

# Perceptions on and Practice of Breastfeeding in Pujehun district, Southern Sierra Leone

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# “Perceptions on and Practice of Breastfeeding in Pujehun district, Southern Sierra Leone”

A thesis submitted in partial fulfilment of the requirement for the degree of Master in International Health

By

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Declaration:

Where other people’s work has been used (either from a printed source, internet or other source) this has been carefully acknowledged and referenced in accordance with the departmental requirements

The thesis “Perceptions on and Practice of Breastfeeding in Pujehun district, Southern Sierra Leone” is my own work.

Signature



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KIT (Royal Tropical Institute)

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## Abbreviations and glossary

### Abbreviations

ANC	Antenatal Care
CHA	Community Health Assistant
CHC	Community Health Center
CHO	Community Health Officer
CHP	Community Health Post
CHW	Community Health Worker
CI	Confidence Interval
CUAMM	Italian acronym for University College for Aspiring Missionary Doctors
DHIS	District Health Information System
DHMT	District Health Management Team
DMO	District Medical Officer
FGD	Focus Group Discussion
FHCI	Free Health Care Initiative
HCW	Health Care Worker
IYCF	Infant and Young Child Feeding
KIT	Dutch acronym of Royal Tropical Institute
MCHA	Mother and Child Health Aid
MCHP	Mother and Child Health Post
MOHS	Ministry of Health and Sanitation
NGO	Non-government Organization
OR	Odds Ratio
PHU	Primary Health Unit
PNC	Post-natal Care
SD	Standard Deviation
SECHN	State Enrolled Community Health Nurse
SLDHS	Sierra Leone Demographic Health Survey
TBA	Traditional Birth Attendant
WHO	World Health Organization

## Glossary

Age-appropriate breastfeeding rate	Proportion of children 0-23 months of age who are appropriately breastfed. This includes exclusive breastfeeding for infants 0-5 months and children 6-23 months who received breastmilk as well as solid, semi-solid or soft food during the previous day.
Children ever breastfed rate	Proportion of children born in the last 24 months who were ever breastfed.
Complementary feeding	Starting to give other foods and liquids, along with breast milk, to meet the nutritional needs of the infant when breastmilk alone is not sufficient.
Continued breastfeeding	The child received breastmilk and timely, adequate, and safe complementary feeding for the first 2 years of life or beyond.
Continued breastfeeding at 1-year rate	Proportion of children 12-15 months of age who are fed breastmilk
Continued breastfeeding at 2-years rate	Proportion of children 20-23 months of age who are fed breastmilk.
Early initiation of breastfeeding	Starting to provide breastmilk to the infant within 1 hour after birth
Exclusive breastfeeding	The infant receives breastmilk (including milk expressed or from a wet nurse) and allows the infant to receive ORS, drops, syrups (vitamin, minerals, medicines) but nothing else
Exclusive breastfeeding under 6 months rate	Proportion of infants 0-5 months of age who are fed exclusively with breastmilk.
Facility based delivery	A birth occurring in a health facility of any level from Mother and Child Health Post through tertiary facility.
Grand multipara	A woman who gave birth to more than four children
Introduction of solid, semi-solid or soft foods rate	Proportion of infants 6-8 months of age who receive solid, semi-solid or soft foods.
Malnutrition	Deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients. I.e. undernutrition, micronutrient deficiency, overweight and obesity. In this report, malnutrition refers to the first two kinds of malnutrition.
Multipara	A woman who gave birth to more than one, but less than five children
Primipara	A woman who give birth for the first time
Stunting	Height-for-age more than two standard deviations below the WHO Child Growth Standards median. Stunting is associated with chronic malnutrition.
Teenager	A person between 10-19 years old (This study only included persons from 16 and above)
Wasting	Weight-for-age more than two standard deviations below the WHO Child Growth Standard median. Wasting is associated with acute malnutrition.

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## Abstract

In Sierra Leone, many children do not reach the age of five year. According to the Demographic and Health Survey 2013, the under-five mortality rate was 156 deaths per 1000 live births. In addition, children suffer from diarrhoea and respiratory infections. It has been well established that exclusive breastfeeding for six months and continued breastfeeding with complementary feeding for two years highly contributes to a decrease in child morbidity and mortality. Interventions to promote breastfeeding practice can positively contribute to survival, health and development of children. However, multifactorial determinants influence breastfeeding practice. Currently, the breastfeeding practice of and perceptions on breastfeeding in Pujehun district, Southern Sierra Leone, is not well known. This study aimed to gain understanding on the current breastfeeding practice in Pujehun district and to explore the perception on breastfeeding in order to develop recommendations for appropriate strategies to promote breastfeeding practice and improve child health in Pujehun district. An exploratory mixed-method study is used to answer the research questions, including a survey of 194 mothers, interviews and focus group discussions. The results reveal that although the exclusive breastfeeding rate is increasing over the years to presently 63%, there is still a gap between the practice of breastfeeding and WHO recommendations. Furthermore, this study describes among others, that nurses and husbands have major influence on feeding practice and that the perception of not having enough breast milk production and 'bad stool' of the baby are barriers for exclusive breastfeeding practice. Recommendation for interventions to improve breastfeeding practice in Pujehun district are made for District Health Management Team.

Keywords: Breastfeeding, determinants, Sierra Leone, mix-method

Word count: 12222



## Introduction

Since 2017 I have worked as a public health officer in Pujehun district, Sierra Leone, for an NGO called CUAMM, Doctors with Africa. The project I work for supports the only district hospital in Pujehun as well as the primary health care service in the district in the field of maternal and child health care. In my function, I came across a high infant and child morbidity and mortality in Pujehun district and Sierra Leone in general. In the hospital we see children under six months suffering from diarrhea, pneumonia and other infections. Practice of exclusive breastfeeding in the first six months of the life of the newborn is related with the protection against these infections. The high number of severe sick children, which potentially could have been prevented by the practice of exclusive breastfeeding, in combination with my personal experience as breastfeeding mother, triggered my curiosity to answer the questions about the status of the breastfeeding practice in Pujehun district and the question why many women in Pujehun district do not practice exclusive breastfeeding and how to improve breastfeeding practice.

Since January 2012, CUAMM started to implement a program called “Mothers and Children First” in four sub-Saharan African countries focusing on expending safe assisted deliveries and infant care. This program has now expanded to seven countries, including Sierra Leone in 2017. The project aims to ensure that the most vulnerable people – mothers and children- have access to healthcare, with the focus on the first 1000 days of life. This project gave me the chance to conduct the research described in this thesis. Furthermore, this program will be able to support the DHMT in Pujehun to implement interventions based on the recommendations derived from this study<sup>1</sup>.

## Organizations involved in the research

### **Doctors with Africa CUAMM**

Doctors with Africa CUAMM is an Italian NGO which has been supporting health service delivery in Africa for over 60 years. Currently, it is working in eight African countries (Angola, Mozambique, Ethiopia, Sierra Leone, South Sudan, Tanzania, Uganda and Central African Republic). Its main focus is maternal, newborn and child health at district level. The organization has adopted the continuum of care approach and the use of operational research as the main health service delivery strategy in its interventions. <http://www.mediciconlafrica.org/>

### **District Health Management Team, Pujehun District, Government of Sierra Leone**

The District Health Management Team (DHMT) under the supervision of the District Medical Officer (DMO) oversees planning, implementation and evaluation all the health services in Pujehun district. The DHMT develops, implements and evaluates the operational plans establish by the Ministry of Health and Sanitation (MOHS) and oversees all public health activities and health service delivery in the peripheral health units (PHUs), the health centers in the district.

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<sup>1</sup> More details on the follow-up of this study can be found in appendix 6.

## Country setting; Sierra Leone

Sierra Leone is a West-African country bordering Guinea and Liberia with a coastline of Atlantic Ocean. This country has 7,1 million inhabitants of which 14.9% lives in the capital Freetown. The country is divided into 14 districts and the capital Freetown is in Western Area Urban (Figure 1). The majority of the population (59%) lives in the rural areas of Sierra Leone. Of the total population, 40.8% are under 15 years of age, 55.7% of the population is between 15-64 years while 3.5% of the population is 65 years or above. The life expectancy of women is 51,3 years and for men 47.6 years. The majority of the households are working in the agricultural & fishing sector (54%). The literacy rate among the whole population is 51% while the literacy rate in rural areas is only 37%. (1)

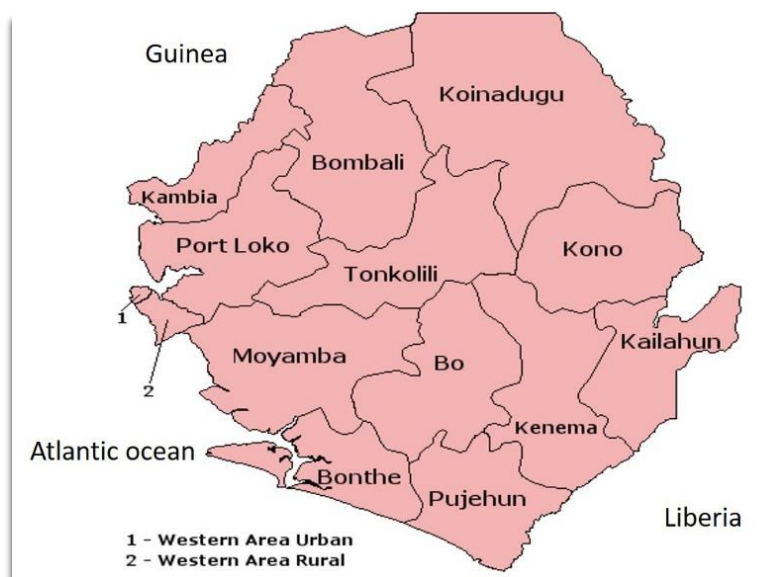


Figure 1. Map of Sierra Leone

## Health system

The structure of the health service delivery comprises the secondary health care system, primary health care system and the community as depicted in figure 2. The secondary health care consists of governmental regional or district hospitals complemented by Faith Based Hospitals and hospitals owned by Non-Governmental Organizations (NGO). In addition, a small proportion of the secondary health care is provided by the private sector. The primary health care is provided at health centers in the district called Peripheral health units (PHUs). These health centers are facilities with various levels of health care worker (HCW). From the larger to the smaller health centers are Community Health Center (CHC), Community

Health Post (CHP), and Maternal and Child Health Post (MCHP), respectively. The CHCs are all staffed with at least a Community Health Officer (CHO), who received at least 3-year training at university diploma level. CHP are staffed with at least a Community Health Assistant (CHA) who received 2-year university certificate level training. The lowest level of health center is the MCHP who are staffed with Mother and Child Health Aid (MCHA) who received a 1.5-year basic training. All health centers are linked to Community Health Workers (CHW) in catchment villages. CHWs were introduced in 2012, however CHWs were no longer active since the Ebola outbreak in 2014. Since 2016, the government presented a new CHW policy in 2016 (2). A new training program for CHWs has started in 2017 and is still ongoing prior to full implementation of the CHW system. The Ebola outbreak 2014-2015 did not only had an impact on the CHW program but the whole health system in Sierra Leone in general, among other on the training and the number of HCW and on health service delivery (3)(4). E.g. the facility-based delivery decreased more than 20% during the Ebola outbreak (4). Before the Ebola outbreak, the Free Health Care Initiative (FHCI) was launched in 2010 which introduced free health care for pregnant and lactating women and children under five year in all government facilities. This FHCI still applies to the current health care system.

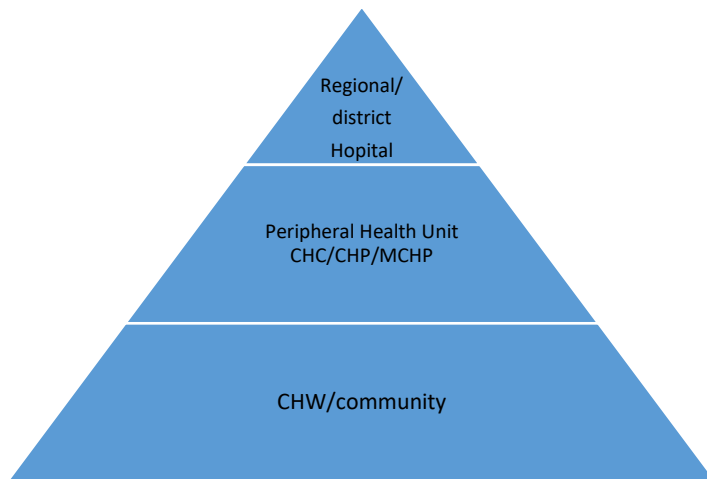


Figure 2. Overview of the health care delivery system in Sierra Leone

## Pujehun District

Pujehun District is a rural district located in the Southern Region of Sierra Leone, bordering Bonthe district, Bo district, Kenema District and Liberia. Pujehun district has a total population of 386,050 inhabitants, an estimated under-five population of 63,502 and an estimated 16,934 pregnant women per year. (Sierra Leone Statistics 2017 available at DHTM, personal communication). The majority belongs to the Mende ethnic group. Pujehun district is divided into twelve Chiefdoms (figure 3). The majority of the households (77%) are involved in agriculture (1) and 18.1% of the population above 15 years is employed by an employer(1). From the population of six years and older, 28,8% attended primary school, 12.5% attended junior secondary school and 47.4% did not attend school (5). Radio is the main mass media in the district, 44% of household have access to radio compared to 0.4% who has access to television (6). There are three radio stations covering (part of) Pujehun district. Radio regarding health promotion is mainly in the form of radio shows by the government or health care implementing partners.



Figure 3. Map of Pujehun district. Each colour represents a chiefdom. The only referral hospital is in Pujehun Town, Panga Kabonde chiefdom (yellow).

### Health system in Pujehun District

One district government hospital is serving the entire district of Pujehun regarding secondary health care. The primary health care, under supervision of the DHMT, consists of 82 health centers, including 14 CHCs. Since 2015 there is a referral system in place implemented by CUAMM, doctors with Africa. This referral system consisting of free ambulance service for pregnant and lactating women and motorbike voucher system for children under-five who need referral from the health center to the hospital.

## Background

### *Breastfeeding*

WHO recommends exclusive breastfeeding for six months for all new-borns (7). The criteria for exclusive breastfeeding are defined by the WHO as “the infant receives breastmilk (including milk expressed or from a wet nurse) and allows the infant to receive ORS, drops, syrups (vitamin, minerals, medicines) but nothing else” (8). In addition, it is recommended that the infant will receive continued breastfeeding, which includes breastmilk and timely, adequate, and safe complementary feeding for the first two years of life or beyond (9). However, it has been estimated that only 36% of all infants under six months worldwide were exclusively breastfed during the period of 2007-2014 (10). This number only increased to 40% in 2017 (11).

It has been well established that breastfeeding has major benefits for child health and survival (12). It has been shown that exclusive breastfeeding decreases mortality due to infection diseases. Breastfeeding has a protective effect against diarrhoea and respiratory infections. In addition, breastfeeding reduces severity of diarrhoea. Moreover, breastfed infants have lower risk of hospital admission. (12)(13) It has been established that improvement of breastfeeding practice, exclusive breastfeeding and continued breastfeeding up to two years, together with adequate complementary feeding has a large potential effect on child mortality and it could prevent the death of 820.000 children below the age of five years per year worldwide (10)(13).

### *Malnutrition*

Major causes of diseases and deaths are linked to malnutrition. Yearly undernutrition is associated with 45% of all child mortality, which are 2.7 million children annually worldwide (10). In 2016, globally 155 million children under-five were stunted (chronic malnutrition) and 52 million children were estimated to be wasted (acute malnutrition). Known determinants for stunting are infectious diseases, diarrhoea and suboptimal complementary feeding in children under two years (14). There is a clear role for exclusive breastfeeding in preventing infectious diseases and respiratory illness. Additional research will be important for understanding the effect of promoting exclusive breastfeeding on stunting.

