
11 newborn in the same room after delivery is rooming-in<sup>52</sup>. Sometimes, the health worker has to  
12 clean and make this room ready for the mother and newborn. When there is a shortage of staff,  
13 this delays the transfer of the mother and newborn to the rooming-in room, and affects early  
14 breastfeeding.

15 *“I wanted to transfer the mother and baby to the postnatal ward... before she commences  
16 breastfeeding (of the newborn). The (lying-in) room is not set (for use yet). I have to clean and  
17 make the room so she is comfortable to commence breastfeeding” (birth attendant 4)*

### 18 ***Ineffective rooming-in practices***

19 When rooming-in happens, the quantitative study reveals that mothers who do not have skin-to  
20 skin contact with their newborns in the first hour after birth are twice as likely not to breastfeed  
21 early, compared to mothers who did (RR=2.3, 95% CI=1.8-2.8; p<0.001). Just keeping the mother  
22 and newborn in the same room (rooming-in) without skin-to-skin contact has no influence on  
23 early breastfeeding (RR=2.6; 95% CI=2.3-2.9; p=0.059).

### 24 ***Lack of privacy and proper visiting-hour policy in the PHCs***

25 The PHCs have open rooming-in rooms that doesn’t guarantee privacy. There are also no defined  
26 visiting hours in the PHCs. The qualitative arm of the study shows that male and female relatives  
27 visit the new mother in the hospital after childbirth. During the visit, the relatives pray for the  
28 newborn baby and congratulate the mother. Some relatives sit around after prayers for long.  
29 When relatives come visiting, the mothers have to dress up to receive them and do not breastfeed

1 during this time. The birth attendants also delay supporting the mother to breastfeed. One birth  
2 attendant suggested that addressing the issue puts them in bad light in the community.

3 *“you know, the people in the community have a unique character or attitude. The moment you try  
4 to talk to them about this kind of issue they feel you are molesting them or depriving them of  
5 coming close to their relatives. They do not know you are trying to ensure their relative (mother  
6 and baby) gets what is beneficial to them” (birth attendant 5).*

## 7 **Facilitators of early breastfeeding**

### 8 ***Health education during ANC and post-delivery period***

9 From the qualitative study, we find that Antenatal Clinics (ANC) helps pregnant women to learn  
10 about breastfeeding newborns within one hour of birth. The knowledge they gain during these  
11 clinics influences their behavior after childbirth. Most mothers who practiced early breastfeeding  
12 said what they learned from ANC influenced their decision to do so. The typical response they  
13 gave is:

14 *“I used to give my children water (after childbirth). I did not know the importance of breastfeeding  
15 early. I used to think breast feeding could start at any time of the day (of birth). I started  
16 breastfeeding early because the health workers tell us (of the importance of starting breastfeeding  
17 immediately after birth) during ANC” (mother 3)*

### 18 ***Encouraging and supporting mothers to start breastfeeding after childbirth***

19 From the qualitative study, we find that when the birth attendants encourage some reluctant  
20 mothers to breastfeed their newborns within one hour of childbirth; they do.

21 *“I was told (by the health worker) to give (the baby breast to suck early enough). Normally, I won’t”  
22 (mother 4)*

23 The encouragement process takes the form of a negotiation between the birth attendant and the  
24 mother. We find that the information passed by the birth attendants to the mothers around the  
25 benefits of early breastfeeding, facilitate early breastfeeding in the PHCs.

26 *“I commenced breastfeeding early because of what the health worker said ...she explained how it  
27 is important to the health of my baby. That’s why I commenced it” (mother 5)*



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4 1 Sometimes, showing the mothers how to place and breastfeed the newborns also facilitates early  
5 2 breastfeeding after childbirth in these health facilities.

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8 3 *“I gently encourage them and tell them to give (breast milk) early... I put the baby on her laps and  
9 4 remove the breast, and demonstrate to her how to breastfeed” (birth attendant 6)*

## 11 5 **DISCUSSION**

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14 6 In our study setting, we find that close to four out of every 10 newborns do not get breastfed  
15 7 within the first hour of birth. This doubles their risk of dying in the first 28 days of their lives<sup>10,15</sup>.  
16 8 Our estimate is four percentage points lower than what researcher observed in PHCs in Asia<sup>31</sup>. It  
17 9 is also higher than estimates amongst mothers who had spontaneous vaginal deliveries (SVD) in  
20 10 some secondary health facilities; and lower than estimates amongst mothers who had SVD in  
22 11 some tertiary health facilities, even in Nigeria<sup>31,53,54</sup>. The mixed results emphasize the influence  
24 12 of context on the early breastfeeding of newborns in different health facilities. It underscores the  
26 13 need for unique interventions to address the problem.