### *Determinants of exclusive breastfeeding practice*

In 1990 the Innocenti Declaration was adopted by international policy makers which stated that infants should be able to receive exclusive breastfeeding for 4-6 months and should be able to receive continued breastfeeding (15). After adopting this declaration, multiple interventions have been launched to improve breastfeeding practice. Among others the ‘Baby Friendly Hospital Initiative’ was launched in 1991 to promote breastfeeding practice in health facilities (16)(17). In addition, studies have been conducted to gain more understanding on determinants of breastfeeding in different countries. In Ethiopia, it has been shown that not attending antenatal and postnatal care visit during pregnancy is associated with non-exclusive breastfeeding (18). A study from rural Uganda exploring barriers for appropriate infant and

young child feeding (IYCF) in Uganda determined that caregiver's knowledge about breastfeeding and complimentary feeding, influence of members of the community or family and burden of other responsibilities of the caregiver are barriers faced by caregivers (19). The influence of family members on decision taking on breastfeeding practice has also been investigated by Kerr et al (20). This study examined the role of grandmothers on child feeding practice in Malawi and established that grandmothers have a powerful role on child feeding practice (20). Furthermore, this study addresses the challenge to consider broader decision makers views, e.g. grandmothers, to understand breastfeeding practice. These examples show that there is a wide range of determinants contributing to breastfeeding practice.

### *Sierra Leone*

Sierra Leone is among the African countries with the highest infant and under-five mortality rate. In 2016 the under-five mortality rate was 114 per 1000 live births while the Sub-Sahara under-five mortality rate was 78 per 1000 live births and the world wide under-five mortality was 40.8 per 1000 live birth (21). In addition, Sierra Leone encounter a high malnutrition rate in children. Although the proportion of underweight children is decreasing over time in Sierra Leone, still 16% of children under-five years of age are underweight. 38% of the children under-five are stunted and 9% are wasted. In Pujehun these proportions of children are 10%, 46% and 8% respectively according to Sierra Leone Demographic and Health Survey 2013 (SLDHS 2013).(22)

According to the SLDHS2013, 97% of the new-borns were ever breastfed. However, only 32% of the infants under six months are exclusively breastfed and this percentage decreases by age. 42 % of children within the age-group 1-2 months are exclusively breastfed and this declines to 25% of children within the age-group 4-5 months. Of the children within the age-group 6-9 months, 97% are breastfed at least once in 24 hours, however, not always combined with appropriate complementary feeding. Children breastfed at least once in 24 hours declined to 48% in children within the age-group 20-23 months. The medium duration of any breastfeeding is 19.8 months. (22)

Recently, the Sierra Leone National Nutrition Survey 2017 demonstrated that exclusive breastfeeding practice has increased over the year to 61.6% compared to 32% reported in the SLDHS2013. This National Nutrition Survey also shows that Pujehun district has an exclusive breastfeeding rate of 61.3%. The neighboring districts show an exclusive breastfeeding rate of 68.1% and 45.7% for Bo and Bonthe respectively. The exclusive breastfeeding rates in all districts in Sierra Leone vary from 30.6% in Western Area Urban region to 73.6% in Koinadugu, Northern Sierra Leone. (23)

Despite the increase of exclusive breastfeeding rates in the past years, there are still opportunities to improve child health by improving breastfeeding practice. However, only limited research has been done to investigate social determinants of breastfeeding in Sierra Leone. Sharkey et al. included a section on breastfeeding in a mix method study on maternal and new-born practice in Sierra Leone (24). This study revealed that there is a belief that frequent stool of the baby is a sign that the milk is not good for the baby. In addition, there is a belief that having sex while breastfeeding will contaminate the milk. Furthermore, grey literature tells that there is a strong belief in Sierra Leone that breastfeeding is not

enough and that the colostrum is thought to be poisonous (25). In addition, several factors are known to be associated with early introduction of complementary food, among others; mothers age and the perceived size of the baby (26). However, more research is required to obtain in-depth knowledge on determinants of exclusive and continue breastfeeding practice in Sierra Leone, more specific for Pujehun district.

## Problem statement

In Sierra Leone, child mortality is one of the highest among the African countries. In 2013, according to the SLDHS, the infant mortality rate was 92 deaths per 1000 live births and the under-five mortality rate was 156 deaths per 1000 live births (22). Although more recent data published by the World Bank show a decrease in under-five mortality to 114 per 1000 live births (21), the numbers remain high and interventions are needed to work towards the Sierra Leone specific Sustainable Development Goal targets of 112, 69, 25 by 2020, 2025 and 2030 respectively (27).

Malnutrition is closely linked to major causes of death (28) and improving infant and young child feeding has a major impact on child survival and child morbidity (8). Early initiation of breastfeeding, exclusive breastfeeding for six months and continued breastfeeding highly contribute to nutritional status of children. In addition, it has been shown that breastfeeding has a protective effect on diarrhoea and respiratory infection and decrease the severity and mortality due to diarrhoea and respiratory infection (29). Despite the major benefits of breastfeeding, breastfeeding practices are not optimal Sierra Leone. According to the latest DHS in 2013 only 32% of the children aged 0-5 months are exclusively breastfed. The same DHS shows that 38% of children under-five are stunted, 9% are wasted and 16% are underweight, of which 6% severely underweight. Moreover, the DHS shows that even 46% of children in Pujehun district, a rural district in Southern Sierra Leone, are stunted.(22)

These numbers show that malnutrition among children under-five and the high child mortality are major public health issues and interventions are needed which address these public health problems. The government of Sierra Leone has set high priority on reproductive, maternal, new born, child and adolescence health and prioritized interventions in the area of child health (30).

One strategy to address under-five mortality and morbidity is by improving breastfeeding practice. Practice and factors associated with this custom must be understood in order to identify appropriate strategies to improve the practice of breastfeeding. This study aims to gain understanding on the current breastfeeding practice in Pujehun district and to explore the perception on breastfeeding in order to develop recommendations for appropriate strategies to promote breastfeeding practice and improve child health Pujehun district.



## Research objectives and research questions

The aim of this study is to gain understanding on the current breastfeeding practice in Pujehun district and the reasons behind this practice. Results from this study can be used to design appropriate interventions to improve breastfeeding practice in order to improve child survival.

### Objective

- 1) To assess the current breastfeeding practice among mothers of children under two year who visit the health clinic in Pujehun district, Sierra Leone.
- 2) To explore determinants of exclusive and continued breastfeeding practice among mothers of children under two year who visit health clinics in Pujehun district, Sierra Leone.

### Research questions

- 1) What is the current breastfeeding practice during the first two years of life among children in Pujehun district?
- 2) What are barriers for exclusive and continued breastfeeding practice in Pujehun district?
- 3) What are enabling factors for exclusive and continued breastfeeding practice in Pujehun district?

## Methods

An exploratory mixed-methods research is used to answer the research questions.

### Cross sectional survey

A cross sectional interviewer-administered pre-tested survey was conducted during May-July 2018 to collect data about the social-demographics, knowledge about breastfeeding, breastfeeding practice and about where women access information about breastfeeding (Appendix 1). The questionnaire was based on a validated questionnaire to assess breastfeeding intention and practice in Nigeria (31) and on the WHO breastfeeding indicators (32) and informed by the conceptual model of Rollins *et al.* (29). The questionnaire is provided in appendix 1. The questionnaire was translated into Krio and Mende, the main local languages in Pujehun district, and reverse translated by a second person to check for consistency. The interview-based questionnaire was pretested on five mothers of children below 24 months. The sample size is calculated to 194 based on the total estimated under-two population of 30549, a confidence level of 95% and margin of error of 10%, an expected prevalence of 0,5 (for social determinants) and a design effect of two. The 194 respondents were selected in five purposely selected chiefdoms. The chiefdoms selection was based on geographically variation (condition of road network) and variation in health seeking behaviour (% institutional delivery). The survey is conducted at facility-level during routine under-five clinic days where children receive their vaccinations and receive growth monitoring. Mothers of children under two years of age were randomly selected and asked to participate in the research. There are weekly under-five clinic days at all health centers. During clinic days all vaccination can be given, from the 1<sup>st</sup> vaccination of BCG until the measles vaccination for children >15 months. Five health centers (CHCs) were purposely selected based on the size of the target population. Inclusion criteria that the woman is a mother from a child under two years of age and the mother is 16 years or above. Exclusion criteria is woman not being the biological mother. The interviewed-administered questionnaires were filled in on paper.

### Semi-structured interview

In a convergent parallel approach, 20 mothers of in five CHCs (four mothers in each chiefdom) were purposely selected and asked to participate in a semi-structured interview after completing the questionnaire. This interview was used to collect more in-depth information on what kind of information mothers received before and during the time of breastfeeding, why mothers decide to continue or to stop with breastfeeding and who or what influenced that decision. The questions were translated into the Krio and Mende and reverse translated by a second person to check for consistency. The interview was pretested on two mothers of children under two years. Participants were purposefully selected based on exclusive breastfeeding under six months (one per center), non-exclusive breastfeeding under six months (two per center), one mother with a child 6-23 months.

In addition, six HCWs were purposely selected for semi-structured interview in order to collect data on health system level regarding breastfeeding at health system level. Criteria for selection was 'working with pregnant and lactating mothers' and different cadres of HCWs were asked to participate in the study,

including MCHA (2), SECHN (State Enrolled Community Health Nurse) (1), CHO (1), midwife (1) and district nutritionist (1). HCWs working in the health centres as well as in the hospital were selected. The language of the interview was in English. All interviews were radio-recorded and notes on paper were made during the interviews. Topic guides of all interviews are provided in appendix 2.

#### Focus group discussions

Subsequently in July 2018, a sequential mix method approach was used to further develop the topic guide for Focus Group Discussions (FGDs). FGDs was used as data collection method to further explore findings raised from the questionnaires and semi-structured interviews. The FGD topic guide was informed by the analysis of the questionnaires and semi-structured interviews and by the conceptual model of Rollins *et al.*(29) Topic guides of FGDs are provided in appendix 3. A pilot FGD was conducted with non-project team members. Seven FGDs were conducted with mothers of children under two years, fathers and community members. The participants were selected from two communities where questionnaires have previously been conducted. Four FGDs were conducted at a health centre and two FGDs (with fathers and community members) took place at a community building in village of the catchment area of one of the health centres. In addition, one FGD was conducted with HCWs from the district. The FGDs were conducted in Mende, except the FGD of the HCWs which was conducted in English. All interviews and FGDs and were radio-recorded. In addition, notes on paper were made during the FGDs.

#### Data collection and analysis

The data from the questionnaire was entered in a Kobo toolbox database, stored on a protected server. The data was systematically analysed using Epi-Info 7 and MS Excel. All data entry was double checked by the main investigator and a sample of the data was cross-checked by a second member of the research team as part of data quality assurance procedure. The statistical analyses of exclusive breastfeeding rate were based on 24-hours recall including 113 participants (mothers of children under six months). The statistical analysis of the determinants was based on recall from birth including all 194 participants.

The audio recording of the interviews and FGDs were transcribed and translated into English by bilingual (Krio Mende and English) speaker. Analysis of the transcript was based on the deductive content analysis approach.

Recent series on breastfeeding in the Lancet presented a conceptual model on determinants and interventions affecting breastfeeding practice whereby the authors structured determinants in multiple levels (figure 4) (29). The first level is related to structural determinants. This relates to social cultural and market context, including social trends and the experience of reactions on women feeding in public and at work. The second layer relates to settings, whereby health systems and services, family and community, and workplace and employment influence decision making concerning breastfeeding practice. The third layer in the conceptual model refers to individual breastfeeding behaviour including mother's age and education and the mother-infant relation. This framework of *Rollins et al.* is used during the development of the study design and for analysis of the results for this study.

The data was coded and systematically analysed using a Framework Methods as described by *Gale et al.* 2013 (33). Excel MS was used for coding purposes. One sheet of the excel document was used for every determinant (theme) of the conceptual framework, social-cultural and market context, health system and services, family and community, workplace and employment, mother and infant attribute, mother-infant relationship. Each determinant was divided into subcomponents (coding) (Appendix 4). The coding was discussed with other research team member.

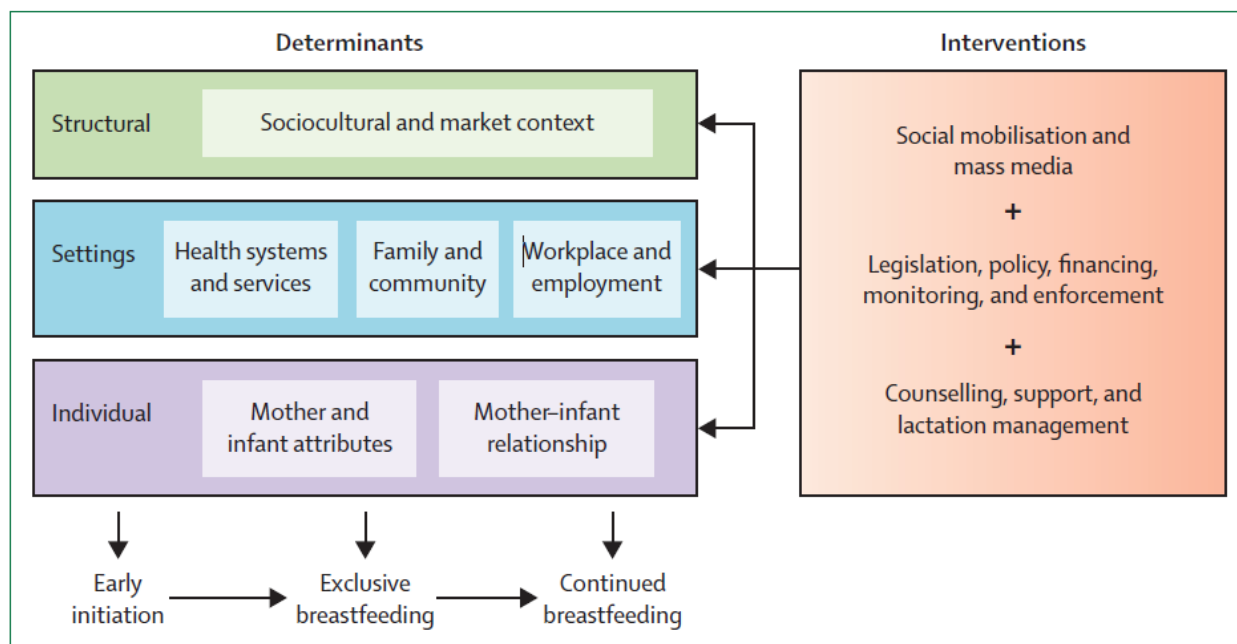


Figure 4. Determinants of breastfeeding. A conceptual framework adopted from *Rollins et al* (29).

### Literature search strategy for background information

Pubmed database has been used to search for literature on breastfeeding. Terms which were used are; Breastfeeding; Sierra Leone; Africa; West-Africa; Low research setting; determinants; Interventions; Young Child feeding; and combinations of these terms.

In addition, the WHO and World Bank websites has been used to search for guidelines, policies and updated information regarding breastfeeding. Furthermore, Google has been used to search for (grey) literature and national guidelines and strategies regarding breastfeeding in Sierra Leone. Also, reference-search has been used to examine literature cited by others.

Only English articles and articles published since 2000 are included in the study (except publication on the Innocent declaration published in 1990).

## Ethical approval

The study was granted ethical approval by the Sierra Leone Ethics and Scientific Review Committee and the KIT Research Ethical Committee of the Royal Tropical Institute, Amsterdam, the Netherlands.

Participants were not coerced to participate in the study. Interviewees were not named at the questionnaire as well as the interviews. All data were handled confidentially, and participants are not traceable for persons outside the research group. All participants were asked to sign a written consent form in an appropriate language (English/Krio) before the participants participated in the study. In case of illiteracy a literate witness signed, and the illiterate participant signed using their thumb print. Further ethical considerations can be found in appendix 5.

## Results

### Overview of participants

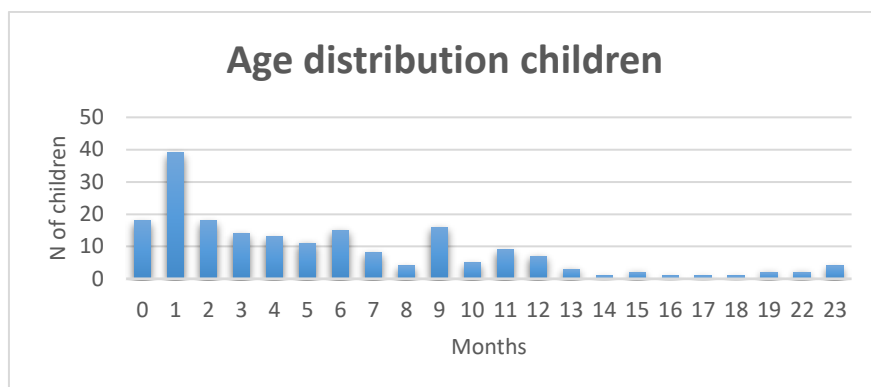
In total 194 mothers of children under two years old responded to the interviewer-administered questionnaire including 113 mothers of children under six months and 81 mothers of children 6-23 months. The mean age ( $\pm$ SD) of the participants was 24.5 (6.6) years with a range from 16 to 45 years. For 53 mothers (27.3%) the child they came with to clinic was their first child (primipara). The range multipara was 2-11 births. The mean age ( $\pm$ SD) of the infants was six months (5.3) with a range of two days to 23.9 months. The age distribution of children is shown in graph 1. The majority of the mothers are self-employed (56%) (e.g. farmer or trader), while 8% are student (all secondary school). The vast majority of the mothers are married or have a partner (93%). Of the mothers interviewed 43% reported not to have received education, while 38% attended secondary education. These and other social-demographic characteristics are shown in Table 1.

Variable	Mothers of child <6 months		Mother of Child 6-23 months	Total
	n (%)	n (%)	n (%)	n (%)
<b>N of participants</b>	113 (58.2)	81 (41.8)		<b>194 (100)</b>
<b>Age of the mother</b>	16-19	30 (28.3)	18 (23.7)	<b>48 (26.4)</b>
	20-25	44 (41.5)	27 (35.5)	<b>71 (39.1)</b>
	26-30	17(16.0)	20 (26.0)	<b>37 (20.3)</b>
	31-35	5 (4.7)	5 (6.5)	<b>10 (5.5)</b>
	>35	10 (9.4)	6 (7.8)	<b>16 (8.8)</b>
<b>Mothers education</b>	No education	48 (42.5)	35 (43.2)	<b>83 (42.7)</b>
	Primary education	24 (21.2)	16 (19.8)	<b>40 (20.6)</b>
	Secondary education	39 (34.5)	30 (37.0)	<b>69 (35.16)</b>
	Tertiary education	2 (1.8)	0	<b>2 (1.0)</b>
<b>Mothers occupation</b>	Employed	3 (2.7)	0	<b>3 (1.6)</b>
	Housewife	42 (37.2)	18 (22.2)	<b>60 (30.9)</b>
	Self-employed	57 (50.44)	52 (64.2)	<b>109 (56.2)</b>
	Student	7 (6.19)	9(11.1)	<b>16 (8.3)</b>
	Other	4 (3.5)	2 (2.5)	<b>6 (3.1)</b>
<b>Marital status</b>	Married/ partner	105 (92.9)	78 (96.3)	<b>183 (94.3)</b>
	Single	8 (7.1)	3 (3.7)	<b>11 (5.7)</b>
<b>Child sex</b>	Male	60 (53.1)	41 (50.6)	<b>101 (52.1)</b>
	Female	53 (46.9)	40 (49.4)	<b>93 (47.9)</b>
<b>Parity</b>	Primipara	30(26.5)	23(28.4)	<b>53 (27.3)</b>
	Multipara (2-4)	64(56.6)	39(48.1)	<b>103(53.1)</b>
	Grand multipara (>4)	19(16.8)	19(23.4)	<b>38(19.6)</b>
<b>Number of children the women gave birth to (mean, SD)</b>	3.0(2.1)	2.9 (2.1)	3.1 (1.0)	<b>3.0 (2.1)</b>
<b>Children alive (mean, SD)</b>	2.4(1.5)	2.4(1.5)	2.5 (1.5)	<b>2.4(1.5)</b>

Mothers were asked about several maternal health related components. Table 2 shows the main maternal health related characteristics. The vast majority of the mothers attended antenatal care (ANC) at least one time (193, 99.5%) and 66.4% (129) received postnatal care (PNC). During pregnancy most of the mothers received information about feeding of children (182, 94%), although not all of those who received information of feeding reported to have received information on the benefits of breastfeeding (177, 91%). All except two indicated to have had a facility-based delivery (either hospital or health center). 71.6% (139) of the mothers reported to have given the first breastfeeding within one hour and 76% (147) had assistance during the first breastfeeding by a health care worker. Of those who reported to have breastfeeding problems (22), 18 reported to have nipple pain (9% of total mothers).

**Table 2. Maternal health related characteristics of mothers with children under 2 year in Pujehun district.**

<b>Variable</b>		<b>Number</b>	<b>%</b>
<b>Attending ANC</b>	Yes	<b>193</b>	99.5
	No	<b>1</b>	0.5
<b>Attending PNC</b>	Yes	<b>129</b>	66.5
	No	<b>65</b>	33.5
<b>Receiving information on feeding during pregnancy</b>	Yes	<b>182</b>	93.8
	No	<b>12</b>	6.2
<b>Receiving information on health benefits of breastfeeding during pregnancy</b>	Yes	<b>177</b>	91.2
	No	<b>17</b>	8.8
<b>Place of delivery</b>	Health center	<b>138</b>	71.1
	Hospital	<b>54</b>	27.8
	Home	<b>2</b>	1.0
<b>Mode of delivery</b>	Vaginally	<b>175</b>	90.2
	Caesarean section	<b>19</b>	9.8
<b>Initiation of breastfeeding (time after delivery)</b>	Within one hour	<b>139</b>	71.6
	Between 1-24 hours	<b>47</b>	24.2
	More than 24 hours	<b>8</b>	4.1
<b>Assisted by health care worker during the first breastfeeding</b>	Yes	<b>147</b>	75.8
	No	<b>47</b>	24.2
<b>Problems during breastfeeding</b>	Yes	<b>20</b>	10.3
	No	<b>174</b>	89.7
	Mastitis	<b>4</b>	2.1
	Nipple pain	<b>18</b>	9.3



Graph 1. Age distribution of the children from the surveyed mothers

Table 3 shows the number of semi-structured interviews and FGDs conducted. Of the mothers who participated for the questionnaire 20 were purposely selected for a semi-structured interview. Of these 20 mothers, there were five mothers of a child under six months who reported to practice exclusive breastfeeding. Ten mothers of a child below six months who reported not to practice exclusive breastfeeding and five mothers of a child aged between 6-23 months.

		Number of participants	
<b>Semi-structured interview</b>	Mothers of children under 2 year	20	
	Health care worker	6	2 MCHA (f), 1 SECHN(m), 1 CHO(m), 1 midwife (f), 1 nutritionist(f)l.
<b>FGD (n of FGDs x n of participants)</b>	Mother of children under 2 years	1x7	
	Fathers of young children	1x8	
	Community members	2x9	
	Health care worker	1x9 1x11	Including town chiefs, TBAs, Women leaders, traditional healers, youth leaders, mothers in law and religious leaders.
	Health care worker	1x6	5 MCHA (f), 1 SECHN (f)

### Breastfeeding practice among respondents

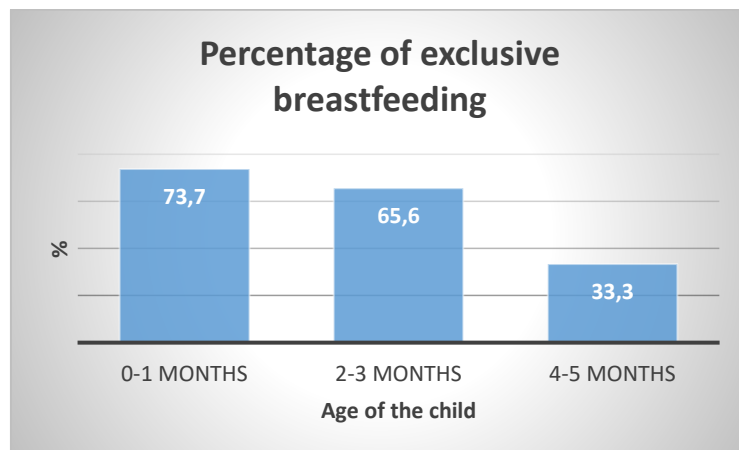
Several indicators have been proposed by the WHO to assess child feeding practice for children 0-23 months of age(8) (table 4). One of these indicators is early initiation of breastfeeding, which is defined as 'Proportion of children born in the last 24 months who were put to the breast within one hour of birth'(8). In this study, the early initiation rate is 71.6% (95% CI 65.2- 78.1) among all surveyed mothers (table 4).



The indicator 'Exclusive breastfeeding under six months' is defined as the proportion of children 0-5 months who are fed exclusively with breastmilk during the previous day (24-hour recall). Of the 113 mothers of children under six months, 42 reported to have given solid, semi-solid, or soft food in the last 24 hours (37%) and 71 mothers of children under six months reported to have only given breastmilk in the last 24 hours (62.8%). This results in a reported exclusive breastfeeding rate of 62.8% (95% CI 53.9-71.7) based on a 24-hour recall (table 4). Further disaggregated data into smaller age groups revealed that of the children within the age group 0-1 months, 74% of the infants are exclusively breastfed. As shown in graph 2, exclusive breastfeeding decreases in the age groups 2-3 months and 4-5 months to 66% and 33% respectively (based on 24-hours recall).

In addition to the above calculation, a similar reported exclusive breastfeeding rate of 65% is calculated based on a recall from birth including all 194 participants (126/194). This calculation is revealed from the question how old the baby was when they first introduced anything else other than exclusive breastfeeding.

The mean age of the introduction of anything else other than breastmilk among all the children under six months is 3.2 months (SD±1.67). This is based on 24-hour recall. Considered all 194 mothers, the mean age of introduction of anything else than breastmilk is 3.95 months (SD±2.26) based on recall from birth.

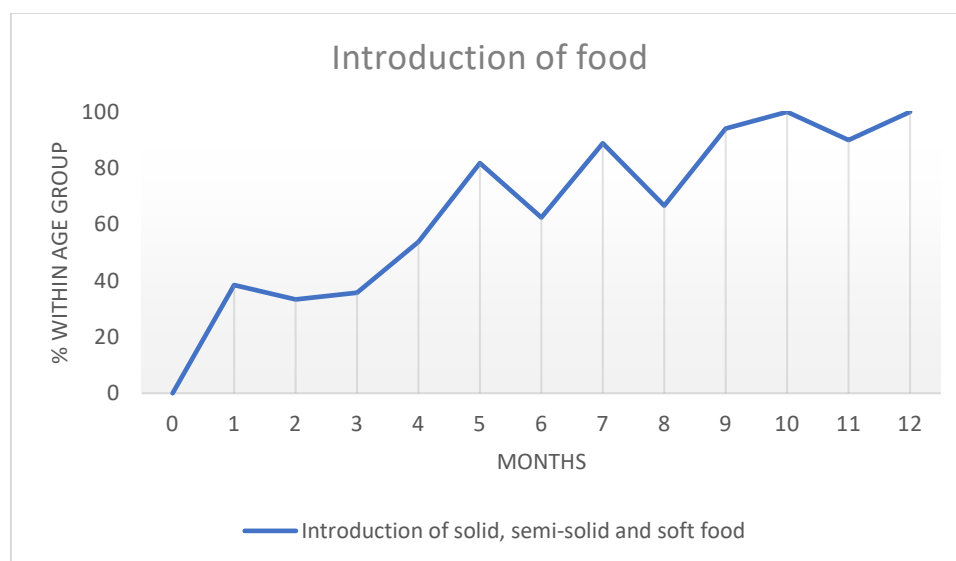


Graph 2. Percentage of exclusive breastfed children per age group (based on 24-hours recall).

All surveyed mothers (194, 100%) reported to have ever breastfed their child. All mothers of children between 12-15 months (12 out of 12, 100%) reported to have continued to breastfeed at 1 year least once a day (indicator 'continued breastfeeding at 1 year' defined as 'Proportion of children 12-15 months of age who are fed breastmilk') (table 4). Two-third of the mothers of children between 20-23 months reported to have breastfed in the last 24 hours, however the sample group is small (n=6).

The introduction of solid, semi-solid, and soft food is recommended starting from six months of age (8). The indicator 'introduction of solid, semi-solid and soft food' is defined as 'Proportion of infants 6-8 months of age who receive solid, semi-solid or soft foods'. As depicted in graph 3 the percentage of introduction

of other food besides breastfeeding are gradually going up to a percentage of 70% (21 out of 30, 95% CI 53.6-86.4,) of children between 6-8 months receiving solid, semi-solid or soft food at least once during the last 24 hours (table 4) and 94% (95% CI 85.4-102.1.) at age group 9-11months.



Graph 3. Trend of introduction of solid, semi-solid and soft food for children 0-12 months among all participants (based on 24-hours recall). The percentage for each month calculated based on the children included in the study of that specific month who received solid, semi-solid or soft food the day before the survey or during the night. Sample size for each age groups varies from 5 to 39 as depicted in graph 1.

133 of the 194 mothers (68.6%, 95% CI 62.0-75.1) are given age-appropriate breastfeeding to their children. This indicator includes exclusive breastfeeding for infants 0-5 months and children 6-23 months who received breastmilk as well as solid, semi-solid or soft food during the previous day.

Indicator	Number	%	95% CI
Early initiation of breastfeeding	139 (of 194)	71.6	65.2-78.1
Exclusive breastfeeding under 6 months	71 (of 113)	62.8	53.9-71.7
Continued breastfeeding at 1 year	12 (of 12)	100.0	
Introduction of solid, semi-solid or soft foods	21 (of 30)	70.0	53.5-86.3
Children ever breastfed	194(of 194)	100.0	
Age-appropriate breastfeeding	132 (of 194)	68.6	62.0-75.1

## Determinants of breastfeeding practice

Participants of the survey as well as the interviews and FGDs were asked about determinants of breastfeeding. The determinants are described below according to the conceptual model of *Rollins et al* (29) as depicted in the Methods section. Potential determinants revealed from the survey were investigated for correlation with breastfeeding practice. The interviews and FGDs were aimed to further explore whether determinants influenced breastfeeding practice and to get more understanding from participants perceptions on breastfeeding. Factors significantly associated with exclusive breastfeeding are shown in table 5. The odds ratios (OR) compared the group mothers who reported to give exclusive breastfeeding with the group of mothers who reported not to practice exclusive breastfeeding for six months.

Variable	OR (95%CI)	P-value	Correlation
Receiving information during pregnancy on benefits of breastfeeding	0.34(0.1-0.9)	0.03	0.15
Having family and friends who give breastfeeding	4.3(2.1-8.9)	0.01	0.18
Having family and friends giving breastfeeding and formula milk (negatively associated)	1.1 (0.4-3.2)	<0.001	-0.29
Knowing what kind of feeding family and friends give to their child	2.3 (1.0-5.0)	<0.001	0.10
Mother knowing to be breastfed herself as child	0.4 (0.2-0.8)	0.01	0.20
Age 20 years and above	3.7 (1.9-7.3)	<0.001	0.28
(Grand) multipara	3.1 (1.6-6.1)	<0.001	0.25
Intention during pregnancy to give breastfeeding	0.2 (0.1-0.4)	<0.001	0.16
Nipple pain (negatively associated)	4.3 (1.5-12)	0.03	-0.21

### Structural – Sociocultural and market context.

Mothers participating in the survey were asked whether they have ever received information on breastfeeding or formula milk via radio. Almost all women (181/194, 93%) reported hearing about breastfeeding on the radio, while 52% (102/194) of all women reported to have received any information on formula milk on the radio. The qualitative data confirmed that listening to the radio is a way to receive information on breastfeeding. The people receiving information in this way are not limited to the mothers. Fathers, family and other community members indicated to have received information via the radio on breastfeeding as revealed by the FGDs.