27  
28 14 The northeast region of Nigeria has a shortage of skilled health workers. The Boko-Haram  
29 15 insurgency has made this worse<sup>55-57</sup>. It is also worsened by staff absenteeism in PHCs in the region.  
31 16 Only about 35% of employed staff in PHCs in Gombe are likely to be at work on any given day, for  
32 17 example<sup>22</sup>. Studies suggest that a shortage of human resource and a dominant population of  
33 18 unskilled health care workers affects the quality of newborn care in health facilities<sup>17,58-60</sup>. This is  
34 19 not overall consistent with our study findings. We find that unskilled health workers are dominant  
35 20 in our study setting. Also, we find that human resource shortage is a barrier to early initiation of  
36 21 breastfeeding in the PHCs. We did not find that the skills of the birth attendants influenced the  
37 22 early breastfeeding of newborns. This may be because clinical mentors have trained the birth  
38 23 attendants in our study on newborn care. Educational interventions around support for the  
39 24 breastfeeding of newborns has been found to improve health workers' knowledge, attitude, and  
40 25 compliance with the practice<sup>61,62</sup>.

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49 26 In our study, we find that the mothers denied safe traditional birth practices like praying, reciting  
50 27 religious texts, or reading religious books during deliveries were five times more likely not to  
51 28 breastfeed the newborns than the mothers not denied. This supports the findings from other  
52 29 settings that shows that the unwillingness of birth attendants to accommodate safe traditional  
53 30 birth practices affects mothers' adoption of supportive care<sup>59,63,64</sup>. This may be because mothers

1 perceive denial of such traditional practices as mistreatment or abuse<sup>59,65</sup>. A study in Norway finds  
2 that the recent abuse of women by “both known and unknown” perpetrators affects their  
3 breastfeeding behavior<sup>66</sup>. Although in our study, we found no evidence to support this. Instead  
4 we find that birth attendants’ attitude, rapport skills, and negligence during the delivery period  
5 doesn’t affect early breastfeeding practice amongst mothers. The discrepancy in findings may be  
6 because the women in our study setting perceive or tolerate abuse differently than women in  
7 other settings<sup>67</sup>.

8 Washing of the breast with water after childbirth is a hygiene related practiced in parts of the  
9 world<sup>68</sup>. In our study, mothers express a strong need to wash the breast and/or have a bath before  
10 breastfeeding newborns. This makes the “need for a bath after childbirth” a major theme for why  
11 mothers delay breastfeeding newborns in our study setting. Some health workers also agree that  
12 mothers should wash their breasts first before breastfeeding newborns after childbirth<sup>18</sup>. Their  
13 inability to help the mothers to wash their breasts or have a bath before breastfeeding may be  
14 because there is no running water in the health facility. Only 38% of priority PHCs in Gombe have  
15 running water<sup>22</sup>. The need to wash the breast may be deeper than the need for hygiene,  
16 nonetheless. Washing of the breast or having a bath after childbirth before breastfeeding  
17 newborns has traditional and/or religious undertones in other parts of the world<sup>60,69</sup>.

18 The other barriers that influence early breastfeeding of newborn in PHCs that our study finds are  
19 post-delivery pains and fatigue within the first hour after birth, delay in skin to skin contact during  
20 rooming-in, and poor visiting hour policy in the PHC. These findings reinforces what other studies  
21 have reported<sup>5,21,24,33,41,54,60</sup>. The post-delivery fatigue may be because the mother is famished.  
22 This may also be due to anemia, infections, thyroid disorders, mood disorders and  
23 cardiomyopathy<sup>70</sup> which our study does not assess. The quantitative arm of our study shows that  
24 mothers not encouraged to take fluids or eat during the second and third stages of labor are more  
25 likely not to breastfeed early after childbirth. There is no evidence from our study that the fatigue  
26 may be due to blood loss. We also find that rooming-in is not enough and that skin to skin contact  
27 must be deliberate. Mothers that did not have skin to skin contact with their newborns while in  
28 the rooming-in room were more likely not to breastfeed than those who did in our study. Our  
29 study reemphasizes that the lack of restrictions on relatives visiting the mothers in the post-  
30 delivery period impedes breastfeeding<sup>71</sup>. This could be because the mothers don’t feel  
31 comfortable breastfeeding in front of male relatives or visitors.