*“They advise us [on the radio] about exclusive breastfeeding for six months and take good care of our babies.”* (Mother, Bandajuma)

*“Yes, we get a lot of learning from the radio and hospital that breastmilk is good for babies.”* (Father, Bandajuma)

The qualitative research did not reveal further clarification on the advertisement on formula food. Interestingly, it suggested that mothers are in favor of giving biscuits to their children and they consider biscuits as a meal (not specifically for children under or above six months). A nutritionist indicated that the picture on the package of the biscuits shows a well-nourished baby and this could shape the ideal picture of a baby. *“People are fan of biscuits. Because they see a fat child on the package of the biscuit. They think that their child become like that when they will give the child biscuit.”* (Nutritionist)

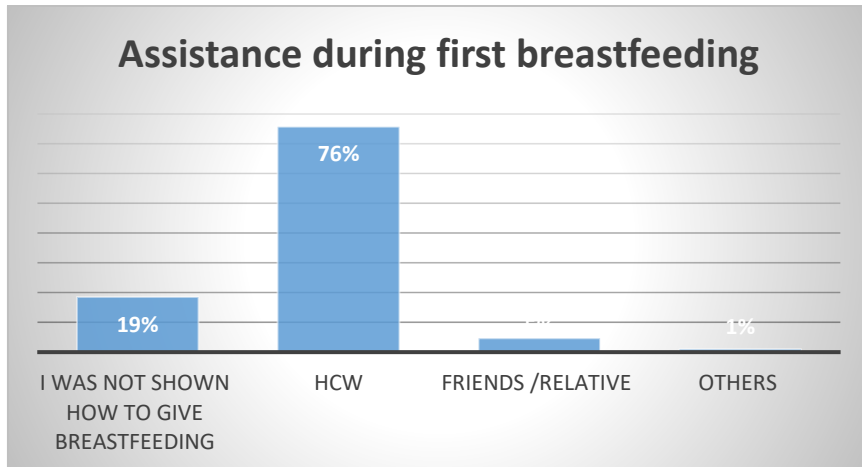
## Settings - Health system, and services

### Determinants on early initiation of breastfeeding.

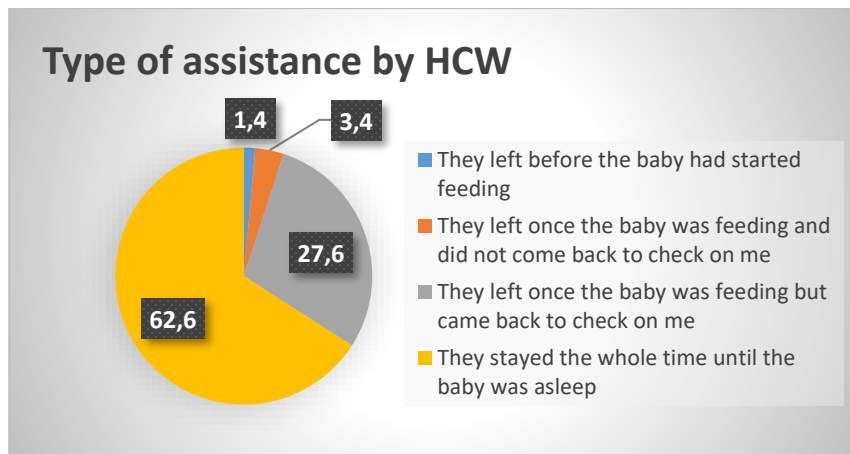
175 women (90%) had a vaginal delivery while the others had a caesarean section. Although the mode of delivery is not significantly associated with exclusive breastfeeding practice, vaginal delivery is positively associated with early initiation of breastfeeding ( $P < 0.001$ , table 6). Furthermore, being assisted by an HCW during the first breastfeeding is significantly associated with early initiation ( $P < 0.001$ , table 6). 76% (147/194) of the women reported to be assisted by a health care worker during the first breastfeeding, while 19% (36/194) of the women indicated that they did not receive any assistance while giving the first breastfeeding. This reveals that although the vast majority of the mothers delivered at a facility (99%), not all women were assisted by the HCW during the first breastfeeding. 6% (11/194) of the mothers were assisted with the first breastfeeding by friends or family or someone else (graph 4). 61% of all women reported to be assisted with the first breastfeeding within one hour after birth. (71.6% of all women reported to have given the first breastfeeding within one hour). From the 138 mothers who delivered in a health centre 81% (112/138) were assisted by an HCW, although among the 54 who delivered in the hospital only 65% (35/54) were assisted by an HCW. When women were assisted by an HCW, most of the HCW stayed with the woman until the baby was asleep, while only 1.4% of the HCW left before the baby was drinking (graph 5). The assistance by an HCW during early initiation was also mentioned during interviews and FGDs with the mothers. *“When I gave birth, after the cutting of the cord, my aunt who was the nurse, took the baby and placed him on my chest to breastfeed him. She assisted me any way.”* (Mother, Sahn Malen). In addition, the HCWs see it as part of their role to assist the woman with the first breastfeeding. *“To put the baby to the breast. That is my role.”* (MCHA). Also, the midwife in the hospital see it as their role to promote breastfeeding, however, the find challenges in promoting breastfeeding because of time constrains. *‘Yes, we try (to give health talk), when they are in the ward, when we have time..... They spend less time with us and most of the time we tend to forget to talk about breastfeeding. They deliver, and they are fine.’* (HCW hospital).

**Table 6. Factors associated with early initiation of breastfeeding**

Variable	P-value	OR (95%CI)	Correlation
Vaginal delivery as mode of delivery	$P < 0.001$	18.6 (5.2-67.1)	0.41
Assisted by HCW during early initiation	$P < 0.001$	5.0 (2.5-10.2)	0.34



Graph 4. Persons who gave assistance during the first breastfeeding as mentioned by surveyed mothers.



Graph 5. Type of assistance received by surveyed mothers during the first breastfeeding by an HCW.

### Information on breastfeeding

Almost all women did receive at least one ANC (99.5%). ANC visit is an opportunity to receive information on child feeding. 182 of the 194 women (94%) indicated to have received information during pregnancy on feeding of the child, although slightly less women (177/194, 91%) received information during pregnancy on health benefits of breastfeeding. Only providing information is not a factor significantly associated with exclusive breastfeeding. However, receiving specific information on the benefits of breastfeeding is significantly associated with exclusive breastfeeding practice (P0.03, based on recall since birth, table 5). In general, the health centre is the place to receive information on breastfeeding. 92% (179/194) of the surveyed mothers received information at the health centre and all 20 women

interviewed mentioned to have received information on (exclusive) breastfeeding at the health centre, either during pregnancy, just after giving birth or during clinic visits with their new-born. Examples of the information given around exclusive breastfeeding are shown in box 1 as is mentioned by mothers during the interviews and FGDs.

Box 1. Information given at the health center around exclusive breastfeeding

Breastfeeding is good  
Exclusive breastfeeding for 6 months  
The child becomes healthy, strong, fat and smart  
The child will not get malnourished  
The child will not get sick  
Don't give anything else than breastfeeding  
Do not give hot water, native herbs, other food

Furthermore, this study reveals that HCWs have major influences in the decision-making process around child feeding. 56% (108/194) of the mothers indicated that the HCW helped them to proceed with breastfeeding. Qualitative findings show that a large majority of the interviewed mothers stated that the HCW influenced them in giving breastfeeding to their child. (Box 2)

Box 2. Quotes related to the influence of the health care worker on decision-making around feeding

*'It was the nurse [who influenced me the way I give feeding to my baby].'* (Mother, Pujehun)  
*'After two weeks she was just crying, I want to give him [powder] milk but the nurse advised me [not to give powder milk].'* (Mother, Sahn Malen).  
*'The nurses [made me to feed him this kind of way.]'* (Mother, Pujehun)

Although the majority of the mothers indicated that the HCW advised them to give six months exclusive breastfeeding, some mothers responded on the question that the HCW informed them otherwise. *'They said she should suckle the breast milk for two months or for one month.'* (Mother Bandajuma).

In addition to the HCW, also the Community Health Workers (CHWs) provide information on breastfeeding in the villages. While mothers indicated that they received information from HCWs at the health centre, some fathers and community members received information from the CHWs. *'We have CHWs who are also helping to inform us.'* (Father Bandajuma).

### **Role and training of the HCW**

Most of the information on breastfeeding given at the health centre is given by MCHA. They also see it as their role to inform and counsel the mothers on exclusive breastfeeding. *'My role? So, I have to advise the mothers, one-to-one counselling'* (MCHA Pujehun). They mentioned that they provide information by

giving health talks and one-on-one counselling during ANC and directly after birth. All HCWs participated in this study were convinced that exclusive breastfeeding for six months should be the standard for all children.

During interviews and FGD the HCWs indicated that they got training on nutrition during their course and some received refresher training. However, they also indicated that are not aware of guidelines, protocols or tools.

## Settings – Family and community

### **Husband**

Women were asked who helped them to continue breastfeeding and who influenced them to stop exclusive breastfeeding. Of all the surveyed mothers 19% (37/194) indicated that their husband helped them to continue breastfeeding. Of these 19%, 78% (24/37) of the surveyed mothers practiced exclusive breastfeeding. Furthermore, 9% (6/68) of the mothers who did not practice exclusive breastfeeding for six months indicated that their husband influenced them to stop breastfeeding. During the qualitative interviews a quarter of the mothers stated that they get support from their husbands. The kind of support they mentioned is provision of food and encouragement. The fathers themselves see the role for the husband to provide food and to encourage the mother (Box 3).

Only 11 surveyed women indicated that they are single. All of these single mothers did not practice exclusive breastfeeding with a correlation coefficient of -0.33. Because of the low number of single mothers, statistical significance could not be calculated.

The qualitative data revealed that there is believed that having sex during breastfeeding will contaminate the breastmilk and will lead to malnutrition (Box 4).

Box 3. Comments regarding husband's involvement on child feeding practice

*'The father of the baby [is supporting me] because he is given me enough food. He is encouraging me.'* (Mother, Sahn Malen)

*'My husband support me like providing food for me.'* (Mother, Bandajuma)

*'We the fathers should support the lactating mothers with enough food so that they can feed our babies well. Encouragement is also important because without encouragement the woman will find it difficult to breastfeed their baby.'* (Father, Pujehun)

*'Yes, if you are a farmer, businessman, carpenter just work hard to provide food for your wife. If not she will not breastfeed your baby exclusively because she will go out for food. When your wife is without food, she will disobey you.'* (Father, Bandajuma)

*'Most people used to say that new born baby on exclusive breastfeeding will feel hungry, and sometimes they feed the baby with hot water, but now I have realized that is a lie that the best food for baby is breastmilk. In fact, given hot water to baby will result to caught.'* (Father, Pujehun)

*'For the hot water, it is his father, because stomach kept drying, so he told me to give her the hot water one morning and after which the child has a stool.'* (Mother, Zimmi)

*'Most of women also refused to breastfeed their baby because of lack of encouragement from their husband and parents. Today most young husbands do not take care of their wife they will neglect them for another woman because they are lactating mothers'* (Mother FGD, Bandajuma)

Box 4. Comments regarding sex and breastfeeding

*'[no sex] For simple reason that it will affect the breastmilk and if you feed your baby with such breastmilk will lead to malnutrition. Also, maybe just having sex will lead to another pregnancy which will not give room for proper caring of the young baby. For me whenever my wife is breastfeeding, I go out.'* (Father Pujehun)

*'I heard a mother went to have sex with someone else to have food and then the child became ill.'* (Father Bandajuma)

### Family and friends

Influences of other family members and friends is mentioned to a lesser extent by the mothers who responded to the survey. 4% (8/194) of all mothers indicated to be supported by family and 10% (7/68) of the mothers who are not practicing exclusive breastfeeding indicated that family members influenced them to stop exclusive breastfeeding. Qualitative findings reveal that a quarter of the mothers indicated that family members influenced them in decision making. Influences of other family members is also



mentioned by the fathers and community members. The influence of the family can be both contributing factor for exclusive breastfeeding as well as barrier for exclusive breastfeeding.

*'Family, my mother. She used to tell me that people were saying that breast milk is very good for the baby and it is good that every mother should breastfeed her baby from birth to six months.'* (Mother Gbondapi).

*'At four months. My aunty told me to try other food. Corn milk.'* (Mother Pujehun)

*'At first somebody in the community will come and just say there is bad water in the stomach of the baby and the only thing that will remove the bad water is hot water.'* (Community member, Bandajuma)

Interestingly, the way family and friends feed their babies is associated with exclusive breastfeeding. The awareness of the mother that friends and family are giving breastfeeding is significantly associated with exclusively breastfeeding practice of the mother ( $P < 0.001$ , table 5). Of the women who indicated that most of their family and friends give breastfeeding, 82% (53/65) practice exclusive breastfeeding. In addition, family and friends giving breastfeeding combined with formula is negatively associated with practicing exclusive breastfeeding ( $P < 0.001$ , table 5). Also knowing what family and friends are given to their children is associated with exclusive breastfeeding practice ( $P = 0.03$ , table 5). Furthermore, knowing that the mother herself was breastfed as a baby is associated with exclusive breastfeeding practice ( $P < 0.001$ , table 5). 51% of the all surveyed mothers did not know how they were fed themselves as baby.

### Settings - Workplace and employment

Although the majority of the surveyed women indicated that it is possible to breastfeed during work, FGD participants suggested that women experience difficulties with exclusive breastfeeding practice while farming.

*'They don't have time to sit and breastfeed their babies, some as the result of farming, while the baby will be in the hut, they will be busy working on the farm. So, most time they give enough of strong food<sup>2</sup> so that they will have time to do their farm work.'* (Mother, FGD Bandajuma)

*'Also, those who work on farm find it difficult to come to the hut repeatedly, so they give hot water to the baby so that that baby will sleep, and the mother will have time to work on the farm.'* (Mother, FGD, Bandajuma)

*'Some women start weaning at two months and start giving pap. If you give pap, the child will sleep more and more so you have more time to work.'* (HCW, FGD Pujehun)

Furthermore, although being a student is not statistically significantly associated with breastfeeding practice, FGD participant suggest that school going mothers have difficulties with breastfeeding their child.

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<sup>2</sup> Like corn milk or benimix (porridge of rice, beans, fish, sesame seeds or groundnuts, homemade or pre-packed)

*'Some lactating mothers are school going pupils so most time they leave their babies with their parents at home, so if they are crying the only way is to give milk or hot water because of they are crying.'* (Mother, FGD Bandajuma)

## Individual – Mother and infant attribute

### **Age and parity of the mother**

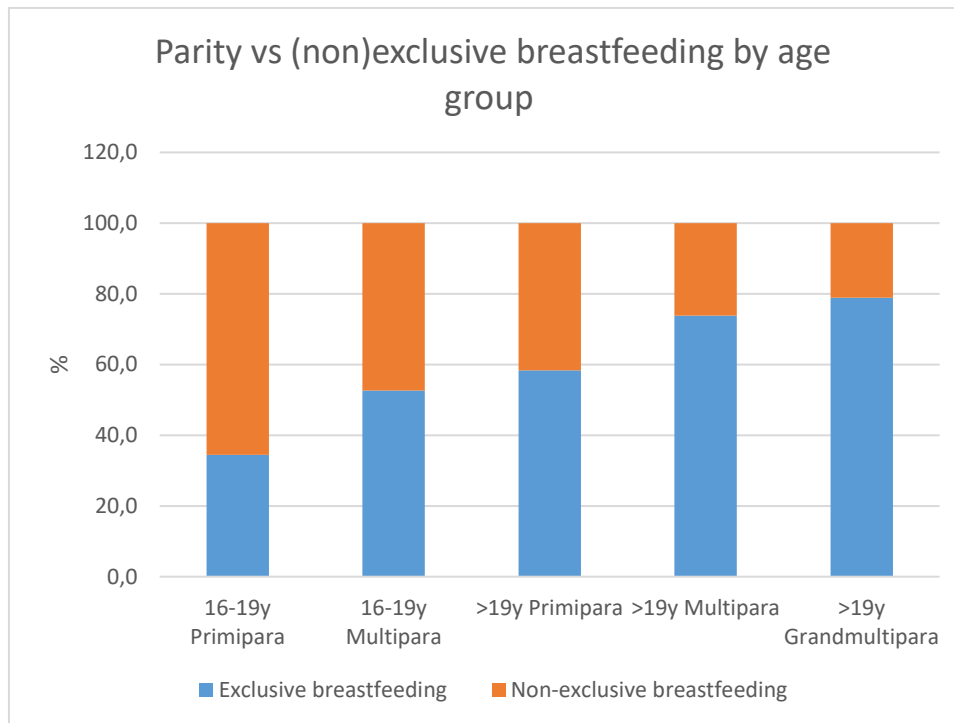
The age of the mother is significantly associated with exclusive breastfeeding. While 73% (106/146) of the mothers above 19 years practice exclusive breastfeeding, only 42% (20/48) of the teenage mothers (16-19 year) practice exclusive breastfeeding ( $p < 0.001$ , table 5). Several potential reasons are given by participants of FGDs why some teenage mothers don't practice exclusive breastfeeding. This includes, going to school, belief that 'the breast will slack' (sagging of the breast), and no time for breastfeeding because they go to clubs and other places for enjoyments.

In addition, there is a significant association between the parity of the mother and exclusive breastfeeding. 72% (102/141) of the (grand)multipara give exclusive breastfeeding, while only 45% (24/53) of the primipara practice exclusive breastfeeding ( $P < 0.001$ , table 5).

Of all primipara mothers, 55% (29/53) are teenager. Although less teenagers primipara practice exclusive breastfeeding (10/29, 34%), also the exclusive breastfeeding rate of primipara mothers above 19 years of age is lower (14/24, 58%) than the exclusive breastfeeding rate of (grand)multipara as shown in graph 6.

In the FGDs some women talked about their experience as multigravida.

*'I suffer the act of given hot water to my children, but when I introduce exclusive breastfeeding for six months, I saw the difference, the child is very strong.'* (Community member, Bandajuma)



Graph 6. Distribution of exclusive breastfeeding practice vs non-exclusive breastfeeding practice among teenage mothers and mothers above 19 years of age, divided by parity.

### Intentions for breastfeeding during pregnancy

There is a significant association between the intention to breastfeed and the practice of exclusive breastfeeding ( $P < 0.001$ , table 5). Of the mothers surveyed, 66% (129/194) stated that they intended to give breastfeeding when they were pregnant. Of the women who intended to give breastfeeding 78% (100/129) practiced exclusive breastfeeding. 14% (28/194) of the mothers did not have a feeding plan when they were pregnant. This is comparable with the qualitative finding of which slightly more than half of the interviewed mothers indicated that they were planning to give breastfeeding. Only one mother mentioned she was planning to give breastmilk and powder milk.

### Decision-making

A majority of the mothers who stopped exclusive breastfeeding before six months indicated that it was their own decision (41/68, 60%).

*'The baby cried a lot and I tried to breastfeed her, but she did not accept the breast milk, so I boiled small hot water and give to her. After that she felt asleep. It is my own experience what influenced me.'*

(Mother, Gbondapi)

*'I decided myself.....They were all advising me to breastfeed my baby and no one was supporting me about giving corn milk and that of rice pap.'* (Mother, Sahn Malen)

### Given reasons for introduction of anything else besides breastmilk before six months

The quantitative findings tell us that a major reason to feed anything else other than breastmilk to their baby besides breastfeeding is the perception that the baby felt hungry or that the baby was sick as shown in graph 7.

Qualitative data reveals that a major barrier to continue exclusive breastfeeding is the perception that the breastmilk was not enough and ‘the stomach of the baby was dry’ (the stool was not frequent). Other frequent reasons given were that baby was crying and that the mother herself was hungry/lack of food and poverty (box 5). Not mentioned by the mothers but mentioned by HCWs is that some women do not give exclusive breastfeeding because they believe that children get worms if you give only breastfeeding. In addition, breastfeeding problems were mentioned as a barrier to give exclusive breastfeeding. This is confirmed by quantitative data. 9% (18/194) of the women reported to have problems with nipple pain and two-third of these mothers did not give exclusive breastfeeding up to six months. Experience of nipple pain is negatively associated with exclusive breastfeeding (P=0.03, table 5).



Box 5. Quotes related to reasons to give anything else besides breastmilk before 6 months.

*‘When he was 3 weeks [I start giving other food]. That is because my breast was not having enough breast milk.’* (Mother Pujehun)

*‘Because there are times that the breast milk was not enough for him.’* (Mother, Bandajuma)

*‘Her stomach was dried; Her stomach kept drying; She was not able to have a stool.’* (Mother, Zimmi)

*‘Because the baby is always crying. I give hot water.’* (Mother, Bandajuma)

*‘Lack of enough food for the mother, if the mother is not satisfied, she can hardly feed the baby.’* (Mother, Pujehun FGD)

*‘Except if I am hungry, if I am hungry, I will not be able to breast feed the child because my head will twist.’* (Mother, Gbondapi).

Graph 7. Reasons given for giving anything else besides breast milk to their child among surveyed mothers who did not practice exclusive breastfeeding for 6 months

## Individual – Mother-infant relationship

Contributing factors for exclusive breastfeeding mentioned are the love between the mother and the baby when giving breastfeeding. Interesting, the HCWs mentioned about the binding and the love created by breastfeeding, while the mothers do not mention about binding and love. However, mothers perceived it as benefit if they see the child being healthy.

*'It is the bound between the baby and the mother. It creates love between the baby and the mother.'*  
(HCW, Sahn Malen)

*'Whenever I see my baby healthy and strong is a benefit for me.'* (Mother, FGD, Bandajuma)

Figure 5 shows a summary of enabling factors and barriers for exclusive breastfeeding practice in Pujehun district identified in this study.

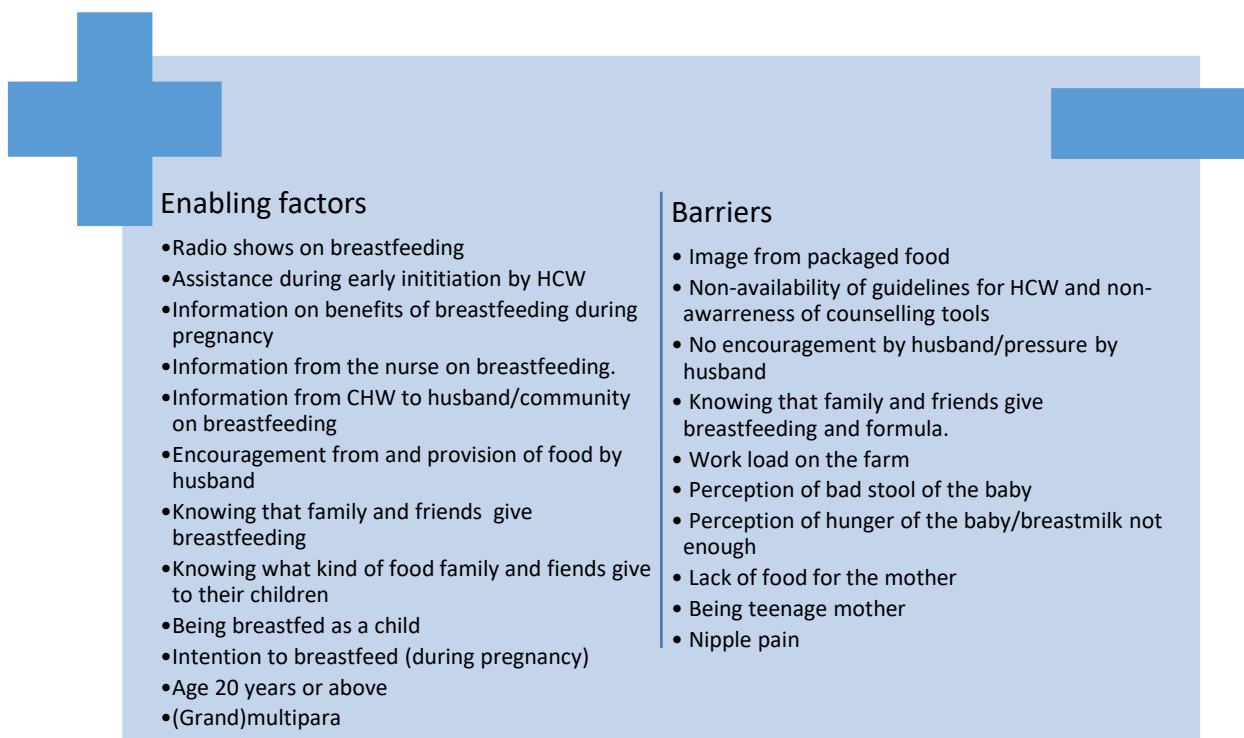


Figure 5. Summary of enabling factors and barriers for practicing of exclusive breastfeeding in Pujehun district

## Other findings

Besides determinants of exclusive breastfeeding, the qualitative data reveals other findings outside the used conceptual framework. These findings regarding complementary feeding and suggested interventions to improve exclusive breastfeeding are described below.

### Perception on complementary feeding

The WHO recommends a minimum dietary diversity of at least four groups of food for a day for children from 6-23 months (8). The groups of food are 1) grain, roots and tubers 2) legumes and nuts 3) dairy products 4) flesh foods 5) eggs 6) vitamin rich fruits and vegetables 7) other fruits and vegetables. Although this study did not address the complementary feeding patterns of children above six months, qualitative data reveals some findings regarding the perception on complementary feeding.

The HCWs explain the mothers how to prepare locally made benimix when the child reach six months of age (containing rice, beans, fish, sesame seeds or groundnuts). Mothers, fathers and community members mention about this benimix during the FGDs. In addition, they mention other local food given to their children like banana, fish, egg, and potato. However, upon the question what mothers give to the children when they reach six months, participants often mention food from a package, like pre-packed benimix and corn milk. Furthermore, formula milk or cowmilk seems to be perceived as complete meal. Also, biscuits and glucose water are mentioned as meal. Furthermore, mothers and HCWs mentioned that some mothers tend to give ORS to their children to complement breastfeeding. Box 6 depicted some quotes regarding (pre-packed) complementary food.

Box 6. Quotes related to the perceptions on (pre-packed) complementary food.

*'Corn milk, the one in the cream packet. Yes, I buy. Because I tried benimix, but he doesn't want to tolerate benimix..... No, only from the packet.'* (Mother Sahn Malen)

*'When she was six months, I used to buy glucose biscuit and drop it in a cup of water allowing the sugar to drain out of the biscuit then I drained the sugar water and put the biscuit in a small pot and steer it to pap.'* (Mother FGD Bandajuma)

*'No, we cannot afford the cost (for formula milk). But for corn milk it's one thousand Leone.'* (Mother FGD Bandajuma)

*'I give hot water with ORS to my baby.'* (Mother, FGD Pujehun)

*'Yes they (HCWs) were talking about Benimix if your baby is six months. As for me the first thing I gave to my baby was Nutrilon (formula milk). After six months.'* (Mother, Sahn Malen)

*'At the age of six months you can now add another food to the breastmilk like corn milk, benimix, glucose in water'* (Father, FGD, Pujehun)

*'Some prefers to buy the biscuits, because the cost of living.'* (HCW, FGD, Pujehun)

*'Even if you child has grown up to 6 months you still have to breastfeed your child. Then, some of them buy milk, Celack, Nutrilon, Cow milk.'* (HCW Sahn Malen)

### Suggested interventions

During FGDs and some interviews, participants were asked about possible interventions to improve breastfeeding practice in Pujehun district. Most suggestions were mentioned by HCWs. Among the suggestions were to continue health talk during clinic, more focus on breastfeeding after delivery in the hospital, and showing videos about breastfeeding in the health centres. Furthermore, it has been suggested by HCW to introduce a rewarding system for mothers who practiced exclusive breastfeeding for six months, e.g. by provide them a certificate or bracelet. Regarding engagement of the community it has been proposed (by HCWs, community members and fathers) to empower CHWs to engage the whole community, including chiefs and elderly, and to have home visits by HCWs and CHWs. Furthermore, it has been suggested to stress on engaging the husband to join the clinic for ANC, e.g. by making it compulsory. Other suggestions by community members and fathers was that exclusive breastfeeding should be compulsory and controlled by by-laws. Regarding the provision of food for the mother and complementary food, it has been suggested to emphasizes on 'backyard gardening' and support gardening by mothers-to-mothers support groups. (Box 7)

Box 7. Suggested interventions by participants of interviews and FGDs.

*'Some don't breastfeed because they don't know, so if we health educate them, tell them why, tell them the advantages, tell them how to, then I am sure they participated in breastfeeding. So, we have to health educate and put the child to the breast and watch them breastfeeding.'* (HCW, hospital)

*'They don't spend much time with us and most of the time we tend to forget to talk about breastfeeding. They deliver, and they are fine. We see them only once. We don't emphasis. With C-Section they stay longer and sometimes we monitor the breastfeeding, but the normal deliveries, before they go home, we talk to some, we can still emphasize more on exclusive breastfeeding, not just breastfeeding.'* (HCW, hospital)

*'How can you improve the breastfeeding? We can show the video. This can even motivate the women.'* (HCW hospital)

*'A bracelet that shows this baby is doing well. So, they tend to want to have a bracelet and want to do well. It is a way to motivate the mother. It is not the money, but just some small things like the bracelet. That shows the baby is doing fine. They tend to be attracted to that.'* (HCW Pujehun)

*'When I was in Massam, we gave a certificate, that exclusive breastfeeding certificate. Some were proud on that certificate. And you will know the different, the once who give exclusive breastfeeding and the once who give mixed feeding. You see. (HCW FGD Pujehun)*

*'Yes, it is a manner of disseminating the message on breastfeeding to mothers who stay far from the health centers. Out posting, during campaigns help to improve this message. You cannot just be an armchair healthcare worker. You should go out to go to the ones who cannot come to the health center. But if you go you have to train more TBAs, CHWs, so they can help do disseminate the message about breastfeeding.'* (HCW Bandajuma)

*'They give herbs, we do not see it. But if we do home visits, we will see, and it will reduce.'* (HCW FGD Pujehun)

*'Yes, let it be compulsory to bring your husband during 1 ANC. Once a month accompanying the wife to the hospital. Yes, that is very important. You get to know what happens with your wife. And the midwife can tell you if your wife is in good condition or not. And she needs drugs to help prevent complications. That is very important. You cannot just impregnate you wife and just let her. Pregnancy is not a disease you know. So, you can accompany her every time to the hospital. I believe that is very important.'* (HCW Bandajuma)

*'Encourage the women to do back yard gardening. Because some things we can just grow in our compound. That would help us a lot. Maybe you don't have money, but if you have the garden you can just go at the back of your house and take some vegetables.'* (HCW district Pujehun)



## Limitations

The study design has limitation. A major limitation of the design is that it is a facility-based survey. This means this study is representative for the population visiting the health centre only as is described in the objective of the study. Although a hard-to-reach population might be excluded, this research shows that there is a need for interventions to improve breastfeeding practice among the mothers who visit the clinic, which is the majority of the mothers estimated based on the immunization rates. Pujehun district has relatively high vaccination coverage. E.g. Oral Poliomyelitis vaccination (OPV) 1, 2, 3 had a coverage of 86%, 86% and 84% respectively in the first 2 quarters of 2017 (unpublished data). Approximately the same vaccination coverage is reached for Pentavalent 1, 2, and 3. Since only mothers for children under two years who will come for immunization and growth monitoring will be selected, the facility-based set up will introduce a selection bias.

Another limitation of this study design is that only people in the catchment area of the CHCs are selected, and not from smaller health centres. This due to time and resource limitations. This approach might result in exclusion of groups living in hard-to-reach areas. However, all health centres in Pujehun district are located at rural locations.

A recall bias could be expected. The questionnaire included questions about the breastfeeding practice just after birth, e.g. whether they received help from somebody (health care worker, relative, etc.) with breastfeeding in the first period after birth. Mothers of younger children might remember this in more detail than mothers of children aged two years, which would result in an overestimation of help by children born in 2017 compared to children born in 2016. Although the exclusive breastfeeding rate is calculated on 24-hour recall (only considered the data of mother of a child under six months of age), the statistically significant factors related to exclusive breastfeeding are calculated based on recall from birth because of the limited sample size.