1 Helping mothers to breastfeed within an hour of birth is an international recommendation  
2 practiced by health care providers in most of the world<sup>32,72</sup>. We find that birth attendants in our  
3 study setting practice this and the strategy facilitates the early breastfeeding of newborns in  
4 public PHCs. This may be because there is an awareness of the recommendation<sup>73</sup>. Our study also  
5 reinforces findings from previous studies on the benefits of health education on the timely  
6 breastfeeding of newborns<sup>74,75</sup>. In our study, we find that health education received by mothers  
7 during ANC and the post-delivery period improves the practice of early initiation of breastfeeding  
8 in public PHCs, in our study setting

## 9 **CONCLUSION**

10 Only about 60% of babies born in public PHCs in Northeast Nigeria get breastfed in the first hour  
11 of birth. This means the rest miss important nutrition that saves lives. The stakeholders in the  
12 region must increase their focus on improving the breastfeeding practices in public PHCs. This will  
13 improve the survival of newborns and impact of their investments. Instituting policies that protect  
14 mothers' privacy; and finding innovative ways to accommodate and promote safe traditional  
15 practices in the intrapartum and postpartum period in PHCs will improve the early breastfeeding  
16 of newborns in these PHCs. Birth attendants in PHCs must also be trained on effective rooming-  
17 in to further improve early breastfeeding of newborns in these public PHCs, however.

## 18 **LIST OF ABBREVIATIONS**

19 PHC (Primary Health Care hospital/facility), ANC (Antenatal Care) VHW (Village Health Workers),  
20 CHEWs (Community Health Extension Workers).

## 21 **DECLARATIONS**

### 22 **Ethics approval and consent to participate**

23 The Gombe State Ministry of Health Ethics Committee granted ethical approval for the qualitative  
24 arm of the study (reference no: MOH/ADM/658/VOL.II/104). Mothers and birth attendants also  
25 gave their consent to take part in the study before the interviews. The IDEAS team at the London  
26 School of Hygiene and Tropical Medicine (LSHTM) got ethical approval for the quantitative arm of  
27 the study from LSHTM (reference 6088).

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1  
2  
3  
4 1 The study is funded as part of the evaluation of SFH's MNCH2 project being funded by the Bill and  
5  
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7  
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9  
10 4 intervention is funded through donor grants received by SFH. The donor did not play a role in the  
11  
12 5 design of this evaluation.  
13  
14

#### 15 16 6 **Data Availability**

17  
18  
19 7 Data for the quantitative arm of the study is in a secured database at the London School of  
20  
21 8 Hygiene and Tropical Medicine. Write to Nasir Umar through [nasir.umar@lshtm.ac.uk](mailto:nasir.umar@lshtm.ac.uk) to place a  
22  
23 9 reasonable request for the anonymized version of it. Also, write to Shobo Olukolade, through  
24  
25 10 [shoboolukolade@gmail.com](mailto:shoboolukolade@gmail.com) to ask for the anonymized transcripts of the qualitative data.  
26  
27

#### 28 29 11 **Competing interest**

30  
31  
32 12 OGS and PL are consultants working for Society for Family Health (SFH), OI and JA are full-time  
33  
34 13 staff of SFH. GA is the Former Executive Secretary of Gombe State Primary Health Care  
35  
36 14 Development Agency. SFH's program in Northeast Nigeria seeks to improve MNCH outcomes in  
37  
38 15 the general population.  
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#### 41 42 16 **Author Contribution**

43  
44  
45 17 OGS conceived of the study and developed the original draft of the manuscript. OGS analyzed the  
46  
47 18 quantitative data. OGS and PL analyzed the qualitative data. NU, GA, JA, and OI reviewed, edited,  
48  
49 19 and made significant contributions to the development of the final manuscript. All authors read  
50  
51 20 and approved the final manuscript.  
52  
53

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4 School of Hygiene and Tropical Medicine, for leadership in designing and implementing the  
5 quantitative arm of the study.

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