Regarding the qualitative part of the study, this is a relatively small sample size and collected at limited number of locations because of time and resource constrains. However, using these research tools we gain more understanding on determinants of breastfeeding.

Furthermore, the presence of a researcher during the interviews (for the survey and the semi-structured interview) and FGDs might bias responses of the participant. It might be that participants gave the answer they think they are supposed to give. We emphasized that there are no wrong answers and that everything is confidential and will not be shared with healthcare workers or community members.

Another reporting bias might have occurred regarding the age of the mother. The age reporting is based on self-reporting and not based on identity card. Not all mothers are aware of their age. The age of the child is based on the under-five cards of the child, given to the mother directly after birth at the health center (or given when the family upon registering the child for birth certificate in case of home birth).

## Discussion

This mixed-method study aimed to gain understanding on the current breastfeeding practice in Pujehun district and to reveal determinants regarding breastfeeding practice in this Southern district of Sierra Leone. To understand the current breastfeeding practice, this study made use of the WHO indicators to assess child feeding (8). To investigate and analyze determinants, the analytical framework described by Rollins et al. (29) was used. In this discussion, possible interventions regarding the determinants described in the model will be discussed. A limit of this study and the use of the analytical framework was that the complementary feeding patterns are not assessed in detail in this study.

### Characteristics of participants

As depicted in table 1, the average number of children the mothers ever gave birth to is 3.0. The average number of children born in Sierra Leone is 4.4 for women in age group 35-39 year (1). The means age of the respondents of this study is 24.5 year. The average parity of women in the rural areas is Sierra Leone is 3 in the age group 25-29 year (1). This is comparable with the reported average parity in this study.

A total of 194 women responded to the interviewer-based questionnaire. Of these 194, 43% responded that they did not receive any education while 21% and 35% attended primary and secondary school respectively. Interesting, the mean age of the women who did not attend school was 27 years, while the means age of the women attending school was 23 years and 21 years for primary school and secondary school respectively. A possible explanation might be that school became more accessible over the years (personal communication). The population and housing census of the Statistics Sierra Leone 2015 revealed the same pattern in literacy rate, whereas the literacy rate within the age-group 20-24 year is 56.2% for females, the a literacy rate within the age-group 25-29 year is 38.6% (5).

Regarding the maternal health related characteristics, we see that respondents of the survey have a high ANC attending rate of 99.5% (attending at least one ANC visit). This is higher than the latest published estimates of the District Health Information System (DHIS) 2016 of 88.6% (34). However, the latter is based on national coverage and not Pujehun specific. The DHIS 2017 reveals an ANC rate of 91% for Pujehun district (unpublished data, DHIS, personal communication).

In addition, we observe a high institutional delivery rate of 99%. The national estimates of this institutional delivery rate 2016 is between 72.8% and 87% (34). However, the annual maternal death surveillance report 2017 revealed an institutional delivery rate of 112% for Pujehun district (unpublished data). Furthermore, the Sierra Leone Multiple Indicator survey 2017 reveals an institutional delivery rate of 91% for Pujehun district (6).

Remarkable is the high cesarean-section rate. The cesarean-section rate is skewed for different data collection sides. While the cesarean-section rate of Pujehun collection side was 24%, the cesarean-section rate of the other data collection sides was between 1% and 4%. The cesarean-section rate in the only hospital performing cesarean-section in Pujehun district was 42.6% in 2017 and the cesarean-section rate

among all institutional deliveries 2017 in Pujehun district was 3.2% and (CUAMM data collection, unpublished). A possible explanation for the difference of cesarean-section rates among respondents of different data collection sides might be that mothers stay in Pujehun for a while after the birth of the newborn and come the under-five clinic in Pujehun Town.

### Breastfeeding practice in Pujehun District

This study reveals a reported exclusive breastfeeding rate of 62.8% among children under six months of age. This is an increase compared to the (national) 32% reported in the DHS2013 (22), equivalent to a yearly increase of almost 6%. The results of this study are comparable with the recently published National Nutrition Survey which reveals a national exclusive breastfeeding rate of 61.6% and an exclusive breastfeeding rate of 61.3% for Pujehun specifically (23). The current study reveals a sharp decrease of exclusive breastfeeding practice as children grown older, from 73.7% in children aged 0-1 month to 33.3% in children within the age-group of 4-5 months. Although the exclusive breastfeeding rate is higher compared to the DHS2013, the trend of declining exclusive breastfeeding rate by age of the child is similar (22).

The early initiation of breastfeeding of 71.6% revealed in this study is higher than the 52.7% reported for Pujehun in the National Nutrition Survey (23). The difference might be due to recall-bias. The indicator of continued breastfeeding at one year is comparable in both studies, 100% in the present study vs 97% for Pujehun in the National Nutrition Survey (23). This study reveals that 100% of the children was ever breastfeed. This is comparable with 99.1% (national) reported in the National Nutrition Survey (23). The timely introduction of solid, semi-solid and soft food rate among children 6-8 months reported in this study (70%) is comparable with the National Nutrition Surveys which reveal a rate of 71% for Pujehun district (23). Interesting, the average age of introduction of food revealed in the National Nutrition Survey is 5.7 months (23). While this study reveals a mean age of 3.2 (based on 24-hours recall from mother of children under six months who did not exclusive breastfed) or 3.9 (based recall from birth considering the response of all mothers who introduced anything else besides exclusive breastmilk). This difference might be explained by the set-up of the questionnaire. The National Nutrition Survey based the mean age only on recall from birth asked to mothers of children above six months of age. While the mean age of 3.9 revealed in this study is based on the response of all mothers of children between 0-23 months who indicated to have given anything else besides breastfeeding.

The introduction of the free health care initiative (FHCI) in 2010 might have had an impact on the improvement of breastfeeding practice (35). This initiative introduced free health care for children under five year and pregnant and lactating mothers which increased the accessibility of health care for these groups. Furthermore, key strategies to promote breastfeeding practice were described in the Sierra Leone National Food and Nutrition Security Policy 2012 – 2016 (36). Among others, these key strategies described are integrate feeding counseling for pregnant and lactating women into antenatal, post-natal and outreach services and development of nutrition messages. However, the rapid decrease of exclusive breastfeeding

over age and relatively low rate of timely introduction of complementary food shows that there is still a need for interventions regarding IYCF practice in Pujehun district.

## Determinants of exclusive breastfeeding

### Structural - Social cultural and market context.

This study suggests that the radio can function as mass media tool to inform the community on best breastfeeding practice. In particular, this media is reaching fathers and other stakeholders in the community. Although scientific evidence is limited on the effectiveness of mass media interventions regarding IYCF and breastfeeding practice specifically, studies have shown that mass media interventions in combination with additional behavior change interventions can have a positive influence on improving IYCF including early initiation of breastfeeding and exclusive breastfeeding (37)(38)(29).

This study did not reveal an association between information on formula milk on the radio and exclusive breastfeeding. However, it has been suggested that the picture of the healthy baby on the package of biscuits influence mothers to give these biscuits to their babies. It has been established that marketing of breastmilk substitutes is associated with lower breastfeeding duration (29). Whether the marketing strategies of pre-packed food influence exclusive breastfeeding practice and or feeding practice for children above six months in Pujehun requires further investigation.

### Settings - Health system and services

A significant association between early initiation and the mode of delivery has been revealed from this study. The significantly negative association between a caesarean delivery and early initiation of breastfeeding has been shown in various low-and middle-income countries (39). Furthermore, a Canadian study described that women with an emergency cesarean section were less likely to successfully breastfeed within 24 hours compared to women who had a vaginal delivery. It has been suggested that an operation might effect lactogenesis (40). The present study shows that less women are assisted by an HCW during the first breastfeeding in the hospital compared to women who deliver in a health center. These, together with the qualitative findings that HCWs in the hospital realize that there is not enough time and attention for breastfeeding in the hospital, suggest that there are possibilities for improvement regarding promotion of breastfeeding in the hospital.

The Sierra Leone national reproductive, maternal, newborn child & adolescent health strategy 2017-2021 mainly focus on promotion on breastfeeding during post-natal, infant and childhood period (30). The most recent guidelines include breastfeeding as counselling topic for all eight recommended visits (41). Interesting, this study shows that receiving information on health benefits of breastfeeding during pregnancy and the intention during pregnancy to breastfeed are positively associated with exclusive breastfeeding. Furthermore, the most common place to receive information on breastfeeding is the health center and the women indicated that the nurse has major influences on decision making regarding breastfeeding practice. A previous study in Sierra Leone also indicated that nurses are important

influencers during decision making regarding pregnancy, delivery and first few months of child life's (24). In addition, the fact that the intention during pregnancy to breastfeed is associated with exclusive breastfeeding practice, indicate the importance of the antenatal period, and shows opportunities for promoting breastfeeding by the nurse during the ANC.

All HCWs are aware of their role in promoting breastfeeding during ANC and the new guideline on maternal and obstetric care (implemented after data collection) also includes counselling on exclusive breastfeeding during all ANC visits (41). Although this guideline only indicate that pregnant women should be counselled on exclusive breastfeeding during all the recommended eight ANC visits. The guideline does not include how and on what HCWs are expected to inform pregnant women. In addition, there are no specific guidelines on how to counsel and when to counsel on other occasions beside ANC. Furthermore, there are no guidelines on how to assist mothers in case of breastfeeding problems. Counselling cards on IYCF as counselling tool are available at all health centers and could be used during for counselling. Nevertheless, HCWs do not mentioned about these counselling cards when asking for guidelines, protocols or tools. Although this study shows that the majority of the women received information on feeding for children and benefits of breastfeeding, there are still possibilities to improve counselling e.g. developing and implementation of specific guidelines and by making HCWs more aware of the possibilities of the IYCF counselling cards. Noteworthy, individual or group counselling activities regarding breastfeeding promotion has been shown as effective strategy to improve breastfeeding (29).

Nipple pain, described as individual determinant, is negatively associated with exclusive breastfeeding. Nipple pain might be preventable by correct position and attachment, expressing breastmilk or antibiotic treatment (42)(43). Nipple pain or breast complications has been shown as a barrier for exclusive breastfeeding in other Sub-Sahara African countries (44)(45). Since 9% of the surveyed mothers in Pujehun district expressed to experienced nipple pain in combination with the negative association with exclusive breastfeeding suggests that there are opportunities within the health system to pay more attention on nipple pain among breastfeeding mothers to prevent nipple pain as barrier for exclusive breastfeeding. One opportunity might be to develop guidelines regarding nipple pain and breastfeeding for Sierra Leone.

In addition to a role for the nurse in promoting breastfeeding practice, there seems also be a role for the CHWs in promoting breastfeeding. CHWs can inform fathers and other stakeholders in the villages. As shown in this study, besides the nurse, the father/husband is a major influencer regarding feeding practice of the child. Currently, the CHWs are not actively involved in the health system, although the government of Sierra Leone in collaboration with partners are working towards improvements regarding CHW integration into the health system. As indicated by participants of the FGDs with fathers, community stakeholders as well as HCWs, there seem to be opportunities to promote best breastfeeding practice towards the whole community by CHWs since they are in all villages. In addition, CHWs might help the HCWs in making home visits for follow-up purposes. Furthermore, CHWs might encourage the husbands to accompany the pregnant women to ANC in order to receive more information on breastfeeding and to engage more fathers in promoting exclusive breastfeeding. Although the Sierra Leone health policy regarding nutrition security mention husbands as target group for interventions to improve exclusive breastfeeding(36), there are no specific strategies to target these group. Engaging CHWs to promote best

breastfeeding practice targeting husbands might be a strategy to involve husbands in child feeding decision making.

### Settings - Family and community

This study reveals that besides the nurse, the husbands/fathers of the baby have a major influence on decision-making regarding child feeding. This finding goes in line with a previous study in Sierra Leone (24). The majority of the women who felt supported by their husband practice exclusive breastfeeding. However, there are also husbands who influence women to stop exclusive breastfeeding. Participants of the FGDs mentioned that having sex during breastfeeding contaminates the breastmilk. Although the current study could not identify whether this belief as a barrier for exclusive breastfeeding, this belief has been described as a barrier for exclusive breastfeeding in four districts in Sierra Leone by Sharkey et al. (24). In that study FGD participants suggested that the belief that sex contaminates breastmilk is a barrier for exclusive breastfeeding. Including this topic in health promotion might reduce the impact of this potential barrier.

Although less mentioned in the quantitative findings, the qualitative findings reveal that also other family members and friends influence decision-making. The influence of family and friend are mentioned as supportive factor as well as a barrier for exclusive breastfeeding. Persons who are mentioned are (grand)mothers, mother-law, aunties and fathers of the mother. Sharkey et al. reported that Traditional Birth Attendant (TBAs) were mentioned as influential persons around maternal and newborn issue (24). The mothers participated in this study did not mentioned TBAs as influencers, however, HCWs mentioned that TBAs are still influencing decision-making regarding child feeding, in a supporting as well as barrier for exclusive breastfeeding.

Interestingly, the knowledge that other family and friends breastfed their children has a positive influence of exclusive breastfeeding. In addition, the knowledge that the mother is breastfed herself has a positive influence on exclusive breastfeeding. These findings also has been found other developed and developing countries (46)(44). These findings, in combination with the finding in general that knowing what friends and family give to their baby is positively associated with exclusive breastfeeding, suggest that talking about breastfeeding in the community might have positive influence on exclusive breastfeeding. Mother-to-Mother (peer) support groups can be a platform to interact with other mothers among others about feeding of children. Mother support groups where part of the Sierra Leone national food and nutrition implementation plan 2013-2017 (47) and recommended by WHO as strategy to improve infant and child feeding (9). However, in Pujehun district, the mother support groups are currently not active.

## Settings - Workplace and employment

The majority of the interviewed mothers were self-employed. Quantitative findings do not suggest a negative impact of work on breastfeeding practice. However, qualitative findings suggest that working on the farm might be a barrier for women to exclusively breastfeed their child. This finding suggest that there might be opportunities to targeted farmers and families of the farmer women for breastfeeding promotion, since 59% of the working population on Pujehun district work in the agriculture sector (22). In addition, participants of the FGDs suggested that going to school might be a barrier. However, this study did not explore in more detail the potential barriers of going to school.

## Individual

Although nurses, husbands and other family or friends are influencers regarding breastfeeding, the majority of the mothers participating in this study stated that it was their own decision to stop breastfeeding. Several reasons are given for the introduction of other food besides breastfeeding. A major reason is the perception that the child is hungry and that the breastmilk is not enough, or that the child is crying. A systematic review on influencing factors of exclusive breastfeeding in developing countries has shown that these barriers are found in several other developing countries (44). It has not been determined whether the perception of the mother of not having enough breastmilk is related to the actual breastfeeding supply. However, it might be that other factors are related to the perception of not having enough breastmilk and counselling on breastfeeding might influence this perception. E.g. counselling on the proper techniques of breastfeeding and taking enough time to breastfeed the infant might contributed to better milk production (2). Another reason of giving anything else besides breast milk, mainly boiled water and herbs, is the perception that the baby has 'bad stool'. Participants of the interviews and FGDs refer to the black meconium and to constipation of the infant. Stool of infants can be irregular and can have a variable appearance (48). There is no evidence that the perception of constipation is related to medical issues and the perception might come from inadequate knowledge of stool patterns of infants. Although additional research is needed to establish whether infants suffer from constipation. Providing health information to mothers and community members addressing meconium and 'normal stool' is essential when aiming to prevent children getting water and herbs early in life.

In this study, almost 30% of the mothers are teenage mothers and 27% are primipara. The DHS2013 showed that 48% of all teenagers became childbearing (22). This study reveals that teenagers and primipara are risk groups for non-exclusive breastfeeding practice. These findings are similar to findings in other developing countries (44) and clearly emphasizes the need to target teenagers and primigravida in breastfeeding promotion activities. However, the activities should not exclude multigravida, since the fact that not all multigravida give exclusive breastfeeding. Whether teenagers experience other barriers then non-teenagers, e.g. regarding school which is suggested in this study, requires further investigations.

## Conclusion

In conclusion, although the exclusive breastfeeding rate is not yet optimal, the exclusive breastfeeding rate has been increased over the years. However, the sharp decrease of exclusive breastfeeding rate by age group from 74% in the age group 0-1 month to 33% in the age group 4-5 months shows that more effort is needed to promote exclusive breastfeeding practice for all children under six months. In addition, the relatively low percentage of introduction of solid, semi-solid, and soft food of 70% for children within the age group of 6-8 months and relatively low percentage of age-appropriate breastfeeding shows the need for interventions to achieve better IYCF practices, including breastfeeding practice.

This study reveals that the majority of the women made the decision to stop exclusive breastfeeding herself. However, nurses and husbands have also been shown as influencers on decision making. Enabling factors identified for best practice of breastfeeding are, among others, assistance during the first breastfeeding, receiving information on benefits of breastfeeding during pregnancy, counselling by the nurse, support from the husband and knowing how friends and families feeding their babies. Main barriers identified in this study for best breastfeeding practice are, no encouragement from the husband, perception of bad stool of the infant and perception of not having enough milk production. This study also shows that teenagers and primipara are more likely to go for non-exclusive breastfeeding. However, further research is needed to investigate the needs of teenage mothers and primipara in order to improve breastfeeding practice for these specific groups.

### **Timely introduction of soft, semi-solid, and solid food**

This study did not investigated determinants on the timely introduction of soft, semi-solid and solid food. However, this study revealed that only 70% of the children between 6-8 months are consuming food on daily basis, meaning that 30% of the children in this age group did not get complementary food on daily basis. This indicates a need for further research to assess quantity and quality of supplementary feeding practice of children above six months and to establish determinants on the introduction of food and to address feeding patterns for children above six months.





I advise the DHMT of Pujehun district the following activities. Some activities might need collaboration and support from partners, among other CUAMM, Doctors with Africa.

- In order to improve counselling on breastfeeding by HCWs guidelines would be favorable. It is recommended to advocate on national level to develop specific guidelines on when to counsel, what to recommend to pregnant and breastfeeding mothers and how to handle with breastfeeding problems.
- To organize training sessions on breastfeeding during monthly in-charge meetings with PHU staff and organize on-the-job training regarding breastfeeding. Based on the results of this study, it is recommended to include 1) Awareness raising that HCWs have major influence on breastfeeding practice. 2) Opportunities using of the Nutrition Counselling Cards. 3) Benefits of exclusive breastfeeding. 4) Prevention and treatment of nipple pain. 5) Breastfeeding techniques to increase milk supply. 6) Normal stool patterns of infant. 7) Awareness raising of the fact that teenagers and primipara are risk groups for non-exclusive breastfeeding practice. It is highly recommended to do follow-up on these trainings through supervision, monitoring and evaluation.
- To dedicate staff for breastfeeding support in the hospital and to train health care staff on Baby-Friendly-Hospital-Initiative in order to improve in-hospital breastfeeding support.
- To develop tailored radio messages and broadcast regular radio shows on breastfeeding targeting the whole community in order to inform mothers, husbands and community members, on best practice and benefits of breastfeeding and to encourage husbands and other community members to support breastfeeding mothers.
- CHW program can be re-enforced and training can be given to CHWs on best breastfeeding practice, targeting the whole community and encourage husbands and other community members to support breastfeeding mothers.
- To motivate breastfeeding mothers to practice exclusive breastfeeding, specific motivators can be introduced. An example is to introduce bracelets for all mothers who exclusively breastfed for six months. The distribution of bracelets will not only motivate the mother to exclusive breastfed but might also lead to more discussion in the community on breastfeeding. In addition, the handing over of the bracelets can be an opportunity for the HCW to talk about supplementary feeding.
- It is recommended to re-introduce mother-to-mother groups. These groups give the mothers the opportunity to discuss and learn about breastfeeding. It has been shown that knowing what kind of food friends and family are given to their child have a positive influence on breastfeeding practice. In addition to the discussion and learning process, mother-to-mother groups can motivate mother to start 'back yard gardening'. Growing your own food might contribute to reduce the barrier of 'feeling hungry' among breastfeeding mothers. In addition, it can provide healthy supplementary food for children above six months.
- In order to develop strategies to target teenagers and primipara, it is recommended to contact health partners to collaborate to further explore specific determinants of breastfeeding practice in these specific groups.

Table 8 shows these recommendations and provides a link to the strategies described in table 7. Furthermore, it gives directions who can take the responsibility for implementing activities.

<b>Table 8. Specific recommendation for action in Pujehun district</b>			
<b>Objective</b>	<b>Activity</b>	<b>Responsible person</b>	<b>Strategy (see table 7)</b>
<p>Improve counselling through:</p> <p>Improving awareness among HCWs on barriers and enables of exclusive breastfeeding</p> <p>Development and implementation of national guidelines on breastfeeding</p> <p>Explore determinants of breastfeeding for specific risk groups</p>	<p>Training sessions during in-charge meeting and on-the-job training</p> <p>Supervision and monitoring of HCW</p> <p>Advocated for national guidelines regarding breastfeeding</p> <p>Investigate determinants of breastfeeding practice for teenagers and primipara</p>	<p>DHMT (District nutritionist)</p> <p>DHMT (DMO and district nutritionist)</p> <p>Health partner</p>	3, 4,11
<p>Improve in-hospital breastfeeding support</p>	<p>Dedicate staff for breastfeeding support</p> <p>Train health care staff on Baby-Friendly-Hospital-Initiative</p>	<p>District nutritionist (DHMT) in collaboration with the matron, midwife in-charge and partners (e.g. CUAMM)</p>	2
<p>Inform community members including pregnant and lactating mothers, fathers and other stakeholders on best practice and benefits of breastfeeding</p> <p>Encourage husbands to encourage breastfeeding mothers</p>	<p>Mass media: Develop tailored radio messages and broadcast regular radio shows on Breastfeeding</p> <p>Re-enforce CHWs and train CHWs on best breastfeeding practice</p>	<p>DHMT (district nutritionist) in collaboration with partners (e.g. CUAMM)</p> <p>DHMT (district nutritionist and CHW focal person)</p>	1, 7
<p>Encouragement of breastfeeding mothers</p> <p>Stimulate discussion in community</p> <p>Stimulate counselling on child feeding during clinic visit</p>	<p>Introduce bracelets for all mothers who exclusively breastfed their child for 6 months</p>	<p>DHMT (among others district nutritionist and District health sister) in collaboration with health partners (e.g. CUAMM)</p>	8,10
<p>Encourage discussion about breastfeeding among mothers</p> <p>Encourage 'backyard' gardening for food supply</p>	<p>Re-introduces mother-to-mother peer groups</p>	<p>DHMT (among other district nutritionist and district health sister) in collaboration with health partners</p>	8, 12

## References

1. Statistics Sierra Leone (SSL). Sierra Leone 2015 Population and Housing Census national analytical report. Sierra Leone; 2017.
2. Amir LH, Bearzatto A. Overcoming challenges faced by breastfeeding mothers. *Aust Fam Physician*. 2016;45(8):552–6.
3. Shoman H, Karafillakis E, Rawaf S. The link between the West African Ebola outbreak and health systems in Guinea, Liberia and Sierra Leone: A systematic review. *Global Health*. 2017;13(1):1–22.
4. Brolin Ribacke KJ, Van Duinen AJ, Nordenstedt H, Höijer J, Molnes R, Froseth TW, et al. The impact of the West Africa Ebola outbreak on obstetric health care in Sierra Leone. *PLoS One*. 2016;11(2):1–12.
5. Statistics Sierra Leone (SSL). Education and Literacy. Sierra Leone 2015 Population and Housing Census Thematic Report on education and literacy. 2017.
6. Statistics Sierra Leone. Sierra Leone Multiple Indicator Cluster Survey 2017. Sierra Leone; 2018.
7. World Health Organization. The Optimal Duration of Exclusive Breastfeeding - Report of an Expert Consultation. *Dep Nutr Heal Dev Dep Child Adolesc Heal Dev*. 2001;(March):10.
8. World Health Organization. Indicators for assessing infant and young child feeding practices. WHO Press. 2008.
9. World Health Organization. Global strategy for infant and young child feeding. Geneva, Switzerland; 2003.
10. World Health Organization. Infant and young child feeding Factsheet July 2017 [Internet]. 2017 [cited 2017 Nov 14]. p. 2–7. Available from: <http://www.who.int/mediacentre/factsheets/fs342/en/>
11. World Health Organization (WHO). 10 facts on breastfeeding [Internet]. 2017 [cited 2019 Jan 10]. Available from: <https://www.who.int/features/factfiles/breastfeeding/en/>
12. Victora CG, Bahl R, Barros AJD, França GVA, Horton S, Krasevec J, et al. Breastfeeding in the 21st century: Epidemiology, mechanisms, and lifelong effect. *Lancet*. 2016;387(10017):475–90.
13. Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS. How many child deaths can we prevent this year? *Lancet*. 2003;362(9377):65–71.
14. Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M, Ezzati M, et al. Maternal and child undernutrition: global and regional exposures and health consequences. *Lancet*. 2008;371(9608):243–60.
15. World Health Organization, UNICEF. Innocenti Declaration. In: WHO/UNICEF policymakers' meeting on "Breastfeeding in the 1990s." Florence, Italy; 1990. p. 2.
16. World Health Organization (WHO). Baby Friendly Hospital Initiative [Internet]. [cited 2019 Jan 10].

Available from: <https://www.who.int/nutrition/topics/bfhi/en/>

17. UNICEF, World Health Organization (WHO). Baby-friendly hospital initiative : revised, updated and expanded for integrated care. World Health Organization. 2009. 23 p.
18. Tadesse T, Mesfin F, Chane T. Prevalence and associated factors of non-exclusive breastfeeding of infants during the first six months in rural area of Sorro District, Southern Ethiopia: a cross-sectional study. *Int Breastfeed J*. 2016;11(1):25.
19. Nankumbi J, Muliira JK. Barriers to infant and child-feeding practices: A qualitative study of primary caregivers in rural Uganda. *J Heal Popul Nutr*. 2015;33(1):106–16.
20. Bezner Kerr R, Dakishoni L, Shumba L, Msachi R, Chirwa M. “We Grandmothers Know Plenty”: Breastfeeding, complementary feeding and the multifaceted role of grandmothers in Malawi. *Soc Sci Med*. 2008;66(5):1095–105.
21. Worldbank. Assessed 21 November 2017. <https://data.worldbank.org/indicator/SH.DYN.NMRT?end=2016&locations=SL&start=1989&view=char>.
22. Statistics Sierra Leone (SSL) and ICF International. 2014. Sierra Leone Demographic and Health Survey 2013. Vol. 36. Sierra Leone; 2014.
23. Directorate of food and nutrition, Government of Sierra Leone Ministry of Health and Sanitation. Sierra Leone national nutrition survey 2017. Sierra Leone; 2018.
24. Sharkey A, Yansaneh A, Bangura PS, Kabano A, Brady E, Yumkella F, et al. Maternal and newborn care practices in Sierra Leone: a mixed methods study of four underserved districts. *Health Policy Plan*. 2016;(August 2016):czw104.
25. UNICEF. Assessed 18 July 2017. [https://www.unicef.org/nutrition/sierraleone\\_35185.html](https://www.unicef.org/nutrition/sierraleone_35185.html).
26. Issaka AI, Agho KE, Page AN, Burns P, Stevens GJ, Dibley MJ. Determinants of early introduction of solid, semi-solid or soft foods among infants aged 3-5 months in four Anglophone West African countries. *Nutrients*. 2014;6(7):2602–18.
27. Government of Sierra Leone Ministry of Finance and Economic. United Nations the 2030 Agenda for Sustainable Development Advanced Draft Report on Adaptation of the Goals in Sierra Leone. Sierra Leone; 2015.
28. World Health Organization. Essential Nutrition Actions: improving maternal, newborn, infant and young child health and nutrition. Geneva, Switzerland; 2013.
29. Rollins, B., Hajeerbhoy, Horton, Lutter, Martines, Piwoz, Richter V. Why invest, and what it will take to improve breastfeeding practices? *Lancet*. 2016;387(10017):491–504.
30. Ministry of health and sanitation Sierra Leone. Sierra Leone national reproductive, maternal, newborn, child and adolescent health strategy 2017-2021. Sierra Leone; 2017.
31. Emmanuel A, Clow SE. A questionnaire for assessing breastfeeding intentions and practices in Nigeria: validity, reliability and translation. *BMC Pregnancy Childbirth*. 2017;17(1):174.
32. World Health Organization. Indicators for assessing infant and young child feeding practice. Part

2. World Health Organization. Geneva, Switzerland; 2008.
33. Gale NK, Heath G, Cameron E, Rashid S, Redwood S. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Med Res Methodol.* 2013;13(1):1.
  34. Government of Sierra Leone Ministry of Health and Sanitation. Annual Health Sector Performance Report 2016. Sierra Leone; 2016.
  35. Witter S, Brikci N, Harris T, Williams R, Keen S, Mujica A, et al. The Sierra Leone Free Health Care Initiative (FHCI): process and effectiveness review. *Hear (Health Educ Advice Resour Team).* 2016;(May).
  36. Ministry of Health and Sanitation. Sierra Leone National Food and Nutrition Security Policy 2012 - 2016. Sierra Leone; 2012.
  37. Graziose MM, Downs SM, Brien QO, Fanzo J. Systematic review of the design , implementation and effectiveness of mass media and nutrition education interventions for infant and young child feeding. *Public Health Nutr.* 2017;21(2):273–87.
  38. Kim SS, Rawat R, Mwangi EM, Tesfaye R, Abebe Y, Baker J, et al. Exposure to Large-Scale Social and Behavior Change Communication Interventions Is Associated with Improvements in Infant and Young Child Feeding Practices in Ethiopia. *PLoS One.* 2016;11(10):1–18.
  39. Takahashi K, Ganchimeg T, Ota E, Vogel JP, Souza JP, Laopaiboon M, et al. Prevalence of early initiation of breastfeeding and determinants of delayed initiation of breastfeeding: Secondary analysis of the WHO Global Survey. *Sci Rep.* 2017;7(February):1–10.
  40. Hobbs AJ, Mannion CA, McDonald SW, Brockway M, Tough SC. The impact of caesarean section on breastfeeding initiation, duration and difficulties in the first four months postpartum. *BMC Pregnancy Childbirth.* 2016;16(1).
  41. Government of Sierra Leone Ministry of Health and Sanitation. National Protocols and Guidelines for Emergency Obstetric and Newborn Care. Sierra Leone; 2018.
  42. NTVG. Richtlijn Borstvoeding (2015, multidisciplinair). Netherlands; 2015.
  43. Lisa H Amir, Anita Bearzatto TRAC of GP. Overcoming challenges faced by breastfeeding mothers. Australia; 2016.
  44. Balogun OO, Dagvadorj A, Anigo KM, Ota E, Sasaki S. Factors influencing breastfeeding exclusivity during the first 6 months of life in developing countries: A quantitative and qualitative systematic review. Vol. 11, *Maternal and Child Nutrition.* 2015. p. 433–51.
  45. Adujna B, Tadele H, Reta F, Berhan Y. Determinants of exclusive breastfeeding in infants less than six months of age in Hawassa, an urban setting, Ethiopia. *Int Breastfeed J.* 2017;12(1).
  46. Begley C, Gallagher L, Clarke M, Carroll M, Millar S. The national infant feeding survey 2008. Dublin, Ireland; 2008.
  47. Government of Sierra Leone Ministry of Finance and Economic. National food and nutrition security implementation plan 2013-2017. Sierra Leone; 2013.
  48. Marks K. Infant and toddler nutrition. *Aust Fam Physician.* 2015;44(12):886–9.

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# Appendix

## Appendix 1 Cross sectional survey

### Breastfeeding perceptions and practice

Facility

\_\_\_\_\_

Data of interview

\_\_\_\_\_

Code

\_\_\_\_\_

1. In what month and year were you born?

yyyy-mm-dd  
\_\_\_\_\_

2. Please tell me your age.

\_\_\_\_\_

3. What is your highest level of educational?

- No formal education
- Primary
- Secondary
- Tertiary

4. Are you married or do you have a boyfriend or are you single?

- Single
- Married / boyfriend

5. What is your occupation?

- Employed
- Housewife
- Self-employed
- Student
- Others

6. How many children did you give birth to?

7. How many children are alive?

\_\_\_\_\_

8. When was the last time you gave birth? Date of last birth

yyyy-mm-dd  
\_\_\_\_\_

9. Do you have an 'under 5 card' for the child you come with for the vaccinations? Can you show me for the date of birth?

yyyy-mm-dd  
\_\_\_\_\_

10. What is the name of your child you come with?

\_\_\_\_\_

11. Is it a male or female?

- Male
- Female

12. Did you ever breastfeed (NAME)?

- Yes
- No

13. How long after birth did you first put (NAME) to the breast?

- Less than 1 hour
- Less than 24 hours
- More than 24 hours

14. Was (NAME) breastfed yesterday during the day or at night?

- Yes
- No
- I don't know

15. Sometimes babies are fed breast milk in different ways, for example by spoon, cup or bottle. This can happen when the mother cannot always be with her baby. Sometimes babies are breastfed by another woman, or given breast milk from another woman by spoon, cup or bottle or some other way. This can happen if a mother cannot breastfeed her own baby. Did (NAME) consume breast milk in any of these ways yesterday during the day or at night?

- Yes
- No



16. Did (NAME) eat any solid, semi-solid, or soft foods yesterday during the day and/or night? Like formula milk (baby milk), powder milk, juice, yogurt, pap, fruits, rice vegetables, herbs, (hot)water or other food apart from breast milk.

- Yes  
 No

17. When you were pregnant, how did you plan to feed him/her in the first six months?

- Breast milk  
 Formula (babymilk)  
 Combination of breast and formula (babymilk)  
 Others  
 I didn't have any plans.

18. What kind of food did your baby have for his/her first feed?

- Breast milk  
 Formula (babymilk)  
 Local herbs  
 Water  
 Other

19. If you give anything else than breastfeeding, how old was your baby when you first introduced anything other than breast milk? (in months).

\_\_\_\_\_

20. If you give anything else than breastfeeding, what was the main reason that led you to choose the way you fed this baby?

- My baby felt hungry  
 I do not produce enough milk  
 I was advised by relatives to do so  
 I was advised by health care workers to do so  
 I was advised by the TBA to do so  
 My baby was sick  
 Time/work related activities did not allow me to give breastfeeding only  
 Others  
 I only give breastfeeding

21. If your baby had any fluid other than breast milk in the early days of breastfeeding (water/formula/sugar water/local herbs), was it because you were advised to or because you wanted your baby to have it?

- I was advised to give anything else  
 I wanted to give my baby something else  
 I only gave my baby breast milk in the early days

22. Was your baby born in the hospital or at home?

- PHU  
 Hospital  
 Home

23. Thinking of the birth, what type of delivery did you have?

- Normal  
 Caesarean section

24. How big was your baby when he/she was born?

- Small  
 Normal size  
 Big

25. Did you have skin to skin contact with your baby after he/she was born (in the first hour after he/she was born) to start breastfeeding?

- Yes  
 No  
 I can't remember

26. If you had skin to skin contact, who assisted you?

- I was not shown how to give breastfeeding  
 Nurse/MCHaid  
 Friends /relative  
 Others

27. Did they stay with you while you were breastfeeding?

- I was not shown how to breastfeed.  
 They stayed the whole time until the baby was asleep  
 They left once the baby was feeding but came back to check on me  
 They left once the baby was feeding and did not come back to check on me  
 They left before the baby had started feeding

28. How useful did you find this help?

- I was not given any help at all at this time  
 Very useful  
 Not very useful  
 Not useful at all.

29. On the day that you left hospital after the birth of your baby, or after 2 days if you had a home birth, how did you feed your baby?

- Breast milk  
 Formula (babymilk)  
 Combination of breast and formula  
 Expressing breast milk  
 Breast milk or formula and other food or fluids  
 I don't remember.

30. After you left the hospital or 1 day after birth at home, did you receive any home visit from any of the following?

- Nurse  
 TBA  
 Community Health worker  
 No visit in the first two weeks from any of these above

31. After the birth of your baby, did you went for postnatal visit to the health clinic?

- Yes  
 No

32. Did you attend any antenatal care when you were pregnant with your child?

- Yes  
 No

33. Did anyone discussed feeding your baby with you during pregnancy?

- Yes  
 No

34. While you were pregnant with your baby, did you receive any information about the health benefits of breastfeeding?

- Yes  
 No

35. Where did you received this information?

- Health Center  
 Relatives  
 TBA  
 Others  
 I didn't receive information

36. What kind of feeding did your friends and family give to there babies when they were small?

- Most of them gave formula  
 Most of them breastfed  
 About half of them formula fed and half breast fed  
 Other food  
 I don't know

37. How were you fed when you were a newborn baby?

- Breastfed  
 Formula fed  
 Breast and formula milk  
 Other food  
 I don't know

38. Who or what helped you most to continue breastfeeding?

- Own experience  
 Friends/other mothers  
 Mother in law  
 Husband  
 Other relatives  
 Health professional (Nurses/Doctors)  
 Peer or support groups  
 Voluntary organizations  
 Magazine/Radio  
 Others

39. If you stopped with breastfeeding: Who or what influenced you to stop giving breastfeeding only and nothing else?

- Own experience
- Friends/ other mothers
- Mother in law
- Husband
- Other relatives
- Health professional (Nurses/Doctors)
- Peer or support groups
- Voluntary organizations
- Magazine/Radio
- Others
- I still give breastfeeding only and nothing else

40. Were there problems breastfeeding your baby in the early days?

- Yes
- No

41. Since your baby was born, have you had any of the following as a result of breastfeeding?

- Mastitis (inflammation of the breast tissue)
- Thrush
- Nipple pain
- None of the above
- Others

42. Did anyone give you help with problem (difficulty with breastfeeding) in the early days?

- I didn't have any problem
- Nurse helped me
- Friend/relative helped me
- Members of local support group helped me.
- Nobody helped me
- Others

51. Which of the following best describes breastfeeding your baby?

- I would like to have breastfeed for longer
- I breastfed for as long as I intended
- I had breastfed for longer than I had intended
- I still breastfeed

52. For how long (in months) did you breast feed your previous baby?

\_\_\_\_\_

43. How do you intend or did you intended to continue feeding your baby till 6 months?

- Breast milk
- Formula
- Combination of breast and formula
- Porridge
- Others

44. How long do you intend or did you intended to feed this baby with breast milk only? ( in months). So nothing else, like (hot)water, formula milk, juice, pap, but breastfeeding only.

\_\_\_\_\_

45. At what age of your baby will you stop or did you stop breastfeeding entirely? ( in months)

\_\_\_\_\_

46. Have you ever seen an advertisement on radio, posters or in a magazine or elsewhere for breastfeeding?

- Yes
- No

47. Have you ever seen an advertisement on radio, posters or in a magazine or elsewhere for infant formula?

- Yes
- No

48. Since your baby was born, have you ever feed him/her in a public place?

- No-I never fed in a public place
- Yes-Breastfed in a public place
- Yes-bottle fed infant formula in a public place
- Yes -bottle fed expressed breast milk.
- Yes -other foods

49. Have you ever had problems finding somewhere to breastfeed your baby in a public place?

- Yes
- No

50. Is it possible to breastfed at your workplace?

- Yes
- No
- Not applicable

## Appendix 2 Guide semi-structured interviews

### Semi-structured interview with mothers of children <2 year

Facility:                      Date:                      Code survey:                      Number recording:                      Women EBF/NEBF child/>6 month

#### Personal background

- Age
- Age of the baby in months:
- Children alive
- Education
- Marital status

#### Breastfeeding practice

- Before your baby was born, can you tell me how you were planning to feed your baby, and can you tell me why you plan to feed your baby that way?
- When your baby is/was 6 months or younger, can you tell me how long do you intend to feed this baby with breast milk only and no other food or fluids? And can you tell me the reasons why?
- If you give anything else than breastfeeding. How old was your baby when you first introduced anything other than breast milk? And can you tell me the main reason for giving other food or fluids than breast milk?
- If you gave anything else, what was it? Like, hot water, formula milk, pap, native herbs, yoghurt, rice or vegetables?
- Do you experience difficulties with giving breastfeeding? Can you explain? (physically (pain)/time/work/social). Can you describe some of the challenges you encounter?
- How do you feed your child when he or she was sick in the first 6 months?

#### Support and information

- What or who influenced you on the way you are feeding your baby? (Family/health care worker/TBA/community members) And what do they tell you?
- Did you receive any information about breastfeeding while you were pregnant? If so, where did you receive the information? What did they tell you? What do you know about the benefits of breastfeeding?
- If you went to antenatal care visit, what did the nurse tell you about feeding of your baby?
- Do you want to tell me anything else about how you experience breastfeeding?

## **Semi-structure interview health care worker**

### **Personal information**

- Age
- Workplace
- Cadre

### **Role of the HCW**

- Can you tell me what do you think is the role of the health care worker in promoting breastfeeding?
- Can you tell me what kind of information do you give to the mother about breastfeeding (frequently/exclusive breastfeeding/position)?  
And at what moments do you give this information? (ANC/PNC/after delivery/home visits)
- Do you think the health care system is doing enough to promote exclusive breastfeeding practice? If not, what would you suggest improving in the health care for more promotion of exclusive breastfeeding?

### **Support for HCW to provide quality care**

- Did you receive training about breastfeeding? When?
- Are you aware of guidelines, policies and tools about breastfeeding promotion in the health care system? If yes, can you briefly explain to me about the content of these documents and how they are useful for you?

### **Reason for women to breastfeed or not to breastfeed**

- What do you think are the main reasons for the women to give exclusive breastfeeding?
- What do you think are the main reasons for the women to stop with exclusive breastfeeding?
- Who or what influence decision making around child feeding?

## Appendix 3 Topic guide FGDs

### Focus group Discussion mothers of children <2 year

<p><b>Experiences with breastfeeding</b></p> <p>Probes:</p> <p>Your own experiences Experiences from other mothers Positive/ negative/ problems/ challenges Benefits of breastfeeding Risks of non-exclusive breastfeeding Taboos Influenced in choice making by e.g. husband, family, in-laws, TBA, HCW, other</p> <p>Food apart from breastfeeding Preparation of food Complementary feeding Formula milk/water Influenced in choice making by e.g. husband, family, in-laws, TBA, HCW, other</p>
<p><b>Reasons to choose or not for breastfeeding</b></p> <p>Breastfeeding/no breastfeeding Information - ANC/radio HIV infection</p>
<p><b>Assistance to give breastfeeding from:</b></p> <p>Nurse Husband Mother in law Family Other</p>
<p><b>Stopping of breastfeeding:</b></p> <p>No milk Pain Work Age of child Sickness of mother Other</p>
<p><b>How can Hospital /HCW facilitate in giving breastfeeding</b></p> <p>Information Discussion groups Others</p>

## Focus group Discussion Father

<p><b><i>Father knowledge about breastfeeding</i></b></p> <p>Own experience with you partner and child Positive/negative Information from mother of the child/HCW/community members/others Food for baby from 0 to 6 months Food for baby at 6 months and after Taboos</p>
<p><b><i>Role for the father</i></b></p> <p>Agreement with mother regarding breastfeeding Role for the fathers Support mother Gather information Seeking care for mother of the child Others</p>
<p><b><i>Support for mother during breastfeeding</i></b></p> <p>Care for the mother Help with household Take care of other children Other ways</p>

## Focus group Discussion Community-members

<p><b><i>Feeding of young babies in the community</i></b></p> <p><i>Breastfeeding</i> <i>Exclusive breastfeeding</i> <i>Water</i> <i>Native herbs</i> <i>Pap</i> <i>Benimix</i> <i>Other</i> <i>Feeding above 6 months</i> <i>Feeding by mother/father/siblings/others</i> <i>Food for mothers</i></p>
<p><b><i>Decision of feeding of young children from</i></b></p> <p><i>Mother</i> <i>Mother-in-law</i> <i>Father</i> <i>TBA</i> <i>HCW</i> <i>CHW</i> <i>Others</i></p>

## Focus group Discussion Health Care Workers

<p><b><i>Experience how women feed their baby</i></b></p> <p><i>Breastfeeding</i> <i>Exclusive breastfeeding</i> <i>Water</i> <i>Local herbs</i> <i>Pap</i> <i>Rice</i> <i>Package of food</i> <i>Other</i></p>
<p><b><i>Role for HCW</i></b></p> <p><i>Support to women</i> <i>Information –Which information / when giving information</i> <i>Information on complementary feeding</i> <i>ANC</i> <i>Postnatal care</i> <i>Vaccination days</i> <i>Problems with breastfeeding</i> <i>Information sharing with community</i></p>
<p><b><i>Support from Government on breastfeeding for HCW</i></b></p> <p><i>Guidelines</i> <i>Policies</i> <i>Training</i> <i>Tools</i></p>
<p><b><i>How can improvement be being made in Pujehun regarding breastfeeding</i></b></p> <p><i>Information to women /community</i> <i>Hospital</i> <i>Guidelines</i> <i>Training</i> <i>HCW</i> <i>CHW</i></p>

## Appendix 4 Coding framework

<b>Themes and coding framework for qualitative data analysis</b>	
Theme	Coding
Sociocultural and market	Contributing factor Barrier Neutral Intervention
Health system and service	Information nurse/hospital benefits Information nurse/hospital Disadvantage non-exclusive BF Information during ANC Influence Barrier Neutral Intervention After 6 months Training of nurses
Family and Community	Contributing factor Barrier Influence Experience Knowledge for other than mother Neutral Intervention After 6 months
Workplace and employment	Contributing factor Barrier Neutral Intervention
Mother and infant attribute	Contribution factor -knowledge Contribution factor -experience Barrier Neutral Intervention After 6 months
Mother and infant relation	Contribution factor Barrier Neutral Intervention



## Appendix 5 Ethical considerations

This study involves human participants, therefore ethical implications are being considered according to four main ethical principles.

### **Respect for autonomy**

Participation to the study is voluntary and participants have the right to refuse from participation at any time without given reasons. Participants are informed about the aim of the study, the procedure and confidentiality (written inform sheet has been read out in appropriate language (English/Krio/Mende)) which among others, include that the choice to participate or refuse to participate did not affect health care delivery of job evaluation (for the health care worker). All participants were asked to sign a written consent form in an appropriate language (English/Krio) before the participants participate in the study. In case of illiteracy a literature witness signed, and illiterate participant included their thumb print as well. All interviews and the FGDs took place in convenient place which ensures privacy. The data is transcribed anomalously.

### **Bon-maleficence**

We foresee only minimal harm for the participant related to the time the participant spends for the study.

### **Beneficence**

The participants do not directly benefit from this study. However, this study provided inside in the perception and knowledge of the women on breastfeeding practice. The obtained knowledge will contribute to further development interventions aiming to improve breastfeeding practice. Improving breastfeeding practices aims to benefit younger children as well as the community.

### **Justice**

Written policies are followed by the research team to ensure fair procedures. Raw data of the survey and transcripts of the interviews and FGDs will be stored for five years. The results from the study will be presented in a written report and will be presented to (local) authorities. In this manner, knowledge obtained during this study will be available to others.

## Appendix 6 Follow up of the study

### **Results of this study has been presented**

- To all CHOs who are in charge of supervision of all health centers, including the CHOs in-charge of the facility of the study locations
- To HCWs in Pujehun district and DHMT members
- The report on this study will be available for CUAMM headquarters, CUAMM Sierra Leone country office, DMO and other DHMT members, and CHO supervisors (who supervise all health centers in the district).
- Planned activity: Presentation on a quarterly National Mother and Child Health Meeting for MoHS and implementation partners.

### **Adoption of the recommendation**

- Doctors with Africa, CUAMM has adopted the following activities into the 2019 planning (to be implemented in collaboration with DHMT Pujehun district)
  - Develop tailored radio messages and broadcasting of radio shows regarding breastfeeding
  - Support the hospital to improve in-hospital breastfeeding support
  - Introduction of bracelets for mother who exclusively breastfed for 6 months